

ANNEX 2 – Non-revenue Water Management in Central Asian Countries

Regional Workshop on “Capacity Development, Water Operators’ Partnerships and Financing for Non-revenue Water Management” in Central Asian countries

7-9 July 2014, Dushanbe, Republic of Tajikistan

Each utility is requested to return this summary of Non-revenue Water Management in their utility **by 20. June 2014** to taeko.yokota@unhabitat.org and liebe@unwater.unu.edu. It may be provided in English or Russian, and will be part of the workshop proceedings. Tables and figures may be included, but should be referenced in the text.

Title: *IWA's Water Balance in Iran*

Name of the Utility: *National Water and Wastewater Engineering Company (nww)*

City and Country: *Tehran - Iran*

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Abstract

After the successful application of performance standards and indicators recommended by the International Water Association (IWA) by a number of countries, the National Water and Wastewater Engineering Company (NWW) decided to use the studies for the management and assessment of water losses in the networks under its control. Accordingly after review of the required information, the company prepared the strategic program (recommended by IWA) for reduction of water losses in the network, the first step of which consisted of preparing the water balance program. Accordingly, after the relevant training workshops and numerous meetings (over 80 in total) the water and wastewater companies (35 companies) were notified of the mentioned program in a very large scale. In addition to the IWA recommended indicators, new formats, software applications and indicators were also prepared and used for collection and verification of data and network comparison.

1. General background on the utility

Urban Water Distribution Information In Iran (2013):

- *No. of water and wastewater companies under NWW: 35 companies*
- *No. of connections: 14447000*
- *System input volume: 5607000000 M³*
- *Water network length: 142000 km*
- *%NRW: 24.7%*

2. Status of non-revenue water and water loss reduction and future

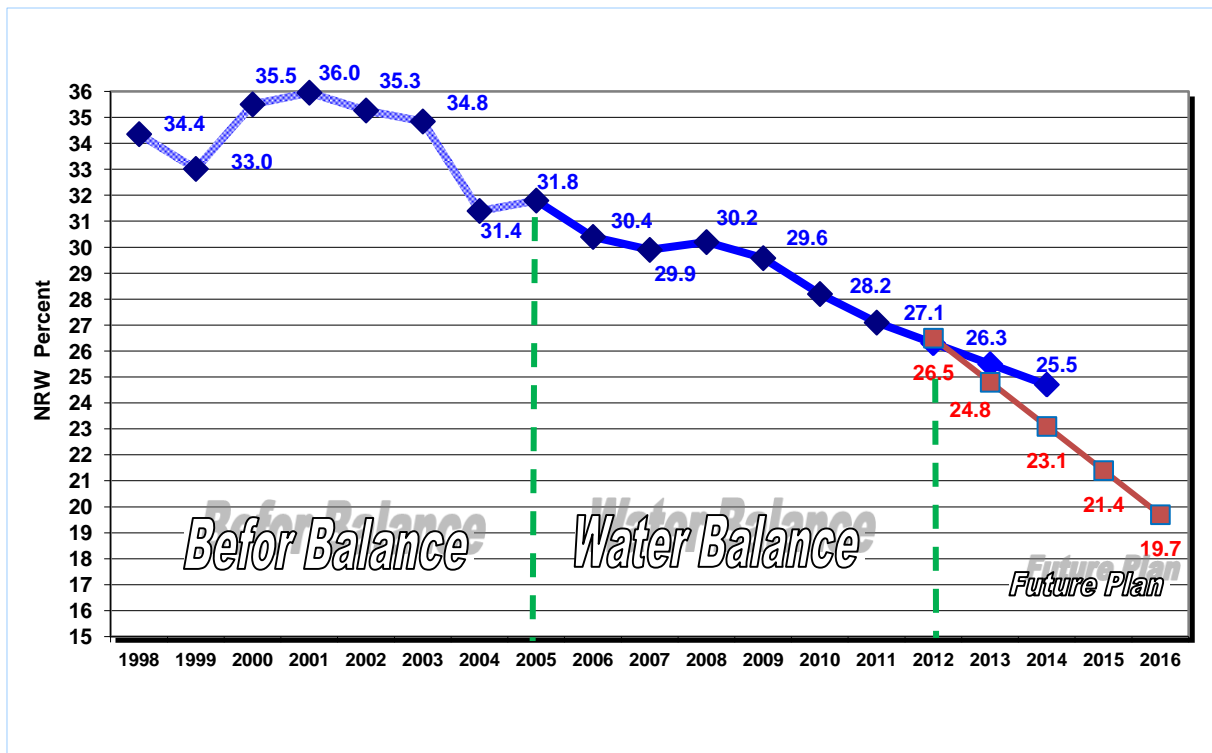
After implementation of Water Balance Program a number of information was obtained on the situation of Non-Revenue Water in Iranian cities, which were not available before. This section presents some results of the project.

Figures 1 present the water balance table based on the NRW components and their ratio for the year 2013.

NWVEC	A	Inputs	B	Total inputs	C	Outputs	D	Outputs	E	Outputs	F	Outputs									
		m ³ /year		% of input		m ³ /year		% of input		m ³ /year		% of input	m ³ /year	% of input							
National Water and Wastewater Engineering Company (2013)	Well	3046110815	System input volume	5607292262	Authorized consumptions	4313986870	Authorized billed consumptions	4221584901	Water delivered to other networks (bulk sale)	122071840	Revenue water	4221584901									
		54.3								2.2											
		Billed metered consumptions							3831848646												
	Qanat	18403933													Billed unmetered consumptions	267664415					
		0.3														4.8					
	Spring	164720621													Unbilled metered consumptions	20024296	Non-Revenue Water	1385707361			
		2.9														0.4					
	Purchase of treated water	957271910						17.1								Unbilled unmetered consumptions			72377674		
																			1.3		
										Unauthorized consumptions		163309242								2.9	
	WTP input	1348290839						24.0								Data management and system errors			120165803		
																			2.1		
										Meter inaccuracies		266764793								4.8	
	Other sources	72494144						1.3								Leakage in distribution network			364845504		
										6.2											
			Leakage in transmission lines	46916387							0.8										
			Overflows from storage tanks	5303665							0.1										
								Leakage from tanks	15340547												
									0.3												
								Leakage on service connections	312249785												
									5.6												

Figures 1: the water balance table based on the NRW components and their ratio for the year 2013

Figures 2 present the amount of NRW percentage in Iran before and after water balance program and the future plan.



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3. Efforts of the utility to reduce non-revenue water and water loss reduction

As mentioned NWW launched the water balance program in the year 2005, with the objective of assessing and managing the losses in networks of the subsidiary companies. Given the fact that companies had different definitions for UFW components prior to this action, there was an initial need for training the staff on the use of standard terms and for introducing the new indicators and methods for reduction of Non-Revenue Water. To this end the Company undertook extensive activities to train the relevant staff, which included:

- Organization of Specialized Training Workshops (350 man/hours)
- Organization of a training course (5400 man/hours)
- Holding explanatory meetings (640 man/hours)
- Organization of 36 local workshops in the companies for urban managers (5700 man/hours)
- Cooperation with the WBI for organization of a 2-day workshop targeted at all the Operational Deputies and staff in charge of Non-Revenue Water in the companies.

After these activities, NWWEC undertook started to implement the program through measures described below:

- Study, translation and compilation of various references
- The compilation of Water Balance Manual
- Design of software in EXCEL environment
- Collecting data from companies, analysis and generating reports
- Defining indicators to control data accuracy and preparing the draft benchmarks for NRW components
- Calculating the acceptable level of NRW (standard) in each city

4. Greatest challenges of the utility in addressing non-revenue water

The IWA Water Balance Program has been implemented in all the national cities (1060 in total) yielding to acceptable outcomes on identifying the conditions of the networks from the aspects of real losses, apparent losses and non revenue water. Before the program this form of information was unavailable, while today it is available for every city. Currently all projects in the NWW affiliated companies are based on a target oriented strategy and are designed and defined accordingly. The results of the water balance program have illustrated the weaknesses of each network and through an economical analysis (made possible by the software distributed to each company) the priorities of each NRW reduction project are set. Moreover since successful implementation of Water Balance program depends on accurate measurement of parameters of correct engineering estimation of some components, the companies are encourage to upgrade the measuring equipment at their disposal.

5. Knowledge and capacity needs to improve non-revenue water management:

We welcome anything that will improve NRW management.