



BENTIU WATER UTILITY BOARD BUSINESS PLAN 2021-2021



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Mission Statement

To preserve and enhance our water system so that we may provide safe drinking water at an affordable cost that will further improve the quality of life of our customers and promote economic growth

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Introduction

Protracted conflict and associated economic decline in South Sudan continue to take toll on consistent access to basic services by the people. Services like water supply and hygiene services have been severely affected across states within the country. Access to improved water sources remain a challenging across Unity State. Resource constraints – both financial and human – mean it continues to struggle to maintain services across the city and has no capacity to extend services to underserved areas without external support. Fresh fighting in Unity in July 2016, combined with the conflict-driven economic crisis, hyperinflation, shortages of fuel and consumables, and delays in paying salaries of civil servants has further strained private and public service provision systems. WASH sector in South Sudan remains embryonic, and while some guiding policies exist, legal gaps remain, and operationalization has been slow.

This Business Plan is a product, the wider consultancy assigned to CIVITRA Research and Consulting Inc. Kenya, whose aim are: To develop a policy framework to guide the management of the Bentiu conventional water treatment system and the Rubkona emergency water supply system, support Concern staff in the identification, formulation and training utility management teams for the running of each. Secondly, is to provide recommendations on how to set appropriate tariffs setting as well as simple guidelines for drafting by-laws to support the operations and provide training for stakeholders on the implementation of the guidance. There are two main ways that urban water systems can be run:

- As a public utility
- As a profit making private company

There is also a range of other options such as cooperatives and social businesses, i.e. businesses that reinvest their profits in the business in order to achieve social goals than benefit the shareholders. A public utility is often criticised for poor service.

The immediate plan is to have the Bentiu Water Utility is run as a public water utility under an independent Water Services Board that is composed of experienced civil servants from various ministries and the town council, supervisor of the utility. With the plan to commercialize water services, a cost reflective tariff was designed, and the utility, despite being a public facility, is expected to borrow a lot from the private sector. For instance, recruitment of strong qualified staff, and retaining them by keeping them motivated, customer focus, asset management and

having business acumen that will guarantee a sound financial base. Presently water is free of charge. There are many illegal connections by Government Officers and institutions. These illegal connections are presently being organized and coordinated by the Utility staff. It is against this backdrop that this business plan is being prepared.

Purpose

- I. Five year capital investment and development plan projects that totals US\$ 1,434,921.
- II. This Business Plan provides information generation of revenue should the State Legislative assembly debate and pass a bill cancelling universal free water, recognizing the Water Board as a statutory body and stopping all the illegal connections.
- III. The Plan has details concerning in-process expansion in coverage plans and corresponding financial obligations as well as increased revenue generation
- IV. A raft of accountability mechanisms that views the customers as right-holders and puts them first, is also explained in the Plan, checks and balances within the Utility, as well as citizenry.

This is a 5 year Horizon Business Plan that charts the way to growth for Bentiu Water Utility. In light of the fragile state, the push-and-pull movement of civilians between the PoC and the communities of origin, the Business Plan shows – a US\$ 1,500,000 investment spread over 5 years and shared between strategic capital investment priorities, growth to realize more coverage and capacity development. Mutual accountability mechanisms- internal and external forms the pinnacle of the plan. All these can only be realized with the promulgation of a new legislation that allows for paying for water and recognition of Bentiu Water Utility as a Statutory organ.

Table 1: Core dimensions of Bentiu Utility’s business implementation plan

Core dimension	Key information
<i>WASH sector Enabling environment</i>	Provides an in-depth understanding of South Sudan’s Urban WASH legal and institutional framework, to ensure that operational, management, accountability and contingency plans were in line with national policies and programmes; while responding to and operating within key institutions.
<i>Technical feasibility</i>	Suggests technical improvements needed in the medium- to long-term, to ensure the long-term sustainability of the infrastructure, as well as staff wellbeing and retention.
<i>Commercial viability</i>	Depicts the profile of private buyers likely to purchase water: their patterns of consumption, their purchase power, their service expectations and willingness to pay; as well as a life-cycle cost analysis. It also provides suggestions on arrangements for collection of service charges/tariffs.
<i>Marketing</i>	Provides key information on the main customer base and recommends how to market water sales to each customer segment.
<i>Local accountability mechanisms</i>	Provides recommendations on mechanisms that the community-led operator would need to have in place in accordance with the institutional and legal framework of the sector.
<i>Contingency planning</i>	Provides guidance on how to implement strategies that enable the continued provision of services in the wake of an event that poses an unacceptable business risk and/or operational disruption to Bentiu Water Utility.
<i>Research Studies</i>	Highlights key assessments needed in order to raise the level of service and to bring the whole water facility to standard engineering design and practice. This will in turn lower operational costs, increase revenue as well as deliver quality services.

South Sudan Water Policy

The main focus of the policy is to avail water of sufficient quantity and quality to sustain healthy standards of living and a robust economy, while at the same time ensuring the protection of the ecosystem, e.g. the Sudd as Ramsar site (wetland of international importance). Approved in 2007, the Water Sector Policy outlines how the water sector will evolve in South Sudan, including establishing basic principles with an aim to provide distinction to the broad sub-sectors of the sector, namely: Water Resources Management (WRM), Rural Water Supply and Sanitation (RWSS), and Urban Water Supply and Sanitation (UWSS). In addition to setting up of the Sector Institutions such as a Water Council and preparation of an Investment Plan. The WASH Cluster partners are urged to coordinate their efforts more closely with MWRI and State level actors to ensure that longer term operational sustainability issues are addressed. The policy support States, Counties and communities to develop their own sustainable solutions for service provision, e.g. through private service providers. It is on these basis that Concern Worldwide is supporting the Town Council and the Ministry for State Infrastructure, Housing and Roads to chart a business road map for the next 5 years.

Lastly, According to the Presidential Decree 2008, MWRI also has a regulatory mandate to oversee the performance of UWS services, to inspect rural water facilities and to set water tariffs for urban and rural water. It is also overseeing water resources development, conservation and management.¹

¹ MWRI (2011) Water, Sanitation & Hygiene (WASH) Sector Strategic Framework – “Water for Life and Development, Sanitation and Hygiene for Healthy and Productive Citizens”. Ministry of Water Resources & Irrigation: Juba

Commercial viability

One of CWW-SSD's primary concerns from the outset was the Bentiu Water Utility's commercial viability and sustainability in the context of the protracted political crisis in South Sudan. The priority was to ensure that the Bentiu Water Utility would serve the poorest and most vulnerable people, while remaining a competitive, profitable and thus viable business model within Unity's water supply market; so as to limit, as far as possible, dependency on external agencies such as CWW-SSD. To better support the operating agency in that process, CWW-SSD conducted substantial market research with the users of the Bentiu Water Utility to collect data on their socio-economic backgrounds, business operation models, consumption patterns, service expectations, and willingness and ability to pay for improved water services in the future. Such detailed customer profiling, coupled with a life-cycle cost analysis, helped CWW-SSD refine suggestions to maximize Bentiu's ongoing commercial viability and the efficiency of its operations. This exercise also provided insights on what kind of tariff structure would be most effective in responding to market prices, guaranteeing affordability for the poorest and most vulnerable people and securing the sustainability of service provision.

Water Source

The intake is on the banks of the Bahr-el-Ghazal River. The production of the plant is estimated to be 900M³/day. The main components are as described below: A floating intake and suction pipe in the Bahr-el-Ghazal River. The river flows all year round and is the source of water supply for the two schemes. The water quantity is more than adequate with 98% exceedance flows in the range of 27 Million Cubic Meter/Month.

Description of Present Assets²

The Water supply network in the town consists of a pump intake, a treatment plant, clear water tank, and an elevated tank and transmission and distribution network. The intake is located at coordinates (Latitude: 9.256386°N and Longitude: 29.789789°E).

- The suction pipe is 3 inches GI pipe of length 14m which terminates at the raw water pumping station on the bank.
- Raw water pumping station consisting of 2 pumps Model DE 65/20 with impeller diameter 214mm. The pumps are used in alternation. The exact design discharge and head could not be determined. These

² Concern worldwide, (2020), Final Hydraulic Modelling & Technical Assessment Report Juba: South Sudan

pumps deliver water to the treatment chambers via 40m long GI pipe of 3 inch diameter.

- A compact steel water treatment structure consisting Coagulation, Sedimentation and Filtration Chambers. The chlorinated water is then pumped to the clear water tank.
- The ground concrete clear water tank of volume 95M³. From the tank, water is pumped to the steel elevated tanks.
- Steel elevated tanks (2 No.) each 22.5M³ and totalling 45M³. The height of the steel tower is 12m. From the reservoirs, the water is transmitted by gravity to the entire network. Most of the network consists of public water points with few yard connections and a bulk water dispenser. A spot check at the water points further from the intake witnessed low pressures thereby pointing to hydraulic or supply deficiencies.
- 1 No. Online Chlorine dozer.
- 1 No. Aluminium Sulphate dozing machine
- 4 No. diesel IC engines as Prime Movers of the Pumps: 1 No. raw water pump at the intake, 1 No. for pumping water into the overhead tanks, 1 No. for Alum pumping and finally, and 1 No. potable IC engine for shunting the elevated tanks to supply clean water directly water tankers directly
- A typical public/communal water-point within the Bentiu supply network. They consists of 4 taps.
- Bulk water tankers and donkey carts supplied via a dedicated dispenser at the treatment plant.
- The Bentiu supply system covers an approximate supply area of 5.24KM². The network is divided into three branches. The network has a total pipeline length of approximately 12.441KM. This is summarized in Table 2 below:

Table 2: Bentiu Network pipe information³

Pipe Name	Length (m)	Material	Pipe Diameter (Inch)
Transmission Main	33	HDPE	4
Branch 1	735	HDPE	4
Branch 1 – 2	782	HDPE	2

³ Ditto

Branch 1 – 3	539	HDPE	2
Branch 1 – 4	564	HDPE	2
Branch 1 – 5	1,029	HDPE	2
Branch 2	Total: 926		
	742		• 2
	184	HDPE	• 4
Branch 2-1	308	HDPE	2
Branch 2-2	1,158	HDPE	2
Branch 3	774	HDPE	2
Branch 3 – 1	1,477	HDPE	2
Distribution	4,115	HDPE	2

- There are 48 No. water points whereby 45 No. are communal taps/yard taps/Institutional taps, 2 No. water kiosks and 1 No. bulk dispenser. The institutional water points and yard taps are still shared with the community. Pumping is done for 8.5 hours in a day.
- The operation and maintenance of the scheme is wholly funded by the Concern Worldwide NGO with nil water user fees levied.
- The Asset Base is presently valued at US\$ 256,570, majorly composed of pipework.

The Bentiu Payam is made up of seven (7 No.) Bomas namely; Bilnyang, Bimruok, Derra, Engass\ Hai-Ingass, Kalbalek\ Kalebalek, Kordapdap and Nyuenypiu\ Nyuenpiu. The Bentiu water supply network is wholly located in Bentiu Payam.

Present Reach and Five Years Projections

Table 3: Customer Projections

Utility	Now in 2020	After 5 years
Bentiu	28,744	33,647

Water Consumption per HH

20L/P/D. with the accrued public health benefits, increased uptake of hygiene promotion messages, and with the increased number of people having disposal income and demanding increased level of service in the form of house connections, this figure is expected to increase to 35L/P/D on average by year 5.

Bentiu Town Scheme Extensions

Proposed extensions would lead to additional 14 No. water points to bring the total number of water-points to 62 No. Water points and pipes of various diameters measuring 27, 627m (27.627km) in length i.e an increase of 15, 185m (15.185km) and an area of 8.95km² which is an increase of 3.71km². The additional villages that would be served by these lines are as follows;

- Bilnyang & Bilnyang A
- Thokyier Gany A & B
- Kuer Buona B
- Dar Salam A & B
- Bentiu New Side
- Tieba
- Kab Elek B
- Mankuai
- Nyuenypiu
- Amolithabek
- Bimruok
- Haiyiathak
- Kordapdap A
- Hayengas

For the above rehabilitation to happen, the below listed activities with corresponding financial commitment will have to be done as shown in Table 3 below.

Table 4: Rehabilitation and Extension Plan⁴

Rehabilitation/Upgrading Bentiu BENTIU WATER UTILITY		
Sn/no	Item	Cost (USD)
A1.1	Preliminary and General items	63,830.00
A1.2	Intake & Treatment Plant works including storage units	253,890.00
A1.3	Transmission Pipeline to Bentiu town + water points	243,445.00
A1.4	Generator, Pumps and Pump House	55,091.00
A1.5	Sub- Total	616,256.00
	Add 15% contingency	92,438.40
	Grand total	708,694.40

Bentiu Water Utility Board Composition

It is proposed that oversight of Bentiu Water Utility is delegated by the Town Council (Government Government) and the Ministry of Infrastructure, Roads and Housing to a Water Board that consist of ten members as follows:

- 2 No. Respected members from the Community for each of the Utility (male & female), example a School teachers, Nurse, social worker
- 4 No. Professional in the community – preferably : Lawyer, Engineer, Accountant/Finance backgrounds (not a must)
- 4 WTO

All tariff changes and loans must be approved by the Bentiu Water Utility Board and Town Council.

Burgeoning Population due to improved security and the proposed dissolution of the PoC

With the possibility that the PoCs and IDP Camps at the Hub might be dissolved, and with people returning to their homes and communities to resume normal life, the elevated tanks in both utilities might need to be raised need to 1.5 or two-fold to provide more pressure in order for meet the demand of the increased coverage. Problems portend of excessive pressure in the vicinity of the respective utilities. McKenzie et al., (2002) pointed out that through considerable research, it has been shown that burst frequency is very sensitive to maximum system pressure. An effective leakage management strategy should take into account the pressure dynamics of a water distribution network. Break Pressure Tanks (BPTs) will also need to be constructed along the supply lines for water points in the vicinity of the Water Utility.

Customer Base

There are currently approximately 28,744 people (2020) in Bentiu. On a per capita basis connected customers use 20 lpd. This is projected to rise to 33,647 people in the next four years.

Bulk Suppliers

3 Companies take water in bulk from the Utility in 30M³ trucks/water boozers. These are: (i) Superior, (ii) Nat Oil

Company and (iii) G4. They have special agreements with the Utility. Each brings a barrel of diesel per month, in exchange of the month supply of safe water. The Utility has an agreement with the State Government. However, the nature of the agreement on the supply of water is not known. Each truck makes 8 trips per day. Going forward the Board will re-evaluate these batter-arrangements and put appropriate cash re-imbursements based on the drawn tariff.

Secondly, there are donkey carts that make trips each day to the Utility to get safe water to supply business in the market and food kiosks/restaurants. A donkey cart carries a capacity of 400L. Each trip is charged at 100 SSP.

Access to Water⁵

Most of the respondents (93.5%; N=399) mainly accessed drinking water from known safe sources in the locality. Only 6.3% stated that they accessed their drinking water from the river. This is as shown in the table below.

Table 5: Respondent Sources of Water

Water Source	No. of Respondents (N)	Respondent %
Water Point/Borehole	131	32.8
Yard Tap in Compound	48	12.0
Water kiosk/Tap Stand	186	46.6
Water tanker	3	0.8
Donkey cart vendor	5	1.3
River/stream	25	6.3
Other	1	0.3
Total	398	100

Most of the respondents (90%; N= 399) reported that their primary water source is accessible throughout the year.

⁵ Concern and Unicef (2019), Assessment Report Willingness to pay water services report Rubkona and Bentiu, Unity: South Sudan

Competitors:

Rain water huge financial risk to the operational and tactical goals of Bentiu Water Utility. This is evidenced by the drastic drop in reduction in production from 860M³/day to only 45M³ per day during rainy season. Secondly, as shown in Table 5 above, boreholes comes second after piped water in terms of water access. The Water Utility will therefore have to compete with borehole owners in water services delivery.

Unsatisfied demand:

With the present population/beneficiaries being 28,744 people out of the 41,328 people in Bentiu *Payam*, the unsatisfied demand then is 12,584 people. This represent 30% of the population. However, it is also possible that these are the places where Boreholes (the Utility's Competitors) are concentrated in supplying safe water. With good level of services and customer confidence in the Utility business operations among the communities in Bentiu *Payam*, the 30% remaining still presents huge opportunity for the Utility to expand to.

Tariff:

Currently there is no tariff payment. Communities in Unity are thus eager for solutions to chronic issues such as dilapidated infrastructure, lack of investment and unfair pricing. Ongoing safe access to potable water amid South Sudan's protracted crisis is fundamental to people's survival, and represents a step towards developing a situation of normality and ultimately one in which the people can thrive. A cost reflective tariff of 50 SDG per 20 L Jerrycan has been established (*CIVITRA Research and Consulting Company, 2021*). A program of education of the community, institutional set up as well as a raft of legislations by the State Assembly and Government is expected before mid-2021 in or order to operationalize

payment for water services. to professionalize, and to consolidate management arrangements capable of responding to the community's water needs before, during and after shocks (including spikes in conflict, significant deteriorations in the health situation, including but not limited to cholera, and economic disruption).

Risk:

Short- to mid-term prospects for public investment in infrastructure (including WASH infrastructure) are bleak, with peace building efforts curtailed by the ongoing conflict, to which the vast majority of the state budget is being channelled. Furthermore, South Sudan's WASH sector remains at an embryonic stage, and while some guiding policies exist, legal gaps remain, and operationalization has been slow. This has contributed to the dilapidation of existing service delivery systems, as well as a lack of clarity of sectoral roles and responsibilities, leading to fragmentation and duplication of such roles, exacerbated by weak accountability and oversight systems.

Contingency planning

Bentiu Water Utility provides a vital service to the community. Safeguarding its continued operation before, during and after a crisis is thus crucial to enable the communities to be minimally prepared and to endure and bounce back faster from shocks. Bentiu faces a high security threat, due to the warring clans. Although the town has remained stable for a while, insecurity generated by the crisis is a reminder of how socially and politically volatile the city remains. Bentiu Water Utility and Concern Worldwide acknowledge that Bentiu is also likely to be affected by flooding due to its proximity to the river. Given how vital the water supply is to communities in withstanding crises and bouncing back more quickly from them, it is essential that plans are developed to safeguard its operation during shocks.

Table 6: Proposed Sources of Revenue

		Present	Future
Description ¹		Approx. Annual Amount ((US\$)	Approx. Annual Amount (US\$) ²
1	Tariff (@US\$ 0.39/M ³) ³	97,693	114,301
2	Grants	25,000	25,000
	Universal Connection (as per water points) 17 No. Water points @US\$ 25 service fee	425	1300
4	Kiosks (1 No.) @US\$ 100 service fee	100	1200
5	INGOs Connection (1 No.) MSF Hospital @US\$ 250 service fee	100	250
6	Gvmnt Connection (1 No.) Hospital @US\$ 250 service fee	250	250
	Gvmnt Connection (9No.) Ministries & allied offices @US\$ 100 service fee	900	1400
5	Gvmnt Connection (6 No.) Schools@US\$ 100 service fee	600	1100
6	Connection (as per HH with good disposal income expecting higher level of service) (5No.) @US\$ 100 service fee	500	800
7	Meter Renting @US\$ 50 service fee (47 No.)	2,350	1,500
8	Reconnection fees for defaulters	3,000	9,000
9	Penalties for offenders (contravention of the By laws)	1,000	11,000
		131,918	167,101 ⁴

Table 7: Foreseen capital expenditures to realize Payment for water services

		Present	Future
Description		Approx. Annual Amount ((US\$)	Approx. Annual Amount (US\$) ⁵
1	Purchase of Bulk Water Meters (5No. - @for raw water/intake, for production and 3 No. District Meters for the three mainlines for leakage reduction program) @ US\$ 250	1,250	
2	Purchase of Water Meters (47 No.) @ US\$ 70	3,290	
3	Construct 7 Water Kiosks @US\$ 1,200	8,400	
4	Purchase PRV – Pressure Reducing Valves for the three mainlines for leakage reduction program) @ US\$ 250	1250	
Total Operational Costs including paying for Capital Asset depreciation costs		97,693	114,301 ⁶
6	Meter Testing Costs by third party		2,000
7	Leakage detection program costs		6,000
8	3 No. Motorbikes		3,500
9	2 No. Computer		2,500
	4 Additional critical staff		2,000
	Office Operational Expenses		2,000
	Expenditure on phones and communications		1,000
	Seminar & Workshops on sensitization of customers (education of land lords as stakeholders should be prioritized)		3,500

Systems Strengthening (a) Making digitized as built drawings, Mapping the Network (b) 3No. GPS Hand-held gadgets purchase (c) transformation from a single entry manual accounting system to an automated double entry accrual based accounting system (d) a restructured organization that is closer to customers and more accountability for operational and customer service results, (e) a revised tariff structure that has produced significantly more revenues and provides appropriate subsidies for poor customers, f) a complete inventory and valuation of Bentiu's fixed assets and (f) Marketing and Advertisements		60,000
	111,883	196,801

Note the items above aren't included in Table 4 of the Business Plan

Five Year Capital Improvement Plans and Development Projects

In addition to completing proposed extension project by UNICEF and Concern and following the proposals by the March 2020 Hydraulic Modelling study, and the Report on the Training of Board members', recommendations, the projects listed in Table 13 of this plan shall be carried out over the FY 2021 to F2025 time period.

Table 8: Capital Improvement Plans and Software (Capacity Building) for 5 Years

	5 Year Plan	Estimate FY 2021	Projected FY 2022	Projected FY 2023	Projected FY2024	Projected FY2024
Investments						
i. Rehabilitation/Upgrading Bentiu BENTIU WATER UTILITY	708,694	208,694	500,000			
ii. Purchase of Bulk Water Meters (5No. - @for raw water/intake, for production and 3 No. District Meters for the three mainlines for leakage reduction program) @ US\$ 250	1,250		1,250			
iii. Purchase of Water Meters (47 No.) @ US\$ 70	3,290		3,290			
iv. Construct 7 Water Kiosks @US\$ 1,200	8,400		8,400			
v. Purchase PRV – Pressure Reducing Valves for the three mainlines for leakage reduction program) @ US\$ 250	1250		1250			
vi. Meter Testing Costs by third party	2,000		2000			
vii. Leakage detection program costs	6,000		6000			
viii. Fire Hydrants	12,000		12,000			
ix. Air Compressor and related horse pipes of appropriate size and pressure gauges – for Pipes, Pumps and IC Engine Cleaning	12,000	12,000				

x.	Pressure gauges/Meters at the Pump House, Storage Supply tank, and one per main lines (3No. Mainlines)	4,000	4,000				
Studies							
i.	NRW: Leakage Studies and detection	15,000			15,000		
ii.	Mapping and Digitization of the as-built designs and drawings	15,000				15,000	
iii.	Operational , Human Resources and Financial Systems Study	10,000		10,000			
iv.	Complete inventory and valuation of Bentiu's fixed assets	7,500	7,500				
v.	Solarization of the System to save at least 30% of the energy costs(Hybrid Model Study)	10,000					10,000
Operational Projects							
i.	Transformation from a single entry manual accounting system to an automated double entry accrual based accounting system	8,500		8,500			
ii.	4 Additional critical staff	2,000				2,000	
iii.	Customer Complaint Center	500	500				
iv.	Customer Meter Replacement	5,000					5,000
v.	3 No. Motorbikes (125 cc capacity engines) and 5 Bicycles	4,000		4,000			
vi.	2 No. Computer	2,500		2500			
vii.	Washouts ⁷	2,500		2500			
viii.	Regular Pipe Cleaning ⁸	8,000		2,000	2,000	2,000	2,000
ix.	Pipe Marker Posts in the fields that are frequently set on fire	2,500	2,500				
x.	Pipe repairs, replacements, and rehabilitations and extensions	16,000	3,200	3,200	3,200	3,200	3,200
xi.	Valve Chambers and Section Valves	7,500	3,500	3,500			
		875,384	241,894	570,390	20,200	22,200	20,200

Commercial loans terms are onerous and include interest rates of approximately 10% and repayment terms of no more than eight years. For these reasons, the water expansion, main replacements and operational projects will need to be funded from utility earnings. The Consultants recommends that due to the necessity of some of these items as they are meant to bring the Water Utility to Standard practice, grants should be sought to complete these items.

Financial Projections

Key Assumptions

Bentiu Utility's investment plan and cash flow projections that are included on the following pages have been prepared based on information provided by the Utility's management. The key assumptions that were used as the basis for the investment plan and cash flow projections are as follows:

1. The number of private (domestic) connections will increasing. Of course this is dependent on the volatile security situation in the country and the State in particular.
2. The number of non-domestic connections will increase following the passing of the bill into law on cancellation of Universal Free Water and the recognition of the Board.
3. Billed water use per customer per month will increase following assertiveness of the new Board.
4. Water tariffs will increase 20% in FY 2022 in order to provide necessary funds for projects.
5. The estimated collection rate will increase gradually from 0% in FY 2021 to 98% in FY 2023.
6. Salary and wage rates will increase 10% annually.
7. NRW will decrease 3% per year from 2022 to 2015 as the NRW project initiated by Bentiu Water Utility is implemented.
8. Electricity expense will increase based on the percent increase in annual water production plus 50%. The all-in unit cost of energy will increase 7% annually.
9. Chemical expense will increase based on the percent increase in annual water production plus an assumed annual increase in the unit cost of chemicals of 10%.
10. Fuel and lubricate expense will increase at annual rate of 15%
11. Maintenance and repair expense will increase at an annual rate of 10% plus estimated increments for new boreholes and additional vehicles (5%)
12. Loans from the Financial Markets will bear interest at 12 % and will be payable over a 25 year repayment period.

Additional explanatory notes are included with the Investment Plan and Cash Flow Projections on the following pages. Details of revenues, expenses and debt service are also included in this section of the business plan.

Cash Projections

Table 9: Five Years Cash Projections for Bentiu Utility

sal. Incr. is 10%	110%		tariff incr. is 20%	120%	Fuel incr. is 15%	
	5 Year Plan	Estimate FY 2021	Projected FY 2022	Projected FY 2023	Projected FY2024	Projected FY2025
Operating Revenues						
Water Sales	726,992	97,693	117,232	140,678	168,814	202,576
Other operating revenues	254,689	34,225	41,070	49,284	59,141	70,969
Total operating revenues	981,681	131,918	158,302	189,962	227,954	273,545
Operating Expenses						
Salaries & Wages	79,509	13,023	14,326	15,758	17,334	19,068
Chemicals	94,903	15,545	17,099	18,809	20,690	22,759
Fuel & Lubricants	95,978	14,235	16,370	18,826	21,650	24,897
Maintenance & repairs	39,329	7,118	7,473	7,847	8,239	8,651
Other operating expenses	22,426	4,058	4,261	4,474	4,698	4,933
Total operating revenues	332,144	53,979	59,530	65,715	72,611	80,308
Cash flow from Operations	649,537	77,939	98,772	124,247	155,343	193,237

Water Sales Projections

Table 10: Water Sales Projections

	Estimate FY 2021	Projected FY 2022	Projected FY 2023	Projected FY2024	Projected FY2025
1. Number of Customers		1.01	1.05	1.04	1.05
Private - Domestic (# of benefs)	28,744	29,031	30,483	31,702	33,287
Non-Domestic (# of benefs)	1,500	1,515	1,591	1,654	1,737
	30,244	30,546	32,074	33,357	35,025
2. Billed Annual in Use (Cubic meter)	251,120	301,344	361,715	433,934	520,855
3. Composite Water tariff (US\$/M3)	0.39	0.47	0.56	0.67	0.81
4. Total Water Billed (R2 X R3)	97,937	141,029	203,139	292,437	421,218
5. Estimated Collections	100%	65%	75%	83%	90%
6. Total Water Sale (R4 X R5)	97,937	91,669	152,354	242,722	379,096

Monitoring and Evaluation

Table 11: Performance Indicators

	Unit	2021 Baseline	2022	2023	2024	2025
EQUITABLE SERVICE						
1. Population served with access to water supply	%	-	76	80	83	87
2. Population with household connection	%	-	27	29	31	33
3. Operating cost coverage ratio (op. rev/op. exp.)	%	-	150+	150+	150+	150+
4. Water consumption	L/p/d	-	36	37	37	38
EFFICIENT SERVICE						
5. Ratio of staff per thousand water connections	%	-	9.2	8.6	8.2	7.8
6. Revenue/ Bill collection efficiency	%	-	90	92	94	96
7. Staff with vocational qualification or above	%	-	26	32	38	44
8. Unaccounted for Water (w. delivered- w. billed)/w. delivered)	%	-	29	28	27	26
9. Energy efficiency (kWh / water delivered)	Ratio	-	TBD	TBD	TBD	TBD
SUSTAINABLE SERVICE						
10. Pipe extension executed	Km	-	21	21	22	23
11. No. of pipe breaks (per year/per km)	Ratio	-	TBD	TBD	TBD	TBD
12. No of water samples testing with negative coli forms against total	%	-	87	89	91	93
13. Training Program (training hours/employee)	Ratio	-	5	7	7	10

Table 12: Recommended indicators for physical losses and NRW (Source: Alegre et al., 2000)

Function	Level	Performance Indicator
Financial: NRW by volume	1 (Basic) ⁹	Volume of NRW [% of system Input Volume]
Operational: Physical losses	1 (Basic)	[Litres/service connection/day] or [litres/km of mains/day](only if service connection density <20/km)
Operational: Physical losses	2 (Intermed.) ¹⁰	[litres/service connection/day/m pressure] or [litres/km of mains/day/m pressure][only if service connection density is<20/km)
Financial: NRW by cost	3 (Detailed) ¹¹	Value of NRW[% of annual cost of running system]
Operational: Physical Losses	3 (Detailed)	Infrastructure leakage index (ILI)

Further, the Business Plan envisages the promulgation of a legislation that will stop Universal Free Water, and therefore stopping all the illicit connections and water theft, subsequently reducing commercial/apparent losses, therefore increasing water production and sales and revenue.

Bentiu Water Utility Board should develop systems and procedures to be able monitor and report on the above performance measures in a way that can be periodically verified by external stakeholders.

Accountability

Although financial constraints matter, they do not constitute the only barrier. WaterAid’s report *Bridging the gap – Citizens’ Action for accountability in water and sanitation*⁶ argues that the missing ingredient needed in order to reach poor people is accountability to the people, which necessitates the meaningful involvement of users in the planning, delivery and monitoring of water services. This increases the chances of delivering reliable, sustainable and affordable water services to more urban inhabitants.⁷

The engagement of users in utility reforms and ongoing service improvement processes is crucial, since reforms to improve efficiency (inevitably the main driver for reforms) do not “necessarily translate into geographical equity or a commitment to serve the poor... without incentives, a clear mandate to serve the poor or a ‘champion’, companies chase markets that are ‘easy’, offer the highest returns and do not require subsidies”.⁸ However, user engagement is far from simple and its outcomes far from predictable. Table 13 and 14 below expound on the provider and user side accountability tools to be deployed.

6 WaterAid 2006

7 WB 2009

8 Castro and Morel 2008 p291

Table 13: Provider-side accountability tools

Aim	Mechanism	Description	Leading Agency	How often
<i>Information and consultation</i>	User outreach/ad hoc user meetings and forums	Display public information on: <ul style="list-style-type: none"> - Water tariffs - Opening hours - Complaint phonenumber - Emergency numbers 	Bentiu Water Utility Board General Assembly	Beginning of operations and update as needed
	Publication of performance data	<ul style="list-style-type: none"> • Display public information on: <ul style="list-style-type: none"> - Amount of water produced - Amount of water sold - # of complaints, type of complaints and how long it took to resolve - Water quality • Produce quarterly financial and technical reports 	Bentiu Water Utility Management Users' Committee	Information on monthly basis; report every quarter to be shared with local government authorities, Concern Worldwide and Bentiu Water Utility Board

Standard setting and regulation	Contract with service provider	Performance contract between Bentiu Water Utility and Water Facility O&M Team, which specifies expectation of service provided (water quality standards, opening hours, etc.)	Bentiu Water Utility Management Users' Committee	Beginning of operations
	Regulation	Development and ratification of customer charter and integrity pacts	Draft by Concern Worldwide and agreement by Bentiu Water Utility Management Users' Committee	
Performance monitoring and feedback	Retrospective performance/perception surveys	Conduct customer satisfaction surveys to follow up on service commitments and identify inefficiencies and problem areas	Bentiu Water Utility Management Users' Committee	Quarterly basis
Redress and recourse	Internal complaint/grievance mechanisms	Define how people complain, to which point of contact, how long it takes for complaints to be resolved and what kind of responses are given	Bentiu Water Utility Management Users' Committee	Beginning of operations

Table 14: User-side accountability tools

Aim	Mechanism	Description	Leading Agency	How often
Information and consultation	Citizen's charter	Bentiu Water Utility Users' Charter: Bentiu users spell out Provider responsibilities and service standards for ratification by provider, with regular monitoring meetings to evaluate progress	Users' Group representatives (HH, bicycle vendors, water tankers)	Beginning of operations and meetings on regular basis
Performance monitoring and feedback	Citizens' user platforms	Bentiu Water Utility users' platforms: users meet to reach coherence and consensus as to service challenges	Users' Group representatives (HH, bicycle vendors, water tankers)	Meet when needed, initially supported by Concern Worldwide
Redress and recourse	Use of complaint mechanisms	Bentiu Water Utility Users' make use of complaint mechanisms to individually or collectively voice grievances that help improve services and receive compensation	Bentiu community	When needed

Financial sustainability

To demonstrate Bentiu's commercial viability, the plan has also projected cash flow following the principles of the life-cycle cost analysis and cost recovery. Using these approaches, it is possible to account for expenses to enable the Bentiu Water Utility's short-term and long-term operationality, including provisions to replace, extend and enhance the water supply system (Tables 7, 8 and 9). By calculating the level of expenditure, it is in turn possible to demonstrate just how much the community-based operating agency would have to charge to operate on a cost-recovery. Calculations revealed that even charging the very minimum, in an optimal scenario, the Bentiu Water Utility's financial sustainability was assured. This demonstrated that, if transparent and effective cash handling procedures were followed, money generated through the sale of water would be enough to cover monthly expenditures (operations and minor maintenance), while setting aside enough for major replacements and even a surplus that could be used as a community revolving fund to finance activities for the wider benefit of people living in the Bentiu area. Most sources of expenditure are considered, but moving forward it is likely that new costs will be incurred. For example, taxes are not included in initial calculations because the concept of social enterprise in South Sudan is new, and it remains unclear how the government will tax this business.

(Footnotes)

1 As per MWRI (2011) Water, Sanitation & Hygiene (WASH) Sector Strategic Framework – “Water for Life and Development,

Sanitation and Hygiene for Healthy and Productive Citizens”. Ministry of Water Resources & Irrigation: Juba, for example in Juba in 2011, UWC had a total of 2504 customers, each paying between US\$ 2.5 and US\$ 40per month i.e. an *average of US\$ 8.4 per month. In addition, UWC charges a connection fee of 255 SDG (USD 102).*

2 For the water point, it will be 250 users per tap. In a Water point, there are 4 No. Taps. This bring the number to 1,000 per water point. Based on a per a per capita usage of 20L/p/d, then this comes to 20,000 liters per day. Taking US\$ 0.39 per M3, then this comes to US\$ 19.8 per water point. For 17 Water points, this comes US\$ 2,847 income per day. Multiply by 365 days = US\$ 48,399

3 For the water point, it will be 250 users per tap. In a Water point, there are 4 No. Taps. This bring the number to 1,000 per water point. Based on a per a per capita usage of 20L/p/d, then this comes to 20,000 liters per day. Taking US\$ 0.39 per M3, then this comes to US\$ 19.8 per water point. For 17 Water points, this comes US\$ 2,847 income per day. Multiply by 365 days = US\$ 48,399

4 Note that a major part of this is loan (@US\$120,000). It is expected that with Governance and Board oversight, including capacity building on financial management, the credit rating for Bentiu Water Utility should raise and so is the capacity to source money from domestic financial market

5 From Table 3, this will be a 20% increase in population

6 The same value in Table 6 future water production costs. As this is a Non-Profit public body production costs is approximately the same as sales costs with zero profit margin. Note that Annuity for Capital recovery costs has been factored in already

7 Required for minimum 10m drop in elevation. This can be found on the worksheets of the Hydraulic Modelling Report (March, 2020). Fortunately, Sud swamp is relatively plain/flat and so not so many wash-outs will be required.

8 Is based on Hydraulic Modelling studies and the installation of fire hydrants and valves

9 Level 1 (basic): Is a first layer of indicators that provides a general management overview of the efficiency and effectiveness of the water supply undertaking.

10 Level 2 (intermediate): Additional indicators that provide a better insight than the Level 1 indicators; for users who need to go further in depth.

11 Level 3 (detailed): Indicators that provide the greatest amount of specific detail, but are still relevant at the top management level.



Notes

www.concern.net

Republic of Ireland

52-55 Lower Camden Street Dublin 2

+ 353 1 417 77 00

info@concern.net

Northern Ireland

47 Frederick

Street Belfast

BT1 2LW

+ 44 28 9033 1100

belfastinfo@concern.net

England and Wales

13/14 Calico

House Clove Hitch

Quay London

SW11 3TN

+ 44 207 801 1850

londoninfo@concern.net

USA

355 Lexington Avenue

19th Floor

New York

NY 10017

+ 1 212 5578 000

info.usa@concern.net

Republic of Korea

Chunji Building, 2F, 374

1 Seogyo-dong, Mapo-

Gu Seoul, 121 894

+82 324 3900

info.korea@concern.net