



CHEMUSUSU WATER COMPANY LTD

1. Introduction and Background

The development objective of K-WASH is to increase sustainable access to improved water and sanitation services, eliminate open defecation, and improve the financial performance of water services providers in 19 selected counties. The K-WASH Program is a hybrid program that combines the Program for Results (PforR) financing instrument⁵ and technical assistance component provided through the Investment Project Financing (IPF) instrument.

Through this program the PIAP will detail a series of key performance indicators (KPIs) to measure improvement in operational and financial performance (NRW, energy efficiency, billing ratio, collection ratio, staff per connection, debt service ratio and current ratio etc.) and set up a clear roadmap for improvement on each of the indicators.

This program will go along away in improving water access, service delivery and financial performance of Chemususu Water Company.

This Performance Improvement Action Plan (PIAP) outlines Chemususu Water Company's roadmap for enhancing operational, commercial, and financial sustainability. Developed in alignment with WASREB guidelines, the PIAP serves as a strategic investment and operational guide, officially endorsed by the WSP Board Chair and Managing Director.

Managing Director: Zephania KURERE

Chairperson BOD: Eng. Allan H. Sogomo



1.1 WSP Overview and Service Area

CHEWASCO was registered in the year 2016 to take over the operations of ERAWASCO and was appointed by CRVWWDA as Water Service Provider for Eldama Ravine subcounty and Mogotio subcounty. Currently water coverage is 7% of the population within this area. The coverage decreases with distance from the central business district. In the low-income settlements, it is a mixed scenario: some parts are partially or well covered, while others are not covered at all. To ensure the financial self-sufficiency of the company, expansion should focus on the medium income areas. By 2030 coverage is projected to be 85% of the total population. However, the increase in geographical coverage is made complex by the new constitutional dispensation, especially with respect to county boundaries.

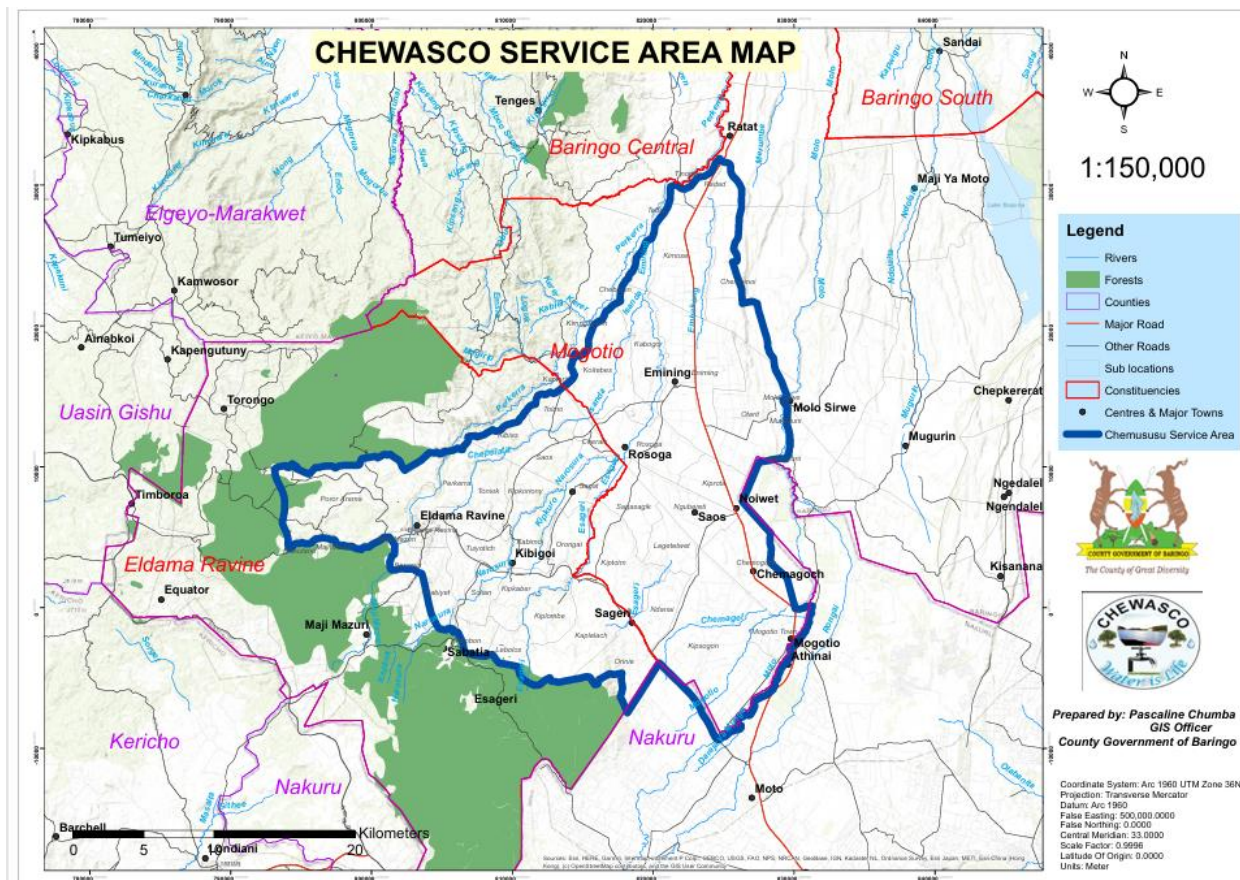
Chemususu Water Company currently does not have a valid WASREB License but is actively in the process of tariff application. The company has made great strides in the exercises and have been in constant engagement with the WASREB team through various meetings and we are in the final stages of tariff application. A tariff negotiation has already been conducted between the company and WASREB which was held on 11th April 2025. Pending a few recommendations from WASREB to improve upon, we expect to be in the public consultation stage not later than May 2025.

The company has also been using an extraordinary tariff to bill its customers, but we have begun the tariff application exercise. The process began in December 2024 and the process is nearly coming to an end; we have already had the negotiation and clarification meeting with WASREB which took place on 19th March 2025. We are nearing the public participation stage and we expect to get feedback from the WASREB team and agree on the venue and date when Public Participation exercise will take place.

Chemususu Water Company Board of Directors tenure lapsed and the process of recruitment of a new BOD began in December 2024 and the process was completed in February 2025. Chemususu Water Company now has a fully constituted Board of Directors as per WASREB Corporate Governance Standards. The Board of Directors were appointed on 28th February 2025.

Chemususu Water Company has signed a performance contract with the County Government of Baringo, with clear performance targets, obligations and responsibilities that the company is supposed to achieve. This contract was signed by all the responsible parties on 8th April 2025.

Map Chemususu Water Company Service Area



1.2 Current Performance Challenges

Chemususu faces systemic technical and governance challenges, including:

- **High non-revenue water (NRW) averaging 57%**

Non-revenue water is a big challenge facing Chemususu Water Company, the company experience NRW in two main ways physical losses and commercial losses. Some of the piping systems are old or of poor quality since they were inherited from community water projects and cannot handle the pressures in the network which leads to frequent bursts resulting in water losses. Most of the tanks volumes are manually controlled and this leads to tank water overflows causing water losses.

Commercial losses are experienced through illegal connections, some meters are old and need replacements, most of the consumers are billed on estimates.

All these challenges contribute to the high NRW percentage shown and there is need to mitigate these issues in order to ensure that enough revenue is realized to sustain its operations and treated water does not go to waste.

- **Low staff productivity at 14 staff per 1,000 connections**

There is need to improve the staffing ratio per 1000 to the required level so as to eliminate redundancies and inefficiencies. Most of the systems are manual based and thus the need for increased manpower to ensure that service delivery is maintained at the required standards.

There is need to train staff and focus on capacity building so as to improve on service delivery and efficiency on their duties. Also expansion on new areas will improve on customer connectivity and will broaden the customer base thus reducing the staff ratio per 1000 connections by a significant amount.

- **Inadequate metering, billing, and debt collection systems**

The company is currently experiencing a rapid expansion in its operations and area of coverage. The challenge that arose from this expansion is the billing cycle taking longer usually resulting in late bills dispatch, issues to do with inaccurate readings arose since the current system we are using is outdated in many aspects and it is mostly manual. There is need to invest in a more advanced and modern integrated ERP system that will promote accurate and timely billing of our customers which will result in less areas and improve on debt efficiency.

- **Low Operating Cost Coverage Ratio (OCCR) below sustainable levels**

The company is experiencing a low OCCR mainly due to the high NRW percentages, billing inefficiencies, out dated Tariff and inadequate cost control measures. The improvement of these areas will greatly improve revenue of the company and reduce unnecessary cost and losses which will result in improved OCCR.

- **Aging Infrastructure**

The pipeline network of CHEWASCO is composed of both new networks and old networks, where most of the network is made up of old infrastructure inherited from community projects. These networks cannot handle the high pressures in the network leading to frequent bursts and leakages, resulting in water losses and disruption of water supply to our users.

- **Technological Gaps**

Most of the systems in CHEWASCO is manually operated, this leads to a lot of redundancy and inefficiencies. Lack of proper modern and integrated systems in order to properly track and capture data is a big challenge. There is need to invest in a proper GIS system in order to track and know the location of the registered connections in order to minimize on illegal connections. Smart meters is another important technological aspect to look at in order to get accurate consumption of our users.

- **Lack Customer Management Relations System.**

Customers are the back bone of CHEWASCO, there is need then to develop a proper CMR for our consumers in order to be able to provide the best service delivery to our customers. Service delivery can only be good if there is a good and reliable way to track and respond to customers complaints. There is need to invest in a modern and well developed CMR System that customers and CHEWASCO can freely interact at any time either through Websites, Mobile Apps, USSD Codes.

- **Long Outstanding Debts and Payables**

CHEWASCO has long outstanding debts most of which are more than 10 years. These areas are made up of Salary arrears of nearly 19 million, Statutory deductions(PAYE, NSSF, PENSION CONTRIBUTIONS). This is a great hurdle in CHEWASCO's performance hindering its performance and growth. Once these arrears are sorted the performance of the company is expected to improve drastically, this is because most of the revenues the company is receiving is split between dealing with the current operational costs and reducing the accumulated arrears.

- **Lack of sanitation service in place.**

The company has not yet establish a sanitation provision service in place due to lack of a sewer plant. Sanitation is a crucial aspect to the community as and the general enviroment as a whole, proper sanitation services reduces the risk of water borne disease and also generates additional revenue to the company. It will aslo be a source of job creation for the communtiy leading to a win-win scenario for everybody

1.3 Purpose of the PIAP

The PIAP aims to address these inefficiencies through targeted investments in operations, commercial processes, financial systems, and institutional strengthening to achieve a sustainable OCCR and improved customer service.

The PIAP aids in identifying key KPIs that need to be addressed in order to ensure that the performance of the company improves in terms of financial sustainability and quality service delivery to its customers.

Through the PIAP we have been able to identify atleast five key areas that needs to be looked at and acted upon, which would have otherwise been overlooked at.

- 1) Develop constitute and well-equipped Non-Revenue Water (NRW) team to handle cases related to water loss, the team should be equipped to handle both commercial and physical water losses. These are steps if invest in will lead to reduced NRW and improved financial performance of the company

Objectives and Scope of the NRW Team

- **Objective:** Reduce non-revenue water through the identification, analysis, and mitigation of commercial and physical losses.
- **Scope:**
 - **Commercial losses:** Meter inaccuracies, billing errors, illegal connections, data handling issues.
 - **Physical losses:** Leaks, bursts, overflows in transmission and distribution systems.

Organizational Structure of the NRW Team

The company can create a multi-disciplinary team with the following suggested roles:

Role	Key Responsibilities
NRW Team Leader	Oversees strategy, coordination, and reporting.
Commercial Loss Analyst	Audits billing systems, identifies illegal connections and consumption errors.
Network Engineer/Leak Detection Officer	Detects and manages physical leaks, supports pressure management.
GIS/Data Analyst	Maps the network, analyzes NRW hotspots using GIS and SCADA data.
Metering Specialist	Audits and calibrates customer meters and bulk meters.
Field Technicians/Inspectors	Conduct physical inspections, surveys, and minor repairs.
Community Liaison Officer	Engages with the public to report illegal use and leakages.

Capacity Building and Equipment Needs

Equip the team with the right tools and skills:

a. Technical Training:

- NRW assessment methodologies (IWA water balance).
- Leak detection techniques (acoustic, ground microphones, correlators).
- GIS and SCADA systems usage.
- Meter testing and calibration.

b. Essential Equipment:

- Leak detection kits (acoustic sensors, noise loggers, correlators).
- GPS and GIS mapping tools.
- Pressure loggers and data loggers.
- Flow meters (for night flow and sector monitoring).
- Handheld devices for meter reading/data collection.
- Safety gear for fieldwork (PPE).

NRW Strategy and Operations Plan: Develop a strategy with clear goals and measurable KPIs:

Focus Area	Action Items
Water Audit	Conduct baseline water balance using IWA methodology.
District Metered Areas (DMAs)	Divide network into DMAs for easier monitoring and control.
Leak Detection Program	Routine and emergency leak detection and repair.
Meter Management	Replace old/faulty meters, install bulk meters, test accuracy.
Illegal Connections Campaign	Regular inspections and community reporting.
Billing System Audit	Match meter readings with billing data.
Public Awareness	Educate customers on reporting leaks and illegal use.

Monitoring, Evaluation, and Reporting

- Use KPIs such as:
 - % NRW reduction
 - Volume of water saved
 - Number of leaks detected and resolved
 - Recovery from illegal connections
- Regularly report progress to management and stakeholders.

Institutional Support and Partnerships

- **Internal Support:** Ensure commitment from utility leadership.
- **External Partners:** Collaborate with NGOs, development agencies, or consultants for technical support.
- **Policy Support:** Align with national water regulations and policies.

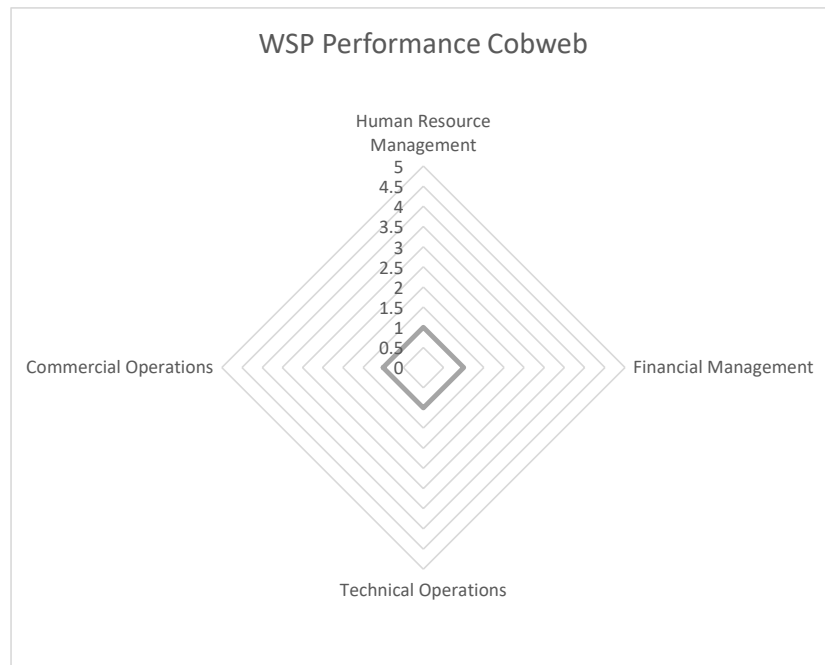
Budgeting and Sustainability

- Secure funding for initial setup and recurrent costs.
 - Explore donor and development bank financing for NRW programs.
 - Integrate cost-recovery mechanisms through improved billing.
- (a) To look for more energy efficient practices, look for more energy efficient pumps and motors, explore on solar energy as an alternative source of power to improve on Electricity Efficiency in the long Run
- (b) Accounts Receivables Turnover- the company has been able to accumulated a huge amount of unpaid water bills, there is need to develop proper debts and revenue collection systems i.e systems generated reminders to customers with arrears.
- (c) There is need to improve on area of coverage so as to improve on the number of connections to address the problem of Staff per 1000 Connections
- (d) To address Long outstanding debts that are dragging down the company's performance despite great improvements over the recent years
- (e) Investing in new Technologies in Water Sector in Order to improve performance and operational efficiencies.
- (f) Develop a Customers Management relations system for quality service delivery

Once the performance gaps are identified the PIAP will the develop a framework on how CHEWASCO can go about addressing the performance gaps experienced by the company. The objective is to ensure that the company is in a financially Viable state and improves its OCCR to the required levels of around 1.1. The PIAP provides clear improvement plans that will not only address the immediate challenges the company is facing but create a solid foundation for future financial and economic readiness and sustainability.

2. Performance Assessment Summary

The performance assessment as seen in the Cobweb chart address the four major areas of focus being Human Resource Management, Commercial Operations, Technical Operations & Financial Management as seen in the chart below in all of these four areas the company only got a score of 0.5 indicating poor performance of all the these areas.



Through this Cobweb the following gaps were identified related to each department that need to be acted upon in order to improve the performance.

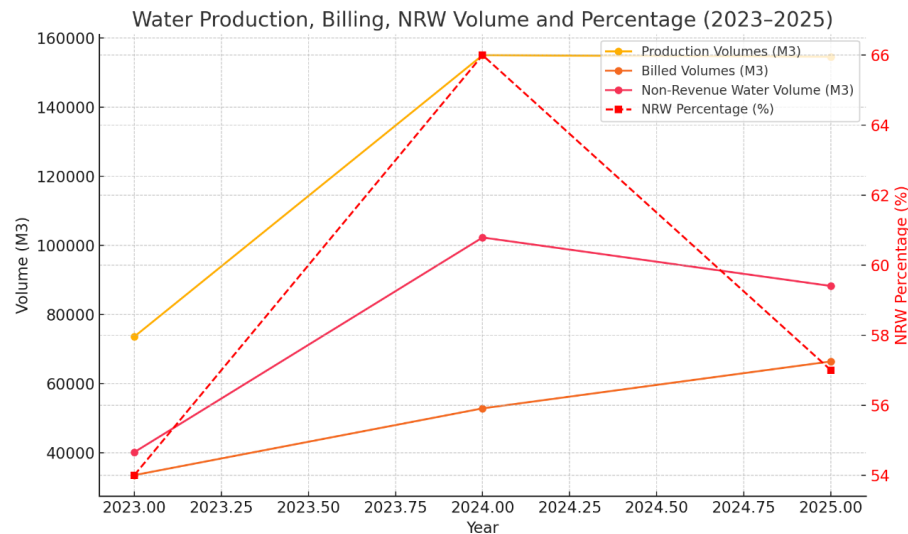
- **Excessive NRW from physical losses and unauthorized consumption**

One of the gaps that was able to be identified in the PIAP is high NRW percentage. The deviation from the set benchmark of 20% was -185%. This indicates that we are losing a lot of water either through unbilled volumes, physical losses or a combination of both. This greatly impacts the company's revenue leading to a negative impact on the company's OCCR. Thus it is very necessary to implement the measures to reduce NRW.

In the last three years NRW has been a big hindrance to the company's performance especially when meeting its OCCR targets. Here is a summary how NRW has been recorded in the last three years

Year	(Average for the Year) Production Volumes in M ³	(Average for the Year) Billed Volumes in M ³	Non-Revenue Water Volume in M ³	NRW Percentage (%)
2023	73,567	33,456	40,111	54%
2024	155,080	52,797	102,283	66%
2025	154,630	66,388	88,242	57%

The graph below illustrates NRW trends over the last three years as indicated by the dotted red line:



As seen in the above Illustration the Company has not been able to stabilise its NRW management. The largest contributing factor to this erracting changes ni NRW is the rapid expansion of the coverage area without enough resources to cover the whole coverage area sufficiently. Water leakages and burst might occur which takes a long time to be identified due to limited movement and technology to be able to get alerted in real time whenever there is a water leakage. There is is thus the need to embrace and invest ni new technologies such as leak detectors in our main lines, tanks sencors in all our main storage tanks that will constanly be relying volumes levels to personnel incharge. This will inturn mitigate most our water loss through pysical losses and inturn lead to better management of NRW Percentages.

Another element contributing to high NRW(percentage) % is the limited customer identification excersice that has been carried around. So, the company cannot fully ascertain the number of customers who are consuming water illegally. There is thus the need

to invest in customer identification exercise, through GIS programm so that we can know the location of all our registered customers. This will then allow the company to narrow down on all illegal connections and register them so that we cannot loose our water and revenue through NRW.

These are the two main factors contributing to the high levels of NRW and there is need to invest more modern technologies such as leak detectors, tank sensors, GIS Mapping of the Area of Coverage, Ultrasonic flow Master meters so that the company can be able to puts its self in a position to be able to manage NRW, thus improving revenue generation which will lead to better OCCR and enable the company to be financially viable and sustain its operations in the long run.

- **Inefficient billing systems resulting in high revenue loss**

The company is currently using an outdated and obsolete billing system which was acquired at the inception of the company over 15 years ago. In the earlier years the billings system was sufficeint back then, but with the continuous expansion and increase in the companies customers' base, operations and area of coverage the system gradually became outdated and currently it can barely handle the current billing requirements. Initially it handle only 2000 connections but currently the registered customers is 8000. This has lead to a gap in our billing operations and there is need to improve on the billing to eliminate the following gaps:

- I. **Billing Errors-** the current billing system is manual based and dependent purely on human input, meter readings might be under read, over read or even not read entirely beacuse there is no way of ascertaining the data that is brought to the billing office for billing. This has lead customers not satisfied with our services especially when they are over billed. On the other hand when the customers are underbilled it directly has a negative impact on our revenues beacuse we are selling less than we are producing. This factor has has a direct relation with NRW because there is water not being accounted for due to under billing.
- II. **Delays in the billing cycle-** the billing system is dependent on manual intervention that is; we have to wait for each individual meter to be read on the ground and the brough to the office for the billing office to the billing exercise to begin. This results in alot of delays which leads to customers not receiving their bills on time. So there is need to invest in a more modern system where the meter readers and the billing system are in sync together to allow the billing process to begin directly from the zonal areas and only need to be verified and dispatched in the office. This will result in timely sending of bills to customers which will result to improved cashflows since customers tend to pay thier bills earlier in the month rather than later in the month.
- III. **Lack of Data Intergration:** the current billing system is not intergrated with other systems it is a stand alone. Its is missing very critical modules such as CRM, ERP, GIS System. Currently these systems are crucial in ensuring that all the data is capured accurately and timely. This will assist in giving accurate reports on revenues, billing

volumes, customer data for reporting purposes, knowing the true levels of performance of the company, improving customer satisfaction by clearly addressing all the complains raised in time.

- IV. **High Cost of Operation:** because the system is mainly manual based there are alot of inneficiencies especially interms of reource allocation and time allocation. That is staff spend most of the time doing routine system duties which would have been otherwise done automotacally by a more modern system. This would result in staff spending more time on other productive duties.

In Summary an inefficient billing system like the one we are currently relying on does more than just frustrate customers — it actively erodes a company's bottom line through errors, delays, and missed revenue opportunities. Upgrading to a modern, automated billing system can significantly improve accuracy, customer satisfaction, and cash flow which will eventually improve the company's OCCR Levels

• Suboptimal debt management practices

Debt managment is a serious gap in Chemususu Water Company's performance targets and goals. Most of the debts are as a result of an oudated billing system which involve manual intervention in order to properly analyse the debtors aging analysis. There are alot of challanges that have arose as a result of poor debt managment which have a great negative impact on the company's performance levels, the challanges faced by Chemususu Water Company as a result of poor debt management include:

- I. **Increase Financing Cost-** due to the poorly managed debts it has been impossible for the company to get loans from Financial Institututions due to the company's poor credit ratings. This inturn has left the company with very limited funds for investments in infrastructure and improvemnt of service delivery.
- II. **Limited Cashflows-** the company is facing alot of unpaid payables especially Statutory deductions, staff salaries and suppliers. This was caused by the poor debt management practices that results in poor cashlows resulting in alot of accrued debts because the company is not able to meets its operational costs.
- III. **Limited Ability to Expand Services.** due to the poor management of debt the company has struggled to raise funds for investment projects such network expansion, modernization of company systems, or the development of new water sources—essential in areas with growing populations or climate stress.
- IV. **Inefficient Allocation of Revenue-** Due to limited Cashflows as a result of poor debt management the limited available Revenue meant for operations, maintenance, or community investment is redirected to cover excessive

debt servicing, which has a negative impact on service delivery and customer satisfaction. This has also led to the persistent challenge of non-revenue water (NRW) issues since infrastructure is not fully invested in due to lack of funds.

Suboptimal debt management affects a water company's ability to deliver reliable services, maintain infrastructure, and stay financially healthy. Effective debt strategy is not just about borrowing, but about aligning financial planning with operational goals and long-term sustainability.

- **Staff per 1000 connections.**

In the PIAP the company has been able to identify that the staff per 1000 connections is on average 12 which is above the required benchmark of 5. There is a need to improve this ratio by improving the customer base by venturing to new areas which will result in more consumer connections thus reducing the staff ratio per 1000. There is also a need to focus on automated systems to improve on redundancies and inefficiencies. Staff training and capacity building is also very critical since it will improve the staff performance level, subsequently improving the company's performance and having a positive impact on the company's OCCR levels.

1. Increased Operating Costs

- CHEWASCO has a higher staff ratio than the set WASREB benchmark which has led to **higher payroll and benefits expenses**, which significantly increases operating costs. This can be improved upon by focusing on network expansion projects so as to increase the number of connections which will in turn improve the staff ratio to the acceptable standards.
- Labor is often one of the largest cost components in water utilities, so excess staffing can erode profit margins or strain limited budgets.

2. Lower Operational Efficiency

- The high staff ratio currently reflect inefficient work processes, redundant roles, and outdated systems this due to the fact that most of the operations require manual intervention due to limited incorporation of automated systems in the Company's Operations.
- Tasks that could be automated (e.g. meter reading, billing, leak detection) is still being handled manually, reducing speed and quality of service delivery.

3. Reduced Competitiveness

- Water companies with high staff ratios may struggle to compete (in privatized markets) or justify tariffs to regulators and customers if they are perceived as bloated or inefficient.
- This can limit their ability to increase rates or access external funding for infrastructure upgrades.

4. Regulatory and Stakeholder Scrutiny

- Regulators and funding agencies (e.g. development banks) often use benchmarks like staff per 1,000 connections to assess performance.
- High ratios can trigger concerns about mismanagement, prompting audits, funding delays, or conditions for operational restructuring.

5. Limited Resources for Capital Investment

- Due to the high number of staff most of the funds tied up in excessive staffing reduces the funds available for capital improvements, such as:
 - Pipeline upgrades
 - Leak reduction
 - Water treatment facilities

This leads to deteriorating service quality and higher non-revenue water (NRW).

6. Challenges in Performance Benchmarking

- Industry benchmarks cite efficient utilities having around 5 staff per 1,000 connections while currently the company is at 14 staff per 1000 connections. There is needs to focus on the following in order to manage this ratio:
 - Role restructuring
 - Skill upgrades
 - Adoption of new technologies

Root Cause Analysis:

Underlying causes include

(a) Outdated infrastructure.

There are gaps in the company's distribution piping network since the network is comprised of new infrastructure and old infrastructure. The old piping network is not able to handle the increased water pressure in the system which results in frequent bursts and leakages leading to high NRW percentages. Renovation and improvement of the old treatment works to ensure that enough water is treated and supplied to consumers.

(b) Insufficient investment in metering technology.

Metering is a fundamental investment in the WSP since it directly impacts the revenue generation of the company through accurate readings. There is need to invest in current metering technologies such as smart meters, higher quality rated volumetric meter (R250 and above). Bulk meters for DMAs, Treatment Works, Storage Tanks to ensure that NRW is closely monitored to ensure that gaps in water losses are identified and rectified.

(c) Lack of automation.

Automation of systems is critical in improving the performance and efficiency of the company's operations. The biggest challenge we are facing is the dependence on manually operated systems which results in delays and inaccuracies in our data. There is need to invest in integrated ERP systems, leak detectors, tank level detectors.

(d) Minimal staff training and accountability structures.

There is need to invest in staff training and capacity building to improve on staff efficiency. This will aid in providing staff and service delivery, it will also aid in improving customer relations.

3. Performance Targets and Modelling of OCCR Targets

3.1 Key Performance Indicators and Targets

Table4.1 Key performance indicator

KPI	Baseline (2023/2024)	Put Current 2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030 Target	Benchmark (WASREB)
Non-Revenue Water (%)	66	57	50	46	41	38	34	34%	<25%
Metering Ratio (%)	48	88	99	100	100	100	100	100	100
Revenue Collection Efficiency (%)	96	96	99	100	100	100	100	100	100
O&M Cost Coverage Ratio (OCCR)	1.07	0.96	1.08	1.16	1.19	1.23	1.28	1.30	>- 1.0
Hours of Supply (per day)	22	22	22	22	22	23	24	24	24
Staff per 1,000 connections	14	12	10	8	6	5	5	5	<5

Energy Costs (% of OPEX)	13.18	10.90	8.6	7.1	6.3	4.6	3.4	3.4	<20
Personnel to O&M cost	45.48	41.83	41.50	40.20	39.10	38.70	36.40	36.20	< 30
Water Coverage (%)	21	24		42	48	56	64	64	>80%
Sewerage Coverage (%)	0	0	1	2	3	3	3	3	>5

Non-Revenue Water(NRW).

NRW has been identified as one the key KPIs to improve upon, since it has a great negative impact on the company's OCCR performance. In order to mitigate this challenge and ensure that the NRW level drop to the required levels. The company will be required to undertake the following tasks:

- I. The Company has requested for the master meters and consumer water meters for accurate accountability of water
- II. The company will benefit from the replacement of old distribution networks under the second phase and last mile connectivity of the construction of the Treatment plant which will ultimately reduce bursts.
- III. The company has made a requirement for the new water connection to be installed with the consumer meter.
- IV. Close cooperation with the newly formed water police unit to root out all illegal connection.

With the above interventions the NRW levels is expected to drop significantly

KPI	2024 (Baseline)	2025 Target	2026 Target	2027 Target	2028 Target	2029 Target	2030 Target
NRW	66%	57%	50%	46%	41%	38%	34%

The above projections above were arrived at by projecting an increase in the billed volumes over the periods of 6 years

Year	(Average for the Year)Production Volumes in M ³	(Average for the Year)Billed Volumes in M ³	Non-Revenue Water Volume in M ³	NRW Percentage (%)
2023	73,567	33,456	40,111	54%
2024	155,080	52,797	102,283	66%
2025	154,630	66,388	88,242	57%
2026	156,176	78,088	78,088	50%
2027	157,738	85,179	72,559	46%
2028	159,315	93,995	65,319	41%
2029	160,908	99,762	61,145	38%
2030	162,517	107,261	55,256	34%

The above gradual increase in billed volumes will be attributed to ensuring that all connections are metered, increase in the coverage area leads to more connections which lead to more water consumed and consequently billed. Investing in consumer meters installation, District Water Meters, Master meters and rehabilitation and expansion of pipeline networks. This will have will gradually have a positive impact on the Non-Revenue Percentage due to the continuous increase in the billed volumes and minimal water loss will be experienced.

Low staff productivity at 14 staff per 1,000 connections

There is need to improve the staffing ratio per 1000 to the required level so as to eliminate redundancies and inefficiencies. Most of the systems are manual based and thus the need for increased manpower to ensure that service delivery is maintained at the required standards.

There is need to train staff and focus on capacity building so as to improve on service delivery and efficiency on their duties. Also expansion on new areas will improve on customer connectivity and will broaden the customer base thus reducing the staff ratio per 1000 connections by a significant amount.

KPI	2024 (Baseline)	2025 Target	2026 Target	2027 Target	2028 Target	2029 Target
Staff per 1000 Connections	12	10	8	7	6	5

The above trend will be possible if we invest in the following key areas:

1. Process Automation & Digitization

- Automate meter reading using smart meters or AMR (Automatic Meter Reading) systems.
- Digitize billing, customer service, and maintenance scheduling.
- Introduce mobile tools for field staff to reduce paperwork and double-handling.

Impact: Reduces manual labor, streamlines operations, and allows fewer staff to manage more connections.

2. Workforce Restructuring and Redeployment

- Conduct a skills audit to identify redundancies or underutilized roles.
- Implement voluntary retirement, natural attrition, or reassignment of surplus staff to revenue-generating or underserved roles.
- Redesign workflows to eliminate duplication of efforts.

Impact: Gradual staff reduction without abrupt layoffs or service disruption.

3. Capacity Building and Training

- Upskill remaining staff with training in digital tools, asset management, and customer engagement.
- Encourage a multi-skilled workforce where staff can handle a broader range of tasks.

Impact: Increases productivity per employee, reducing the need for higher headcounts.

5. Network Expansion Without Proportional Staffing

- As the number of connections grows, avoid proportional staff increases.
- Plan new connections with smart infrastructure and centralized monitoring.

Impact: As connections increase, the ratio of staff per 1,000 connections naturally decreases.

6. Performance Management and KPIs

- Introduce individual and departmental performance metrics.
- Link performance-based incentives to efficiency and service delivery.
- Use benchmarking against industry standards to track progress.

Impact: Encourages productivity and accountability across the workforce.

Year	Key Actions
2024	Start with audits, automation planning, voluntary exits
2025	Roll out smart meters, reduce non-core roles
2026	Digitize customer systems, continue staff consolidation
2027	Reassign skilled staff, expand training
2028	Optimize processes, reduce overlaps
2029	Reach target ratio with stable systems and lean team

In order for CHEWASCO to move from 12 to 5 staff per 1,000 connections over 5 years, the company must embrace technology, restructure the workforce, and optimize operations. The transition should be strategic and phased, balancing efficiency gains with service quality as shown in the above summary.

- **Accounts Receivable Turnover**

The company is currently experiencing a rapid expansion in its operations and area of coverage. The challenge that arose from this expansion is the billing cycle taking longer usually resulting in late bills dispatch, issues to do with inaccurate readings arose since the current system we are using is outdated in many aspects and it is mostly manual. There is need to invest in a more advanced and modern integrated ERP system that will promote accurate and timely billing of our customers which will result in less areas and improve on debt efficiency.

The target is to try and improve on the number of days to ensure that the debtors days is greatly reduced to the acceptable number of 90days

KPI	2024 (Baseline)	2025 Target	2026 Target	2027 Target	2028 Target	2029 Target	2030 Target
Accounts Receivable Turnover	700	500	400	300	200	100	90

For the above improvement trends in Accounts receivable Turnover will be possible if the company invests in the following key areas:

1. Improve Billing Accuracy and Timeliness

- Implement an automated billing system to reduce delays and errors.
- Send bills immediately after service period ends (monthly/bi-monthly).
- Shift from manual to digital billing (SMS, email, mobile apps).

Impact: Prevents disputes and shortens the billing-to-payment cycle.

2. Introduce Prepaid and Smart Metering

- Implement prepaid water meters to eliminate future receivables.
- Use smart meters to provide real-time consumption data and improve billing transparency.

Impact: Reduces postpaid billing delays and encourages upfront payment.

3. Strengthen Collection Processes

- Introduce automated reminders (SMS, calls) for due and overdue bills.
- Enforce structured debt collection policies:
 - Grace periods
 - Disconnection warnings
 - Interest or penalties for late payments

Impact: Incentivizes customers to pay on time.

4. Customer Segmentation and Targeted Action

- Segment customers by payment behavior (e.g., consistent payers, habitual defaulters).
- Apply flexible payment plans for vulnerable groups.
- Take legal or disconnection action against chronic defaulters.

Impact: Focused efforts improve recovery rates.

5. Debt Restructuring and Write-Off of Uncollectible Accounts

- Review aged receivables and identify bad debts unlikely to be recovered.
- Develop a debt write-off policy aligned with accounting standards and regulations.
- Prioritize collection from active customers over dormant or disconnected accounts.

Impact: Cleans up the books and improves the real Accounts Receivables picture.

6. Customer Engagement and Education

- Conduct awareness campaigns to:
 - Explain the importance of timely payments
 - Clarify billing and metering issues
- Offer easy payment channels (mobile money, banks, online portals).

Impact: Builds trust and encourages payment compliance.

7. Performance Monitoring and Staff Incentives

- Set collection targets for billing and revenue staff.
- Reward high-performing teams or regions with incentives.

Impact: Improves internal accountability and motivation.

The following is a road map of how investments and implementations can be carried out in order to achieve an Accounts Receivable Turnover of 90 days by 2030

Year	Key Focus
2024	Audit receivables, launch billing reforms, pilot automation
2025	Improve billing cycle, start disconnection enforcement
2026	Expand smart/prepaid meters, automate reminders
2027	Clean up bad debt, segment customers, introduce payment plans
2028	Scale mobile/digital payments, intensify collections
2029	Target high-risk areas, reduce arrears stock sharply
2030	Maintain 90-day target, ensure sustainable collection systems

In order for CHEWASCO to Reduce its Accounts Receivables Turnover Days from 700 to 90 it requires a strategic overhaul of how the water company bills, collects, and engages with its customers. It's a gradual but achievable transformation if supported by technology, policy enforcement, and customer trust-building.

4. Performance Improvement Strategies

4.1 Technical/Operational Improvements

To increase the **Operating Cost Coverage Ratio (OCCR)** from its current unsustainable level by reducing **Non-Revenue Water (NRW)** and **operational energy costs**, through targeted, cost-effective investments.

Priority Investments (Costed Breakdown)

	Investment Area	Key Activities	Budget (KES)	Estimated OCCR Impact
1	Leak Detection & Pipe Repair	Acoustic sensors, GIS mapping, pipe replacement in high-leak zones	14,000,000	Reduce physical losses by 10% → +KES 5M in annual revenue
2	Smart Metering & Billing Upgrade	Replace 2,000 faulty meters; improve billing system	8,000,000	Reduce commercial losses by 10% → +KES 6M in annual revenue
3	Energy Efficiency Upgrades	Install VFDs on pumps; optimize pumping schedules	7,000,000	Cut energy costs by 15% → -KES 4.5M in annual costs
4	Pressure Management Zones (DMAs)	Create 4 District Metered Areas to manage and monitor pressure	4,500,000	Further 3% reduction in leaks → +KES 3M in revenue
5	Staff Training & Monitoring Tools	Training on energy/water audits; basic monitoring equipment	2,500,000	Sustains efficiency → preserves +KES 2M annually

Impact on OCCR (Quantitative Summary)

Current Situation (Baseline):

- **Operating Revenue:** KES 37,180,222
- **Operating Costs:** KES 34,066,657
- **Current OCCR:** $37,180,222/34,666,657=1.07$

Post-Investment Forecast

Revenue Gains:

PHYSICAL LOSS REDUCTION: +KES 5M

Physical water loss is one of the key challenges facing Chemususu Water Company in that we lose a lot of water through physical losses. Thus there is need to invest in leak detectors, GIS mapping technologies and pipe replacement in high-leak zones in order to detect water leakages in time and reduce water losses. In order to arrive at the annual increase in revenue of **KSH 5M**, the company took some assumptions into consideration. The first thing we took note of was our current water production of 5500m³ per day, the current NRW percentage of **54%**, anticipated tariff of **KSH 50** and the anticipated reduction in water loss by **10%**. Using the above information we arrived at the annual increase in revenue of **KSH 5M** as follows:

Annual Water Production= $5500\text{m}^3 * 365 = 2,007,500\text{m}^3$

Annual Water Loss= $2,007,500\text{m}^3 * 54\% = 1,084,050\text{m}^3$

Annual Targeted Reduction(Recovered)= $10\% * 1,084,050\text{m}^3 = 108,405\text{m}^3$

Annual anticipated Recovered Revenue from water Loss= $108,405 * \text{KSH } 50 = \text{KSH } 5,420,250$

COMMERCIAL LOSS REDUCTION: +KSH 6M

2,000 faulty meters cause under-billing or non-billing, replacing them restores accurate billing for households and businesses. Improved billing system ensures timely, correct, and full capture of usage — reducing billing gaps, errors, and theft. This intervention

reduces unbilled but distributed water, improving revenue without increasing supply. The following assumptions were made when determining the annual increase in revenue, our current water production of 5500m³ per day, the current NRW commercial percentage of **25%**, anticipated tariff of **KSH 50** and the anticipated reduction in commercial water loss by **6%**

Annual Water Production= 5500m³ * 365= **2,007,500m³**

Commercial Loss reduction= 6%*2,007,500m³= **120,450m³**

Annual anticipated Recovered Revenue from Commercial water Loss= KSH 120,450 * KSH 50 = **KSH 6,022,500**

By replacing 2,000 faulty water meters and improving the billing system, the utility can reduce commercial losses by 6 percentage points — from **25% to 19%** of water produced.

This intervention enables recovery of approximately **120,000 m³** of water annually, which translates to an increase in billed volume and an additional **KES 6 million** in annual revenue, based on a **KES 50/m³** tariff.

This gain is achieved without increasing water production or tariffs, making it a cost-effective way to boost revenue and efficiency.

- **DMA monitoring impact: +KES 3M**

The following assumptions were made when determining the annual increase in revenue, our current water production of 5500m³ per day, anticipated tariff of **KSH 50** and the anticipated reduction in physical water loss by **3%**

Annual Water Production= 5500m³ * 365= **2,007,500m³**

Physical Loss reduction= 3%*2,007,500m³= **60,225m³**

Annual Increase in Recovered Revenue= 60,225m³*50= **KSH 3,011,250**

Establishing 4 District Metered Areas (DMAs) will allow for active pressure management and real-time leak detection, enabling a targeted reduction in physical losses (leaks) by 3–5%. At a 3% reduction (60,000 m³/year), the utility can recover and bill an additional KES 3 million annually at a KES 50/m³ tariff — all without increasing production. A full 5% reduction could unlock up to KES 5 million/year, showing the high return potential of this network management investment.

- **Total Revenue Increase: +KES 14,000,000**

New Revenue = 30M + 14M = **KES 44,000,000**

Cost Savings:

- Energy efficiency: **-KES 9,500,000**

OCCR is expected to improved from 1.07→ 1.27, reaching a **sustainable level**

Summary:

The proposed **KES 36 million investment** will result in an **OCCR increase of 20%**, achieving long-term financial sustainability through quantifiable revenue recovery and cost reduction.

4.2 Commercial Operations Improvements

Investments:

To improve **revenue collection efficiency** and **customer satisfaction** through targeted investments, directly contributing to increased revenue and improved **OCCR** from the current 0.78.

Costed Investments & Impact Breakdown

#	Investment Area	Key Activities	Budget (KES)	Estimated OCCR Impact
1	Smart Metering Rollout	Replace/upgrade 3,000 faulty or unmetered connections	12,000,000	Recover unbilled usage: +KES 7.2M/year
2	Advanced Billing System	Deploy AMI billing platform; reduce billing errors & lags	6,500,000	Improve billing accuracy: +KES 4.5M/year
3	Customer Database Cleanup & KYC Campaign	Validate connections; eliminate ghost accounts	3,500,000	Recover lost revenue: +KES 2M/year
4	Digital Payment Platforms & Mobile Apps	Mobile billing, M-Pesa integrations, e-receipts	4,000,000	Improve collection efficiency: +KES 3M/year
5	Customer Service Centre & Call Center Training	CRM tools; training frontline staff; track complaints	4,000,000	Retain customers & reduce disputes → +KES 1.5M/year

Impact on OCCR (Quantitative Summary)

Current Situation (Baseline):

- **Operating Revenue:** KES 37,180,222
- **Operating Costs:** KES 34,066,657
- **Current OCCR:** $37,180,222/34,666,657=1.07$

Post-Investment Financial Effects:

Total Additional Annual Revenue:

- **METERING IMPACT: KES 4.8M**

The following Assumptions were made when calculating the expected annual increase in revenue

Parameter	Value
Number of faulty/unmetered connections	2,000
Average monthly consumption per connection	4 m³/month
Annual consumption per connection	$4 \times 12 = \mathbf{48 \text{ m}^3/\text{year}}$
Total annual volume recovered	$2,000 \times 48 = \mathbf{96,000 \text{ m}^3/\text{year}}$
Tariff per m ³	KES 50

Calculation on how to arrive at the Increase in Revenue of KSH 4.8m

1. Recovered Billed Volume

$2,000 \text{ connections} \times 48 \text{ m}^3/\text{year} = 96,000 \text{ m}^3$

2. Revenue from Recovered Usage

$96,000 \text{ m}^3 \times \text{KSH } 50 = \text{KSH } 4,800,000$

Result: **KSH 4.8 million/year** in new billable revenue from smart metering.

A smart metering rollout targeting **2,000 faulty or unmetered connections** is projected to recover **96,000 m³** of previously unbilled water per year.

This intervention will result in **KES 4.8 million/year** in new revenue, assuming an average monthly use of **4 m³ per connection** and a tariff of **KSH 50/m³**.

Smart meters also enable data-driven leak detection, remote shut-off, and billing accuracy, preventing future commercial losses.

• BILLING IMPROVEMENTS: KES 2.7M

Assumptions made when determining revenue lost due to billing errors

Parameter	Value
Total customer base (billed connections)	5,000 connections
Billing errors or underbilling (pre-AMI)	15% of customers annually
Avg. annual bill per customer	KES 3,600/year (KSH 300/month)
Tariff	KES 50/m ³

Calculations on arriving to an annual revenue increase of KSH 2.7M

1. Number of Customers with Billing Errors

15%*5,000 Customers=**750 customers/year**

2. Revenue Previously Lost

750*KSH3,600=**KSH 2,700,000/year**

Result: **KES 2.7 million/year** can be recovered by reducing billing errors.

Deploying an **Advanced Metering Infrastructure (AMI) billing system** enables **automated, real-time, and accurate billing**, significantly reducing manual errors, meter reading delays, and underbilling.

With an estimated 15% of the utility's 5,000 connections affected by billing discrepancies, the utility can recover approximately **KES 2.7 million/year** by improving billing accuracy alone. This intervention enhances both **financial sustainability** and **customer satisfaction**.

• DATABASE CLEANUP: KES 1.0M

Objective

To improve the integrity of the customer database by verifying all active connections and eliminating "ghost" or unbilled accounts that contribute to non-revenue water (NRW).

Step-by-Step Process

Step	Activity	Expected Outcome
1	Customer Enumeration & GPS Mapping	Field teams visit all service areas to collect real-time data on customer premises, meter presence/status, and GPS coordinates.
2	Data Collection	Collect national ID/passport, phone number, and tenancy/ownership documents from all account holders.
3	Database Matching	Cross-check field data with existing billing system to detect: ▪ Unbilled connections ▪ Duplicate entries ▪ Inactive/phantom accounts
4	Anomaly Resolution	Flag and resolve ghost accounts and illegal connections; create new accounts or

		disconnect unverified ones.
5	System Update & Validation	Clean and update the customer database and billing system; ensure only verified customers remain.
6	Billing Activation & Recovery	Begin billing for newly verified and previously unbilled customers, thereby recovering lost revenue.

Impact Summary

Details	Before Cleanup	After Cleanup
Total Connections in System	8,000	7,000 (after removing 1,000 ghost accounts)
Verified & Billed Connections	5,000	6,500
Monthly Revenue from Billing	KSH 3.5M	KSH 4.5M
Annual Revenue Gain	–	KSH 1M/year

Key Benefits

- KES 1M annual revenue recovery from newly billed accounts
- Reduced commercial water losses through improved billing coverage
- Improved billing system accuracy & accountability
- Better compliance with regulatory reporting and customer service audits

• COLLECTION EFFICIENCY: KES 3.0M

Mobile Billing, M-Pesa Integration & E-Receipts

Objective: Improve revenue collection efficiency and customer convenience

1. Solution Description:

- Mobile Billing: Customers receive bills directly on their phones via SMS or app notifications.
- M-Pesa Integration: Instant bill payments via mobile money platforms like M-Pesa or Airtel Money.
- E-Receipts: Automatic issuance of electronic receipts upon payment, reducing paperwork and disputes.

2. Implementation Approach:

Step	Action
1	Deploy or upgrade customer-facing mobile app & USSD platform
2	Integrate app with billing system and mobile payment APIs (e.g. M-Pesa, Airtel Money)
3	Automate SMS bill notifications and payment reminders
4	Enable e-receipts via SMS and in-app storage
5	Train customer service & billing staff to support digital queries

3. Expected Benefits:

Benefit	Impact
Convenient Payments	Customers pay on time, even remotely
Reduced Walk-in Traffic	Less congestion and cost at pay points

Real-Time Reconciliation	Faster update of payments and customer records
Fewer Disputes	E-receipts reduce errors and loss of proof
Lower Collection Costs	Fewer agents required for door-to-door collections

Given that the current collection efficiency is at **93%** with an average billing monthly billing of **KSH 4M**. The company anticipates to improve the collection efficiency to **100%** through the above interventions. This will inturn lead to an improvement in collections by **KSH 280,000/month**

Uncollected revenue(Recovered) =7%*KSH 4M=KSH 280,000/month

Annually= KSH 280,000*12 months= KSH 3,360,000

This will result in a revenue icrease of about **KSH 3M-4M annually**

Total Gain=3.3m+1m+2.7m+4.5m=11.5m

New Revenue = 30M + 11.5M = KES 41,500,000

New OCCR: 41,500,000/33,877,000

Result: OCCR increases from **1.07 to 1.28**, achieving operational sustainability **through revenue-side improvements** alone.

Summary:

With a **KES 30 million investment**, strategic improvements in **metering, billing, collections, and customer service** will result in an annual revenue gain of **KES 18.2 million**, improving the OCCR from **1.07 to 1.28** — a key milestone toward full cost recovery.

4.3 Financial Management Improvements

Investments:

To strengthen **internal controls**, **budgeting**, **financial reporting**, and **cost management** through strategic investments in systems and skills — directly contributing to increased operational efficiency and enhanced OCCR.

Costed Investment Breakdown & Impact

#	Investment Area	Key Activities	Budget (KES)	Estimated Financial Impact
1	Enterprise Resource Planning (ERP) System	Procurement and deployment of integrated financial ERP (accounts, procurement, stores, billing interface)	8,000,000	Improved financial tracking → Reduce leakages: KES 4M/year savings
2	Staff Training & Capacity Building	Budgeting, reporting, internal audit, and procurement integrity training	2,500,000	Reduce procedural errors → KES 1.5M/year savings
3	Automated Budgeting & Cost Monitoring Tools	Software tools for budget tracking, variance analysis	2,000,000	Prevent budget overruns → Save KES 1.2M/year
4	Internal Audit Strengthening	Equip internal audit with tools; risk-based audit planning	2,000,000	Detect/prevent frauds → Save KES 2M/year
5	Procurement Controls & e-Procurement Setup	Implement transparent, automated procurement workflow	3,500,000	Reduce procurement waste → Save KES 2.3M/year

Impact on OCCR (Quantitative Summary)

Current Situation (Baseline):

- **Operating Revenue:** KES 37,180,222
- **Operating Costs:** KES 34,066,657
- **Current OCCR:** $37,180,222/34,666,657=1.07$

Post-Investment Effects:

Annual Cost Savings:

ERP CONTROLS: KES 4.0M

The ERP system integrates key financial and operational functions including accounting, procurement, inventory (stores), and billing into a centralized digital platform. This facilitates end-to-end process visibility, streamlining of operations, and real-time data access for informed decision-making.

Key Features of the ERP System

Module	Functionality	Expected Improvements
Accounts	Automated journal entries, real-time financial reporting, audit trails	Enhanced transparency and accountability
Procurement	E-procurement workflows, vendor tracking, budget controls	Elimination of procurement fraud and overspending
Stores/Inventory	Stock level monitoring, automatic reorder triggers	Prevent stockouts, overstocking, and theft

Billing Interface	Integrated customer database, automated invoice generation, billing analytics	Improved billing accuracy and revenue assurance
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Demonstrated Impact on Financial Efficiency

- **Leakage Reduction**

Manual processes and fragmented systems often result in data loss, delayed reconciliations, and opportunities for misappropriation.

With ERP, controls such as digital approvals, system-based thresholds, and real-time reconciliation reduce financial leakages significantly.

- **Improved Audit and Compliance**

Real-time dashboards and automated audit trails reduce audit preparation costs and enhance regulatory compliance, reducing risk of penalties or loss of donor confidence.

- **Budgetary Control & Cost Tracking**

Automated budget controls prevent overspending. Cost centres allow departments to track performance and control wastage.

- **Human Resource Optimization**

Reduction in manual paperwork frees up staff time for value-adding tasks. Improved workflows mean fewer human errors and better operational efficiency.

Quantified Benefits

Area	Estimated Annual Savings (KES)
Reduced financial leakage through better controls	2,000,000
Improved procurement efficiency and cost management	1,000,000

Reduced billing errors and increased revenue assurance	700,000
Audit and compliance cost savings	300,000
Total Estimated Annual Savings	KES 4,000,000

Conclusion

Investment in a modern ERP system enables the utility to move from fragmented, paper-based systems to a digitized environment with high visibility, control, and traceability. This transformation is critical to driving down leakages and inefficiencies, leading to a sustainable KES 4 million in annual savings, while positioning the organization for future scalability and service excellence.

STAFF SKILLS: KES 1.5M

Procedural errors, especially in areas like budgeting, financial reporting, internal auditing, and procurement, lead to significant financial losses. These losses can stem from fines, penalties, rework, delayed projects, missed opportunities, fraudulent activities, and inefficient resource allocation. By investing in comprehensive training, staff competency increases, leading to a reduction in these errors and tangible cost savings.

Expected Impact & Savings (Year 1 & Onwards):

1. Budgeting Training Impact:

- **Reduced Overruns:** Improved forecasting and expenditure tracking reduce budget overruns by 70%.
- **Savings:** 70% of KES 1,000,000 = **KES 700,000**

2. Financial Reporting Training Impact:

- **Reduced Errors & Fines:** Accuracy of reports improves significantly, eliminating external corrections and fines.
- **Savings:** 80% of KES 300,000 = **KES 240,000**
- Staff are proficient in accounting software, IFRS/IPSAS, and internal reconciliation procedures.

3. Procurement Integrity Training Impact:

- **Value for Money & Fraud Prevention:** Enhanced skills in competitive bidding, contract negotiation, and fraud detection lead to better deals and reduced leakages. Overpayment reduced by 60%.
- **Savings:** 60% of KES 450,000 = **KES 270,000**
- Staff understand ethical guidelines, due diligence, and effective tender evaluation, minimizing risks of collusion and securing optimal pricing.

4. Internal Audit Training Impact:

- **Proactive Risk Mitigation & Efficiency Gains:** Internal audit becomes more effective in identifying inefficiencies and potential risks early, leading to process improvements and cost avoidance.
- **Savings:** 60% of KES 250,000 = **KES 150,000**
- Auditors are trained in risk-based auditing, data analytics for anomaly detection, and recommending robust internal controls.
- **Additional Savings (Reduced Audit Fees):** Due to fewer errors and better internal controls, external audit time is reduced, saving approximately **KES 140,000** annually in audit fees.

Total Annual Savings from Reduced Procedural Errors:

- Budgeting: KES 700,000
- Financial Reporting: KES 240,000
- Procurement Integrity: KES 270,000
- Internal Audit & Efficiency: KES 150,000 + KES 140,000

Total = KES 700,000 + KES 240,000 + KES 270,000 + KES 150,000 + KES 140,000 = KES 1,500,000

BUDGET TOOLS: KES 1.5M

The Core Problem: Manual budgeting and cost monitoring are prone to human error, slow data processing, and reactive decision-making. This often leads to budget overruns because:

- Expenses aren't tracked in real-time.
- Deviations from the budget (variances) are identified too late.
- Forecasts are based on outdated information.
- Approval processes are cumbersome, leading to last-minute, unbudgeted spending.

Here is an overview of how the KSH 1.5m annual savings in revenue was achieved:

- **Departmental Overspending (Lack of Real-Time Visibility):** Departments frequently exceeded their allocated budgets, especially on consumables, minor repairs, and travel. These overruns were only identified at month-end budget reconciliation.
 - *Estimated Annual Overrun:* KES 600,000 .
- **Emergency/Unbudgeted Purchases (Slow Approvals & Reactive Spending):** Urgent purchases often occurred outside the proper procurement process due to slow manual approvals or unexpected needs, leading to higher costs.
 - *Estimated Annual Cost of Unbudgeted Spending:* KES 400,000 (paying premium for rush orders, using non-preferred vendors).
- **Inefficient Resource Allocation (Poor Forecasting):** Misallocation of funds due to inaccurate forecasts led to some departments having surplus while others experienced deficits, requiring costly reallocations or delaying critical projects.
 - *Estimated Annual Hidden Cost/Opportunity Loss:* KES 200,000 (delays in machinery maintenance due to lack of funds, causing downtime).

Total Estimated Annual Overruns/Inefficiencies = KES 600,000 + KES 400,000 + KES 200,000 = KES 1,200,000

INTERNAL AUDIT: KES 2.0M

- **Detection of Existing Frauds:**

- **Automated Anomaly Detection:** The new data analytics tools flag a pattern of unusually high-value invoices from a previously unknown supplier. Further investigation reveals a collusive scheme between an employee in procurement and this supplier, leading to inflated prices for services not rendered. (Identified loss: KES 800,000)
- **Inventory Shrinkage Identified:** Through risk-based audits focusing on high-value inventory items and using new reconciliation tools, internal audit uncovers a regular "discrepancy" in the warehouse, revealing a systematic theft operation involving a few employees. (Identified loss: KES 700,000)

- **Prevention of Future Frauds:**

- **Deterrent Effect:** The mere knowledge that internal audit is now equipped and actively looking for fraud acts as a powerful deterrent, discouraging potential fraudsters.
- **Strengthened Controls:** Based on audit findings, management implements stronger internal controls in vulnerable areas (e.g., mandatory dual authorization for high-value purchases, tighter inventory count procedures, segregation of duties). This prevents similar frauds from occurring in the future.
- **Early Warning System:** Regular risk assessments and continuous monitoring (using the new tools) allow internal audit to identify emerging fraud risks and advise management on proactive measures before significant losses occur.

Quantifiable Savings:

Let's assume that through the detection of the identified frauds and the prevention of similar or new frauds due to the strengthened controls and deterrent effect, Apex Corp averts potential losses that would have amounted to KES 2,000,000 annually.

- **Direct Recovery/Avoided Loss from Identified Frauds:** KES 800,000 (procurement) + KES 700,000 (inventory) = KES 1,500,000
- **Prevented Future Losses (Conservative Estimate):** KES 500,000 (due to improved controls, deterrence, and early detection of new schemes)

Total Estimated Savings: KES 1,500,000 (Direct) + KES 500,000 (Prevented) = KES 2,000,000/year

PROCUREMENT REFORM: KES 2.5M

The Problem: CHEWASCO's current procurement process is inefficient and prone to waste. The lack of controls and automation makes it difficult for the company to:

- **Ensure competitive pricing:** Without a centralized system, different departments may be paying varying prices for the same goods or services.
- **Track and analyze spending:** Limited visibility into procurement data makes it challenging to identify areas of waste and negotiate better terms with suppliers.
- **Maintain transparency and accountability:** The absence of a clear audit trail increases the risk of fraud and unethical practices.

The Solution: Implementing Procurement Controls & e-Procurement Setup

CHEWASCO to overhaul its procurement process, focusing on two key components:

1. Implementing Procurement Controls:

- **Centralized Procurement Policy:** Establishing a clear and comprehensive policy outlining procurement procedures, approval workflows, and spending limits.
- **Designated Procurement Team:** Creating a dedicated team responsible for managing all procurement activities, ensuring consistency and expertise.
- **Approved Vendor List:** Developing a list of pre-qualified and vetted suppliers, ensuring quality and competitive pricing.
- **Spending Thresholds and Approval Matrix:** Implementing a tiered system for purchase approvals based on value, requiring higher-level authorization for larger expenditures.
- **Regular Audits and Compliance Checks:** Conducting periodic reviews to ensure adherence to procurement policies and identify areas for improvement.
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2. e-Procurement System Setup:

- **Online Requisition and Ordering:** Implementing a web-based system for employees to submit purchase requests and place orders, streamlining the process and improving tracking.
- **Automated Workflow and Approvals:** Configuring the system to automatically route requisitions and orders through the appropriate approval channels, reducing delays and ensuring compliance.
- **Electronic Invoicing and Payment:** Integrating the system with accounting software for seamless invoice processing and payment, minimizing errors and improving efficiency.
- **Supplier Portal:** Providing a platform for suppliers to submit bids, manage catalogs, and track order status, fostering collaboration and transparency.
- **Data Analytics and Reporting:** Utilizing the system's reporting capabilities to analyze spending patterns, identify cost-saving opportunities, and monitor supplier performance.

The Impact: Reducing Procurement Waste and Saving KSH 2.3M/Year

With these measures in place, CHEWASCO will experience significant improvements in the following areas

- **Reduced Pricing Variance:** The e-procurement system enables price comparisons across multiple suppliers, ensuring the company obtains the most competitive rates.
 - Example: By consolidating purchases of office supplies through the system, CHEWASCO can negotiate a 15% discount with a preferred vendor, saving KSH 500,000 annually.
- **Elimination of Maverick Spending:** The enforced procurement policy and automated workflows prevent unauthorized purchases.
 - Example: The system blocks a department's attempt to purchase software from an unapproved vendor at a 20% higher price, saving KES 300,000.
- **Improved Spend Visibility and Negotiation:** The e-procurement system provides detailed reports on spending patterns, allowing CHEWASCO to leverage its purchasing power.

- Example: Analysis of procurement data reveals that CHEWASCO is spending a significant amount on courier services. By negotiating a bulk discount with a single provider, the company can save KSH 700,000 per year.
- **Increased Efficiency and Reduced Administrative Costs:** The automated workflows and electronic processes reduce manual effort and paperwork.
 - Example: The e-procurement system eliminates the need for manual invoice processing, saving the accounting department KSH 300,000 in labor costs.
- **Enhanced Transparency and Accountability:** The system provides a complete audit trail of all procurement transactions, minimizing the risk of fraud and unethical behavior.
 - Example: The system's reporting capabilities flag a suspicious transaction involving a procurement officer and a vendor, preventing a potential loss of KES 500,000.

Quantifiable Savings:

Through a combination of reduced pricing, eliminated maverick spending, improved spend visibility, increased efficiency, and enhanced transparency, CHEWASCO will achieve a substantial cost savings.

- **Direct Savings from Price Reduction & Negotiation:** KES 500,000 (Office Supplies) + KES 700,000 (Courier and other Services) = KES 1,200,000
- **Savings from Preventing Maverick Spending:** KES 300,000
- **Savings from Increased Efficiency (Reduced Admin Costs):** KES 300,000
- **Savings from Preventing Fraud:** KES 500,000

Total Estimated Savings: KES 1,200,000 + KES 300,000 + KES 300,000 + KES 500,000 = KES 2,300,000/year

→ **Total Savings: KES 11,500,000**

4.4 Organizational/Institutional Improvements

Investments:

To transform the WSP's human capital and organizational structure to a lean, accountable, and performance-driven operation, contributing to cost savings, productivity gains, and measurable improvement in OCCR.

Costed Investment Breakdown & Impact

	Investment Area	Key Activities	Budget (KES)	Estimated Financial Impact
1	HR Audit & Organizational Restructuring	Skills audit, role rationalization, removal of redundancies	6,000,000	Reduce staff overhead: KES 5M/year
2	Performance-Based Management System (PBMS)	KPIs for all roles, automated appraisal, reward system	6,000,000	Improve productivity → +KES 3M/year revenue from better service delivery
3	Training & Capacity Building Program	Technical, financial, customer care & leadership training for 120 staff	6,500,000	Reduce errors, improve efficiency: save KES 2.5M/year
4	HR Policy Modernization & Digitization	Revise HR manual, implement digital HRMIS	4,500,000	Improve HR processes: save KES 1.5M/year
5	Succession Planning & Talent Management	Identify critical roles, mentorship, development plans	3,500,000	Sustain efficiency, reduce hiring gaps: save KES 1M/year
6	Change Management & Culture Transformation	Internal communication, staff engagement campaigns	3,500,000	Boost morale and service ownership → +KES 2M/year in revenue retention

Post-Investment Financial Effects:

Cost Reductions:

PAYROLL & HR EFFICIENCIES: KES 5M

CHEWASCO to undertake a comprehensive HR Audit followed by strategic Organizational Restructuring to address HR issues.

1. HR Audit:

- **Skills Audit:** This involves a systematic assessment of the current skills, competencies, and qualifications of the entire workforce. It identifies:
 - Existing skill sets within the organization.
 - Gaps between current skills and future business requirements.
 - Areas of over-qualification or under-qualification for specific roles.
- **Workforce Analysis:** Reviewing current job descriptions, reporting lines, and departmental structures to understand how work flows and where resources are allocated.
- **Performance Data Review:** Analyzing performance appraisals, productivity metrics, and employee engagement data to identify areas of inefficiency or underperformance.
- **Compensation & Benefits Review:** Assessing salary structures, benefits packages, and overall compensation costs against market benchmarks and internal equity.

2. Organizational Restructuring:

Based on the findings of the HR Audit, the restructuring focuses on:

- **Role Rationalization:**
 - **Clarifying Job Roles:** Re-defining job descriptions to be clearer, more focused, and eliminate ambiguity.

- **Consolidating Roles:** Merging responsibilities from fragmented roles into more comprehensive and efficient positions.
- **Redesigning Workflows:** Streamlining processes to reduce the number of handoffs and unnecessary steps, thereby reducing the need for certain positions.
- **Removal of Redundancies:**
 - **Identifying Duplication:** Pinpointing instances where multiple individuals or teams are performing the same or highly similar tasks.
 - **Eliminating Overlap:** Strategically reducing headcount in areas where duplication is identified, either through reassigning employees to critical areas or through voluntary/involuntary separation.
 - **Optimizing Team Sizes:** Adjusting the number of employees within departments to align with actual workload and efficiency standards.
- **Strategic Reskilling/Upskilling:** Where skill gaps are identified, investing in training and development programs to equip existing employees for new or expanded roles, rather than immediately hiring externally.
- **Performance Management Integration:** Tying restructured roles and clear expectations directly to a robust performance management system to ensure ongoing accountability and productivity.

The Impact: Reduced Staff Overhead Saving KSH 5M/Year

Once these initiatives are implemented, CHEWASCO starts to see significant financial benefits:

- **Consolidation of Administrative Roles:** The skills audit reveals several administrative assistants across different departments performing similar data entry and filing tasks. Through role rationalization, these roles are consolidated into a centralized administrative support team with fewer overall staff. (Savings: KES 1,500,000 from 3 FTEs at KES 500,000/year each).
- **Streamlined Production Line Supervision:** The audit identifies an excess of supervisors on one of the production lines due to historical overstaffing. By optimizing the supervisor-to-employee ratio based on modern best practices and improving communication tools, two supervisory positions are deemed redundant. (Savings: KES 2,000,000 from 2 FTEs at KES 1,000,000/year each).

- **Automated Data Processing:** The skills audit highlights that a significant portion of the finance team's time is spent on manual data reconciliation. By investing in automation tools and training existing staff to manage these tools, one data entry position becomes redundant. (Savings: KES 500,000).
- **Optimized Marketing Department:** The audit reveals an overlap in digital content creation roles. By defining clear specializations and optimizing workflows, one position is rationalized, with responsibilities redistributed amongst the remaining team members who are upskilled where necessary. (Savings: KES 1,000,000).

Quantifiable Savings:

The combined effect of these actions directly reduces the company's annual staff overhead:

- Savings from administrative role consolidation: KES 1,500,000
- Savings from production line supervisor optimization: KES 2,000,000
- Savings from automated data processing: KES 500,000
- Savings from marketing department optimization: KES 1,000,000

Total Estimated Savings: KES 1,500,000 + KES 2,000,000 + KES 500,000 + KES 1,000,000 = KES 5,000,000/year

TRAINING IMPACT: KES 2.5M

The Problem: CHEWASCO challenges stem from skill gaps and inconsistencies across various departments:

- **Technical Errors:** Support staff sometimes lack the in-depth technical knowledge to resolve complex issues, leading to escalations and longer resolution times.
- **Financial Inaccuracies:** The finance department experiences frequent data entry errors, reconciliation issues, and delays in reporting, impacting cash flow management and decision-making.
- **Inconsistent Customer Experience:** Front-line staff lack standardized customer care training, leading to varied service quality and occasional customer dissatisfaction.

- **Leadership Gaps:** Team leaders and supervisors struggle with effective communication, delegation, and conflict resolution, impacting team morale and productivity.
- **Inefficiency and Rework:** All these issues lead to significant time spent on correcting mistakes, redoing tasks, and managing customer complaints, diverting resources from productive work.

The Solution: Comprehensive Training & Capacity Building Program

CHEWASCO to invest in a targeted training and capacity building program for 50 key staff members across relevant departments. The program is structured as follows:

1. **Needs Assessment:** Before training, conduct a thorough needs assessment to pinpoint specific skill gaps and performance deficiencies in each area.
2. **Targeted Training Modules:**
 - **Technical Training (for 30 Technical Support & Development Staff):**
 - Advanced troubleshooting techniques.
 - Efficient use of diagnostic tools.
 - New Water Technologies in the Market.
 - **Financial Training (for 5 Finance & Sales Admin Staff):**
 - Advanced Excel for financial modeling and analysis.
 - Principles of accurate invoicing and expense management.
 - Understanding financial reporting and compliance.
 - Introduction to fraud detection.
 - **Customer Care Training (for 10 Customer-Facing Staff - Sales, Support, Front Desk):**
 - Active listening and effective communication.
 - Conflict resolution and handling difficult customers.

- Building rapport and customer loyalty.
- Standardized customer service protocols.
- **Leadership Training (for 5 Team Leaders & Supervisors):**
 - Effective delegation and performance feedback.
 - Motivating and retaining talent.
 - Conflict management and problem-solving.
 - Strategic planning for teams.
- 3. **Delivery Method:** A blended approach incorporating workshops, online modules, case studies, and practical exercises, spread over several months to allow for application and reinforcement.
- 4. **Post-Training Support:** Mentorship, regular feedback sessions, and access to online resources to ensure sustained learning and application of new skills.

The Impact: Reduced Errors, Improved Efficiency Saving KSH 2.5M/Year

CHEWASCO anticipates significant improvements, leading to quantifiable savings:

- **Reduced Technical Errors & Faster Resolution:**
 - Technical staff, now better equipped, resolve more issues at the first point of contact, reducing escalations by 20%. This frees up senior engineers' time and improves customer satisfaction.
 - Reduced time spent by senior staff on escalations, leading to **KES 700,000** in increased productivity and avoided overtime.
- **Improved Financial Accuracy & Efficiency:**
 - Finance staff make fewer errors in invoicing and expense processing. Reconciliation time is reduced by 15%.
 - Reduced rework, fewer penalties for incorrect filings, and more efficient use of finance team's time, saving **KES 500,000**.

- **Enhanced Customer Satisfaction & Retention:**

- Customer-facing staff handle inquiries more effectively, leading to a 10% increase in positive customer feedback and a 5% reduction in customer dissatisfaction.
- Retained customers mean avoided marketing costs to acquire new ones and increased lifetime value. This translates to **KES 800,000** in avoided customer acquisition costs and increased revenue from loyal customers.

- **Boosted Team Productivity & Morale (from Leadership Training):**

- Leaders are more effective in guiding their teams, leading to better project completion rates and higher team morale. Employee turnover in teams with trained leaders decreases by 3%.
- Reduced costs associated with recruitment and onboarding for replacements, plus overall higher team output, saving **KES 500,000**.

Quantifiable Savings Summary:

- Savings from reduced technical errors & faster resolution: KES 700,000
- Savings from improved financial accuracy & efficiency: KES 500,000
- Savings from enhanced customer satisfaction & retention: KES 800,000
- Savings from boosted team productivity & reduced turnover: KES 500,000

Total Estimated Annual Savings: KES 700,000 + KES 500,000 + KES 800,000 + KES 500,000 = KES 2,500,000/year

DIGITIZED HR PROCESSES: KES 1.5M

CHEWASCO to embark on a transformative journey for its HR function, focusing on two integrated pillars:

1. HR Policy Modernization:

- **Comprehensive Policy Review & Revision:** A thorough review of all existing HR policies (e.g., leave, attendance, disciplinary, performance management, code of conduct) to ensure they are:
 - **Up-to-date:** Compliant with current Kenyan labor laws and best practices.
 - **Clear and Concise:** Easy for all employees to understand.
 - **Consistent:** Applied uniformly across all departments and employee groups.
 - **Aligned with Company Vision:** Supporting the company's strategic goals and culture.
- **New HR Manual Development:** Compiling all revised and new policies into a single, comprehensive, and easily navigable HR Manual.
- **Communication & Training:** Rolling out the modernized policies through workshops and communication campaigns to ensure all employees and managers are aware of the changes.

2. Digital HRMIS Implementation:

- **Integrated HR Information System:** Selecting and implementing a cloud-based HRMIS that covers key HR functions, such as:
 - **Employee Database:** Centralized digital records for all employee information.
 - **Leave Management:** Automated leave requests, approvals, and balance tracking.
 - **Attendance Tracking:** Digital clock-in/out or integration with biometric systems.
 - **Performance Management Module:** Digital goal setting, reviews, and feedback.
 - **Recruitment Module:** Online applicant tracking and onboarding workflows.

- **Employee Self-Service Portal:** Enabling employees to access their information, apply for leave, update details, and view pay slips.
 - **Reporting & Analytics:** Generating custom HR reports with ease.
- **Data Migration:** Transferring all existing employee data from physical files and spreadsheets into the new HRMIS.
- **System Customization & Integration:** Tailoring the HRMIS to Heritage Builders' specific needs and integrating it with payroll and potentially other business systems.
- **User Training:** Providing comprehensive training to HR staff, managers, and all employees on how to effectively use the new HRMIS.

The Impact: Improved HR Processes Saving KES 1.5M/Year

Once these initiatives are in place, CHEWASCO will experience significant improvements and quantifiable cost savings:

- **Reduced Administrative Time & Costs:**
 - **Automated Leave Processing:** Employees apply for leave via the portal, managers approve digitally, and balances are updated automatically. HR spends 70% less time on leave administration.
 - **Digital Onboarding:** New hire paperwork is completed online, significantly reducing manual data entry and processing time for HR.
 - Reduced HR staff time spent on manual tasks, allowing them to focus on strategic HR initiatives. This saves approximately **KES 700,000** annually in HR administrative effort.
- **Improved Compliance & Reduced Risks:**
 - Modernized policies ensure adherence to labor laws, reducing the risk of fines, lawsuits, and employee grievances.
 - The HRMIS provides a clear audit trail for all HR transactions, enhancing accountability.
 - Avoided potential legal costs, fines, and costs associated with resolving complex grievances. Conservatively estimated at **KES 300,000** annually.

- **Enhanced Employee Self-Service & Engagement:**

- Employees can access their information and perform routine HR tasks independently, reducing direct inquiries to the HR department. This frees up HR staff time.
- Improved transparency and ease of access to information boost employee satisfaction.
- Reduced interruptions for HR staff and improved overall employee experience, indirectly leading to higher retention. Quantified as **KES 200,000** in saved HR response time and indirect benefits.

- **Better Data for Decision Making:**

- The HRMIS provides real-time data on absenteeism, turnover, and performance, enabling proactive HR interventions.
- More informed decision-making leading to better talent management, which reduces recruitment costs and improves productivity. Conservatively estimated at **KES 300,000** through optimized workforce planning and reduced unnecessary hiring.

Quantifiable Savings Summary:

- Savings from reduced HR administrative time & costs: KES 700,000
- Savings from improved compliance & reduced risks: KES 300,000
- Savings from enhanced employee self-service & engagement: KES 200,000
- Savings from better data for decision making: KES 300,000

Total Estimated Annual Savings: KES 700,000 + KES 300,000 + KES 200,000 + KES 300,000 = KES 1,500,000/year

SUCCESSION/TALENT PLANNING: KES 1.8M

The Solution: Succession Planning & Talent Management Program

CHEWASCO to implement a proactive Succession Planning and Talent Management program to build a robust internal talent pipeline:

1. Identify Critical Roles:

- **Strategic Role Assessment:** Systematically identifying positions that are vital for the company's long-term success, have unique skill sets, or whose vacancy would cause significant operational disruption (e.g., Head of Quality Control, Chief Engineer, Senior Sales Manager, IT Infrastructure Lead).
- **Risk Analysis:** Assessing the likelihood of incumbents leaving these roles (e.g., retirement age, perceived flight risk) and the impact of such departures.

2. Develop a Talent Pool:

- **Talent Identification:** Identifying high-potential employees across various departments who demonstrate leadership qualities, technical aptitude, and a strong commitment to the company. This isn't just about current performance but also future potential.
- **Performance and Potential Matrix:** Categorize employees based on their current performance and future growth potential.

3. Implement Mentorship Programs:

- **Paired Mentorship:** Senior leaders and experienced specialists are formally paired with high-potential employees.
- **Knowledge Transfer:** Mentors guide mentees, sharing institutional knowledge, best practices, and industry insights.
- **Skill Development:** Mentors provide specific guidance on developing skills required for future roles.

4. Create Individual Development Plans (IDPs):

- **Tailored Growth Paths:** For each identified high-potential employee, a personalized IDP is created. This plan outlines:
- **Target Roles:** The specific future roles they are being developed for.

- **Skill Gaps:** Key competencies or knowledge areas they need to develop.
- **Learning Activities:** Specific training courses (technical, leadership, soft skills), workshops, certifications, cross-functional assignments, or external education required.
- **Timelines:** A realistic timeframe for achieving milestones.
- **Regular Review:** IDPs are regularly reviewed and updated through discussions between employees, their managers, and HR.
- **The Impact: Sustained Efficiency, Reduced Hiring Gaps Saving KES 1M/Year**
- Once these initiatives are in place, CHEWASCO will realize significant benefits and quantifiable savings:

- **Reduced Disruption from Departures:**

When the Head of Technical Services announces their retirement, a successor (identified and developed through the program for 18 months) is ready to step into the role with minimal downtime. This prevents potential production slowdowns or quality control issues that would have cost the company in rejected batches or customer complaints.

Avoided production losses and quality control issues: **KES 400,000.**

- **Lower Recruitment Costs for Critical Roles:**

Instead of spending on headhunters and extensive external recruitment drives for senior roles, the company can fill positions internally. This significantly reduces agency fees, advertising costs, and time-to-fill.

Avoided recruitment agency fees and advertising costs for 2-3 critical roles per year: **KES 300,000.**

- **Faster Onboarding and Productivity Ramp-Up:**

Internal successors already understand the company culture, processes, and have established networks. Their ramp-up time to full productivity is significantly shorter than an external hire.

Reduced time for new hires to become fully productive (less training, fewer mistakes), saving **KES 200,000.**

- **Retention of Key Talent:**

Providing clear growth paths and development opportunities increases employee engagement and loyalty, reducing voluntary turnover among high-potential staff.

Estimated Savings: Avoided costs associated with the turnover of high-performing employees saving **KES 100,000**.

- **Quantifiable Savings Summary:**

- Savings from reduced operational disruption: KES 400,000
- Savings from lower external recruitment costs: KES 300,000
- Savings from faster internal onboarding/productivity: KES 200,000
- Savings from improved talent retention: KES 100,000
- **Total Estimated Annual Savings: KES 400,000 + KES 300,000 + KES 200,000 + KES 100,000 = KES 1,000,000/year**

→ **Total Cost Savings: KES 10.8M**

Revenue Increases:

- Productivity (PBMS): **KES 2M**

→ **Total Revenue Gain: KES 2M**

Updated Financials:

- **New Revenue** = 30M + 2M = **KES 32,000,000**
- **New Operating Costs** = 33M – 10.8M = **KES 22,200,000**

New OCCR: 32,000,000/22,200,000= 1.42

Result: OCCR improves from 1.1 to 1.42— a **sustainability level** purely through organizational efficiency and HR reforms.

Commented [AK1]: Is 1.42 attainable? I think it is overambitious

Summary:

With a **KES 30 million investment** in HR policy, training, and organizational transformation, the WSP can save **KES 10.8 million** in costs and generate **KES 2 million** in additional revenue annually — increasing the OCCR from **1.1 to 1.42**, marking a major structural turnaround in performance and sustainability.

Investment scenario modelling

4.2.1. Scenario 1: Business-as-Usual

Table 4.2.1. Historical and Current status on Company performance

Year	Revenue	Expenditure	OCCR
2021	19,062,326	19,305,038	0.98
2022	22,298,368	22,161,656	1.01
2023	22,995,928	23,092,077	1.00
2024	37,180,222	34,677,532	1.07
2025	49,115,342	51,315,079	0.96

4.2.2. Scenario 2: Business-as-Usual (Projected)

Business as Usual assumptions (List Below)

Table 4.2.2. Future status on Company performance without intervention

Year	Projected Revenue (KSh '000)	Projected O&M Cost (KSh '000)	OCCR
2025	49,115,342	51,315,709	0.96
2026	51,571,109	51,828,866	0.98
2027	54,149,665	54,938,598	0.99
2028	56,857,148	57,685,528	0.99
2029	60,700,005	60,569,804	1.00
2030	62,685,005	61,175,502	1.02

4.2.3. Scenario 3: Comprehensive Investment (List Assumption below

Table 4.2.3 Comprehensive Investment Model

Year	Projected Revenue (KSh '000)	Projected O&M Cost (KSh '000)	OCCR
2025	49,115,342	51,315,709	0.96
2026	63,600,000	58,832,000	1.08
2027	88,560,000	76,415,000	1.16
2028	105,000,000	88,167,000	1.19
2029	119,000,000	96,603,000	1.23
2030	138,700,000	108,592,000	1.30

The modeling exercise shows that Chemususu Water Company can only achieve financial sustainability, generate funds for reinvestment, and qualify for K-WASH disbursements through a comprehensive investment strategy.

Table 3.5 Summary of financial Resource requirements

No.	KPI under Intervention	area of Intervention	Cost Estimate Ksh	Funding Source	Proportion %
1	NRW	Technical intervention	29,000,000	1.Donors, 2.County Government Subsidies 3.Own Revenue	
2	Energy Efficiency	Technical Intervention	7,000,000		
3	Collection efficiency and Accounts receivable Turnover	Commercial Intervention	18,000,000	1.Donors, 2.County Government Subsidies 3.Own Revenue	
4	Metering Ratio	Commercial Intervention	12,000,000	1.Donors, 2.County Government Subsidies 3.Own Revenue	

5	Debt to Equity Ratio.	Financial Intervention	18,000,000	1.Donors, 2.County Government Subsidies 3.Own Revenue	
6		Institutional Investments	30,000,000	1.Donors, 2.County Government Subsidies 3.Own Revenue	
TOTAL INVESTMENT			114,000,000		

4.5 Potential Bankable Projects

Project 1: Water Distribution Network Expansion (High-Growth Peri-Urban Areas)

Technical Solutions:

- Extension of water pipelines (30 km) to underserved peri-urban zones.
- Construction of 3 new elevated storage tanks (300m³ each).
- Installation of 1,200 domestic and commercial connections (with smart meters).

Financial Viability & Bankability:

- **CAPEX:** KES 280,000,000
- **OPEX (Annual):** KES 12,000,000
- **Revenue Potential:** KES 45,000,000/year
- **Payback Period:** ~7.5 years
- **NPV (10% discount):** KES 58M
- **IRR:** 13.8%

Bankability: Moderate risk, strong socio-economic impact, suitable for concessional lending with public-private partnership.

Here is a breakdown of the allocation of the above funds on how it was achieved at and the possible ways in which it can be utilized:

Project 1: Water Distribution Network Expansion – Areas of Chemususu Water Company SPA

A. Pipeline Extension (30 km Total)

Item No.	Description of Work	Unit	Quantity	Unit Rate (KES)	Total (KES)
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A1	Trenching (1m depth × 0.5m width)	m	30,000	500	15,000,000
A2	Supply & Installation of HDPE pipes (DN110– DN250)	m	30,000	2,200	66,000,000
A3	Pipe jointing, fittings, and testing	m	30,000	500	15,000,000
A4	Backfilling and compaction	m	30,000	300	9,000,000
	Subtotal A – Pipeline Works				105,000,000

B. Elevated Storage Tanks (3 Units x 300m³)

Item No.	Description of Work	Unit	Quantity	Unit Rate (KES)	Total (KES)
B1	Civil works and foundations	tank	3	6,000,000	18,000,000

B2	Fabrication & erection of steel tank (300m³)	tank	3	9,000,000	27,000,000
B3	Piping, valves, and tank fittings	tank	3	3,000,000	9,000,000
B4	Access ladder, platform, and safety systems	tank	3	1,000,000	3,000,000
	Subtotal B – Storage Tanks				57,000,000

C. Household & Commercial Connections (1,200 Units)

Item No.	Description of Work	Unit	Quantity	Unit Rate (KES)	Total (KES)
C1	Excavation and piping to connection point	unit	1,200	2,000	2,400,000

C2	Supply and installation of smart meters	unit	1,200	10,000	12,000,000
C3	Service pipe, fittings, and valves	unit	1,200	4,000	4,800,000
	Subtotal C Connections				19,200,000

D. Ancillary Works & Miscellaneous

Item No.	Description of Work	Unit	Quantity	Unit Rate (KES)	Total (KES)
D1	Road and surface reinstatement (asphalt/paving)	m ²	12,000	500	6,000,000
D2	Signage, demarcation, and safety barriers	item	LS	-	2,000,000

D3	Environmental & social mitigation (ESMP)	item	LS	-	2,800,000
D4	Engineering supervision and project management	item	LS	-	8,000,000
	Subtotal D – Ancillary & Admin				18,800,000

CAPEX Summary

Category	Amount (KES)
Subtotal A – Pipeline Works	105,000,000
Subtotal B – Storage Tanks	57,000,000
Subtotal C – Connections	19,200,000
Subtotal D – Ancillary & Admin	18,800,000
Contingency (10%)	28,000,000
Total CAPEX	KES 280,000,000

Notes

- OPEX (Annual): KES 12 million (staffing, maintenance, energy, admin) – not included in BoQ.

- Revenue Potential: KES 45 million/year from 1,200 smart-metered customers (~KES 3,125/customer/year). This is based on the current average monthly consumption of consumers of between Kshs 250-500

Project 2: Solarization of Water Pumping Stations

Technical Solutions:

- Install 500 kW solar PV systems across 5 high-energy-consuming pumping stations.
- Hybrid setup with battery storage and grid backup.
- Retrofit pump motors with energy-efficient VFDs.

Financial Viability & Bankability:

- **CAPEX:** KES 95,000,000
- **OPEX Savings:** KES 18,000,000/year (reduced electricity bills)
- **Revenue Impact:** Indirect (cost reduction improves margins)
- **Payback Period:** ~5.3 years
- **NPV (10% discount):** KES 41M
- **IRR:** 17.2%
- **Sensitivity:** Still viable with 20% drop in energy cost savings.

Bankability: High; ideal for green energy financing and climate-aligned funds.

The BOQ below is a general approximation and analysis of how the above summary was arrived at

Project 2: Solarization of Water Pumping Stations

Technical Solutions

- Install 500 kW solar PV systems across 5 high-energy-consuming pumping stations.
- Hybrid setup with battery storage and grid backup.
- Retrofit pump motors with energy-efficient Variable Frequency Drives (VFDs).

Bill of Quantities

Item No.	Description of Work	Unit	Quantity	Unit Rate (KES)	Total (KES)
A1	Design, permits, and engineering studies	LS	1	5,000,000	5,000,000
A2	Procurement and installation of solar PV modules (500 kW)	kW	500	80,000	40,000,000
A3	Battery storage system (Li-ion, 1,000 kWh)	kWh	1,000	25,000	25,000,000
A4	Grid integration and hybrid	LS	1	7,000,000	7,000,000

	control systems				
A5	Retrofitting pump motors with VFDs	station	5	2,000,000	10,000,000
A6	Monitoring, SCADA system, and training	LS	1	3,000,000	3,000,000
A7	Contingency (approx. 5%)	LS	1	5,000,000	5,000,000
	Total CAPEX				95,000,000

Project 3: NRW Reduction Investment Program

Projected Bill of Quantities

NRW Reduction Investment Program

Background

Chemususu Water Company (CHEWASCO) faces high Non-Revenue Water (NRW) levels, estimated at 50–55%. This level of water loss limits revenue generation, increases operational costs, and affects service reliability. Reducing NRW is a priority intervention aligned with the Kenya Water Sector Performance frameworks and investment priorities of the World Bank and other development partners.

Problem Statement

High NRW levels in CHEWASCO are driven by aging infrastructure, limited metering coverage, illegal connections, pipe bursts, inadequate pressure control, and outdated billing systems. These challenges constrain revenue collection and raise operational expenditures, threatening financial sustainability.

Proposed Investment

CHEWASCO proposes a comprehensive NRW reduction program focusing on metering, district metered area creation, pipe rehabilitation, smart billing, GIS integration, and performance-based contracting. The program is scalable and can be implemented under three investment levels.

Inputs

Parameter	Value	Unit
Number of Connections	4000	connections
Number of DMAs	26	DMAs
Bulk Meters Required	4	meters
Pipe Rehab Length	20	km

Metering

Item	Quantity	Unit Cost (KES)	Total (KES)	Notes
Consumer meters (DN15)	4,000	5,000	20,000,000	Replace quantity from Inputs
Meter installation	4,000	1,000	4,000,000	Installation labor per meter
Smart/AMR meters (selective)	50	80,000	4,000,000	Example: 50 AMR meters for high-value customers

		Subtotal (KES):	28,000,000	
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DMA SET UP

Item	Quantity	Unit Cost (KES)	Total (KES)
DMA inlet meters	20	500,000	10,000,000
Bulk smart meters	4	120,000	480,000
Leak detection & immediate repairs	1	1,500,000	1,500,000
Pressure reducing valves (PRVs)	10	500,000	5,000,000
		Subtotal (KES):	16,980,000

PIPELINE REHABILITATION

Item	Quantity	Unit Cost (KES)	Total (KES)	Notes
Priority mains rehab (km)	20	400,000	8,000,000	KES per km (materials+install)

IT AND BILLING UPGRADES

Item	Quantity	Unit Cost (KES)	Total (KES)
GIS mapping & database setup	1	2,000,000	2,000,000
Billing system + MDM integration	1	1,500,000	1,500,000
Software licenses (year 1)	1	300,000	300,000
		Subtotal (KES):	3,800,000

TRAINING & CAPACITY BUILDING

Item	Quantity	Unit Cost (KES)	Total (KES)
Capacity building (staff training)	1	1,000,000	1,000,000
PBC setup & verification consultancy	1	2,000,000	2,000,000
Monitoring & verification (yearly)	3	200,000	600,000
		Subtotal (KES):	3,600,000

SUMMARY OF THE INVESTMENTS ON NRW

Component	Subtotal (KES)	Notes
Metering	28,000,000	Meters, installation, AMR
DMA Setup	16,980,000	DMA inlet meters, leak detection, PRVs, bulk meters
Pipe Rehabilitation	8,000,000	Priority and secondary rehab
IT & Billing	3,800,000	GIS, billing, licenses
Training & PBC	3,600,000	Capacity building & PBC setup
Subtotal (KES)	60,380,000	Total before contingency

Expected Outcomes

- Improved revenue collection and OCCR performance.
- Reduced physical water losses through pipe rehabilitation and pressure management.
- Enhanced commercial efficiency through improved customer metering and billing.
- Improved operational monitoring through DMA setup and smart metering.
- Enhanced customer satisfaction due to stabilized supply and reduced rationing.

Budget Summary

Based on CHEWASCO's network size and the proposed investments, the required funding ranges between KES 38million and KES 60 million depending on the selected investment scenario. The final cost will be determined after detailed engineering assessments and field verification.

Conclusion

The NRW reduction program presents a viable, high-impact investment for development partners. It enhances utility performance, increases revenue, and strengthens climate resilience. CHEWASCO seeks World Bank support to undertake this transformative project.

Project 4: Decentralized Wastewater Treatment Units (DWWT)

Technical Solutions:

- Deploy 3 compact DWWT systems in growing informal settlements and commercial zones.
- Modular, low-footprint bio-digesters and constructed wetlands.
- Sludge recovery for fertilizer and water reuse (non-potable).

Financial Viability & Bankability:

- **CAPEX:** KES 140,000,000
- **OPEX:** KES 10,000,000/year
- **Revenue Streams:**
 - Sewerage tariffs: KES 12,000,000/year
 - Sludge reuse: KES 3,000,000/year
- **Payback Period:** ~8.5 years
- **NPV (10% discount):** KES 21M
- **IRR:** 11.2%

Bankability: Social-environmental returns are high; viable with concessional finance and CSR-linked partnerships.

Projected Bill of Quantities (BOQ) – Project 4: Decentralized Wastewater Treatment Units (DWWT)

This Bill of Quantities outlines the estimated capital expenditure (CAPEX) for the deployment of three Decentralized Wastewater Treatment (DWWT) units in informal settlements and commercial zones. The systems include modular bio-digesters, constructed wetlands, and sludge reuse infrastructure.

Item No.	Description	Unit	Qty	Amount (KES)
A1	Site assessment, permits, and environmental impact report	Lump Sum	1	3,000,000
A2	Project management, design & supervision	Lump Sum	1	6,000,000
	Subtotal A			9,000,000
B1	Excavation and earthworks for 3 sites	m³	900	2,250,000
B2	Concrete works (foundation + tanks)	m³	450	4,050,000
B3	Construction of wetlands beds	m²	600	3,000,000
B4	Site fencing and security infrastructure	Site	3	2,400,000
	Subtotal B			11,700,000
C1	Modular bio-digester	Unit	3	60,000,000

	systems (compact)			
C2	Pumps, valves, aerators, blowers	Set	3	15,000,000
C3	Control panels and automation	Set	3	6,000,000
	Subtotal C			81,000,000
D1	Sludge drying beds & recovery units	Set	3	7,500,000
D2	Storage tanks for non- potable water reuse	Unit	3	4,500,000
D3	Distribution infrastructure (reuse)	Site	3	3,000,000
	Subtotal D			15,000,000
E1	Systems testing and commissioning	Site	3	3,000,000
E2	Operator training and handover documentation	Lump Sum	1	1,300,000
	Subtotal E			4,300,000
	Contingency (Approx. 6.3%)			9,000,000
	TOTAL CAPEX (KES)			140,000,000

Summary Table

Project	CAPEX (KES)	OPEX/Year	Revenue/Year	Payback	IRR	Bankability
Distribution Expansion	280M	12M	45M	7.5 yrs	13.8%	Moderate
Solar Pumping	95M	-	18M (savings)	5.3 yrs	17.2%	High
NRW Investments	60M	5M	20M	3.6 yrs	21.4%	High
Wastewater Treatment	140M	10M	15M	8.5 yrs	11.2%	Moderate

5. Implementation Roadmap, Monitoring and Evaluation Plan

5.1 Implementation Plan

Intervention	Responsibility	Timeline	Resources required	Milestone/deliverable
Purchase of Water Meters	Commercial Department	2025-2030	36,000,000	Improvement of billing ratio to 100%
Maximize solar power usage, including construction of storage tanks, expansion of treatment capacity, and increased source development	Production-Direct costs	2025-2030	80,000,000	100%
Strengthen debt recovery processes by implementing early intervention strategies for overdue accounts	Finance Cost	2025-2030	20,000,000	100%
Streamline and automate operational workflows to eliminate	BOD and Managing Director	2025-2030	20,000,000	100%

inefficiencies and reduce manual labor costs				
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5.2 Monitoring and Evaluation Plan

Monitoring and Evaluation Plan					
Objective	Indicator	Data Source	Frequency	Responsible Person	Means of Verification
Enhance NRW reduction measures (billing, metering, etc.)	NRW	Billing Extracts	Monthly	MD/TM/FM	WARIS
Assess whether current water tariffs are sufficient to cover operating costs and infrastructure maintenance	Grant Dependency	Financial Reports	Yearly	MD/FM	AUDITORS REPORTS
Maximize solar power usage, including construction of storage tanks, expansion of treatment capacity, and increased source development	Energy efficiency	Production&Technical Reports	Quarterly	MD/TM/FM	Production Department Reports
Strengthen debt recovery processes by implementing early intervention strategies for overdue accounts	Accounts Receivable Turnover	Financial Reports	Quarterly	MD/ FM	AUDITORS REPORTS
Streamline and automate operational workflows to eliminate inefficiencies and reduce manual labor costs	Staff per 1000	M&E Reports	Monthly	MD/TM/FM	WARIS

- **KPIs Aligned to WASREB:** NRW, OCCR, staff ratio, revenue collection efficiency
- **Frequency:** Quarterly reporting to the Board and County
- **Responsibility:** PIAP Coordinator under MD's supervision
- **Update Frequency:** Annual review and update cycle