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WATER, SANITATION, AND HYGIENE FINANCE (WASH-FIN)

Surkhet Valley Water Supply Users' Organization (SVWSUO) Water Tariff and Cost Review Update



USAID WASH-FIN PROJECT

MARCH 2020

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This report was prepared by:

Tetra Tech

159 Bank Street, Suite 300

Burlington, Vermont 05401 USA

Telephone: (802) 495-0282

Fax: (802) 658-4247

E-Mail: international.development@tetratech.com

Tetra Tech Contacts:

Sam Huston, Chief of Party

159 Bank Street, Suite 300

Burlington, VT 05401

Tel: (802) 495-0282

Email: sam.huston@washfin.org

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DISCLAIMER

The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

TABLE OF CONTENTS

- TABLE OF CONTENTS 4**
- ACRONYMS, ABBREVIATIONS, ETC. 5**
- EXECUTIVE SUMMARY..... 6**
- 1.0 SURKHET VALLEY WATER SUPPLY USER’S ORGANIZATION..... 7**
 - 1.1 CUSTOMER BASE 7
 - 1.2 WATER SYSTEM 7
 - 1.2.1 Historical Financial Information..... 8
 - 1.2.2 Tariff Recommendation..... 10
 - 1.2.3 Projected Financial Information..... 11
 - 1.2.4 Reserves to Cover Revenue Risks of Natural Disasters..... 12
- 2.0 TARIFF POLICIES AND CALCULATIONS..... 13**
 - 2.1 POLICY OPTIONS 13
 - 2.1.1 Definition of Revenue Requirements..... 13
 - 2.1.2 Selection of a Tariff Structure..... 13
 - 2.1.3 Test Year 14
 - 2.2 REVENUE REQUIREMENTS 14
 - 2.3 ALLOCATION OF REVENUE REQUIREMENTS TO TARIFF STRUCTURE 16
 - 2.4 BOARD APPROVAL AND CUSTOMER FEEDBACK PROCESS..... 16
- 3.0 MONTHLY BILL COMPARISONS 18**
 - 3.1 COMPARISON TO OTHER PRIVATE SOURCES 19
 - 3.2 COMPARISON TO GLOBAL STANDARDS..... 19
- 4.0 FINANCIAL PROJECTIONS..... 20**
- ADDENDUM: CONSIDERATIONS AND IMPLICATIONS OF COVID-19..... 27**

ACRONYMS, ABBREVIATIONS, ETC.

FY	Fiscal Year
GON	Government of Nepal
KM	Kilometer
L/S	Liter per second
M ³	Cubic meters
NPR	Nepal Rupee
NRW	Non-Revenue Water
O&M	Operations and Maintenance
SVWSUO	Surkhet Valley Water Supply User's Association
TDF	Town Development Fund
USAID	United States Agency for International Development
WASH	Water, Sanitation, and Hygiene
WASH-FIN	Water, Sanitation and Hygiene Finance

DEFINITIONS OF SELECT TERMS

PAYGO	Pay-As-You-Go (capital expenditures paid from internally generated funds)
Revenue Requirements	Cost to be recovered from tariffs
Test Year	Year or years that are used to define the Revenue Requirements

CONVERSION FACTORS

NPR to USD	1 NPR = \$.0089 as of March, 2019
l/s to m ³ /d	86,400 l/s = 1 m ³ /day

SVWSUO FISCAL YEAR

FY 2018/19	July 16, 2018 to July 16, 2019
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EXECUTIVE SUMMARY

INTRODUCTION

The Water, Sanitation and Hygiene Finance (WASH-FIN) project is a five-year technical assistance project financed by the United States Agency for International Development (USAID). Its primary objectives are to close financing gaps to achieve universal access to water and sanitation and to increase the potential to reach additional beneficiaries at scale in priority countries. WASH-FIN is currently in the fourth year of a five-year implementation in eight countries, including Nepal.

In Nepal, WASH-FIN is engaging with partners to develop viable models for decentralized local/municipal water, sanitation, and hygiene (WASH) service delivery under the new federal structure in collaboration with central, provincial, and local governments. One of the activities is a cost and tariff study of Surkhet Valley Water Supply User Organization (SVWSUO) in Birendranagar, Nepal. In 2018, WASH-FIN supported development of an initial draft cost and tariff study for SVWSUO based on an analysis of national cost data and a review of SVWSUO's technical, commercial, and financial indicators. The analysis and review from the initial study were used to calculate an estimated tariff to conform with WASH-FIN principles and industry practices of cost recovery, financial viability, efficiency, and social equity. Partly based on the analysis in this initial draft study, SVWSUO approved a tariff increase in 2018, averaging 23 percent across five tariff blocks.

Since then, SVWSUO's has approved a Five-Year Business Plan (2019–2024) that includes capital projects and associated costs and a plan to review the tariff in fiscal year (FY) 2020/21 and 2022/23. SVWSUO requested WASH-FIN support to update the tariffs based on the capital project cost, financing plan, and operating expense data developed for the Five-Year Business Plan compared to the national-level data utilized for the initial tariff study. The objective is to review the tariff adjustments and ensure future recommended tariffs are sufficient to cover SVWSUO's operational and capital needs and maintain prudent levels of cash reserves consistent with the approved 2019–2024 Business Plan.

OVERVIEW OF REPORT AND RECOMMENDATIONS

This report presents analysis and recommendations to revise SVWSUO's tariff structure and to adjust tariffs so that water revenues will be sufficient to cover operating expenses, principal and interest payments on Town Development Fund (TDF) loans and cash financed capital expenditures from FY 2020/21 to FY 2021/22. In addition, it is recommended that the current five block tariff structure be converted and simplified to a three-block tariff structure. The tariff revisions will result in average monthly bill increases for most customers in the 15 percent to 20 percent range, to reflect the real costs of services being provided. However, for customers using less than 8 m³ monthly, there will be no increase. The tariff revisions will partially support the capital investment needs detailed in the SVWSUOs 5-year Business Plan to increase production, enhance efficiency, improve quality, and build human resources and systems capacity to meet growing demand.

This report is also intended to provide guidance to SVWSUO for future efforts to maintain cost-reflective water tariffs, as well as serve as a reference for other water user associations and sector stakeholders in Nepal. In this regard, Section 2 of this report describes, the generally accepted policy options that should be evaluated whenever water tariff revisions are being considered. Section 2 also includes the detailed calculations that support the tariff recommendations.

The report was completed prior to the onset of the COVID-19 pandemic, which disrupted the socio-economic environment globally. In light of the COVID-19 pandemic and the associated disruption in the WASH sector, WASH-FIN received a request from USAID to consider the implications of the pandemic

on the recommendations of this report. See the Addendum for an analysis of the pandemic impact on the report recommendations. It should be noted that the rationale and the considerations made for the tariff adjustment are still valid even after considering the impact of the COVID-19 pandemic.

I.0 SURKHET VALLEY WATER SUPPLY USER'S ORGANIZATION

I.1 CUSTOMER BASE

The population in the Surkhet Valley Water Supply User Organization (SVWSUO) service area is estimated at 185,000; approximately 50 percent of the population has access to improved water supply. Over the past five years, the population has increased at an average annual rate of 10 percent. As of July 2019, SVWSUO provided water service to 16,305 customers. As shown in Table I.1, 98 percent of the customers are residential households and consume 95 percent of the total billed water volume. The highest consumption per customer is by government institutions at 34 cubic meters (m³) per month.

TABLE I.1: CUSTOMERS AND AVERAGE MONTHLY BILLED VOLUME

Customer Type	Number of Customers	Percent of Customers	Avg. Mo. Water Volume Billed (in m ³)	Percent of Mo. Water Billed	Avg. m ³ Billed per Customer
Households	15,989	98%	179,075	95%	11.20
Business	24	0%	282	0%	11.75
Government	194	1%	6,562	3%	33.82
Others	98	1%	2,273	1%	23.19
Total	16,305	100%	188,192	100%	11.54

Households not connected to the water system tend to be located in rural and less populated areas. These households rely on rainwater harvesting during the wet season and water from nearby sources, rivers, streams, or wells during the dry season. Many households, including those connected to the water system, store water in vessels and larger storage devices. Bottled water is also sold by a few private companies. In general, larger businesses tend to supplement their water needs by developing boreholes or purchasing water from water tanker vendors. Some of the larger hotels no longer buy water from SVWSUO and instead rely on boreholes.

I.2 WATER SYSTEM

The water system is largely gravity fed and leverages multiple water sources for a cumulative design capacity of 157 liters per second (l/s). Water supply is intermittent and generally scheduled for two to three hours in the morning and two hours in the evening. On average, the supply is 6.68 hours per day during the wet season and 3.34 hours per day in the dry season.

SVWSUO currently operates two sand filtration treatment plants and one Horizontal Roughing Filter with a combined design capacity of 90 l/s (2.8 million m³/year). Water supply is distributed largely through a gravity-fed network that consists of 68 kilometers (km) of transmission main and 328 km of distribution main. There are 28 ground water storage facilities that can store up to 5,390 m³ of water.

In order to meet current and future water demand, SVWSUO’s 2019–2024 Business Plan¹ includes plans to construct six capital improvement projects that are projected to increase existing water supply by 22 percent, double treatment capacity, improve drinking water quality, and reduce non-revenue water (NRW) by replacing old and leaking pipes. The cost of these capital projects is estimated at 332 million Nepal Rupees (NPR) through the end of fiscal year (FY) 2021/22; the projects are anticipated to be financed from a combination of national government grants, loans from the Town Development Fund (TDF), and internally generated or pay-as-you-go (PAYGO) funds. As presented in Table 1.2, the capital projects combined with internal improvement projects included in SVWSUO’s Business Plan is projected to increase water production and hours of service delivery and enable more households to connect to the distribution network.

TABLE 1.2: HISTORICAL AND PROJECTED WATER PRODUCTION AND WATER BILLED/CUSTOMER

Fiscal Year	Production in M ³	Water Billed in M ³	Estimated NRW Percent	Number of Customers	Water Billed M ³ /Customer
2013/2014	2,775,168	1,739,184	37%	13,209	132
2014/2015	2,743,632	1,751,009	36%	13,264	132
2015/2016	2,837,264	1,815,849	36%	14,015	130
2016/2017	2,970,009	1,900,806	36%	15,658	121
2017/2018	3,225,114	2,064,073	36%	15,882	130
2018/2019	3,528,606	2,258,308	36%	16,305	139
2019/2020*	3,950,070	2,528,045	36%	17,505	144
2020/2021*	4,830,659	3,333,154	31%	18,705	178
2021/2022*	4,830,659	3,526,381	27%	19,905	177
2022/2023*	4,830,659	3,671,301	24%	22,000	167

* Projected

The projected increase in water production from FY 2020/21 to FY 2021/22 (22 percent) reflects the anticipated date that the new water supply from the capital projects mentioned above and detailed in Section 3.0 will become operational. An annual increase in customers of 1,200 per year to serve demand is projected due to the increase in water supply, reduction in NRW, and SVWSUO’s planned efforts to accelerate house connections.

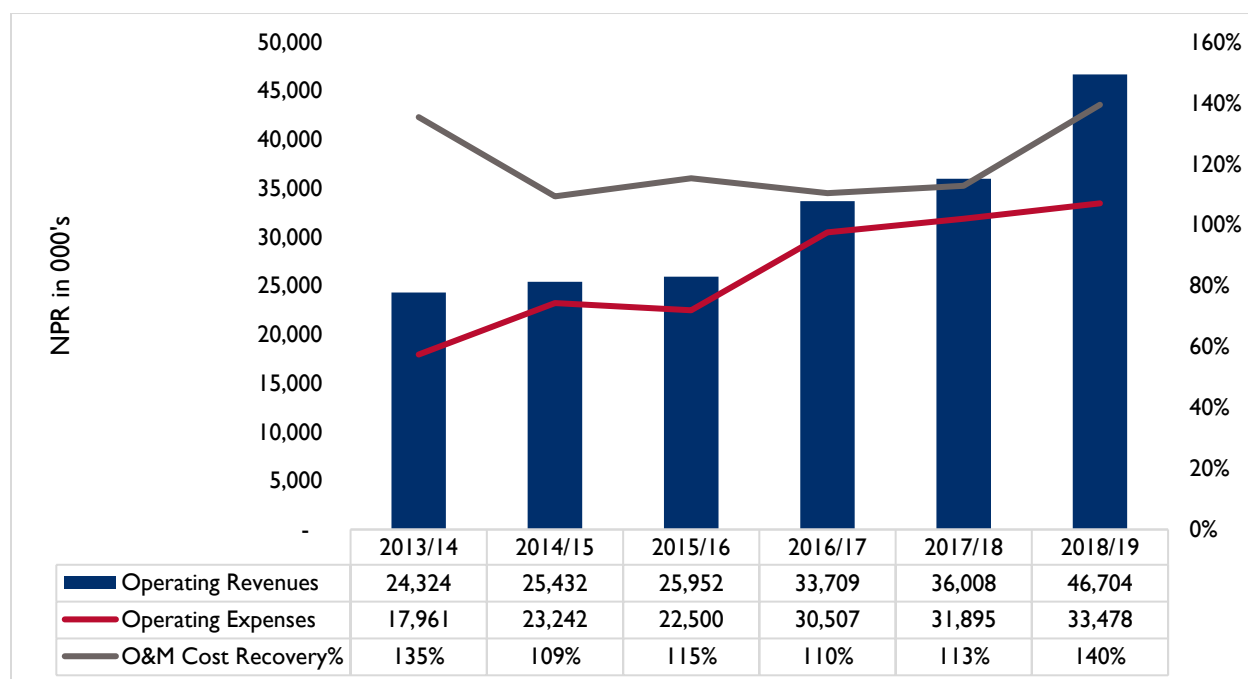
1.2.1 HISTORICAL FINANCIAL INFORMATION

As of July 2019, SVWSUO’s balance sheet included over NPR 436 million in total assets, most of which were contributed by the Government of Nepal (GON). Total liabilities were less than NPR 100 million, including NPR 55 million in outstanding TDF loans. Net working capital totaled NPR 35 million, including NPR 30 million in cash. The cash balance is equivalent to approximately nine months of operating expenses. Water, Sanitation and Hygiene Finance (WASH-FIN) project analysis shows that SVWSUO’s current financial condition based on its July 2019 balance sheet is appropriate for a non-for-profit water utility. However, it is recommended that SVWSUO consider maintaining a larger cash balance with a dedicated portion set aside to offset potential revenue loss and remediation costs related to natural disaster events. This is in line with SVWSUO’s Five-Year Business Plan, which identified a risk related to natural disasters that can result in revenue losses due to service disruptions and costs to repair and replace damaged infrastructure.

¹ The calculations and financial projections in this tariff update are based on the capital improvement projects in the Business Plan. The capital plan has changed since the Business Plan however, and the tariff update takes this into consideration in calculating the updated tariff recommendations.

As presented in Figure I.1, SVWSUO's operating revenues increased substantially in FY 2016/17 and FY 2018/19 due to tariff increases. Although SVWSUO had a positive cost recovery percentage from FY 2013/14 to FY 2018/19, the amount of the operating cost recovery (operating revenues minus operating expenses) was not sufficient to pay the principal and interest on loans from the TDF that were used to finance capital projects constructed between FY 2015/16 and FY 2017/18. Tap fees totaling more than NPR 100 million paid by households requesting a connection to the distribution network were used to pay the principal and interest payments and fund capital expenditures from FY 2013/14 to FY 2017/18.

FIGURE I.1: HISTORICAL OPERATING REVENUES, EXPENSES, AND OPERATIONS AND MAINTENANCE (O&M) COST RECOVERY PERCENT



Going forward, annual tap fees will not be sufficient to pay for the cost of capital improvements, net of government grants. For this reason—and increasing operating expenses—future tariff increases are needed.

I.2.2 TARIFF RECOMMENDATION

As presented in Table I.3, it is recommended that SVWSUO’s current minimums plus five-block tariff structure be converted to one that includes minimums but only three blocks. It is further recommended that the block tariffs be increased to cover increasing operating expenses, additional cash-financed capital expenditures, and principal and interest payments on any new TDF loans.

TABLE I.3: CURRENT AND RECOMMENDED TARIFF SCHEDULES

SN	Blocks	Current	Proposed	Increase	Percent Increase
1	0 m ³ Institutions	150	150	0	-
	0–8 m ³ Individuals	100	100	0	-
2	9–18 m ³	15	20	5	33%
	19–28 m ³	20	20	–	–
3	29–38 m ³	25	40	15	60%
	39–48 m ³	40	40	–	–
4	> 48 m ³	50	60	10	20%

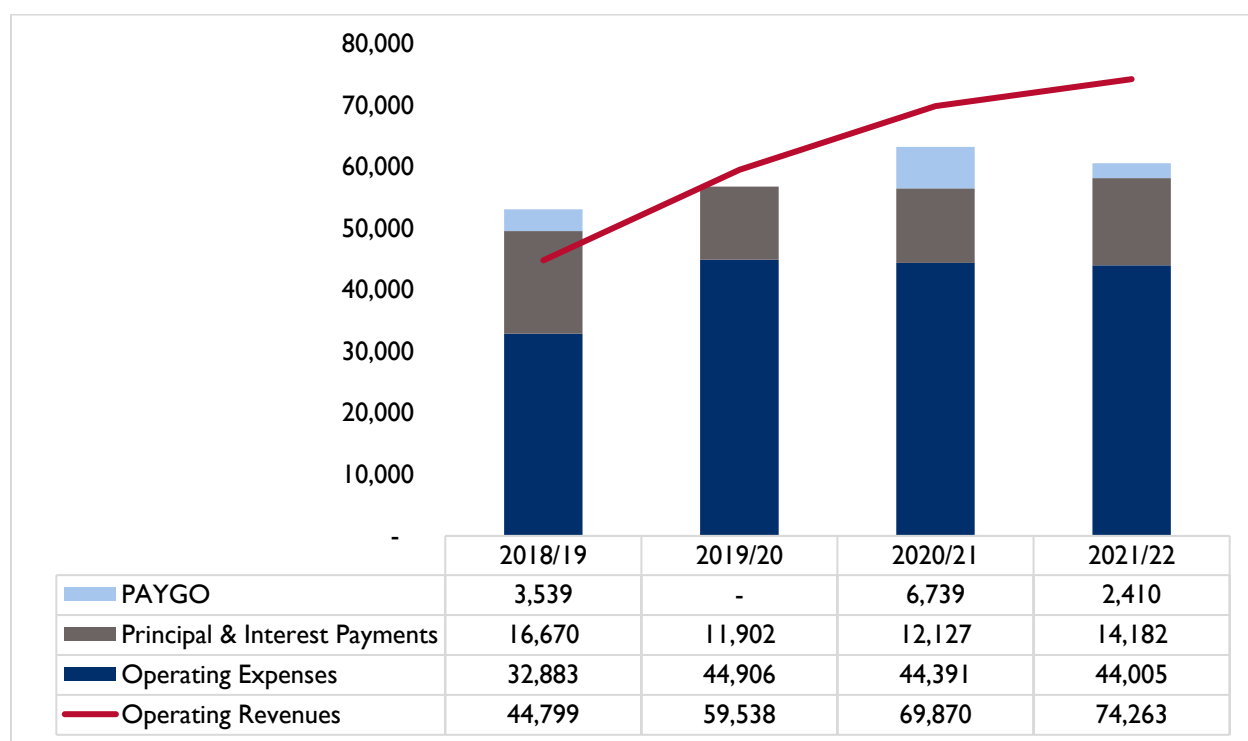
Policy decisions and calculations supporting the recommend tariff schedule are included in Section 2.0 of this report. Assuming the recommended tariff schedule is approved, there will be no cost increase for household customers consuming 8 m³ of or less of water per month. The increase for most other household customers will be in the 15 to 20 percent range. However, the increase will be smaller for households that currently use 19 to 28 m³ per month because the current third block remains unchanged in order to achieve the recommended three-block tariff structure. The monthly bill increases for institutional customers is mixed depending on monthly consumption level. There will be no cost

increase for institutional customers consuming 8 m³ of or less of water per month. Bill comparisons based on multiple monthly consumptions levels are included in Section 3.0 of this report together with affordability measures-based on the World Health Organization guidelines. Section 3.0 also includes comparisons of the cost of drinking water provided by SVWSUO to the cost of drinking water sold by water tanker vendors and bottled companies in the Surkhet Valley.

1.2.3 PROJECTED FINANCIAL INFORMATION

The recommended tariff schedule presented in Table 1.3 above was designed and calculated to ensure that the average annual Revenue Requirements in FY 2020/21 and FY 2021/22² of NPR 61.9 million is achieved; this is further detailed in Section 2.2. Figure 1.2 below compares the projected operating revenues to revenue requirements in each fiscal year only.

FIGURE 1.2: PROJECTED OPERATING REVENUES COMPARED TO PROJECTED REVENUE REQUIREMENTS

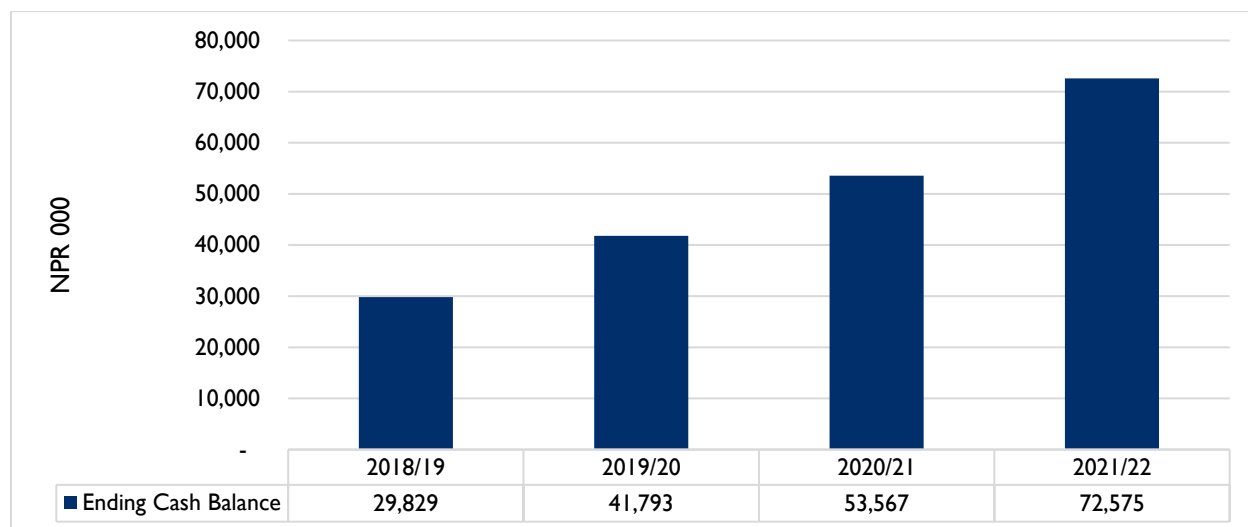


As presented in Figure 1.2, the operating revenues in FY 2020/21 and FY 2021/22, which are almost exclusively derived from water tariffs, exceed the average Revenue Requirements by approximately 17 percent. The 17 percent additional is needed to cover the higher FY 2020/21 Revenue Requirements and provide a contingency for potential increases to the projected FY 2021/22 Revenue Requirements.

Figure 1.3 below presents a projection of SVWSUO cash balance through the end of FY 2021/22. As presented, the cash balance is projected to increase by NPR 42.7 million from FY 2018/19 to FY 2021/22 due to the tariff changes recommended in this report.

²The average annual Revenue Requirements are calculated as the sum of annual i) PAYGO, ii) principal and interest payments on loans used to finance capital investments, and iii) operating expenses in FY 2020/21 and FY 2021/22 divided by two.

FIGURE 1.3: PROJECTED CASH BALANCE



I.2.4 RESERVES TO COVER REVENUE RISKS OF NATURAL DISASTERS

SVWSUO’s Business Plan has identified risks related to climate change and natural disaster events and corresponding mitigation measures. This risk includes potential revenue loss and remediation costs and at times SVWSUO transfers available funds into a cash reserve fund to be used to offset any revenue loss and remediation costs associated with earthquakes, floods, and droughts; these funds are included in the ending cash balance in Figure 1.3 above. WASH-FIN is working with SVWSUO to evaluate the merits of undertaking a more detailed study to understand this in terms of the costs of prior disasters that impacted SVWSUO, and possibly other user’s organizations, and related policies around the reserve fund.

2.0 TARIFF POLICIES AND CALCULATIONS

2.1 POLICY OPTIONS

Three important policy options were discussed and agreed upon with the Executive Chairman, select board members, and key officials before commencing any analytical efforts to update the water tariffs. The three policy options are briefly described below, including the logic of SVWSUO policy selections.

2.1.1 DEFINITION OF REVENUE REQUIREMENTS

Revenue Requirements refer to the cost that needs to be recovered from tariff revenue. Generally, there are two methods used to measure cost. The first option is to base the cost on international accounting standards that include provisions for depreciation and interest on debt financing plus a rate of return on net invested assets. This option is typically referred to as the Utility Approach in water tariff technical guidelines and is used by private water companies that are regulated by a national economic regulatory agency. The second option is to base the cost on budgeted operations and maintenance cost plus principal and interest payments on debt and recurring capital expenditures paid from internally generated funds (PAYGO). This option is often referred to as the Cash Needs Approach in water tariff technical guidelines and used by government owned and community-based utilities.

SVWSUO selected the Cash Needs Approach because the stakeholders believed it was the most appropriate option for a not-for-profit utility and is more easily understood.

2.1.2 SELECTION OF A TARIFF STRUCTURE

Tariff structure refers to the mechanism that will be used to bill customers in a way that recovers the Revenue Requirements to cover costs. A simple tariff structure would be one where all customers are billed the same unit price for one m³ of billed water. The SVWSUO tariff structure includes a minimum monthly bill of 100 NPR for domestic customers that use 8m³ of water or less (150 NPR for institutions). Customers that use more than the minimum are currently charged based on a five inclining block structure. As part of the Tariff Study, the following alternative tariff structures were discussed with the Executive Chairman and other stakeholders.

Reduce the number of inclining blocks. Fewer blocks will make the tariff structure easier to administer and understandable to customers. Fewer blocks also provide a logical basis for cross subsidies whereby the middle block in a three-block structure is often based on full recovery of Revenue Requirements. The first block is generally subsidized while the third block provides the needed subsidy.

Implement separate and higher inclining block tariffs for commercial customers. If implemented, more of the Revenue Requirements will be allocated to commercial customers. However, care is needed to make sure the commercial tariffs are not so high that some commercial customers invest in their own private water supply.

Consider separate block or uniform tariffs based on hours of service. Approximately 40 percent of the customer base is located in urban areas that have double the average hours of service compared to other areas. Better service, in terms of average hours of supply, may be justification for higher tariffs to customers located in urban areas.

Use unmetered fixed tariffs for service areas with minimal hours of service and high levels of intermittent service. If there are service areas with intermittent service, low water demand, and little variability in water use among customers, a fixed unmetered tariff may be more efficient than the current metered tariff. Metering customers with low water use is expensive, relative to the amount

billed, and has little purpose when the meters are defective and customers are billed the minimum. Thus, consideration should be given to using unmetered tariffs in selected geographic areas.

Have a separate tariff for customers with yard taps. Yard taps are shared with multiple households but still billed based on the inclining block tariff structure. As a result, the monthly bill per household can be higher than a family with the same use with a separate house connection. For purpose of fairness, consideration should be given to establishing a uniform tariff for water use from yard taps.

SVWSUO opted to reduce their five-block tariff structure to a three-block structure for the reasons noted above. The last option, a separate tariff for customers with yard taps, was discarded as SVWSUO has ongoing efforts to replace all yard taps with meters at each household dwelling. The other options were considered to have merit but not selected as part of this tariff update.

2.1.3 TEST YEAR

In tariff setting, the Test Year refers to the year or years that are used to define the Revenue Requirements. Utilities that are regulated by a national economic regulatory agency often require to base their Revenue Requirements on historical cost. Municipal owned utilities often base their Revenue Requirements on future year cost.

SVWSUO selected a Test Year based on projections of Revenue Requirements for the average of FY 2020/21 and FY 2021/22. This was done because a precedent had been set to update water tariffs on a biennial basis and the next scheduled tariff update was scheduled for July 2020.

2.2 REVENUE REQUIREMENTS

Consistent with the policy choices made by the Executive Chairman, board members, and key SVWSUO officials, costs were analyzed as a basis for developing the Revenue Requirements (presented in Table 2.1 below).

TABLE 2.1: REVENUE REQUIREMENTS (IN NPR '000)

	Actual 2018/2019	Budget 2019/2020	Projected 2020/2021	Projected 2021/2022	Revenue Requirements
O&M Expenses:					
Salaries	10,565	20,600	20,600	20,600	20,600
Benefits and Allowances	5,950	9,251	9,251	9,251	9,251
Repairs and Maintenance	9,316	4,798	4,798	4,798	4,798
BP Projections	-	-	2,000	1,000	1,500
Provision for Bad Debts	2,060	2,250	1,333	1,411	1,372
Other	4,992	8,007	6,409	6,945	6,677
	32,883	44,906	44,391	44,005	44,198
Capital Costs:					
Pay-as-you-go CAPEX)	5,181	-	6,739	2,410	4,575
Principal and Interest Payments	16,671	11,902	12,127	14,182	13,155
Total Revenue Requirements:					
Annual Revenue Requirements	54,735	56,808	63,257	60,597	61,927
Average Number of Customers	16,305	17,505	18,705	19,905	18,705
Reference Price/Customer/Month	208	270	282	254	276

As shown in Table 2.1, the total Revenue Requirements (NPR 61,927,000) is based on the average of the projected operations and maintenance (O&M) expenses and capital costs for FY 2020/21 and FY

2021/22. The projected O&M expenses are largely based on the current year budget (FY 2019/20) adjusted for known changes in individual expense items.

Table 2.2, details the financial analysis that was prepared to determine the PAYGO financing of capital cost that is part of the Revenue Requirements.

TABLE 2.2: PAYGO FINANCING (IN NPR'000)

	Actual 2018/2019	Budget 2019/2020	Projected 2020/2021	Projected 2021/2022	Revenue Requirements
Capital Expenditure:					
Capacity Enhancement Projects	-	-	25,900	11,000	18,500
Construction of New Supply Projects	-	30,600	20,400	-	10,200
New Water Treatment Plant	-	-	36,000	60,000	48,000
Distribution R&R Projects	11,387	9,000	40,613	25,000	32,807
Chlorination Equipment	-	500	6,500	6,000	6,250
NRW Projects	-	1,000	-	-	-
General Improvements	552	1,500	948	1,000	974
	11,939	42,600	130,361	103,100	116,731
Less:					
GON Grants	-	(35,640)	(103,422)	(74,490)	(88,956)
TDF Loans	-	-	(9,000)	(15,000)	(12,000)
Tap Fees	(8,400)	(11,200)	(11,200)	(11,200)	(11,200)
PAYGO Financing	3,539	-	6,739	2,410	4,575

Table 2.2 is based on an updated version of the capital expenditure plan developed as part of SVWSUO's Business Plan and includes all known capital projects SVWSUO is likely to incur during the Test Year and sources of finance. The total amount of the annual expenditures was reduced by the expected amount of project specific grants from the Government of Nepal, loan proceeds from the TDF, and tap fees to be paid by future customers. The remainder represents the estimated amounts that SVWSUO will need to fund from internally generated cash flow (PAYGO financing).

Table 2.3 details the financial analysis that was prepared to determine the principal and interest payments that are part of the Revenue Requirements. WASH-FIN reviewed the loan amortization schedules on SVWSUO's two existing TDF loans and assumed similar loan terms for the new TDF loan that is anticipated to fund part of the capital expenditure plan as presented in Table 2.3. The projected principal payments and accrued interest in 2020/21 and 2021/22 form the basis for the average principal and interest payments that are part of the Revenue Requirements.

TABLE 2.3: PRINCIPAL AND INTEREST PAYMENTS (IN NPR'000)

	Actual 2018/2019	Budget 2019/2020	Projected 2020/2021	Projected 2021/2022	Revenue Requirements
Beginning Balance	67,497	54,612	45,738	45,297	45,517
Proceeds	-	-	9,000	15,000	12,000
Principal Repayments	(12,885)	(8,874)	(9,441)	(11,306)	(10,374)
Ending Balance	54,612	45,738	45,297	48,991	47,144
Accrued Interest	3,786	3,028	2,686	2,876	2,781
Total Principal and Interest	16,670	11,902	12,127	14,182	13,155

2.3 ALLOCATION OF REVENUE REQUIREMENTS TO TARIFF STRUCTURE

The final step in the tariff calculations was the allocation of the Test Year Revenue Requirements to the selected tariff schedule. Several allocation scenarios were prepared in order to arrive at a preferred scenario that resulted in reasonable monthly bills to customers with different average monthly use patterns. Table 2.4 includes the preferred allocation scenario. The resulting monthly bill increases are presented in Section 3.0 of this report.

TABLE 2.4: ALLOCATION OF TEST YEAR REVENUE REQUIREMENTS TO THE SELECTED TARIFF SCHEDULE

Block	Tariff/m ³	Number of Customers	Mo. Volume Billed in m ³	Average Mo. m ³ /Customer	Mo. Billed Revenue (NPR)
0–8 m ³ Individuals	100	9,529	55,979	5.87	952,859
0–8 m ³ Institutions	150	155	264	1.71	23,231
9–18 m ³	20	5,819	97,462	16.75	1,745,571
19–28 m ³	20	2,017	59,790	29.65	1,008,384
29–38 m ³	40	673	28,971	43.02	606,063
39–48 m ³	40	239	13,457	56.40	310,201
> 48 m ³	60	274	29,890	109.02	965,111
		18,705	285,814	15.28	5,611,420
		Test Year Volume	3,429,768	Test Year Revenue	67,337,036

The allocation process is effectively an iterative process designed to find the minimums and block tariff amounts that will result in projected revenues that are equal to or exceed the Test Year Revenue Requirements, and any reasonable monthly bill increases.

The following sub-steps were conducted to determine a preferred scenario of minimums and block tariff amounts that met the above objectives:

1. Billing records were analyzed to estimate the monthly volume billed in m³ by the current and recommended tariff blocks. The total monthly volume billed in m³ presented in Table 2.4 is based on the average of the projected FY 2020/21 and FY 2021/22 monthly billed volume as presented in Table 1.2 included in the Executive Summary of this report.
2. Different tariffs/m³ were selected and applied to the monthly volume billed in m³ to arrive at the monthly and annual billed revenue. The resulting annual revenue presented in Table 2.4 (NPR 67,337,036) is about 9 percent more than the total Revenue Requirements (NPR 61,927,000) presented in Table 2.1. The 9 percent overage is needed to cover the higher FY 2020/21 Revenue Requirements (NPR 63,257,000) and provide a contingency for potential increases to the projected FY 2021/22 Revenue Requirements.
3. Simultaneously with sub-step 2, the monthly bill comparisons presented in Section 3.0 of this report were updated and subsequently determined to be acceptable by the Executive Chairman, select board members, and key officials.

2.4 BOARD APPROVAL AND CUSTOMER FEEDBACK PROCESS

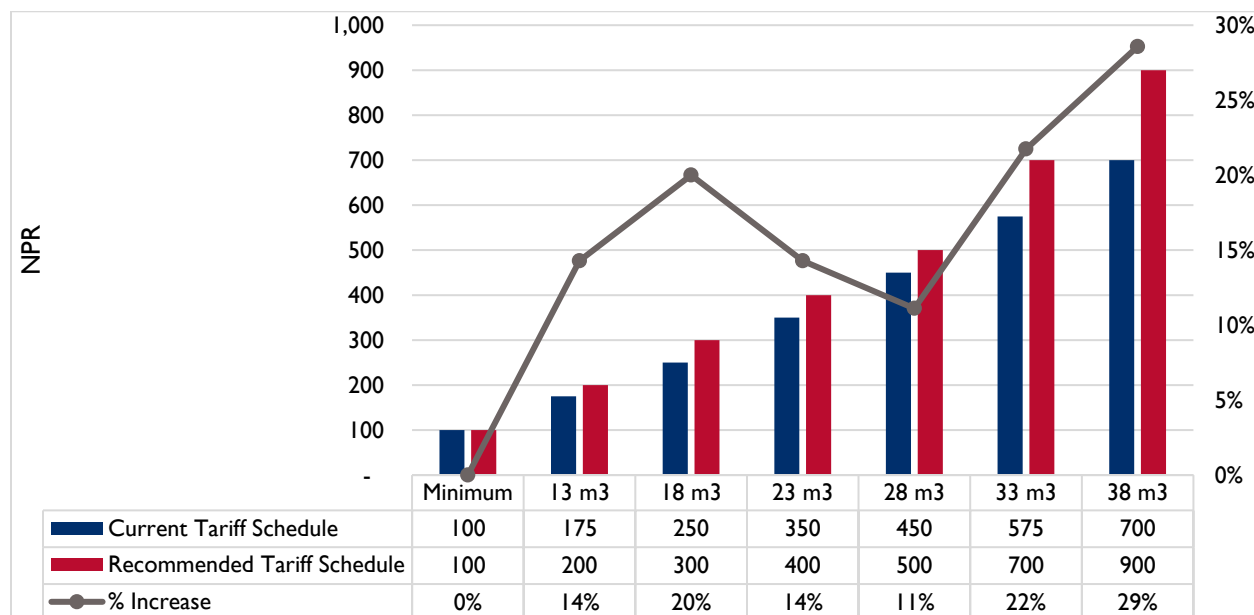
SVWSUO has a practice of rolling tariff updates with approval first from the Board and then ratified at the Annual General Meeting. The Executive Chairman first presents the tariff update as an agenda item on a regular monthly board meeting for discussion with the Board, along with the Chairperson from each Scheme, and representatives from Surkhhet Municipality and the Provincial Water Office who are also invited to attend. At this meeting, the Board decides whether to pass a resolution, or send it back for

further review. If the recommended tariff receives Board approval, it will then move to the Annual General Meeting for consideration where all scheme members and customers can participate and have a say. The Annual General Meeting may result in a different opinion than that of the Board and the tariff update may not be ratified. However, our understanding is that agenda items approved by the Board typically get ratified at the subsequent Annual General Meeting. Once the Annual General Meeting ratifies the Board approval, the updated tariff comes into effect (normally from the beginning of new fiscal year).

3.0 MONTHLY BILL COMPARISONS

In FY 2018/19, SVWSUO provided water service to a little just over 16,000 customers. More than 98 percent of the customers were classified as domestic households. Figure 3.1 presents a comparison of the monthly household bills for all but the very largest household customers based on the existing tariff schedule to the recommended tariff schedule.

FIGURE 3.1: COMPARISON OF MONTHLY BILLS – CURRENT VS. RECOMMENDED TARIFF SCHEDULES



As presented in Figure 3.1, the average monthly bills for household customers consuming less than or equal to 8m³ of water will remain same. The increase for most other household customers will be in 15 percent to 20 percent range. However, the increase will be smaller for household customers that consume between 19m³ to 28m³ of water per month. The smaller percent increase results because the existing third tariff block is not increased in efforts to transition from the existing five-block tariff schedule to a three-block tariff schedule.

Table 3.1 provides additional information about the monthly bill increases including the estimated number of customers by tariff block and the bill amounts for the household customers that use more than 38m³ of water per month.

TABLE 3.1: AVERAGE MONTHLY HOUSEHOLD BILLS AT RECOMMENDED TARIFFS

Number of Customers	8,336	5,016			1,717		554		183		158	18	5
Monthly Use	8	13	18	23	28	33	38	43	48	75	150	225	
Tariff Schedule in NPR													
0–8 m ³	100	100	100	100	100	100	100	100	100	100	100	100	
9–28 m ³	20	–	100	200	300	400	400	400	400	400	400	400	
29–48 m ³	40	–	–	–	–	–	200	400	600	800	800	800	
49 m ³ and over	60	–	–	–	–	–	–	–	–	–	1,620	6,120	10,620
Monthly Bill	100	200	300	400	500	700	900	1,100	1,300	2,920	7,420	11,920	
Current Monthly Bill	100	175	250	350	450	575	700	900	1,100	2,450	6,200	9,950	
Amount of Increase	–	25	50	50	50	125	200	200	200	470	1,220	1,970	
Percent Increase	–	14%	20%	14%	11%	22%	29%	22%	18%	19%	20%	20%	

Table 3.2 provides comparable information for customers billed on the institutional tariff schedule. Except for the minimum bill, the recommended institutional tariff schedule is the same as the recommended domestic household tariff schedule.

TABLE 3.2: AVERAGE MONTHLY INSTITUTIONAL BILLS AT RECOMMENDED TARIFFS

Number of Customers	45	56			41		33		25		30	24	4
Monthly Use	8	13	18	23	28	33	38	43	48	75	150	225	
Tariff Schedule in NPR													
0 m ³	150	150	150	150	150	150	150	150	150	150	150	150	150
1–8 m ³	20	160	160	160	160	160	160	160	160	160	160	160	160
9–28 m ³	20	–	100	200	300	400	400	400	400	400	400	400	400
29–48 m ³	40	–	–	–	–	–	200	400	600	800	800	800	800
49 m ³ and over	60	–	–	–	–	–	–	–	–	–	1,620	6,120	10,620
Monthly Bill		310	410	510	610	710	910	1,110	1,310	1,510	3,130	7,630	12,130
Current Monthly Bill		270	370	470	595	720	920	1,120	1,370	1,620	2,970	6,720	10,470
Amount of Increase		40	40	40	15	(10)	(10)	(10)	(60)	(110)	160	910	1,660
Percent Increase		15%		9%	3%	-1%	-1%	-4%	-7%	5%	14%	16%	

3.1 COMPARISON TO OTHER PRIVATE SOURCES

It is noteworthy that even with the recommended tariff changes, the cost of water supplied by SVWSUO is substantially less than water from other available private sources. WASH-FIN analysis indicates that the cost of (private) bottled water exceeds NPR 2.50 per liter, whereas the cost of water supplied in the first two household blocks presented in Table 3.1 averages NPR .03 per liter. Further, the cost of water from water tanker vendors tends to average NPR 1.4 per liter whereas the cost of water supplied in the third block presented in Tables 3.1 and 3.2 equates to NPR .06 per liter.³

3.2 COMPARISON TO GLOBAL STANDARDS

The World Health Organization established a recommended ceiling for the cost of water at 3 percent of household income.⁴ The recommended minimum monthly bill to household customers (NPR 100) equates to .5 percent of the reported monthly household income of the poorest households in Nepal (NPR 18,338). Further, the average monthly household bill for customers in the first two household tariff blocks presented in Table 3.1 (NPR 350) equates to 1.2 percent of the reported average income for all household income in Nepal (NPR 30,121).⁵ However, the cost of water billed by SVWSUO does not include coping costs that customers incur to store or supplement water from other sources.

³ The cost of water per m³ from private sources and water tanker vendors was derived from focus group discussions with SVWSUO's customers conducted by WASH-FIN in July 2018.

⁴ See: <https://www.un.org/en/sections/issues-depth/water/> (accessed March 2020).

⁵ Household income levels are based on the Fifth Household Budget Survey 2014/15 published by the Nepal Rastra Bank.

4.0 FINANCIAL PROJECTIONS

The SVWSUO 2019–2024 Business Plan includes six Capital Investment Projects and associated financial projection Schedules and assumptions. Schedule I includes updated capital expenditures and financing arrangements associated with the six Capital Investment Projects in FY 2019/20 and Test Year (the average of capital investment in FY 2020/21 and FY 2021/22). The most significant assumptions used to prepare the following financial projections are described in the notes in each schedule.

TABLE 4.1: SCHEDULE I – PROJECTED CAPITAL INVESTMENT PLAN (NPR 1,000s)

	Actual 2018/2019	Budget 2019/2020	Projected 2020/2021	Projected 2021/2022
Capital Expenditure:				
Capacity Enhancement Projects	–	-	25,900	11,000
Construction of New Supply Projects	–	30,600	20,400	–
New Water Treatment Plant	–	-	36,000	60,000
Distribution R&R Projects	11,387	9,000	40,613	25,000
Chlorination Equipment	–	500	6,500	6,000
NRW Projects	–	1,000	–	–
General Improvements	552	1,500	948	1,000
	11,939	42,600	130,361	103,100
Investment Plan:				
GON Grants	–	35,640	103,422	74,490
TDF Loans	–	-	9,000	15,000
Tap Fees	8,400	11,200	11,200	11,200
PAYGO Financing	3,539	(4,240)	6,739	2,410
	8,400	42,600	130,361	103,100

Notes:

1. The Capacity Enhancement Business Plan Projects will restore the design capacity and useful life of the existing water treatment plants.
2. The Construction of New Supply Business Plan Projects will add 35 l/s at two water sources (20 l/s and 15 l/s, respectively).
3. The New Water Treatment Plant Business Plan Project will have a design capacity of 91 l/s (a little more than a 100 percent increase over the existing three water plants' capacity).
4. The Distribution R&R Business Plan Project will replace 52 km of old and leaking distribution main and extend 25 km of existing distribution line.
5. The Chlorination Business Plan Project is needed to increase the chlorine residual and improve water quality.
6. The NRW Business Plan Project is anticipated to decrease the NRW through a combination of distribution improvements and meter replacements.
7. General improvements are for recurring capital expenditures such as vehicles, equipment, computers and building improvements.
8. National government grants are anticipated to fund 75 percent of the capital projects; the TDF loans will cover an additional 9 percent, tap connection fee will cover 16 percent and PAYGO funds will cover the remainder.

TABLE 4.2: SCHEDULE 2 – PROJECTED BALANCE SHEET (NPR 1,000s)

	Actual	Projected		
	2018/2019	2019/2020	2020/2021	2021/2022
Assets				
Fixed Assets	562,543	605,143	735,504	838,604
Accumulated Depreciation	(167,169)	(197,426)	(234,201)	(276,131)
Fixed Assets, Net	395,374	407,717	501,303	562,472
Cash	29,829	41,793	53,567	72,525
Other	10,367	11,367	12,367	13,367
Total Assets	435,570	460,877	567,237	648,413
Equity and Liabilities				
Equity Accounts:				
Capital Contributions	466,602	513,442	628,064	713,754
Accumulated Amortization	(123,511)	(149,183)	(180,586)	(216,274)
Capital Contributions, Net	343,091	364,259	447,477	497,480
Retained Earnings	8,598	18,617	39,039	63,178
	351,689	382,876	486,516	560,657
Liabilities:				
Town Development Loan	54,612	45,738	45,297	48,991
Staff Gratuities	23,854	25,848	28,009	30,351
Other	5,415	6,415	7,415	8,415
	83,880	78,001	80,721	87,756
Total Capital and Liabilities	435,570	460,877	567,237	648,413

Notes:

1. The increase in fixed assets is based on the Projected Capital Investment Plan shown on Schedule I.
2. The increase in capital contributions is based on the capital projects to be financed from national and provincial government grants as shown on Schedule I plus tap fees projected to be received after FY 2018/19.
3. Accumulated depreciation is calculated at 5 percent of fixed assets; accumulated amortization is calculated based on 5 percent of capital contributions.
4. Staff gratuities are estimated lump sum payments to be paid to existing employees upon retirement.

TABLE 4.3: SCHEDULE 3 – PROJECTED STATEMENT OF NET INCOME (NPR 1,000s)

	Actual	Projected		
	2018/2019	2019/2020	2020/2021	2021/2022
Operating Revenues:				
Water Sales	41,200	57,047	67,337	71,657
Installation Fees	1,880	720	720	720
Application Fees	43	–	–	–
Late Fees	1,676	1,743	1,813	1,886
	44,799	59,538	69,870	74,263
O&M Expenses:				
Salaries	10,565	20,600	20,600	20,600
Benefits and Allowances	5,950	9,251	9,251	9,251
Repairs and Maintenance	9,316	4,798	4,798	4,798
Business Plan Projects	2,060	–	2,000	1,000
Provision for Inventory W/D	–	–	–	–
Provision for Bad Debts	–	2,250	1,333	1,411
All Other	4,992	8,007	6,409	6,945
	32,883	44,906	44,391	44,005
EBDITA	11,916	14,632	25,479	30,258
Non-Operating Incomes:				
Depreciation, Net	(3,371)	(4,585)	(5,372)	(6,242)
Interest Income	1,478	1,500	1,500	1,500
Interest Expense	(3,786)	(3,028)	(2,686)	(2,876)
Other, Net	1,093	1,500	1,500	1,500
Net Income (Loss) Before Tax	7,331	10,019	20,421	24,139

Notes:

1. Installation & applications fees are generally paid at the time of actual connection. However, about 55 percent of all projected new connections are assumed to have pre-paid these fees before FY 2018/19.
2. Late fees are levied on the amount of delayed payments. It will increase as the water sales increase.
3. The provision for bad debts starting in FY 2019/20 is estimated to be an average of 2.5 percent of water sales.

TABLE 4.4: SCHEDULE 4 – PROJECTED STATEMENT OF CASH FLOWS (NPR 1,000s)

	Actual	Projected		
	2018/2019	2019/2020	2020/2021	2021/2022
Cash Flow from Operations				
Net Income (Loss)	7,331	10,019	20,421	24,139
Depreciation Expense	3,371	4,585	5,372	6,242
Increase in Staff Gratuities	2,171	1,994	2,161	2,342
Change in Working Capital Items	(772)	–	–	–
	12,100	16,598	27,954	32,723
Cash Flow from Other Activities				
Payment for Fixed Assets	(11,917)	(42,600)	(130,361)	(103,100)
Government Grants Received	–	35,640	103,422	74,490
Loan Proceeds from TDF	–	-	9,000	15,000
Tap Fees	4,213	11,200	11,200	11,200
TDF Principal Repayments	(12,885)	(8,874)	(9,441)	(11,306)
	(20,589)	(4,634)	(16,180)	(13,716)
Net Cash Flow	(8,489)	11,964	11,774	19,007
Beginning Cash	38,319	29,829	41,793	53,567
Ending Cash	29,829	41,793	53,567	72,575

Notes:

- Customer tap fees are based on the assumption that 1,200 new customers will be connected to the water system each year (see SVWSUO 2019-2024 Business Plan, Figure 7). It is assumed that 55 percent of these customers paid the tap fee prior to FY 2018/19 and that the remaining 45 percent will pay the tap fee as they connect to the water system over the five-year timeline.
- The details of loan proceeds from TDF and TDF principal repayments are included in Schedule 7.

TABLE 4.5: SCHEDULE 5 – PROJECTED WATER SALES (NPR 1,000s)

	Actual	Projected		
	2018/2019	2019/2020	2020/2021	2021/2022
Available Water Supply				
Supply Capacity in l/s	157	157	192	192
Wet Season Supply in m ³	NA	2,468,794	3,019,162	3,019,162
Dry Season Supply in m ³	NA	1,481,276	1,811,497	1,811,497
	3,528,606	3,950,070	4,830,659	4,830,659
Water Delivered in m³				
Water Production in m ³	3,528,606	3,950,070	4,830,659	4,830,659
Estimated NRW %	36%	36%	31%	27%
	2,258,308	2,528,045	3,333,154	3,526,381
Water Sales in NPR 1,000s				
Water Sold in m ³	2,258,308	2,528,045	3,333,154	3,526,381
Average Tariff in NPR/m ³	18.24	22.58	20.20	20.32
	41,200	57,074	67,337	71,657

Notes:

1. Available water supply is projected to increase to 192 l/s in FY 2020/21 as the Capital Investment Plan projects are completed.
2. Wet season supply in m³ is based on supply capacity in l/s x 86.4 x 182 days; dry season supply is assumed to be 60 percent of wet season supply.
3. The estimated NRW percent starts to decrease in FY 2020/21 as 52 km of old and leaking pipes are replaced and as the NRW Reduction project is projected to start to show results.
4. The average tariff in NPR / m³ in FY 2018/19 reflects 2 months at the previous tariff levels and 10 months at the tariff levels approved in September 2018. On an annualized basis the September 2018 tariff increase resulted in a 16 percent increase in water sales.

**TABLE 4.6: SCHEDULE 6 – PROJECTED SALARIES, BENEFITS & OTHER EXPENSES
(NPR 1,000s)**

	Actual 2018/2019	Budgeted 2019/2020	Projected 2020/2021	Projected 2021/2022
Salaries Expense				
Number of Employees	35	62	62	62
Average Pay/Employee	302	332	332	332
	10,565	20,600	20,600	20,600
Benefits and Allowances				
Salary Expense	10,565	20,600	20,600	20,600
Average Benefit and Allowance %	56%	45%	45%	45%
	5,950	9,251	9,251	9,251
Repairs and Maintenance				
Capital Asset Cost	562,543	700,543	792,604	862,604
Repairs and Maintenance %	1.7%	0.7%	0.6%	0.6%
	9,316	4,789	4,789	4,789
Other Operating Expenses				
Transportation	1,507			
AGM and Committee Expenses	780			
Printing and Stationary	408			
Monitoring and Evaluation	–			
Communications	357			
Chemicals	419			
Electricity	246			
All Other	1,275			
	4,992	8,007	6,409	6,945

Notes:

1. The substantial increase in salary and benefits in FY 2019/20 compared to FY 2018/19 is due to the conversion of contract workers to permanent employee and day laborers to contract workers. The average pay per person per employee will remain same for FY 2020/21 and FY 2021/22.
2. Repair and maintenance consist of labor, materials and civil works for the distribution system.
3. All other operating expenses includes one-off election expenses (happens every four year for the selection of board members and the scheme committee members) in FY 2019/20.

TABLE 4.7: SCHEDULE 7 – PROJECTED TDF LOAN ACTIVITY (NPR 1,000s)

	Actual	Projected		
	2018/2019	2019/2020	2020/2021	2021/2022
Old TDF Project Loans				
Beginning Balance	30,737	21,723	16,041	9,954
Proceeds	–	–	–	–
Less Principal Payments	9,014	5,682	6,087	6,521
Ending Balance	21,723	16,041	9,954	3,433
Accrued Interest	1,994	1,423	1,018	584
Enhancement Project TDF Loan				
Beginning Balance	36,759	32,889	29,697	26,343
Proceeds	–	–	–	–
Less Principal Repayments	3,870	3,192	3,354	3,523
Ending Balance	32,889	29,697	26,343	22,820
Accrued Interest	1,791	1,605	1,443	1,274
New TDF Loan				
Beginning Balance	–	–	-	9,000
Proceeds	–	-	9,000	15,000
Principal Repayments	–	–	–	1,262
Ending Balance	–	-	9,000	22,738
Accrued Interest @ 5%	–	-	225	1,018
All TDF Loans Combined				
Beginning Balance	67,497	54,612	45,738	45,297
Proceeds	–	-	9,000	15,000
Principal Repayments	12,885	8,874	9,441	11,306
Ending Balance	54,612	45,738	45,297	48,991
Accrued Interest @ 5%	3,786	3,028	2,686	2,876

Notes:

1. The outstanding Original Project loan with the TDF that will be paid in full by FY 2021/22 through fixed annual principal and interest payments of approximately NPR 7.1 million.
2. The outstanding loan with TDF for the Enhancement Project that will be paid in full by FY 2026/27 through fixed annual principal and interest payments of approximately NPR 4.8 million.
3. The weighted average interest rate on the two existing TDF loans is 6 percent
4. Proceeds to finance CIP projects are only for those projects to be financed from the TDF. (See Schedule I)
5. Principal payments on new TDF loans are expected to start in FY 2021/22 after the applicable capital projects are put in service.

ADDENDUM: CONSIDERATIONS AND IMPLICATIONS OF COVID-19

The Water Tariff and Cost Review Update report was finalized just before the onset of the COVID-19 pandemic. As the pandemic progressed and caused disruptions globally, WASH-FIN received a request from USAID to consider the implications of COVID-19 on the report. As WASH-FIN was developing a rapid assessment of the impact of COVID-19 on a select group of water utilities, it waited for the results of that study before assessing the implications of the pandemic on tariff setting.

The rapid assessment was conducted on ten water utilities across Nepal during July and August 2020. The findings showed that the water utilities were impacted by the pandemic but not seriously within the early period assessed. High impact was observed for meter reading and billing, tariff collections and human resource availability, including declines in revenues. While utilities did not experience problems meeting their obligations, including debt payments, continued lockdown and decline in revenues could reduce ability to cover costs and repay debt in the future. Five of the ten utilities didn't have reserve funds available and two reported shortage of funds attributed to the COVID-19 induced shut-down. With limited and possibly eroding availability of reserve funds, there is a risk of a backward slide for utilities that have made gains and amplified challenges for utilities already struggling before the pandemic. As such, it is imperative that utilities continue to adjust tariffs and related financial policies to cover the true cost of providing the service and be better able to weather economic risks in the long run. This is the approach recommended in the SVWSUO Water Tariff and Cost Review Update.

SVWSUO had a positive cost recovery ratio from FY 2013/14 to FY 2018/19 but it was insufficient to cover debt service principal and interest on the TDF loans used to finance capital projects constructed between FY 2015/16 and FY 2017/18. Tap fees totaling more than NPR 100 million paid by households requesting a connection to the distribution network were used to pay the principal and interest payments and fund capital expenditures from 2013 to 2018. Going forward, tap fees will not be sufficient to pay for the cost of capital improvements, net of government grants, and is not viable. This reality, combined with increasing operating expenses, will require future tariff adjustments.

The report shows that 98 percent of SVWSUO customers are residential households that consume 95 percent of the total billed water. Fifty-one percent of them consume within minimum block i.e. less than or equal to eight cubic meters of water every month. Most of these customers are economically vulnerable with limited resources to fall back on at the time of emergencies like COVID-19. The tariff adjustment won't affect this group of customers as the average monthly bills for household customers in this minimum block will not change. The increase for most other household customers will be in the 15 to 20 percent range. However, the increase will be smaller for households consuming between 19 cubic meters to 28 cubic meters of water per month. This is due to the existing third tariff block not being increased as part of a transition from a five-block to a simplified three-block tariff schedule, which the report also proposes. The tariff update envisions that the households that consume more water (in excess of eight cubic meters per month) are the ones that are able and willing to pay for the services that they avail.

It is noteworthy that as of September 2020, SVWSUO has started but not yet completed the tariff adjustment approval process due to the pandemic. However, the rationale and the considerations made for the tariff adjustment are still valid even after considering the impact of the COVID-19 pandemic. It is necessary to adjust and simplify the tariff to ensure SVWSUO's operational and capital costs are covered and prudent levels of cash reserves are maintained, consistent with SVWSUO's approved 2019-2024 Business Plan.

U.S. Agency for International Development

1300 Pennsylvania Avenue, NW

Washington, DC 20523

Tel: (202) 712-0000

Fax: (202) 216-3524

www.usaid.gov