WATER AND SANITATION TO THE URBAN POOR

Devolution Trust Fund Zambia

Enhancement of Utility Performance through Water Loss Reductions – *A Zambian Perspective*

Sam Gonga/Ian Banda
DTF Manager/CEO Kafubu WSC

Presentation Overview

- Introduction to DTF
- Project Background
- Objectives
- Implementation Approach
- Challenges
- Lessons Learnt
- Experience from the field – Kafubu WSC

Introduction … Why DTF

- Urbanisation and inadequate service provision in peri-urban areas
- Outbreaks of water-borne diseases
- Utilities financially weak at inception even now -< 100% coverage of O&M
- Govt set up DTF as provided for by WSS Act of 1997
- Operates a basket fund with support from Govt, KfW, EU and DANIDA

Project Background

- Utilities established without capitalization,
- Inherited dilapidated and over-used infrastructure from local authorities and a huge and de-motivated staff
- Utilities were and are still obliged to provide an acceptable level of service to everyone within their service areas –peri urban areas included
- Hence DTF provides grants to Utilities to improve service delivery in these areas through financing investments in infrastructure for WSS
- The weaker Utilities also need support in other areas of their operations

Project Background *Cont'd*

- Major challenges facing Utilities are low metering ratios, high UfW (NRW), low collection efficiency (perhaps due to poor water supply) and high energy bills
- Hence separate financing window was established within DTF called the Performance Enhancement Fund (PEF) for grant funding such purposes
- The PEF has consequently intentionally focused on NRW and energy reduction/optimisation measures

Project Objectives

- To contribute to efficiency enhancement & viability of the Utilities
- Increase meter coverage and update customer database
- Enable comparison of supply Vs Consumption
- Determine levels of NRW at micro area level/follow up measures

Implementation Approach

- Proposals evaluated taking into account generated Incremental Cash Flow (ICF) and performance of the Utility
- The ICF is computed based on assumptions of impact of metering on future demand
- Metering likely to lead to a reduction on consumption by households
- This likely results in a reduction in direct production and distribution costs, & are thus included in the ICF

Implementation cont'd

- Proposals with a –ve ICF are normally rejected
- However, a proposal with a –ve ICF could still be a viable project since the water saved through metering would benefit other areas within the system
- Step by step iterative process: 1st metering, customer update, lastly network repairs

Challenges

- Knowledge gap between mgt and operational staff in merits of NRW reduction
- Lack of credible data at conception stage and during implementation
- Obtaining operational data to compute ICF for 5years in advance is generally difficult & could lead to inaccurate results
- At times project team does not coordinate with other functional depts within utility
- Little time for analysis of generated data – *half-baked results*

Lessons Learnt

- Utilities are at different levels of understanding concepts on NRW
- Metering/NRW programmes can be a challenge to smaller and weaker Utilities
- there is a need to continuously build capacity in utilities in WDM/NRW practices
- Peri-urban areas also a source of high NRW - integrate these areas in such programmes

- **Thanks** → Practical Aspect (Kafubu WSC)

PRESENTATION FORMAT

- Background
- Project Objectives
- Results
- Lessons Learnt and Conclusions

BACKGROUND

- Kafubu Water and Sewerage Company (KWSC) Limited was established in July 2000 and operates the towns of Ndola, Luanshya and Masaiti serving approximately 48,000 customers.
- Main activities in the area are manufacturing, mining and agriculture.
- High NRW of over 65% at inception of KWSC in 2000

BACKGROUND (Cont'd)

- Low metering ratio at inception (6%).
- Severely dilapidated network infrastructure which is in dire need of refurbishment.

Project Objectives

The overall objective of this project was to improve supply to Lubuto township in Ndola. The specific objectives were:

- reduce water losses
- increase revenue from water sales
- increase revenue from sewage treatment services

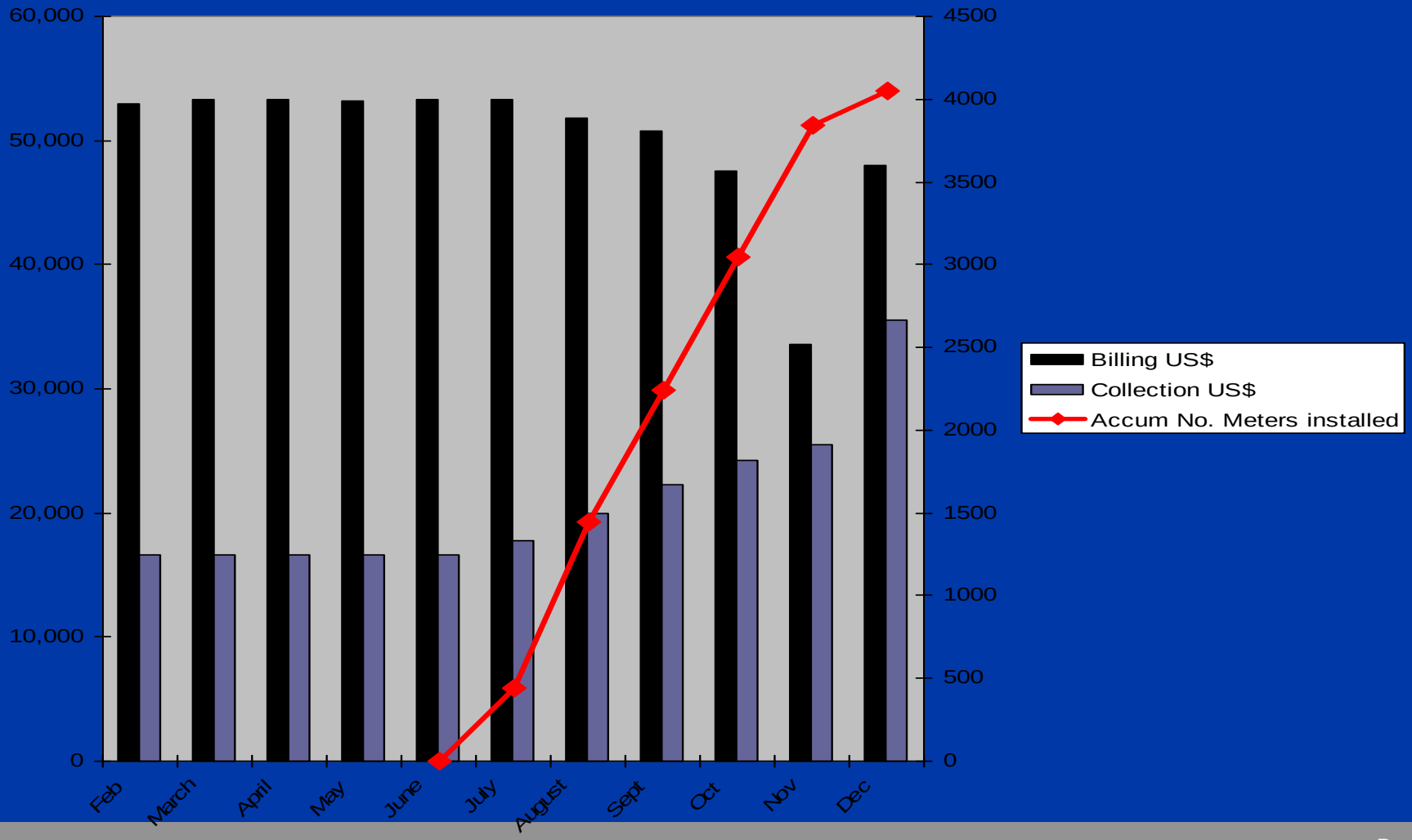
US$ 350,000 was sourced from the DTF!!

Key Project Activities

- Customer sensitisation
- Installation of 4000+ domestic meters
- Installation of a district meter
- Repair of customer premises leaks
- Spot repair of network distribution leaks

Results

Financial analysis in Lubuto Township "**before and after metering**"



Results: The IWA Water Balance Before and After

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Annual System Input Volume

63,463 766 m3/year

63 463 766 m3/year

Error Margin [+/-]: 0.9%

Authorized Consumption

30 423 120 m3/year

31,207 685 m3/year

Error Margin [+/-]: 0.1%

Water Losses

33 040 646 m3/year

32, 256 081 m3/year

Error Margin [+/-]: 1.8%

Billed Authorized Consumption

29 712 420 m3/year

30,496 985 m3/year

Billed Metered Consumption

7 024 140 m3/year

11 687 105 m3/year

Billed Unmetered Consumption

22 688 280 m3/year

18 809 880 m3/year

Unbilled Authorized Consumption

710 700 m3/year

Error Margin [+/-]: 3.5%

Unbilled Metered Consumption

0 m3/year

Unbilled Unmetered Consumption

710 700 m3/year

Error Margin [+/-]: 3.5%

Commercial Losses

1 739 371 m3/year

1 503 847 m3/year

Error Margin [+/-]: 5.5%

Unauthorized Consumption

565 750 m3/year

Error Margin [+/-]: 12.7%

Customer Meter Inaccuracies and Data Handling Errors

1 173 621 m3/year

Error Margin [+/-]: 5.3%

938,097 m3/year

Physical Losses

30,752 234 m3/year

31 301 275 m3/year

Error Margin [+/-]: 1.9%

Revenue Water

29 712 420 m3/year

30 496 985 m3/year

Non-Revenue Water

32,966 781 m3/year

33 751 346 m3/year

Error Margin [+/-]: 1.7%

Lessons Learnt and Conclusions

- Metering as an ENTRY WLR, strategy improved access to water

  Before : 40% - 12hrs

  After: 100% - over 15hrs
- Billing is much more fairer (diagram shows a nett reduction in billing after project!!) as customers are billed for what they consume
- Wastage has reduced as customers are MORE PRUDENT in their water usage
- Sewage revenue is now captured as compliance rate has been enhanced
- Other COMPLIMENTARY INTERVENTIONS focusing on improving the structural integrity of the network NEED to be employed (this is due to e.g. increased pressures that can trigger failure and hence water loss! which negates the gains accrued)
- Revenue collection in the Area has increased by over 100%.
- Unauthorized consumption by disconnected customers using fixed charge has been eradicated
- Payback 24 months!!!

Lessons Learnt and Conclusions

- Meters need to be replaced **after 5years** hence intervention should be on-going, it is not an “end in itself”
- Water Balance Model Diagram very helpful tool
- Enhanced Economic Efficiency
- Social Equity
- Enhanced Sustenance of watsan provision by the utility

Thank you very much!!