

## S13.3-2 第1次本邦研修の報告会



# Solomon Water Participants NRW Management Training Presentation

Solomon Water Conference Room  
Friday 31<sup>st</sup> May 2013

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## Presentation Outline

- Introduction participants
- Acknowledgement
- Lessons learnt
- Issues identified/suggestion activities for future improvement
- Recommendations
- Comments & questions

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## Participants Introduction

- Ellen Inahia – Service Delivery & Communication Manager
- Benjy Billy – Team Leader (operations & network & NRW Coordinator
- Daisy Manega – Team Leader Meter Reading
- Austin Ata – Coordinator Connection Services

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## Acknowledgement

- Solomon Water Management
  - Confidence & trust in us
  - Capacity building – Managing NRW activities
- JICA representatives
  - Efforts and commitments of all acknowledged
  - Equipped & prepared to take up the challenge – betterment of our service
- Our partners in Japan
  - Yokohama Water Works Bureau
  - Yokohama Water
  - Naha Prefecture & Municipal/Naha City – Okinawa
  - Miyakojima Municipal

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## Training Focus

- Gain knowledge on countermeasures on NRW rate reduction in Yokohama & Okinawa from the perspective of Water Supply Management.
- To deepen our understanding on the management advantage of investment planning for NRW reduction, and to utilise it in the future's water supply management of Solomon Water (SW).

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## Topics Covered -

- Water Supply Designing & Management
- Reduction of NRW
- Replacement of aged pipes & leak prevention
- Water Purification
- Mapping System
- Repairment (practical)
- Delivery of Water Supply class (simulation)
- Meter Reading Management
- Charge/Tariff collection
- Water Resources Development

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## Focus

- Management of NRW activities thru tasks implemented by key relevant departments & NRW team members (SW)
  - Current situation we experiences
  - Recommendations
  - Proposed activities

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## Topics Covered -

- Ecological Purification System/Slow Sand filtration
- Measures against Leakage ( Leak Management)
- Water Quality (Bacteria, Hardness and Chlorine practical test)
- Culture, Hospitality and the beauty makes the difference!

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Situation Analysis		
CURRENT SITUATION	RECOMMENDATIONS	PROPOSED ACTIVITIES
<b>Connection Services</b> ❖ Lack of guidelines & processes to guide the facilitation of connection services.	i. Formulation of policies, processes and procedures. ii. Formulation of standard design and practices for field workers.	- Currently on progress – SDCD - Liaise with procurement office & other relevant unit to develop a standard & practices for field workers. - Standard installation of meter box.
<b>Meter Management</b> <input type="checkbox"/> Inconsistency of customer consumption rates due to meter/faulty/stop/meter duration <input type="checkbox"/> Inconsistency of readings (new meters/meter replacement/metering of direct line)	i. In place a system – to monitor meter life span. ii. Possibility for purchasing of new hand-held device used in Japan Water Bureau iii. Revisit re-checking processes. iv. Clear demarcation by responsible officers & flow of information	- Expand on what the unit currently developed on day to day schedules of tasks/target per day. - Documentation process to be filled & kept/linkages with CC customer abnormality in readings. - Monitoring - Remodel of system used by MR (consistent with

Situation Analysis		
CURRENT SITUATION	RECOMMENDATIONS	PROPOSED ACTIVITIES
<b>Billing Processes</b> <input type="checkbox"/> Tariff charges <input type="checkbox"/> Turbidity of water <input type="checkbox"/> Categories of customers <input type="checkbox"/> High ranges – customer charges	i. Essential for Review of our Tariff charge. ii. Increase customer base – manageable iii. Clear basis for tariff changes to be established. iv. Stabilization of fuel – Gov't intention v. Introduce new billing system	- Redefine the charges for connection charges and avoid reconnection fees. - Clear define guidelines on the processes – reflect finance and operations (linkages within the GIS) - Consumption rates etc.
<b>Revenue collection</b> <input type="checkbox"/> Collection	i. Improve our current revenue collection system.	- Establish <b>pay centres</b> – banks transactions, convenient shops. - Cashier must ne connected with Revenue unit

CURRENT SITUATION	RECOMMENDATIONS	PROPOSED ACTIVITIES
<b>Leakages</b> <input type="checkbox"/> Human Resource of SW – existing resources who are trained in leakages (not fully utilized) <input type="checkbox"/> Turbidity of water <input type="checkbox"/> Categories of customers <input type="checkbox"/> High ranges – customer charges	i. Identify and upgrade of technical officers. ii. Job specification - Need to redefine current officers with leakage skills	- Training - Creating and managing of leak control zones (LCZ) - Acquiring of leak detection equipment's/detections/f unctions & demand management.
<b>Pressure management</b> <input type="checkbox"/> High leakage – create meter damage & damage to household damages	i. Manage the pressure at the acceptable level	- Create pressure management zones (PMZ) - Installation of pressure reducing valves (PRV) - Installation of break-pressure tank (BPT).

CURRENT SITUATION	RECOMMENDATIONS	PROPOSED ACTIVITIES
<b>Mapping</b> <input type="checkbox"/> Data on main distribution and network/appliances and customer meter not updated.	i. To improve the capacity and quality of this service. ii. Outsourcing	- Collection of field datas - Update of drawings (create map/drafts man) - Reintroduce new mappings for new lines - Hard copies into soft copies.
<b>Water Resource</b> <input type="checkbox"/> Catchment areas not defined or protected. <input type="checkbox"/> Quality issue <input type="checkbox"/> Land ownership	i. Central Gov't to take up the water source works, establishment of dumps, acquiring of water catchment areas & regulatory	- Liaise with relevant stake holders secure (compulsory/lease arrangements). - Management of water source facilities. - Develop treatment plants ..environmental friendly system for filtering.

## Lessons learnt

- ❑ Outsourcing
  - ❑ Meter reading, connection services, and leakages activities.
- ❑ Immediate Activities
  - ❑ Orientation program – SD&CD

## Solomon Water

### ❑ Lesson learnt

- ❑ Customers Service & Communication
  - ❑ Approach in Targeting schools.
  - ❑ Service Check
  - ❑ Public relations
  - ❑ Polices & Guidelines
  - ❑ Proper Documentation

## Lessons Learnt

- ❑ Revenue & Disconnection
  - ❑ Monitoring of payment
  - ❑ Payment system
  - ❑ Reminders to customers
  - ❑ Disconnection process

## Lesson Learnt

- ❑ Leak Management
  - ❑ Creation of Blocks
  - ❑ Pressure Management
  - ❑ Leak Detection Techniques & Devices
  - ❑ Guideline for carryout leakage process.
  - ❑ Repair Techniques
  - ❑ Connection Standards
  - ❑ Mapping – very important .



## Lessons Learnt

- ❑ Water Resource Management
  - ❑ Management of Catchment area
  - ❑ Prefectural Gov't- look after treatment
  - ❑ Water Rights
  - ❑ Water Quality STD(Japan WHO)
- ❑ Outsourcing
  - ❑ Meter reading, connection services & leakages

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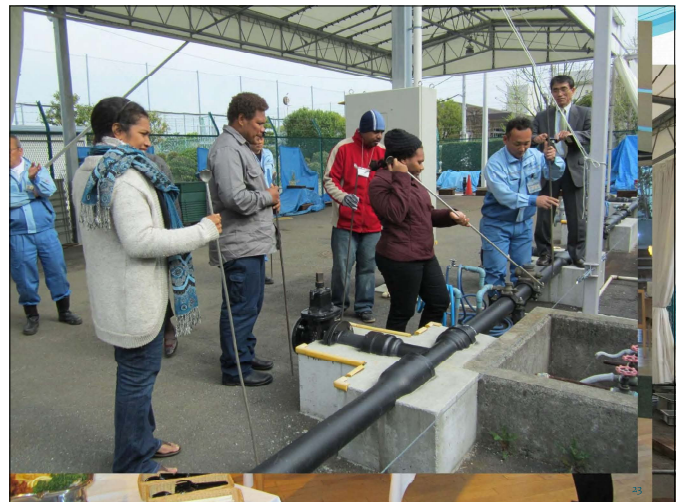
## Lessons Learnt

- ❑ Culture, Hospitality and the Beauty makes the Difference!
  - ❑ Respect and Honesty
  - ❑ Friendliness
  - ❑ Attitude ( Positive Mindset)
  - ❑ Very Alert to Details
  - ❑ Initiative and Innovative
  - ❑ Preservation of Cultural Heritage and History.
  - ❑ Time Management

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Flashback!



ARIGATO-GOZAIMASU

Flashback!



### S13.3-3 配水量分析のレビュー





# The Project for Improvement of Non-Revenue Water Reduction Capacity for SIWA in Solomon Islands

## REVIEW ON ANALYSIS OF IWA WATER BALANCE

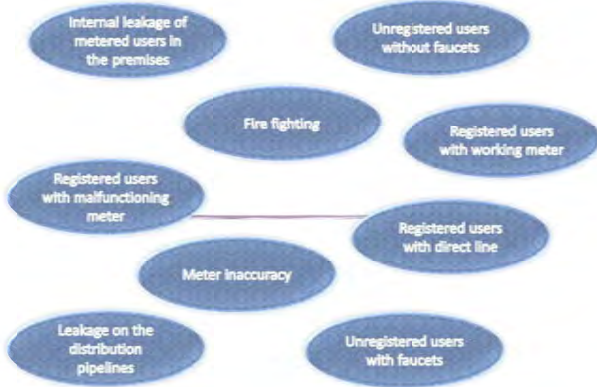
June 2013

### Project Team

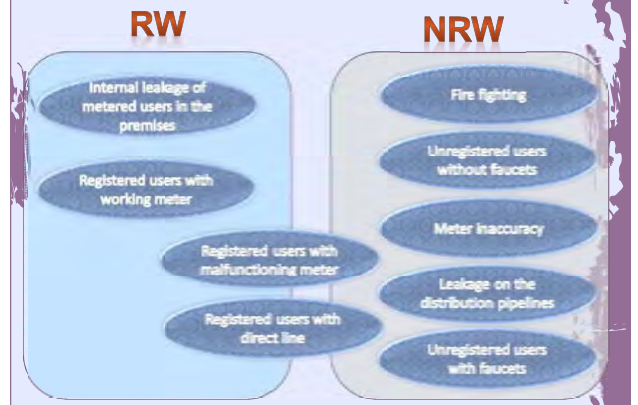
### Contents

- ◆ Which Categories between RW and NRW?
- ◆ Revenue Water & Non-Revenue Water
- ◆ Types of Current Service Connection
- ◆ Demarcation of responsibility
- ◆ How to estimate meter error?
- ◆ Identify causes of NRW
- ◆ IWA Water Balance before countermeasure at Namo Ruka, White River)
- ◆ Data of MNF Measure
- ◆ Data of MNF Measure for Report
- ◆ Relation among Water Flow Rate, Leakage Rate and Water Pressure

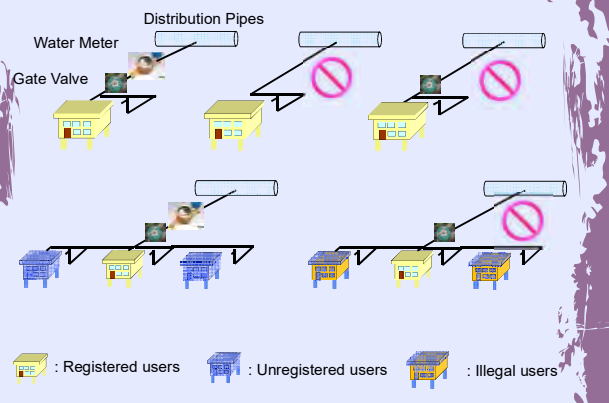
### Which Categories between RW and NRW?



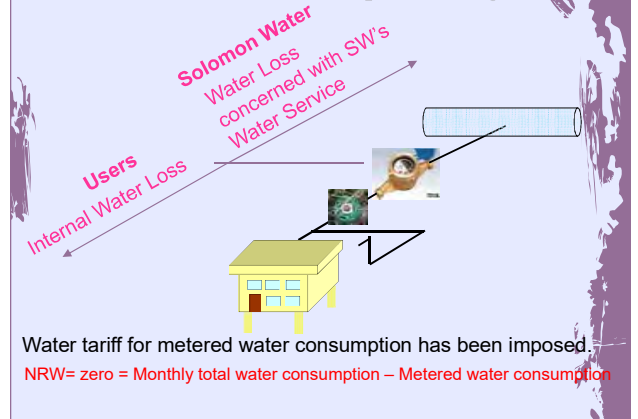
### Revenue Water & Non-Revenue Water



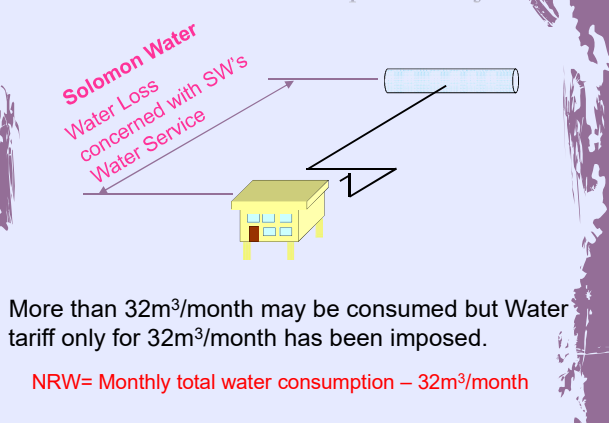
### Types of Current Service Connection



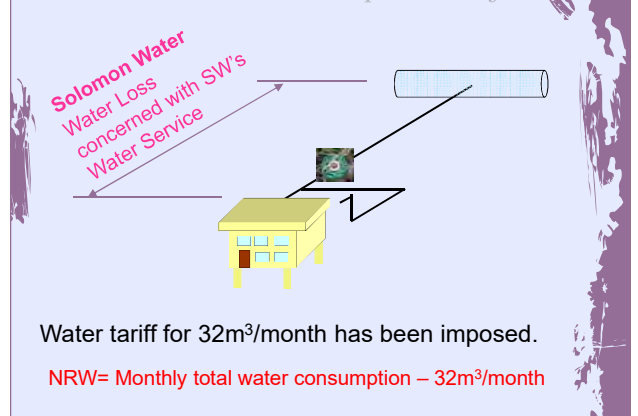
### Demarcation of responsibility-1



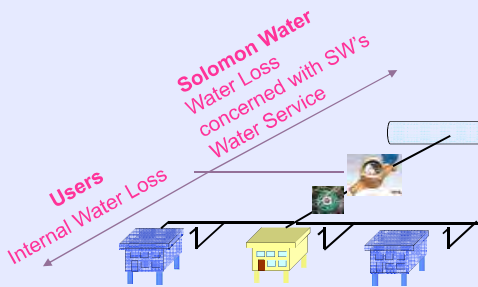
### Demarcation of responsibility-2



### Demarcation of responsibility-3



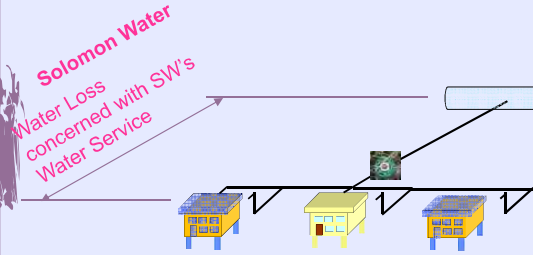
## Demarcation of responsibility-4



Water tariff for metered water consumption has been imposed.

$NRW = \text{zero} = \text{Monthly total water consumption} - \text{Metered water consumption}$

## Demarcation of responsibility-5



Water tariff for 32m<sup>3</sup>/month has been imposed.

$NRW = \text{Monthly total water consumption} - 32\text{m}^3/\text{month}$

## How to estimate meter error?

Tested Meter (L)	TR-III (L)	Difference	Error (%)
0.6	0.6%		
0.6	0.6%		
-211.4	210.6%		
-17.2	-17.2%		
95	100.3	-5.3	-5.3%
80	100.2	-20.2	-20.2%
0.099	0.10073	-0.00173	-1.7%
98	99.8	-1.8	-1.8%
103.3	100.3	3	3.0%
average			-12.9%

## Identify causes of NRW

Category of Connections	Nos. of HHs	Q (m <sup>3</sup> /day)	Description
A Registered users with meter (Working)	12	18.366	Metered quantity by meter readers
B Registered users without meter (Malfunctioning)	29	30.740	Unmetered quantity (Assumed quantity of 32m <sup>3</sup> /month/household in flat rate)
C Registered users without meter and faucet used for 24hrs	(6)*	75.720	Water has been flowing for 24hrs. Water quantity per minute (m <sup>3</sup> /min) is measured in households concerned by using a cup and converted to daily quantity (m <sup>3</sup> /day). 32m <sup>3</sup> /month should be deducted from the measured quantity.
D Unregistered users use water for 24 hrs. (Without faucet)	3	23.040	This is water quantity consumed in illegal connections. (m <sup>3</sup> /min) was measured in households concerned by using a cup and converted to daily quantity (m <sup>3</sup> /day).
E Unregistered users	8	8.480	This is water quantity in illegal connections. It is assumed that water of 32m <sup>3</sup> /month in their household is consumed. Households do not connect to SW's service lines but rely on neighbor households who connect to SW's service lines. However, neighbor household only pay for their own tariff in flat rate. It is assumed that water of 32m <sup>3</sup> /month for each household who rely on neighbor, is consumed.
F Households pay to registered neighbor, but neighbor only pay for one.	11	11.660	This is checked by using Test-meter. Water leakage
G Meter Inaccuracy	-	3.910	
H Real Loss	-	174.814	

## IWA Water Balance before countermeasure at Namo Ruka, White River)

Component	Billed Authorized Consumption	Billed (Metered) [A]	Billed (Unmetered) [B]	Q (m <sup>3</sup> /day)	Proportion
RW				49.106	14.2%
Unbilled Consumption	Unbilled Unmetered Consumption			0	0%
Unauthorized Consumption		[E]+[F]			12.5%
NRW Losses	Metering Inaccuracy	[D]	[G]		1.1%
Real Loss		[C]	[H]		21.8%
					85.8%
					50.4%
Total System Input Volume				100.0%	100.0%

### Data of MNF Measure

VELOCITY (m/s)	FLOW RATE (m <sup>3</sup> /h)	PRESSURE (kg/cm <sup>2</sup> )	leakage rate (m <sup>3</sup> /h)	MNF
2013/6/17 11:00	1.190	9.8046	2.324	3.41
2013/6/17 11:01	1.849	9.3899	2.187	1.22
2013/6/17 11:02	1.912	8.6525	2.032	
2013/6/17 11:03	1.869	8.4561	1.977	
2013/6/17 11:04	1.915	8.6639	1.883	
2013/6/17 11:05	2.074	9.3828	2.029	
2013/6/17 11:06	1.107	9.9158	1.914	
2013/6/17 11:07	1.08	9.9467	2.106	
2013/6/17 11:08	1.108	9.9467	2.106	
2013/6/17 11:09	1.131	9.6438	2.106	
2013/6/17 11:10	1.138	8.3171	2.259	
2013/6/17 11:11	1.111	7.799	2.048	
2013/6/17 11:12	1.112	7.9576	1.895	
2013/6/17 11:13	1.13	8.7658	1.895	

## Data of MNF Measure for Report

Pilot Area Name: Namo Ruka

Date	Time	FLOW RATE (m <sup>3</sup> /h)	WATER PRESSURE (kg/cm <sup>2</sup> )	LEAKAGE RATE (m <sup>3</sup> /h)	LEAKAGE RATE (m <sup>3</sup> /min)	Date at MNF	MNF	Water Pressure at MNF (kg/cm <sup>2</sup> )	Assumed Daily Leakage (m <sup>3</sup> /day)
2013/6/17 11:00		9.8046	2.324	1.650181818	1.300089924	15-Jun	3.41	3.2528	76.616
2013/6/17 11:01		8.3889	2.187	1.590545455	1.281169204			4.46627155	0.074
2013/6/17 11:02		8.6525	2.032	1.477818182	1.239154564			4.30027796	0.072
2013/6/17 11:03		8.4561	1.977	1.452727273	1.19865864			4.22026233	0.070
2013/6/17 11:04		8.6639	1.883	1.369454545	1.170239961			4.12602478	0.069
2013/6/17 11:05		9.3828	2.029	1.475083636	1.247577739			4.28209235	0.071
2013/6/17 11:06		10.0528	2.131	1.548818182	1.244816938			4.389328139	0.073
2013/6/17 11:07		9.9158	1.914	1.362000000	1.179830494			4.198460364	0.069
2013/6/17 11:08		9.9467	2.106	1.531636364	1.237562972			4.363500300	0.073
2013/6/17 11:09		9.6438	2.106	1.531636364	1.237562972			4.363500300	0.073
2013/6/17 11:10		8.3171	2.259	1.642900000	1.387160188			4.518229448	0.076
2013/6/17 11:11		8.0485	1.851	1.346181818	1.160250757			4.090812118	0.068
2013/6/17 11:12		7.9576	1.895	1.378181818	1.173958884			4.139147772	0.069
2013/6/17 11:13		8.7658	1.895	1.369454545	1.170239961			4.125024078	0.069
2013/6/17 11:14		9.3364	2.288	1.662545455	1.389397324			4.546157078	0.078

## Relation among Water Flow Rate, Leakage Rate and Water Pressure

