Incorporating Non-Revenue Water activities is not enough. A comprehensive approach is the sustainable solution

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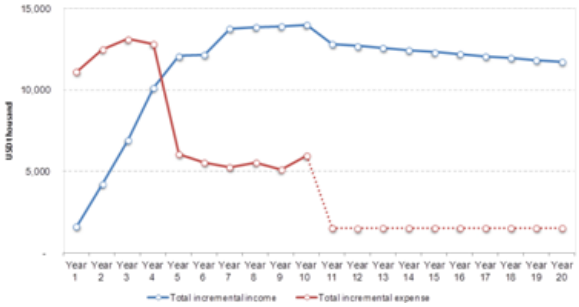
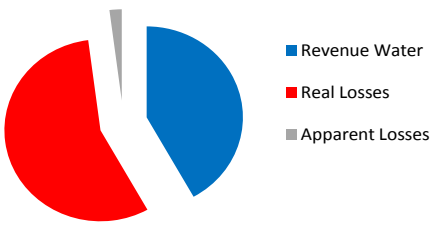
Typical Long term NRW reduction financial benefit analysis Graph



Awareness of the potential savings that non-revenue water (NRW) management can bring has increased over the past several years (demonstrated in the amount of water loss conferences, experts, technologies etc), in part due to the International Water Association's (IWA) Standard Water Balance and recognition of the components of NRW. Still most utilities throughout the world attempt to address NRW reduction by implementing autonomous initiatives rather than a comprehensive NRW approach to reducing water losses, and improving their overall efficiency. This paper will try to explain why **choosing a comprehensive NRW approach is a sustainable choice, with more chances to succeed in reducing losses and improving efficiency**.

Reality proves that when it comes to reducing NRW, implementing one or more initiatives to reduce losses will not solve the problem. **Water systems are complex** and utilities must work around challenging issues on a daily basis while overseeing the maintenance and renewal of infrastructure. Water mains replacement is a key part of infrastructure renewal however it is not an effective approach to NRW reduction because the majority of both unreported and reported leaks result from the service connections rather than the mains themselves. Mains' leaks can be significant; but because they are often large they are often reported and repaired quickly. Collectively the volume of water loss from small leaks that are either undetected or ignored exceeds the loss from a relatively small number of water main failures because they can run for days, months, or even years. Additionally, each initiative should be examined in economic terms, meaning, is the economic benefit of the result is higher than the cost of doing it. And even when taking into account all considerations, reducing lost, increasing efficiencies, and improving service – is challenging.

2011 Water Audit
New Providence, Bahamas



A water utility that is interested in reducing losses and renewing its infrastructure, should adopt a holistic and comprehensive NRW approach. The answer lies in considering all of the water utility goals (increased customer service satisfaction, save water and energy, sustainable results). For

almost three decades Water and Sewerage Corporation (WSC) in the Bahamas has had very limited success in coping with increasing levels of Non Revenue Water (NRW). Some NRW reduction efforts have shown good results, but those were not maintained. WSC has realized that a long-term comprehensive approach had to be taken. In 2011 real losses on the island of New Providence exceeded both revenue water and apparent loses combined (based on Miya's baseline study report for WSC).

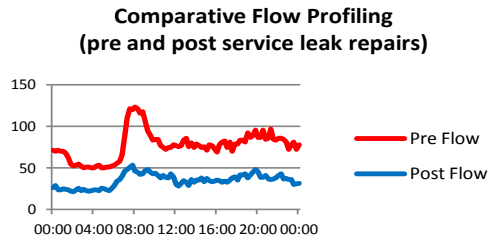
In 2012, WSC embraced on a project that includes a **comprehensive suite of water efficiency solutions, incorporating strategic and financial planning**, based on local audits of Non Revenue Water (NRW). The contract is performance-based, with high percentage of the fees paid over the project lifetime directly related to the actual achievement of the targets agreed. International NRW experts will selectively employ and train local staff and contractors to execute the work, ultimately turning over the knowledge to the WSC staff. Some financing for the implementation phase is provided by the Inter-America Development Bank (IDB), assisting WSC in the first years while the project cash flow will still be negative.

Miya, an Arison Group Company was chosen (after a long international bidding process) by WSC to implement the comprehensive solution.

Miya is a global provider of comprehensive urban water efficiency solutions, including Non Revenue Water (NRW) reduction which developed a four stages comprehensive NRW reduction proposal to optimize urban water usage, based on the best practice methodology proposed by the International Water Association (IWA). The company partners with water utilities as a service provider, on a turnkey project basis, in order to ensure the long term efficiency of their networks, with the mission is to help the cities of the world benefit from the huge opportunity presented by water loss reduction and effective management of urban water. **Miya is the first global company to offer a comprehensive water efficiency solution and a one stop shop for water loss projects.**

Miya holds vast experience in implementing water efficiency projects around the globe, proven to not only improve the financial situation of the water utility, but also improve customer service levels, reduce energy consumption and lower contamination and health risks. The company's approach is to set all projects' goals in term of NRW objectives and by that to ensure that the design, contract and execution are all in sync with the water utility's NRW objectives. **Miya evaluates the investment and return potential of each activity and orchestrate all the efforts, with one goal in mind – the reduction of NRW levels.**

As NRW reduction is multifaceted, water utilities should also adopt risk mitigation activities, in addition to real losses and apparent losses reduction. The Rapid Result Initiative (RRI) Miya conducted in one of WSC existing pressure management zones, demonstrate the efficacy of technology and techniques in the local environment. The condition in the field helps **determine which activities are going to be most effective to implement to reduce NRW in the whole project.** The RRI showcase a reduction of NRW while increasing minimum standard of service (15 PSI) and identify how this success was achieved.



A comprehensive solution not only involves training the water utility employees to properly use the technology, tools, and techniques, turning over the knowledge to the water utility staff, but also extends to educate the community at large through train-the-trainer efforts. The company, as part of its vision for ensuring environmental sustainability and community support, believes that sustainable change comes through the education of the younger generation. In cooperation with the Bahamian government, and as a contribution to the community, **Miya initiate and finance a pilot water efficiency educational program in primary schools in New Providence**, including implementation of water conservation measures. The principles for the education program include: students' education on the importance of water efficiency, school's staff empowerment with basic knowledge and skills related to water efficiency, community ownership and responsibility for water infrastructure and reporting of water related problems and stronger relationship between WSC and its consumers.

Innovative technologies are a strategic tool to improve NRW projects outcomes, and that is the reason Miya is devoting vast amount of resources in developing its knowledge and expertise in NRW new technologies. Innovative technologies can allow water utility not only to improve daily operations efficiency, but also to increase its services reliability. New technologies improve data quality and collection, support decision processes and forward planning. More than that, customers service expectations are raising, which require water utilities to incorporate new technologies to provide better service. **Miya developed close relations with NRW technologies vendors** which allows the company to have access to the most up-to-date info about new NRW technologies, and to collaborate with vendors based on customer needs. Those collaborations range from strategic, long-term partnerships to informal, case-by-case collaborations.

While water utilities are usually risk-averse, and shy away from implementing new technologies that they are not familiar with, **Miya can provide the know-how and thus confidence in integrating new technologies in the NRW efforts**. Miya screens new technologies, and analyzes these technologies to examine how effective are these technologies when integrated in the company's NRW projects. Miya developed experience in piloting and implementing state of the art technologies in its subsidiaries and projects and adapt them locally considering the effectiveness and usefulness of new technologies. Differently then technology vendors that promote one methodology and their portfolio of products, Miya has the ability to choose which approach is best suited to the customer's need and which technology to use so it would be the most cost-effective for the specific project. All of the above allows access to a comprehensive database of state of the art technologies in the field of NRW. That is the

reason **Miya is capable of bringing state of the art, most effective technologies both commercially and technically to reduce lost which will result in a positive return on investment.**

Example for one of those technologies which Miya is using in its NRW projects is Netbase -the world's leading water network management system, with an emphasis on water loss reduction management. Netbase has a comprehensive range of applications that fulfill all of the requirements for a Water Distribution Management system incorporating water industry methodologies and best practices. **Netbase brings together corporate systems data** (SCADA, Telemetry, AMR, billing, GIS etc) **into an integrated database to provide transparency to the status of the network** and to the data issues around determining and reducing NRW. Netbase is being implemented as part of the WSC project, together with an advance SCADA system that acts as the feeder of real time information into Netbase, and the "executer" of the outcome from Netbase, controlling pumps, tank levels etc.

In conclusion, as water systems are complex, only a comprehensive approach to NRW through strategic and financial planning, that incorporate all stakeholders (customers, employees, shareholders, community in general, etc.) is the sustainable solution that can reduce losses, maintain its infrastructure, and repay itself in years to come for the benefit of the water utility and its customers.