

**Impact Assessment of Drinking Water Supply and Sanitation Project
in Sankhrapur Municipality – 2, Kathmandu, Nepal**

A Thesis

Submitted to

Faculty of Humanities and Social Science,
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In

Rural Development

Submitted By

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I, hereby declare that my thesis entitled “**Impact Assessment of Drinking Water Supply and Sanitation Project in Sankhrapur Municipality-2, Kathmandu, Nepal**” submitted to Central Department of Rural Development, Tribhuvan University, is entirely original work prepared under the guidance and supervision of my supervisor Assoc. Prof. Bishnu Bahadur Khatri. Any help I received during my research and thesis preparation is appreciated. I also confirm that the reference section of the thesis includes all information sources and citations of works cited. The results of this thesis presented, or any other submissions made as part of the requirements for the degree, have never been used to obtain the degree. In addition, I certify that no part of the content of this thesis has been previously published in any form.

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The evaluation Committee has approved this thesis entitled “**Impact Assessment of Drinking Water Supply and Sanitation Project in Sankhrapur Municipality-2, Kathmandu, Nepal**” submitted by Mr. Ayush Shrestha for the partial fulfillment of the requirements for the Degree of Masters in Arts (M.A.) in Rural Development.

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Ayush Shreshta
Kathmandu, Nepal
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ABSTRACT

This academic study was focused on “**Impact Assessment of Drinking Water Supply and Sanitation Project in Sankhrapur Municipality, Kathmandu Nepal**” which is a project area of Neighbor Society Service Company (NSSC) and has exacted a community-based water supply and sanitation project. The study adopted a mixed method, so conducted household survey for quantitative data collection and conducted focus group discussion and key information interview for qualitative data collection.

The general objective of the study was to evaluate the socio-economic impact of drinking water supply and sanitation project. Similarly, other objectives were to assess the socio-economic status of the project beneficiaries, to assess the economic and social impacts of the drinking water project on the local people and to examine the contribution of beneficiaries for environmental an sustainability.

The study followed evaluative research design and employed both qualitative and quantitative data. A total 105 households were surveyed for the collection of the data. Focus Group Discussion and Key Information Interview were also conducted for the purpose of collecting qualitative data for data triangulation.

Both qualitative and quantitative data revealed that the project had a significant positive impact socially, economically and environmentally. The project helped to reduce the time spent fetching water, created new income generation activities, improved household income and productivity, allocated time and funds into priority area and reduced expenses related to healthcare and water collection. Similarly, the project has contributed to bring change in traditional gender norms, change in attitude towards hygiene practices and cultural change towards health practices which have contributed to improved public health. The environment has also positively benefitted from the project, the project has contributed to improving waste segregation practice and reducing visual pollution, and tree plantation water conservation practices such as water re-use and rainwater harvesting have also improved after the project. WSUC and involvement of beneficiaries in community discussion and contribution of fund by beneficiaries and local government for operation, repair and maintenance have contributed for the long-term sustenance of the water infrastructure.

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ABBREVIATIONS/ ACRONYMS

ADB	:	Asian Development Bank
ANM	:	Auxiliary Nurse Midwife
CBO	:	Community-Based Organization
CLTS	:	Community-Led Total Sanitation
DWSS	:	Department of Water Supply and Sewerage
EU	:	European Union
GoN	:	Government of Nepal
GWP	:	Global Water Partnership
HIV	:	Human Immunodeficiency Virus
INGO	:	International Non-Governmental Organization
IUDP	:	Integrated Urban Development Project
IWRM	:	Integrated Water Resources Management
KVWSSSP	:	Kathmandu Valley Water Supply Sector Project
MDGs	:	Millennium Development Goals
NEWAH	:	Nepal Water for Health
NGO	:	Non-Governmental Organization
NSSC	:	Neighbor Society Service Company
OECD	:	Organization for Economic Cooperation and Development
PPP	:	Public-Private Partnership
PWD	:	Public Works Department
RWSS	:	Rural Water Supply and Sanitation
RWSSFDB	:	Rural Water Supply and Sanitation Fund Development Board
SDGs	:	Sustainable Development Goals
STWSSSP	:	Small Town Water Supply and Sanitation Sector Project
UEIP	:	Urban Environment Improvement Project

UN	:	United Nations
UNDP	:	United Nations Development Programme
UNICEF	:	United Nations Children's Fund
VMW	:	Village Maintenance Worker
WASH	:	Water, Sanitation and Hygiene
WSUC	:	Water Supply User Committee
WSSB	:	Water Supply and Sewerage Board
WHO	:	World Health Organization

CHAPTER- ONE

INTRODUCTION

1.1 Background of the Study

Nepal is a small yet geographically diverse and landlocked country which lies between two major nations India, surrounding it on the east, west, and south, and China to the north. With a population of approximately 29.16 million and an area of 147,565 square kilometers (NSO, 2021), Nepal is divided into three regions: the mountainous north, the hilly middle region, and the flat Terai plains in the south. The governance structure in Nepal operates at three levels: central, provincial, and local. It consists of seven provinces—Koshi, Madhesh, Bagmati, Gandaki, Lumbini, Karnali, and Sudur Paschim (Gyawali, 2020).

Nepal is a developing countries and it is one of the richest in terms of water resources. Water is the largest and most important natural resources of Nepal. The major sources of water are glaciers, rivers, rainfall, lakes, ponds and groundwater. There are over 6,000 rivers in Nepal with three major river basin I.e. Saptakoshi, Gandaki, Karnali (Khadka, 2019). In Nepal, heavy rains occur from mid-June to September, with about 82 Percentage of precipitation during the monsoon. Numerous rivers flow from north to south, originating from the Himalayan snow.

A successful life depends on water. Without it, living beings cannot survive. Therefore, access to clean, safe water is a fundamental need for all people. Water is used for multi-purposes including drinking, bathing, washing and cleaning, agriculture, industries, hydropower generation as well as religious and recreational values such as swimming, fishing and different forms of eco -tourism.

On a global scale, 1 in 3 people worldwide or approximately 2.2 billion people lack access to safe drinking water (UNICEF & WHO, 2019). Additionally, at least 2 billion people use drinking water sources contaminated with feces, increasing the risk of diseases like diarrhea and cholera (WHO, 2019). Floods and other water-related disasters account for 70 Percentage of all deaths related to natural disasters, and 1 million people die annually from water, sanitation, and hygiene-related diseases (UNICEF & WHO, 2017).

In Nepal, the provision of safe drinking water is a persistent challenge despite the country being rich in water resources. As of 2019, the Government of Nepal reported that 91 Percentage of the population had access to basic water services, and 99 Percentage had access to basic sanitation. However, only 25 Percentage of the population has access to safe drinking water, highlighting a critical gap between coverage and water quality. This disparity is further exacerbated by the fact that 95 Percentage of industrial waste is left untreated, polluting the water sources and causing significant public health risks (UN, 2020).

Moreover, Nepal's diverse topography poses unique challenges for water distribution. Rural areas, particularly those in the hilly and mountainous regions, face difficulties in accessing water, as many rely on seasonal streams and distant water sources. In these areas, women and children are often tasked with collecting water, which consumes a significant portion of their time and energy. The lack of infrastructure, combined with environmental degradation and climate change, makes the management of water resources even more critical (UN, 2020).

The first systematic water supply system, Bir Dhara, was constructed in 1895 by Prime Minister Bir Shamsher, bringing piped water from Shivapuri to Kathmandu. In 1972, the Department of Water Supply and Sewerage (DWSS) was established to manage rural water supply, followed by the Water Supply and Sewerage Board (WSSB) in 1973 for urban areas. The Nepal Water Supply Corporation (NWSC) was established in 1990, focusing on urban municipalities. The ministry of local development oversaw small water projects with community participation.

To provide safe drinking water, control waterborne diseases, and reduce costs, the government and private sectors initiated several efforts during the early stages of planned development. However, from the fourth year plan INGOs like UNICEF provided support for water and sanitation sector (1970-75), the fifth year plan there was entry of private sectors (1975-80). The sixth year plan (1980-85) the government began prioritizing the involvement of non-governmental sectors, the private sector, more INGOs and NGOs to promote drinking water and sanitation. Community participation started with the seventh Plan. The ongoing Fifteenth Plan also stresses providing safe drinking water and sanitation through the combined efforts of government, public, and private sectors, with a goal to reach 99 Percentage of the population (GWP Nepal, Jalsrot Vikas Sanstha, 2018).

1.2 Statement of the Problem

Nepal is rich in water resources, with potential for economic and social growth through its proper utilization. Water can be the main source of development through irrigation, energy, navigation, and providing clean drinking water, which ultimately contributes to economic progress. Despite being the second-largest country in terms of water resources, Nepal faces numerous challenges, including poor economic conditions and uneven water distribution. While water is available throughout the country, households often need to rely on multiple sources, and seasonal variations affect availability. Although some villages now have water schemes in place, such as in Sankhrapur municipality where tap water facilities were installed, there is a need to evaluate whether these projects have achieved the expected outcomes.

The issues of inadequate access to drinking water and sanitation remain a global persistent challenge especially in developing countries like Nepal. International organizations like WHO (2020) has highlighted that unsafe drinking water is affecting globally 2 billion people worldwide contributing to water borne diseases. Furthermore the lack of post project management has resulted in lack of proper water management and environment degradation (UNICEF, 2019).

The current situation raises several concerns: Are these drinking water projects truly improving the social and economic well-being of local people? Have they resulted in better income generation and health conditions? Additionally, questions remain about the sufficiency and equitable distribution of water, and how well these projects are managed and maintained. This study aims to assess the impact of the drinking water project on the local population, focusing on its social, economic, and health-related outcomes.

Tap water facility were made available in the Sankhrapur Municipality wards no 2, 3 years ago. Before this scheme, people were dependent on various water sources such as river/stream/well etc. to fulfill their needs of drinking water. Now, they have tap water facility. A local NGO called NSSC had implemented the drinking water and sanitation project with the support of Rural Water Supply & Sanitation Fund Development Board (RWSSFDB).

It is now felt required to assess the impacts brought by the drinking water program on the local people. This study aim at answering the following questions:

- i. What are the social impacts brought by the drinking water project?
- ii. How has the project impacted household income and expenditure pattern
- iii. What are the changes that local people have experienced in their health condition after the new drinking water scheme?
- iv. How has the community people contributed for the sustainability of drinking water project?

1.3 Objectives of the Study

The general objective of the study is to evaluate the socio-economic impacts of drinking water and supply and sanitation project.

The specific objectives of the study are as follows:

- i. To assess the socio-economic status of the project beneficiaries.
- ii. To assess the economic and social impacts of the drinking water project on the local people.
- iii. To examine the environmental and sustainability practices by beneficiaries.

1.4 Significance of the Study

This study is significant because it evaluates the impact of drinking water and sanitation projects on rural communities in Nepal, particularly their effects on social, economic, and health conditions. Access to clean water is critical for improving public health, reducing waterborne diseases, and promoting better living standards. By examining how water projects have influenced local income, community participation, and household management, this study will provide valuable insights into the broader socio-economic benefits of clean water supply.

Water is a key resource in Nepal, yet despite its abundance, many rural areas still struggle with accessibility, uneven distribution, and seasonal shortages. This research will assess whether drinking water projects implemented in Sankhrapur, municipality, have addressed these issues effectively and whether they have achieved their intended goals of improving the quality of life. Additionally, the study will highlight the role of NGOs, local governments, and community participation in managing and maintaining these water systems.

The findings of this study will help policymakers, government agencies, and NGOs to better understand the impact of water projects and may guide future efforts to improve water access, ensuring that clean water is available equitably and sustainably for all

communities. This research will also contribute to the broader discussions on how drinking water projects can drive socio-economic development, particularly in rural areas.

1.5 Limitation of the Study and Delimitation of the Study

The research has been done for academic purpose and has been done in micro level based on small sample of the limited area. Due to the constraints of time and budget the research has been done in only ward no 2 of Sankhrapur, hence the findings and conclusion from the research might not be generalized. The study is done in a community in Sankhrapur, Sankhrapur is a relatively developed and close to the capital, so the findings might not be replicable for more remote places of the country like Far Western and mountain regions.

The construct delimitations associated with this study are as follows:

- The study has been conducted in Sankhrapur municipality, Kathmandu.
- The respondents residing in ward no. 02 will be selected purposively.
- The socio-economic impact will be focused.

Thus, this research study will be based on limited information that will be collected through 105 sample numbers or respondents.

1.6 Organization of the Study

This study has been divided into five chapters. The first chapter consists of introduction part of the study. The second chapter consists of relevant literature related to study. The third chapter consists of the research design and various methods on how data will be collected and analyzed. The fourth chapter consists of the analysis and presentation of the data. The fifth chapter consists of the conclusion, summary and recommendations.

CHAPTER- TWO

LITERATURE REVIEW

2.1 Conceptual Review

2.1.1 Water as a Human Right

Water is one of the most crucial resources. Water is essential for every living thing. The utilization of water is multi-purpose such as domestic, development, recreation activity and so on. The existence of human settlement is dependent on water which can be traced back to the ancient times as settlements were usually near river, lakes, oceans etc. Water, sanitation and hygiene collectively known as WASH is pre requisite for social and economic development, and gaining equity in its access and use by all is a concern of the fundamental human rights. United Nations (UN) has recognized the importance of WASH and has included it in sustainable development goals (SDGs) number 6- clean water and sanitation in 2015 to be achieved by 2030 with the overall ambition ‘no one is left behind, and WASH for all’. UN also declared in 1993, 22 March as World Water Day (UN Water, 2024).

The constitution of Nepal has also included the rights to live in clean environment and rights to utilize adequate clean water as the fundamental rights of Nepali people. Water as human rights refresh to the equitable access and distribution of safe, sufficient and affordable water for all people irrespective of their socio-economic background. The mright ensure that all people should have access to adequate and sufficient water for personal and domestic use. The concept calls for governments and organizations to ensure that water is available, accessible, and safe for consumption and use as well as ensure access to adequate sanitation facilities to prevent diseases and to promote hygiene.

WASH projects can play a crucial role in socio-economic progress for developing countries like Nepal. Although Nepal’s drinking water coverage is 91 Percentage only 25 Percentage of the population has access to clean drinking water (UN 2020). With access to clean drinking water, community benefits socially economically and in public health.

2.1.2 Concept of Community Participation in Drinking Water Supply and Sanitation

Community Participation refers to the process of including local people and community in the process of planning, making decisions, and implementing the plans. It is the process in which the local people identify their problems and comes up with solution. The major emphasis of this approach is empowerment of local community, collective action, and shared responsibility (Sapkota, 2020). According to UN (2015) Community participation is essential for ensuring equitable development, and resource ownership as it helps to integrate the local knowledge to meet their actual needs, promote accountability and long term sustainability. Similarly according to WHO (2019), describes community participation as an essential for inclusive and sustainable development.

Community participation plays a vital role in determining how effective and sustainable the project can be. The involvement of local community helps to address whether the project is meeting their actual needs, and if it is equally distributed. The formulation of Water Users and Sanitation Committees (WUSC) helps to ensure community ownership, promote accountability and reduce reliance on external organizations.

2.2 Theoretical Review

Drinking water, sanitation, health (WASH), project is multi-dimensional and can play a crucial role in influencing health, economic activities, equity in access to water, participation on decision making and so on. Various theories help us to understand these impacts better. Each theory provides different insights to understand these impacts.

2.2.1 Participatory Development Theory

Participatory Development Theory can be understood as the theory that prioritizes the involvement of people in development activities to solve their own issues (Manual, nd). The theory emphasizes on empowering the communities and to take ownership to ensure that the development plans goes hand in hand with their actual needs and priorities. According to (UNICEF, 2019) has highlighted that projects are more likely to succeed when the people benefiting from the projects take ownership and take

active part in the decision making. Community participation is crucial for the success of WASH projects. Community participation helps to ensure equitable access, empowering communities to take ownership, and ensuring long term sustainability

In Nepal, participatory approaches have been implemented in rural water projects. Projects like the Community Managed Drinking Water Supply (Adhikari N. P., Community Managed Drinking Water Supply in Nepal, 2008) and Community-Based Water Supply and Sanitation Sector project in Nepal by Asian Development Bank (ADB) in 2018 has shown how participatory approach can play a crucial role in long term sustainability.

2.2.2 Behavioral Change Theory

Behavioral Change is a theory which emphasizes the need in change of mind set and behavior to improve socio-economic and health outcomes. According to this theory people are more likely to change their behavior when they see something as a threat and believe that by adopting new behavior it can remove that threat. According to this theory risk, perception, social influence, and access to resources are the crucial factors that can result in behavior change (WHO, 2019).

Behavioral change theory is crucial as it helps to understand about the change in perception and practices. It helps to understand not only access to water and sanitation facilities but also adopt practices that help to improve public health, such as hand washing, change in waste management, covering water storage and so on.

2.2.3 Sustainable Development Goals (SDG 6 Clean water and Sanitation)

The sustainable development goals were developed in 2015 as continuation of the millennium development goals. The SDG 6 specifically focuses on universal access to drinking water and sanitation for all. SDG 6 gives special emphasis to equitable access, community involvement, and long term sustainability.

The SDG 6 framework integrates water and sanitation with broader goals ensuring that water and sanitation projects meet the current need of people without compromising the ability of future generation to meet their own needs.

2.3 Policy Review

2.3.1 Global Evolution of Water and Sanitation Policies

Water and sanitation policies first began to take place after the Second World War, with special emphasis on improving public health. In 1948, it was declared as Universal Declaration of Human Rights which led the foundation for access to essential services as a human right. However, water and sanitation was not specifically mentioned (UN, 1948).

During the 1980s, it was declared as the Drinking Water Supply and Sanitation Decade which was launched by the United Nations. The initiative was focused on improving the access to safe water and basic sanitation facilities in developing countries by providing assistance with financial and technical resources (UNICEF, 1985).

In December 2016, the Organisation for Economic Co-operation and Development (OECD) adopted the Council Recommendation on Water, providing high-level policy guidance on managing water resources and delivering water services. It addresses areas such as water quantity management, water quality improvement, risk management, governance, and sustainable financing. To support its implementation, the OECD developed the "Toolkit for Water Policies and Governance," compiling policies and governance arrangements that align with the Recommendation (OECD, 2021).

Established in 2015, these principles outline 12 must-dos for governments to design and implement effective water policies. They apply the water policy cycle, encompassing management functions like drinking water supply, sanitation, flood protection, and water quality. To facilitate implementation, the OECD introduced a Water Governance Indicator Framework, evolving practices, and assessment guides (OECD, 2024).

RegNet serves as a global forum to share and promote good practices in regulating drinking water and sanitation services to protect public health. Its mission includes advocating for improved regulations, supporting the development of internationally recognized guidance, and assisting regulators in establishing or updating frameworks (WHO, 2018).

The EU enacted Directive 2020/2184 to safeguard drinking water quality within its member states. The directive aims to protect human health by ensuring water intended

for human consumption is wholesome and clean, free from microorganisms and contaminants. It mandates regular monitoring and reporting on water quality, applying the precautionary principle in setting contaminant levels (EU, 2024).

Global Water Partnership (GWP) founded in 1996 with support from the World Bank, UNDP, and the Swedish International Development Cooperation Agency, the GWP promotes integrated water resources management (IWRM). This approach encourages coordinated development and management of water, land, and related resources to maximize economic and social welfare without compromising the sustainability of vital ecosystems. The GWP provides a platform for knowledge sharing and advocacy to advance water governance globally (GWP, 2021).

The Sustainable Development Goals (SDGs) were launched in 2015 as the continuation of the MDGs. The SDGs gave special emphasis to drinking water and sanitation and kept it as a stand-alone goal in number 6 as (SDG 6) safe drinking water and sanitation for all. This goal aims to ensure universal and equitable access to safe water and sanitation for all by 2030 with special emphasis to affordability, long term sustainability and reducing disparities (UN, 2015).

2.3.2 Review of Water Related Policies in Planned period of Nepal

The First Five year plan (1956-1962): During the early years there was no separate department for water supply and sanitation. Water supply and irrigation fell under the same department under the Public Work Department (PWD) which fell in the ministry of agriculture, transport and construction. The drinking water services were limited to urban areas only. The major activity done during the first year plan was the construction of Sundarijal water treatment plan with the support of government of India.

The Second year plan (1962-65): There were no significant changes during the second year plan. Drinking water services were still under the PWD. The major focus was to provide drinking water service to more urban areas.

The Third year plan (1965-70): The third year still emphasized on expansion of drinking water service to urban areas only. The drinking water supply still remained under the PWD. Till 1970 only 3.7 Percentage of the total population had access to pipe drinking water.

The Fourth Year Plan (1970-75): The fourth year plan focused on establishing institution for drinking water services and established the Department of Water Supply and Sewerage (DWSS) in 1974 and started providing drinking water facilities to district headquarters with new focus on fulfilling basic needs. International organizations such as UNICEF started supporting drinking water facilities for communities having less than 1500 people. World Bank (WB) started supporting urban drinking water services by establishing Water Supply and Sewerage Board and initiated its first phase in Kathmandu and Pokhara. By the end of fourth year plan piped drinking water reached 7.5 Percentage

The Fifth Year Plan (1975-80): During the fifth year plan the major plan for drinking water and sanitation was health and hygiene of people and initiated sewerage system in urban areas. It also established Khanei Pani Bikash Samiti to manage the completed drinking water system. In 1976 HELVITAS initiated community water supply system in western regions. WB also expanded the project to Phase 2 in Biratnagar and Birgunj. By the end of the 5th year plan piped drinking water coverage reached 11 Percentage

The Sixth Year Plan (1980-85): The sixth year plan was marked as the Water and Sanitation decade and its major focus was to increase the involvement of NGOs, INGOs and volunteer organizations in water and sanitation sector. In 1984 the first ADB loan project was implemented in 22 districts of mid-western and far-western areas. More donors like the UNDP and UK also started supporting in water and sanitation projects. By the end of sixth year plan the coverage reached 37 Percentage

The Seventh Year Plan (1985-90): The seventh year plan was marked by a significant change as it started focusing on community participation. DWSS started adopting community oriented approaches and developed guidelines for it. The role of DWSS also significantly changed to more of a facilitator rather than direct provider. ADB provided second loan for rural water supply project in 35 districts Eastern, mid-west and far west. It also formulation of public utility commission to regulate tariff. There were entry of more INGOs and NGOs such as Water Aid, REDDVARNA, Care Nepal, NEWAH, FINNIDA to promote drinking water sector.

The Eighth Year Plan (1992-1997): The eighth year plan made an review of drinking water sector and prepared documents and formulated a ten year plan (1991-2000) with the goal of providing drinking water services to 72 Percentage of the population. The eighth year plan made sanitation an integral component of drinking

water and introduced the participatory decision making, cost sharing and management by water users and sanitation committees. ADB also provided loan for third project. The Janta ko Afno Khanei Pani ra Sarsafai project was also initiated with the support of f WB. After the success of the project with the support of WB established th Rural Water Supply and Sanitation Fund Development Board through a formation order under the Development Board Act.

The Ninth Year Plan: (1997-2002): The main focus of the ninth year plan was sustainable development of drinking water and sanitation activites with meaningful participation of communities, user groups and local government at all stages of the project and optimum mobilization of local resources as a part of minimum 10 Percentage cost sharing. The ninth year plan also encouraged the NGOs, Community Based Organizations(CBOs) and private sector as partners for development. The ninth year plan mainly focused on serving socially and economically disadvantaged commutes active participation throughout all phases of the project and reducing the environmental impacts of the project.

The Tenth Year Plan (2002-2007): The main goal of the tenth year plan was to provide basic water and sanitation services throughout the country with the aim of reducing child-health and water bone diseases and to encourage private sectors in urban water management.

The tenth year plan was again revised after the development of Rural water and sanitation national policy 2004 and Rural Water and Sanitation National Strategy (2004) to set new targets to provide safe, reliable and affordable water supply with basic sanitation facilities to 100 Percentage of the population based on priority targeting the most socially and economically vulnerable groups, to reduce water bone diseases and save the time of women and children from fetching water. The policy focused innovation, rehabilitation; improvement and expansion work of the existing drinking water system and improve the quality of the service.

The Eleventh Year Plan: (2007-2010): The eleventh year plan focused on promoting inclusive development and providing water to all urban areas and emerging towns.

The Development of Urban Water Supply and Sanitation Policy (2009)

The policy was established to address the complexity of urban water supply and sanitation service delivery. The policy identified four major initiatives at the implementation level to address the urban water and supply sanitation challenges, and provide important insights for the development of policies for four major urban

projects i.e. Small Town Water Supply and Sanitation Sector Project (STWSSSP), The Kathmandu Valley Water Supply Sector Development (KWSSSP), Urban Environment Improvement Project (UEIP) and Intergrated Urban Development Project (IUDP).

The Twelfth Year Plan (2010-2013): The twelfth year plan focused on improving the water quality and services, and improving the roles and responsibilities of local community participation in all phases of the project i.e. planning, implementation, and maintenance of the project.

The Thirteenth Year Plan (2013-2016): The thirteenth year plan focused on enhancing access to quality water services as provided by the National Drinking Water Standards, 2005. It also focused on using alternative technologies to improve access to water in dry areas such as rain water harvesting, solar and electric pumping and ensure that the measures are environmental friendly and climate change resilient.

The Fourteenth Year Plan (2016-2019): The fourteenth year plan focused on providing water and sanitation services to all throughout the country and ensures that the existing facilities are functioning properly and ensuring improvement in water quality.

The Fifteenth Year Plan (2019-2024): The fifteenth year plan has focused on not only universal access to water and sanitation facilities as well as improvement in its quality. Fifteenth year plan has also given special emphasis on community participation and gender inclusion for managing water supply system for long term sustainability. Special emphasis has also been given on foreign collaboration for hydro power development with private and foreign sectors to utilize Nepal's water resource potential and being climate resilient and address climate related issues (GWP Nepal, Jalsrot Vikas Sanstha, 2018).

2.3.3 Sanitation Policies in Nepal

“Sanitation refers to the provision of facilities and services for the safe disposal of human waste, such as urine and feces. It also includes maintaining hygienic cognitions through services such as garbage collection and wastewater disposal” (WHO, 2021). “Sanitation is equipment and systems that keep place clean, especially by removing human waste” (Blackett & Moonieya, 1999).

Sanitation is the combination of hardware, software, mind ware and orgware. The hardware includes structural aspects such as toilets, pipes, taps, and soaps. Software

focuses on promotional activities such as policies, plans, capacity development, monitoring and evaluation. The mind encompasses attitude and behavior and the orgware refers to the institutional arrangement. The fundamental aim of all sanitation interventions is to break the chains of fecal and oral contamination in order to promote hygiene and environmental sanitation for health improvement (Adhikari K. , 2015).

In 1994, Nepal National Sanitation Policy and Guidelines for planning and Implementation of Sanitation Program was prepared. It was the first sanitation policy in Nepal and recognized sanitation as basic right of the people. The policy states that sanitation should not be understood just as latrine construction alone, but as a package of activities and services related to personal, household and environmental hygiene. The policy defines sanitation as all activities which improve and sustain hygiene in order to raise the quality of life and the health of an individual and recognizes sanitation as basic right of the citizen (Adhikari, 2015).

In 1998, the Nepal government introduced the National Water Supply Sector Policy which laid more focus on the principles of decentralization, empowerment of Water Users and Sanitation Committees (WUSCs) and sanitation as an integral component of water supply projects (Rokaya, 2022).

The government of Nepal in order to ensure its commitment to ensure the access of basic water supply and sanitation services to all households by the end of 2017 introduced the Integrated National Rural Water Supply and Sanitation Policy 2004, this was the first policy that that mandated to allocate 20 Percentage budget for sanitation sector activities. Various community approaches emerged to address the sanitation situation throughout the country such as The School Sanitation and Hygiene Education Program, Community-Led Total Sanitation (CLTS) and so on.

Sanitation and Hygiene Master Plan 2011

By 2010, as there were many development agencies focusing in the wash sector and implementing various WASH projects using different methods there was a need of strong coordination and harmonization within the Wash sector. Due to the realization of these concerns, the government of Nepal launched the comprehensive National Sanitation and Hygiene Master Plan in 2011 with the commitment of 6 key ministries (Rokaya, 2022).

The Master Plan strongly demands and enables environment and strategic steps to enhance coordination, build stakeholders alliance, synchronize diverse efforts, maintain uniformity and standard in program and support optimally utilize local resources, strengthen grass root level institutions and ultimately reduce dependency in the sanitation sector activities through common vision, unified planning and implementation and collective results.

2.3.4 Policies of Rural Water Supply and Sanitation Fund Development Board (RWSSFDB)

The Rural Water Supply and Sanitation Fund Development Board (Fund Board), established on March 14, 1996, by the Government of Nepal (GoN) under the Development Board Act 1956, is an autonomous organization under the Ministry of Water Supply and Sanitation (MoWSS), promoting and integrating community-led, demand-driven and participatory approach in rural drinking water and sanitation (RWSS) services all over the country. The prime objectives to set up the Fund Board were to:

- bring about fundamental changes in the conventional supply-oriented approach to a demand-driven approach and participatory decision making
- support the government in sector policy making and development efforts. The major funding agency is the IDA/World Bank and with contributions coming from GoN and the communities (RWSSFDB, n.d.).

Objectives of Fund Board

1. Empowering rural communities in service delivery with full emphasis on community ownership and responsibility for supporting in mobilization of social and economic capital of rural people and reduce rural poverty.
2. Promoting cost effective and sustainable development of projects.
3. Supporting GoN to mainstream RWSSFDB approach within the sector and even beyond the sector.
4. Supporting GoN in policy formulation to meet MDG and national target in the sector.

Key Strategies of RWSSFDB

Taking facilitating roles and continue effective self-managed community institutions and strengthen the capacities of those communities and support them in project identification, planning, implementing and managing the projects activities.

Mobilizing supporting organizations, NGOs, CBOs and private sector organizations to support the community in capacity building and project implementation efforts.

Community capacities are appropriately strengthened and assisted in project identification, planning, implementation and overall management of the scheme.

Public and private organizations, such as NGOs and private sector firms are mobilized to support the community for capacity building and implementation of the program by adopting public private partnership (PPP) model in program implementation.

2.4 Empirical Review

Safe drinking water is one of the basic needs of our life. Lack of safe drinking water leads to poverty and diseases so availability of safe drinking water is essential to live a healthy life and is fundamental basic need just like food, shelter, clothing and so on. Various international organizations, NGOs, institutions, sociologists, economists, have conducted various research related to the impacts cause by drinking water projects globally and in Nepal

On a global and regional level, WASH interventions have significantly reduced disease prevalence. Practices like hand washing practices have reduced diarrhea by 40 Percentage and improved water quality has reduced cholera by 50 Percentage (UNICEF, 2020). Similarly the economic benefits brought by the WASH projects can also be seen “every \$1 invested in WASH yielding a return of US\$ 4.30 due to reduced healthcare costs and increased productivity (Hutton & Haller, 2021). Similarly WASH programs have improve the attendance rate of school going children especially girl children by 20-25 Percentage by addressing menstrual hygiene challenges and gender equity (UNICEF, 2019). Community based water supply system in the Sub-Saharan Africa has resulted in empowering women through active participation and involvement in decision making process and also by improving their roles in leadership (UN Women, 2018).

Research such as “Assessing the Impact of Drinking Water and Sanitation on Diarrheal Disease in Low-and Middle-Income Settings” analyzed and found out that improvement in drinking water sources resulted in reducing diarrhea by 15 percent. It also found out that water and sanitation interventions combined together resulted in reducing water borne diseases by 30 percent. The major health benefits were observed

in the areas where both water and sanitation services were improved together (Wolf et al, 2014).

“The Impact of Water, Sanitation, and Hygiene Interventions on the Health and Well-Being of People Living with HIV” examined the effects of WASH on individuals who are living with HIV, the research found out that access to clean and proper sanitation reduced the infection such as diarrhea and skin diseases by 40 percent and improved hygiene practices helped to improve immune system and overall well-being of HIV patients. The research has emphasized that clean water is essential for therapy as contaminated water can reduce the effectiveness of medications (Yates et al, 2015).

In a research titled “Rapid Evidence Assessment of the Impacts of Sewerage, Drainage, and Piped Water Chlorination in Urban Settings of Low-and Middle-Income Countries” focused on urban low and middle income countries where water contamination and inadequate sanitation services are prevalent. The research found out that sewerage system resulted in reducing water borne diseases such as cholera and typhoid by 45 percent and proper drainage system reduced the risk of vector-borne diseases such as malaria and dengue by 30 percent (Prasad & Jenkins, 2015).

“Sustainable Water and Sanitation in Sierra Leone” assessed WASH project in Sierra Leone that aimed at improving access to clean water and sanitation WAU and WAR districts. The project resulted in improving access to safe drinking water by 35 percent; it also resulted in improving community health significantly, diseases like diarrhea was reduced by 33 percent and overall reduce in water borne diseases by 22 percent (Vonk. 2022).

Similarly, so many case studies have been done to study about the impacts of drinking water projects in Nepal.

A case study by (Bhurtel, 2014) in Lekhnath Municipality has also highlighted how the projects have impacted the local people socially and culturally in a positive way. The research found that after the project there was significant improvement in health with reduction in water bone diseases by 77 Percentage. The research also found that household sanitation improved where 57.4 Percentage respondents reported satisfactory change while 36.1 Percentage reported it was cleaner than before. There was signification improvement in income generation 72.2 Percentage respondent’s reported there was improvement while 36.1 Percentage responded it improved very

significantly as the time saved was allocated to productive activities such as farming and small businesses. The research also found out that there was improvement in community involvement especially women where it noticed that 42.6 Percentage of households involved both genders in project activities.

Similarly a case study by (Shrestha, 2018) study of Pokhara Lekhnath of Kaski District has also highlighted the positive changes the project has brought in the lives of local people. He found out that before the Small Town Water Supply System (STWSS) was implemented people had to rely on public tap and other unsafe water sources. People mostly women spent lots of time fetching water every day and there was high prevalence of water borne diseases. However, after the project was implemented he found that there was significant change in time spent for fetching almost 98.4 of household reported reduced time for fetching water, according to his research it was also found out that water borne diseases reduced by 77 Percentage. Overall he also found out that there was active participation by both men and women for the projects management and maintenance. Although, there were many positives due to the project there were few challenges, the rapid population growth was creating strain for water resources and the persistent challenge of unequal distribution of water and maintains its quality.

Similarly research has been done by international organizations. The research done by WHO findings suggests that projects that are culturally silent and locally owned tend to be more sustainable and effective. WHO has focused on behavior change and found that knowledge alone is not sufficient and projects needs to address cultural, structural, and psychological barriers to bring change in behavior and sustain WASH practices. WHO has also found that children can be agents of behavior change and has suggested the importance of hygiene education for bringing long term behavioral change (WHO, 2019)

Research done by Asian Development Bank (ADB) has also given strong emphasis on community led approaches, focusing on long term empowerment of community for long term sustainability. The ADB findings also suggest a cost sharing mechanism in which community member contribute 10 to 20 Percentage for the funding and maintenance of water system. The ADB findings show the need of a strong community based approach is required for long term sustainability and equity. The research also found that there were improvements in hygiene practices especially

hand washing with soap, and proper water system which led to better health outcomes,

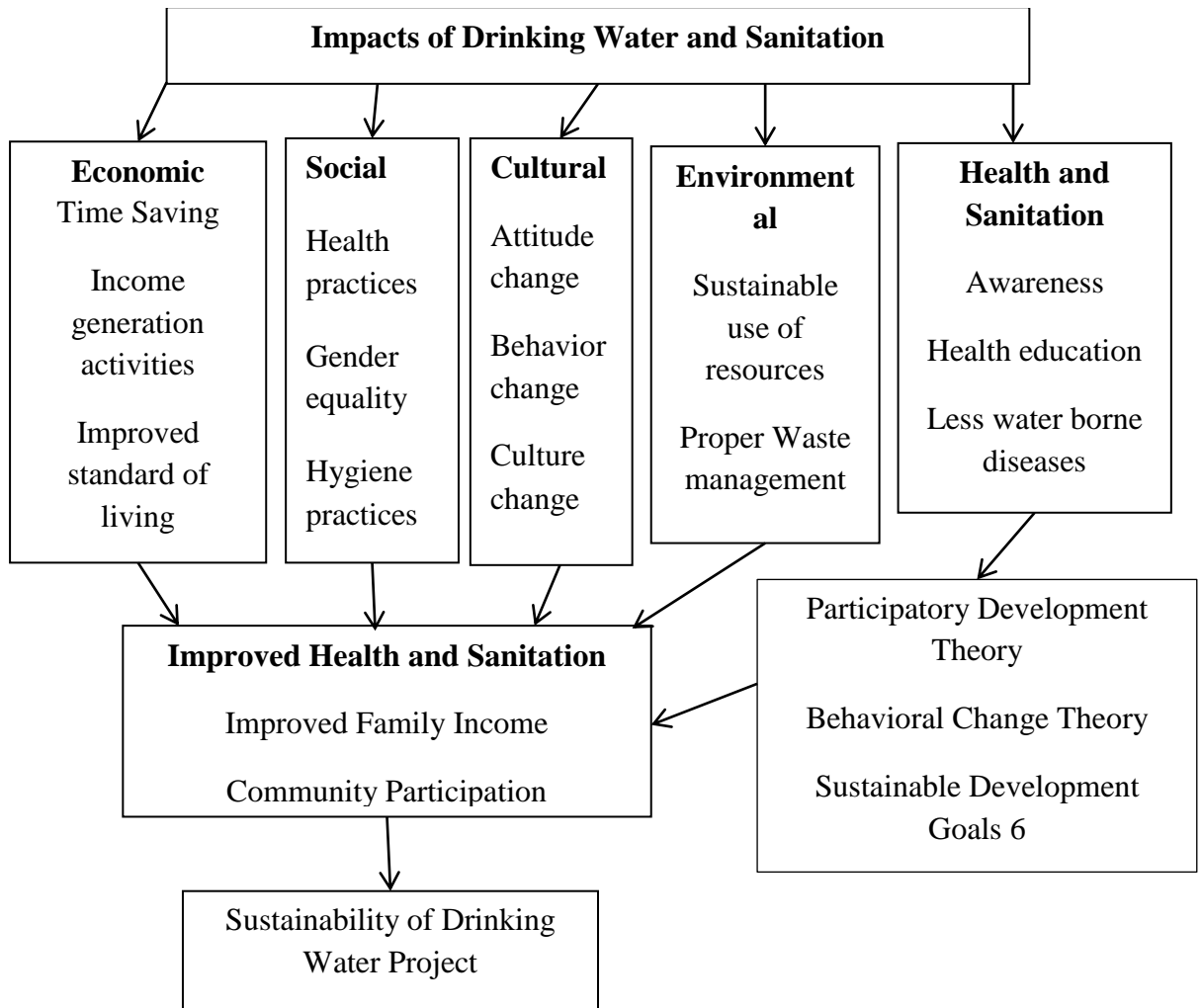
The research done by UN in Nepal was based on participatory approach the findings suggests that participatory approach created a sense of ownership among the members of the community and helped to ensure better maintenance of the infrastructure and long term sustainability. It also found that there was improvement in hygiene practices like hand washing with soap, and proper water storage which led to overall better health outcomes especially in school as it reduced absenteeism particularly girls who had to miss classes due to lack of proper facilities. The research also found out that special emphasis was given to marginalized groups such as women, and low income group. The women were included in water use committees promoting gender equality and empowerment.

The empirical evidence from the literature above shows the immense socio-economic impacts of drinking and sanitation projects can have i.e. improvement in health, time saving, generating income and promoting social equality. However, addressing gaps such as behavioral change, issues of long term maintenance needs to be addressed for long term sustainability.

2.5 Conceptual Framework

Figure 1

Impacts of Drinking Water and Sanitation



From the above following framework, it becomes clear that lack of drinking and sanitation project brings significant multi-dimensional challenges in the life of local people i.e. economic, social, health, environmental and cultural challenges. The economic challenge includes loss of time due to fetching water, resulting in less income generation activities and low standard of living. The cultural challenges include health risks in cultural activities, gender inequality and lack of hygiene practices such as hand washing and so on. The environmental challenges include unsustainable utilization of resources, and the lack of waste management which results in more pollution and degradation of the environment. The health challenges include lack of awareness and education which results in high water borne diseases

due to poor sanitation and the social challenges includes lack of participation, empowerment and capacity building of local people.

The theories mentioned in the framework above helps to analyze how access to drinking water and sanitation projects helps to improve health and sanitation, income of the family, community participation and how all these factors contribute to the long term sustainability of the project.

CHAPTER- THREE

RESEARCH METHODOLOGY

3.1 Research Design

To obtain an in depth understanding of impacts brought by the drinking water project in ward number 2 of Sankhrapur municipality the research design is evaluative employing qualitative and quantitative data. The evaluative research design covers a detailed analysis of how the projects have brought improvement in health, economic benefits, community engagement and sustainability of the project.

3.2 Rationale of Study Area Selection

The study has been carried out in the ward number 2 of Shankharapur Municipality of Kathmandu district. Tap drinking water facility were made available in the municipality 3 years before. Being the study an assessment, the area having drinking water facility has been selected as a study site on the basis of research problem, one ward of the Sankharapur, where NSSC - Kathmandu has carried out the drinking water scheme with the support of Rural Water Supply & Sanitation Fund Development Board (RWSSFDB).

3.3 Nature and Source of Data

The study used both qualitative and quantitative data. Primary data was collected through developing a set of questionnaires and testing among the users' group to know the present status and people's view on drinking water and its socio-economic impacts. The secondary data is collected from books, journals, articles etc.

3.4 Study Universe and Sampling

From the website of RWSSFDB, the total beneficiary households of the project in Sankhrapur Municipality was found to be 105 households which is universe of the study. Census method were employed to cover all 105 households for the purpose of the study.

3.5 Methods of Data Collection

3.5.1 Household Survey

Household survey has been conducted to collect primary data of the research in the format of questionnaire to get the most accurate information from the beneficiaries of

the project. The format of questionnaire for household survey has been attached in annex II.

3.5.2 Focus Group Discussion (FGD)

FGD has been conducted with the water users WSUG to get a bit more detailed information and to ensure that the data from questionnaires are reliable. FGD was conducted with 9 WSUG. The guidelines for FGD have been attached in annex III.

3.5.3 Key Information Interview (KII)

KII will be conducted with ward in-charge, Chairman of water users committee and members, team leader, VMW, ANM, Women's group leader of the project. KII will be done to find the impacts of schemes on health, workload, and other economic activities. The guidelines for KII have been attached in annex IV.

3.6 Data Analysis and Presentation

The data was logically interpreted along with simple tables, charts, graphs. Mainly, Statistical Package for Social Science (SPSS) will be used to analyze the information. Collected information were analyzed by using simple statistical tools like percentage, mean, standard deviation and it was presented with tables and pie-charts.

3.7 Ethical Consideration

The research has taken consent in every process and has ensured respect for the right of individual privacy, dignity, and freedom during the implementation of the process. Similarly, the researcher has ensured the confidentiality of the respondents. The data received from the respondents have not been manipulated through monetary and other means for personal benefit and has followed the university's rules and guidelines.

CHAPTER- FOUR

ANALYSIS AND INTERPRETATION OF DATA

This chapter attempts to analyze the collected data and information from the field survey and various sources in response to meeting the objective of the study and to derive the major findings of the study. After the collection of the data with the help of different methods of data collection, data are presented and analyzed in this chapter with the help of simple statistical tools such as tabulation, percentage, bar graph, pie chart, etc. The data consists of impacts brought by the drinking water and sanitation project on the local people socially, economically and environmentally. For the analysis and interpretation, the chapter has been organized in the following way:

4.1 Socio-Demographic Profile of the Respondents

4.1.1 Gender Distribution

Participation of both men and women are crucial to analyze the impacts brought by the project. The level of participation from both men and women determines whether everyone has equally benefitted. Analyzing gender distribution helps to identify gaps in participation and ensure whether everyone is included. However, it is important to note that the gender representation indicates the respondents who were present at the time household survey was being conducted and not their actual participation during the project. The following table illustrates the gender distribution of the respondents.

Table 4.1

Gender Distribution

Gender	Frequency	Percent
Male	76	72.4
Female	29	27.6
Total	105	100

Source: Field Survey, 2024

The table above shows the gender distribution of the respondents who were present while the household survey was being conducted. The table shows that 72.4 percent were male while 27.6 were female. The table indicates that men were more active and willing to participate during the household survey. The participation of female also highlights a positive that female also active and willing to participate during the

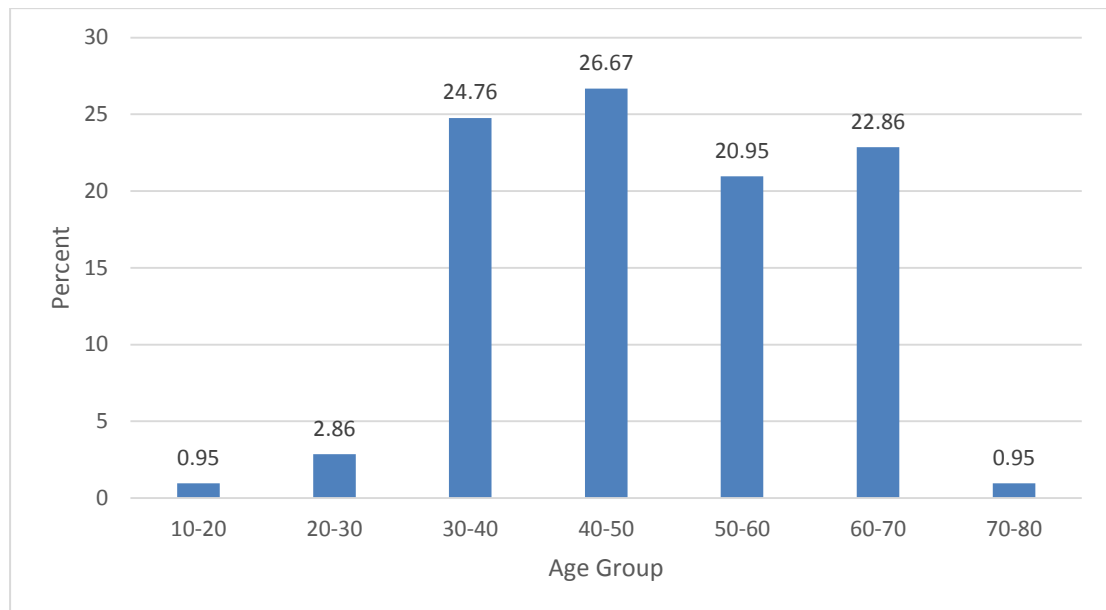
household survey. This also indicates a change towards gender equality as female are not only responsible for traditional gender roles such as household work.

4.1.2 Age Composition

Analyzing the age distribution helps us to understand which age group was more actively involved during the project. A balanced representation across age groups helps us to understand weather everyone of different age groups have benefited from the impacts bought by the project. Age also plays a crucial role in influencing perspectives related to water management, hygiene practices and the sustainability of the project.

Figure 2

Age Composition



Source: Field Survey, 2024

The figure above highlights that the middle-aged individuals (30-50) years are most involved in the project, followed closely by elderly people (60-70) years. Although lower in number only around (1 percent) of young people was involved it highlights the growing awareness. Hence the balanced involvement of individuals from different age groups helps to ensure the long term sustainability of the project.

4.1.3 Marital Status

Analyzing the marital status is crucial as it can influence household's responsibilities, financial stability, and decision making power. A married individual often have

shared responsibilities and plays a crucial to help us understand about changing culture, attitude and behavior of traditional gender norms. The following table below illustrates the marital status of the respondents.

Table 4.2

Marital Status

Marital Status	Frequency	Percent
Single	7	6.7
Married	91	86.7
Divorced	5	4.8
Widowed	1	1.0
Single Women	1	1.0
Total	105	100

Source: Field Survey, 2024

From the table above it becomes clear that the majority of the respondents were married (86.7 percent) suggesting the shared decision making process which is crucial for the long term sustainability of the project. On the other hand single (6.7 percent), divorced (4.8 percent), and widowed (1 percent) highlights the inclusivity of different backgrounds. The participation of single women (1 percent) also indicates the growing change towards gender inclusivity.

The balanced representation of different marital status indicates a positive inclusivity of people of different background ensuring that the project benefits each individual.

4.1.4 Caste/Ethnicity

The caste and ethnicity is crucial to analyze as it helps us to understand the type of community. It plays a crucial role as it helps us to understand about community engagement, distribution of resources and social inclusion of different groups. It also helps us to understand whether the drinking water and sanitation services are equitably distributed among all community members and if any groups are excluded and needs more attention to be uplifted. The following table illustrates the caste/ethnicity of the respondents.

Table 4.3*Caste/Ethnicity*

Caste/Ethnicity	Frequency	Percent
Indigenous	105	100

Source: Field Survey, 2024

The table above shows that 100 percent of the respondents belong to the indigenous community and mainly belonging to the Tamang, Waiba and Lama groups. This indicates that the study area is homogeneous and has a collective understanding and equitable water distribution. Due to the absence of different ethnic group the findings may not be represented for a more diverse community.

4.1.5 Religion

Analyzing the religious composition is crucial as different religion have different cultural practices and effects the hygiene and sanitation practices. Religion composition helps to understand about the change in culture and awareness related to health practices, hygiene and sanitation. The following table below illustrates the religious composition of the respondents.

Table 4.4*Religion*

Religions	Frequency	Percent
Bouddha	104	99.0
Christian	1	1.0
Total	105	100

Source: Field Survey, 2024

The table above indicates that the study area is predominately a homogeneous area as almost all the respondents (99 percent) identify themselves as Buddhist. Homogeneity in religion plays a crucial role in the changing cultural practices related to health, sanitation and hygiene practices. On the other hand only (1 percent) of the respondent identify themselves as Christian. Although in minority it highlights a positivity of strong inclusion of people of different gender, caste and religion. Homogeneity in religion also indicates a strong sense of shared understanding in the community.

4.1.6 Education Status

Education is one of the most important indicators as it helps individuals to step into brighter side of life. Education helps to acquire knowledge and skills and helps the individual to earn his/her livelihood and overall development. Education develops consciousness and awareness. Better literacy rates often leads to better hygiene, better waste management and awareness related to water infrastructure and system. Hence analyzing of educational level is crucial and must.

The educational status in study area is not satisfactory as majority of the respondents are illiterate and the most common education level is till primary level. The table below illustrates the education level of the respondents.

Table 4.5

Education Status

Education	Frequency	Percent
Primary	32	30.5
Secondary	18	17.1
Higher	2	1.9
Illiterate	53	50.5
Total	105	100

Source: Field Survey, 2024

The table above represents the education level of the respondents. As we can see from the table it reveals more than half of the respondents 50.5 percent are illiterate. Among the people who have completed formal education most of the respondents 30.5 percent of the respondents have education till only primary level. Only 17.1 percent of the respondents have education till secondary level while only small fractions 1.9 percent of the respondents have perused higher education. The following data indicates that majority of the respondents might struggle understanding about the importance and guidelines from the project. It also highlights the need of more training and awareness programs to enhance the community's ability to manage and sustain water infrastructure effectively.

Table 4.6

Higher Education Field

Higher Education	Number	Percent
Education	2	1.9
No Higher Education	103	98.1
Total	105	100

Source: Field Survey, 2024

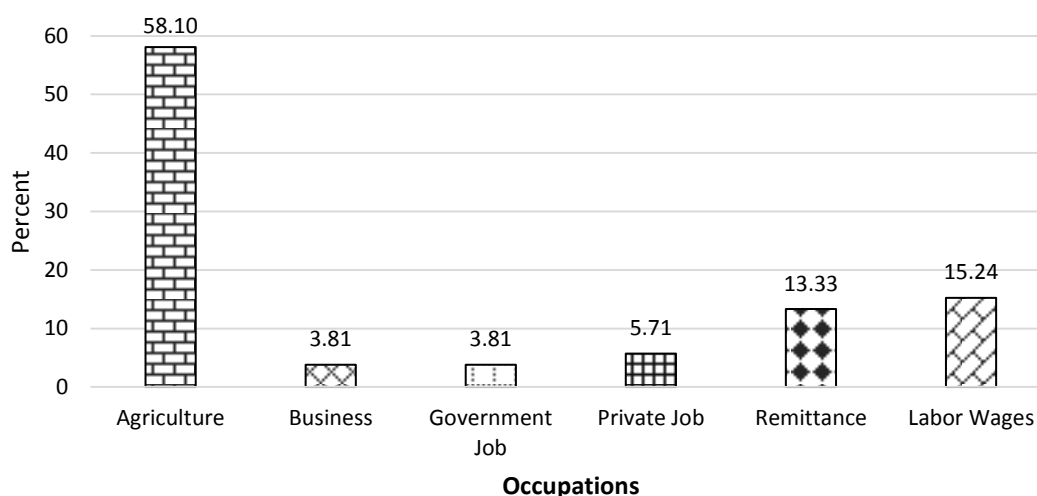
The table shows the number of respondents who have perused higher education from out of 105 respondents only 2 respondents have completed higher education in field of education. While the majority of the respondents have not pursued further education indicating the need of further awareness programs related to the importance of education.

4.1.7 Family Occupation

Family occupation helps us to understand how people earn their livelihood. It is important to understand about the occupation of the respondent as occupation plays a crucial role in understanding about water consumption patterns. Different types of work require different amount of water weather it is for domestic use, irrigation, business activities and so on.

Figure 3

Family Occupations



Source: Field Survey, 2024

The most common occupation in the study area is agriculture followed by labor wage while business, private and government jobs are seen less in the area. The following figure below illustrates the occupation distribution of the respondents.

The table above shows the occupation of the respondents. The data shows that agriculture is the major occupation in the study area (58.1 percent) this indicates that more than half of the respondents rely on agriculture for their livelihood highlighting the critical need of water availability not only for domestic use but also for irrigation and livestock farming and any disruption in water supply directly effects the livelihood of the people.

Other occupations, labor wages (15.2 percent), remittance (13.3 percent), private jobs (5.7 percent), and government job (3.8 percent) indicates that a portion of the respondents are less reliant on water resources for livelihood but still require water for daily chores. On the other hand occupation such as business and enterprise such a small tea shops and local shops relies on water sources for cleaning and sanitation.

Hence, the diverse occupation distribution of the study area highlights the crucial need of access to reliable water supply for different day to day activities of individuals such as household chores, livestock farming, and irrigation and so on.

4.1.8 Land Holding Status

Land ownership is a crucial factor as it determines the economic productivity of households as the study area is dominatingly agriculture the consistent water supply is crucial. Individuals with larger landholdings may have higher demand. Hence the land holding can also help us to understand about the water sufficiency and satisfaction level of the respondents.

The land holding status of respondents majority of respondents own small landholding across different land types the majority of the respondents own 1-3 ropani farmland. The table below illustrates the land holding status of the respondents.

Table 4.7*Land Holding Status*

Land Type	Land Holdings	Frequency	Percent
Farmland	<1 Ropani	3	2.9
	1-3 Ropani	52	49.5
	3-5 Ropani	34	32.4
	More than 5 Ropani	16	15.2
	Total	105	100
Pastureland	<1 Ropani	103	98.1
	1-3 Ropani	2	1.9
	Total	105	100
Non-Cultivated Land	<1 Ropani	101	96.2
	1-3 Ropani	1	1.0
	3-5 Ropani	2	1.9
	More than 5 Ropani	1	1.0
	Total	105	100
Rented Land	<1 Ropani	101	96.2
	1-3 Ropani	4	3.8
	Total	105	100
Leasehold Land	<1 Ropani	105	100.0
	Total	105	100

Source: Field Survey, 2024

The table above indicates that almost half 49.5 percent of the households own 1-3 ropani of farmland while 32.4 percent of the household have 3-5 ropani and 15.2 percent with more than 5 ropani. The data indicates that the majority of the community relies on small scale agriculture resulting in increased demand for water for irrigation and livestock farming making consistent water availability essential for making agriculture sustainable as majority of the respondents are reliant on agriculture for livelihood.

Further pastureland is close to non-existing in the study area as almost all 98.1 percent of the respondents own less than 1 ropani indicating that respondents rely on household- stored food for feeding the livestock. Whereas when it comes to non-

cultivated land majority of the respondents are actively engaged in agriculture while few respondent have significant portion of non-cultivated land indicating the aging population who are no longer actively engaged in agriculture resulting in unused plot of land.

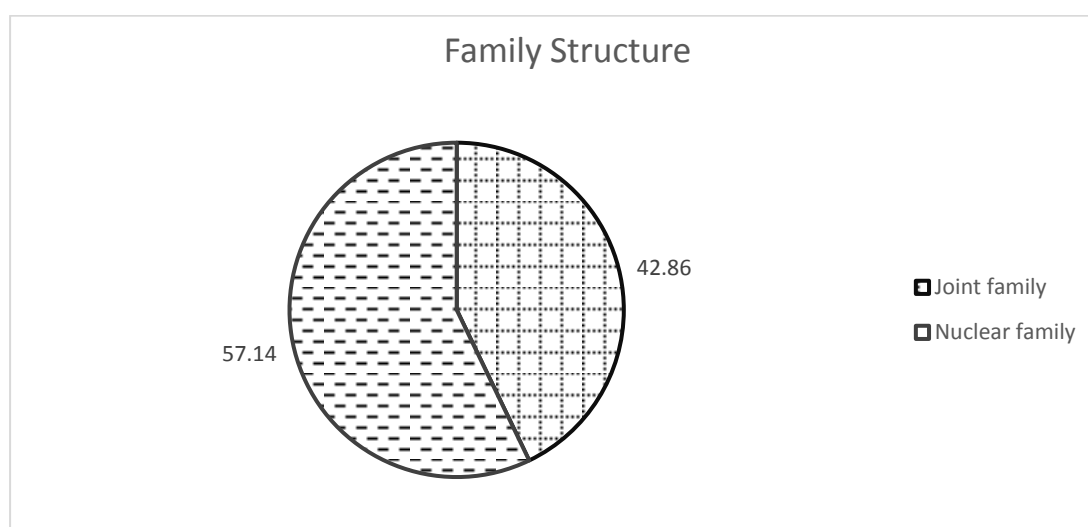
When it comes to rented land majority of the respondents don not rely on rented and only few respondents (3.8 percent) rent 1-3 ropani land for agriculture. This indicates that renting of land is not seen much in the study area. Furthermore 100 percent of the respondents do not rely on leasehold land ensuring land security.

4.1.9 Family system

The type of family system helps us to understand about household water consumption patterns, and sanitation needs. Nuclear family which usually consists of 1to 5 family members and joint family which consists of more than 5 members, usually joint families with higher household size require higher water availability for daily activities such as cooking, cleaning etc. Family occupation helps us to analyze the water consumption patter of the family. The figure below illustrates the family system of the respondents.

Figure 4

Family Structure



Source: Field Survey, 2024

The figure above shows that 57.14 percent of the respondents belong to nuclear families, while 42.86 percent belong to joint families. The majority nuclear family

indicates a shift towards smaller household members and requires lower water consumption for domestic purpose such as drinking, cooking etc.

On the other hand 42.86 percent of the respondents belong to joint family where different generation and relatives live together. These types of households have higher water consumption as more people share the same water resource making water management more difficult.

4.1.10 Household Income

The majority of the respondents earn annually between 50001 to 100000 while a certain portion earn more than 100001 to 500000 and a small minority earn more than that this can be seen from the table below.

Table 4.8

Household Income

Yearly Income of Family(RS)	Frequency	Percent
10000-50000	1	1.0
50001-100000	74	70.5
100001-500000	29	27.6
500001-1000000	1	1.0
Total	105	100

Source: Field Survey, 2024

As we can see from the table above the majority of the respondents earn between 50001 to 100000 accounting to 74 respondents out of 105 (70.5 percent) while 29 respondents (27.6 percent) earn between 100001-500000 while only 1 respondent (1 percent) earn more than 500000.

4.1.11 Household Expenditure

The expenditure of majority of respondents annually is between 50001 to 100000 while a certain portion has expenditure above 100000 the expenditure of the respondents can be seen from the table below.

Table 4.9*Household Expenditure*

Total Yearly Expenses(RS)	Frequency	Percent
50001-100000	89	84.8
100001-500000	15	14.3
500001-1000000	1	1.0
Total	105	100

Source: Field Survey, 2024

From the above table we can see that 89 respondents out of 105 respondents (84.8 percent) have annual expenditure between 50001 to 100000. While a certain portion 15 respondents (14.3) respondent have expenditure between 100001 to 500000 while a small minority 1 respondent (1 percent) haven annual expenditure above 500001.

4.1.12 Training Received

The majority of the respondents were not able to participate in training programs provided by the project such as safe water purification, waste management and composing and leadership. The following table below shows the participation of the respondents in different training programs.

Table 4.10*Training Received*

Items	Responses	Frequency	Percent
Hygiene Sanitation	No	54	51.4
	Yes	51	48.6
	Total	105	100
Safe Water Purification	No	91	86.7
	Yes	14	13.3
	Total	105	100
Handwashing	No	58	55.2
	Yes	47	44.8
	Total	105	100
Waste Management Composing	No	102	97.1
	Yes	3	2.9
	Total	105	100
Leadership	No	101	96.2
	Yes	4	3.8
	Total	105	100

Source: Field Survey, 2024

As we can see from the table above the majority of the respondents were not able to participate in various training programs provided by the project. Hygiene and Sanitation program is almost balanced as 51.4 percent of the respondent responded that they did not participate in the training whereas 48.6 respondents responded that they participated. When it comes to water purification the gap is very high as only 13.3 percent of the respondent participated in the training program whereas a huge percentage 86.7 percentage were not involved. Hand washing is also almost balanced as 44.8 percent were involved whereas 55.2 percent were not involved. When it comes to waste management composting and leadership has the biggest gap as 97.1 percent of the respondents were not involved in waste management and composting with only 2.9 percent were involved. Leadership follows closely with 96.2 percent of the respondents were not involved and only 3.8 percent were involved. This data shows that although various training programs were provided by the project only few respondents took active participation.

4.2 Economic Impacts of the Project

The drinking water and sanitation project has brought significant economic impacts in Sankhrapur Municipality, such as time spent, change in household income, new income generation opportunities and reduction in health expenses due to decrease in water borne diseases. Before the project many household had to spend significant amount of their time for fetching water which consumed significant portion of time and energy which significantly affected their household productivity and at the same time limited their opportunities to engage in income generation activities. The economic impacts brought by the drinking water and sanitation project have been shown below.

4.2.1 Time Spent for Collecting Water Before the Project

The people of Sankhrapur municipality before the implementation of the project had to rely on shared public tap and distant water sources for their daily needs. Fetching water was a time consuming activity as people had to wait in queues and walk significant distance in some cases multiple times a day to fulfill their day to day needs. The time spent by the residents of Sankhrapur Municipality before the project's implementation has been illustrated below.

Table 4.11*Time Spent for Water Fetching Water Daily*

Items	Frequency	Percentage
Less Than 15 Minutes	19	18.1
15-30 Minutes	67	63.8
30-60 Minutes	18	17.1
More Than 1 Hour	1	1.0
Total	105	100

Source: Field Survey, 2024

The table above shows the time residents of Sankhrapur Municipality used to spend for fetching water daily before the implementation of the Project. The majority of the household's (63.8 percent) had to spend between 15-30 minutes daily for fetching water, while (17.1 percent) had to spend between 30 minutes to 1 hour daily. On the other hand only a small portion of the residents (18.1 percent) had a relatively easier access and took less than 15 minutes daily for fetching water daily while a few households (1 percent) faced extreme difficulty as they had to spend more than 1 hour daily for fetching water.

The daily time spent by the residents highlights the inconvenience as the residents had to spend a significant amount of their time for fetching water daily. This hampered their ability to engage in productive activities, such as agriculture and other income generating activities.

4.2.2 Time Saved After Access to Drinking Water System

After the implementation of the project and access to tap water facilities in home, the residents of Sankhrapur Municipality experienced significant reduction in time for fetching water. With the access to clean drinking water in their homes the residents no longer had to spend a significant portion of their time waiting in queue for fetching water to fulfill their day to day water needs and making it more convenient. The time saved by the residents after getting access to tap water system at homes has been illustrated through the table below.

Table 4.12*Time Saved Daily*

Time Saved Daily	Frequency	Percentage
less than 15 minutes	13	12.4
15-30 minutes	71	67.6
30-60 minutes	19	18.1
more than 1 hour	2	1.9
Total	105	100

Source: Field Survey, 2024

The following table above shows the time respondent saved daily after the introduction of tap drinking water facilities in their homes. Majority of the respondents (67.6 percent) responded that they saved 15-30 minutes daily after the introduction of tap water system. Similarly 18.1 percent responded that they saved 30-60 minutes daily and a small portion (1.9 percent) responded that they saved more than 1 hour after the introduction of tap water system in their home as now they no longer had to walk a significant amount and wait in queue daily for fulfilling their daily water needs.

The introduction of pipe water system highlights the significant convenience for the residents as they no longer have to spend a significant amount of time walking long distance and waiting in queue for their turn to fetch water and enabling to engage in productive activities such as agriculture, livestock farming and other income generating activities.

4.2.3 Utilization of Saved Time

With the introduction of tap water system and access to reliable water source has resulted in saving significant amount of time for the residents. The saved time has been utilized in various different ways by the residents which have contributed to overall household management and income improvement. Most of the respondent have utilized the saved time after getting improved access to water for income generation activities and household chores. While others respondents reported that they have no idea how they utilize their saved time. The following table below illustrates how the respondents utilize their saved time.

Table 4.13*Utilization of Saved Time*

Utilize of Saved Time	Frequency	Percentage
Household chores and Income generation	70	66.7
Education	1	1.0
All activities combined	10	9.5
Household chores only	4	3.8
No idea	20	19.0
Total	105	100

Source: Field Survey, 2024

The table above shows how the respondents have utilize their saved time after getting access to improved water. The majority of the respondents (66.7 percent) reported that they utilized their saved time for household chores such as cleaning, cooking and feeding the animals, while at the same time they have been able to spend more time for income generation activities such as agriculture and more time on animal husbandry. While (9.5 percent) of the respondents reported that they managed to balance all activities and were able to send their children to school on time as they didn't have to worry about fetching water. On the other hand (3.8 percent) of the respondents reported that they were able to spend more time for household chores and their household was much more cleaner compared to before, however they stated that they did not feel any difference when it comes to income generating activates. On the other hand (19 percent) of the respondents reported that they had no idea and didn't feel any difference as for them fetching water was not really an issue before as well.

Through KII, with the chairperson of WSUC chairperson I also found out that there has been increase in kitchen gardening activities in study area. Due to the improvement in water availability, households have starting growing vegetables which have reduced their dependence on purchasing from the market resulting in household savings and healthy life.

Overall, the project has enabled the residents of Sankhrapur, Municipality to utilize their saved time more productively, the increased engagement in kitchen gardening and animal husbandry highlights the broader economic benefit for the residents aside from time savings only.

4.2.4 Opportunity for New Income Generation Activities

With access to a reliable water source has provided the opportunity for residents of Sankhrapur, Municipality to engage in new income generation activities. Before the project, due to limited availability of water residents had to rely on small scale agriculture as only means of income, however the introduction of tap water system has provided the opportunity for the residents to engage in new income generating activities and diversify their income and reduce their dependence on agriculture as only source of income. The following table below illustrates the response of the residents for new income generating activities.

Table 4.14

Opportunity for New Income Generation Activities

Response	Frequency	Percentage
Yes	93	88.6
No	12	11.4
Total	105	100

Source: Field Survey, 2024

The table above shows that majority of the residents (88.6 percent) reported that access to improved water source provided them the opportunity to engage in new income generating activities by expanding their agricultural activities highlighting the positive economic impacts brought by the project. However, (11.4 percent) of the respondents reported that they did not feel that after the project new income opportunity was created reflecting the lack of awareness and limited skills to benefit from improved access to water.

Through FGD, with the water user beneficiaries and KII with the chairperson of water user committee I found out that animal husbandry has significantly increased as almost all the households now practice animal husbandry mainly buffalo and goat. With increased availability of water the residents have been able to raise animals more effectively contributing to more productivity and more income. Although animal husbandry has significantly increased activities like small business and entrepreneurship has not seen much progress.

Overall, the improved access to water has provided new opportunity to expand their agricultural activities. The rise in animal husbandry highlights the significant improvement in the productivity of the residents of Sankhrapur, Municipality.

4.2.5 Change in Income After the Project

With improved access to water facilities, household were able to significant amount of time for fetching water which the residents were able to utilize for new income generation activities and were able to expand their agriculture and provided the opportunity for animal husbandry at the same time. The selling of milk to local nearby dairy has significantly improved the income of the residents after the project. The following table below illustrates the change in income of the households after the project.

Table 4.15

Change in Income After the Project

Change in Income	Frequency	Percentage
Increased significantly	76	72.4
Increased slightly	16	15.2
No change	13	12.4
Total	105	100

Source: Field Survey, 2024

The above table shows that majority of the respondents reported that due to the and project after getting access to improved water facilities their income increased significantly more due to increased productivity from agriculture and animal husbandry which significantly improved the household income. At the same time 15.2 percent of the respondents reported that they felt their household income increased slightly compared to before which indicates the slow transition the rise in kitchen gardening activities have also reduced the dependence on market which contributes to saving of household income slightly. On the other hand 12.4 percent of the respondents reported that they didn't feel any change in income after the project, this is mainly due to limited knowledge of the opportunities provided by the improvement in water and old aged people who are not able to gasp the opportunity.

4.2.6 Expenses Related to Health and Water Collection

The expenses related to health and water collection has reduced after the project as individuals do not rely on multiple sources for collecting water and due to improve in water quality and getting access to clean water various water borne diseases such as diarrhea and typhoid have also reduced. The following table shows the response of respondents.

Table 4.16

Expenses Related to Health and Water Collection

Category	Frequency	Percentage
Yes	99	94.3
No	6	5.7
Total	105	100

Source: Field Survey, 2024

As we can see from the table above majority of the respondents (94.3 percent) stated a reduction in expenses related to health and water collection, while only 5.7 percent stated that their expenses did not reduce. From the following data we can see that improved water and sanitation facilities had a positive economic impact on households by reducing the costs related to health and water collection. The reduce in health expenses is mainly due to improved access to clean drinking water and better sanitation and hygiene practice such as hand washing etc. resulting in reduce in water borne diseases. However although the majority of the respondents stated that their expenses related to health and water collection a small portion stated that their expenses related to health and water collection did not reduce highlighting that few individuals have not been able to benefit from the project.

4.2.7 Economic and Financial Impacts

The economic and financial impacts of the drinking water and sanitation project have been assessed though some key indicators such as new income opportunity, financial resource allocation of households to priority area, economic benefits, affordability and fund management for operation and maintenance. The table below presents means that indicates people agreement and disagreement while the standard deviation indicates the variation.

Table 4.17*Economic and Financial Impact*

Items	Min	Max	Mean	Std. Deviation
Created new income opportunity	1	5	4.52	0.99
Allocate finance resource priority area	1	5	4.82	0.65
Economic benefit worth invests	1	5	4.56	0.71
Cost affordable	1	5	3.36	0.85
Funds for om effectively collected managed	1	5	3.39	0.95

Source: Field Survey, 2024

When it comes to new income generation opportunity the mean score is 4.56 from a maximum of five, this indicates that most of the respondents believe that the project provided new income opportunities. Activities like kitchen gardening helped to reduce the dependence on market for vegetable while animal husbandry helped to significantly improve the income of the residents by selling the milk to nearby dairy. However, the standard deviation of 0.99 indicates some level of variation that although majority of the respondents reported an increase in new income opportunities; some of the residents did not feel new income opportunities mainly due to the lack of awareness related to the opportunities created by increased water supply.

When it comes to allocation of financial resources to priority area has a mean score of 4.82 which strongly indicates that households are now able to spend their financial resources in priority area such as children education, expansion of agriculture, food and nutrition and saving for future needs and improve their overall quality of life. The low standard deviation of 0.65 indicates that there is less variation indicating a strong agreement that people are now being able to spend their financial resources in priority area.

When it comes to if the economic benefit is worth investing has a mean score of 4.56 which indicates that majority of the respondents agree that the economic benefit they received after the project is worth investing to keep it sustainable for a long period of time. *While conducting FGD respondents reported that they are willing to pay as they have significantly benefited due to improved access to water supply.* The standard

deviation of 0.71 suggests that although majority of the respondents have a positive perspective there is a slight variation as some of the respondents did not feel that they did not benefitted much after the project.

The cost affordability has a mean score of 3.36 which indicates a neutral perspective by the respondents. The major reason for the neutral perspective that I found out through *KII* is *because at the present moment the local government is covering the cost of water supply for management and maintenance and the residents are receiving the water service for free. However, for long term sustainability there is plan for bringing back small charge for water consumption leading to neutral perspective.*

The standard deviation of 0.85 indicates the varying opinion, where some of the respondents are willing to pay while some of the respondents feel little bit hesitant. The change in system form a free service to a paid model highlights the neutral perspective.

Funds for operation and maintenance are effectively collected have a mean score of 3.39 indicating that the respondents have a neutral perspective when it comes to fund raising. Some of the respondents feel that the funds are collected and utilized efficiently while some of the respondents reported that they have no idea on how funds are utilized. The standard deviation of 0.95 indicates the variation in the response of the respondents. The lack of awareness regarding on how the funds are being utilized leads towards a mixed opinion by the respondent.

4.3 Social, Health and Hygiene Impacts of the Project

The implementation of drinking water and sanitation project has helped to bring significant change in the Sankhrapur, Municipality. The project has significantly influenced the community participation, change towards traditional gender roles, and change in attitude towards health and hygiene practices. People's involvement in the project has helped to create awareness resulting in change in cultural practice and attitude as well as develop a sense of ownership towards the water infrastructure. The social impacts bought by the drinking water and sanitation project have been shown below.

4.3.1 Respondents Involved in Project and Their Contribution

Community involvement in any project plays a crucial factor in the success and sustainability of the project. The level of participation by family members in different phases such as planning, monitoring, implementation helps to develop a feeling of collective ownership and responsibility which helps to create a ‘we feeling’ due to which people value the project as their own and they become more encouraged to conserve and maintain it for a long period of time.

The people of Sankhrapur, Municipality contributed in various ways with most households being involved in monitoring activities, while fewer households were involved in the planning and implementation phases. The following table below illustrates the involvement of the respondents in the project and how they contributed.

Table 4.18

Respondents involved in Project and Their Contribution

Variables	Response	Frequency	Percentage
Involved in decision-making on Project	Yes	73	69.5
	No	32	30.5
Capacity of planning in project	Yes	27	25.7
	No	78	74.3
Capacity of Monitoring in project	Yes	95	95.2
	No	5	4.8
Capacity of implementation on project	Yes	60	57.1
	No	45	42.9
All above Capacity	Yes	7	6.7
	No	98	93.3
Total		105	100

Source: Field Survey, 2024

The above table shows that (69.5 percent) of the respondents were involved in the project decision making process while the (30.5) percent of the respondents reported that they had no idea. However, 69.5 percent reflects a strong community engagement during the project. (25.7) percent of the respondents reported that they were directly involved in the planning phase. One of the KII person who chairperson of WSUC said “I found out that before making any major decision community meetings were held where the community members can give their views and concerns.” This indicates that although only a few members were involved in the planning phase, the communities were actively involved through active discussion.

The highest level of participation can be seen during the monitoring phase where (95.2 percent) of the households were actively involved. The residents took responsibility such as ensuring that the WSUC was properly managing the project or not, weather meetings were being conducted for discussing crucial decisions, weather the raw materials were being bought in required amount and if the construction was being done properly. The high involvement in monitoring indicates strong public accountability and transparency.

Participation in the implementation phase was also notably high with (57.1 percent) of the respondents were directly involved by providing labor for collecting raw materials, carrying and lifting the materials, digging for setting the pipelines and so on. Those who were not able to contribute to labor work directly contributed to paying funds. Overall, participation during the project was very good where people contributed in different ways to make the project a success

4.3.2 Cultural and Gender Decision

The drinking water and sanitation project has significantly contributed towards gender and culture shift. Activities like fetching of water and cleaning of household were generally seen as activity that should only be done by women; however the project has managed to bring change towards such gender roles and empower women; while at the same time bring change in culture and attitude towards health and hygiene. The following table below illustrates the women empowerment, change towards gender role and change in attitude towards health and hygiene.

Table 4.19

Culture Change and Gender

Variables	Response	Frequency	Percentage
Marginalize represent	Yes	104	99.0
	No	1	1.0
Female Decision making on project and household	Yes	105	100.0
	No	0	0
Change in attitude towards gender roles	Yes	104	99.0
	No	1	1.0
Cultural Change	Yes	102	97.1
	No	3	2.9
Attitude Change	Yes	103	98.1
	No	2	1.9
Total		105	100

Source: Field Survey, 2024

The above table shows that almost all the respondents reported that marginalized groups were involved during the project. However *while conducting FGD I found out that since the area is homogeneous there was no marginalized group since all people belong to the same group.* However under represented group such as women were highly encouraged to actively participate throughout the different phases of the project which indicates a strong progress towards gender inclusion

When it comes to female decision making during the project, all of the respondents reported that female were involved in decision making process. They played an active role in discussion and shared their concerns. They also reported that after the project they felt empowered and now they were more involved in the household decision making process as well. *While conducting KII with WSUC female member, I also found out that after the project women have started female groups where they organize monthly meetings and collect funds and provide loans to required members at the time of need.* These shifts highlight a positive change towards gender equality. The change towards traditional gender roles can also be seen as (99 percent) of the respondents reported that the household activities are now done by both men and women collectively did the household chores together which indicates a positive breakdown of traditional gender norms.

The change in culture change towards health practices can also be seen. Previously, many residents used to go to shamans and spiritual healers when they fell sick. However, now (97.1 percent) of the respondents reported that they go to nearby health post when they fall sick while (2.9 percent) of the respondents reported that they still visit the shaman and spiritual healers.

The project has managed to significantly improve the hygiene practices in the community as well (98.1 percent) of the respondents reported that they felt attitude towards hygiene practices is improving. They reported that practices like hand washing with soap is now common in the area. They also reported with access to clean water they were now able to clean themselves and clothes more often highlighting a positive change towards hygiene practices.

4.3.3 Water Distribution and Satisfaction

Access to clean and reliable drinking water is a must for improving the health, sanitation and quality of life of people. Water satisfaction level helps to assess the success of the project as the residents are able to meet their day to day needs. Water satisfaction is based on factors like equal distribution, availability in sufficient amount, and its proper functioning. Overall, the majority of the respondents are satisfied with the water distribution. The following table illustrates the water satisfaction level of the respondents.

Table 4.20

Water Distribution Satisfaction

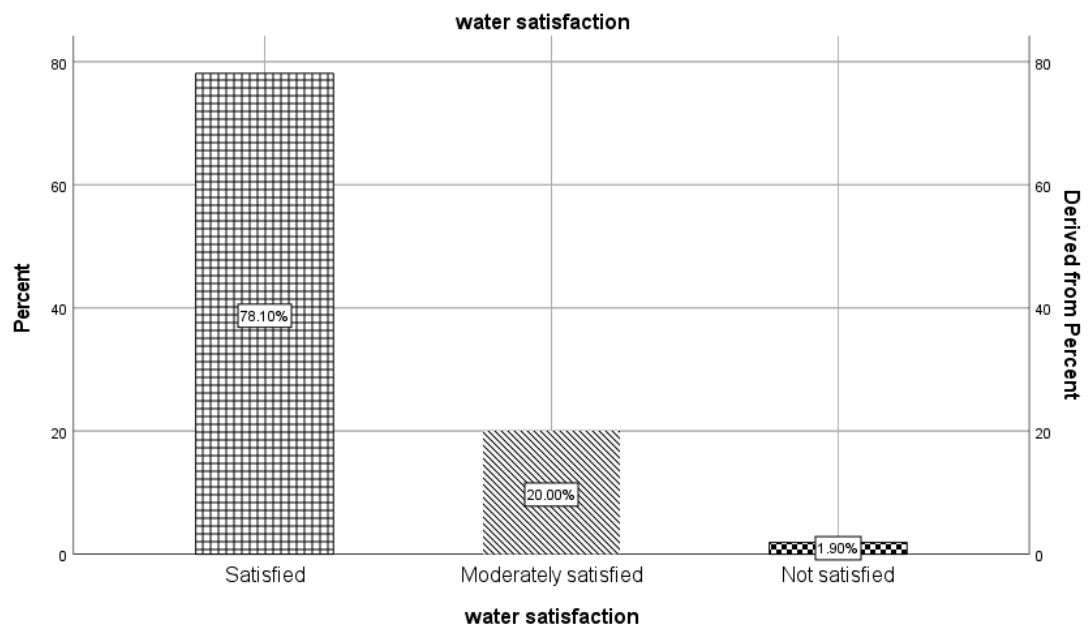
Water Satisfaction	Frequency	Percentage
Satisfied	82	78.1
Moderately Satisfied	21	20.0
Not Satisfied	2	1.9
Total	105	100

Source: Field Survey, 2024

The above table shows that majority of the respondents (78.1 percent) are satisfied with the availability and distribution of the water they reported that the availability of water was sufficient to meet their daily needs. While the majority of the respondents reported that they were satisfied portion (20 percent) reported that they were moderately satisfied through *FGD I found out that the major reason for the moderate level of satisfaction is not due to the technical and environmental challenges. They stated that tap water stopped working from time to time which interrupted their daily activities. They also stated that natural disasters like landslide are a major challenge as it affects the water source and destroys the pipelines which results in water shortage for a while. They also stated that water did come all times and they didn't face any inequality as the water was equally distributed for all. Some of the respondents in minority (1.9 percent) reported that they were not satisfied with the availability of water at all and stated that their tap water system was not functioning.*

Figure 5

Water Distribution Satisfaction



Source: Field Survey 2024

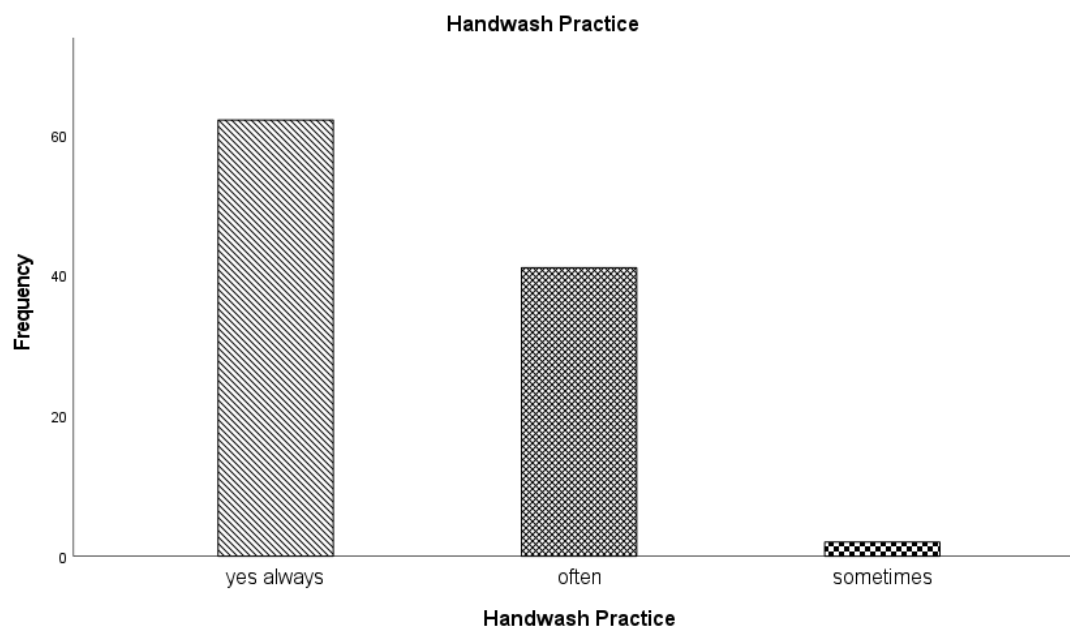
The above figure visually represents the distribution satisfaction level of the respondents. The majority of the respondents belong to the satisfied category which indicates the positive impacts most of the household experienced. Next is the moderately satisfied and not satisfied group who were satisfied when the tap water system was functioning but the tap water system not working from time to time made it inconvenient for them as they faced water shortage issue While the people who are not satisfied is mainly due to the tap water system not function highlighting the need for improvement in water infrastructure. Overall, the project has been successful in providing clean water access to majority of the respondents, however addressing to the technical issue is a must for the long term sustainability of the project.

4.3.4 Hand washing Practice

Proper hand washing is essential hygiene practice it helps to maintain good hygiene and prevent waterborne diseases and contribute to better health. Due to the implementation of the drinking water and sanitation project, people now have access to clean water which has contributed to better hygiene practices in the community. The following figure below illustrates the hand washing practices of the respondents.

Figure 6

Hand Washing Practice



Source: Field Survey, 2024

The graph above shows that majority of the respondents (58 percent) reported “yes always” which indicates that they regularly practiced hand washing with soap this highlights a positive growing trend of importance of personal hygiene. Some of the respondents (48 percent) reported that they practiced hand washing often instead of always which highlights that the importance of self-hygiene is slowly growing in the study area while only a few minority (2 percent) reported that they did practice hand washing but only sometimes which indicates that hand-washing practices is gradually improving in the study area.

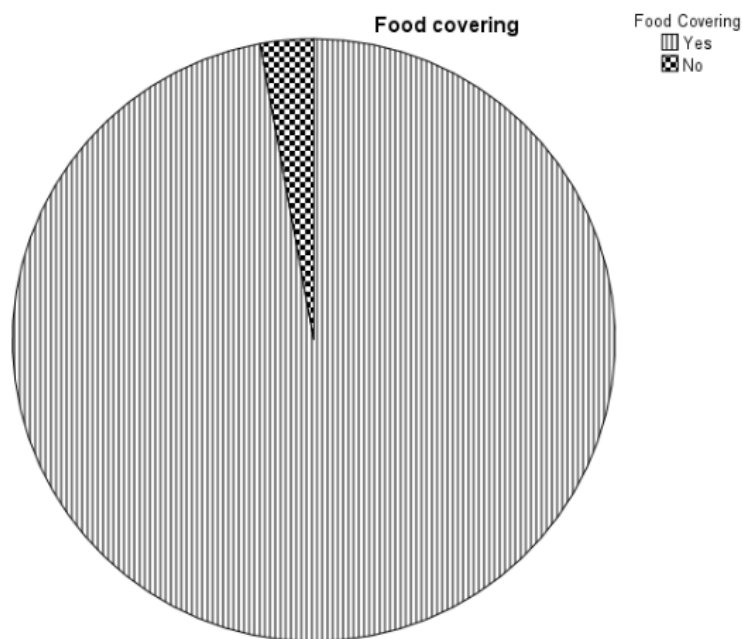
Furthermore, through FGD, I also found out that due to the availability of clean water it has helped to contribute to not only hand washing but other hygiene practices as well such as more frequent showering, washing clothes and keep the household much cleaner. This improved access to clean water has positively impacted the hygiene practices, contributing to better health and overall well-being.

4.3.5 Food Covering Practice

Food hygiene plays an important role in maintaining public health. Covering food helps to prevent food from dust, insect and contamination and helps to prevent illness such as cholera, typhoid, dysentery etc. The food covering practice in the study area is good. The following figure below illustrates the food covering practice in the study area.

Figure 7

Food Covering Practice



Source: Field Survey, 2024

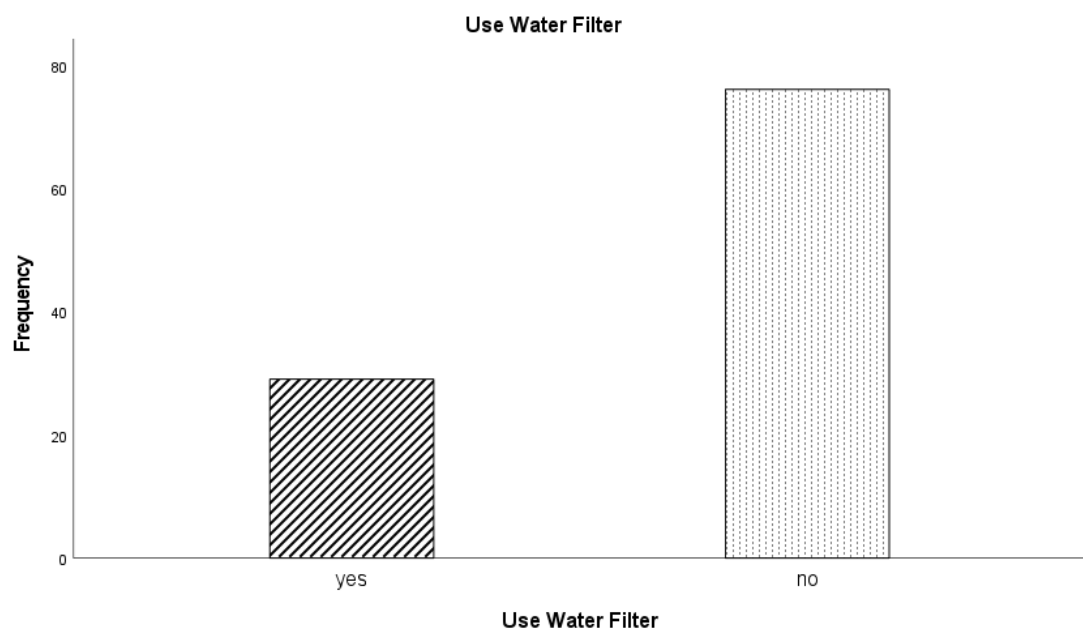
The pie chart above indicates that almost all of the respondents cover their food which is a positive hygiene practice in the community. Proper food hygiene reduces the risk of contamination while at the same time prevents prevalence of waterborne diseases such as typhoid, and malaria. However a small portion of the respondents reported that they do not cover their food which indicates the need to promote awareness of food hygiene as it helps to prevent various diseases.

4.3.6 Water Filter Practice

Access to clean drinking water is essential for good health. The use of water filter helps to maintain the water quality by removing the impurities and contamination from the water. The majority of the respondents do not use water filter in the study area. The following figure below illustrates the use of water filter by the respondents.

Figure 8

Use of Water Filter



Source: Field Survey, 2024

The figure above shows that majority of the respondents do not use water filters, while a small portion use water filter. The respondents also reported that during the rainy season since the water gets contaminated they usually boil the water before drinking. During KII the *team leader also supported that the use of water filter is good but not a must since the water provided is good quality.*

The response of the respondents and team leader indicates the confidence in water quality. The practice of boiling water further indicates an understanding of water quality and the importance of protecting themselves from waterborne diseases. Although the confidence in quality of water is genuine and good, promoting the

awareness about consistent water filtration even when the water looks clean helps to prevent waterborne diseases.

4.3.7 Waterborne Diseases Comparison

Access to clean water and hygiene practices are essential to reduce waterborne diseases. Reduction in waterborne diseases highlights the quality of water and acts as a key indicator. Hence, it is important to evaluate the perception of change in water borne diseases. This perception helps to understand how effective the project has been and if it truly resulted in reducing waterborne diseases. The following table below illustrates the perception of the respondents.

Table 4.21

Waterborne Diseases Comparison

Waterborne Diseases Comparison	Frequency	Percentage
Significantly less	42	40.0
Slightly less	22	21.0
No change	17	16.2
Not sure	24	22.9
Total	105	100

Source: Field Survey, 2024

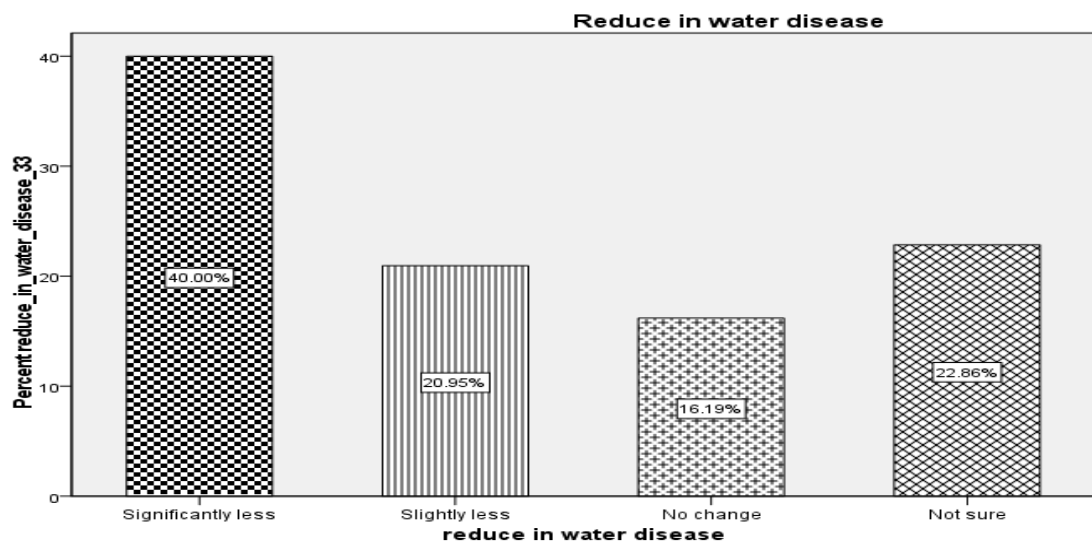
The table above shows that (40 percent) of the respondents reported that they felt that waterborne diseases significantly reduced after the project, while (21 percent) of the respondents reported that they felt waterborne diseases slightly decreased after the project which indicates the positive health and hygiene practices. However, (16.2 percent) of the respondents reported that they didn't feel any difference, while (22 percent) of the respondents reported that they were not sure.

Although there are different perceptions through *KII with the ANN of health post in study area they stated that water borne diseases had decreased significantly, however during rainy season there are some cases of waterborne diseases compared to before.* Improvements in quality of water, awareness of health and hygiene practices have played a significant role in reducing waterborne diseases.

The following figure below visually represents the respondent's perception of decrease in waterborne diseases.

Figure 9

Reduce in Waterborne Diseases



Source: Field Survey, 2024

While the perception of respondents is positive as majority of the respondents feel that waterborne diseases have significantly or slightly reduced indicate the growing awareness of waterborne diseases. However further interventions are required to make people aware of the importance of health and hygiene to reduce waterborne diseases and for people to have a better lifestyle.

4.3.8 Social Awareness

Social empowerment is a crucial aspect as it helps to assess the community engagement, equal distribution and long term sustainability. The following table below highlights the key indicator with statistical measurement mean and standard deviation. The mean indicates the respondent's agreement and disagreement while the standard deviation indicates the variation in the response.

Table 4.22*Social Empowerment*

Items	Min	Max	Mean	Std. Deviation
Promoted to adoption of modern hygiene practice	1	5	4.59	0.82
Active gathering and discussion for promoting hygiene and sanitation	1	5	2.31	1.42
Training and awareness programs impacted on sanitation habit	1	5	2.98	1.48
Social inequality related to water access reduce in community	1	5	4.50	0.88

Source: Field Survey, 2024

The following table indicates that promotion of modern hygiene practices has a mean score of 4.59 which indicates that the project significantly contributed to the adoption of modern hygiene practices. Most of the respondents strongly agree that hygiene practices such as hand washing, food hygiene practice like covering food, and personal hygiene such as washing clothes and showering have significantly improved due to access to clean water. The low standard deviation of 0.82 indicates that the responses have less variation and more consistent.

Active gathering and discussion for promoting hygiene and sanitation have received the lowest mean of 2.31 this indicates that majority of the people disagree that such discussions were taking place. However, the high standard deviation of 1.42 indicates significant variation in the responses. This indicates that some of the respondents agreed while others disagreed or were not sure if such discussion took place.

Training and awareness programs positively impacted sanitation habits received a mean score of 2.98 this indicates a neutral feeling while the high standard deviation of 1.48 indicates the significant variation. This suggests that training programs were being conducted many people were not able to participate which might be the major factor in variation between those who participated. The significant variation in response highlights the lack of access, motivation and lack of time by the respondents to be able to attend training programs.

When it comes to inequality related to water access has reduced in the community has received a high mean score 4.50 which indicates that most of the respondents felt that there was no inequality when it comes to water access after the project’s implementation. The low standard of 0.88 indicates the consistency in response indicating that all households benefitted equally.

4.3.9 Community Empowerment

Community empowerment is a crucial indicator as it helps to develop a sense of ownership and responsibility. Overall, the community feels empowered by the success of the drinking water and sanitation project and have developed a strong sense of ownership over the water infrastructure. The following table below illustrates these key indicators.

Table 4.23

Community Empowerment

Items	Min	Max	Mean	Std. Deviation
Community has developed a strong sense of ownership	1	5	4.06	0.95
Feels proud and empowered by the success of project	1	5	4.23	0.88
community organizes regular cleaning campaign	1	5	2.39	1.07

Source: Field Survey, 2024

The above table shows that community has developed a strong sense of ownership has received a high mean score 4.06 this indicates that most of the respondents agreed that they felt a strong sense of ownership over the water infrastructure. When people feel strong sense of ownership they are more likely to take care of it and use it in a sustainable manner. The standard deviation of 0.95 indicates that the response is relatively consistent with little variation which means that the standard deviation is close to the means which indicate that community have developed a strong sense of ownership.

Community feels proud and empowered has received the highest mean score 4.23 this indicates that respondents strongly agree that they feel proud and empowered by the success of the project. The lowest standard deviation of 0.88 indicates the most

consistency in response and is close to the mean. This further indicates the strong agreement that the community feels empowered by the success of the project.

Community organizes regular cleaning campaign has received the lowest mean of 2.39 which indicates that cleaning campaigns are not usually practiced in the study area. The highest standard deviation among the three indicators indicates the great variation in the responses that while some respondents felt that cleaning campaigns took place from time to time while other respondents disagreed that such campaigns took place.

Overall, the project has been successful in creating a sense of ownership of the water infrastructure in the community and empowering the community which can be seen through the high mean and lower standard deviation. However cleaning campaigns is inconsistent as it has received the lowest and mean and the highest standard deviation. Cleaning campaigns should be encouraged to keep the surrounding clean and promote long term sustainability and hygiene practices within the community.

4.4 Environment and Sustainability Practices

This section explores how the project has promoted positive environmental habits. This section deals with waste separation and how people dispose their waste, it also deals with community perception if they feel they have visibly seen waste improvement in the community and if cleaning campaigns are being organized. The sustainability part deals with the system on how funds are being raised for management, who pays for the repair and maintenance of the water infrastructure and the respondent's confidence level in the long term sustainability of this water infrastructure. The environmental impacts of drinking water and sanitation project have been shown below.

4.4.1 Waste Segregation Practice

Proper waste management is essential for long term environmental sustainability as it helps to reduce the pollution and helps to keep the environment clean. Separating waste into degradable and non-degradable helps to promote healthy recycling habits and contributes to reducing environmental pollution. In the study area the waste separating practice is good. The following table illustrates the waste separating practice of the respondents.

Table 4.24*Waste Segregation Practice*

Category	Frequency	Percentage
Yes	90	85.7
No	15	14.3
Total	105	100

Source: Field Survey, 2024

The above table shows that majority of the respondents (85.7 percent) reported that they practice waste separation which indicates that the project has been successful in making the people aware of the importance of waste segregation. However (14.3 percent) reported that they did not separate their waste which contributes to environmental pollution. The data indicates that the projects was mostly successful in encouraging waste segregation and promote positive recycling habits, however few people are still unaware about the importance of waste segregation and keeping the environmental clean. More community efforts should be done to promote the importance of waste segregation and keeping the environment clean.

4.4.2 Waste Disposal Method

Proper waste disposal method is crucial for maintaining the environment and improving the health of people. Waste disposal methods such as open burning and throwing it in public space results in water, air and land pollution which significantly impacts the environment and health of the people. The waste disposal method in the study area was found to be not satisfactory. The following table below illustrates the waste disposal method by the respondents.

Table 4.25*Waste Disposal Method*

Category	Frequency	Percentage
Throw it outside	47	44.8
Burn it	57	54.3
Compose it	1	1.0
Total	105	100

Source: Field Survey, 2024

The above table shows that majority of the respondents (54.3 percent) reported that they burned their waste including harmful materials such as plastic which is a harmful practice and contributes to air pollution; whereas (44.8 percent) reported that they threw their waste outside however it is important to note that the respondents also reported that they do not throw their waste in public space and throw it in area where it is less populated. Although this prevents visibility it still contributes to environmental pollution. Composing of waste is close to non-existing as only (1 percent) of the respondents reported that they compose their waste and used it for agricultural production. The following data shows the need of promoting and making people aware of sustainable waste management practice such as composing and collective cleaning campaigns.

4.4.3 Visible Waste Improvement

Visible improvement in waste helps us to assess the improvement in environment as people can enjoy a healthy lifestyle and helps also helps us to assess how effective the waste disposal method have been as the community can enjoy the cleaner surroundings and better sanitation. In the study area visible improvement in waste can be seen. The following table illustrates the visible waste improvement by the respondents.

Table 4.26

Visible Waste Improvement

Category	Frequency	Percentage
Yes	80	76.2
No	25	23.8
Total	105	100

Source: Field Survey, 2024

The table above shows that the majority of the respondents (76.2 percent) reported that they felt the environment was much cleaner after the project in the community. However (23.8) percent of the respondents reported that they didn't feel much changed even after the project. Although the majority of the respondents reported that they felt the environment was cleaner it is important to note that the respondents also reported that deliberately threw their waste in areas where it less crowded area instead

of public areas. This practice does help to keep the environment clean in public areas; however it cannot hide the lack of proper waste disposal method in the area and is still contributing to environmental pollution.

4.4.4 Community Cleaning Campaign

Community cleaning campaign plays an important role as it helps to keep the environment clean. It also helps to develop feeling of collective responsibility for keeping the environment. Frequent cleaning campaigns helps to ensure the long term sustainability of the environment. In the study area cleaning campaigns are close to non-existing. The following table below illustrates the community cleaning campaigns according to the respondents.

Table 4.27

Community Cleaning Campaign

Category	Frequency	Percentage
Never	104	99.0
Festival times	1	1.0
Total	105	100

Source: Field Survey, 2024

The table shows that almost all of the respondents (99 percent) reported that community cleaning campaigns never took place. While only (1 percent) of the respondent reporting that generally cleaning campaigns didn't take place but only sometimes during festival times it took place. The respondents also reported that cleaning is more self-initiative and they have not seen much collective efforts being organized. The following data indicates that structured cleaning campaigns such as cleaning campaigns every week end should be strongly promoted. Structured cleaning campaigns helps to improve participation, develop social cohesion, prevent environmental pollution and promotes long term sustainability of the environment.

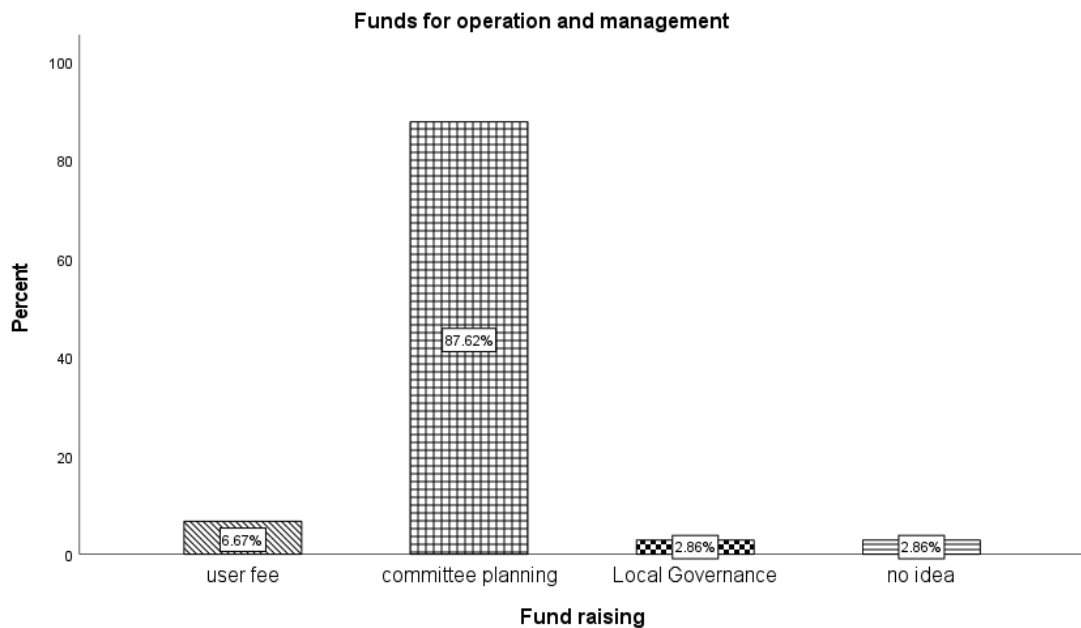
4.4.5 Funds for Operation and Management of Tap Water System.

For water system to function properly funds are necessary for its daily operation and management. In the study area most of the funds for operation are mainly raised through local contribution through community meetings where community members and the WSUC discuss on how funds should be raised. The community meeting

highlights an inclusive and transparent method on how funds are raised. The following figure below illustrates how funds are raised according to the respondents

Figure 10

Funds Operation and Management



Source: Field Survey, 2024

The above figure shows that majority of the respondents (87.62 percent) reported that funds are generally raised through committee planning where the WSUC and community members discuss on how and from where funds should be raised. This suggests that the community plays a crucial role in managing the water system by making collective decision. While (6.67 percent) of the respondents reported that the residents paid user fee for the operation and a small percentage of the respondents reported that local government funded for the operation while (2.86 percent) of the respondents reported that they had no idea.

Through KII with the chairperson of WSU CI also found out that before funds were being collected from water user beneficiaries on a consistent basis and the collection was good on a monthly basis, however due to the landslide they discontinued

collecting funds for a while as it would create conflict as some of the beneficiaries were not able to use the water system.

The following data indicates a positive collective community decision making process where the community actively discusses on how funds should be raised. The active discussion also highlights the less reliance on only one source for raising funds for the operation and management of the water system highlighting a positive collective community decision making process.

4.4.6 System for Reporting the Water Infrastructure

Proper reporting system is essential for the long term sustainability of the water supply system. When the water system stops working a clear reporting process helps to resolve them and the residents can enjoy uninterrupted water access. The respondents reported that they usually report issues related to their tap water system to the WSUC. The following table illustrates the system for reporting the water infrastructure according to the respondents.

Table 4.28

System for Reporting the Water Infrastructure

Category	Frequency	Percentage
WSUC	101	96.2
No	3	2.9
No idea	1	1.0
Total	105	100

Source: Field Survey, 2024

The table shows that almost all the respondents 96.2 percent reported that they report issues related to their tap water system to the WSUC which indicates positive local management of the water system. The respondents also reported that when major issues occur such as breaking pipelines by landslides the respondents stated that community meetings were held to discuss on how to resolve and source of funding. On the other hand, 2.9 percent of the respondents reported that they didn't feel such systems were in place for reporting issues while 1 percent reported that they had no idea.

The presence of WSUC highlights the existence of system for reporting issues related to the tap water system and the community meetings indicates an overall positive community decision making process. However, the community decision making process also indicates a time consuming process as there might be delays for resolving urgent issues.

4.4.7 Funds for Repair and Maintenance of Water System

For the long term functioning of the water system consistent maintenance and repairing are necessary. When issues like pipeline breakdown occurs proper financial planning helps to ensure timely maintenance and help to prevent long term disruption. According to the respondents the water user committee is mainly responsible for funding the repair and maintenance. The following table below illustrates the major source of funding for repair and maintenance according to the respondents.

Table 4.29

Funds for Repair and Maintenance

Category	Frequency	Percentage
Water User Committee	99	94.3
Local Governance	5	4.8
No Idea	1	1.0
Total	105	100

Source: Field Survey, 2024

The above table shows that according to majority of the respondents 94.3 percent reported that water user committee is mainly responsible for funding the repair and maintenance of the water system, while 4.8 percent of the respondents reported that local government funded for the repair and maintenance while 1 percent of the respondents reported that they had no idea who funded.

Through KII with the chairperson of the WSUC before small amount of funds were being raised from the water beneficiaries for repairing minor issues, however after the landslide that resulted in the breakdown of the pipelines the local government was funding for the time being for the repair and maintenance.

Additionally while conducting KII with VMW, I also found out that WSUC is mainly responsible for the repair and maintenance of the water system of minor issues, however when there is significant damage such as water tank leakage, pipe line washout during such time local government usually pays for such repairs.

The WSUC has been playing a crucial role for the repair and maintenance of the water system and ensuring its operating properly through community meeting and raising small amount of funds from the water beneficiaries. However, the recent landslides that resulted in the breakage of pipelines were funded by the local government for repair and maintenance. This raises question on the long term financial sustainability when the government funding stops. A more consistent fund raising planning is necessary for long term sustainability.

4.4.8 Confidence of Long-Term Sustainability

The long term sustainability of the water system is dependent on various factors such as regular maintenance, proper funding and ability to deal with external challenges such as natural disasters. Although the respondents have significantly benefited from the tap water system there are various concerns regarding its long term sustainability based on how confidence the respondent feel regarding the long term sustainability of the water system. The following table below illustrates the confidence level of the respondents.

Table 4.30

Long Term Sustainability of the Project

Category	Frequency	Percentage
Very confident	17	16.2
Somewhat confident	83	79.0
Not confident at all	5	4.8
Total	105	100

Source: Field Survey, 2024

The following table shows that majority of the respondents 79 percent feel somewhat moderate level of confidence they feel that the water system can last for a long period of time, however they are not that confident; while 16.2 percent of the respondents are very confident and believe that the water system can last for a long period of time. On the other hand 4.8 percent of the respondents are not confident at all that the water

system can last for a long period of time and showed their frustration regarding the disruption from time to time.

Through FGD I also found out that the reason for the moderate level of confidence is mainly due to the water disruption and natural disasters like landslides were a major confidence for the low level of confidence.

The above data suggests the need for improving the water infrastructure resilience and to prepare an emergence funds for emergency cases is essential to make the community feel fully confident in the long term sustainability of water system.

4.4.9 Environment Conservation and Sustainability

The public perception regarding the environmental impacts helps us to assess if the project managed to promote positive environmental habits. The table below represents some of the indicators which are measure through statistical indicators mean and standard deviation. The mean represents people’s perception while the standard deviation represents the variation in the response. The following table below illustrates the perception of the respondents.

Table 4.31

Environment Conservation and Sustainability

Items	Min	Max	Mean	Std. Deviation
Project incorporates sustainable practice	1	5	4.46	0.85
Project initiation in reducing visible pollution and environmental degradation	1	5	4.33	0.75
Encouraged planting trees and other measures to improve the environment	1	5	3.93	0.62

Source: Field Survey, 2024

The above table shows that “project incorporates sustainable practice” has received the highest mean of 4.46 this indicates that most of the respondents strongly believe that the project has incorporated sustainable practice for the long term sustainability of the environment. The standard deviation of 0.85 indicates that the responses are somewhat consistent with little variation suggesting that while majority of the respondents agree while some have different views.

“Project has helped to reduce visible pollution and environmental degradation has received the second highest mean of 4.33 and standard deviation of 0.75 this indicates that the majority of the respondents agreed that the project has helped to reduce visible pollution. The lower standard deviation of 0.75 also indicates more consistency in the response.

“Encouraged planting trees and other measures to improve the environment has received the lowest mean score of 3.93 suggests that the respondents generally agreed that the project encouraged tree plantation and other measures, however the low mean of 3.93 compared to other indicator suggests that the respondents did not strongly agree compared to the other two. The standard deviation of 0.62 indicates that responses were more consistent indicating not much disagreement among the respondents.

Overall, the community strongly agrees that the project has strongly incorporated sustainable practices and has helped to reduce the pollution. However the low mean score regarding tree plantation and other measures suggest that more effort should be encouraged for environmental conservation.

4.4.10 Water Conservation Practice

Water conservation practice is important because it helps to ensure the sustainable use of water resources in the community. Proper water conservation practices such as re-use and rainwater harvesting helps to reduce the wastage and ensure water is available for various domestic and agricultural needs. The following table below illustrates the respondent’s perception regarding water conservation practice.

Table 4.32

Water Conservation and Productivity

Items	Min	Max	Mean	Std. Deviation
Improved water access has positively impact productivity	1	5	4.74	0.66
Awareness of water conservation	1	5	4.03	0.96
Water conservation practices	1	5	4.41	1.09

Source: Field Survey, 2024

The following table shows that awareness of water conservation has received a slightly lower mean of 4.03 this indicates that while most community members are aware of conservation practices, some respondents are unaware of water conservation or are practicing water conservation practice without knowing. The higher standard deviation also indicates the variations in the responses that while the community members are aware of the conservation practice some of the members might still be unaware. The data suggests the need of further promoting the importance of conservation for the sustainable use of water resources.

Water conservation practices have received a higher mean of 4.41 which suggests that water conservation practice is mostly practiced in the community. The respondents reported that the practice of rainwater harvesting and re-use of water for various domestic and agricultural uses was practiced. For example the respondents stated the water waste from washing vegetables was used for kitchen gardening. Although, water conservation practice has received a higher mean the high standard deviation of 1.09 indicates variations in the responses this indicates although water conservation is being practiced in the community some of the respondents feel that community members are not aware and feel it is not being practiced in the community.

When it comes to improved water has impacted productivity it has received the highest mean of 4.74 this suggests that people strongly agree that improved water has positively impacted the productivity. The respondents stated that the improved water has significantly contributed to their domestic, agricultural and hygiene needs. The low standard deviation 0.66 also indicates less variation in the responses that the respondents strongly agree improved water has positively impacted productivity.

CHAPTER- FIVE

SUMMARY OF THE FINDINGS, CONCLUSION AND RECOMMENDATIONS

This chapter provides a simple overview of the findings of the impacts brought by the drinking water and sanitation project in Sakhrapur, Municipality. After summarizing the findings this chapter also provides conclusion about how effective these impacts were and whether the residents were positively impacted or not. Finally, this chapter provides some recommendations that can help for the long term sustainability.

5.1 Summary of the Findings

Sankhrapur Municipality has a homogeneous caste/ethnicity point of view. The study area comprises of indigenous groups mainly Tamang, Waiba and Lama and religious practice is Bouddha. To fulfill the increasing demand of water the project was implemented with support of RWSSFDB which is funded by World Bank by mobilizing local NGO called NSSC for providing technical assistance. The fund board provided 97.5 percent of the funding while the community had to provide 2.5 percent of the funds. Before the project's implementation the people of Sankhrapur, Municipality were facing the issue of water shortage, however after the project's implementation the people are now able to live a more conveniently. The project has ensured that the communities are engaged in water management, raised awareness on importance of hygiene, sanitation, water conservation, and environmental sustainability. The project has also ensured the participation of underrepresented group like women are actively involved in all phases of the project which have significantly contributed to culture change towards traditional gender norms as well as change in attitude towards hygiene and sanitation.

Before the implementation of the project, people had to rely on public tap for fetching water for their daily needs which was a very time consuming activity as people had to walk distance and wait in queue for their turns to collect water multiple times a day. But now after the implementation of the project after getting pipeline access at their homes it has saved the time and energy significantly as it has reduced the workload of fetching water multiple times a day. This has also contributed to allocation of time towards more productive activity such as agriculture, kitchen gardening, animal husbandry, education, household chores and so on. Activities like kitchen gardening

has also helped to reduce the dependence on market contributing to save in income of the residents. About 63.8 percent of the respondents reported before the project they had to spend between 15-30 minutes every day for fetching water. Similarly about 17 percent of the respondents reported that they used to spend 30 minutes 1 hour for fetching water, and about 1 percent of the respondents reported they used to spend more than 1 hour meanwhile about 18.1 percent reported they used to spend less than 15 minutes for fetching water. About 67.6 percent of the respondents said that they now save 15-30 minutes after the project. Similarly about 18.1 percent of the respondents said that they now save 30-60 minutes and about 1.9 percent of the respondents said that they save more than 1 hour while about 12.4 percent of the respondents said they save less than 15 minutes. About 88.6 percent of the respondents reported that improved water access enabled new income generation activities while about 11.4 percent said they did not feel any new income generation opportunity, Similarly, about 72.4 percent of the respondents reported that their household income improved significantly after the project and about 15.2 percent of the respondents said they felt that their household income improved slightly while about 12.4 percent of the respondents said there was no change in household income after the project.

Community participation was also a strong component of the project, with about 69.5 percent of the households were involved in various phases of the project while about 30.5 percent of the respondents were either unaware or not involved in different phases of the project. About 95.2 percent of the households were actively engaged in monitoring the different activities while about 57.1 percent of the households contributed their labor and about 25.7 were involved during the planning phase while about 6.7 percent of the households were involved in all phases of the project. Similarly, 100 percent of the respondents said that female were actively involved in all phases of the project highlighting a positive shift in traditional gender roles and community inclusiveness. The positive change in attitude towards health, hygiene and sanitation can also be seen with about 98.1 percent of the responded stated that there was change in attitude towards health, hygiene and sanitation after the project, while 1.9 percent of the respondents stating that they didn't feel any such change. The change in attitude towards health, hygiene and sanitation has resulted in reducing the spread of waterborne diseases with about 40 percent of the respondents expressed

their view that the tendency of spreading of waterborne diseases after the project reduced significantly, similarly about 21 percent expressed their view that it reduced slightly. While about 16.2 percent of the respondents expressed their view that there was no change while 22.9 percent of the respondents said that they were not sure. Similarly, when it comes to expenses related health and water collection about 94.3 percent of the respondents said that their expenses related to health and water collection reduced after the project while about 11.4 percent of the respondents said that it did not reduce. When it comes to water satisfaction about 78.10 percent of the respondents said that they were satisfied with the availability and distribution of water after the project, while about 20 percent of the respondents said that they were moderately satisfied and about 1.9 percent of the respondents stated that they were not satisfied with the availability and distribution of water.

The project has also contributed for bringing positive environmental changes. The project promoted the importance of keeping the environment clean by encouraging activities such as tree plantation and cleaning campaigns. The project has also made people more responsible towards waste management which has helped to reduce visible pollution making the environment cleaner and pleasant. The project have also made people aware of the importance of water conservation practice by encouraging practices such as re-use and rain water harvesting which are now common in the area. The practice of waste segregation can clearly be seen with about 85.7 percent of the respondents responding that they separate their waste as degradable and non-degradable while about 14.3 percent respondents said that they do not separate their waste, similarly the most common waste disposal method seen is burning the waste with 54.3 percent respondents stating that they burn their waste, at the same time about 44.8 percent of the respondents stated that they threw their waste in less crowded area while only about 1 percent of the respondents said that they composed their waste.

The financial and operational sustainability appears promising; about 87.6 respondents stated that the funds for operating and managing the water system were mainly done through committee planning by organizing community meetings. Similarly, about 6.7 percent of the respondents said that they use to pay user fee and about 2.9 percent of the respondents said that local government used to provide funds for operation while 2.9 percent of the respondents said that they had no idea.

Similarly, for the repair and maintenance of the water infrastructure about 94.3 percent of the respondents said that water user committee was mainly responsible for the repair and maintenance. Similarly, 4.8 percent of the respondents said that the local government was responsible for the repair and maintenance while about 1 percent of the respondents said that they had no idea.

The inclusive community decision making process and financial contribution by community highlights a positive for sustainability of the project, however technical issues, natural disaster like landslides and pricing mechanism remains the major challenges for the long term sustainability of the project.

5.2 Conclusions

This study has explored the changing patterns of Sankhrapur, Municipality people and the socio-economic impacts after the project's implementation. People in the area have positively impacted due to the availability of water. The people were able to save time due to the supply of drinking which has enabled them to engage in more productive activities such as kitchen gardening and income-generating activities and at the same time reduce their expenses related to health and water collection which has significantly resulted in improving household income.

The community have not only benefitted economically but socially as well after the implementation of the project. The main change is the people's participation. The community members are now active and involved in various communities meeting related to the water system. Women have also significantly benefited as it has helped to promote gender equality as women also take active part in decision making process and at the same time it has helped to change the traditional gender norms in the community helping to reduce the workload of household chores only enabling them to engage in productive activities. The change in attitude towards sanitation, hygiene and improvement in water quality has significantly helped to reduce the spread of waterborne disease in the area.

The project has brought positive environmental benefits. It has helped to reduce visible pollution helping to make the environmental much cleaner and convenient for the people to live in. It has also helped to promote and make people aware of the importance of waste segregation. The encouragement of plantation of trees has also

helped to keep the environment much cleaner. Overall, the project has positively impacted the people economically, socially and environmental.

5.3 Recommendations

This study answers the problems related to drinking water, health and environment as the study has explored the change in patterns after the intervention of the project. Therefore, I would like to make the following suggestions.

- i. WSUC and local government should collaborate and organize training program to improve the skills of community members for operating and maintaining the water supply system
- ii. Water quality testing should be done twice a year to ensure water is of quality to reduce waterborne diseases.
- iii. Water tariff system should be encouraged and should be based on affordability of all community members. The quantity pricing should be done through community meeting
- iv. In addition to the tariff system regular monthly collection system should be implemented for ensuring consistent funding for maintenance and sustainability.
- v. Since animal husbandry is now widely practiced in the area training programs should be organized for producing bio gas. Bio gas will help with waste management practice and at the same time it will provide an alternate source of fuel for the households.
- vi. Zero waste system should be promoted for management of non-degradable waste.
- vii. Tree plantation should be further promoted as it helps to reduce the risk of land slide and at the same time improve water sources during summer season which are the major challenges of the area.
- viii. Various community campaigns should be organized as it will help to develop unity in the community and at the same time will help to promote sanitation and hygiene.

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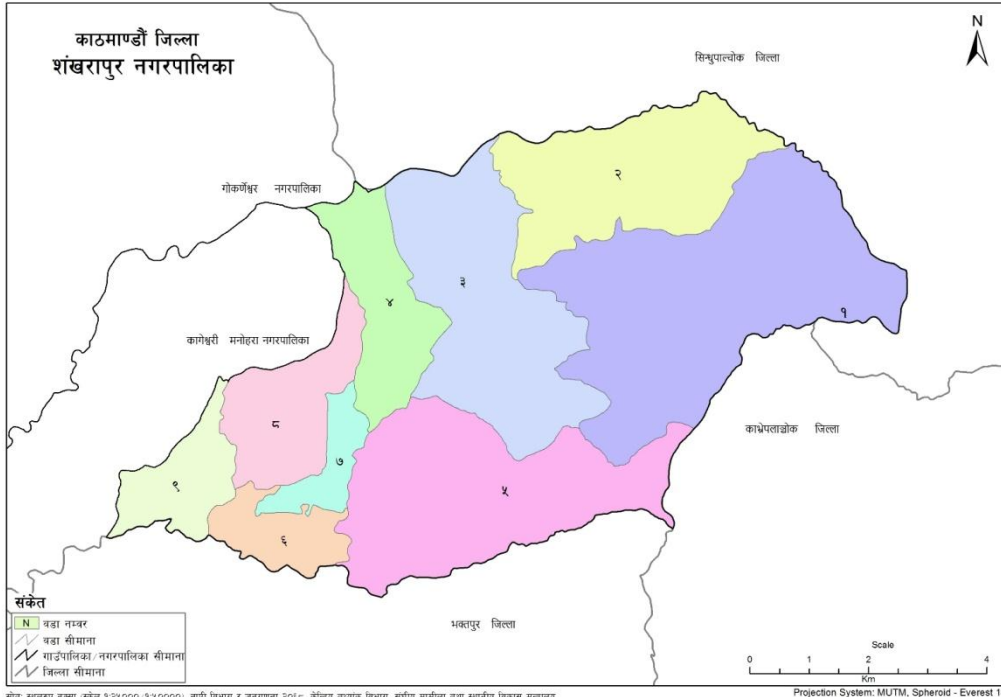
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ANNEX-1

MAP OF SANKHRAPUR, MUNICIPALITY



स्रोत: भक्तपुर नक्सा स्केल १:२५०००-१:२००००, सावी विमान र जनगणना २०६८, केन्द्रिय ताल्याङ्क विभाग, मन्दीप मार्गिता तथा स्थानीय विकास मन्त्रालय
तयार पार्ने: ई. प्राविण चौदरी, सचिव भासा, डिस्ट्रिक्ट, काठमाडौं

ANNEX-2:

HOUSEHOLD SURVEY QUESTIONNAIRE

Impact Assessment of Drinking Water Supply and Sanitation Project in Sankhrapur Municipality-2, Kathmandu, Nepal

Section A: Household Characteristics

1. Name:
2. Age:
3. Sex of the respondent: Male Female Others
4. Marital Status: Single Married Divorced Widowed Single Woman
 Single Man
5. Caste/ethnicity: Brahmin Chhettri Indigenous Dalit Other
6. Religion: Hindu Bouddha Christian Muslim Others, then please specify.....
7. Your formal educational status: Primary Secondary Higher Graduate
 Illiterate
8. Your subject specification in higher education: Management Education
Arts and Humanities Sciences and Technology Health Engineering
Agriculture Forestry
9. Animal Science/Veterinary IT Others
10. Any training you have completed: Hygiene & sanitation Safe water
purification Hand washing Waste management & composing Leadership
 Others, please specify.....
11. Family system: Joint family Nuclear family
12. Total numbers of female members..... and total numbers of male
members.....
13. Number of school-going children: Government school Private
school.....
14. Number of college-going children: Government college/university
Private college.....
15. Family occupations: Agriculture Enterprises Business Govt. job
Private job Remittance Labor wages
16. Food Sufficiency: <3 months 3-6 months 9-12 Months >12 Months

17. Land Holdings status:

Items	Present (In Ropani)	Land Measurement
Farmland		1 Bigha = 20 Kathha,
Pastureland		1 Kathha = 20 Dhur
Non cultivated land		1 Ropani = 16 Aana
Rented Land		1 Aana = 4 Paisa
Leasehold Land		1 Paisa = 4 Daam
Total		

Income	Amount in NRs	Expenditure	Amount in NRs
Agriculture		Daily consumption	
Local Shop		Cloths	
Government Job		Accessories/Gold	
Private Job		Child Education	
Daily Wages		Festival celebration	
Remittance		Medicine	
Others		Others	
Total		Total	

18. Annual Income and expenditure of your family.

Section B: Socio-Cultural Impacts

S. N.	Questions	Response	Remarks
1.	Were you and your family involved in decision-making during the project?	1. Yes 2. No	
2.	If yes, in what capacity?	1. Planning 2. Implementation 3. Monitoring 4. All of the above 5. Others, specify _____	
3.	Were marginalized group (e.g., dalit, women) adequately represented in the project and project related committees?	1. Yes 2. No	
4.	Are the female more active and involved in decision making after the project?	1. Yes 2. No	
5.	Are you satisfied with the availability and distribution of the water?	1. Satisfied 2. Moderately satisfied 3. Not satisfied	

6.	Have you seen change in attitude towards gender roles (e.g., household chores, fetching water) after the project?	1. Yes 2. No	
7.	Did the project help to address cultural and religious challenge? (e.g., going to spiritual healer when children are sick etc.)	1. Yes 2. No	
8.	Have attitude toward sanitation and hygiene improved in your community after the project?	1. Yes 2. No	

Section C: Economic Impacts/Health Impacts

S. N.	Questions	Response	Remarks
1.	How much time did you spent before fetching water daily?	1. Less than 15 minutes 2. 15-30 minutes 3. 30-60 minutes 4. More than 1 hours	
2.	How much time do you save daily after accessing water through tap system?	1. Less than 15 minutes 2. 15-30 minutes 3. 30-60 minutes 4. More than 1 hours	
3.	What do you utilize saved time for?	1. House hold chores 2. Income generation activities 3. Education 4. Others	
4.	Have your household income improved after the project?	1. Increased significantly 2. Increased slightly 3. No change 4. Decreased	
5.	Did improved access to water enable new income-generating activities such as farming, entraprunarship?	1. Yes 2. No 3. If yes, specify_____	
6.	Have your household expenses related to health and water collection reduced	1. Yes 2. No	

	after the project?		
7.	Have you noticed reduction in water borne diseases in your household (e.g., diarrhoea, typhoid) after the project?	1. Yes 2. No 3. Not sure	
8.	How frequently do household members suffer from water borne diseases now compared to before the project?	1. Significantly less 2. Slightly less 3. No change 4. More than before	
9.	Does your household consistently practice hand washing with soap?	1. Yes always 2. Often 3. Sometimes 4. Never	
10.	Does your household cover stored food to prevent contamination?	1. Yes 2. No	
11.	Does your household use water filter or other methods to purify drinking water?	1. Yes 2. no	

Section D: Environmental Impact and Sustainability:

S. N.	Questions	Response	Remarks
1.	Does your household separate waste (degradable, non-degradable)	1. Yes 2. No	
2.	How does your house dispose waste?	1. Throw it outside 2. Burn it 3. Compose it 4. Wait for waste collector 5. Others specify _____	
3.	Is there visible improvement in waste management in your community after the project?	1. Yes 2. No	
4.	Does your community organize collective cleaning campaigns?	1. Weekly 2. Monthly 3. Never	
5.	How are funds raised to operate and manage the tap water system?	1. User fees 2. Community donation	

		3. Others, specify _____	
6.	From where are funds for repair and maintenance paid?	1. Household contribution 2. Water user committee 3. Local governance 4. Others, specify _____	
7.	Is there a system for maintaining the water infrastructure? (Committees, VMW, WSUC etc.)	1. Yes 2. No 3. If yes, specify _____	
8.	How confident are you in the long term sustainability of the project?	1. Very confident 2. Somewhat confident 3. Not confident at all	

Section E: Measuring Scales

Measurement Scales: 1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree

S. N.	Items	Response				
		1	2	3	4	5
1	The project has created new local employment opportunities in the community.					
2	My household is now able to allocate more financial resources to education and other priorities after the project.					
3	Improved water access has positively impacted the productivity of my household.					
4	The economic benefits of the project are worth the investment and effort required to sustain it.					
5	The cost of maintaining access to water is affordable for my household.					
6	Community has developed a strong sense of ownership over the water system.					
7	Project has promoted to adoption of modern hygiene practices without disrupting cultural norms.					
8	There is now active gathering and discussion for promoting					

	hygiene and sanitation.					
9	Training and awareness programs provided by the project have positively improved sanitation habits.					
10	Social inequality related to water access has reduced in the community.					
11	My community feels proud and empowered due to success of water and sanitation project.					
12	My community organizes regular cleaning campaign to maintain environment.					
13	Awareness of water conservation has increased due to the project.					
14	Funds for operation and maintenance are effectively collected and managed.					
15	Water conservation practices (e.g., reuse) are now common in my household.					
16	The project incorporates sustainable practice to ensure long term environment benefits.					
17	The project has helped to reduce visible pollution and environmental degradation in the community.					
18	Because of the project we feel encouraged to plant trees and other measures to improve the environment					

Section F: Open ended question

1. How has your household benefitted the most from the project?

2. What are the main challenges for the long term sustainability of the drinking water system?

3. What is your recommendation for long term sustainability of the project?

ANNEX-3

QUESTIONNAIRE FOCUS GROUP DISCUSSION (FGD)

Dear [Respondents].

Thank you for taking the time to participate in the interview. This study aims to assess the impacts of drinking water and sanitation project with a focus on health, sustainability, participation, and community engagement. Your insights will contribute to understanding the effectiveness and challenges of the project.

Guideline for Discussion

- 1.1 Information on people's participation and how they contributed during the project.
- 1.2 Change in attitude towards gender role and women empowerment.
- 1.3 Behavioral change towards health practice; reduce in waterborne diseases and attitude towards hygiene and sanitation.
- 1.4 How people mainly benefitted after the project
- 1.5 New income generation opportunity and improvement in household income and productivity.
- 1.6 Waste segregation practice and waste disposal method.
- 1.7 Water conservation and conservation practices.
- 1.8 System related to the operation and how funds are raised.
- 1.9 System for repair and maintenance.
- 1.10 Area for improvement and suggestions.

Thank You for you Participation

ANNEX-4

GUIDELINES FOR KEY INFORMATION INTERVIEW

1. Information of Key Informant

KII Respondent's Name:.....Date:2081/.../.....

Designation.....Contact No.....

2. Questions

2.1 How were the people involved and contributed during the project?

2.2 Have attitude towards traditional gender norms changed after the project and are women more active in decision making process after the project?

2.3 Has there been reduction in waterborne diseases after the project and has there been change in attitude towards hygiene and sanitation habits after the project?

2.4 Do people visit health post when they are sick or do people still go the shaman's?

2.5 Have people benefitted from improved access to water services and did it help to improve household's income?

2.6 Have people started the practice of waste segregation after the project and how is the waste disposed?

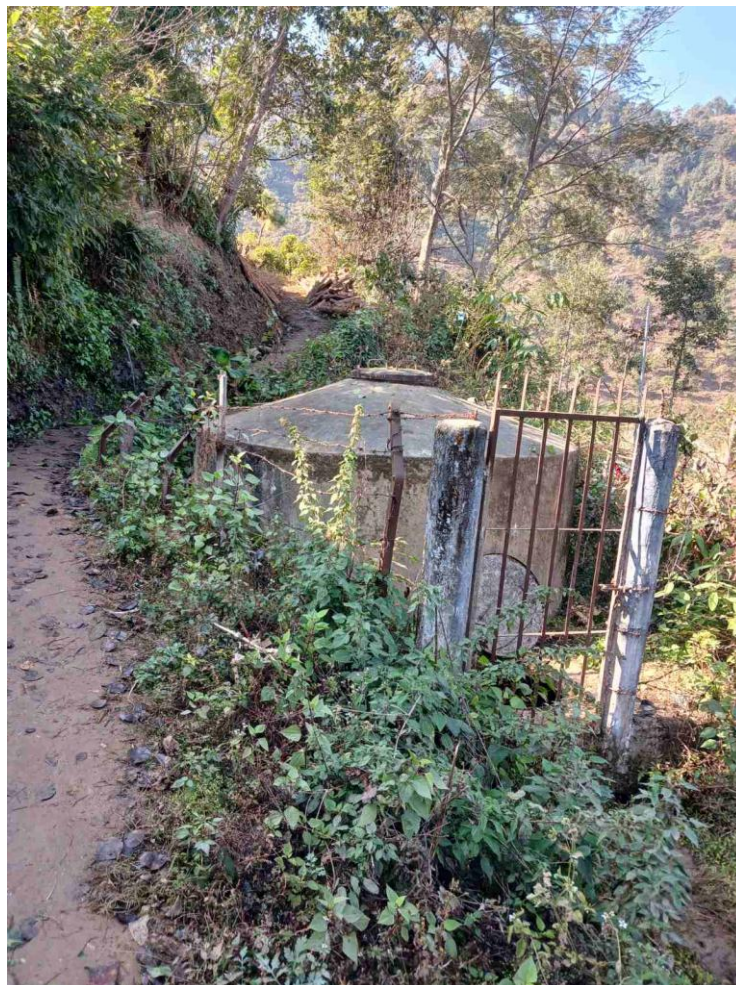
2.7 How are funds raised for operation and management and who is responsible for paying for the repair and maintenance of water infrastructure?

Thank you for your cooperation.

ANNEX-5
PHOTO GALLERY



Picture: Arrival at the Village



Picture: Construction of water tank by the project



Picture: KII with Ward Chairperson



Picture: Team leader of the Project



Picture: Household Survey



Picture: Focus Group Discussion



Picture: Animal Husbandry