Intricacy of a Performance Based Co-Management NRW Reduction Project Case: Kingston, Jamaica

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Project Area – Kingston and St. Andrew



Why NRW Reduction Project?

High levels of NRW (est. 59%)

- Inefficiency in operations
- Vicious Cycle
- Diminishing value of Utility by the Customer
 - No support when applying for a Tariff review
 - Sees staff as non-performers
- Climate change Unpredictable rainfall patterns
 - Traditionally known as land of 'wood and water'
- Scarcity of Commodity in the capital city
 - Impacting lives
 - Impacting economy





KSA Reservoirs – 3rd quarter of 2015

Hermitage

Mona







Water Resource Utilization

Water Resources and Demand (MCM/yr) by Hydrologic Basins



NATIONAL WATER COMMISSION







Primary Objective

 "To establish within the National Water Commission (NWC) a sustainable non-revenue water management capability to deliver the long-term NRW targets and objectives of the NWC."





Secondary Objectives

- a) Reduce NRW within the KSA to 37% of water into supply within 2 years from the start date of the contract to 30% by the end of year 5.
- b) Maximise the income collected by the NWC, and to which it is entitled.
- c) Prepare and implement Strategies and Actions Plans that will ensure the improved performance and efficiency of the NWC.





Contract

- Covers all of Kingston and St. Andrew parishes
 - Includes Socially Challenging Areas ("Red Areas")
- Term 5 years, with gradual transfer of management from the Consultant to the Utility staff over the 5 years.
 - But Consultant remains fully responsible for achievement of performance targets.
- Value \$42.5m (funding by the Inter American Development Bank)
- Co-management team
 - Miya 28 staff
- NWC 148 staff



Project Phases

- Phase 1: Strategy Preparation
 - Months 1 to 6, includes a detailed validated baseline audit, economic analysis and development of the NRW reduction strategy
- Phase 2: Execution
 - Months 7 to 24 Led by the Miya team
- Phase 3: Consolidation
 - Months 25 to 48 NWC deputy team leader and other NWC project team members gradually take on more responsibility for the project
- Phase 4: Sustainability
 - Months 49 to 60 NWC staff are fully managing the project. Miya team leader monitoring project progress and only taking action where necessary





Characteristics of Project Area

- Area 155 km²
- Elevations from sea level to 525 m above sea level
 - High pressures over 140 m head in certain parts,
 - low in other parts 5 M
- Population 588,300
 - 11,790 households in Socially Challenging Areas
 - Plus informal settlements
- 107,000 active accounts
- Sources 2 surface water, 9 wellfields, plus 1 import
 - 25 inputs metered, 40 unmetered produce around 200 Mld
- Network 1,584 km
 - 44 storage tanks, 27 pumping stations











Game Changer

- NRW estimated at 59% in KSA
- Critical project for the enterprise
- For success Requires participation of all
 - Mgmt, Staff, Contractor, Unions, Politicians, Funding Agencies
- Chance to improve several areas of operation in KSA
- Knowledge transfer will occur from Consultants to NWC staff





Co-Management Concept

- What is Co-Management ?
 - Two or more entities jointly managing an institution, project etc.
- Why Co-management
 - History of failure to maintain NRW after contractor leaves
 - Inadequate involvement of NWC staff
 - Inadequate capacity building with past approaches
 - Take advantage of contractor's experience on wider spectrum of water issues
 - Non Obligation of contractors (generally) going forward after contract period ends





Benefits of Co-Management and Performance Incentive Contract

- More control for the Utility
- Better knowledge transfer



- Exposes staff to best practices
- Possible Replication of process in other parts of the country
- Consultants have to work "harder" to earn their profit
- Better 'sell' to external stakeholders





Challenges of Co-Management and Performance Incentive Contract

- Consultant may feel their hands are tied
- NWC staff non-performance Penalty claims
- NWC refuse to change modus operandi
 Penalty claims
- Staff assigned to Co-Mgmt team feels they are now doing more work;
 - claiming for higher remuneration
 - staff refusing to be assigned to Co-Mgmt team
- Potential Grievances
 Union actions
- Potential work stoppages



Challenges observed in developing the ToR

- Information to be provided to bidders
- Stakeholders having differing views
- Scope of Work
- Contract terms and incentives
- Bid Evaluation Criteria
- Organisation restructuring
- Risks and Mitigation Measures





How to Improve Implementation ?

- Sensitisation/buy in of Stakeholders
- Advertise improvements internally and externally
- Continually identify risks and craft mitigation strategies
- Provide frequent updates and seek feedback to/from stakeholders
- Undertake complementary activities efficiently





NRW Reduction Targets

- NRW Reduction Targets expressed as percentages
 - Consultant wants Targets to be reviewed and be based on ELL analysis
 - NWC wary of conflict of interest as new targets set by contractor for the contractor to achieve





Consultant spective





Perspective of Consultant

- Challenging Project
 - NRW Reduction Target, Timescale, Budget
- Some "Low hanging fruits"
 - Considerable potential for pressure reduction
 - But need to maintain supply flexibility
 - Requires a calibrated hydraulic model for design
 - Considerable potential for improving materials and quality of repairs
 - Will dramatically reduce break rates and rework
 - Good environment for certification of training
 - Comprehensive detailed training program, with certification, being developed and provided

OMMISSI



Issues

- NRW Reduction Targets expressed as percentages
 - Targets to be reviewed, based on ELL analysis
 - NWC wary of conflict of interest as new targets set by contractor for the contractor to achieve
- Baseline consumption to be used for all further NRW reduction analyses
 - No incentive to reduce apparent losses! (being reviewed)
- 2014 / 15 worst drought on record
 - Intermittent supplies, but supply times not recorded
 - Determination of baseline in accordance with contract not possible

Production volumes not properly derived



Issues (Continued)

- Main KSA system currently operates as one open system, but with throttled valves throughout network (some valves buried)
- Proposal assumed use of NWC vehicles and equipment
 - Vehicles at end of life high failure rate
 - Mainly pickup trucks, not panel vans (Contractor prefers panel vans)
 - Very limited equipment for repair work





Issues (Continued)

Procedures and resources for pipeline repair

- No adequate dump trucks
 - To bring imported material to each repair
 - To removed excavated material (rejected or wet)
 - Excavators recommended Need Trailers and trailer drivers
 - Not used before by the utility
 - Certification required by traffic authority





NWC Pickup Truck







NWC Panel Vans



miya



Pipe Bedding









Detailed Validated Water Audit

- completed the following tasks:
 - Testing production meter accuracy
 - Analysis of historic production data
 - Random sample testing of revenue meters
 - *Logging distribution system pressures –Installing consumption monitor on sample of unmeasured customer services (information only)
 - Detailed audit of customer meter reading and billing processes and data
 - *Random sample survey to quantify degree of illegal connections



*Redone as a result of drought conditions or requests



Updated Validated Audit

- Based on (near) 24/7 supply
 - May, June, July 2016
- Incorporating:
 - Results of unmeasured consumption monitor analysis
 - Results of additional illegal connections surveys
 - More accurate average pressure data under 24/7 supply
- Will update economic analysis
- May result in changes to NRW reduction strategy





Development of NRW Reduction Strategy

- Completed the following tasks:
 - Developed comprehensive training program
 - Supported by new Standard Operating Procedures (SOPs)
 - Review of NWC current working practices and materials
 - To improve asset management
 - Review of meter management
 - Improving NWC GIS data and update processes
 - Improving existing NWC hydraulic model
 - To support outline pressure zone designs
 - Initial procurement of equipment and materials
 - Preparation of warehouse, vehicles etc.



 Development of strategy for Socially Challenging Areas (SCAs)



Key Strategy Components

- Comprehensive training program
- Advanced pressure management (remote node control) and transient control
- Control of reservoir overflows
- DMA establishment
- Leak detection and repair
- Improved repair procedures and materials
- Replacement of under-performing meters
- Community activities in SCAs





Initial Implementation

- Extensive training provided (more to come)
 - NWC managers
 - NRW staff
 - New leakage inspectors
 - Repair / maintenance teams
 - Meter management staff
 - New equipment training
- Initial zone office leak repairs using new equipment and materials
- Dedicated leak detection work
- Field data collection for model calibration

Design of pressure management in boosted zones









Summary

- Final audit and strategy development submitted and accepted, updated validated water balance to be submitted
- Very interesting, novel approach to performance based NRW reduction contracts
- If successful could result in wider adoption of this type of contract
 - Some lessons to be learnt from this contract
- Will deliver one of the first comprehensive certified training programs for NRW management
- Leak Repair work started
- Some initial challenges to overcome
 - But good co-operation by both parties



Any Questions?

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