CHAPTER-ONE

Introduction

1.1 General Background

Nepal, with an area of 147,181 Sq. km. and around 23.2 million populations, lies in the lap of the Himalayas between the two giant neighbors, India and China. These two countries have been linked with Nepal from the time immemorial by geographical, cultural, economic and social ties. (NRB: 2006, p.1)

Nepal is one of the richest countries in the world in terms of bio-diversity due to its unique geographical position and latitudinal variation. The elevation of the country ranges from 70 m above sea level to the highest point on earth, Mt. Everest at 8,848 m, all within a distance of 150 km with climatic conditions ranging from subtropical to arctic. This wild variation fosters an incredible variety of ecosystems, the greatest mountain range on earth, thick tropical jungles teeming with a wealth of wildlife, thundering rivers, forested, hills and frozen valleys. Administratively, Nepal comprises five development regions east, west, central, med west and far west, 14 zones and 75 districts. Each development region has a development center and from there development activities for the region are administered. Within each district, there are nine illakas, each of which comprises a varying number of village development committee areas. The national capital, Kathmandu situated within the central development region. (FNCCI: 2000, p. 15)

Topographically, the country can be divided into three well-defined physio-geographical belts running parallel to each other from east to west. The Terai region covers 23 percent of the total land area with 44 percent of the total population. This region is located to less than 600 meters above the sea level, which is predominantly flat and alluvial land. The hill region

covers 50 percent land of the total land area of the nation with 48 percent of the total population. It is located to 600-2000 meters above the sea level, including the various ranges of the Himalayan foothills. Similarly the mountain region covers 27 percent of the total land area with 8 percent of the total population, over 2000 meters above the sea level comprising the Himalayan range and touching some portions of the Tibetan Plateau (FNCCI:2000, p.15).

In Nepal, the monsoon period with heavy rains occurs between mid June and September. About 82 percent of the precipitation is confined to the monsoon period. A number of rivers flow from north to south originating from the snow of the mountain Himalayan range. The river system of the country is made up of three main rivers Gandaki, Kosi and Karnali and their tributaries. There is plentiful perennial streams in the hill, and seasonally fluctuating rivers and shallow and deep ground water in the Terai. There is an average of 53 village development committees in each district having the total of 39,015 village development committees in 75 districts.

The population of Nepal has always been increasing because of its high growth rate, the number of birth is higher than the number of death. The word's population is growing up by 80 millions per year. In Nepal the total population will reach to 32.7 million by 2015 (UNDP/HDR, 2000, p. 125). The annual population growth rate is recorded as 2.1 percent. About 81 percent of the total population is depending on agriculture. The large and rapidly growing population makes reversal contribution to all environmental problems. So far as the water problems are concerned in the terms of population, the water problems have become ever more severe.

Nepal is rich in natural resources but due to poor economic conditions, peoples do not have good access to safe drinking water facility. So, they are suffering from various kinds of disease, for example typhoid, cholera, jaundice and amoebic dysentery. The water resources are not

available near most of the rural areas. The government of Nepal thinks over such problem and has stared to invest annual budget for good management of the drinking water and sanitation sector. Now, various INGOs, NGOs and other social institutions have also started to work in the field of drinking water and sanitation.

Drinking water is the basic need of all human beings and provision of convenient, safe, clean and adequate drinking water is the declared commitment of government of Nepal. It has been realized that the development of water supply and sanitation sector (WSSS) brings in enhanced socio-economic benefits and public health improvements. Population growth, rapid urbanization and industrialization are imposing rapidly growing demands of water supply, and it pressurizes the government for the development of water resources. The growing imbalance between the demand and supply has brought various problems. Lack of drinking water, there is pollution, and environmental degradation. As a result, a high incidence of water related diseases causes significantly low productivity in our small country. Inadequate access to safe water supplies, combined with poor environmental sanitation conditions and personal hygiene practices are major factors impeding the improvements to health condition in Nepal. Poor water supply, sanitation and hygiene conditions have given rise to diarrhea, dysentery, hepatitis and parasitic diseases, and have exacerbated anemia and malnutrition among children. These diseases frequently take an epidemic form causing sudden heavy demands of health services, which have only limited resources to combat these outbreaks.

Most of the people accept that water supplies should provide free as a social services, because they argue that water is freely gifted by nature. Water supply traditionally in Nepal, has also been considered as a social service and it is felt to be the obligation of a government or those in power to supply water very cheaply and of necessary, even free. It should be

remembered that there is in such things as a free lunch in the world, because everything has a cost for production. Supply of water also incurs cost. So, with increasing cost of providing services the responsible authorities cannot provide freely or heavily subsidized drinking water in Nepal.

There is a long standing tradition of charging a very small amount for water. So, the revenue received from this system is very low. This has not only placed a heavy burden on the government but also has often led to inflationary borrowing.

The first piped water supply system in Nepal dates back to 1985 AD. When water was brought into some areas of Kathmandu, the system was known as Bir Dhara. Although the planned period started from 1956-62, greater stress on the development of rural water supply was stressed from the fourth plan period (1970-75) onwards. The advent of the international water supply and sanitation decade (IWSSO), a national plan for the sector was prepared so as to cover 67 percent of the total population with piped water supply and some 13 percent with adequate sanitation facilities. Adequate thrust was given during the national plan periods (sixth and seventh) and failed for the development of the sector with the allocation of some 4 percent of the national annual budget for the water sector along. The achievement though was for less to that the ambition target in both water supply and sanitation during the decade, but the impetus that was given for the sector development was, however, an encouraging development. In 1972, a separate agency dealing inclusively with the sector was realized and department of water supply and sewerage (DWSS) was established. DWSS since then it has been responsible for supplying water to rural and some urban areas of Nepal. The water supply and Sewerage Board (WSSB) was established in 1973 to take care of sector development in some major urban centers. WSSB was subsequently turned in water supply and sewerage corporation (WSSC). In 1984, it was renamed as Nepal water supply

corporation (NWSC) 1990. 3 municipalities outside the valleys are the working area of the Nepal water supply corporation. The municipality water supply system are run under the DWSS also had set a target to handling over to the NWSC gradually. For the development of small scale water supply projects with the population size 1500 or less of the local level with the maximum participation from the beneficiary communities, the ministry of local development was held responsible.

The eight plan aimed at raising the drinking water supply coverage to 72 percent of the population. The actual average was 61 percent. On the other hand, in the sanitation field where the plan target was raising the sanitation the actual coverage achieved was 20 percent. The effect of different projects, large scale private housing construction with one side sanitation all over the country, and greater awareness of the people account for his increase.

During the plan period the additional 3852 thousand peoples of the rural sector and 739 thousand peoples of the urban area (sector), the total 4591 thousand will be provided additional drinking water facility according to the objective of availing the facility of drinking water of minimum service standard to all the people by the end of the tenth plan.

Table: 1 Drinking water facility by the end of the Tenth Plan

Population in thousand

S.N.	Particulars	Population		Total
		Rural sector	Urban sector	
1	Benefited population up to FY 2058/59:	14388	2630	17017
2	Percentage of benefited people up to FY 2058/59:	70.9	76.0	71.6
3	The population to be benefited from the existing system by FY 2063/64:	15115	2974	18089
4	Additional population to be benefited during the period of the tenth plan.	3852	739	4591

Sources: NPC, Tenth Plan, 2002, p. 515.

National planning commission has published the tenth plan document emphasizing the need of people's participation and private sector improvement in drinking water and sanitation sector. The plan covers the broad issues of development of water supply in rural areas. It adopts an ambitious target of providing safe drinking water to all by the end of the plan.

Every year March 22 has been celebrated as the world water day. But in reality, many rural parts of Nepal have been suffering for lack of safe drinking water. The government claims that roughly 71.6 percent of the population has access to safe drinking water currently but critics say the situation may not be as bright. In remote hill area of Nepal, many poor communities must fetch water from sources up to 15 km away, with women and children carrying it on their backs over such distances. (ADB: 2001, p. 26)

Lack of water supply and sanitation is the problem of the nation as a whole. Parbat district is not an exception for it. Being a hilly area there is a high cost involved in supplied water and the revenue received from water tariff is nominal. On the other hand, the demand for water is increasing every day, and the supplied piped water is insufficient to meet the demand of the people due to several causes as well as the leakage of water. So the current question is how to increase to supply of water and reduce the leakage of water. The appropriate pricing of water may help in water supply and decrease in leakage of water.

1.1.1 Planned Development and Budget Allocation for Water Supply and Sanitation

As per need for development planning in the less developed 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 keeping in view for the welfare of unprivileged groups of the country. This is the reason for which the Tenth Plan has mentioned poverty alleviation as one of the main objectives as the five years development plan of the country. It has prepared a program for alleviating poverty with the concept of twenty year perspective plan, which has a formulate a clear and about the living standard of the poor community effectively. The plan has made an outlay of Rs. 234029 million, out of which social services are getting the highest share of 38.6 percent followed by agriculture, irrigation and forestry, 24.0 percent electricity, gas and water 15.4 percent, transport and communication 15.6 percent trade, hotel and restaurant 1.5 percent, industry and mines 1 percent, finance and real estate 1.2 percent and the miscellaneous 2.8 percent. (NPC: Tenth Plan, p. 51)

To provide safe drinking water and to control water born diseases, various efforts were made by the government sectors as well as by private sectors at the beginning of the planned development. Among them, people 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 people participation only from the 8^{th} plan. Expected success could not be achieved and only 71.6 percent of the total population got an access of drinking water at the end of the ninth plan period. Among them 71 percent of the people of rural area and 76 percent of urban area were benefited during this plan period. (NPC: Tenth Plan, p. 498)

With the advancement of democracy in February 1950, and more prominence has been given to the drinking water since the first five year plans to tenth five year plan, with the increasing allocation of annual budgets and in plan periods development of urban water supply projects gradually extended to the urban areas could fulfill the limited peoples demand of drinking water supply. But in the beginning of the first and

second plan periods, more funds and construction of water supply systems were conducted only in important urban centers and district head quarters.

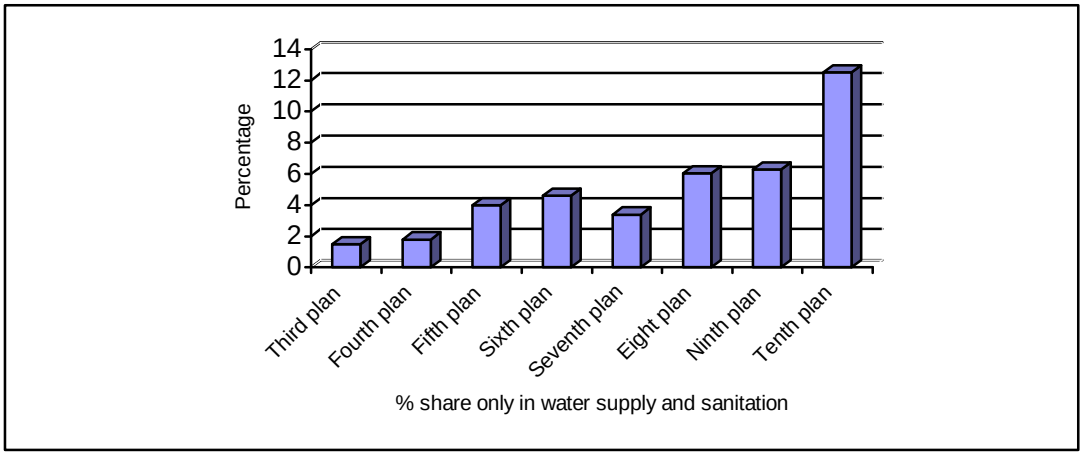
Table: 2 Budget allocation to the water supply and sanitation sector (Rs. in million)

Plan period	All sector	Water/sanitation sector	% share only in water supply and sanitation
Third plan	2101	31	1.5
Fourth plan	5048	92	1.8
Fifth plan	10985	437	4.0
Sixth plan	21750	100	4.6
Seventh plan	29000	989	3.4
Eight plan	87080	5258	6.04
Ninth plan	18958	1190.20	6.38
Tenth plan	23402.9	2922.00	12.5

Sources: National Planning Commission.

From third five year plan the construction of drinking water schemes was also extended to rural areas of Nepal during the past 10-15 years. Approximately 2000 rural and urban water supply projects have been implemented by various government and non-governmental agencies up to the end of 1990.

Figure: 1 Budget allocation to the water supply and sanitation sector (Rs. in million)



1.2 Statement of the Problem

Though, Nepal is one of the poorest countries of the world, it is rich with the various natural resources. Nepal is known as the second biggest country in water resources, but it has been found no satisfactory utilization because of the poor economic condition and other domestic problems, such as lack of technology, unskilled manpower etc. Therefore, these resources are not properly used. Safe drinking water and the environmental sanitation is the recent phenomenon in Nepal. Most of the urban water supply schemes are intermittent seasonally and contaminated by human and animal waste.

There are various problems, which are overviewed in VDC level in getting access to drinking water and sanitation of the study area. Firstly, it has been very difficult to manage the position of taps because of the lack of large source of water. The houses are not near to each other. As a result, one tap covers only 2-3 houses and another tap covers 5-15 houses. Because of this random settlement, it has been very difficult to supply water in this area properly. Likewise, the programs like training, seminar, discussion have not been held regularly. So in the lack of public awareness, there has been problem of sanitation in the study area. Females are busy in domestic works. So it seems that females participation is very less than the participation of male in the construction.

Likewise, the people of the study area are poor and they are living with poor economic condition because of the lack of income generation activities. So they don't have affordability to water services. Similarly, the study area doesn't have proper market. So the vegetables, fruits produced by the people haven't been consumed and there is declination of income generation activities. Because of the lack of industrial development of this rural area, people are obliged to live poorly.

The increasing population in Pang VDC demands more quantity drinking water than ever before. Consequently, the supply of drinking water

needs to be increased. As the increased in demand has not been met by corresponding increasing in water supply, Pang VDC has been experiencing water shortage in recent years. The present study is confined to water supply and sanitation in Pang VDC area of Parbat district along with the people's participation and it's impact in the society. Still there are many issue, which has not been properly addressed they are:

1. What is the condition of water supply and sanitation?
2. How do people get drinking water easily?
3. How do they show their participation in water supply and sanitation program?

1.3 Objective of the Study

The general objective of the study is to identify the economic implication of the water supply and sanitation of Pang VDC of Parbat district. The main objective of the present study are as follows:

1. To identify the status of rural water supply and sanitation in the Pang VDC of Parbat district.
2. To assess the level of local people's participation/absorptive capacity, affordability in water supply and sanitation sector in the study area.
3. To measure the impact of water supply and sanitation on the people of the study area.

1.4 Significance of the Study

Water is recognized as one of the most important basic needs of the people. Provision of safe drinking water in adequate quantities is the present requirements 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 in these days. The government policies are to ensure sustainability and ownership by the users groups, particularly in the rural areas.

Water resources of drinking water are in the condition of scare. These are being drought and population is increasing rapidly. So, assessment of drinking water and proper sanitation management will be a challenging matter.

The study had importance both in National and local level. In national level it is helpful to make policies to remove poverty and other problems of the rural area. Not only that, but also the study helps many institutions and associations to make plan for the development regarding many rural areas like the study area. Besides, the study informs about the present and past situation in terms of water supply and other subjects. The study provides the history of water supply and gives real information about the study area. It is useful to know the improvements and changes. It also gives focus on people's participation, gender awareness, income generation and affordability which are essential for the policy makers of national and local level. It will be also helpful to researchers, students and persons interested in this sector.

1.5 Limitation of the Study

The study is fully focused on the area Pang VDC of Parbat district. So results of this study may not represent the problems of the country as a whole. But the study has observed some social condition, economic condition and affordability of water supply and sanitation in a micro level conducted within a short span of time. This study is based upon the water supply and sanitation problems.

1.6 Organization of the Study

The dissertation has been divided into six chapters. The first chapter deals with the introduction of the subject matter including issues and problems, objectives and rational of the study. Similarly, various studies are made in the second chapter through review of literature. The third chapter is about research methods of the proposed study. The fourth chapter is the

description of the study area. The fifth chapter is data analysis and presentation of the findings. The six chapter focuses on conclusion and recommendation.

CHAPTER-TWO

Review of Literature

There are different scholars, academician and different books, journals, previous research works, reports, acts, articles, plans and policies, other published and unpublished documents who contribute the literature on water supply and sanitation development. Their studies include different aspect of rural water supply and sanitation development. Some of the study has been discussed as following;

Great pressure is being exerted on the water resources of many developing countries, particularly those located in arid or semi–arid regions. Acute water shortage exists in many areas of the world and is likely to become more severe in future years. In some areas further economic growth will not be possible until adequate additional water supply become available. In other areas failure to increase the water supply may well result in standards of living being reduced below present levels. Water shortage is one of the most important problems facing administrators and policy-makers in many developing countries (UN, 1965).

The rehabilitation of damaged water and sanitation system immediately following world war-II, primarily dealt with the municipal systems in the more industrialized countries. Some part of world interrupted by new doubts of human conflict. This development process, helped by great scientific technical and industrial advances seems to be spreading with the positive benefits. The problem now, especially in the field of water supply and sanitation, which requires a global awareness and major investment along with the participation by the communities concerned is to help promote the courage of entire population in spite of the rapid increase in their numbers (UNICEF,1986).

It has the evident over the part form decades that determining the effect of water supply and sanitation and other environmental factor of health and sequent the social and economic condition of communities and in particular on children was a much more complex matter than had at first been realized, biomedical, epidemiological, immunological, nutritional and other research, combined with technical developments and social science development have provided insight which now make it possible to plan more purposefully for remedial action. The recently intensified action in the field of human resources development is an important factor in strengthening the special basis of water supply and sanitation program. This includes the training of people at all level, governments, technical support staff, social worker and above all community workers, themselves.

An estimated 1,800 million people need improved water supplies in the fifteen years to the end of the century, if developing countries are to reach the target of full coverage. The first half of the international drinking water supply and sanitation decade has seen increases in the percentage of rural population with access to safe water supplies, but only in Asian has the pace been quick enough to envisage a target of essentially full coverage by end of the century, to make a lasting impact on the urgent needs, community water supply strategies must be based on sustainable and replicable programmes, and must take account of the pace at which resource constrains can be over come. Human resource development programmes take time to produce result and institutional changes can only be accomplished gradually (W.B., 1987).

An analysis of ADB's water operations shows positive trends. For such concerns as the in corporation of social and environmental dimensions, increased water user responsibility and water use efficiently, cost recovery, institutional strengthening, quality control, and monitoring arrangement. ADB's water projects, however, tended to be identified , processed,

administered , and evaluated within their sub-sector context, reflecting the fragmented approach to planning and implementing water projects in most DMCs. For example, legal aspects of water allocation have been addressed in less than one quarter of approved projects, and only one third of the projects included water conservation measures. This tends to confirm that ADB's water loans have in the past, focused largely on improving water services (supply-side solutions) in a sub-sector context, and that relatively few have addressed water resource issues, including water scarcity and efficient allocation of water between different uses. The striking lesson from ADB's involvement in water related projects is that, as competition for water increases a more comprehensive and integrated approach to water operations is needed to encompass goals of social welfare, environmental integrity, and economic productivity. A new generation of water projects with an integrated approach to supply and demand management has emerged. (ADB, 2000 Annual Report).

Thought rising levels of industrial emissions of pollution pose a serious threat to the health of urban inhabitants in developing countries, at present the two most important environmental factors affecting the health of the urban poor are the inaccessibility of clean water and the lack of sanitation. It is estimated that 1 billion people worldwide have no access to clean water and an additional 1 billion live in areas with chronic water shortages; 1.7 billion have no access to sanitation. Between 1970 and 1980, the number of urban households in the developing world without adequate sanitation rose by 247 percent and those without safe water increased by 56 percent. In 1995, at least 25 percent of urban communities (and 58% of rural ones) were without clean water for sanitation needs. Because there are no alternative sources, many of poor collect drinking water from rivers, streams, and canals that are polluted with human excreta and chemicals. Investment in clean water and sanitation can essentially provide economic returns because relatively small initial outlays may be used to avert the

much larger costs associated with urban crises. It is imperative, however, that efforts to provide improved urban sanitation and clean water be carried out simultaneously in rural areas (M. P. Todaro/Stephen C. Smith, 2003).

During the past two decades, there have been a larger number and variety of initiatives in rural areas and informal urban settlements to develop systems of community ownership and management of basis drinking water and sanitation services. Usually, NGOs have acted as intermediaries between communities and the authorities to help work out structures and systems (technological and financial), organize and fund training of community level workers, and enable water users associations and local water management committees to become established.

One factor in many successful schemes has been the participation of women as managers, village mechanics and health motivators. There has also been a strong emphasis on information–sharing and social mobilization. Choice of technology, and the potential for the community to run it and pay for the service, is critical. There is little point in providing electrically pumped supplies, or even hand-pumps, if breakdowns cannot be repaired. Communities are often well aware of their limitations (ADB, 2004).

At the world summit on sustainable development, governments. Rightfully put pressure on themselves to deliver adequate sanitation and safe drinking water by 2015 to halve the proportion of people without access. They also confirmed the target of developing water resources management plans by 2005 a commitment first agreed at the Rio de Janeiro Earth summit a decade before.

The re-solution does not include any target for quantity. Clearly, water that is not used for drinking does not need to meet these standards. Particularly in rural areas, people may tap a number of different water sources depending on what the water is to be used for and its availability, which may be seasonal (Water Resources Journal –2004 UN).

Drinking water supply and sanitation sector is widely studied in Nepal. The earlier studies concentrated mainly in technical field and in providing the piped drinking water supply in the country. In the beginning, technical issues related with the supply of drinking water in the urban areas were taken prominently to study. Later, water supply in the rural areas were taken with the supported of UNICEF to improve the life of the people 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 and Government of Nepal has been implementing rural water supply programs in different parts of the country for the last one and half decade. This has really increased the coverage for drinking water in the country. The 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 as the important requirement for the initiation of the rural drinking water projects in the country. Under the ADB project, 22 district plans were prepared. These plans have provided the general background on the status of water and sanitation in these districts.

The water resources act (1992) published by government of Nepal/ministry of law and justice, law book management board, has been enacted to address the need to make arrangement for conservation, management, rational utilization and development of water resources in Nepal; and to make timely legal arrangement for determining beneficial uses of water resources preventing environmental and other hazardous effects and also for keeping water free from pollution. This impact priorities the water use as drinking water, irrigation, other agricultural are: hydropower, industrial use, navigation, recreational uses and other uses (Government of Nepal, 1993).

Ministry of housing and physical planning (MHPP, 1989) had reported on the existing situation of the water supply systems in some towns of Nepal. It has also highlighted the needs and investment required for the water supply. It has pointed out several shortcomings and also forwarded many proposals for reforms. These include need for more water treatment plants upgrading the existing supply, networks and proposals for the control of contagious water borne diseases.

The Nepal water supply corporation published "Management Information Report" for all its staffs, to provide monthly record and dates, information related with production of water, connection, metering and meter – reading, tanker service, billing and collection financial position and others keeping this in mind that the water supply and sewerage to be managed systematically (NWSC, 1995).

The "Mid-term Evaluation of Drinking Water and Sanitation Programme" published by CREHPA have evaluated the programme conducted by Nepal Red Cross Society and Japanese Red Cross Society. The objective of the mid term evaluation is to assess the impact of drinking water and sanitation programme on the community in the project areas of the Terai and hill districts (CREPHA, 1996).

Government of Nepal/national planning commission has published the tenth plan documents emphasizing the need for more decentralization, provide basic drinking water and sanitation, reduce child mortality rate by controlling water borne disease, cost recovery, community participation and private sector involvement in water supply and sanitation sector. It has adopted an ambitious target of providing drinking water to all by the end of the plan (GN /NPC, 1998).

The impact of drinking water supply among the villagers, during the field work, the respondent informed that the villager are more affecting from the availability of drinking water. The villagers had to fetch drinking water

from far distance. Mainly in April, May and June in both villages. It was very difficult to fetch drinking water. But after the completion of drinking water project, the two villager are well facilitated with drinking water thought pipes (Thapa, 1998).

Generally, every one knows that clean drinking water saves life, and unclean drinking water is harmful. The impact of drinking water in different aspects of villager's life has improved. All of the people informed that their life is better than before due to availability of drinking water in the village like the people replied that drinking water has direct impact on the following issues:

- Adequacy of drinking water in quality and quantity.
- Children are able to go school clean.
- Able to feed water to livestock.
- Starting of kitchen garden.
- Time saved.

Government of Nepal has been implementing rural water supply programs in different parts of the country for the last one decade. The ADB supported program has initiated from the third phase onwards. In such studies, the socio-economic variable, such as, ethnicity, income level, affordability and cost sharing have been considered in the selection of the schemes (ADB, 1998).

Nepal and Japanese red cross society has launched the fourth phase of the DWSP (1989/99 to 2002/03) with more emphasis on the institutional development in Chitwan, Sarlahi, Saptari, Jhapa and Panchthar. The programe covers altogether 15 VDCs during the period (NRCS, 1998).

The most commonly recognized the impact of improved sanitation will be the health status of the people. Economic benefit will be derived on health care both of the individual and the country improved sanitation can also contribute to promotion of tourism (DWSS and UNICEF, 2002).

The drinking water project has saved many women and children from the strenuous task of collecting water has helped them save their time, which is being used in more productive activities (NRCS, 2003).

Likewise, with the availability of the clean water nearly, there has been an increase in the frequency of bathing, washing and people made free from the skin disease. People feel in the mind that each and every households should have a toilet. As a result, there has been an increase in the number and use of latrines. So, the environment surrounding streams, ponds, rivers agricultural lands and bushes have also greatly improved.

Before the project, the water and food borne disease such as diarrhea, dysentery and worm infection were high in all the study communities. The housewives also used to suffer continuously from a number of respiratory illness due to constant exposure to indoor smoke as released by traditional stoves, with the introduction of this project, the water , food and filth borne disease are not only minimize, but also nearly eliminated as reported by diverse group of study participants (NRCS, 2003).

Government of Nepal/National Planning Commission has published the population monograph the source of drinking water are different like that piped water, Dug-well, Spout water and other. Safely improved of drinking water is difficult to classify water sources as safe or unsafe without laboratory test. Contamination at sources, water collection points, water collection jars, locations of storage within households etc. are common factors that pollute water. Information on reliability of water supply services and quality of water supplied has yet to be collected. So rather than classifying water source as safe or unsafe it is more practicable to classify water source as improved or unimproved source. In general, water from piped line and Tube-well is considered as improved sources of drinking water. Hence in this report, analysis is based on assuming water from piped line and Tube-well as improved source of drinking water.

Overall, 53.4 percent household in Nepal is served by piped water. The second common source of drinking water is Tube-well/Borehole 28.6 percent followed by well 9.1 percent and spout water 6.5 percent. Still, 1.5 percent households draw water from river/stream and 0.9 percent draw water from some other sources. Combining the percent of households with access to improve source of drinking water comes to be 82 percent. Distribution of drinking water by source is not homogenous across the regions. Sixty-six percent households draw water from piped line in urban sector whereas the corresponding for rural sector is 51 percent resulting in a 15 percent point difference in piped water as water source used by place of residence (NPC, 2003).

The piped water is considered as a source of safe water. Only 14 percent of households in Nepal have access to drinking water piped to the house and 30 percent have their drinking water piped but outside the house. The remaining 56 percent of households depend on covered well 37 percent, open well 5 percent and others 14 percent. Access to piped water is positively associated with household consumption. 39 percent of households in the richest quintile have their drinking water piped to their housing units. Only 3 percent among households in the poorest quintile. Most accessible facility in the country is the source of drinking water more than 98 percent of households are within 30 minutes of this source. Disparities across regions or consumption groups are minimal (NLSS 2003/04, Vol-1).

At the national level, 25 percent of households say drinking water facility is "good" while 52 percent report "fair" and the remaining 23 percent say "bad". 37 percent of households in the mid-west and the far-west perceive this facility to be in poor status, these figures for other development regions are smaller Kathmandu valley among urban areas and the west MTS/hills among rural areas, in particular, have more than one- third of their households dissatisfied with drinking water supplied by the

government. Once again, disparity in "bad" perceptions across consumption quintiles is minimal (NLSS, 2003/04, vol-2).

Nepal water supply corporation published the annual report, which has the objective of providing compact yet important information to his customers and various agencies about the corporation's organizational structure, areas where it provides its services, technical, financial, administrative and social activities and annual progress.

Nepal is rich in water resources but the challenging situation is in supplying water to high population density areas like the capital. Every year there has been a quantitative increase in the consumption of water, but the greatest challenge for the corporation is to narrow the gap between the production and supply despite supplementing the production, improvement and supply management in an equitable and effective manner through the preparation and competition of various projects. To overcome the scarcity of water supply in the future, in the context of the lengthening deadline of the long-term Melamchi project, the implementation of short term and long-term projects is another big challenge for the corporation (NWSC, 2005).

As global loss of biodiversity has been a threat food security, water issue and to publish health. However, strategic planning for the convention on biological diversity has raised. Some critical issues in this aspect. A billion people in the world don't have enough to eat and the population is growing. It makes vulnerable livelihood move resilient by providing risk spreading option across a range of species rather than relying on a few that may become susceptible to disease, pests, climate change and market collapse (Subedi, D.R., 2005).

Prasai in his report of a rural drinking water project has indicated that the project had various problems such as water leakage, pipe breaking, and corruption in office and electricity interruption problems for supplying the water sufficiently. The waste management disposal, health and sanitation,

education and improved cooking stoves and the mobilization of people for drinking water and sanitation in sustainable manner have been recommended. Before the implementation of drinking water project, the villagers had big problem of drinking water and they had to fetch from far distance. However, at present, they are well facilitated with the drinking water due to availability of drinking water the sanitation sector has also been improved so the health problems such as diarrhea and other diseases are decreasing in the villages. There has also been improvement in the socio-economic condition and increase in the tourism activities (N.R. Prasai, 2004).

The rural water supply and sanitation fund development board has been working in the drinking water and sanitation sectors. It has prepared project implementations plan. For RWSSP–II after the successful implementation of RWSSP-I, it has been mainly focusing to promote cost-effective and sustainable demand driven rural poverty with full emphasis on community ownership and responsibilities.

The Board strategies and program components of project–II which is to ensure sustainable access to improved water supply and sanitation service will be achieved by: (a) integrating health and hygiene programs with water supply services ; (b) strengthening governmental and nongovernmental capacities to facilitate the delivery of rural water supply and sanitation capacity to operate and maintain improved water supply and sanitation facilities; (c) strengthening community to operate and maintain improved water supply and sanitation facilities; (d) empowering and providing opportunities to women/girls as the primary beneficiaries by involving them in planning, implementation and management of the schemes; (e) ensuring that Dalit and Janajati households in the catchments areas are also included and that these groups participate fully in the planning implementation and management of the schemes; (f) assisting women to use the time saved in

collecting water to identify ways to increase income; (g) reducing the time spent by girls in collecting water thus allowing increased school enrollment and retention of girls in school (RWSSP, 2005).

The general review of above mentioned literatures contain about water supply and sanitation development. The present study is an attempt to investigate. Its production, expenditure capacity and consumption in the Pang VDC of the Parbat district.

CHAPTER-THREE

Research Methodology

A research undertaking must be equipped with research methodology. Research methodology is a format of methods that has to be followed as guiding principle in a scientific study. It is a science of methods/rules and it deals every step of method. Different method can be applied in some research. In order to achieve the objectives of the research, methodology is necessary. This research also adopted some specific methods. In this chapter, the research method used to conduct the present study by collecting required information needed for the study is discussed. It deals with selection of the study area, the research design, universe and sampling procedure, nature and sources of data, technique of data collection and the analysis of the data.

3.1 Selection of the Study Area

The one village; Pang village development committee of Parbat District is taken as study area for the present study. Pang VDC has 1,015 households. Three wards in Pang VDC were selected by purposive, non-random sampling method. These are ward numbers 1, 2 and 3. The study area contains various characteristics as ward no. 1 has moderate population density, health facility is accessible and dinking water facility is poor. Ward no. 2 has low population density, health facilities are rare, drinking water facility is poor. Ward no. 3 has high population density, health facility is accessible and drinking water facility is relatively better than other wards. The people do not have safe drinking water and health facilities. The purpose of the study is basically to explore the problems, impact socio-economic status change, people's participation and situation of the drinking water supply and sanitation of the Pang VDC. In fact, it is because water plays a significant role in the overall development of the country, indirectly. In order to alleviate poverty and develop the overall socio-economic status

of the nation, natural resources, mainly water resources, should properly be utilized.

3.2 Research Design

The present study is based on exploratory as well as descriptive research design. Because it explains the situation, people's participation and it explores the impact of drinking water and sanitation. In order identify the problem, available literatures are studied. This has helped in identifying the problems of the particular study area.

3.3 Universe and sampling

Three wards of Pang village development committee of Parbat district were selected by the present disscrtant on the basis of purposive sampling on the basis of verities of localities, people's drinking water facility and sanitation management. Among 75 households 25, 22 and 28 respondent from ward no. 1, 2 and 3 were selected by simple random sampling methods. Because for crosscheck and qualitative information.

Total 24 checklist, 8 checklist to each ward is filled by respected people as social worker, official member, political leader etc. by purposive non-random sampling methods.

3.4 Respondents

Information are the main pivot of research. Without actual data research can not be fruitful. Thus, source of information should be accurate and appropriate. Respondents are extremely important sources. Therefore, in this research the head of the households were taken as the respondents. Apart from them, key informants, teachers, social workers and local political leaders were also the sources of the information collected.

3.5 Nature and Sources of Data

The nature of data in this study is both primary and secondary. Beside it, data are also qualitative and quantities nature. Primary data were collected through fieldwork using observation, questionnaire, interviews, key informants survey and others. And the secondary data were collected from various sources such as: various journals, articles, papers, reports, books records, Act and regulation related to water supply and sanitation. Secondary data have been used to extend and elaborated to strengthen the context provided by the primary data.

3.6 Technique of Data Collection

We know that the reliability and validity result of any research depends on its techniques used for data collection. Hence, for every study, the data collection techniques are most important to obtain reliable information. This study has also used different techniques such as questionnaire, interview, observation, and key informant interviews.

3.6.1 Questionnaire

Questionnaire is list of questions asked to respondents to obtain actual facts. In this study, many questions were used to get actual information about the drinking water and sanitation sector. Mainly, structured and unstructured questionnaires were used for the collection of data for selected households. Checklists were developed to conduct the interviews with the respective respondents.

3.6.1.1 Structured question

Only one set of structured questionnaire was used per household. These questionnaires contained both close and open ended questions. Household survey was conducted to gather more information with the help of structural questionnaire. Questionnaire consisted of questions as situation,

people's participation and impact of water supply and sanitation sector of the study area.

3.6.1.2 Unstructured questionnaire

During the period of research unstructured questions were prepared to get the information on socio-economic variables. A total of 75 sampled households were interviewed using this questionnaire to collect socio-economic condition, water supply and sanitation situation, people's participation, health and waste management of the sampled households. Basically, key information were asked several cross questions to get reliable data. These types of questionnaire were very helpful to obtain required facts.

3.6.2 Observation

Observation is the basic tool for the collection of qualitative data in the fieldwork. Participation and non-participant observation were the main source for obtaining primary data. Both observation were used in this study. Observation was conducted to study existing situation, impact, personal health and sanitation, waste management and participation in the study area. In reality observation intensively helps to obtain primary data connecting with water supply and sanitation using local people's disputes as well participation methods.

3.6.3 Key informants

Key informants are important sources of data collecting with the help of some social workers, political leaders, teachers, poorer household, aged person and female heads were purposively selected as key informants. So it was ensured that they to be included in the sample. They were interviewed so as to know about various aspects on the drinking water and sanitation management. So, key informants helped to find out fact in the research and helped to find out detail information about the study area.

3.6.4 Focus group discussion

Focus group discussion was very compatible during the field survey and success to achieve reliable information. In focus group discussion was held with user, users' group, personnel and VDC officials to obtain the level participation, affordability and willingness to pay to the service.

3.6.5 Interview schedule

Under interview schedule a set of questionnaire was prepared to obtain the information from the respondent, administration of drinking water office and concerned authorities. The questionnaires were about drinking water and sanitation management.

3.7 Data Analysis and Interpretation

Information does not speak by itself. The information collected in the field, which should be analyzed and interpreted in order to make the research meaningful. Analysis is the careful study of available facts so that one can understand and draw conclusions from them on the basis of established principle and sound logic. For the purpose of this study, the different data obtained by using various sources which are scanned and tabulated under different headings. Data gathered from primary and secondary sources and they analyzed according to their nature. Qualitative data has been descriptively analyzed whereas quantitative data has been analyzed and interpreted on the basis of statistical tools like percentages and different charts.

CHAPTER-FOUR

Setting of the Study Area

4.1 Introduction of the Study Area

Parbat district is a hilly and backward area located in the western development region of Nepal. It is one of the four district of Dhaulagiri zone. The total area of this district in 494 sq. km., at the central of Syanja, Mygdi, Gulmi, Kaski and Baglung districts. In administrative point of view, there are 55 VDC, 11 Ilak and two electoral constituency (CBS, 2001). According to census 2001, the total population of the district is 1,57,826, among them 84,884 (53.79%) are female and 72,942 (46.21%) are male. The total number of household in Parbat district is 32,731 and the population density is 3191 sq. km. It is located between $27^0$88" latitude and $83^0$39" longitude and situated 850 m. to 3500 m. from the mean sea level.

Pang VDC is situated in Parbat district. It is 7-14 km. away from Kusma, the district headquarters. It lies in the north west part of the headquarters. It lies between $28^0$14'42" from $28^0$14'00" north latitude and $83^0$36'40" from $83^0$39'30" east longitude. It is situated 720m (Kali Gandaki, Sahasra Dhara) to 2180m (Tohre) from sea level. The total population of pang VDC is 5967, among them Dalit people are 850 (D.P. 2061 B.S.). Pang VDC consists of various caste/ethnic groups but the dominating groups are Brahmin. Nuclear family system is the main feature of the social structure. On the northern part of Pang VDC lies Banau VDC, on the sourther lies Baglung district, on the west lies Nangliwang VDC and on the east lies Khurkot VDCs.

4.2 Physical Setting of the Pang VDC

Administratively, Parbat district in divided into 55 VDC, Pang VDC is one of them. The total area of this VDC is 866.05 (ha) with 984 households. Pang VDC is located about 7 to 14 km. from the district

headquarters and east to west length about 6 km. and north to south about 8 km. It is situated 720 m to 2180 from sea level. There are 16 villages in the VDC which are as follows:

Table: 3 Number of village in the VDC with different wards

Ward no.	Village name	Height
1	Sahasra Dhara, Vpalo Bahaur, Kunako Chaur	720-800
2	Tala Ko Pang, Simle, Birauta	800-820
3	Tar	820-900
4	Sarikate, Subedi thar	900-920
5	Nuwar	920-1000
6	Khariwata, Tohre	920-2180
7	Chachar kot	1000-1700
8	Dhavdhake, Aagakheta	1000-1500
9	Sidhali	1200-2180

Source: Village Profile of Pang VDC.

4.3 Climate

The area of Pang VDC is small with geographical point of view, but diverse climatically. The climate of his VDC can be divided into two broad categories: warm temperature and cold temperature. The temperature of the VDC is flexible. During the winter season -5^{0}C from 2^{0}C to summer season 29^{0}C from 36^{0}C temperature can be found. The average temperature is 16^{0}C to 27^{0}C. The study area receives maximum 100 mm. and average 4000 mm to 5000 mm rainfall annually.

4.4 Population Distribution

Population plays a vital role in the drinking water and sanitation management of the study area. The growth of the number of people is viewed as a national problem. It generates a number of problems which have a multiplier effect on national phenomena.

According to CBS the total population of Parbat district is 157826 and the number of households is 32731. The total number of males is 72942 and of the females 84884 in the total population. The total number of males is 72942 and of the females 84884 in the total population. The total population of Pang VDC is 5967 in 984 households. The total number of male population is 3038 and of the females 2929. The population of Brahmin is the largest among other caste/ethnic groups. Pang VDC has 58 settlement, 23 settlement are scatter and 8 settlement are cluster and 27 settlement neither scatter nor cluster.

Table: 4 Ward-wise population composition of Pang VDC

Ward	H.H.	Male		Female		Total	
		Number	Percent	Number	Percent	Number	Percent
1	91	256	8.42	230	7.85	486	8.15
2	64	170	5.60	162	5.53	332	5.57
3	95	278	9.16	283	9.63	561	9.40
4	129	419	13.80	405	13.83	824	13.81
5	145	515	16.95	468	15.98	983	16.47
6	141	428	14.08	400	13.66	828	13.88
7	114	360	11.84	371	12.67	731	12.25
8	115	339	11.15	331	11.30	670	11.23
9	90	273	8.98	279	9.52	552	9.25
Total	984	3038	100.00	2930	100.00	5967	100.00

Source: D.P, 2061.

As seen in the above table, the total population of the VDC, the number of male exceeds female. In ward no. 2, the population is the least when in ward no. 5, the population is the largest.

4.5 Economy of the Village

As in other rural parts of the country, the economic activity of the people of Pang VDC is based on agriculture. Almost all the population is engaged in agricultural activities. The main agriculture products are rice, wheat, maize, potato and millet. Besides agriculture animal husbandry, vegetables are most of the young generation are engaged foreign employment in India and in west countries. Due to the lack of cultivated land as well as unequal distribution of land, more than half of the population does not produce enough food to feed them for the year. Very few people are involved in non-farm activities. Some people are working in government offices. The income source of VDC is based on different sectors.

The farmers sale rice, maize and milk in the local bazaar. Beside these, farmers, keep the goats that has also become a source of income in that area. The method of cultivation is still traditional i.e. they plough the fields through plough and Yake by Oxes. Farmers used the compost and cattle dung manure. Some of them have started to use chemical fertilizer and hybrid seeds.

4.6 Socio-cultural Pattern

Society is a web of social relationship. Every people live in society wants to do something and more about the phenomena. Culture is an umbrella term for the human being. Generally, culture is a man made factor. All the activities of human beings are included in culture. Culture is a factor of development. In the name of development we have adopted new social movement. The study area is composed of various castes/ethnic groups like, Brahmins, Kumal, Sarki, Kami, Newar and others. Every caste has its own cultural aspect. Inhabitant of this area have occupied traditional ritual sine traditional period. But, now in the name of modernization socialization, transportation, education, interstate etc. affected the socio-cultural pattern of people. All caste/ethnic groups have same behaviour owning of highly

closeness to each other. Give respect and take respect is major slogan of the local people. Birth ritual, mirage death ritual are similar all caste in the study area.

The Dalit people also adopt their different customs like Brahmins through Hindu system but they do not have sacred thread (Janoi). Principally high caste people do not take wine and other so many things, which is common to untouchables. The Dalit people of the study area speaks Nepali language. They do not have their own mother tongue. They have their own priest (Bhanja or brother-in-law) and they worship Hindu god and goddess. High caste people are depended upon Dalit for leather goods and agricultural wage labour. Similarly, Dalits are dependent upon high caste people for their survival not only leather work but also by many other ways. Dalit of this area are adopting new tools and technology through which they are getting more yields. Thus most of the Dalits of the study area have been changing their socio-cultural as well as economic condition.

4.7 Education

Education is light of life, which goes from womb to tomb. It is the power of knowledge. If it essential for wisdom competency and excellence. Qualification is property of poor people.

Education is the most important factor to change the condition of drinking water and sanitation of the study area. Most of the people of Pang VDC are far behind from the light of education. In this area, the Brahmin, Chhetri and Newar are more educated than the others, Kumal, Kami, Damai and Sarki. At present, there are five primary schools, one lower secondary school, two secondary schools and one higher secondary school.

Table: 5 Schools facility of this village

Ward No.	Name of school	Students			Staff/teacher			Toilet		Drinking water facility
		Male	Female	Total	Male	Female	Total	Tem.	Per.	
1	Pang Dhairani H.S.S.	204	201	405	14	1	15	-	1	good
3	T.R.B.L.S.S.	50	40	90	4	3	7	-	1	bad
4	Newar Subedi S.S	191	217	408	11	4	15	-	1	good
5	Bhawani Childcore L.P.S.	12	17	29	0	2	2	-	-	-
6	Khariwata S.S.	168	131	299	5	3	8	0	1	good
7	Ganesh L.S.S.	40	37	77	2	0	2	0	0	-
8	Cidali L.S.S	66	86	152	4	0	4	0	0	-
9	Laxmi L.S.S.	26	19	45	1	1	2	0	0	-
Total		746	658	1505	41	14	55		3	

Source: Field Survey, 2007.

4.8 Health

Health is wealth. Healthy mind, in a healthy body, in healthy environment can achieve goals of sustainable development including the all aspects of human being. In Pang VDC there is one health post. People are getting health facilities from there. According to health post in-charge people are suffering from many diseases like skin disease, diarrhea, dysentery, jaundice, worm infection and respiration problem. 80 percent people are suffer from waterborne disease but no any symbol of pestilence. Health worker always preservative in these disease. Every ward of this VDC has a Woman Health Volunteer (WHV). WHVs provide general health facilities to the local people. Similarly, there is lot of Community Health Workers (CHW), community medicine assistants (CMA) and Assistant Nurse Midwifes (ANM). These technicians provide health facilities to the local people. In Pang VDC there is one private clinic. Private clinic help the cure than the prevention.

4.9 Water Sources

Nepal is rich in terms of water sources. Pang VDC is also a part of the country where there are different kinds of water sources. In this area there are different stream, which contribute the Kaligandaki. Mainly, Khahare

Khola, Dhambuko Khola and Shyalk Khola etc. are the main stream of this area which irrigated some part of cultivated land.

There are different source of water which provide the facility of drinking water. Mainly, Tohare Ko Mul, Dharapani, Tato Pani, Ghang Ko Mul, Khariwata Ko Dhara, Chanaute, Sahasradhara, Rato Pani and Upareta Ko Mul etc. are the main sources of spring water.

The people of Pang VDC area have been using drinking water taken from different Mul and Khola, but recently government of Nepal had been connected through the CHAURASI DHARA project (based of Tohare Ko Mul). People were get drinking water easily, after the successful completion of the project. Now this project interruption causes by landslides and technical problem. The people heavily depend upon the spring water.

4.10 Transportation and Communication Facilities in the Study Area

Transportation and communication are the main pivot of development. Higher the accessibility network, higher the access to prosperity. Nepal is a rural based country. Most of the rural areas are deprived from transportation and communication. Rural urban linkage is possible only through Social Overhead Capital (SOC). There are various typologies and components of rural urban linkage among them transportation, communication, services, institution are the vital components.

Parbat district is hill and backward district of western development region. This district is accessible to the SOC facilities. Mostly SOC facilities is centralized in district headquarter but most of the VDCs are not access to the transportation side by side communication. There are 55 VDCs in the Parbat district. Among them Pang VDC is one of the VDC of Parbat district. Now this VDC is low accessible to the both communication and transportation.

4.11 Occupational Status

Occupation is a part of the social status of a person and also, determine and the success of people in society. Occupational status is a great element, which reflects the socio-economic status of a person. In this VDC most of the people are engaged in agriculture sector and few are engaged in other occupations such as, business, services, industry etc. The agriculture is the major source of livelihood. The given table 5 below shows the average data of occupation structure of the Pang VDCs.

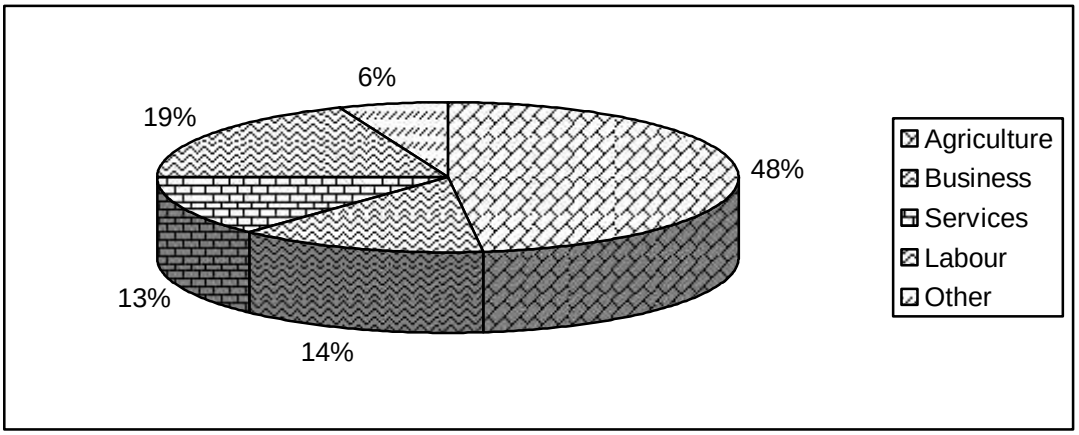
Table: 6 Respondents occupation structure

Kind of Occupation	Percentage
Agriculture	48.00
Business	14.00
Services	13.00
Labour	19.00
Other	6.00
Total	100.00

Source: VDC Office Pang, Parbat, 2007.

Table 6 shows that the 48 percent of the total population depends on agriculture sector. And the rest of the people are involved on other sector of which business 14 percent, services 13 percent, labour 19 percent and other 6 percent.

Figure: 2 Respondents occupation structure



CHAPTER-FIVE

Data Analysis and Presentation of the Findings

This chapter discusses the major findings of the study. It describes various types of the status of water supply and sanitation that were found among the sampled households during the study period. Besides it, this chapter described the people's participation in water supply and sanitation system.

5.1 Characteristics of the Respondents

5.1.1 Caste wise distribution

It is found that Pang VDC is heterogeneous in terms of caste composition. The people having different castes and ethnic groups are living in different localities with different professions and activities. There were so many castes such a Brahmin, Chhetri, Newar, Gurung, Magar, Sanyasi, Kuni, Damai, Sarki and other. As shown in table 5.1.1 respondents are distributed as caste and sex. A total of 75 respondents from three wards were selected for interview. Among them 60 (80%) were. Male and 15(20%) were female.

Table: 7 Caste and gender wise distribution of respondents

Caste/Ethnic Group	Settlement			Gender		Total
	Ward 1	Ward 2	Ward 3	Male	Female	
Brahmin	8(32)	13(59.09)	19(67.85)	35(58.33)	5(33.33)	40(53.33)
Chhetri	4(16)	2(9.09)	4(14.28)	7(11.67)	3(20)	10(13.33)
Newar	4(16)	2(9.09)	2(7.14)	6(10)	2(13.33)	8(10.67)
Gurung/Magar/Sanyasi	3(12)	1(4.54)	1(3.57)	4(6.67)	1(6.67)	5(6.67)
Kami/Damai/Sarki	5(20)	4(18.18)	1(3.57)	7(11.67)	3(20)	10(13.33)
Other	1(4)	0	1(3.57)	1(1.67)	1(6.67)	2(2.67)
Total	25(100)	22(100)	28(100)	60(100) (80)	15(100) (20)	75(100)

Source: Field Survey, 2007.

The majority of respondents were Brahmin 40(53.33%), Chhetri (13.33%), Newar 8(10.67%), Gurung, Magar or Sanyasi 5(6.67%), Kami, Damai, Sarki 10(13.3%) and other people were 2(2.67%).

5.1.2 Sample distribution of respondents

Three wards from the Pang VDC were selected for the study. Total 250 households were found in ward no. 1, 2 and 3. Among these, ward 1-25 (33.34%), ward 2-22(29.34%) and ward 3-28(37.34%) of sampled households were selected (table 8).

Table: 8 Sample distribution of households

Area	Total Households	Sample Households
Ward 1 (Tala Ko Pang)	91(36.4)	25(33.34)
Ward 2 (Simle, Biruta)	64(25.6)	22(29.34)
Ward 3 (Tar)	95(38)	28(37.34)
Total	250(100)	75(100)

Source: Field Survey, 2007.

5.1.3 Respondents HH profile by education and age

The majority of the respondent's family members were lies in the age between (15-60 yrs) -96 (37.5%), (5-15 yrs)-79(30.86%), (60 above yrs)-46 (17.96%) and (0-5 yrs)-35 (13.67%).

Table: 9 Respondent's HH profile by education and age

Settlement	Education and age category									Total
	Age				Education					
	0-5	5-15	15-60	60 above	Illiterate	Under SLC	SLC	Certificates	Diploma degree	
Ward 1	12 (34.28)	25 (31.65)	34 (35.42)	14 (30.43)	20 (37.73)	27 (31.76)	22 (31.88)	13 (38.24)	3 (20)	85 (33.20)
Ward 2	8 (22.86)	22 (27.85)	24 (25)	21 (45.65)	16 (30.19)	25 (29.41)	23 (33.33)	7 (20.58)	4 (26.67)	75 (29.29)
Ward 3	15 (42.86)	32 (40.50)	38 (39.58)	11 (23.95)	17 (32.07)	33 (38.82)	24 (34.78)	14 (41.18)	8 (53.33)	96 (37.5)

Total	35 (13.89) (100%)	79 (31.35) (100%)	93 (37.5) (100%)	46 (17.96) (100%)	50 (20.70) (100%)	85 (33.73) (100%)	69 (26.95) (100%)	34 (13.28) (100%)	15 (5.86) (100%)	250 (100%)

Source: Field Survey, 2007.

Note: Figures in parenthesis are percentage.

The education status in respondent HHs member were satisfactory. The majority of the people were illiterate 53(20.70%), Under SLC 85(33.20%), SLC 69(26.95%), Certificate level 34(13.28%) and Diploma/Degree level 15 (5.86%).

5.2 Drinking Water and Sanitation Situations

5.2.1 Use of water source (same/different) for household purpose

Most of the respondents get water for drinking, cooking, bathing, washing and for all the household purpose from the same source of water by means of piped drinking, they are 70 (93.33%) and remaining 5(6.67%) respondents get water from the same source but different means, that is directly from the spring without piped method.

Table: 10 Use of water source (same/different) for household purpose

Source	Settlement			Age				Gender		Total
	Ward 1	Ward 2	Ward 3	0-5	5-15	15-60	60 above	Male	Female	
Same water source for various purpose	23 (92)	21 (95.46)	26 (92.86)	0	0	58 (95.55)	12 (92.30)	57 (95)	13 (86.67)	70 (93.33)
Different water source for various purpose	2 (8)	1 (4.54)	2 (7.14)	0	0	4 (6.45)	1 (7.70)	3 (5)	2 (13.33)	5 (6.67)
Total	25 (100)	22 (100)	28 (100)	0	0	62 (100)	13 (100)	60 (100)	15 (100)	75 (100)

Source: Field survey, 2007.

Note: Figure in parenthesis is percentage. M= Male and F= Female.

5.2.2 Connection of piped drinking water

Connection to piped drinking water was found in 71(94.67%) household/respondents and not connected was in 4(5.33%). 4 household are at the top of the spring water and that's the reason they think as they don't

have necessity of piped drinking water. For them it is easier to get water from the spring water directly then from the piped drinking water. Respondents of ward 1, 2 and 3 were poor piped drinking water facility. People are not satisfied piped drinking water system.

From the poor piped drinking water system there is great change leakage and it is also occurring there. When there is leakage, there is also a chance of impurity in water as well as they don't get sufficient water for there daily life. So it is not innate that they are not satisfied with such system of drinking water

Table: 11 Availability of piped drinking water

Source	Settlement			Age				Gender		Total
	Ward 1	Ward 2	Ward 3	0-5	5-15	15-60	60+	M	F	
Connection to piped water	24 (96)	21 (90.90)	26 (96.43)	0	0	60 (96.77)	11 (84.62)	59 (98.33)	12 (80)	71 (94.67)
No connection to piped water	1 (4)	1 (9.10)	2 (3.57)	0	0	2 (3.23)	2 (15.38)	1 (1.66)	3 (20)	4 (5.33)
Total	25 (100)	22 (100)	28 (100)	0	0	62 (100)	13 (100)	60 (100)	15 (100)	75 (100)

Source: Field survey, 2007.

Note: Figure in parenthesis is percentage. M= Male and F= Female.

5.2.3 Time required to reach water source in different seasons

The time required to reach the water source varied with the season. In rainy season the households 26(34.67%) had required (0-10) minutes, 30(40%) had required (10-20) minutes and 19(25.33%) household required (20-30) minutes to reach of water source.

Table: 12 Time required to reach the water source

(Time Period is minutes)

Source	Settlement			Age				Sex		Total
	Ward 1	Ward 2	Ward 3	0-5	5-15	15-60	60 +	M	F	
	Rainy season									
0-10 min	8	6	12	0	0	22	4	22	4	26(34.67)
10-20 min	10	11	9	0	0	25	5	23	7	30(40)
20-30 min	7	5	7	0	0	16	3	15	4	19(25.33)
Total	25	22	28	0	0	63	12	60	15	75(100)
	Winter/summer season									
0-10 min	6	5	7	0	0	15	3	16	2	18(24)
10-20 min	8	8	10	0	0	22	4	20	6	26(34.67)
20-30 min	11	9	11	0	0	25	6	24	7	31(41.33)
Total	25	22	28	0	0	62	13	60	15	75(100)

Source: Field survey, 2007.

Note: Figure in parenthesis is percentage. M= Male and F= Female.

In most of the households female fetches the water in few household children fetches water and in some a few households male fetches water but it can be taken as rare case. In winter/summer the households 18(24%) required (0-10) minutes, 26(34.67%) required (10-20) minutes and 31(41.33%) required (20-30) minutes to reach the water source.

5.2.4 Use of water source and amount of water used by season

The most popular water source was found to be the public tap among the households of Pang VDC area, both in rainy and winter/summer seasons.

Table: 13 Use of water source and amount of water used

Types of water source	Settlement			Caste					Amount (liter)				Gender		Total
	Ward 1	Ward 2	Ward 3	Brahmin	Chhetri	Newar	Gurung, Magar, Sanyasi	Damai, Kami, Sarki	0-100	100-200	200-300	300+	M	F	
Well	1	-	-	-	-	-	1	-	-	-	1	-	1	-	1(1.33)
Public tap	23	20	27	39	10	8	3	10	10	32	19	9	57	13	70 (93.33)
House tap	-	1	-	1	-	-	-	-	-	1	-	-	1	-	1 (1.33)
stream/river/ pond	-	1	-	-	-	-	-	1	-	1	-	-	-	1	1 (1.33)
Collected	-	-	1	-	-	-	-	1	1	-	-	-	1	-	1 (1.33)

rainy water															
Spring water	1	-		-	-	-	1	-	-	1	-	-	-	1	1 (1.33)
Total	25	22	28	40	10	8	5	12	11 (14.67)	35 (46.67)	20 (26.67)	9 (12)	60	15	75 (100)
	Summer/winter seasons														
Well	1	-	1	-	-	-	1	1	-	1	1	-			2 (2.66)
Public tap	23	20	27	39	10	8	3	10	10	32	18	10			70 (93..33)
House tap	-	1	-	1	-	-	-	-	-	1	-	-			1 (1.33)
stream/river/ pond	-	1	-	-	-	-	-	1	-	1	-	-			1 (1.33)
Collected rainy water	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spring water	1	-	-	-	-	-	1	-	1	-	-	-			1 (1.33)
Total	25	22	28	40	10	8	5	12	11 (14.67)	35 (46.67)	19 (25.33)	10 (13.33)	60	15	75 (100)

Source: Field survey, 2007.

Note: Figure in parenthesis are percentage. M= Male and F= Female.

In rainy season, public tap was used by 70(93.33%) households/respondents followed by those who used well, other sources, stream/river pond, spring water and at least house tap and collected rainy water by 1(1.33%). An amount of 100-200 it of water per day was the rate used by maximum 35(46.67%) households and 300+ above it. Per day water was used by minimum 9(12%) households/respondents.

In summer/winter season, public tap was used by 70(93.33%) of the households/respondents the followed by well, spring water other source. stream and household tap 1(1.33%). 100-200 its per day water was used by the maximum 35(46.67%) households used and the minimum 10(13.33%) households respondents used 300-above its per day each.

5.2.5 Problem and opinions concerning drinking water

The 75(100%) respondents of Pang VDC area opined the quality of water negatively from the following reasons.

Table: 14 Problem and opinions concerning drinking water

	Settlement			Caste					Satisfaction with drinking water		Gender		Total
	Ward 1	Ward 2	Ward 3	Brahmin	Chhetri	Newar	Gurung, Magar, Sanyasi	Dami, Kami, Sarki	Yes	No	M	F	
Bad smell	5	4	5	5	3	2	1	3			10	4	14(18.67)
Bad taste	4	6	7	5	2	3	2	5			14	3	17(22.67)
Polluted water (muddy/sandy)	12	9	10	24	2	1	1	3			27	4	31(41.33)
Contaminated microbes/worms	3	2	4	5	2	2	0	0			6	3	9(12)
other	1	1	2	1	1	0	1	1			3	1	4(5.33)
Total	25	22	28	40	10	8	5	12		75(100)	60	15	75(100)

Source: Field survey, 2007.

Note: Figure in parenthesis are percentage. M= Male and F= Female.

Household respondents reported various problems in drinking water 31(41.33%) respondents reported polluted water, 17(22.67%) respondents reported Bad last, 14(18.67%) respondents reported bad smell, 9(12%) respondents reported contaminated and 4(5.33%) other problems.

5.3 People's Participation in Drinking Water

5.3.1 People's participation in drinking water system

Participation of people in drinking water and sanitation progamme was studied especially untouchable, ethnic, woman disadvantaged and other people. Mostly 33 (44%) household had in other's people's participation and then 16(21.33% had women, 9(12%) had disadvantage. 12(16%) had untouchable, 5(6.67%) had ethnic people's participation for drinking water in decision making.

Table: 15 People's participation in drinking water system

Group	Settlement			Caste					Participation			Gender		Organization of meeting		Total
	Ward 1	Ward 2	Ward 3	Brahmin	Chhetri	Newar	G, M, S	D, K, S	High	Medium	Low	M.	F.	Yes	No	
Untouchable	7 (28)	4 (18.18)	1 (3.57)						1	2	9	10	2			12 (16)
Ethnic	3 (12)	1 (4.54)	1 (3.57)						1	1	3	4	1			5 (6.67)
Other	8 (32)	11 (50)	14 (50)						2	4	27	28	5			33 (4.4)
Women	6 (24)	3 (13.64)	7 (25)						2	4	10	12	4			16 (21.33)
Disadvantage	1 (4)	3 (13.64)	5 (17.85)						1	2	6	6	3			9 (12)
Total	25 (100)	22 (100)	28 (100)	40	10	8	5	12	7(9.33)	13(17.33)	55(73.33)	60	15	13 (17.33)	62 (82.67)	75 (100)

Source: Field survey, 2007.

Note: Figure in parenthesis is percentage. M= Male and F= Female.

According to household respondents, untouchable, ethnic, woman and disadvantaged people had low participation in drinking water and sanitation as 55(73.33%), medium 13(17.33%) and high 7(9.33%). Participation 62(82.67%) respondents said that there were not organized any meeting whereas 13(17.33%) said that the few were meetings organized.

5.3.2 Selection of Project and expenditure on drinking water

Most of the respondents 26(34.67%) selected the drinking water project, followed by school, sanitation, hospital and other projects selected 3(4%).

Table: 16 Selection of project and expenditure on drinking water

Field of choice for support	Settlement			Caste					EXP. (R.S)		Gender		Total
	Ward 1	Ward 2	Ward 3	Brahmin	Chhetri	Newar	Gurung, Magar, Sanyasi	Dami, Kami, Sarki	5000-10000	10000-15000	M	F	
School	3	3	2	4	1	1	1	1					8 (10.67)
Hospital	1	2	1	2	0	1	0	1					4 (5.34)
Drinking water	9	7	10	15	3	1	2	4	53	22			26 (34.67)

Electricity	0	0	0	0	0	0	0	0					0
Sanitation	7	5	7	12	2	2	1	2					19 (25.34)
Irrigation	5	4	6	6	3	3	1	3					15(20)
Other	0	1	2	1	1	0	0	1					3(4)
Total	25	22	28	40	10	8	5	12					75 (100)

Source: Field survey, 2007.

Note: Figure in parenthesis is percentage. M= Male and F= Female.

If any project or organization requested for drinking water 53(70.67%) of the respondents could deposit Rs. 5,000-10,000 and 22(29.33%) respondent could deposit Rs. 10,000-15,000 each. Though 22(29.33%) respondents could deposit great amount of money then remaining respondents but all head the same voice for the reliable of project and they would deposit as much as they could.

5.4 Health and Sanitation

5.4.1 Form of drinking water

Pang VDC area was mostly suffering from polluted water. So, the respondents had to use various methods of making water pure. Despite these problem 37(49.34%) of the households used direct (Plain) water, 18(24%) the households filtered, 9(12%) households used chemical and 8(10.67%) households boiled used drinking water respectively.

Table: 17 Form of drinking water use

Form us of drinking water	Settlement			Caste					Gender		Total
	Ward 1	Ward 2	Ward 3	Brahmin	Chhetri	Newar	Gurung, Magar, Sanyasi	Dami, Kami, Sarki	M.	F.	
Boiled	3	2	3	4	2	2	0	0	6	2	8(10.67)
Filtered	5	6	7	9	2	3	1	2	14	4	18(24)
Using chemical	2	3	4	5	2	1	0	1	7	2	9(12)
Direct (plain) use	15	11	14	22	4	2	4	9	31	9	40(53.34)
Total	25	22	28	40	10	8	5	12	60	15	75(100)

Source: Field survey, 2007.

Note: Figure in parenthesis is percentage. M= Male and F= Female.

5.4.2 Ways for the safe usage of dinking water

Half of the total households/respondents 41(54.67%) used only water by cleaning the water pot and 12(16%) used soak and water. 20(26.67%) household used ash and water for cleaning the drinking water pot. Mostly, Brahmin and Chhetri castes used soap, but Gurung, Magar, Sanyasi, Kami, Dami used ash and water for cleaning the water pot. It would be better to clean pot water by pot washing powders and water which are prescribed from the health point of view.

Table: 18 Ways for the safe usage of dinking water

Method	Settlement			Caste					Gender		Total
	Ward 1	Ward 2	Ward 3	Brahmin	Chhetri	Newar	G,M,S	D,K,S	M.	F.	
1. Method of cleaning water pot											
With only water	13	13	15	21	6	5	4	5	34	7	41(54.67)
With ash and water	7	5	8	12	2	1	1	4	15	5	20(26.67)
With soap and water	4	3	5	6	2	1	0	3	9	3	12(16)
Other	1	1	0	1	0	1	0	0	2	0	2(2.67)
Total	25	22	28	40	10	8	5	12	60	15	75(100)
2. Proper storage											
Clean before filling	12	10	12	17	5	5	3	4	26	8	24(45.34)
Though stored water	8	7	9	13	3	2	2	4	20	4	24(32)
Covering water pot	5	5	6	10	2	1	0	3	13	3	16(21.33)
Other	0	0	1	0	0	0	0	1	1	0	1(1.33)
Total	25	22	28	40	10	8	5	12	60	15	75(100)
3. Handling											
Cleaning of WP (mug, glass) before use	10	11	13	15	5	5	2	7	28	6	34(45.34)
Dipping cap of glass in water	11	9	10	20	3	2	1	4	25	5	20(40)
Pouring water from pot	3	2	4	5	2	1	1	0	6	3	9(12)
Other	1	0	1	0	0	0	1	1	1	1	2(2.67)
Total	25	22	28	40	10	8	5	11	60	15	75(100)

Source: Field survey, 2007.

Note: Figure in parenthesis is percentage. M= Male and F= Female.

During storage of water, 34(45.34%) of the respondents stored water before cleaning the water pot, 24(32%) of the respondents stored water pot

throwing some water before collecting water and 16(21.33%) of the respondents stored water by covering the watch pot. 34(45.34%) of the respondent were taken out of water by cleaning cup, mug, glass before use, 30(40%) of the respondents were taken out of water by dipping cup, mug, glass without cleaning and 8(13.34%) of the respondent taken out of water pouring water through the pot.

5.4.3 Situation of toilet use

Most of the (people) household had toilet but 10(13.33%) had no toilet due to various reasons such as lack of ideas, shortage of money and defecation in open place. Mostly, Dalit and Janajati people had no toilet.

Table: 19 Situation of toilet use

Cause	Settlement			Caste					Toilet		Gender		Total
	Ward 1	Ward 2	Ward 3	Brahmin	Chhetri	Newar	Gurung, Magar, Sanyasi	Dami, Kami, Sarki	Yes	No	M	F	
Lack of idea	0	0	1	0	0	0	1	0			1	0	1(10)
Shortage of money	2	1	2	0	1	0	1	3			4	1	5 (50)
Toilet in open	2	1	1	1	0	1	0	3			3	1	4(40)
Shortage of land	0	0	0	0	0	0	0	0			0	0	0
Total	4	2	4	1	1	1	2	5			8	2	10 (100)

Source: Field survey, 2007.

Note: Figure in parenthesis are percentage. M= Male and F= Female.

5.5 Personal Sanitation

5.5.1 Hand washing habit

Most of the household/respondents in Pang VDC area had the habit of washing hands before meal, after meal and after touching the food. But only few of them washed hands after work. Hand washing habit was mostly found among Brahmin, Chhetri and Newar, but less so among Janajati, Dalit and ethnic people and also less among old people.

Table: 20 Hand washing habit

Activities	Settlement			Caste					Age				Gender		Total
	Ward 1	Ward 2	Ward 3	Brahmin	Chhetri	Newar	Gurung, Magar, Sanyasi	Damai, Kami, Sarki	0-5	5-15	15-60	60+	M	F	
Before meal	5	4	6	8	3	1	1	2							15(20)
After meal	12	10	13	17	5	4	3	6							35(46.67)
After toilet	2	2	3	5	1	0	0	1							7(9.33)
After touching dirt	3	4	2	6	0	1	0	2							9(12)
After work	2	2	3	4	1	1	0	1							7(9.33)
Other	1	0	1	0	0	1	1	0							2(2.67)
Total	25	22	28	40	10	8	5	12	-	-	67	8	60	15	75(100)

Source: Field survey, 2007.

Note: Figure in parenthesis is percentage. M= Male and F= Female.

5.5.2 Materials used in washing hands

Most of the households/respondents 15(20%) used soap while washing hands, and at least 4(5.33%) of the respondents used mud. Other materials such as water/soap, soap/ash, mud/water/soap, soap/ash/mud, mud/soap were also used by respondents. Higher castes such as Brahmin, Chhetri and Newar used soap, whereas the lower caste Janajati, Dalit, ethnic people used mud/ash in washing their hands. The reason, except Brahmin, Chhetri and Newar, other had not used soap, was that they were uneducated as well as they could not afford money for it.

Table: 21 Materials used in washing hands

Response	Settlement			Caste					Age				Gender		Total
	Ward 1	Ward 2	Ward 3	Brahmin	Chhetri	Newar	Gurung, Magar, Sanyasi	Damai, Kami, Sarki	0-5	5-15	15-60	60+	M	F	
Soap	7	6	8	16	2	3	0	0			21	0	19	2	21(28)
Mud/soap	2	1	2	2	1	0	1	1			3	2	4	1	5(6.67)
Water/soap	5	4	6	8	2	2	1	2			15	0	13	2	15(20)
Mud/water/soap	1	2	2	3	1	0	0	1			5	0	4	1	5(6.67)
Soap/ash	4	3	4	7	1	1	0	2			8	3	7	4	11(14.67)
Soap/ash/mud	1	2	2	1	1	1	1	1			5	0	3	2	5(6.67)
Ash/mud	3	1	2	2	1	1	0	2			4	2	3	3	6(8)
Mud	1	2	1	1	1	0	1	1			4	0	4	0	4(5.33)
Other	1	1	1	0	0	0	1	2			2	1	3	0	3(4)
Total	25	22	28	40	10	8	5	12	-	-	67	8	60	15	75(100)

Source: Field survey, 2007.

Note: Figure in parenthesis is percentage. M= Male and F= Female.

5.5.3 Bathing frequency

Most of the respondents 21(28%) took. Bath 8 times per month, while the least of the respondents 1(1.33%) took bath only 2 times per month. 5(6.67%) of the total respondents took bath just one time a month.

Table: 22 Bathing frequency

Respondent in frequency	Settlement			Caste					Age				Gender		Total
	Ward 1	Ward 2	Ward 3	Brahmin	Chhetri	Newar	Gurung, Magar, Sanyasi	Damai, Kami, Sarki	0-5	5-15	15-60	60+	M	F	
2	0	0	1	1	0	0	0	0			1	0	1	0	1(1.33)
4	3	0	0	2	1	0	0	0			2	1	1	2	3(4)
5	2	4	5	4	2	1	1	3			9	2	8	3	11(14.67)
6	3	2	5	7	1	1	0	1			9	1	8	2	10(13.33)
8	8	5	8	14	1	2	1	3			19	2	16	5	21(28)
9	1	1	1	1	0	1	0	1			3	0	3	0	3(4)
10	1	1	1	2	1	0	0	0			2	1	3	0	3(4)
12	3	2	3	3	1	1	1	2			7	1	8	0	8(10.67)
15	2	3	2	3	1	1	1	1			7	0	6	1	7(9.33)
30	1	2	2	1	1	1	1	1			5	0	4	1	5(6.67)
45	1	2	0	2	1	0	0	0			3	0	2	1	3(4)
Total	25	22	28	40	10	8	5	12	-	-	67	8	60	15	75(100)

Source: Field survey, 2007.

Note: Figure in parenthesis is percentage. M= Male and F= Female.

5.6 Waste Management and Water Borne Disease

5.6.1 Ways of managing the wastes

Solid wastes were disposed in various ways by the respondents. 38(50.67%) of the respondents were disposing the waste materials at pit near the house, but 16(21.33%) of the respondents were disposing the waste materials everywhere. 17(22.67%) of the respondents were disposing the waste materials through private waste collector. 4(5.33%) of the respondents were others and no any respondents of the pit managed by VDC.

Table: 23 Ways of managing the waste

Place	Settlement			Caste					Gender		Total
	Ward 1	Ward 2	Ward 3	Brahmin	Chhetri	Newar	Gurung, Magar, Sanyasi	Dami, Kami, Sarki	M.	F.	
Pit near the house	13	11	14	25	3	4	2	4	33	5	38(50.67)
Private waste collector	3	7	7	8	4	2	1	2	12	5	17(22.67)
Pit managed by VDC											
Everywhere	8	3	5	7	2	2	1	4	12	4	16(21.33)
Other	1	1	2	0	1	0	1	2	3	1	4(5.33)
Total	25	22	28	40	10	8	5	12	60	15	75(100)

Source: Field survey, 2007.

Note: Figure in parenthesis is percentage. M= Male and F= Female.

5.6.2 Causes of water borne diseases

Table: 24 Causes of water borne diseases

Cause	Settlement			Caste					Gender		Total
	Ward 1	Ward 2	Ward 3	Brahmin	Chhetri	Newar	Gurung, Magar, Sanyasi	Dami, Kami, Sarki	M.	F.	
Dirty water	13	12	15	24	4	4	2	6	34	6	40(53.33)
Dirty food	6	5	7	10	2	2	1	3	13	5	18(22.67)
Sanitation problem	3	2	1	2	1	1	1	1	5	1	6(21.33)
Disposable waste	2	2	4	3	2	1	1	1	6	2	8(5.33)
Education problem	1	1	1	1	1	0	0	1	2	1	3(4)
Total	25	22	28	40	10	8	5	12	60	15	75(100)

Source: Field survey, 2007.

Note: Figure in parenthesis is percentage. M= Male and F= Female.

Most of the respondents 40(53.33%) though that dirty water is being the cause of disease, 18(24%) had dirty food, 8(10.67%) had though about the disposable materials, 6(8%) had thought to sanitation problem and 3(4%) respondents though about the education problem being the cause of disease.

5.6.3 Common water borne diseases

The most common water borne disease is diarrhea 22(29.33%) respondents suffered from this disease. Only 1(1.33%) of the respondents

suffered from worm infection/cold. Other various water borne disease were cough/cold, jaundice, dysentery, fever/throat infection, pneumonia and skin disease in the decreasing order.

Table: 25 Common water borne diseases

Cause	Settlement			Caste					Gender		Total
	Ward 1	Ward 2	Ward 3	Brahmin	Chhetri	Newar	Gurung, Magar, Sanyasi	Dami, Kami, Sarki	M.	F.	
Dianhea	7	6	9	13	2	3	2	2	17	5	22(29.33)
Cough/cold	2	1	3	3	1	1	0	1	14	2	6(8)
Fever/throat infection	2	2	3	6	0	0	0	1	5	2	7(9.33)
Jundice	1	2	2	2	1	0	0	2	4	1	5(6.67)
Skin disease	1	1	1	2	1	0	0	0	3	0	3(4)
Dysentery	3	4	5	5	2	2	1	2	10	2	12(16)
Pheunomin	5	4	3	6	2	1	1	2	10	2	12(16)
Diarrhea/dysentery	3	2	2	2	1	1	1	2	6	1	7(9.33)
Worm int/cold	1	0	0	1	0	0	0	0	1	0	9(1.33)
Total	25	22	28	40	10	8	5	12	60	15	75(100)

Source: Field survey, 2007.

Note: Figure in parenthesis is percentage. M= Male and F= Female.

The male suffered from diarrhea, dysentery, cough etc. and females suffered from jaundice, pneumonia and cough mainly.

Water borne diseases mostly affected the Dalit, Janajati, Ethnic peoples than the Brahmins and Chhetris.

5.6.4 Treatment of sicknesses

About the respondents, 23(30.67%) were treated at hospital but 5(6.67%) were treated at home by the priest and wizard. A small percentage of respondents 10(13.33%) were treated with by herbal method during their sickness.

Table: 26 Treatment of sickness

Cause	Settlement			Caste					Gender		Total
	Ward 1	Ward 2	Ward 3	Brahmin	Chhetri	Newar	Gurung, Magar, Sanyasi	Dami, Kami, Sarki	M.	F.	
Household treatment	2	2	3	3	1	1	1	1	5	2	7(9.33)
Treatment from priest, wizard and conjurer	4	3	2	3	2	1	1	2	7	2	9(12)
At hospital	7	6	10	13	3	3	1	3	19	4	23(30.67)
Household/hospital	7	5	9	14	2	1	1	3	18	3	21(28)
Household priest, wizard	2	2	1	2	1	1	0	1	4	1	5(6.67)
Herbal treatment	3	4	3	5	1	1	1	2	8	2	10(13.33)
Total	25	22	28	40	10	8	5	12	60	15	75(100)

Source: Field survey, 2007.

Note: Figure in parenthesis is percentage. M= Male and F= Female.

5.7 Discussion with Key Informants

Different views were given by the respondents, social worker, official member of drinking water and health sector, health worker, volunteer, educated people, local leaders, teachers, NGOs member and businessman through checklist and questionnaire.

- Management of drinking water sector should be given to the community people.
- High participation of community people.
- Government should give priority to fulfill need based programme i.e. drinking water, health, sanitation and education.
- Local government should launch solid management system.
- Mobile health programme may be effective for children.
- Awareness and promotion programme in drinking water and water borne diseases is being necessary.

5.8 View of other people

- Local leader should give priority to public awareness and community people's participation in drinking water.
- According to members of drinking water office, water resources should preserved and utilized properly.
- Health workers said, if the government provides funds, it would be easy to launch health programme in the community sector regularly.
- Social workers, NGO members and educated people said awareness programme in health and drinking water for the community people may be more effective.
- GOs, NGOs, INGOs and other various organizations concerned with the drinking water and sanitation sectors should be activate in this sector.
- Some local leader, businessman and educated person said, public private partnership should be necessary for the drinking water system.

CHAPTER-SIX

Summary, Conclusion and Recommendations

6.1 Summary

The present study has focused on the water supply and sanitation situation in Pang VDC of Parbat. This also explains the people's participation/adsorptive capacity, affordability and impact of water supply and sanitation on the study area.

To obtain the information, the study was guided by a set of research questions and checklist. The study was conducted in three wards of the Pang VDC. The households respondents were selected from ward 1, 2 and 3 on the basis of purposive sampling. 24 checklists were used for the collection of information from each ward of local reputed and various levels of people. The major findings of the study area follows:

- Diffeent castes and ethnic groups like Brahmin, Chhetris, Newar, Gurung, Magar, Sanyasi, Kami, Dami and Sarki live in the area. But Brahmin and Chhetris are the majority.
- Gurung, Magar, Sanyasi, Kami, Dami, Sarki castes have large household size than the Brahmin, Chhetri and Newar becasues of lack of education, awareness and family planning technique and health knowledge.
- Regarding the education status of people, most of the Dalit, ethnic, disadvantaged people are illiterate because people do not send their children to school. Brahmin, Chhetri and Newar were literate and most of them are above SLC and some of them have obtained diploma and degree.
- Most of the people in the study area have no piped drinking water, they need to walk up about 10 minutes in rainy season and about 20-30

minutes in winter/summer seasons to collect water from. People are using the same water source for bathing and washing.

- The quality of water used very poor. It is contaminated and collected, and has bad smell, bad taste.
- Various classes of people such as untouchable, ethic women, disadvantaged have no proper participation in program initiation, implementation and benefit sharing.
- Most of the people in study area do not know the techniques of purifying water, and thus use the water directly. It is the main cause of suffering from the water borne diseases. None of them has toilet due to financial problem.
- The people are unaware about waste matter disposing techniques. They throw waste elsewhere. So the sanitation problem is a great problem.
- The people have very poor personal cleanliness with regard to bathing hand washing, sanitation management, pure drinking water and toilet use. So, they are suffering from various water borne diseases.

It is thus to recommend here that the water and its resources should be properly utilized and various awareness programmes are necessary for personal cleanliness, presentation of water borne diseases, and preservation of the environment and for sanitation management.

6.2 Conclusion

This study has assessed found the situation, people's participation and impact of drinking water and sanitation in the study area.

Drinking water is important not only human survival but for sound public health. The availability of drinking water directly or indirectly will assist the poverty alleviation in the sense that it 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 them more educational opportunities. The other benefits of easy access to drinking water area: it increases women literacy and assist in promoting gender equality.

Education is a major factor for proper utilization of drinking water and management of sanitation. Education status was found to be very poor in the study area. Searching of water resources, ways of drinking water, protective ways from disease and environmental pollution, personal cleanliness, awareness, promotion are element education. So, it is being a challenging for a health life.

Organization of meeting with drinking water and sanitation has found very rare. Participation of untouchable, ethnic, disadvantaged, women people in program implementation, initiation, responsibility. Benefited shoring has found very rare.

Government of Nepal has planned to drinking water supply in different villages. According to his policy of government of Nepal has played a significant role to water supply in the study area. Government of Nepal has policy to distribute water with improved, continuity, reliability and accessibility. Despite the successful completion of the scheme. Some changes area seen. Although some interruptions causes by landslides and floods. The people are willing to recon slides and floods, the people are willing to reconstruction in the small scale. Felling the difficulties in the past people do not want to see any interruption caused by nature.

Poor management of concerned authority, people of the study area deprived from drinking water. They have to use same water sources for drinking water and bathing/washing water, didn't connected long time has required for fetching water resources.

Most of the people of study area were found using plain water (directly), instead of using various method of purification. So, the people have suffered from water borne disease like diarrhea, jaundice, cough, cold, fever, dysentery and skin diseases and they have been found to be receiving treatment at home with priest, wizard, conjurer of herbal methods.

Financial problem was found to be the main cause of not using toilet. people have poor personal cleanliness such as bathing frequency, washing hands before/after meal, and waste management.

6.3 Recommendations

Various suggestions are recommended base on this study findings on drinking water and sanitation access at least in the study area.

- Pang VDC has various water resources such as streams, wells a nd public taps. Therefore, maintenance of the system sources and ensuring equal participation of all people with proper method can make supply of water to each household possible.
- For the success of the program; local leaders, technicians, local people area, development agencies, private institutions, NGOs/INGOs should be fully devoted also in order to harness opportunities.
- Awareness programme in drinking water, sanitation and personal health to child, student, people should be launched.
- Users group participation will make the launching of the programme sustainable.
- The community should be trained in income generation activities. The time saved from reduced water carrying responsibility will allow

community member to participate in such income generation activities.

- Immunization program for prevention of water borne disease, training to people, health education to students, use of purified water, methods of purification of water, personal cleanliness can make the people's life healthy.
- The tree plantation program should be launched for protection the environment.
- An office should be installed to watch out the management frequently.
- Point source protection program with material contribution from beneficiaries should be launched in the community to pressure the nearby alternative water source.
- A water recycling programme should be launched to preserved the rainy season's water. It may help to the water crisis in dry season.
- Managing the public toilets and household disposals are essential for improving the sanitation situation in the study area.

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QUESTIONNAIRE FOR THE STUDY

Interview no:

Date:

Section A : Identification

1. Name of respondent :
2. Caste: 3.a) VDC b) Ward no.
4. Gender: Male [ ] Female [ ]
5. Household structure:

   How many members are there in your household ? Number [ ]

S.N.	Relation	Age	Gender	Educational level	Occupation
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

Section B: Socio-Economic background

1. Households, Population and Percentage

Caste/Ethnicity	No. of HHs	Total no. of Population	Percentage
Bramhin/Chhetri/Thakuri			
Giri, Puri/Bharati			
Dhamai/Kami/Sharki			
Kumal/Darae			
Newar			
Magar/Gurung/Gharti			
Other Ethnicity Groups			

2. Economically Active Population

Ward No.	Agriculture	Service	Business	Labor	Total
1					
2					
3					
4					
5					
6					
7					
8					
9					

3. School Facility

Ward No.	Name of the School	Total Students			School staff			Toilet		Drinking Water Facility
		Boys	Girls	Total	Male	Female	Total	Permanent	Temporary	
1										
2										
3										
4										
5										
6										
7										
8										
9										

4. Other Offices

Ward No.	Name of the Office	Staff			Toilet		Drinking Water Facility
		Male	Female	Total	Permanent	Temporary	
1							
2							
3							
4							
5							
6							
7							
8							
9							

Section C : Drinking water and sanitation situation

1. Where is your drinking water source ?

   Within the compound of house Yes [ ] No [ ]

   Within the public places Yes [ ] No [ ]

2. Is your households using water for cooking, bathing, drinking and washing from the same source ? Yes [ ] No [ ]

3. Is the water source used in winter and summer the same ?

   Yes [ ] No [ ]

4. How much time is required to reach the source of water used for drinking and cooking ?

   Time in rainy season [ ] min

   Time in dry season [ ] min

5. Which type of water source do you use for drinking and cooking ? How much water do you consume ? Please tick in the following.

S.N.	Rainy Season	Tick	Litre/day	Winter/summer	Tick	Litre/day
1	Well			Well		
2	Public tap			Public tap		
3	House tap			House tap		
4	Stream, river, pond			Stream, river, pond		
5	Collected rainy water			Collected rainy water		
6	Spring water			Spring water		
7	Others			Others		

6. How many time consume for drinking water ?

   5-10 minutes. 10-20 minutes 20-30 minutes 30-above

7. Are you satisfied with your drinking water quality ?

   Yes [ ] No [ ]

8. If not, which types of problems are there in the drinking water ?

   a) Bad smell [ ] b) Bad taste [ ]

   c) Polluted muddy/sandy water [ ]

   d) Contaminated (with microbes/worms) [ ]

   e) Other problems [ ]

9. Have you and your household members suffered from water borne diseases ?

   Yes [ ] No [ ]

10. If you were offered a project support, which of the following two would you choose ?

    a) School [ ] b) Hospital [ ]

    c) Managed drinking water system [ ] d) Electricity [ ]

    e) Sanitation [ ] f) Irrigation [ ]

11. For a drinking water supply project, which type of help can you and your household give ?

    a) Cash [ ] b) Labor [ ]

    c) Both [ ] d) None [ ]

12. Are you interested for investment in sanitation as public and private toilet and drainage ? Yes [ ] No [ ]

Section D : People's Participation

1. Is any meeting organized to discuss about a drinking water supply project ?

   Yes [ ] No [ ]

2. If yes, were the following people present in the meeting or not ?

   a) Untouchable group [ ] b) Ethnic group [ ]

   c) Women [ ] d) Disadvantaged people [ ]

3. Is any drinking water and sanitation organization or committee is contacted/requested for project implementation ?

   Yes [ ] No [ ]

4. How was the role of the following people in the decision making process ?

   a) Untouchable: High [ ] Medium [ ] Low [ ]

   b) Ethnic group : High [ ] Medium [ ] Low [ ]

   c) Women : High [ ] Medium [ ] Low [ ]

   d) Disadvantage : High [ ] Medium [ ] Low [ ]

5. Who is mainly responsible in collecting water ?

a) Women [ ] b) Male [ ]

c) Girl [ ] d) Boy [ ]

Section E : Health and Sanitation

1. In what form/way are you using drinking water ?

   a) Boiled [ ] b) filtered [ ]

   c) Using chemical [ ] d) Direct (plain) use [ ]

2. In your view, which problems arise due to dirty water ?

   a) Bad smell/bad taste [ ] b) Teeth problem [ ]

   c) Sickness [ ] d) Others [ ]

3. Do you know about the importance of cleaning the water pot before it is used ? Yes [ ] No [ ]

   If you know, how do you clean the water pot ?

   a) with only water [ ] b) with ash and water [ ]

   c) with soap and water [ ] d) other [ ]

4. How do you store water in your home ?

   a) clean it before filling [ ]

   b) after throwing the stock of water [ ]

   c) covering the water pot with lid [ ]

   d) others [ ]

5. How do you take out water from the pot ?

   a) Cleaning the cup, mug, glass before use [ ]

   b) Dipping cup, mug and glass into the water [ ]

   d) Pouring water from pot [ ]

   d) Other [ ]

6. What are the advantages of using toilet ?

   (multiple answer possible)

   a) Ease for children, old and sick people [ ]

   b) To make the house clean house and the environment fresh [ ]

   c) For secrecy [ ]

   d) Others [ ]

7. Do you know contaminated by human faces (fecal matter) can cause disease ? Yes [ ] No [ ]

If you know, what are the diseases caused by that contamination ?

1.

2.

3.

8. Do you have a toilet in your home ?

Yes [ ] No [ ]

9. If you have, of which type ?

a) pit toilet [ ] b) ventilated toilet [ ]

c) pour flush [ ] d) cistern flush [ ]

10. If you have no toilet why ?

a) lack of idea about it [ ] b) shortage of money [ ]

c) habit of outdoor defecation open place [ ]

d) shortage of land/space [ ] e) others [ ]

Section F : Personal Sanitation

1. What materials do you use for washing hands ? mark ( ) for yes and (X) for No ?

S.N.	Activities	Children below five years		Women		Men	
		Wash (V)	No. wash (X)	Wash (V)	No. wash (X)	Wash (V)	No. wash (X)
1	Water						
2	Ash and water						
3	Husk and flour and water						
4	Mdy/day/soil						
5	Soap and water						
6	Others						

2. When do you and your household members take bath ? mark ( ) for yes and (X) for No

S.N.	Activities	Children		Women		Men	
		Wash (V)	No. wash (X)	Wash (V)	No. wash (X)	Wash (V)	No. wash (X)
1	Twice a day						
2	Daily						
3	Once in a day						
4	Twice in a week						

5	Once in a week						
6	Once in a month						

3. When do you and your household wash members hands ? mark ( ) for yes and (X) for No

S.N.	Activities	Children below five years		Women		Men	
		Wash (V)	No. wash (X)	Wash (V)	No. wash (X)	Wash (V)	No. wash (X)
1	Before meal						
2	After meal						
3	After toilet use						
4	After touching dirt						
5	After work						
6	Others						

Section G : Waste Management

1. Where do you dispose your household solid waster ?

   a) pit near the house [ ] b) private waste, collector [ ]

   c) pit managed by VDC [ ] d) others [ ]

2. Where do you dispose dirty water ?

   a) Soak pit [ ] b) Kitchen garden [ ]

   c) Drainage [ ] d) Others [ ]

3. Are you rearing livestock ? Yes [ ] No [ ]

4. How and where do you dispose the animal waste ?

   a) Compost pit [ ] b) Burning [ ]

   c) Use in Gobar gas plant [ ] d) Others [ ]

5. What are the bad impacts of animal waste deposition ?

   a) Increase in polluted environment [ ]

   b) Transmission of diseases [ ]

   c) Increase of diseases [ ]

   d) Increase in mosquitoes, flies and insects [ ]

   e) Others [ ]

6. What are the causes of water-borne disease ?

   a) Dirty water [ ] b) Dirty food [ ]

   c) Lack of sanitation in house and public places [ ]

d) Disposal of human waste and other waste materials all around [ ]

e) Lack of education/awareness about health and healthy life [ ]

7. If your household members become sick, what do you do ?

(Indicate priority with a number)

a) Household treatment [ ] b) Treatment from priest, wizard, conjurer [ ]

c) Treatment at hospital [ ] d) Others [ ]

8. When your household member suffers from diarrhea, what do you do ?

(indicate number as priority)

a) Drink Jevan Jal [ ] b) Household treatment [ ]

c) Treatment with priest wizard conjurer [ ] d) Treatment at hospital [ ]

9. Which of the following diseases appeared in your household in the past one year ?

S.N.	Diseases	Children below 5 years	Women	Men
1	Typhoid			
2	Worm infection			
3	Dysentery			
4	Diarrhea			
5	Cholera			
6	Skin disease			
7	Malaria			
8	Jaundice			
9	Others			

10. How much money did you spend for the treatment of water borne disease in the past one year ?

S.N.	Diseases	Expenditure
1	Typhoid	
2	Worm infection	
3	Dysentery	
4	Diarrhea	
5	Cholera	

6	Skin disease	
7	Malaria	
8	Jaundice	
9	Others	

Thanks for cooperation

CHECKLIST

Interview No.: .....

Date:.....

1. Name of respondent :
2. Name of office:
3. Level
4. Gender : Male [ ] Female [ ]
5. Are you satisfied with drinking water quality ?

   Yes [ ] No [ ]
6. If there is offered a project support, which of the following would you choose ?

   a) School [ ] b) Hospital [ ]

   c) Managed drinking water system d) Irrigation [ ]

   e) Others [ ]
7. Are you involve in the drinking water and sanitation programme ?

   a) Yes [ ] b) No [ ]
8. What is the role of following people in the participation of drinking water system ?

Caste	High	Medium	Low
a) Untouchable	[ ]	[ ]	[ ]
b) Ethnic group	[ ]	[ ]	[ ]
c) Women	[ ]	[ ]	[ ]
d) Disadvantaged	[ ]	[ ]	[ ]

9. Are the people getting water easily ?

   a) Yes [ ] b) No [ ]

10. In your views, which problems arise due to dirty water ?

    a) Bad smell/bad taste [ ] b) Teeth problem [ ]

    c) Sickness [ ] d) other [ ]

11. In what form/way are people using drinking water ?

    a) Boiled [ ] b) filtered [ ]

    c) using chemical [ ] d) Direct use

12. What are the disease caused by contamination of human feaces to the people.

    a. b.

    c. d.

13. Are the people seem neat and clean habit ?

    a) Yes [ ] b) No [ ]

14. How can be made the pure drinking water system and proper sanitation ?

    Ans.

15. In your views, what bad impacts to the people, of animal waste deposition ?

    a) Increase in polluted environment [ ]

    b) Transmission of disease [ ]

    c) Increase in mosquitoes, flies and insects [ ]

    d) Others [ ]

16. When people are suffered by diarrhea, what suggestion will you give ?

    a) Drink Jivan Jall [ ]

    b) Household treatment [ ]

    c) Treatment from priest, wizard and conjurer [ ]

    d) Treatment at hospital [ ]

17. Which of the following water-borne disease mostly appeared in your society ?

    a) Diarrhea [ ] b) Dysentry [ ] c) Worm infection [ ]

    d) Cholera [ ] e) Typhoid [ ] f) Other [ ]

18. At last which type of support did you need in the drinking water and sanitation system ?

a) Government fund [ ] b) Private fund [ ]

c) NGOs, INGOs [ ] d) People participation [ ] e) Others [ ]

Thanks for cooperation