

CHAPTER ONE

INTRODUCTION

1.1 General Background

Water is the largest natural resources of Nepal although only a relatively low percentage of the total population is getting safe and clean water for daily use. Water is used for drinking, bathing, washing and cleaning. Besides, it is used for agriculture, industrial, hydropower generation, religious purpose and recreation such as swimming, fishing and different forms of eco-tourism. Water is a truly unique commodity. Without it life does not exist. Life can, however, become uncertain even when there is water all around. While excess water in the form of floods and *water deficit* in the form of drought have struck Nepal time and again, consumption of *unsafe water* has claimed thousands of lives annually.

Drinking water is the basic minimum need of all human beings and provision of convenient, safe, clean and adequate drinking water is the declared commitment of the government of Nepal. It has been realized that the development of water supply and sanitation sector brings in enhanced socio-economic benefits and public health improvements. Population growth, rapid urbanization and industrialization are imposing rapidly growing demand of water supply and it pressurizes the government for the development of the water resources. The growing imbalance between demand and supply has brought various problems. It has caused the shortage of drinking water, pollution and environmental degradation. As a result, high incidences of water-related diseases are causing significantly low productivity in our country. Inadequate access to safe water supplies, along with poor environmental sanitation and personal hygienic practices, is the cause of water-born diseases in rural as well as in urban areas of Nepal.

Inadequate access to safe water supplies, combined with poor environmental sanitation conditions and personal hygiene practices, is also the major factor impeding the improvement of 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 people expect that water supply should be provided free of cost as a social service, because they argue that water is a free gift of nature. Traditionally in Nepal water supply has also been considered as a social service and it is taken to be the obligation of the government or those in power to supply water very cheaply, and, if necessary, even free. However, it should be remembered that there is no such thing as fully free in the world, because everything has a cost of production. Supply of water also incurs cost. So, with increasing cost of providing services, the responsible authorities cannot provide free or heavily subsidized drinking water.

There is a long-standing tradition of charging a very small amount of water supply fee. 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 service inevitably deteriorates falling progressively further behind demand. This is the problem of the nation as a whole. Jhapa district is not an exception in this regard. Being a tarai area there is 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 everyday, and the supplied water is insufficient to meet the demand of the people due to several reasons. So, the current question concerns with how to increase the supply of water and reduce the financial cost. The empirical question relates to which price is appropriate for solving the above problems.

To provide safe drinking water, control water born diseases and reduce cost, various efforts were made by the government as well as private sector at the beginning of the planned development process. Among them, public participation did not get much focus until the Seventh Plan. The government gave an importance to optimum mobilization of non-governmental sectors, private sector and public participation only from the Eighth Plan. The running Tenth Plan also has given an emphasis to delivering safe drinking water and sanitation facility through governmental as well as public and private sectors to all the people of the country. Indicative target of the

Tenth Plan is to provide drinking water to 85 per cent of the total population (NPC, 2003: 40).

Up to the present Tenth Plan the government has realized that development cannot be achieved without people's participation. Like other development sectors it started to hand over the drinking water project to the community organizations and till now many drinking water programs are handed over to communities and that has brought a good results.

Thus, governmental and non-governmental sectors are trying to deliver safe drinking water to the people of rural as well as urban areas. There are more than a hundred national and local NGOs, mother's group and local clubs that are involved in the implementation of water supply and sanitation facilities. Although there is only little hope to meet the target of Tenth Plan but there are chances of increasing the people's access to safe drinking water if communities or people's participation is increased in water supply programs.

Chandragadhi is the largest among the 47 VDCs of Jhapa district. According to the VDC profile 2004, it has a total of 3,303 households with the total population of 16,052, out of which 7,071 are male and 8,081 are female. In ward 6 of the VDC, the total number of households is 350, of which 300 are sharing the benefits from the project.

1.2 Statement of the Problem

Human development and equitable distribution of resources form the major developmental need of developing countries like Nepal. Provision of safe water supplies constitutes the primary step in achieving these needs. About nine-tenths of the population of Nepal lives in rural areas, and the majority of them still lack safe drinking water facilities. As the demand for safe water supply increases, there is an evident rise in the level of competition for sharing of available resources.

Although Nepal is one of the poorest countries in the world, it is rich in various natural resources. Nepal is known as the second richest country in water resources,

but its utilization has not been satisfactory because of the poor economic condition and other domestic problems, such as lack of technology, unskilled manpower and corruption. Therefore, these resources are not properly used. Safe drinking water and the environmental sanitation are the recent developmental issues in Nepal. Most of the urban water supply schemes are intermittent, seasonal and contaminated by human and animal wastes.

The increasing population in Jhapa district demands more drinking water than ever before. Consequently, the supply of drinking water needs to be increased. As the increased demand has not been met by corresponding increase in water supply, Jhapa has been experiencing some water shortage in recent years.

The Community Drinking Water Supply and Sanitation Project (CDWSSP) of Chandragadhi VDC is not only providing water to VDC but also to some wards of neighboring Mahespur VDC and Bhadrapur Municipality. However, these days, due to high population growth in Chandragadhi, it is being difficult to provide sufficient water. It is now becoming very necessary to improve the capacity of supply of safe drinking water, for which heavy investment will be needed.

Investing in this sector will spread the service delivery point near to the homes as possible which will provide safe water, not merely water. Provision of such facilities is expected to decrease mortality and morbidity rates, and also save the children's and women's time and energy spent otherwise in fetching water from distant sources. Improved health, utilization of saved time and energy will in turn have direct positive effects in increasing the country's productivity, and hence towards poverty alleviation.

The focal issue in the water supply and sanitation sector today is how schemes can be made to last, and how the sector's development can be made sustainable in essence.

1.3 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 requirement of the people.

Public water supplies are in operation to meet the changing requirements of the consumers. Subsequently, the quality of drinking water has become a prominent issue these days. The government policies are to ensure sustainability and ownership by the user groups, particularly in the rural areas.

To address these issues, the Community Drinking Water Supply and Sanitation Project of Chandragadhi VDC has been planning to improve the service level not only by increasing quantity and reducing cost but also by upgrading the quality of supplied water along with improved continuity, reliability and accessibility. In this context, the user's committee has emphasized quality improvement in drinking water and sanitation in Chandragadhi VDC.

This study examines and explains the local people's participation in the project, status of water supply in the study area, functional status of the project and sustainability of the project. This study may help in the formulation of suitable strategies and policies for operating successful water supply schemes in rural areas. It could also be useful to researchers, students and persons interested in this sector.

1.4 Objectives of the Study

The general objective of the study is to analyze the impact of Community Drinking Water and Sanitation Project at Chandragadhi. The specific objectives are the following:

1. To identify the status of water supply in the study area;
2. To assess the level of local people's participation in the project;
3. To analyze the functional status of the project; and
4. To examine the sustainability of the project.

1.5 Limitations of the Study

The present study is focused on the Community Drinking Water Supply and Sanitation Project at Chandragadhi VDC, in Jhapa District, Nepal. The main limitations of this study are as follows:

- i. The context of this study may or may not be applicable to other places or communities.
- ii. This study was conducted with limited amount of financial resources and time framework.
- iii. Simple statistical tools were used to analyze the data.

1.6 Organization of the Study

This study has been organized into seven chapters. Chapter one deals with the background of the study, statement of the problem, objectives of the study, significance of the study and organization of the study. Chapter two mainly includes the review of literature from related published materials. Chapter three contains the research methodology including rationale of the selection of the study area, research design, nature and sources of data, sampling procedure, techniques of data collection and presentation and analysis of data. Chapter four presents the profile of the study area. This chapter covers introduction, climate, population characteristic, educational, economic and other aspects of the study area including the introduction of the Drinking Water Consumers and Sanitation Committee. Chapter five presents socio-economic and demographic status of the respondents of the study area. This chapter also describes about the age and sex structure, educational attainment, occupation, employment, size of land holding, annual income, livestock etc of the respondents. Chapter six mainly focuses on data analysis, presentation interpretation. This chapter also describes about the sources of water before the project, significant changes after the project, satisfaction toward the project of the people, level of people's participation, duration and reliability of water supply, technical problems related to the project, committee's fund and initiation of community programs through that fund, employment for the local people in the project, and the sustainability potential of the project. The last chapter presents the summary, findings, conclusion and recommendations of the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 History of Water Supply Development in Nepal

The history of water supply development in Nepal dates back to as early as the Lichhavi days when stone spouts, commonly known as *dhunge dhara* were constructed to bring water near to the settlements. Constructed in an elaborate manner, some of these *dhunge dhara* have lasted till the date for centuries.

The modern water supply system, in which water is delivered through pipes, began in 1894 A.D. when a piped water supply system was constructed by the then Prime Minister Bir Shamsher by the name of Birdhara. Sporadic works were carried out after that in providing water supply services such as Karma Kumari Dhara (Amlekhganj), Dhankuta Pani Adda (Dhankuta), Balnarsingh Dhara (Pokhara), Dhirdhara (Birganj), Bhaktapur Pani Adda (Bhaktapur), Lalitpur Pani Adda (Lalitpur), Tri Bhim Dhara (Kathmandu), Hoske (Kavre), Tansen (Palpa), and Khalanga (Jajorkot) by the Rana regime.

Planned development in Nepal was initiated only in 1956 when the first five year development plan for the country was launched. As for the water supply sector, although some major works were carried out to provide services to prominent townships like Pokhara, Dhangadhi and Hetauda, it took more than 16 years to establish a separate department to deal with water and waste water services in the country. Department of Irrigation and water supply that was established in 1966, was divided in two in 1972 into Department of Water Supply and Sewerage and Department of Irrigation. DWSS continued with its responsibility for larger systems, while Local Development Department, with UNICEF assistance started a program for small rural water supply. Until the Seventh Plan, all water supply programs were run under the Department of Water and Nepal Drinking Water Corporation. The government gave an importance to optimum mobilization of non-governmental sectors, private sector and public participation only from Eighth Plan (DWSS, 1997: 2-4).

The running Tenth Plan also has given an emphasis to delivering safe drinking water and sanitation facility through governmental sector as well as public and private sectors to all the people of the kingdom. Indicative target of the Tenth Plan is to provide drinking water to Eighty Five percent of the total population (NPC, 2003: 40).

2.2 The United Nations in the Area of Water Supply

According to the United Nations, over 2 billion Asians will be living in urban centers by 2025. While localize poverty will continue to be a major problem, per capita incomes in most of these cities should be sustainability in excess-double or triple-what they are now. The resulting capacity of consumers to finance provision of water infrastructure and services, whether through taxes or user charges from public or private entities, means that some hundreds of billion of dollars of infrastructure expenditure that might otherwise have been required from government can now be privately or customer financed. All such investments will ultimately be paid for through the water tariffs of increasingly affluent customers and will cost far less than the costs of not having piped water.

The lumpy nature of quality water supply infrastructure investment and the huge costs of infrastructure “catch-up” when millions of people start to become affluent, but cannot depend on a piped water supply.-suggest that the need for far sighted urban planning, including water supply, is over whelming. But equally overwhelming is the cost, when cities expected to house, say, 1-2 million people start to contemplate 10 million or more! The case for planning by government, and for preferred forms of regulation could hardly be stronger. The private sector simply cannot engage in integrated urban planning and investment on a city scale. But what the private sector can do is reduce the need for scarce government funds to be allocated to water supply investments, where the monopoly and essential characteristics of the product enable private financing of investment-if the regulatory structure is right.

The World Summit on Sustainable Development which was held in Johannesburg, South Africa, from 26 August to 4 September, 2002, reached several agreements and outlined how the plan was to be implemented in five areas-water and sanitation, energy, health, agriculture and biodiversity and ecosystem management. For water

and sanitation, some commitments and implementation initiatives were made. They are as follows:

) **Commitments**

- Halve the proportion of people without access to water and sanitation by 2015.

) **Initiatives**

- The United States has announced investing US \$ 970 millions over the next three years
- The European Union has announced the “Water for life” initiative
- The ADB committed a US \$ 5 million grant to UN habitat and earmarked another US \$ 500 million in fast track credit for the Water for Asian Cities Program, and
- The UN has received at least US \$ 20 million in extra resources (Regmee, 2003: 25).

UNESCO, in 2003, also mentioned about the millennium development goal for access to drinking water which was reconfirmed at World Summit for Sustainable Development. It stated that the summit set the target for access to sanitation, i.e. halving, by 2015, the proportion of people who do not have access to basic sanitation, with the following elaboration on action needed:

-) develop and implement efficient household sanitation systems;
-) improve sanitation in public institutions, especially schools;
-) promote safe hygiene practices;
-) promote education and outreach focused on children, as agents of behavioral changes;
-) promote affordable and socially and culturally acceptable technologies and practices;
-) develop innovative financing and partnership mechanism; and
-) Integrate sanitation into water resources management strategies.

The Water Decade (1980-1989)

The United Nation Water Conference held in Mar del Plata in 1977 considered access to safe water as a human right issue. It declared:

All people, whatever their stage of development and their social and economic conditions, have the right to have access to drinking water in quantities and of a quality equal to their basic needs (UNDP, 1994: 4).

The conference urged national governments worldwide to work towards achieving this basic need and recommended:

In order to attain these goals, each country should immediately initiate engineering and feasibility studies on projects that are considered to be of highest priority, and are based on a cost-effective technology appropriate to local conditions, with community participation, good management, and provision for operation and maintenance (UNDP, 1994: 7).

Subsequently the eighties were declared *The International Drinking Water Supply and Sanitation Decade*. In line with this world-wide upsurge in sector activities, in November 1980, Nepal also launched its decade plan for IDWSSD that aimed to increase water supply coverage from 11 percent to 68 percent (Bickram, 2000:32).

2.3 The World Bank in Water Supply Sector

Less than 3 percent of the world's water is fresh water, and most of this is in the ground, ice-caps, and glaciers. Lakes and rivers account for only 0.014 percent of all water. Indeed, water is critically scarce in many places. Generally, a country or region will experience periodic water stress when supplies fall below 1,700 cubic meters per person per year. The global average annual supply of renewable freshwater is about 7,400 cubic meters per person per year. However, twenty-two countries have renewable water resources of less than 1,000 cubic meters per person, and eighteen have more than 2,000. By and large Latin America is best endowed, while Middle East and North Africa is where water is most scarce. By 2025, as many as fifty-two countries inhabited by some 3 billion people will be plagued by water stress or chronic water scarcity. India, now the world's second most populous country, will experience

chronic water shortages nationwide. China will narrowly miss the water stress benchmark.

Issues of scarcity have put water at the top of the international political agenda. Agreement on access to water is an important part of the peace accords between Israel and its neighbors. A water treaty has also helped to maintain peace between India and Pakistan. Today nearly 40 percent of the world's people live in more than 200 river basins that are shared by more than two countries, even within countries, conflicts over water are often bitter. As populations and demand for limited supplies of water increases, interstate and international frictions over water can be expected to intensify (Serageldin, 1994: 1-2).

Focusing on the financing for water supply, the WB observe that the economic costs of providing water include the financial costs of abstracting, transporting, storing, treating and distributing the water and the economic cost of water as an input. The latter cost arises because when water is taken, for example, from a stream for use in a city, other potential users are denied the possibility of using the water. The value of the most valuable opportunity foregone (known technically as the "scarcity value" or "opportunity cost") constitutes a legitimate element of the total production cost of water.

The provision of water supply to households carries several benefits. Households themselves value a convenient, reliable and abundant water supply because of the time savings, amenity benefits, and, to a varying degree, health benefits. Because these "private" benefits constitute the bulk of the overall benefits of a household water supply, the public finance allocation principle dictates that most of the costs of such supplies should be borne by householders themselves. When this is the case, households make appropriate decisions on the type of service they want (for example, a communal tap, a yard tap, or multiple taps in the household). The corollary is that because this is principally a "private good," most of the financing for the provision of water supply services should be generated from user charges sufficient to cover the economic costs of inputs (including both the direct financial cost of inputs such as capital and labor and the opportunity cost of water as an input) (Serageldin, 1994: 18-19).

The Asian Development Bank on the Issue of Water

Access to clean water supply and good sanitation has an immediate and substantial impact on the population, especially for women through time saved in fetching water and for child through decrease in water born diseases and related fatalities. Improvements in access to clean water allow women more time to participate in income generating activities and promote healthy growth of children. Asian Development Bank will continue to support community initiatives in small towns to develop water supply facilities to be maintained by local community or private enterprisers. A water supply and sanitation sector is under preparation by the government and due for completion in July 2006. Asian Development Bank will prepare its strategy for future assistance in this sector based on the government strategy and in consultation with other donors in the sector.

Building on previous projects in the sectors a PPTA in 2001 will be provided to prepare a community based water supply and sanitation sector project for 2002, intended to develop community based water supply project in rural areas. Progress in implementation reforms is crucial to sustaining future sector investment. In this regard, award of private sectors management contract for urban water supply and sewerage services in Kathmandu valley, under World Bank assistance in 2000, will be an important milestone for further processing for Asian Development Bank assistance for the Melamchi Water Supply Project, a 2000 project (ADB, 2001: 24).

Private sector participation in water resources development and management can lead to many economic and financial benefits provided the right environment. Direct participation in build-operate-own/build-operate-transfer type projects require user pay policy to be in place. Heavily subsidized water service and limitation on willingness to pay and affordability discourage private sector participation, unless there is a subsidy guarantee by the government. However, limitation in willingness to pay can be overcome by improved levels of service derived from efficient management expected from private operators.

Even the private sector participation of a lesser degree, such as service contracts, can bring about improvements in economical and financial performance. Operating costs will be reduced and level of service will improve the private sector participation. This is a beneficial situation for the utility as well as for the consumer (ADB, 1996: 354).

About the water's value from supply to demand, the ADB observes that water is always been recognizes as a social good, but is nowadays also recognized as an economic good. Many authorities have noted that the wastage and inefficiency resulting form the construction of the schemes for which costs are not recovered from consumers and which cannot be maintained. Costly supply-driven policies also inhibit the spread of facilities to the least well-off. Rural schemes suffer frequent breakdowns "at the end of the line." In urban schemes, leakage and illegal takeoff are common. For a variety of socio-political reasons, the better-off almost invariably receive the benefits of water services and subsidies in both rural and urban areas (Black and Hall, 2004: 5).

2.4 Nepal Water for Health (NEWAH)

Since the International Drinking Water Supply and Sanitation Decade (1981-90), experiences in many developing countries have shown that even the best-run water organizations cannot successfully implement, operate and maintain a network of widely dispersed water systems without the full involvement and commitment of the users. In the context of Nepal, the Village Development Program (VDP) started rural drinking water supply program in 1952. The government always allocated huge amount of funds for drinking water supply construction but after a few years the project again sought rehabilitation budget. Not only government but also INGOs and the private sector are also partners to construct water supply schemes.

Through the continued effort and mobilization of the community and with the collaborative effort of implementing agencies as well as the community itself, the coverage of water supply is 67 per cent, which is still below the target. In this connection, this study is trying to give general scenario about community management and how it is applying by the different sector organizations (GOs/INGOs) and their roles in the water supply and sanitation program in the

changing context of the development paradigm. Moreover, community management approach is become more important and challengeable for the reliability, sustainability and replicability of the development program (NEWAH, 2001: 1).

Although there is greater understanding of the need to include women and the poor in the management of rural community water and sanitation systems, their participation remains limited. Recognizing that better off and poor women and men have different roles, interests and needs in the rural drinking water and sanitation sector, facilitating their participation in the decision making processes can increase project efficiency and sustainability (NEWAH, 2003: 1).

2.5 The Tenth Plan (2002-2007) of Nepal

The core objectives of the Drinking Water Supply and Sanitation Sector (DWSSS) are to increase sustainable access to basic drinking water in rural areas and basic sanitation in both rural and urban areas. Similarly, upgrading basic drinking water services in urban and semi-urban areas through private sector involvement and checking water-induced diseases through the supply of safe drinking water are other major objectives. The main strategies of the sector are to encourage NGOs, CBOs and the private sector to actively participate in the planning, designing, implementing, operating and maintaining water supply and sanitation schemes with the support from NGOs and the private sector and to formulate and implement necessary legislative reforms and cost recovery policies, among others.

Among the major policies and activities adopted by the Tenth Plan, the government will revise the 1998 rural sub-sector policy to specify clear roles and responsibilities for the various sector actors. It will also reform and consolidate the institutional mechanisms and approaches to facilitate the implementation of demand driven community managed programs and projects by making operational a sector monitoring and evaluation system within the line ministries.

Likewise, the government will formulate an Act to ensure the autonomy of the Rural Water Supply and Sanitation Fund Development Board. With the completion of proposed activities, about 3.8 million people will have access to safe and sustainable

drinking water services. Girls will have better opportunity to go to schools due to time saved in fetching water. Incidence of water borne diseases will be reduced considerably (The Tenth Plan, 2002-2007: 55-56).

2.6 Rural Water Supply and Sanitation Fund Development Board

On 14 March 1996, the government of Nepal created the Rural Water Supply and Sanitation Fund Development Board to promote sustainable and cost effective demand-led rural water supply and sanitation services in facilitation of Non-governmental and Private Organizations with full emphasis on community ownership in conformity with the government's Eighth Plan (1992-97), Ninth Plan (1997-2002) and Tenth Plan (2002-2007) sector policies, which aimed at fundamental changes in rural water supply and sanitation service delivery mechanism in the country. The Ministry of Physical Planning and Works is the line ministry for the Board.

The Board is designed based on the experience of a field testing pilot project, acronymed 'JAKPAS' (the Nepali acronym of Janata Ko Khanepani Ra Sarsafai Karyakram – meaning People's Water Supply and Sanitation Program). Preparation studies for the pilot were carried out with funding by the United Nations Development Program (UNDP) and a grant from Japanese Grant Facility (JGF). The World Bank executed the pilot for a period of three years, during 1993-96, financed by two additional JGF grants.

The Board has completed its First Phase (1996-2003) successfully and entered into Second Phase (2004-2009) to support rural communities on implementation of water supply and sanitation schemes. The Board is being funded by World Bank and DFID (<http://www.rwss.org>, August 2006).

2.7 Action Aid Nepal (AAN) in the Area of Water Supply

Action Aid Nepal has been implementing water projects in hilly rural areas of Nepal since 1984. Over the period, AAN has been learning from its experience and also from those of similar organizations involved in community development. Different approaches and policies have been adopted and the present approach has actually evolved from experience.

In the beginning AAN had implemented projects directly at the request of the users. There was no assessment and prioritization system which involved the community. Even there was no thinking about the project sustainability. Therefore, the feeling of ownership among the users was lacking. As a result in the initial days AAN had to undertake the task of maintenance and repair itself.

From 1989, AAN changed its working procedures. Some responsibility of project implementation was given to the users. Project planning and prioritization were done by the AAN themselves. Community mobilization, site and store management mason and worker management, project implementation, and decision-making once the project was started were taken up by the community. Maintenance fund collection was made compulsory. Priority was given to training, meeting, and workshop with users with the purpose of enabling them for long term sustainability. Likewise, strong technical support was maintained for qualitative outcomes from the implementation of the project. This helped slightly in improving ownership feeling among users, but was not satisfactory.

After 1993 onwards, the main responsibility for project selection and implementation has given to users. AAN has been providing budget and technical support only. Materials management (external and local) decision-making and community mobilization responsibilities have been taken up by the community. Users are exposed and oriented to the market for the material purchase. Local trained human resource is mobilized from the very beginning of the project implementation which has supported in confidence building in them. Priority has been given to users' awareness on health and sanitation, importance of DWS its sustainability, problems, source and environment protection, use of maintenance funds and so on. This has shown good signs on users' ownership (Rai, 1996: 1-2).

2.8 Sustainable Water Supply Systems

Any development endeavor can be said to have become sustainable when it functions effectively as per the design for a minimum duration of the entire design period. Also, the project should impart visible positive impacts on the beneficiaries, i.e., the services must be utilized and the benefits envisaged translated into reality. It must

initiate positive reactions on part of the consumers in operation and maintenance activities which in turn should contribute to lengthen the functioning years of the entire system. Coming to rural water supply, it implies that sustainability can be said to have been achieved when the operation of a water supply scheme contributes towards the long run performance of the community's economy by saving time and energy spent in fetching water from distant sources and also by improving the health of its members through provisions of safe and potable water. Such would in turn help increase the overall productivity of the nation (Bhattachan, 1997: 13).

Today, it is already widely accepted that for the development to be sustainable, the people or the community must be brought to the mainstream as 'actors' of development to participate in development activities which is meant for them. They should not be treated as mere consumers or beneficiaries. The Eighth Five-year Plan launched in 1992, formulated after the restoration of multiparty democracy in 1990, attributed lack of people's participation as one of the major causes of economic disorders in the previous plan periods, and called for an environment in which the source and center of all decision making were the beneficiaries. State agencies such as the Department of Water Supply and Sewerage were asked by successive governments to continue playing the lead role, but as a promoter and facilitator of sector activities, not as the usual provider (Bhattachan, 1997: 13).

2.9 The Meaning of Participation

For a development effort to be sustainable it must begin with the needs and strengths of the people, and it must be made by the people. People must participate fully in the decision-making processes that affect them. The people must be involved in the entire process of the development action, i.e., from inspection and design to implementation. Subsequently, they should be able to handle the services derived out of such action on their own.

Participation emphasizes on the active role played by the mass in development activities devised for it. The major ingredients of people's participation have been identified as the mass sharing of benefits of development, mass contribution to development and mass involvement in the decision making process of development.

According to Lohani, the closet synonym of people's participation is popular participation. He points out the need for both 'quantitative as well as qualitative' involvement of the masses in deciding societal as well as regional, district and national level goals (Lohani, 1980: 17).

Participation does not mean getting people to do what outsiders think is good for them. Many so called 'participatory' programs do not go beyond taking advantage of cheap local labor for construction work or involve token consultation with village chiefs in order to gain the consent of the population. Participation is useful only if it serves to help achieve national economic and political objectives. The focal components of the people's participation in water supply schemes development in Nepal until 1992 had been the contribution by the beneficiaries mostly in the form of free labor (Bickram, 2000: 12).

2.10 Community Participation/Management

Involvement of beneficiary communities in all the phases of the water supply project initiation and development has been recognized as a very important step for the successful implementation, operation and maintenance of the water supply projects. Adequate mobilization of local resources, skills, materials and participation in contributing to the construction fund makes the ownership feeling of the communities stronger. The projects being implemented through the assistance of UNICEF, ADB, World Bank, etc are strictly following the project in certain cases did not even represent the felt need and priority of the communities. Although the policy of HMG of Nepal included involvement of the beneficiary communities in terms of local skills, materials and initiatives with all the phases of the implementation of a project, it was not translated into action effectively (Sharma, 1997: 3-4).

Introduction of development phase prior to implementation allows for genuine participatory decision-making and prepares community to take charge. The beneficiary community is sensitized, mobilized and organized to resolve conflicts and prepare in collective decision of implementation. Every project has made it mandatory to include all willing potential beneficiaries for equitable benefit regardless for wealth, caste and gender. Non-formal education is targeted on poor and disadvantaged

groups to bring them in the main stream of decision making process. Again development phase process establishes a self-selection process for scheme allocation with demonstrated transparent criteria while preparing conflicts and prepare.

Several participatory tools such as self-esteem, associative strengths, resourcefulness, action planning, responsibility and Participatory Rural Appraisal (PRA) are used during the development phase and prior to the implementation phase. In the development phase and prior to the implementation phase Water Supply and Sanitation Users Groups (WSSUGs) and Water Supply and Sanitation User's Committees (WSSUCs) are formed and registered under the Water Resource act in the district's Water Resource Committee (RWSSP, 2004: 11).

In this way, the literatures reviewed above indicate that there were several studies on water supply and sanitation in the past. Most of the studies on water supply and sanitation were primarily focused on health and sanitation aspect. Only a few studies investigated into other direct and indirect impact of water supply and sanitation projects on socio-economic status of the people. Hence, the present study is relevant and vital in view of contributing to filling up gaps in the existing literatures on water supply and sanitation sub-sector in Nepal. Most of the studies are failed to explain about the level of the people's participation in these types of projects.

Our literature review suggests that the projects in which people are involved and empowered have greater chances to be sustainable. The role of the state is that of a promoter of services, not that of a provider. It needs to play the role of the facilitator of development work by bringing the beneficiaries to the mainstream of development.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Selection of the Study Area

The project under the study area has been playing significant role in supplying drinking water to the inhabitants of the area. However, the project has not yet been successful in meeting the complete demand of all households. So the study aims at finding out the constraints in the distribution of water to all the households in the area.

3.2 Research Design

In order to fulfill the objectives of this study, descriptive and exploratory types of research design have been used. In accordance to the above set of objectives, the study was carried out in systematic way.

3.3 Sources of Data

In this study, both primary and secondary data have been used. These are described below.

3.3.1 Primary Data

The primary data was collected using questionnaires to interview one respondent from each selected household. The household selection was done by simple random sampling method. The household details were collected through the direct contact with the head of each sampled household.

3.3.2 Secondary Data

The required secondary data and information were collected from various publications such as books, journals, magazines, published and unpublished dissertations, newspapers, and internet as well as institutions related to drinking water and sanitation like UNDP, UN, WB, ADB, CBS, DWCS and different NGOs and INGOs.

3.4 Total Population and Sample

Among the total beneficiaries of Community Drinking Water and Sanitation Project at ward 6 of Chandragadhi VDC in Jhapa district, 25 percent were selected as the sample on the basis of simple random sampling method. The actual households of beneficiaries were identified from the project office. Among the 300 beneficiary households, only 80 were taken for the study purpose.

3.5 Methods of Data Collection

To collect the required data and information, the head of each sampled household was interviewed. For the personal interview, a pre-designed questionnaire was used. When required, the observation method was used. The data were thoroughly checked, edited and tabulated to make the data set suitable for analysis. Data processing was performed with the help of a calculator, a personal computer, and other electronic and manual devices. Certain other relevant local conditions were recorded in photographs.

3.6 Data Presentation and Analysis

In this study, exploratory as well as descriptive methods were used to analyze the data and information. Presentation of produced data was used in tables and necessary maps and diagrams were also used whenever appropriate. After analyzing and interpreting the data and information, conclusions are drawn and recommendations are made.

CHAPTER FOUR

THE OVER VIEW OF THE STUDY AREA

This chapter presents the geographical setting of the study area. It is further divided into sections such as the location, Chandragadhi VDC, rivers and rivulets, flora and fauna, soil, population characteristics distribution of population on the basis of ethnic group and economic activities of the people of Chandragadhi VDC.

4.1 District Overview

Jhapa is one of the four districts of Mechi zone which lies in eastern development region of Nepal. It covers that land of Mechi zone which is divided into two parts by the Kankai River. Jhapa district is bounded by West Bengal and Bihar states of India in the east and south, respectively, Ilam district in the north and Morang district in the west. It lies between $87^{\circ} 39'$ to $85^{\circ} 15'$ longitude and $26^{\circ} 20'$ to $26^{\circ} 50'$ latitude. Most part of the district lies in the tarai and it comprises a narrow strip of alluvial plain having very low altitude ranging from 100 ft. to 1,800 ft. above the sea level. The major rivers of the district are Mechi, Kankai, Biring, Ratuwa and Deoniya.

The district comprises a total area of 1606 sq. km. with a total of 137,301 households comprising 688,109 people, of whom 341,675 are male and 346434 female (CBS, 2001). Bhadrapur Municipality is the district headquarters.

Jhapa is one of the largest districts of the eastern development region of Nepal. The proposed study has been concentrated on the ward 6 of Chandragadhi VDC in Jhapa district (Map 1).

4.2 Climate

The climate of Jhapa is subtropical to temperate. The average temperature varies from 36° to 39° in summer and 9° to 12° in winter. The average rainfall is 2518 mm, which occurs mostly during the monsoon, June to September (Meteorological Section, Jhapa 2002).

Map 4.1: Map of Jhapa District

4.3 Chandragadhi Village Development Committee

Administratively, Jhapa is divided into 47 VDCs and 3 municipalities. Out of these 47 VDCs, Chandragadhi is one. Its area is 45 sq. km. with the north-south length of about 9 km and the east-west width of about 5 km. Chandragadhi VDC is bounded by Duhagadhi VDC on the north, Mahespur VDC on the south, Bhadrapur municipality and Jyamirgadhi VDC on the east and Haldibari and Garamani VDC on the west (Map 2). From Kathmandu it takes 1 hour by flight and 12 hours by bus to reach Chandragadhi.

Chandragadhi has the total population of 16,052 (7,971 male and 8,081 female) living in 3,303 households. Out of the total population, the Rajbanshi are the major ethnic group of the area whose population is 2,699. Chandragadhi VDC is situated at the elevation of 93 m above the sea level. This VDC covers about 3,950 bigha of land.

4.4 Rivers and Rivulets of the VDC

In Chandragadhi VDC, there are mainly two rivers known as *Ninda* which flows on the eastern side, and *Deonia* that flows along the western side of the VDC. Beside these, there are many rivulets such as *Virchuli*, *Singivitta*, *Handia* and *Jhoda* etc.

4.5 Flora and Fauna

At present, no dense forest area is found in Chandragadhi VDC. However, that does not mean that the area does not have any flora. Previously, Chandragadhi had highly dense forests, but due to the new settlement program most of the forests were

destroyed. The flora like Dalberzia sisoo, Saal (Shorea robusta), Simal (Bombax ceiba), and Tanki (Bauhinia purpurea) are found in this VDC which are very useful for timber and firewood purposes.

In absence of dense forests, many types of fauna are not found. The most common fauna of this VDC are deer, wild boar and jackal and birds like sparrow, crow, peacock, maina, dove and many others.

Map 4.2: Map of Chandragadhi VDC

4.6 Soil

Basically, there are five types of soil found in Chandragadhi VDC such as black soil, loam soil, matteulo yellow soil, sand soil and other wetly and rocky soil. The high yield is produced from the black soil and loam soil. Rest of the soil for high yield is not so important. People cultivate different types of crops in these soils. Types of soil are shown below in the table:

Table 4.1: **Types of Soil in Chandragadhi Area**

Types of Soil	Area in Bigha	Percentage
Black soil	984	24.91
Loam soil	1600	40.50
Matteulo soil	785	19.88
Sandy soil	355	8.98
Other wet and rocky soil	266	5.73
Total	2950	100.00

Source: VDC Office (2006).

4.7 Population Characteristics of the Chandragadhi VDC

The total population of the Chandragadhi VDC is 16052, of which 7,971 are male and 8,081 are female.

Table 4.2: Distribution of Population on the Basis of Ethnic Groups

Ethnic Group	Number
Brahmin-Hill	6127
Chhetri	2144
Rajbanshi	2699
Satar	548
Newar	517
Rai	462
Limbu	281
Gharti/Bhujel	216
Kami	209
Tamang	199
Magar	197
Gangai	132
Damai/Dholi	110
Dalit	110
Muslim	106
Others	1995
Total	16052

Source: CBS, 2001.

From the above table it becomes clear that the highest population of the Chandragadhi VDC is of the Brahmin and the second highest of Rajbanshi, followed by Chhetri, Satar and others.

4.7.1 Educational Situation

There are six primary, two lower secondary, four secondary, two higher secondary schools in the VDC. The numbers of total school going children are 4567. In the study area, i.e. ward 6, there are two secondary schools. Out of total population of the VDC, 69.45 per cent are literate (CHN VDC: 2062).

4.7.2 Social Organizations and Industries

There are many social, economic and some religious organizations working in the VDC. Industries of many kinds can be seen there. Cement, brick and tea industries are some big industries. While saw mills, rice mills etc are medium and other small types of industries are also prevalent there. In the study area there are no such kinds of big or small industries.

4.8 Economic Activities of the People of Chandragadhi VDC

The people of Chandragadhi VDC have adopted various types of occupation like agriculture, animal husbandry, services, tailoring, business, and wage labor. Out of all these occupation, they give more preferences to agriculture. As Nepal is an agrarian country, so the majority of them depend on subsistence agricultural economy. They grow various types of crops like tea, rice, maize, wheat, and mustard. Besides, they also produce different kinds of vegetables such as potatoes, and cash crops such as jute which they sell at the-near by markets.

The agricultural cycle begins from Chaitra-Baisakh (March-April) when maize is sown. In Asad-Shrawan (June-July) they plant paddy in their fields. Wheat is harvested during Baisakh-Jestha (May-June). Maize is harvested during Shrawan-Bhadra (August-September).

The method of cultivation is still traditional, that is, they plough their fields with plough and yoke. But these days some of them have started using tractors for digging furrows the soil and for the purpose of high yields. Some of them have started using chemical fertilizers and improved varieties of seeds. Because of the newly constructed irrigation system, the Hadiya kulo (Hadiya channel) people of Chandragadhi VDC have got some opportunity to increase their farm productivity.

4.9 Introduction of the Project

The drinking water supply project of the Chandragadhi is known as “Shree Drinking Water Consumer and Sanitation Committee”. It is located at ward 7 of Chandragadhi VDC in Jhapa district. Its construction begins in 2038 B.S and completed in 2040 B.S. The system built by the government of Nepal was run under the Department of Water Supply and Sewerage for 18 years before the government decision to hand over the drinking water project to the community in 2057 B.S. In Baisakh 2058 B.S. the government itself formed a committee under the chairmanship of a local social worker Mr. Lekhnath Niroula, to run the project and thus it completely became the property of the community or the users’ group. At the time of handover, there were 1,105 taps for the consumers but till the date the users’ committee has increased them to 1,625. The coverage of the pipe line was 56 km and after the community took over, it increased to 72 km till the date. It has its own land of 12 kattha for running the project where there is a water tank of 450 m³ size and 25 m height, a reserve tank of 360 m³ size, a filter tank and other assets like office houses, garden, generator houses, and boring houses.

This water user committee has not only provided water to the Chandragadhi VDC but also to some areas of Bhadrapur Municipality and Mahespur VDC. Its benefited population is more than 16,000 and water supply capacity is 35, 00000 lt. per day. It supplies water 12 hours per day and it is always regular except at the time of water treatment. Water is distributed after filtering in the modern type of filter tank which was made by the Japanese government in 2047-48 B.S. The water is thus one of the cleanest in Nepal and it can be drunk safely without boiling.

At present, this water users’ committee is getting little support from the government and no other organizations are involved in this project. The committee is self-sufficient to run this project and has a monthly income of Rs. 2, 00,000 and expenditure of Rs. 1, 50,000. Through its monthly income, the committee, it has done sanitation program by constructing the slaughter house for selling meat and fish in ward 7 and these products can be sold only at this house. By this rule, it has become possible to control the contamination of meat and fish in the market area.

All the members of the water user committee are chosen by the consumers through a voting system. Election is held every four years and those people can vote whose name is registered in the committee as a drinking water tap owner. Eleven members are elected and two are selected by the newly elected committee. This committee has given employment for 13 local people from Peon to Section Officer as permanent employees and many others are getting temporary jobs as labors in time to time. Till date, this committee is running self-sufficient smoothly. The committee is always aware of clean and safe water. Although it has a filter tank with the latest Japanese technology, every year the water from the taps at different locations of Chandragadhi VDC is sent to the Royal Nepal Academy of Science and Technology (RONAST) for testing the quality of water, especially for chemical and biological tests. If the water quality is found unsafe for drinking, immediate actions are taken for treatment. It is found until now that till the date the RONAST has given clearance report about the quality of the water.

The committee's important plan in the future is to initiate many income-generating programs so that there would no need to raise the cost of water distribution for consumers.

CHAPTER FIVE

SOCIO-ECONOMIC AND DEMOGRAPHIC STATUS OF THE RESPONDENTS

5.1 Social Profile

Nepalese society is a layer of the multiethnic groups of people living together in a community with different races, languages and cultures. Even today, the multi-racial and multi-linguistic characteristics are quite visible in the population of Nepal.

In the present study, an attempt has been made to highlight on some of the social and economic characteristics of the study area. So far as the social study is concerned, it includes households and average family size, caste/ethnicity composition and educational status. Similarly, the economic conditions of the households such as sources of income, and annual income are discussed.

5.1.1 Households and Average Household Size

The total population of the 80 sampled households in the study area is 475. It was found heterogeneous society with various caste/ethnicity groups of people, such as Brahmin, Chhetri, Rajbanshi, and Newar etc.

Table 5.1: Population and Composition

Caste group/Ethnicity	Number of Households	Population	
		Number	Percentage
Brahmin	50	280	62.50
Chhetri	20	125	25.00
Rajbanshi	4	32	5.00
Other ethnic groups	6	38	7.50
Total	80	475	100.00

Source: Field Survey, 2006.

From the above table we can see that out of total population, Brahmin represents the highest of the 62.50 per cent population followed by Chhetri 25 per cent, Rajbanshi 5 per cent and other ethnic groups are 7.50 per cent. Also out of total households, 50 are of Brahmin followed by 20 of Chhetri, 4 of Rajbanshi and 6 of other ethnic groups. It can be known that Brahmins are the majority groups in the study area.

5.1.2 Age and Sex Structure

Age play an important role for human beings. Man can achieve his target in a fix time of his age. If every man actively participates in economy, social, religious and other organization then they can achieve their goals for their life. By this, not only a single man but a family, village and a country can run smoothly on the way of development. Without participating in these institutions the country always remains underdeveloped. But for active participation, the age of the human being is very important. Before 15 and after 60 it is not known as suitable age of active participation. It is like a universal truth that the age between 15 to 60 is suitable for participating in every economic and other activity. If this age group did not function properly then no any country can be developed.

Table 5.2: Age and Sex Structure

Age (years)	Male		Female		Total	
	Number	Percent	Number	Percent	Number	Percent
0-15	62	27.19	80	32.38	142	29.90
15-59	130	57.02	130	52.64	260	54.74
60 above	36	15.79	37	14.98	73	15.36
Total	228	100.00	247	100.00	475	100.00

Source: Field Survey, 2006.

From the above table we found that the total population of 80 households are 475 and among them 27.19 per cent male and 32.38 per cent female are in between age of 0-15 while 57.02 per cent male and 52.64 per cent female are in between age of 15-59 and 15.79 per cent male and 14.98 per cent female are age of 60 or above than it. Among the total population of 475; 52 per cent are female and 48 percent are male.

5.1.3 Settlement Pattern

The settlement pattern of the study area is densely populated. The majority of private houses are made by brick and cement or they can be known as R.C.C. building with one or two storey. There are some traditional types of houses but now the replacement of these houses, with modern houses is increasing rapidly.

5.1.4 Educational Status

Education is a better means through which human beings may step into a brighter side of life. Education is a learning process. It is an acquisition of such knowledge and skill as it will help the individual to earn his/her livelihood and find a place in adult society. It is a harmonious and all-round growth and development of human power of mental and physical. Education is an essential factor for the development of the society. It also helps to achieve upward mobility.

As a means it does various works for the benefit of the people. Education brings consciousness. For country like Nepal education plays vital role in developing knowledge and skills of people. Thus education becomes one of the sources of economic development. The educational status in the study area was found

satisfactory. Most of the people are positive towards the education and they think that education is must needed. Both male and female education is given equal priority. From the table below we can see the educational status in the study area.

Table 5.3: Educational Status of the Studied Population

Level	Male		Female		Total	
	Number	Percent	Number	Percent	Number	Percent
Illiterate	12	5.27	22	8.90	34	7.16
Primary	50	21.93	54	21.86	104	21.90
Secondary	98	42.98	105	42.52	203	42.73
SLC and above	68	29.82	66	26.72	134	28.21
Total	228	100.00	247	100.00	475	100.00

Source: Field Survey, 2006.

It reveals from the above table that among total population of 475; 5.27 per cent male and 8.90 per cent female are illiterate. But after this, 21.93 per cent male and 21.86 per cent female are literate and their educational status is of primary level. Again in secondary level education there are 42.98 per cent male and 42.52 per cent female can be found. 29.82 per cent male and 26.72 per cent female are found to have obtained SLC and above level of education. In conclusion, we can know that most of the population is literate in this study area. Only few people are found illiterate but most of them are aged male and female who didn't get chances to study at their time when they were young. All respondents think that education should be provided compulsory to their children for both boys and girls. The researcher found that most of the respondents are educated so they are interested to send their children to the schools.

5.2 Economic Profile

Economic condition of the household is the main factor to establish a good status or social prestige in the society. While discussing the general feature of the Nepalese economy, it is found that Nepal is an agricultural country. Most of the people live in the rural areas and adopt agriculture as their means of livelihood. Almost two third of the total area of the country is covered by hills and mountainous region. The cultivable lands are confined in tarai and inner tarai parts of the country. Nepal is

facing many constraints on the way of development. Geographical and topographical feature of the country presents a big barrier which have always created obstacle in the development process. In the field of industrialization, the country has not achieved significant progress. Therefore, the level of poverty varies from village to village because of the topographical and landscape variation.

This study is basically concerned with the general economic activities of the people of the study area. Though the main economic activities of the people lie in the salaried job, agriculture, livestock, service are equally important in every community. Economy plays a vital role in the development of any country. The study area is located in Jhapa district, and the land of this district is extremely stronger than other districts of the country in the case of producing crops and other activities of development. So, the people are also quiet stronger in financial and economical aspects. Because of having fertile land they are able to maintain their lives easily. The researcher found that almost all the respondents have enough land of their own and they can easily produce the food for their family which can be feed for a whole one year period especially the rice produced in the monsoon season. The amount of that rice last for the next year's monsoon season.

5.2.1 Main Sources of Income

The economic condition of the people of the study area is satisfactory. They earn money sufficient to feed the household. Almost all the respondents are engaged in different types of occupation like salaried job, agriculture, livestock and others. Besides, their occupation they also have their own land. Here, the researcher has tried to find out the main sources on income of the respondents. It can be seen by the table below.

Table 5.4: Main Sources of Income

Main sources	Respondents	
	Number	Percentage
Salaried job	47	58.75
Agriculture	20	25.00

Livestock	-	-
Others	13	16.25
Total	80	100.00

Source: Field Survey, 2006.

Here, from the above table it can be seen that for the majority of the respondents (58.75%) the main source of income was salaried job either in the form of private or government job. While for 25 per cent the income mainly come from agriculture and 16.25 per cent depended on other main sources of income, especially retirement allowances. No respondent was found whose main source of income was livestock. In conclusion, most of the people in the study area had salaried job as their main source of income.

5.2.2 Annual Income

As mentioned before, almost all of the respondents are economically strong to take care of themselves and their families; their annual income varies into different ranges. According to the types of job, size of land holding and other sources of income some has their annual income in high level, some in middle while some has low. It can be interpret from the table below.

Table 5.5: **Annual Income**

Annual Income (In Rs)	Respondents	
	Number	Percentage
20,000-40,000	-	-
40,000-60,000	15	18.75
60,000-80,000	25	31.25
80,000 and above	40	50.00
Total	80	100.00

Source: Field Survey, 2006.

Here, from the above table it can be seen that the majority of the respondents (50%) had annual income of Rs. 80,000 and above while 31.25 per cent annual income was Rs. 60,000-80,000 and 18.75 per cent had Rs. 40,000-60,000 of annual income. From this, it is seen that most of the respondents are economically well off.

5.2.3 Size of Land Holding

One of the major causes of the people's poverty is their ownership of the land as well as the ownership of limited quality land. Most of the agricultural land is in the form of 'khet' that lays irrigated category that is very limited. Rest of the other land is the poorest of all that lies in two categories, *Sim* and *Chahar of Pakho*. Land distribution patterns seem to be dependent upon the rank or position of the caste and ethnic status of the people. Brahmin and Chhetri caste groups have more land, and the occupational castes are found more disadvantaged than the others.

Nepal is an agricultural country where more than 81 percent of the population depends on agriculture for their live hood. In the case of Nepal, if any person has a large amount of land and sells his agricultural products, he/she is known as a prestigious person. His political, social and economic status is ranked high in the society. But on the other hand, poor people who do not have sufficient land for their daily life they are known as lower class poor people so, they have to process their life with extreme poverty. At first in the tarai area of eastern Nepal like Jhapa and other districts there was a affect of malaria so people do not want to live there but, after the eradication of malaria, people from hilly area started to migrate in these place and settled there and till now it has become the highly populated area. In the study area almost all people are owner of their own land and they don't have the problem of hand to mouth except few. They have either in big or small size of land. By the table below some interpretation can be made.

Table 5.6: **Size of Land Holding**

Size of Land (bigha)	Households	
	Number	Percentage
0-1	28	35.00

1-5	44	55.00
5-10	6	7.50
10 or more	2	2.50
Total	80	100.00

Source: Field Survey, 2006.

The above table shows that out of total 80 households, all of them have their own land and no respondents were found landless. Here, we can see that 28 respondents (35%) own land between 0-1 bigha, 44 respondents (55%) own between 1-5 bigha, 6 respondents (7.5%) has 5-10 bigha and only 2 respondents (2.5%) has 10 bigha or more land.

5.2.4 Livestock

Sometime a source of subsistence can be livestock for people. For different purposes people keep different types of animals. For the purpose of ploughing they keep oxen, for meat and selling they keep goats, hens, ducks, pigeons, pigs etc and for milking and selling they keep cows, buffalos etc. These types of animal give money or any types of good in return so people are always eager to keep animals in their homes. By selling these animals they can get extra money for their daily needs. So those people who have some amount of land they can be found having livestock. In the study area all the respondents were found having livestock. It can be interpret by the table below.

Table 5.7: **Respondents' Livestock Holding**

Types	Number	Percentage
Cow	121	15.38
Buffalo	61	7.75
Goat	135	17.15
Chicken	460	58.45
Pig	-	-
Others	10	1.27
Total	787	100.00

Source: Field Survey, 2006.

The table reveals that altogether there are 787 animals of different types kept by the respondents. Among all respondents, the majority had kept chickens for their various purposes. Then come goats, cows, buffalos and other animals. Chickens are popular among them because of less space required to keep them.

CHAPTER SIX

THE MAJOR FINDINGS AND DISCUSSIONS

This chapter mainly deals with the status of the water supply, level of the local people's participation, functional status of the project and also the sustainability of the project. This includes sources of water and distance to cover to get water before the initiation of the project, people's satisfaction, water supply per day, the technical problems of consumer's taps, about water user committee's fund, man power of the committee etc. In other words it has tried to find out the impact of the drinking water project on consumers.

6.1 Impact Evaluation of the Community Drinking Water Project

The Drinking Water Supply and Sanitation Project have brought many positive impacts on the community of Chandragadhi VDC. Although, the people used to get water from their own sources like well, tube well etc and those sources were near their home, it used to be difficult to fetch the water. They have to suffer from many problems related to clean drinking water. But after the project initiation, some

changes, such as time saving, consumption and utilization of water can be seen in the study area. People get easy access to safe drinking water and also it became easy to fetch water from taps. The piped water supply became usable for everything like cooking, washing, bathing, drinking etc.

Again after the project was handed over to the community, people are getting more facilities than before. Safe water and long hour supply of water has made positive impact on the consumers. Now people started to think that the project is their own and they participate actively for betterment of this project. If any problems occurred then they can complain to the committee and solve their problems. Before the project was handover to the community sometimes their problems remained for 2-3 months and more but now every problem are solved within 24 hours except supply pipes. Water user committee is elected by voting by the consumers, so the committee is always aware of the problems of the consumers. The committee has managed the water supply so properly that only problems related to taps and water meters are informed by the consumers these days. They are discussed briefly below.

6.1.1 Sources of Water before the Initiation of the Project

In the cases of the under developed countries like Nepal it is found that in those places where there are no any water supply programs were initiated, people get water form other sources like well, tube well, ponds, rivers etc. In the study area, present water supply was constructed in 2038-2039 B.S. under the fully control of government and it was handed to the community only in 2058 B.S. so before the water supply program people in the study area used to get from different sources like well, tube well, kuwa etc. Here it can be known by the table below about the sources of water before the initiation of the project.

Table 6.1: Sources of Water before the Initiation of the Project

Sources	Respondents	
	Number	Percentage
Tube well	44	55.00
Well	28	35.00
River/Pond	-	-
Kuwa	8	10.00

Others	-	-
Total	80	100.00

Source: Field Visit, 2006.

Form the above table it is found that most of the people (55%) used to get water form the tube well, 35 per cent from well, 10 per cent from kuwa before this drinking water program was initiated.

6.1.2 Distance to Cover for Water before this Project

In the study area it is found that before the project, the sources of water used to be mainly well, and tube well. To fetch the water from these sources it takes much time and energy. Although these sources are not far away from their home almost all respondents think that those sources used to be difficult for getting water and they are not safe for drinking.

Table 6.2: **Distance to Cover for Water before this Project**

Distance/time required (in minutes)	Respondents	
	Number	Percentage
Less than 10	72	90.00
10-30	8	10.00
30-60	-	-
More than 60	-	-
Total	80	100.00

Source: Field Survey, 2006.

From the above table we can found that 90 per cent respondents says that they have to cover less than 10 minutes to get water before this project was initiated and 10 per cent says that they cover 10-30 minutes to get water. Here, the question raised that then how people are satisfied with the present water supply if their sources are not far away from their homes before the present project initiated. Almost all respondents think that although they do not cover much distance for water they have to spend energy to get water from well, tube well etc and water was not safe to drink.

6.1.3 Significant Changes observed after the Initiation of the Project

As mentioned before, the consumers uses different sources to get water before the project was constructed and that water was not safe, especially for drinking. The respondents also tell that washing clothes with tube well water was not satisfactory. Sometimes, it changed the color of the clothes. It is also found that in dry seasons it was difficult to get enough water from the tube well and well, in rainy seasons the water of the well becomes more unsafe for drinking and cooking because the rain water directly goes into the well and at he time of storms the dust enter inside the well and make the water polluted. But after the initiation of the project no any problems are occurred for washing clothes, drinking, bathing, childcare etc because of the piped water supply. People are eager to tell that the water of this project can be drink without boiling and no affects of water deceases are found till the date. We can interpret this by the table on next page.

Table 6.3: **Significant Changes Observed after the Initiation of the Project**

Changes	Respondents	
	Number	Percentage
Safe water	52	65.00
Washing clothes	17	22.00
Cooking	6	7.00
Others	5	6.00
Total	80	100.00

Source: Field Survey, 2006.

Table 12 reveals that 65 per cent of the respondents think that the most significant changes occurred after the initiation of the project is safe water while 22 per cent think for washing clothes, 7 per cent for cooking and 6 per cent give other reasons like bathing, agricultural uses etc.

6.1.4 Satisfaction Level of Water Supply

To run any type of community programs properly and sustain, the users or consumers must be satisfied with that program. They should get benefit from that program. If people are not satisfied then that program cannot run in the future. In the case of this

drinking water supply project, most of the people are found satisfied. The entire total of 80 respondents, all expressed satisfaction. Again those respondents were asked the reasons for their satisfaction. This can be seen from the table below.

Table 6.4: Reasons for Satisfaction with the Project

Reasons	Respondents	
	Number	Percentage
Safe water	63	79.00
Sufficient water	16	20.00
Time saved	1	1.00
Others	-	-
Total	80	100.00

Source: Field Survey, 2006.

From the table 13 it can be known that the people are fully satisfied with the project. Out of total respondent 79 per cent says that they are satisfied because of the safe water while 20 per cent satisfied for sufficient amount of water and 1 per cent says time saving. By this table 13 we can draw a conclusion that most of the people are satisfied with the drinking water project.

6.2 Level of People' Participation

Community participation in urban areas is more complex than in rural areas for many reasons. Communities are less cohesive and the water supply infrastructure is often technically more difficult to manage. Furthermore, new scheme construction is less open to self-help contribution because of the community being involved formal wage earning activities and the schemes complexity. However, there still remains a need to fundamentally involve the community in the planning and decision making process for water supply scheme development in order to develop a civic responsibility. However, sanitation is one particular in which community participation can be fostered in a similar manner to both rural and urban areas.

It is generally accepted by the major development agencies that women are also key change agents in the process of improving hygiene behaviors in households and communities. His Majesty's Government of Nepal also endorsed initiatives to involve

women in the development process through inclusion of specific women in development related objectives in recent policy documents. Furthermore, women, as the primary beneficiaries of improved access to water supply and sanitation facilities, have a potentially stronger vested interest in effectively managing and sustaining improved water supply system (Pant, 2002: 76).

The important aspect of people's participation is building the capacity of the beneficiaries in handling development works by themselves. The Human resources must be trained and empowered, and then utilized so as to complement government efforts for rural development. Besides, as the country's financial resources are getting scarcer each year, tackling poverty issue by increasing the amount of central investment is not a visible alternative. Governments can better come to grips with the poverty issue, if they can recognize that the poor can acquire power, when they are organized and are able to bargain, negotiate and exercise countervailing influence on entrenched interests, including the bureaucracy itself (Shams, 1989: 33).

Every project in which the people are involved and empowered has greater chance to function properly. The role of the state is that of a promoter of services, not that of provider. It needs to play the role of the facilitator of development work by bringing the beneficiaries to the mainstreams of the development.

6.2.1 Local Peoples' Participation in the Project

People's participation plays a vital role in the development of a particular place. Because development is for people and if the local people are not willing to participate and involve in the development process they will gain nothing. Although the Drinking Water Supply and Sanitation Project of the study was constructed by the government, the local people didn't get a chance to participate at that time but when it was handed to the community they are eager to take part in every activity of the project. Most of the people show interest in this project and they were asked if they think participation is covered by the people of all backgrounds i.e. of all castes, rich and poor etc. or not. It can be interpreted by the table below.

Table 6.5: Participation of People From all Background

Participation from all backgrounds	Respondents	
	Number	Percentage
Yes	76	95.00
No	4	5.00
Total	80	100.00

Source: Field Survey, 2006.

From the above table, it can be found that the majority of the respondents (95%) think that peoples from all background are participating in this project and 5 per cent answered otherwise. This result shows that this drinking water supply project has created a good will in the community and it is a signal of sustainability and further development.

Again the respondents were asked if they think that the water supply is equal between rich and poor then 92 per cent said that the distribution of the water supply is equal between rich and poor while 8 per cent says no. By the majority's answers, the conclusion can be drawn that this drinking water project has success to reach into the people of all kind.

6.2.2 Essential Initiatives Needed to Increase the Effective Participation

People at the grassroots, when organized, can manage their development very well. Community based organizations, on their own or when motivated by catalytic agents from outside have taken significant initiatives in organizing themselves under local leadership, in identifying their specific development needs and effectively articulating them, in formulating development plans to meet them, and in bargaining and liaising with relevant government agencies, to demand resources and effectively utilizing them for development purposes (Shams, 1989: 19).

Participation of local people in every community-based development program is very important. Participation of both sexes, i.e. male and female, is equally significant. In any type of community development, people's participation is most needed. From

this, more and more people show their interest in development. In the case of Nepal, it is well known that in the name of participation, limited persons involved in the CBOs, who are mainly upper castes and rich people, run programs by their will. By this, the benefits of the programs reached up to those limited persons and majority of the people cannot gain any benefits from those programs.

To share the benefits or to increase the number of the beneficiaries, each and every person should participate in every kind of programs. But it is difficult to increase the participation. The participation should be from different levels of people, i.e. rich and poor, lower and upper castes. So some initiatives should be taken effectively to make participate for all levels of people. In this study, the respondents were asked what sorts of initiatives should be taken to increase the effective participation of the users in this drinking water project.

Table 6.6: **Initiatives Required to Increase Effective Participation**

Initiatives	Respondents	
	Number	Percentage
To raise the awareness level	63	79.00
To eliminate discrimination	10	13.00
To cut the present cost of water	7	8.00
Others	-	-
Total	80	100.00

Source: Field Survey, 2006.

The above table exposes that the majority of the respondents (79%) were of the opinion that to increase the participation of the people, awareness level should be raised. People must know well that the drinking water project is for them and the project is their own property. These respondents also think that these types of awareness building programs should be run by the water users' committee itself. Thirteen per cent of the respondents believed that discrimination should be eliminated, while 8 per cent felt that the present cost of the water must be reduced so that many poor people could participate in the water supply project.

6.2.3 Conflicts among Users

For every type of community-based development programs, the most important factor is to eliminate any types of conflicts among the people who are participating in those programs. If conflicts arise, then that program cannot run properly and cannot be sustainable, and the result will be its failure, and that program should be taken to other places. In the case of Chandragadhi Drinking Water Consumer and Sanitation Committee, it is found that as of today no big conflicts occurred between the users' group and the consumers. But from the observation it is found that there are some cases between the consumers and water users' committee in minor cases and those cases are personal between the committee and some consumers. But for properly running the water supply project, conflicts should not be raised and if they are raised then they must be solved quickly so that in the future there will be no difficulties in running the project.

The respondents were asked whether there are any kind of conflicts arising among the users and the committee then out of total 80 respondents, 83 per cent said, no and 17 per cent said there were some conflicts among the consumers and the water users committee. By the key informants survey it is known that the water users' committee is trying to solve those problems appropriately in future.

6.3 Functional Status of the Drinking Water Supply Project

Here, analysis has been made for the functional status of the Chandragadhi Drinking Water Consumer and Sanitation Committee. Supply of water, duration of water supply, technical problems, committee's fund, programs initiated by the committee and employment created for the local people have been briefly discussed. Every community based programs should be function properly to the people. Here, in the case of the drinking water project of Chandragadhi, this project is functioning properly from the construction year and when it was handed over to the community it is working better than before when it was fully owned by the government and the functional level has increase than before.

The drinking water supply project of Chandragadhi has the source of water from underground resource below 500 meters from the ground surface to distribute the water to the consumers through pipe. The process of taking out the water is by the

water generator machine from which water directly goes to the reserve tank through the pipe at first, then to the filter tank and at last to the overhead tank from which water is distributed by the generator to the consumer's tap in every households. All these water tanks were constructed from the financial aid of Japanese government. The water available meets the demand and is generally of safe quality. There is no disruption in the supply of water.

The target of the drinking water supply of Chandragadhi VDC is to deliver safe water which implies that there is no biological pollution and the water has acceptable chemical properties and color taste. The water should pose no health risks arising out of water induced diseases. Ultimately it should help reduce mortality and morbidity rates. In Nepal, most of the rural water supply projects tap water of springs or small streams (nearer to source) which are generally assumed to be bacteriological and chemically of sound quality.

It was beyond the scope of this study to conduct detailed laboratory analysis of the quality of water in the project. However on the basis of the observation, quality of the water supply is good in this drinking water supply project of Chandragadhi but some times it get polluted through some reasons like chances of sewage to enter the water source or supply pipes, not cleaning the water tanks frequently, consumers habits such as storing water in polluted vessels etc. But the water user's committee of this project is aware of these things and gives more priority to solve these problems when it's occurred. In overall the supply and quality of water from this project is excellent.

6.3.1 Duration of Water Supply

In the study area people are getting sufficient amount of water from their taps. But before the project was handed over to the community they used to get water daily 2 hours and when community took it then it started to supply about 10-15 hours per day. But it depends on consumers' taps which must be in proper condition.

Table 6.7: Duration of Water Supply

Duration (in hour)	Respondents
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	Number	Percentage
Less than 1	-	-
5-10	18	22.00
10-15	62	78.00
More than 15	-	-
Total	80	100.00

Source: Field Survey, 2006.

From the above table, it can be seen that the majority of the respondents (78%) perceived that the duration of water supply is 10-15 hours daily while 22 per cent estimated that they get water 5-10 hours and this problem may be occurred by not maintaining the taps and pipe properly. The following table also stated that the water supply of drinking water project in Chandragadhi is sufficient to the consumers compare to the Kathmandu, the capital of Nepal where people get 2-3 hours or less than that water per day from their taps which is always irregular and not safe to drink without boiling.

6.3.2 Reliability of Water Supply

In successful water supply schemes, the supply functions throughout the year. This implies that the schemes should deliver water in time in all the service delivery points during the designed supply hours each day.

It was beyond the scope of this study to record the 265 days variations in supply of water in all taps stand in whole coverage areas of the project. However based in the interview and the observation, it was found that there in disruption in regular supply of water in the project except for water treatment.

Table 6.8: **Regular Supply of Water**

Regular supply	Respondents	
	Number	Percentage
Yes	80	100.00
No	-	-

Total	80	100.00
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Source: Field Survey, 2006.

From the above table too, it can be clearly seen that all the 80 respondents reported that the water supply was regular. We can thus conclude that the drinking water supply project of Chandragadhi is functioning properly. Its water supply is always regular.

6.3.3 Technical Problems

This study has tried to focus and discuss briefly about the technical problems related to the consumers. It is found that mostly the technical problems related to the consumers are the problems of water meters, taps, and leakage in the pipes. These technical problems occur when consumers buy the low quality or duplicate goods from the market. At the time of registering for new water supply for any households, the water supply project itself sells the water meter to the consumers but due to the poor quality they are found less durable. Here leakage in pipes means the pipe which is under the consumers home's compound. Among 80 respondents, the majority of (74%) noted that they had a technical problem in these aspects and 26 per cent reported that they were not facing any problems. Again those respondents were asked how they solved those problems if occurred. These responses are presented in the table below.

Table 6.9: Solving the Technical Problems

Solving the problems by	Respondents	
	Number	Percentage
Self	6	7.50
Complain to the project technicians	70	87.50
Hiring private technicians	4	5.00
Others	-	-
Total	80	100.00

Source: Field Survey, 2006.

From the table above, it can be found that among the 80 respondents 7.5 per cent solved their problems by themselves, while 87.5 per cent complained to the project technicians and 5 per cent hired private technicians. People have to spend some amount of money for maintaining those problems when they occurred within their home compound. The maintenance are usually for water taps and pipes. Of the total of 80 respondents, 37.5 per cent reported that they had already spent Rs. 100-1,000 for the maintenance, 31.25 per cent had spent Rs. 1,000-2,000, and 17.5 per cent spent Rs. 2,000 or more, while 13.75 per cent responded that they had not spent any money for maintaining the water supply.

6.3.4 Committee's Fund

The Drinking Water Consumers and Sanitation Committee of Chandragadhi VDC in Jhapa district has the monthly income of Rs. 200,000 generated from collection of the charge for water used by the consumers. Out of the total income, Rs. 150,000 is spent as salaries to the employees, electrical charges, and maintenance and the remaining amount of income is saved for future purposes and for sanitation works. This study has tried to find out the people's opinion about the committee's fund whether they think the fund is misused by the water users' committee or not. Out of total of 80 respondents, 15 per cent thought that it might be misused and 85 per cent thought that it was not misused. They thought that the users' committee cannot misuse the fund as the members are elected by the consumers and are responsible to them. If they are found to be corrupt, then they would be thrown out in the next election. It is known that the majority of the people of the study area fully trust the water users' group. From the observation, it was found that the elected water users' group is always responsible to the consumers, and listened to their views, and problems. The committee of the project has made its motto: 'People First'.

6.3.5 Initiation of Community Programs Through the Fund

This water supply project of Chandragadhi VDC has run some community programs through the fund of the committee itself and some donation from different organizations like the Chandragadhi VDC, and DDC Jhapa. These programs are specially related with the sanitation sector. From the committee's fund and some

donation from Chandragadhi VDC office, the project has constructed a slaughter house in ward 7 of the VDC for selling meat of different animals. It has made the rule that the meat should be sold only in this house and no one can sell outside. The project has also made an agreement with District Police Office that if anyone who breaks the rule it will be reported to the police for police action. By this, the pollution is controlled in the market area of the VDC which comes through the flesh of animals.

The committee has made 5 public taps in ward 7 of Chandragadhi VDC for drinking water especially for school's children. The committee is also maintaining the gravel roads in the VDC frequently. The committee also cleans the whole pipeline twice a year with chemicals including water treatment. In future, the committee has planned to build more public taps and public toilets in different wards of the VDC.

Through the key informant survey, it is found that the income of the committee is limited at present. So in the future the committee will initiate some income-generating programs so that more sanitation programs can be launched. The committee has also made a plan from the next year, 2006, to initiate a program of toilet cleaning for both private and public at a cheap price. The garbage which comes out from those toilets is supposed to be store on a dumping site for recycling from which fertilizer can be made and sold. This can generate some income for the committee. The water user committee has also planned for opening a co-operative bank in the future.

6.3.6 Employment for the Local People

At present the drinking water project of Chandragadhi VDC has become a property of the community especially of the people of Chandragadhi VDC. There are altogether 13 employees working in the committee's office. All of them are local people ranked from Peon to Section Officer who are working as permanent employees for the committee. It was found by the researcher that when committee need any employee then they at first make an advertisement in local newspapers for application and they also state a condition that the applicant must be from Chandragadhi VDC and if no one found from Chandragadhi VDC then only the candidates are chosen from another VDC. In the case of temporary job at the time of maintaining pipes and others works such as maintaining generator, constructing building other sanitation works local

people are given first priority. From these types of work many local people are getting jobs as temporary recruits.

6.4 Sustainability Potential of the Project

Here, the sustainability potential of the Drinking Water Consumers and Sanitation Committee of Chandragadhi has been discussed briefly. All development programs should not only function properly but must also be sustainable. According to the Brundtland commission, sustainable development means “meeting the needs of the present without compromising the ability of the future generations to meet their own needs” (Lekhak, 2003: 63). Therefore, the research deals extensively on the maintenance scenario, user response and physical condition of the project. The sustainability potential indicators were decided upon consultation with key informants of the project.

The physical condition of the drinking water project of Chandragadhi has been divided into five categories, with respect to the degree of maintenance/repair, as follows:

Category A: Repair Not Required

Structure falling under this category implies that the structures are in good condition requiring no repair.

Category B: Insufficient Maintenance

This category of structures means the structures require some degree of repair, but could be taken care of by simple maintenance works. For example, in some cases the valves and the joint pipes leaks at some places. This can be dealt without much resource but by simple initiatives on part of the beneficiaries. These do not draw external resources; however, will require a sound tool reserve. This is the stage which, if not handled in time, leads to category C (minor repair), then to category D (major repair) and ultimately to category E in which reconstruction of the structure will be required.

Category C: Minor Repair Required

This is the stage in which minor repair works need to be carried out by mobilizing some monetary resources. For example, missing or broken faucets need to be replaced or broken plasters need to be reattached.

Category D: Major Repair Required

When there is not enough maintenance work or when minor repairs are not handled in time, major repairs of structures are called for. This requires more resources. The whole of the pillar or the platform of a stand post, for example, may need to be reconstructed. Similarly, a considerable length of pipeline may be required to be replaced.

Category E: Reconstruction Required

When structures reach the stage beyond category D, the only solution is reconstruction of the structure, and sometimes even a total rehabilitation of the project itself. But it is also found that till the date repaired is done from category A to C only. According to the key informant survey if the big losses occurred then the committee has manage to repaired those losses by committee's fund, request fund with the government, VDC, DDC and other organizations. But these are for only big losses like category E. Otherwise committee has the provision of saving fund from monthly income for minor repairs. The main repairing structures are water tanks and generators which needed a large amount of money and resources. This drinking water users committee has planned to save 25 per cent out of the total income from next year 2006-2007. This drinking water supply project of Chandragadhi has been constructed by the government of Nepal with strong financial resources and technology. Thus now it has not faced big losses, but the users committee is aware for the future loses. But after a few months of the committee's take over, the project has maintained the water pump turbine with its own funds.

The users' committee is capable to handle the project as a result of its involvement in project conception, construction, implementation to operation and maintenance. Technical manpower is well-trained for their jobs. The water users' committee has made an appropriate plan for the project operation and management. The physical condition of the project is good except some minor repairs. According to the Chandragadhi Water Consumers and Sanitation Committee Act 2057, it is clearly stated that if the committee fully fails to operate the project in the future, then the project would be handed over to the government (DWCSC, 2057 B.S. : 8).

This study has also tried to focus on consumer's views towards the sustainability of the project. Of the 80 respondents, 98 per cent opined that the project is self-sufficient, whereas 2 per cent said it was not. Sometimes problems arise at pipelines, consumer's taps and other structures of the project. Therefore, the study has tried to know from the consumers if the manpower is sufficient for the maintenance or not.

Table 6.10: Sufficiency of Manpower for Maintenance

Sufficiency	Respondents	
	Number	Percentage
Yes	75	95.00
No	5	5.00
Total	80	100.00

Source: Field Survey, 2006.

The table above reveals that out of the 80 respondents, 95 per cent said that the manpower for maintenance is sufficient and only 5 per cent said that they are not in sufficient number. Table 19 shows that many people were making use of this project for a long time.

Table 6.11: Duration of Practicing the Project

Duration	Respondents	
	Number	Percentage
1-5 Years	12	15.00
5-10 Years	5	6.25

10-15 Years	11	13.75
15-20 years	52	65.00
Total	80	100.00

Source: Field Survey, 2006.

From the table above it can be seen that out of the total of 80 respondents, the majority (65%) were using this project for 15-20 years, while 13.75 per cent were using for 10-15 years, 15 per cent for 1-5 years, and 6.25 per cent for 5-10 years. The table also reflects the sustainability of the project to be somehow satisfactory because the people are involved in this project for a long time.

Again, the inquiry made with the respondents has shown that, of the total of 80 respondents, 97 per cent were satisfied with the present water users' committee and only 3 per cent were not satisfied with the committee. The conclusion here can be that if people participate actively in any community-based program and the users' committee becomes successful to satisfy its consumers, then the potential for the sustainability of that community program will be high.

CHAPTER SEVEN

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

This chapter comprises the summary, conclusion and recommendations. The first two sections highlight the overall situation of the drinking water project. The recommendations section provides some tips to uplift the condition of the project.

7.1 Summary

The major objective of the present study was to focus on evaluating the impact of the Drinking Water Consumers and Sanitation Committee of Chandragadhi VDC in Jhapa district. The main aspects studied included social and economic profile of the respondents, identification of the status of water supply in the study area, the level of local people's participation in the project of the Committee, the functional status of the water supply project, and the sustainability potential of the project. Methods of data collection comprised participant observation, unstructured as well as structured questionnaire interviews. Many secondary sources have also been used to support and strengthen the findings of this research. The data and information have been analyzed descriptively.

The major findings of the study are summarized as follows:

-) Most of the people in the study area are Brahmin followed by Chhetri, Rajbanshi, and Newar.
-) The people are well educated. They give more priority to the education of their children, both male and female.
-) Most of the people are engaged in economic activities. Their average annual income is Rs. 80,000 and above. Their main sources of income are salaried job, and agriculture etc.
-) Almost all people have their own land from which they can feed their household for the whole year.
-) Livestock rearing is popular among the people of the study area. Usually they keep cows, buffalos, hens, and goats.
-) Before the initiation of present drinking water supply project, people of the study area used to get water from tube well, well, and *kuwa*.
-) Although, the people had to spend less than 10 minutes to fetch water before the initiation of this project, the water was not safe for drinking, cooking, washing clothes and bathing.
-) The people of the study area have observed significant changes after the initiation of this project especially for safe water for drinking, cooking, washing, and bathing.
-) The people are fully satisfied with the Drinking Water Consumers and Sanitation Committee of Chandragadhi mainly because of safe and sufficient water.
-) People from all backgrounds, e.g., rich, poor, upper castes, and lower castes are participating in this project.
-) People of the study area believe that to increase the participation in the project, the awareness level should be raised and discrimination should be eliminated.

- J It was found that there were no any conflicts occurring between the consumers and the water users' group.
- J People of the study area are getting water 10-15 hours daily and the water supply is always regular except on the days of treatment of the water.
- J Technical problems however occurred frequently in the taps of the consumers, especially in the water meters. The consumers then complain to the project's technicians for maintenance.
- J If any problems occurred in the taps of the consumers or outside, such as pipe leakage, those problems are solved by the committee within 24 hours.
- J Till date, no problems related with water-born diseases had been complained by the consumers to the project office.
- J The water users' committee has done several sanitation works with the committee's own fund, which they get from the consumers as a monthly fee. They have constructed a slaughter house, public taps, maintenance of gravel roads and they have plans for more work in the future.
- J The Drinking Water Consumers and sanitation Committee of Chandragadhi VDC have offered both permanent and temporary jobs to the local people. There are 13 permanent job holders in the committee.
- J There is sufficient manpower for maintenance of the project.
- J The sustainability potential of the project is high but it depends on the maintenance of the water tanks, and generators for which large amount of financial resources is needed.
- J Till date, the water users' committee is capable to maintain the project except some big problems such as water tanks, generators, and pipes.

-) Most of the people of the study are participating in this project for more than 15 years.
-) People of the study area are fully satisfied with the present water users' committee, which is formed by them through election. They are also satisfied with the present cost of the water use.

7.3 Conclusion

Water is fast becoming a positional commodity distributed inequitably amongst co-users falling under the same supply regime, even in Nepal that boasts of its vast water resources. Ismail Serageldin, The World Bank Vice-Chairman, says 'Many of the wars of the centuries were about oil, but wars of the next century will be over water (ITN, 1995: 1).

The Drinking Water Consumers and Sanitation Committee of Chandragadhi VDC was handed over to the community in 2058 B.S. Before that it was run by the HMG itself and known as Chandragadhi Drinking Water Project. After it was handed over to the community, the project has done more jobs than before. These include increasing the supply and quality of water, and maintenance in time. Overall, the present water users committee has given main importance to supply safe and sufficient amount of water to the people. The people's participation in the project has improved its functional status than before. The water users' committee of the project is functioning according to the people's will. People from different backgrounds like poor and lower castes are participating equally and eagerly in the project. The committee is also responsible toward the people as they come from the people through election. In the very short time, the project became capable to serve the people of Chandragadhi appropriately and responsively. Thus, it can be concluded that this project has made a very positive impact on the various aspects of the life of the local people. It has not been criticized by the people or consumers with regard to its present status.

7.3 Recommendations

Drawing on the major findings and the conclusion of this study, the following recommendations are made:

7.3.1 Recommendations for Improvement

-) The present Water Users Committee should continue the trend of its progress made so far.
-) The project should be made easily accessible to the poor and low caste people by reducing the charge of water by the committee.
-) The committee should increase the water during different seasons or occasions like marriage and other religious programs.
-) The users' committee should be strengthened with even more appropriate motivational and training programs to develop confidence among them. The training related to the operation and maintenance of the water supply is essential for the sustainable operation of the project.
-) The Committee should do more sanitation work in the future. Such work would include building public toilets and taps, and running sanitation-related programs.
-) The committee should be capable of controlling the water leakage.
-) To increase the participation of the people, the committee should initiate awareness raising programs.
-) Initiating other income-generating programs should reduce the present rate of charge for water use.
-) The water users' group must not be formed on a political basis, and the election for choosing the committee should be held after every two years, not four years.
-) Employing the skilled manpower in the project should reduce the operation cost of the water supply project.

-) The committee itself should reduce unproductive expenses of the committee, such as tea, snacks, lunch, and dinner.
-) The fund of the committee should be increased for the sustainability of the project. Initiating income-generating programs by the Committee can do it.
-) The Committee should increase the present pipeline coverage and water tank capacity keeping in the mind the process of rapid urbanization in the study area.
-) Over-staffing in the project should be reduced by the Committee.
-) The maintenance cost should be waived or decreased for the consumers except for buying new parts of the water supply at home.
-) The Committee should be aware about avoiding misuse of the Committee's fund by any members, and the fund utilization process should be made transparent to the people.
-) To elect responsible water users' committee members, the Committee should make specific rules and regulations for the members and the people who wish to take part in the election. Some representation of the lower caste people should be ensured in the users' committee.

7.4 Recommendations for Further Research

Based on the major findings, there still remain several vital issues in the sector of water supply that have not been adequately addressed. The following issues seem to be important for any future research, related to the area of drinking water system in Chandragadhi VDC.

- i. Inclusion of private sector: Public-private partnership (PPP) projects have been found successful these days. So, we can think of public sector i.e. government set some norms and modalities and hand over the management of drinking water system to the private sector.

- ii. Incorporation of community water quality testing: Many drinking water systems run by community lack proper mechanism of water quality testing. This could be the area where further research could be done. We have community drinking water quality testing methods but better to apply some extension possible; some modern methods to further purify the water.
- iii. Standardization on intervention procedures of agencies involved in the sector: Several agencies including Department of Water Supply and Sewerage, and VDCs have still been involved in some way or other in the drinking water system in Chandragadhi VDC. Though it is seen that mere autonomy is given to the community run drinking water system, further research could be coordinated specializing how government should intervene in these kinds of projects if deemed necessary.
- iv. Women participation: The participation of women is not so satisfactory in the project. In order to make the system more affective and result oriented, further research could be done to find the ways and areas to increase women's participation.

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Appendix-I

QUESTIONNAIRE FOR THE HOUSEHOLD SURVEY

District:

Date:-

Name of the Respondent:

Interview No:-

Caste:

Age:

M/F:

VDC:

Village:

1. Household Information

Name of the Head	
Gender	
Age	
Religion	
Marital Status	

2. Household Members

Members	Age	Gender	Education	Primary Occupation	Secondary Occupation

3. How much land do you have? (In Bigah/Kattha/Dhur)

(a) Agricultural land_____ (b) Barren land_____

4. How many livestock units do you have?

Types	Cows	Buffalos	Goats	Chickens	Pigs	Others
Adult						
Young						

5. What is your main source of income?

(a) Salaried job (b) Agriculture (c) Livestock (d) Others

6. What is the annual income of your household?

(a) Rs.20000- 40000 (b) Rs. 40000- 60000 (c) Rs. 60000-80000
(d) Rs.80000 and above

7. What were the sources of water before the initiation of this project?

(a) Tube well (b) Well (c) River/Pond (d) Kuwa
(e) Other (Specify)

8. How much distance did you have to cover to get drinking water before this project?

(a) Less than 10 minutes (b) 10-30 minutes (c) 30-60 minutes
(d) More than one hour

9. Are you satisfied with the present condition of water supply?

(a) Yes (b) No

* If yes, why? (a) Safe water (b) Sufficient amount of water
(c) Time saved (d) others

* If no, why? (a) Costly (b) Irregular supply of water
(c) Lack of quality (d) others

10. How many hours do you get water supply per day?

(a) Less than one hour (b) 5-10 hours (c) 10-15 hours
(d) More than 15 hours

11. Is the distribution of water supply equal among rich and poor?

(a) Yes (b) No

12. Is there any kind of conflict arising among users?

- (a) Yes (b) No

13. Are people from all backgrounds are participating in this project?

- (a) Yes (b) No

14. What sorts of initiatives should be taken to increase the effective participation of users?

- (a) To raise the awareness level (b) To eliminate any kind of discrimination
(c) To cut the present cost of water (d) Others

15. Are people getting regular supply of water?

- (a) Yes (b) No

16. Is there any kind of technical problem?

- (a) Yes (b) No

*If yes, what kind of problem?.....

17. How do you solve those technical problems?

- (a) Yourself (b) Complain to the project technician
(c) Hire private technician (d) others

18. Do you think the committee's fund is misused?

- (a) Yes (b) No

19. Has any community program been initiated through that fund?

- (a) Yes (b) No

* If yes, what kind of program?.....

20. Has this project created any employment for local people?

- (a) Yes (b) No

* If yes, for haw many of what type?.....

21. Has the project been self-sufficient?

- (a) Yes (b) No

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

- (a) Yes (b) No

23. Since how long you have been operating/using this project?

Years _____

24. Are you satisfied with the present users committee?

- (a) Yes (b) No

25. Has there been any significant change observed?

- (a) Washing clothes (b) Cooking (c) Childcare (d) Others

26. How much money have you spent for the maintenance of the supply pipe/tap?

Rs. _____

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

- (a) Yes (b) No

*If yes, please mention?.....

.....
.....
.....
.....
.....
.....
.....
.....

Thank You!!!

Appendix-II

KEY INFORMANT QUESTIONS

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

Appendix-III

CHECKLIST FOR KEY INFORMANTS

1. Name: Gender: - Date:-
Address: - Caste/Ethnic group:-
2. Name of the Village:-
3. Water user committee name:-
4. No of households:-
5. Total population benefited:-
5. Major program of water user committee:-
6. Situation of people's participation:-
7. No of meetings of committees and attendance of the local people:-
8. Problem associated with the water supply problem:-
9. Way to overcome the problems and improving the distribution/supply system:-

