A Business Development Plan for the Kalitar Water Supply System

Prepared by Centre for Integrated Urban Development (CIUD)

under the
Kalitar Sustainable WASH Project
Ward Number 6, Godawari Municipality

2023

Foreword

The Business Development Plan (BDP) of the Kalitar Water Supply System (KWSS) has been prepared as a part of the Kalitar Sustainable WASH project which is being implemented jointly by Centre for Integrated Urban Development (CIUD, WaterAid Nepal and Godawari Municipality under the funding support from The Coca-Cola Foundation.

With the direct participation and consultations with the water users' committees of Kalitar and Gairigaon, this plan has been developed incorporating the various dynamics of the system such as household number, calculation of the average monthly income of the users, wilingness to pay and most importantly the estimated annual incomes and expenditures including operation and maintenance cost.

We believe that the plan will be a guding document for the water users committee of the Kalitar Water Supply System in ensurng that the system is financially sustainable and that the committee will have a solicitated document in making amendmends in the plan such as recviewing and restructuring the water tariff rate

The Project Team
Kalitar Sustainable WASH Project

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Chapter: 1 Introduction

1.1 Background

It has been so difficult to establish the importance of water in human civilization. Without water there is no life on the earth. Similarly, if there is proper and safe provision of water then, there will be the great welfare on the dveleopoment projects for the humans. However, water is the basic need for life, it is use for multi purpose like, drinking, cooking, washing etc. and further purpose like commercial (Agriculture, Animal husbandry), industrial purpose (Chemical products, Food and Paper products) and for sanitization purpose. Inorder to protect and improve the health of public as well as the society, pure and safe drinking water plays a significant role. According to the sustainable development goal 6, the Nepalese government has targeted to provide safely managed drinking water to all by 2030.

An incredible progress has been done by Nepal, after the implementation of scheme plan of the Water and Sanitization Users Committee in 2011. 88% of total population has been successfully provided the proper fundamental of drinking water supply system. I

Local government is a responsible organization for the provision of water supply system in a community. However, most of the facilities are centered into the urban areas comparing to the rural areas. Drinking water and sanitization users committee organized a committee inorder to meet the demands of drinking water and water supply system in rural community. A question mark has been arised for the continuity and sustainable plan and development of the users committee. According to the National Information Management and Department of Water Supply and Sewerage Management, 2011, 18% drinking water projects are currently working and 36% needed to be remaintainence. Similarly, 1.8% drinking water supply system are totally damaged due to the lack of proper supervision and maintainenece and weak rules and regulations. Drinking water projects may be self-sustained through the strong implementation of development plan.

Kalitar and Gairigau Drinking Water and Sanitation Users Committee is reformed in 2079 B.S. It lies in southern part of Lalitpur, Godawari municipality-6, approximately 19km from Kathmandu. This committee has aimed to provide the drinking water services to 148 households and 3 organizations.

Differrent drinking water and sanitation users committee has been established in Lalitpur district. These users committee are economically small scaled and are less effective in providing the services to the households and paying the less tarrif for drinking water services. Kalitar drinking water and sanitation users committee is one of the small scaled water and sanitation users' committes (WUCs). This system is providing the drinking water to its community through two reservoir tanks of the capacity of 12 cubic meters and 10 cubic meters.

Through the financial support of Wateraid Nepal, technical support of CIUD and from the investment of Godawari municipality and community, the Kalitar drinking water project has

been designed by CIUD. This project has aimed to provide 85-liter water per person per day, until 20 years for the community.

Beside all large scaled drinking water projects, this project has involved some particular members for the operation and proper maintainence of drinking water. The key aim of Kalitar drinking water and sanitation users committee is to provide the qualitative services of drinking water and create a mutual relationship among the customers and their concerns to establish a Kalitar business development plan.

While developing this drinking water project to business development plan in December 2023, the household survey in the community shows that as they have been facilitated through drinking water services but they want to pay their tarrif through the meter system.

1.2 Objectives:

The key objective of the business plan system is to provide enough drinking water to the community in a sustainable manner.

Some of the specific objectives are:

- Potential assessment for tarrif fixation in driniking water system
- Development of different strategies in drinking water system

Chapter 2: Kalitar Sustainable WASH Project

2.1 Background

Drinking water and sanitation users committee is one of the chief and responsible unit in providing the drinking water services to the community. Similarly, this community formed the drinking water and sanitation users committee which represent the community. Also, key aim of this system is to become aware to tackle the different changes and provide long-term and sustainable development in drinking water

2.2 Total population and Significance of the Settlement

Most of the households of this drinking water project is highly dominated by male population are involved in agricultural practice. Similarly, the community is mostly occupied by Tamang and Chhetri and they are engaged in several professions like business, foreign labours, carpenters, contractors and labors.

Table: 1. Total population and Household

Details	*Household Survey*
Household	148
Population	638
Economic Condition	
Average Monthly Income of Family	24718.48

2.3 Situation Analysis

Centre for Integrated Urban Development (CIUD) has been implementing the Kalitar Sustainable WASH project in Godawari municipality – 6. Under this project, two drinking water supply systems, one in Kalitar and onw in Gairigaun, are being initiated with the direct involvement of the water users committees of both the systems. Before the project, the 148 households have been drinking water from unsafe water without paying any water tariff. The systems will feed the 148 households and 3 community-based institutions with safe and adequate drinking water through safely managed supply system

Chapter 3: Ownership and Management Plan

The effectiveness in water supply management system may create the issues in public health. The main aim of management plan is to assure the proper skill for the linear conduction of water supply system. Some of the management plans are mentioned below:

- Navigation of ownership and legal document in drinking water supply system
- Framework of drinking water managemet plan system
- Description of direction and proper maintainence

3.1 Ownership

The overall community selected the Kalitar drinking water and sanitation users committee and collected water from 2 local resources for the distribution of water in Jamsidel for Kalitar and Bankuti and Ghattedol for Gairigaun. This committee has practiced on improving the sanitation among the experimenter for the amplication for the improvement. This committee is practicing for amplification of improving the drinking water and sanitation among the experimenter. This committee of Kalitar has confined with 11 (6 male and 5 female) and 7 members Gairigaon (5 male and 2 female) *(Namelist attached in Annex-1).* Similarly, 1 village maintainence worker will operate the regulation of drinking water system (Namelist attached in Annex-2). This committee was formed in Falgun 16, 2079 BS. It has conducted a team of 5 members for ensuring the regularity and safety of drinking water system (Namelist attached in Annex-3). Also, this committee has formed its own law.

3.2 Management Plan

The Kalitar Water Users Committee is a team of eleven members including chairpseron, vice chairperson, secretary, treasurer and general members. The system also has a five-member water safety plan (WSP) and a village maintenance worker (aka care taker). Similarly, The Gairigaon Water Users Committee is a team of seven members including chairpseron, vice chairperson, secretary, treasurer and general members. The system also has a five-member water safety plan and a village maintenance worker (aka care taker). The committees will keep the record of both maintenance plan and the daily accounts. The WSP ensures the quality of drinking water through continous monitoring water quality.

The WUCs and WSPs of the Kalitar and Gairigaon Water Supply Systems will jointly operate both the systems. The committee members have a very good practical experience. Besides, they have acquired basic knowledge and technical know-how about the water supply systems. The committees will have to open an account in one of the financial companies and deposit all the collected money and should have a provision two persons among the three key members of the chairoperson, secretary and the treasurer as the signatories of the account. The chart mentioned above depicts how the WUC functions

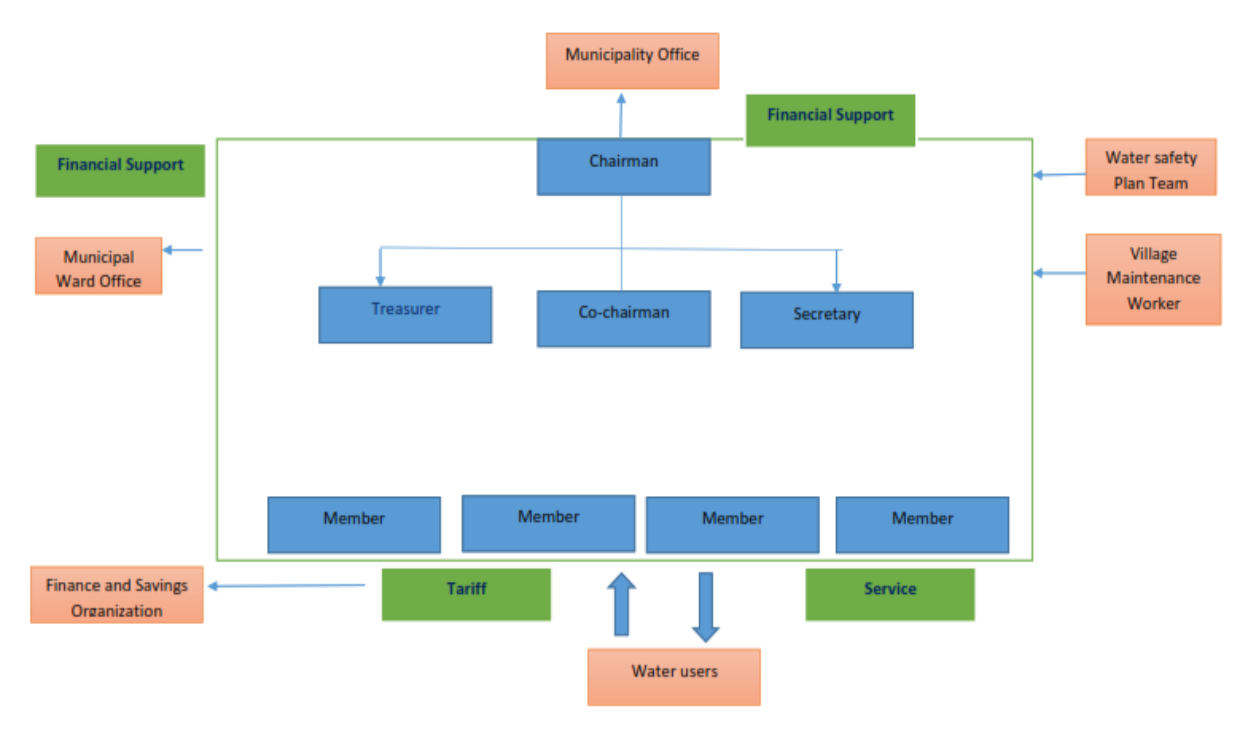


Fig 3 WUC and Operation Structure

3.2.1 The roles and responsibilities of the WUC

The key role of the WUC is to manage, operate and maintain the water supply system and to ensure its quality and quantity.

The following are some of the definite roles and responsibility of the WUC

- ✓ Raise awareness on the improved hygiene behaviours and mobilize commuities
- ✓ Maintain the standard of the drinking water as per Drinking Water Quality Standard 2006
- ✓ Formation of WSP team and implement WSP in the system
- ✓ Keep the record and document of the users including maintaining the list
- ✓ Collect water tariff
- ✓ Conduct regular monitoring of the system in coordination of the WSP team
- ✓ Manage budget and other resources for the maintenance works and procuring parts and services
- ✓ Conduct regular water quality tests
- ✓ Inform and convince the users about the rationale behind the water tariff collection
- ✓ Explore more resources for the system and approach key stakeholders (ward and municipal office)

3.2.2 The key responsilities of the Treasure

- ✓ Prepare a financial plan based on the income and expenses
- ✓ Keep the daily account
- ✓ Keep the record of the monthly incomes
- ✓ Keep the records and the voucher of the outgoing expenses
- ✓ Collect the monthly water fee
- ✓ Control the finance in support of the chairperson

- ✓ Keep the record of the monthly income and expeses
- ✓ Remain as one of the signatories of the bank account

3.2.3 The key responsilities of the Secretary

- ✓ Prepare and circulate the notice for the meetings
- ✓ Prepare a minutes of all the meetings
- ✓ Read out the minute of the previous meetings
- ✓ Keep the records of the payments, minutes and document all the activities such as visits, maintenance and the list of all the users
- ✓ Collect the monthly fee from the community
- ✓ Collaborate with the chairperson to plan as per the community's will
- ✓ Support the treasurer in keeping perfect accounting

3.2.4 The key responsilities of Water Safety Plan (SWP) Team

The key responsilities of WSP Team is to implement all the WSP related activities in the syetemaric order. Besides this, the team collaborates and coordinates with the WUC in any actifvity that is concerned with water quality and support in resources exploration and management.

In order to succeed the WSP, the team has to implement the following tasks

- ✓ Keep the information of the entire system. Prepare social map, system map and flow charts
- ✓ Keep the track of all the possible contamination points, from the source to mouth of the system, analyse the risks and set prevative measures and make all the periodic monitoring
- ✓ If the control measures are not effetive, then the WSP team should collaborate with the WUC in the system improvement works
- ✓ Conduct frequent water quality tests to enusre that the water is safe before supplying to the users
- ✓ Keep the records of monitorings and all the activities and validate them
- ✓ Organize community awareness related activities and promote the complaint mechanism to access the satisfactory level of the consumers and health impact
- ✓ Prepare annual report of all WSP related activities and disseminate the report to all the stakeholders
- ✓ Divide tasks among all the members. Conduct six-monthly monitoring of the entire system, from the source to the household taps
- ✓ Conduct a review of the WSP after the completion of 7/3 steps of the WSP and make necessary amendments of the water safety plan
- ✓ If there is a significant deteoriration of the water quality especially at the time of emergency, make emergency plan to ensure the quality of water.

3.3 Operation and Maintenance Plan

The objective of the operation and maintenance plan is to prepare and present the estimated cost for the maitenances and to ensure the smooth operation of the system and optimize its services.

3.3.1 Facility

The Kalitar WUC will establish the office in a place which is accessible to all. The monthy rent of the office will be NPR 1000.

3.3.2 Staffing

The Kalitar WUC will make a precise work division among its staff. The WUC will appoint one village maintenance worker (VMW) and his/ her duties will be as follows

- ✓ Regular monitoring of the system, from the source to household taps
- ✓ Regular clean ups of the entire water supply system
- ✓ Implement maintenance and preventive measures
- ✓ Collaborate with the technical team and the WSP team
- ✓ Conduct regular maintenance works
- ✓ Carryout protection works such as tree plantations in the areas which are prone to landslides and soil failure
- ✓ Conserve watershed areas and prevent the source from contamination
- ✓ Motivate the users to ensure that the water containers and clean and water is safely stored
- ✓ Regular monitoring of water yielding at the source
- ✓ Take necessary support from the WUC
- ✓ Manage all the necessary equipment for the maitenance works and safely store them
- ✓ Provide information regarding the distribution scheme to the WUC

3.3.2.1 Work Schedule for the VMW

Table 2 Work Schedule for the VMW

1. Daily	2. Weekly
✓ Run the chlorination unit with regular dosing of the bleaching powder ✓ Regular clean ups of the pump ✓ Washout the dirty water ✓ Compile the complaints and remarks of the water users	✓ Apply lubricants in the machinery parts ✓ Tighten the bolts and other parts ✓ Regular inspect of the parts and equipment
3. Monthly	4. Yearly
✓ Inspect the water supply ✓ Regalur inspection of the entire water supply system	✓ Thorough inspection of the entire water supply system and make maintenance plan ✓ Keep the record of the daily, weekly, monthly and yearly maintenance works

3.3.3 Tools and Equipment

The project will provide a tool box containing tools and equipment (see the list at annex 4). They will be solely used for the repair and maintenance. Besides, there should be provision for the extra tools and equipment and their storaage at the time of emergency

3.3.4 Supply Chain Management

There should be spare parts and equipment for the sustainable operation of the water supplt system. For this, there should be easy market access, availability, reasonable price and spare parts. Besides, the parts and equipment should be procured from the nearesr market or any near city or town.

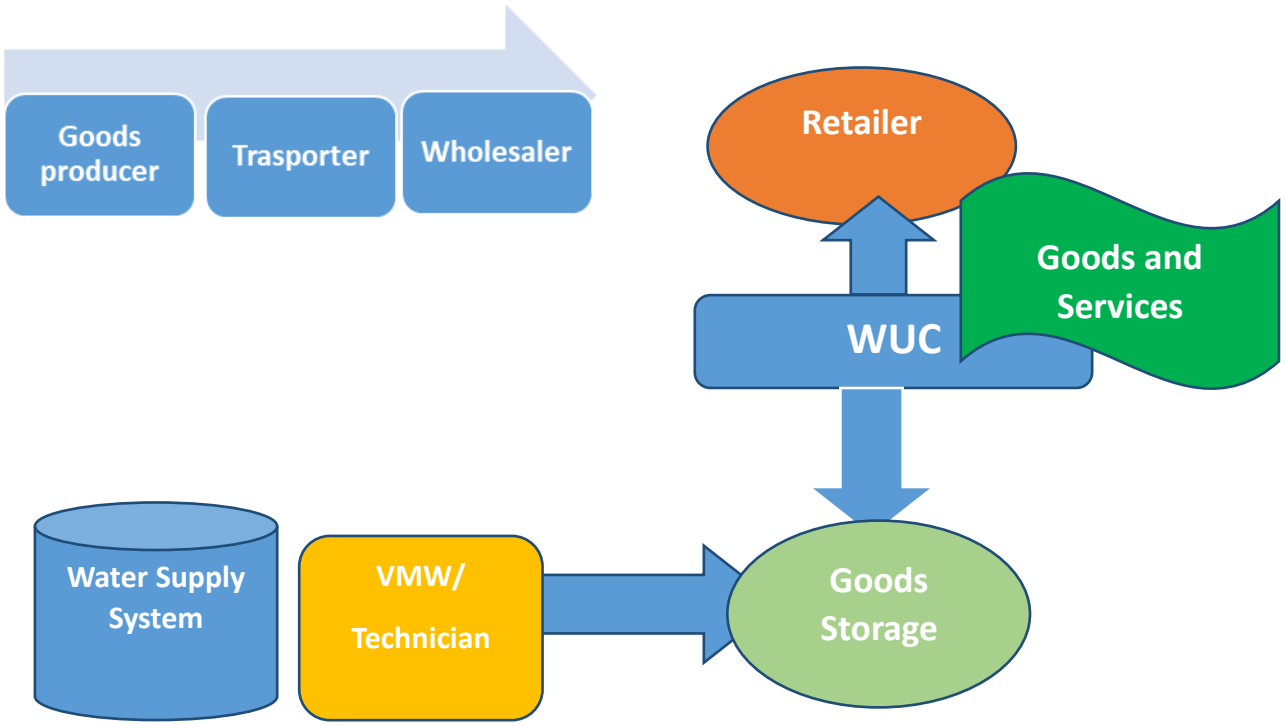


Fig 4. Supply chain of the goods and services of the water supply system

Chapter 4: Unmanaged Infrastructures and Proposed Improvement Plan

The Kalitar WUC will provide safe drinking water to 148 households and three public entities from the protected and managed water source. Based on the water demand, this committee will distribute water from three reservoir tanks of the capacity of 20,000 litres, 12,000 liters and 10,000 litres for the communities of Kalitar and from two reservoir tanks of the capacity of 20,000 litres and 12,000 liters for the communities of Gairigaon. For this, water will be managed from three natural sources.

In the meantime, the Kalitar WUC does not have sufficient spare parts. However, the committee will prepare an inventory of essential spare parts (see the list on the annex 5).

Meanwhile, the committee is supplying water from the same sources through the improperly constructed reservoir tanks and the haphazard pipe network. People are not paying any money against the water that they are using. For the minor repairs, the community is managing themselves.

4.1 The KWSS Proposed Water Supply Improvement Plan

The KWUC, through this system, has the plan to distribute water to 148 households and 3 public entities including a temple and also has a plan to gradually improve the system and its services such as improving the pipe line system. Through this project, the WUC will distribute water from three reservoir tanks of the capacity of 20,000 litres, 12,000 liters and 10,000 litres for the communities of Kalitar and from two reservoir tanks of the capacity of 20,000 litres and 12,000 liters for the communities of Gairigaon. The project will be completed by Dec 2023.

Chapter 5: Financial Planning

Financial planning is an important part of a business. The key objective of the financial planning is to ensure that the WUC is capable to run the water system for the minimum of five years. The plan helps to figure out the primary expenses and incomes.

If the WUC makes expenses for the system, he or she holds the right to make request for the payment. However, it is essential that the process should go through the treasurer with the essential documents. For the release of the check payment, it is essential to have a meeting first. There should be a provision of two people, the chairperson and secretary or the chairperson, as a mandatory as the signatories. Besides, the copies of the check and other documents such as minute should be properly filed.

During the construction of the water supply system and the distribution, there should be a proper planning of mobiliztion of financial and human resources in order to revive the resources. There should be a system of reporting and financial management. The system should be run and utilization of the resources based on the evaluation. Therefore, there should be a proper mechanism of reporting and accounting system.

The WUC is responsible for the social auting and accounting and proper reporting mechanism. Generally, the WUCs adopt simple procedures. The accounting system should be effective enough to track the financial status, be it a simple or complex mechanism.

5.1 Minimum Accounting System

In the Minimum Accounting System, there should be a simple receipt and payment records. This is kept as a cash book in which all the financial transaction is recorded. This also helps to keep the track of the. The book has all the details such as working capital, petty cash and other details such as

- Payment to the vendors
- Payrolls
- Receipts from the consumers

While the reports are documented at the same place, the payments and receipts should be registeted separately and should incorporate the following

- Date of dealings
- Details of income and expenditures
- Amount of income and expenditures

5.2 The Full Accounting System

Generally, the minimum accounting system is related with the cash. Most of the WUCs have adopted this system as this is suitable for the low capital and lower financial transaction. In large projects, materails and servovce are aquired from many different sources and there it requires diffrent payment modes. Therefore, for such projects, the full accounting system is required. This type of system provides a detailed information on investments and helps in preparing financial details and are ussed also for the legal procedures

Meanwhile, the Kalitar Water Users Committee (KWUC) has not used any financial system. However, the KWUC may start with the minimum accounting system.

The minimum financial planning is generally prepared from the beginning to 20 years. However, the WUC will be able to make actual financial planning after the system starts to provdie its services to the users (or consumers). The best period, however, to make plan is five to 20 years after the system begins its operation. Therefore, the financial plan as mentioned below may have some changes in its operation and performance as it is prepared based on the primary assumptions.

5.3 Expected Annual Income

In order to operate the system and to ensure enough budgets for the maintenance, the KWUC may collect tariff from households, schools and other organization. It has been presumed that the income collected from providing services is sufficient to cover all the annual expenses. According to the initial financial plan, the annual income for the system is NPR 295,740.

Table 3. Tentative Annual Operation Cost

Type of Consumer	Rate	Number of Users	Collection Rate	Annual Income
Permanent Users	200	151	100%	362,400
Small Sized Interprise*				
Large Sized Interprise*				
Schools*				
Organizations/ Institutions				
				362,400

Note: * the KWUC will determine the tariff rate

5.4. Assumed Annual Operation Cost

The WUC has prepared a calculation for the operation and maintenance cost for the system operation. The table 2 clearly picturizes the annual operation and maitenance cost which has been determined by the KWUC after holding the rigorous meetings.

Expenditures Details	Month	Rate	Total	Annual Expenses	Remarks
Maintenance cost	1	1500	1500	1500X12=18,000	
Salary for the maintenance worker	1	10000	10000	11000X13=130,000	Festival allowance
Meter Reader	1	5000	5000	5000X13=65,000	
Office Rent	1	1000	1000	1000X12=12,000	All are considered the Management Cost
Management Cost					
Transportation				5000	

Auditing and AGM				15000	
Transportation Legal (audit)				5000	
Water Quality Test			15000	15000	
WUC meeting Cost	1	500	500	500X12=6000	
Total (NPR)				**206,000**	

Table 4. Annual Expected Expenses

5.5 Net Income

The KWUC's annual income, mostly through water tariff collection, is NPR 362400 and the system operatiom cost is NPR 271,000. Therefore, the net income for the system is NPR 91,400.

Income	**Amount**
Permanent Users	362400
Small Sized Interprise*	
Large Sized Interprise*	
Schools*	
Organizations/ Institutions	
	362400
Expenses	
Maintenance Cost	18000
Salary for the maintenance worker and meter reader	195000
Management Cost	58,000
	271000
Net Profit (income-Expenses)	91400

Table 5. Net Income

5.6 Income, Expenditures, Cash Flow and the Balance Sheet

The following table depicts the operation cost, maintenance cost and the emergency cost for 20 years of operating the system

SN	Income, Expenditures, Cash Flow and the Balance Sheet	First year	Second year	Third year	fourth year	Fifth year	Sixth year	Seventh year	Eighth year	Ninth Year	Tenth Year
A	**Annual Income**										
1	Water Tariff Collection	362400	387768	414911	443955	475032	508284	543864	581935	622670	666257
B	**Annual Operation Cost**										
1	Annual Maintenance Cost	18,000.00	19,260.00	20,608.20	22,050.77	23,594.33	25,245.93	27,013.15	28,904.07	30,927.35	33,092.27
2	Annual salary for the maintenance worker and meter reader	195,000.00	208650	223255	238883	255605	273497	292642	313127	335046	358499
3	Annual Management Cost	58,000.00	62,060.00	66,404.20	71,052.49	76,026.17	81,348.00	87,042.36	93,135.33	99,654.80	106,630.63
	Total Cost	271000	289970	310267	331986	355585.5	380090.93	406697.50	435166.40	456628.15	498221.90
C	**Contingency Cost (5% of B)**	13550	14498	15513	16599.31	17779.27	19004.54	20334.87	21758.32	23281.40	24911.09
	Total Cost (B + C)	284550	304468	325780	348585.31	373364.77	399095.47	427032.37	426924.72	488909.55	523132.99
D	**Balamce (A-B-C)**	77850	83300	89131	95369.68	101667.23	109188.53	116831.63	16,378.97	17,525.50	18,752.28

SN	Income, Expenditures, Cash Flow and the Balance Sheet	Eleventh year	Twelvth year	Thirteenth year	fourteenth year	Fifteenth year	Sixteenth year	Seventeenth year	Eighthteenth year	Ninteenth Year	Twenthiet Year
A	**Annual Income**										
1	Water Tariff Collection	712894	762797.64	816193.47	873327.01	934460	999872	1069863	1144753	1224886	1310628
B	**Annual Operation Cost**										
1	Annual Maintenance Cost	35,408.72	37,887.34	40,539.45	43,377.21	46,413.61	49,662.57	53,138.95	56,858.67	60,838.78	65,097.50
2	Annual salary for the maintenance worker and meter reader	383594	410445	439176	469919	502813	538010	575671	615968	659086	705222
3	Annual Management Cost	114,094.78	122,081.41	130,627.11	139,771.01	149,554.98	160,023.83	171,225.50	183,211.28	196,036.07	209,758.60
	Total Cost	533097.5	570413.75	610342.56	653067.22	698781.59	747696.40	800035.45	856038.35	915960.85	980078.10
C	**Contingency Cost (5% of B)**	26654.87	28520.68	30517.12	32653.36	34939.07	37384.82	40001.77	42801.92	45798.04	49003.90
	Total Cost (B + C)	559752.37	598984.43	640859.68	685720.58	733720.66	785081.22	840037.22	898840.26	961758.89	1029082
D	**Balance (A-B-C)**	153141.63	163813.21	175333.79	187606.42	200740	214498.78	229525.77	245912.74	263127.11	281546

5.7 Tariff Calculation Table

The water tariff is calculated based on the following principle

SN	Expenditures Details	First Year	Second Year	Third Year
A	**Annual Operation Cost**			
1	Annual Maintenance Cost	18,000	19,260	20,608
2	Annual salary for the maintenance worker and meter reader	195,000	139,100	148837
3	Annual Management Cost	58,000	62,060	66,404
	Total Cost	271,000	289970	310268
B	**Contingency Cost (5% of B)**	13550	14498	15513
C	**Total Annual Cost (A +B)**	284550	304468	325780

Note: Water tariff can be set for next 20 years in this method

The calculation in the table above has been determined as per following

SN		First Year	Second Year	Third Year
A	**Annual Operation Cost**			
1	Annual Maintenance Cost	1500X 12= 18000/-	18000X (1+ 7%) =19260/-	19260X (1+ 7%) =20608.20/-
2	Annual staff salary and allowance	15000X13 =195000	195000X (1+ 7%) =208650/-	2086500 X (1+ 7%) =223255/50-
3	Annual Management cost	58000/-	62060-	62060X (1+ 7%) = 66400 /-
	Total	271000/-	289970/-	310268.
B	**Contingency (10% of the annual operation cosT)**	13555/-	14498./50-	15513./
C	**Grand Total/ Expenses (A+B)**	284655/-	304468/50-	325780/

Chapter 6: Methods of Water Tariff Fixation

6.1 Water Tariff and Cost Recovery

The key purpose of concept of water tariff is to raise the income to cover the operation cost including the maintenances costs. The fund for the maintenance is essential to ensure the smoot operation of the water supply system. Besides, for the cost recovery, the fixing of the water tariff is very crucial. The fund is also required to cover all the maintenance cost even after the design period.

There are two key objectives of fixing water tariff in the water supply system

a. To cover daily operation cost of the system
b. To accumulate sufficient funds and resources to operate the system even after the design period

The factors that help to determine the water tariff

- The total cost of the project
- Design Period
- Annual maintenance cost
- Annual staff cost
- Annual management cost
- Population
- Population growth rate
- Household number
- Household growth rate
- Per capita water consumtion
- Annual Inflation rate

6.1.1 Flat Rate

This rate does not concern the water consumption and sets only one fixed rate. This rate is suitable for the small scaled water supply systems with lower users

$$\text{Monthly Water Tariff} = \frac{\text{Annual Expenditures}}{\text{Total Household Number of that year X 12 months}}$$

For the annual operation of the system

$$\text{Monthly Water Tariff} = \frac{\text{Annual Expenditures}}{\text{Total Household Number of that year X 12 months}}$$

= 216,300/151X12=119.37 (or 120 per month per household)

$$\text{Monthly Water Tariff} = \frac{\text{Annual Cost Recovery of the Project + Annual Expenditures}}{}$$

Total Household Number of that year X 12 months

6.1.2 Water Consumption Rate:

The consumption rate varies according to the water usage. In order to determine the water consumption rate, it is essential to determine the rate of consumption of water.

For the annual operation of the system

$$\text{Rate per liter of water} = \frac{\text{Annual Operation Cost}}{\text{Total Household Number of that year X 365 X water consumption per person per day}}$$

For the annual operation of the system and for cost recovery

$$\text{Rate per liter of water} = \frac{\text{Annual Cost Recovery of the Project + Annual Operation Cost}}{\text{Total Household Number of that year X 365 X water consumption per person per day}}$$

6.1.3 Water Tariff (Inclusive of Cost Recovery)

Total Cost of the Project	NPR 8,237,702
Design Period	20 years
Tentative Annual Maintenance Cost	18,000
Annual Human Resouce cost including allowance	195,000
Annual WUC office management cost	58,000
Population	638
Population Growth Rate (Annual)	1.5%
Household Number	148
Annual Household Growth Rate	2%
Per Capita Water Consumption	85 liters
Inflation Rate (Annual)	7%

Annual Operation Cost of the Water Supply System	
Cost Title	**For the first year**
a. Annual Maintenance Cost	**18,000**
b. Annual Hunan Resources and Allowance	**195,000**
c. Annual Management Cost	**58,000**
Total (A+B+C)	**271,000**
Contingency (10% of d)	**271000 X0.05% = 13550/–**
Grand Total of the Annual Cost	**284550/–**

Estimation for the Project Recoveru Cost

Title of the Cost	For the first Year
Annual cost for the project recovery cost	8,237,702÷ 10=823,770.20
Contingency Cost (5% of Annual cost for the project recovery cost)	823770.20*0.05=41188/51
Total cost for the cost recovery	**864958.71**

Title	First Year	Second Year	Third Year	Fourth Year	Fifth Year
Annual Operation Cost	284550	284550*1.07 304468.50	304468.5*1.07 325781.29	325781.29*1.07 348585.98	348585.98* 1.07= 372987.00
The Project Recievery cost	864958.71	864958.71*1.07 = 925505.82	990291.2	1059612	1133784.4
The Annual Adjusted cost	1149508.71	1229904.32	1316072.49	1408197.98	1506771.00

Table 10. The annual adjusted cost calculation

Note: The Project Total Adjusted Cost will be increased by 7% every year

The project adjusted cost cam be calculated by adding the sum of annual operation cost and cost recovery cost. According the example above, the total adjusted cost for the first year will be 1,159,508 (284,550 +864,958). Similarly, the adjusted cost for the remaining years can be calculated by the adding 7% as inflation rate and can prepare the adjusted cost for the next 20 years. Then, the water tariff can be determined as follows

6.1.1.1 Flat Rate

The household number for every year can be calculated by adding growth rate of the households in the initial number. For Example,

The household number in the initial year: 151

The household number in the second year: 151 X (1+2% of 151) =154

The household number in the third year: 154 X (1+2% of 154) =157

The flat tariff rate can be calculated (without adding project recovery cost)

Water tariff for the firsr year= Annual Operatrion Cost/12X Household numbers

= 284,550/12X151

= 157 or 160

According to the calculation above, the households should pay NPR 157 or 160 each month to aquire the drinking water service from Kalitar water supply system

6.1.1.2 Consumption Based Rate

First the deterimation of increasing population should be done by adding the population and population growth based on the growth rate. The annual water usage should be calculated with the per capita of 85 liters. For the easy calculation, the 1000 litre of water is considered 1 unit.

Tariff per unit of water in the first year:

Tariff per unit of water	284550 x 1000
	638 X 85 X 365
	14.37 or 15 per unit

Tariff per unit of water in the second year:

Tariff per unit of water	304468X 1000
	651X85X365
	15.07 or 16 per unit

Tariff per unit of water in the third year:

Tariff per unit of water	325,781 X 1000
	664 X 85 X 365
	15.81 or 16 per unit

Tariff per unit of water in the fourth year:

Tariff per unit of water	348,586X 1000
	678X 85 X 365
	16.57 or 17 per unit

Every households have to pay tariff in this rate till the water consumption is from 0 to 10 units. If the user consumes more than 10 units, then the water tariff may increase as per the WUC decision.

Structure for Tatiff Fixation:

0 - 10 units	NPR 150 to 200
11 uhits and above	NPR 25 per unit as per fixed by the WUC

Note: Generally, for the small scaled water supply system, the water tariff should be fixed as per the annual operation cost. And for the large scaled water supply system, the tariff should be fixed considering the annual operation cost and the cost recovery.

Chapter 7: Household Survey on Willingness

A household survey had been conducted to assume the water tariff in Kalitar Water Supply System. The survey was done in 97 households. The following table depicts the key information of the survey

7.1 Household Income

Source of Income	Average Income
Pension	327.04
Animal Husbandary	1071.83
Services	1438.85
labours and wages	11472.56
Trade	1682.10
Foreign employment	5929.03
Land lease for agriculture	65.38
Agriculture in own land	1714.38
Others	1017.22
Total	24718.40

Table 11: Household Income

According to the table 11, the average family income is NPR 23,661.29. As of the 58% of the household, the average monthly income is NPR 20,000 to 40,000. For the time being, each household has to pay NPR 200 per month. This tariff is 0.84 of the average monthly income of a family.

7.2 The Average Income and Deficit of an Average Family

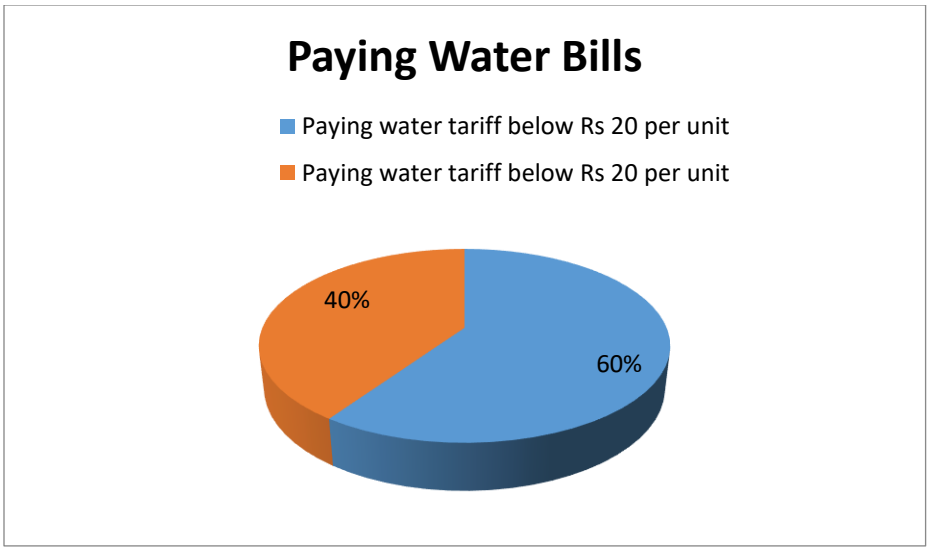
Description	Average Expenses
Average Monthly Income	23661.29
Transportation	
Health	3898.39
Newspapers	
Telephone	1803.23
Water	100
Electricity	855.81
Fooding	12532.36
Entertainment	
Agricuktural Activity	759
Drinking and Smoking	1919.35
Clothing	1928.4
Animal Husbandary	1126.51
Education	7741.94
Average Monthly Expenses	32664.99
Save and (Deficit)	(9003.70)

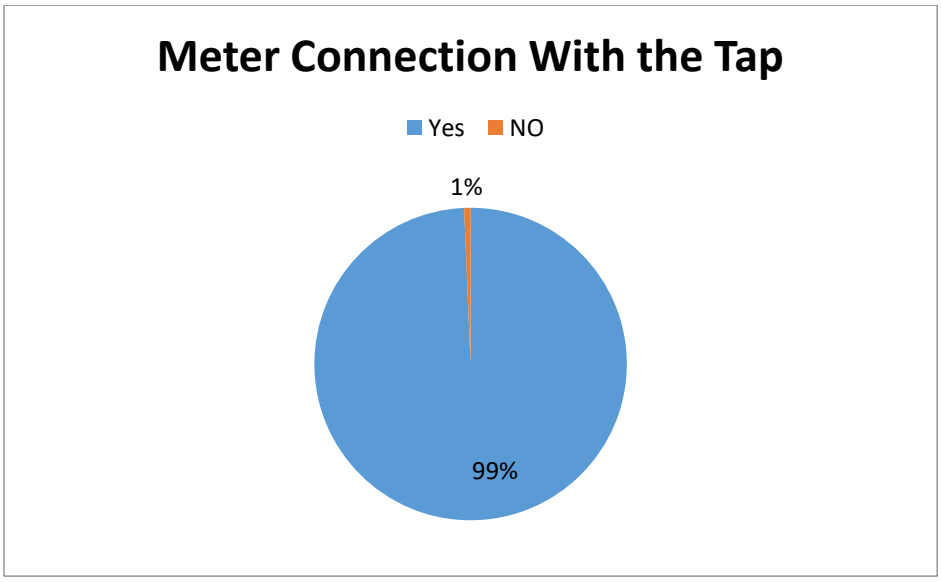
Table: The Average Income and Deficit of an Average Family

According to the table above, the average monthly expenses of an average family are 32,665 and the monthly income is 23661.29. Therefore, the the monthly budget deficit is 9003.70

7.3 Williness Analysis

According to the survey, almost all the households showed their willingness to have their taps connected with the water meter. However, there was two distinct groups in terms of paying water per unit. While 60.4 % expressed to pay the water bills below Rs 20 per unit, the other group of 60% was ready to pay the bill above Rs 20 per unit.





Chapter 8: Summary

The water supply system will be in operation soon after the accomplishment of the construction of intakes, water reservoir tanks, pipe line works and household tap connections. This system will provide the drinking water services within 148 households and 3 organizations.

According to household survey, the average income of family has been observed Rs 23661.29. From the calculation of annual expenditure of WSS, it has been noted that the customer should pay Rs 200 tarrif despite of using services. The tarrif seems to be 0.84 of average income of a family. Similarly, the household will pay the tarrif of Rs 20 per unit as consumption rate according to meter system and tarrif of Rs 200 for the consumption of water of 10 unit. Though there is average deficit of household of Rs 9003 but they are interested to pay the tarrif.

According to the annual calculation of rate of operation cost of 20 years of Kalitar Drinking Water project, it has been estimated that this project may lead as cost-benefit. From the calculation of each year of profit/deficit, the users committee will have Rs 2,81,546 within 20years.

Annex

Namelist of Kalitar Drinking Water

S.N.	Name	Post	Address	Contact No.
1	Padam Bahadur Khadka	Chairperson	Kalitar	9803800134
2	Sarita Tamang	Vice-Chairperson	Kalitar	9808727994
3	Kumar Khadka	Secretary	Kalitar	9866875194
4	Bhum Bahadur Tamang	Treasurer	Kalitar	9866249825
5	Anita Khadka	Vice-Secretary	Kalitar	
6	Shrijana Poudel	Member	Kalitar	9840242399
7	Ramsaran Khadka	Member	Kalitar	
8	Madhav Khadka	Member	Kalitar	9813901129
9	Thuli Maya Tamang	Member	Kalitar	
10	Laxmi Khadka	Member	Kalitar	9842475304
11	Sunita Khadka	Member	Kalitar	9861145280

Name list of Gairigaun Drinking Water

S.N.	Name	Post	Address	Contact No.
1	Kumar Tamang	Chairperson	Gairigaon	9845554210
2	Bhim Bahadur Tamang	Vice-Chairperson	Gairigaon	
3	Basundhara Tamang	Treasurer	Gairigaon	9860063929
4	Shyam Bahadur Tamang	Secretary	Gairigaon	9813305964
5	Suresh Tamang	Member	Gairigaon	
6	Chhaisang Tamang	Member	Gairigaon	
7	Dev Bahdur Tamang	Member	Gairigaon	

2. Name List of the Village Maitenance Workers of the KWSS

SN	Name	Position	Contact Details
		Village Maitenance Workers	
		Village Maitenance Workers	

3. Name List of the Water Safety Plan Group of the Kalitar WSS

SN	Name	Position	Associated With	Contact Details
1	**Kumar Khadka**	**Coordinator**	**Secretary, Kalitar WUC**	
2	**Laxmi Khadka**	**Member**	**Female Community Health Volunteer**	
3	**Madhav Khadka**	**Member**	**Kalitar WUC**	
4	**Bal Krishna Khadka**	**Member**	**Teacher**	
5	**Ram Sharan Khadka**	**Member**		

4. Name List of the Water Safety Plan Group of the Gairigaon WSS

SN	Name	Position	Associated	Contact Details
1	**Shyam Bahadur Tamang**	**Coordinator**	**Secretary Gairigaon WSS**	
2	**Shyam Bahadur Tamang**	**Member**	**User**	
3	**Basundhara Tamang**	**Member**	**User**	
4	**Milan Tamang**	**Member**	**User**	
5	**Raj Kumar Lopchan**	**Member**	**User**	

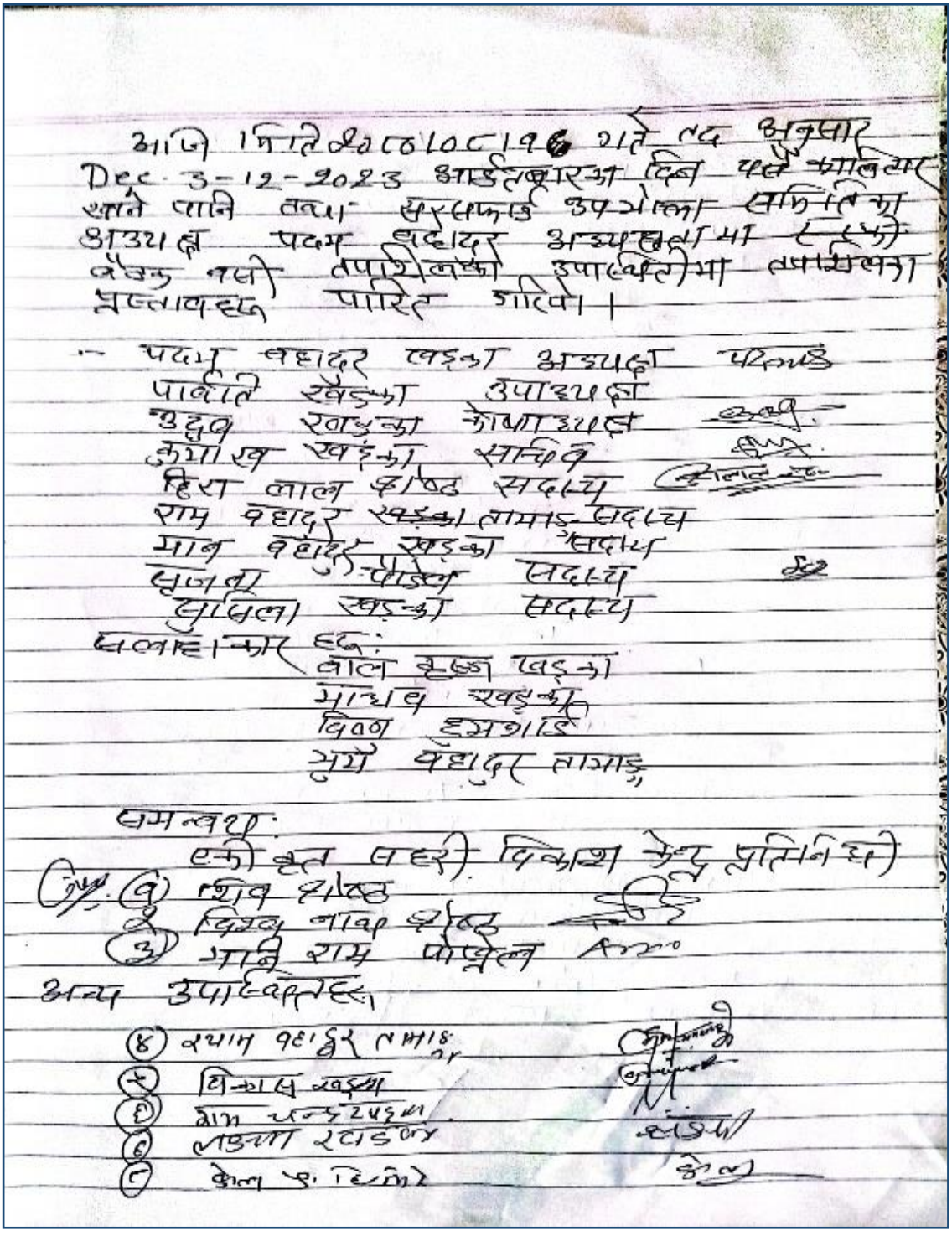
List of tools, parts and Equipments

Tool Name	Unit	Tool Name	Unit
6" dia Heating plate	**1 set**	**Blow tourch**	**1 set**
Hacksaw Frame	**1 set**	**Thermochrome chalk**	**1 set**
Pipe wrench 12"	**1 set**	**Half round file 10 "**	**1 set**
	1 set		**1 set**
Pipe wrench 14"	**1 set**	**Flat file**	**1 set**
Pipe wrench 36"	**1 set**	**Bore hole maschine**	**1 set**
Chain wrench 100 mm	**1 set**	**15-25 mm Auto die set**	**set**

List of Fittings

Nam of the tool	**Quantity**	**Nam of the tool**	**Quantity**
Brass tap	**5 set**	**G.I. Socket (1"-1/2")**	**3 set**
Flow Regulating Valve	**5 set**	**G.I. Socket 15 mm**	**5 set**
15 mm Long nipple	**15 set**	**G.I. Union 15 mm**	**5 set**
Brass union 15 mm	**5 set**	**Water meter**	**5 set**
15 mm G.I. Elbow	**10 set**	**Claimp**	**5 set**

Amnex: Meeting Minute



प्रस्ताव हरु:
१) पानि महसुल
२) विविध

निर्णय नं: १
प्रस्ताव नं: १ पानि महसुल सम्बन्धमा छलफल गर्दा प्रति धारा न्युनतम महसुल रु २००। दुई सय रुपैया (प्रति १० युनिट बराबर) उक्त युनिट पार भो भन्दा बढी युनिट पानि प्रयोग गरेमा प्रति युनिट रु २५ (पच्चीस) का दरले रकम लाग्ने छ।

निर्णय नं: २
प्रस्ताव नं: २ विविध उपर छलफल गर्दा आलिटा (खानेपानि तथा सरसफाई समिति) को संचालित सहरी डिस्ट्रालले (हुनको) योजना लगायत सम्पन्न भएकोले नालिस्य बनेको पानिको उपभोक्ताहरुलाई आज मेला माफर्त अनुमोदन गराइने निर्णय सर्व सम्मति पारित गरियो। (उक्त मेला २०७०।०८।२५ गते सम्पन्न होदा लगभग)

आज मिति २०८० मंसीर ८ गते CIUD तथा Water Aid को सहकार्यमा कालिका खानेपानी तथा सरसफाई समितिका पदाधिकारी हरूलाई १ दिने तालिम पश्चातको तालिम तथा सम्पत्ति व्यवस्थापन योजनाको Data प्रमाणीकरण गर्नका लागि कार्यक्रममा तपशिल बमोजिमको उपस्थिति भयो।

तपशिल

क्र.सं.	नाम	ठेगाना	हस्ताक्षर
१.	पदम बहादुर खड्का	कालिका	
२.	कुमार तामाङ	गैरीगाउँ	
३)	कुमार खड्का	कालिका	
४)	श्याम ब. तामाङ	गैरीगाउँ	
५)	वसुन्धरा	गैरीगाउँ	
६)	चन्द्र लामा (भुम)	कालिका	
७)	कृष्ण खड्का	''	
८)	माधव खड्का	''	
९)	मच्छु खड्का	''	
१०)	डोर प्रसाद घिमिरे	''	
११)	रामशरण खड्का	''	रामशरण
१२)	भिम बहादुर भट्टराई		भिमबहादुर भट्टराई
१३)	नर ब. तामाङ		
१४)	विराज ब. तामाङ		
१५)	देव ब. तामाङ		
१६)	दिल ब. थिङ (तामाङ)		
१७)	रेणु माया घले		
१८)	रन्जीता तामाङ		
१९)	धोडराज तामाङ		
२०)	विकास लामा		
२१)	राम ब. तामाङ		
२२)	राम कुमार तामाङ		
२३)	रूपा तामाङ		
२४)	कान्छी खड्का		
२५)	Ganesh Tamang		