

# ZAMBIA

*Reform of the Water Sector Programme Phase II in Zambia (RWS II)*

**Water kiosk Package of Measure**

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## TABLE OF CONTENTS

ABBREVIATIONS	2
EXECUTIVE SUMMARY	3
1 INTRODUCTION	3
2 INVESTMENT PACKAGES FOR CHILIPI DISTRICT	4
2.1 Package of Measure	4
2.2 Outline of Investment Package for Chipili District	4
3 PROPOSED IMPLEMENTATION MECHANISMS OF THE INVESTMENT PACKAGE	5
4 CONCLUSION	6
5 ANNEX I: WATER KIOSK DRAWINGS FOR THE PROPOSED INVESTMENT PACKAGE	7
6 ANNEX II: BILL OF QUANTITIES FOR PROPOSED WATER KIOSK INVESTMENT PACKAGE	9

### *List of Tables*

Table 1: Outline of Investment Measures for the District	4
Table 2: Cost Estimates for Water Kiosk Investment Package	6

### *List of Figures*

Figure 1: Implementation Approach for the Proposed Investment Package	5
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## **ABBREVIATIONS**

AA	-	Action Area
BoQ	-	Bill of Quantity
CSE	-	Construction Support Engineer
CPs	-	Cooperating Partners
CU	-	Water Supply and Sanitation Commercial Utility
GIZ GmbH	-	Deutsche Gesellschaft für Internationale Zusammenarbeit
LpWSC	-	Luapula Water Sanitation Company
MWDS	-	Ministry of Water Development and Sanitation
NWASCO	-	National Water Supply and Sanitation Council
O&M	-	Operation and Maintenance
RGC	-	Rural Growth Centre
RWSII	-	The Reform of the Water Sector Programme Phase
WASH	-	Water Sanitation and Hygiene

## EXECUTIVE SUMMARY

This report presents an investment package for water kiosks in Chipili District in Luapula province. Chipili currently has a total of 143 hand pumps, of which 96 are functional and 47 are not functional. There are no water kiosks in the entire district. The approach to developing the water kiosk investment package was centered around improving efficiency and the reliability of the water supply in the district. From the case study of the effectiveness of water kiosks, an investment package was developed with accompanying drawings and bill of quantities.

The cost of transforming one functional hand pump to a water kiosk is K80,000 ZMK. The proposed works include:

- 1) Pump testing
- 2) Installation of Solar Powered Pump, Solar Panels and all accessories
- 3) Setting up of steel tank to support 10,000 litre tank
- 4) Construction of steel water kiosk
- 5) Construction of concrete apron
- 6) Lined drainage and soak pit

## 1 INTRODUCTION

Following up from Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ) RWS Phase I that was implemented from 2015 to 2019, the RWS Phase II programme sought to focus on improving the conditions for transparent planning and implementation process for securing water and sanitation services as well as ensuring skills development in the water sector are improved. The implementing activities were clustered into four action areas of the RWS II, namely;

- 1) Sector policy support
- 2) District/rural WASH management in Luapula
- 3) Urban WASH and industrial wastewater management in Lusaka
- 4) Jobs and skills development in Lusaka, Luapula and nationally

The developed water kiosks investment package will contribute to the attainment of the RWS II, objective in that it will improve the efficiency and reliability of the water service supply in Chipili District. The appropriate government partners would be the Ministry for Water Development and Sanitation (MWDS) on implementation level. At the operational level working with the Luapula Water Sanitation Company (LpWSC), Chipili Town Council, in Luapula and the National Water and Sanitation

Council (NWASCO).

Action Area 2 aims to support local authorities in four districts of Luapula Province to develop gender-sensitive District WASH investment plans to improve water supply and sanitation in rural areas and rural growth centers while taking into account the nexus between WASH and nutrition.

## **2 INVESTMENT PACKAGES FOR THE DISTRICT**

The proposed package is the transformation of one hand pump to a water kiosk. This will improve the efficiency and the reliability of the water supply in Chipili district.

### **2.1 Package of Measure**

The design of the investment package is to address the following:

1. Energy source
2. Pumping system
3. Water Storage

### **2.2 Outline of Investment Package for the District**

Chipili currently has no water kiosk in the entire district. However, there are 143 hand pumps, of which 96 are functional and 47 are not functional. The proposed intervention is to transform one function hand pump into a water kiosk. The outline of the measure is provided in the table below.

*Table 1: Outline of Investment Measures for the District*

<b>Sn.</b>	<b>Component Detailed Description</b>	<b>Investment Required</b>
1.	Water Storage	Supply of a PVC 10,000 liter tank
2.	Submersible pump	Install a 0.75Hp Solar Powered Submersible Pump
3.	Solar Panels	Installation of 6x 365 Watts Solar Panels
4.	Water Kiosk	Construction of Water Kiosk, per the drawings provided
5.	Soak away	Construction of a Soak away, per the specifications provided

### 3 PROPOSED IMPLEMENTATION MECHANISMS OF THE INVESTMENT PACKAGE

The approach to identifying the investment measures ranged from observations to case studies where strengths and weaknesses of water kiosks in various communities were identified. It is from these studies that the investment measures have been developed and detailed drawings and BOQs prepared.

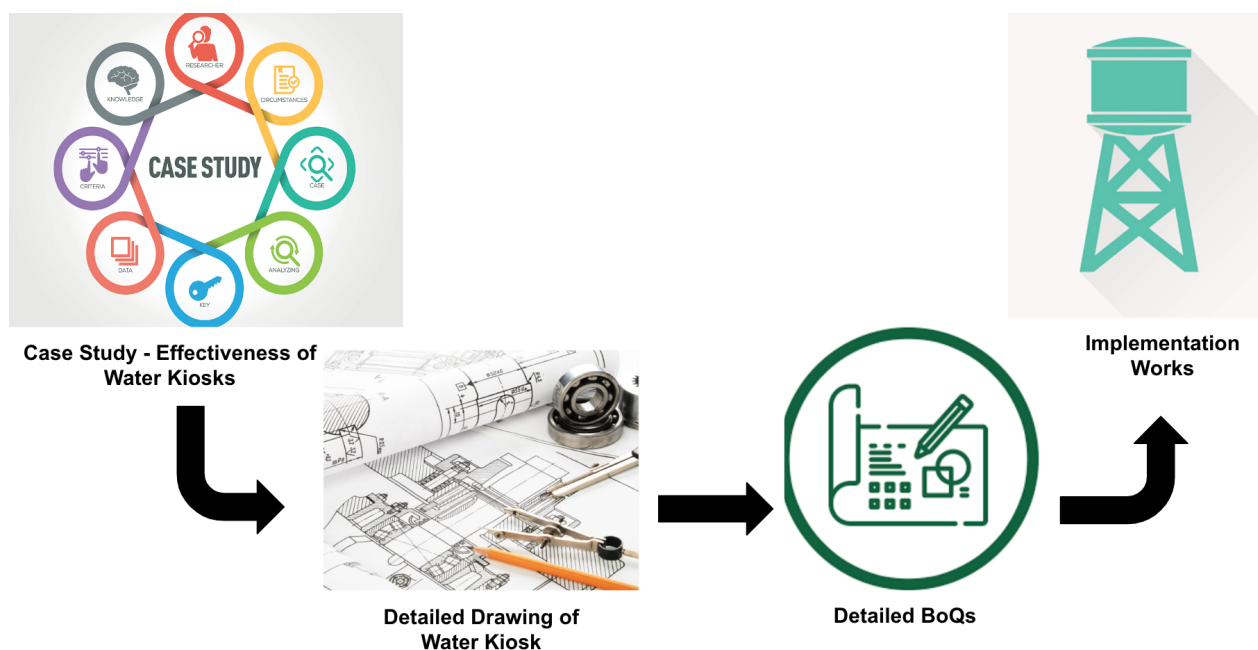


Figure 1: Implementation Approach for the Proposed Investment Package

Installation of solar energy solutions will ensure that the cost of supplying water to the communities is made affordable as that will eliminate the cost of electrically remitted to the commercial utility.

Availability of the water supply at any given time regardless of the time of years is an important core element of the proposed investment. Package. Therefore, the proposed water storage will be significant to move water available throughout the day.

*Table 2: Cost Estimates for Water Kiosk Investment Package*

<b>Item</b>	<b>Description</b>	<b>Amount (ZMK)</b>
1	Preliminaries and General Items	-
2	Borehole, Solar Powered Pump and Tank Stand	65,310.00
3	Water Kiosk	15,776.84
	<b>TOTAL</b>	<b>81,086.84</b>

## **4 CONCLUSION**

The investment of a water kiosk system presented has been developed for Chipili district. Chipili district is one of the districts in Luapula province that has no water kiosk water supply system. It has a total of 143 hand pumps of which 96 are functional.

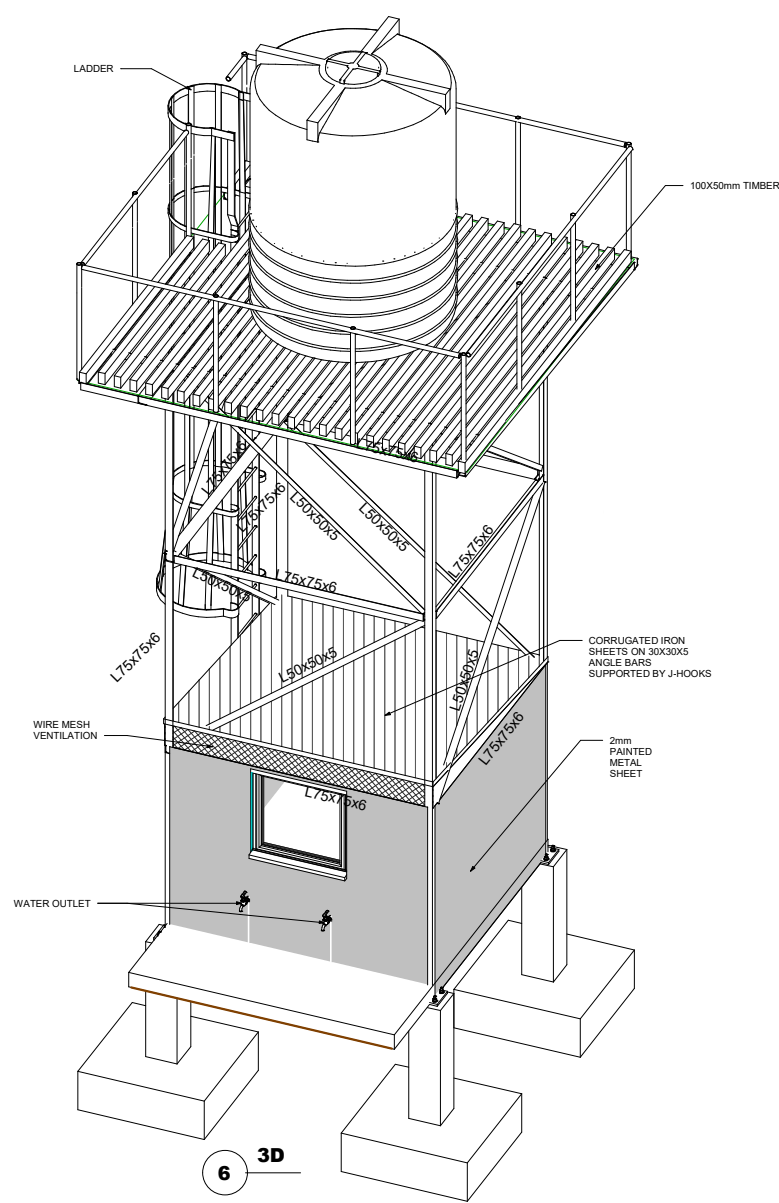
The first step in developing investment packages of water kiosks supply systems is to understand the water kiosks system operation and any failures exhibited by the system. This was conducted by a case study that sought to investigate the effectiveness of the eight (8) water kiosks in Mwansabombwe District. The summary of the findings there highlighted the strengths and weaknesses of the water supply system which have been used to help develop the investment package.

Overall, the proposed investment package includes;

1. Pump testing
2. Installation of solar powered pump, solar panels and all accessories
3. Setting up of steel tank to support 10,000-litre tank
4. Construction of steel water kiosk
5. Construction of concrete apron, lined drainage and soaked pit

The results of the case study conducted identified, informed the engineering drawings. Thereafter, detailed BOQs and costings are compiled in readiness for implementation of works.



[illegible]

## WATER KIOSK DRAWINGS

Project number	CHPL-01
Date	10-12-2022
Drawn by	N.MUMBA
Checked by	
S.1	
Scale	As indicated



<p style="text-align: center;"><b>PROPOSED CHIPILI WATER KIOSK</b></p>	
<p style="text-align: center;"><b>ELEVATIONS AND LAYOUT</b></p>	
Project number	CHPL-01
Date	10-12-2022
Drawn by	N.MUMBA
Checked by	
<p style="text-align: center;"><b>S.2</b></p>	
Scale	As indicated

	<p style="text-align: center;"><b>BILL OF QUANTITIES</b>  <b>For the proposed</b>  <b>WATER KIOSK</b></p> <p style="text-align: center;"><b>BILL No. 1 PRELIMINARY AND GENERALS</b></p> <p>NOTE:</p> <p>The Standard Preliminaries for Building Contract included in Section "A" of the Standard Specification of Materials and Workmanship for Building Works dated February, 1973 of the Contract Documents, have been omitted in its entirety there from, and replaced by the General Conditions and Preliminaries in this Bill of Quantities which shall be read, and understood to the full extent and meaning of each clause</p> <p><b>1 <u>PRELIMINARY PARTICULARS</u></b></p> <p><b>1.01 Description of Works</b></p> <p>The works covered by the provisions of these Bills of Quantities are those required for the Construction of a Water KIOSK</p> <p><b>1.02 Names of Parties</b></p> <p>Employer:</p> <p>Civil Engineering Consultant:</p> <p>User:</p> <p>The aforementioned terms of the parties shall be deemed to include their authorised representatives.</p> <p><b>1.03 Other Consultants</b></p> <p>None</p> <p><b>1.04 Description of Site</b></p> <p>Existing drainage and services are situated on the site and the Contractor shall take all necessary precautions not to disturb these.</p> <p style="text-align: center;"><b>BILL No. 1 PRELIMINARY AND GENERALS</b></p>		
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ITEM	DESCRIPTION	QTY	UNIT	RATE (ZMK)	AMOUNT (ZMK)
2	<b><u>BOREHOLE, SOLAR POWERED PUMP AND TANK STAND</u></b>				
	<b><u>Pump Testing</u></b>				
A	Carry out step draw down, 4 steps @1hr,4hrs continous discharge test, 6hrs or 90% of DD recovery	6	Hr	833.33	4,999.98
	<b><u>Supply and installation of Solar Powered Pump and Accessories</u></b>				
B	Supply and install an AC/DC Solar Powered Submissible Pump System and accessories with the	1	No.	15,000.00	15,000.00
C	Change Over Switch	1	No.	250.00	250.00
D	6mm2 DC Cables - Black	40	m	20.00	800.00
E	6mm2 DC Cables - Green	40	m	20.00	800.00
F	Rubber seal	1	Roll	105.00	105.00
G	40mm poly elbow	2	No.	25.00	50.00
H	40mm poly Adaptor	2	No.	25.00	50.00
I	Cable conduit 15mm *3mtrs- Bunches	1	No.	550.00	550.00
J	2.5mm2 ,3 core marine cable	100	m	20.00	2,000.00
K	Security Solar Light ,complete set with pole	1	item	1,500.00	1,500.00
L	Supply and install 6x 365Watt Solar Panels mounted on a steel stand mounted to the elevated tank	3	No.	4,500.00	13,500.00
	<b>To Collection</b>			<b>K</b>	<b>34,605.00</b>
ITEM	DESCRIPTION	QTY	UNIT	RATE (ZMK)	AMOUNT (ZMK)
	<b><u>Steel Tank Stand and Solar Pannels Support</u></b>				
	Supply and mount 6M high steel water tank stand to concrete sub columns with 16no hold down bolts. The tank stand must be complete with 6mm thick cheque plate platform and ladder for access including all excavations, backfilling and				

	reinforced concrete stub columns and bases. the stub columns to extend upto 2m above ground to allow the construction of a water kiosk under the steel water tank.				
A	Excavations above 1m but not exceeding 1.5m	9	m3	98.00	882.00
B	Ditto in Hard rock	3	m3	400.00	1,200.00
C	C25 Concrete for Foundation and in Stab Columns	5	m3	1,200.00	6,000.00
D	Y16 Reinforcement	150	kg	22.50	3,375.00
E	Supply and Install 75*75*4mm Steel Angle bars as load bearing (6Mtrs length)	7	No.	650.00	4,550.00
F	Supply and Install 50*50*5mm steel angle bars as Supporting members (6Mtrs length)	12	No.	390.00	4,680.00
G	Timber: 100x50mm	15	No.	160.00	2,400.00
	<b>To Collection</b>			<b>K</b>	<b>22,205.00</b>
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>QTY</b>	<b>UNIT</b>	<b>RATE (ZMK)</b>	<b>AMOUNT (ZMK)</b>
AA	<u><b>Water Tank</b></u> Supply and mount ultraviolet UPVC treated 10,000 litres PVC tank on flat softwood planks on	1	No.	8,500.00	8,500.00
	<b>To Collection</b>			<b>K</b>	<b>8,500.00</b>
	<b>COLLECTIONS</b>				
	Page 2				34,605.00
	Page 3				22,205.00
	Page 4				8,500.00
	<b>BOREHOLE, SOLAR POWERED PUMP AND TANK STAND - TOTAL CARRIED TO SUMMARY</b>				<b>65,310.00</b>

ITEM	DESCRIPTION	QTY	UNIT	RATE (ZMK)	AMOUNT (ZMK)
3	<b><u>WATER KIOSK</u></b>				
	<b>Preamble</b> The water kiosk to be built under the elevated steel water tank				
A	Excavate trench to receive foundations commencing at reduced level and not exceeding 1.50m	7.2	m3	98.00	705.60
B	<b><u>Extra over</u></b> all items of excavations for excavating in hard rock	1.44	m3	400.00	576.00
C	Backfilling to foundations with materials arising from the excavations deposited and compacted in	2.88	m3	98.00	282.24
D	<b><u>Hardcore filling</u></b> 150mm thick bed of hardcore laid level and well compacted to AASHO MOD 98%	9	m2	102.00	918.00
	<b>To Collection</b>			<b>K</b>	<b>2,481.84</b>
ITEM	DESCRIPTION	QTY	UNIT	RATE (ZMK)	AMOUNT (ZMK)
	<b>PAINTING AND DECORATING</b>				
	<b><u>Prepare and apply one undercoat and two coats of gloss paint on the following:</u></b>				
A	Meat Sheet Wall	24.0	m²	35.00	
	<b><u>Plumbing</u></b>				
B	Supply and install all accessories for the Kiosk and connect to the water tank	1.0	item	2,500.00	2,500.00
C	Construct a concrete apron for the kiosk	1.0	item	1,500.00	1,500.00
	<b><u>Soakaway</u></b>				
D	Excavate oversite 100mm deep in 'pickable materials and cast a distance not exceeding 50 metres and spread and level where directed	10	m²	55.00	550.00
E	Excavate in pits not exceeding 1.50m deep and				

	get out	15	m³	98.00	1,470.00
G	Ditto exceeding 1.5m deep but not exceeding 3.0m ditto	10	m³	120.00	1,200.00
	<u>Extra over excavating in hard rock</u>	2	m³	400.00	800.00
H	Fill soakaway with stone of various sizes up to the level as directed	23	m³	200.00	4,600.00
I	Layer of polypropylene woven sheeting laid on top of rocks	9	m²	75.00	675.00
	<b>To Collection</b>			<b>K</b>	<b>13,295.00</b>
	<b>COLLECTIONS</b>				
	Page 1				2,481.84
	Page 2				13,295.00
	<b>WATER KIOSK - TOTAL CARRIED TO SUMMARY</b>			<b>K</b>	<b>15,776.84</b>

BILLS OF QUANTITIES For the PROPOSED WATER KIOSK  GENERAL SUMMARY		
REF.	DESCRIPTION	AMOUNT
BILL NR. 1	PRELIMINARY AND GENERALS	ZMW -
BILL NR. 2	BOREHOLE, SOLAR POWERED PUMP AND TANK STAND	ZMW 65,310.00
BILL NR. 3	WATER KIOSK	ZMW 15,776.84
	Total	ZMW 81,086.84
	Value Added Tax @16% (Not Applicable)	
	GRAND TOTAL AMOUNT	ZMW 81,086.84