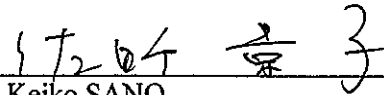
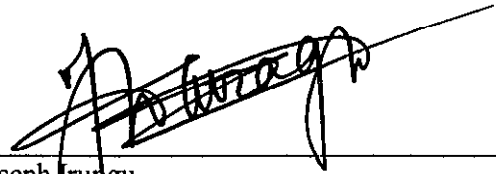


MINUTES OF MEETING  
OF  
THE FOURTH JOINT COORDINATION COMMITTEE MEETING  
ON  
THE PROJECT FOR  
STRENGTHENING CAPACITY IN NON-REVENUE WATER REDUCTION  
AGREED UPON BETWEEN  
JAPAN INTERNATIONAL COOPERATION AGENCY  
AND  
MINISTRY OF WATER AND SANITATION  
THE REPUBLIC OF KENYA


27<sup>th</sup> August, 2018, Nairobi



Keiko SANO  
Chief Representative  
JICA Kenya Office



Mr. Joseph Irungu  
Principal Secretary  
Ministry of Water and Sanitation  
The Republic of Kenya



Masayuki TAGUCHI  
Chief Advisor  
JICA Expert Team

In accordance with the Record of Discussion (hereinafter referred to as the "R/D") signed on 7<sup>th</sup> March, 2016 between the Ministry of Water and Irrigation, later renamed the Ministry of Water and Sanitation (hereinafter referred to as "MWS") and Japan International Cooperation Agency (hereinafter referred to as "JICA") on "The Project for Strengthening Capacity in Non-Revenue Water Reduction"(hereinafter referred to as "the Project"), the 4<sup>th</sup> Joint Coordination Committee (hereinafter referred to as the "4<sup>th</sup> JCC") of the Project was held on 31<sup>st</sup> July, 2018. All members of the 4<sup>th</sup> JCC reviewed the overall Progress and implementation of the Project, and also exchanged opinions on major issues.

The major points of discussions and agreement are summarized as follows:

#### **1. Result of Project Monitoring Ver. 4**

The JCC confirmed the contents of the Project Monitoring Sheet Version4 (covering the period from January 2018 to June 2018), which was as presented at the 4<sup>th</sup> JCC. (Refer to Annex-1)

#### **2. Establishing PDM ver. 2 and PO ver.2**

The JCC agreed that the Project Design Matrix Version 2 (PDM ver.2) was established through revising the PDM Ver.1 which was agreed upon in the Minutes of Meeting (M/M) of the 3<sup>rd</sup> JCC signed in February 2017 between JICA and MWS. (Refer to Annex-2). And the JCC also agreed the Plan of Operation Version 2 (PO ver.2) which was established through revising the PO ver.1 agreed in the 2<sup>nd</sup> JCC in June 2017 between the same (Refer to Annex-3).

#### **3. Changing Record of Discussion for PDM ver.2 and PO ver.2 to be effective**


The JCC agreed that the PDM ver.2 and PO ver.2 above will be effective formally by revising the Record of Discussion (R/D) signed in March 2016 between the MWS, The National Treasury and JICA Kenya Office. JICA will inform the MWS about revision of the R/D in due time.

#### **4. Other Issues discussed in the Fourth JCC Meeting.**

1) JICA Expert Team requested MWS to ensure the procurement of equipment for supporting Non-Revenue Water reduction activities to pilot WSPs by September, 2018 when the next dispatch of experts is scheduled. The MWS committed to procure the equipment and materials in the first quarter of the current fiscal year as a priority.

2) MWS also expressed willingness to utilize the new fiscal year budget for the planned activities to be implemented smoothly such as publishing NRW reduction annual report and renovation of KEWI's platform for NRW training.

3) As stated in the 3<sup>rd</sup> JCC meeting but not yet realized, MWS expressed their continuous willingness to recruit young Engineers to join in the MWS NRW unit to sustainably promote the NRW reduction in this project.



4) The JCC agreed that the signing of Framework of Cooperation (FoC) with County Governments is no longer necessary since the Intergovernmental Water Sector Coordination Framework was signed between the MWS and the Council of Governors (C.O.G) at the Kenya Water Summit on 1<sup>st</sup> March, 2018.

5) JICA Expert Team announced that a NRW reduction training in Japan is planned in December 2018 for technician level and the request for appointing trainee would be submitted through the MWS in due time.

#### **4. Schedule of the Next JCC Meeting**

The 4<sup>th</sup> JCC decided that the 5<sup>th</sup> JCC meeting will be held in February 2019.

END

Annex-1: Project Monitoring Sheet Ver. 4

Annex-2: PDM Ver. 2

Annex-3: PO Ver. 2

Annex-4: Attendance list



Annex-1 Project Monitoring Sheet

TO CR of JICA Kenya OFFICE

PROJECT MONITORING SHEET Ver.4

Project Title: THE PROJECT FOR STRENGTHENING CAPACITY IN NON-REVENUE WATER REDUCTION (Phase 2)

Version of the Sheet: Ver.4 (Term: Jan – Jun 2018)

Name: Masayuki TAGUCHI

Title: Chief Advisor

Submission Date: July 31, 2018

**I. Summary**

**1 Progress**

**1-1 Progress of Inputs (from 1<sup>st</sup> January to 30<sup>th</sup> June, 2018)**

Input by Japanese Side

Note) Man Month in (\*\*M/M) hereunder are ones as of 30th June, 2018.

Experts:

Mr. Taguchi: From 14th Jan. to 17th Mar., from 15th Apr. to 13rd Jun. (4.07M/M)

Mr. Mori: From 14th Jan. to 17th Mar., from 19th Apr. to 29th May, from 14th Jun. to 2nd Aug. (3.93M/M)

Mr. Sekimoto: From 14th Jan. to 14th Mar., from 13rd May to 10th Jul.(3.63M/M)

Mr. Shibazaki: From 19th Jan. to 4th Apr. (2.50M/M)

Mr. Harada: From 19th Jan. to 19th Mar., from 24 Jun. to 3rd Aug. (2.23M/M)

Ms. Sugimoto: From 31st Jan. to 25th Jun.; but working upon requirement of the Project (1.46M/M)

Mr. Saito: From 16th Jan. to 8th Feb. (0.80M/M)

Mr. Takahashi: From 26th May to 24th Jul. (1.2M/M)

Mr. Kano: From 25th Feb. to 11th Mar. (0.50M/M)

Man Month (M/M) during the said period:

Experts: 20.32 M/M

Local staff: 17 M/M

Input by Kenyan Side

Project CPs: Number of Counterpart (CP) members that participated in the reporting



period is 54 representing the following organizations.

MWS (5), WASREB (5), KEWI (5), WASPA (5), Meru WSP (10), Embu WSP (11)  
Nyahururu WSP (6), Nakuru WSP (7)

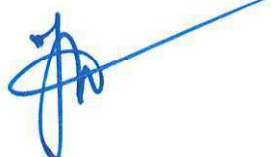
Facilities: Project office at MWS and KEWI as well as regular meeting rooms were provided. Vehicles for Kenyan C/Ps' field visits were provided.

Project implementation costs: The traveling costs and per diem for MWS/KEWI staff were provided by MWS.

### 1-2 Progress of Activities

The following tables indicate the activities implemented during the reporting period.

Activity	Progress
<b>Output 1</b>	
1-1 MWS NRW Unit, in cooperation with WASREB, produces NRW annual reports which include NRW reduction data.	The NRW annual report (1st Ver.) draft was completed and circulated among the contributing institutions for comments. Comments on the draft report were collected and incorporated. The printing of the report will be implemented in September, 2018.
1-2 MWS NRW Unit plans and implements NRW reduction sensitization activities for the Counties.	<ul style="list-style-type: none"> <li>• Kenya Water Summit was held successfully on 1<sup>st</sup> and 2<sup>nd</sup> March, 2018. It was well attended by over 400 participants over 2 days (representatives from 37 Counties). Eng. SAO Alima made a presentation on NRW management in Kenya, in addition to speeches by Cabinet Secretary (CS) and Principal Secretary among others that also highlighted the issue of NRW in Kenya.</li> </ul>
1-3 MWS NRW Unit plans and implements NRW reduction campaigns.	<ul style="list-style-type: none"> <li>• EWASCO invited two schools to the Water Treatment Plant. Students learned about water treatment processes and the importance of water conservation (19th &amp; 23rd March, 2018).</li> <li>• NRW Unit had an exhibition during World Water day on 22<sup>nd</sup> March, 2018 in Taita Taveta County. NRW Unit staff briefed Cabinet Secretary (CS) for Water and Sanitation and Taita Taveta Governor and other participants about NRW.</li> <li>• NRW Unit had an exhibition during Rapid Results</li> </ul>

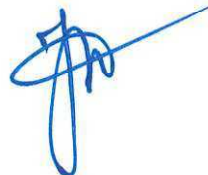




	<p>Initiative launch on 24th May, 2018 where the President of Kenya was briefed on NRW reduction.</p> <ul style="list-style-type: none"> <li>• A Budget for sensitization materials has been approved.</li> </ul>
1-4 MWS NRW Unit conducts reviews of KEWI NRW courses.	Review of 2 <sup>nd</sup> Joint training is in progress.
1-5 MWS NRW Unit conducts reviews of WASREB's NRW reduction activities.	<ul style="list-style-type: none"> <li>• WASREB engaged a local consultant to carry out a survey of the current usage of NRW Standards. WASREB shared the draft survey report with MWS for comments and MWS provided their comments to WASREB in April 2018. The report is currently undergoing final editing.</li> <li>• An editorial committee for NRW Standards was established. The 1st editorial committee meeting was held on 6th June, 2018. MWS is part of the committee. Throughout Phase 2, the committee will be reviewing the existing NRW reduction standards.</li> </ul>

## Output 2

2-1 WASREB conducts survey of the usage of current NRW reduction standards.	<p>WASREB engaged a consultant to carry out a survey (NRW Audit) of the current usage of NRW Standards on nine WSPs. The report is currently undergoing final editing by the consultant. The NRW Audit findings shall be disseminated on Wednesday 1<sup>st</sup> August 2018.</p> <p>In the mean time, WASREB continues to monitor implementation of the NRW Standards especially for Pilot WSPs, very large and large WSPs, followed by the remaining WSPs.</p>
2-2 Based on the survey result as well as Output 4 and 5, WASREB revises the NRW reduction standards.	The inception meeting for the editorial committee was held on 6 <sup>th</sup> June, 2018. Throughout Phase 2, the committee will be reviewing the NRW reduction standards.
2-3 WASREB promotes revised NRW standards through workshop(s).	Activities will be implemented in the 3 <sup>rd</sup> Phase following the output of the editorial committee.
2-4 WASREB incorporates the review results of NRW reduction activities by MWS NRW Unit in their activities.	Comments on NRW audit draft reports received from MWS were taken on board and are part of refining of the reports that the consultant is working on.
2-5 WASREB monitors and evaluates the	Activities will be implemented in 3rd Phase.





usage of revised NRW standards.	To ensure usage of the revised standards, WASREB is making attendance to NRW issues by WSPs a mandatory license condition during the current license applications engagement with the WSPs on a continuous basis.
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### Output 3

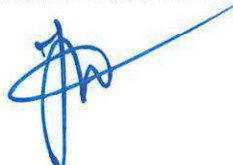
3-1 KEWI studies current status of NRW reduction courses and its challenges.	Activity was completed in Phase 1
3-2 KEWI reviews NRW reduction training strategies and course contents.	<ul style="list-style-type: none"> <li>Challenges in the 2<sup>nd</sup> Course were factored in the 3<sup>rd</sup> Joint NRW Training</li> </ul>
3-3 KEWI, in collaboration with leading WSPs (Embu and Meru, etc.), conducts on-site NRW trainings.	<ul style="list-style-type: none"> <li>3rd Joint NRW Reduction Training Course (Classroom) was conducted on 23rd -27th April 2018. The 3<sup>rd</sup> OJT Joint Training was conducted from 4<sup>th</sup> – 9<sup>th</sup> June 2018 at EWASCO.</li> </ul>
3-4 KEWI incorporates on-site NRW trainings into NRW course contents and materials.	Reviewed 2 <sup>nd</sup> OJT materials were used for the 3 <sup>rd</sup> Joint Training.
3-5 KEWI incorporates the results of review by MWS NRW Unit into NRW course contents.	<ul style="list-style-type: none"> <li>1st Joint evaluation report was completed and disseminated to the members on 12<sup>th</sup> February, 2018.</li> <li>2<sup>nd</sup> evaluation joint training report was presented to the other project counterparts on 25<sup>th</sup> July, 2018.</li> </ul>
3-6 KEWI conducts trace studies of NRW reduction course participants.	<ul style="list-style-type: none"> <li>1<sup>st</sup> follow-up survey reports is ready for presentation to project counterparts on 25<sup>th</sup> July, 2018.</li> </ul>

### Output 4

4-1 The Project team conducts a survey of Urban WSPs and selects pilot Urban WSPs.	Activity was completed in Phase 1.
4-2 Each Pilot WSP conducts analyses of current NRW reduction activities and identifies its challenges.	Activity was completed in Phase 1.
4-3 Each Pilot WSP identifies measures to solve challenges and formulates the NRW reduction plan.	The JICA team introduced templates to support Pilot WSPs in preparing their NRW reduction plans for the year 2017/18 through participatory discussions at the end of Financial Year 2016/17. Several Pilot WSPs prepared their plans in accordance with WASREB's templates in 2017/18. This is because WASREB regulates all the WSPs to do so. To integrate and improve these two sets
4-4 Each Pilot WSP formulates the annual NRW reduction plan including financial schedule based on the NRW reduction plan.	




	<p>of templates as well as to avoid duplication of their duties, JICA expert team have recently prepared two new draft templates after discussions with MWS, WASREB &amp; WASPA; One template for annual activity review and the other template for the continuous tasks of [1] self-assessment of recent conditions, [2] preparation of medium-term plan, [3] preparation of annual plan with financial requirements and [4] quarterly activity monitoring. Since the beginning of this fiscal year, these new draft templates are being used by Pilot WSPs for reviewing their activities conducted in the last financial year and preparing their plans for this financial year onward. The draft template for planning, etc. lists a large number of possible measures for NRW reduction in categories including those measures tried out in the last 6 months in Output 4 with example priority of each measures.</p>
<p>4-5 Each Pilot WSP implements the annual NRW reduction plan.</p>	<p><u>Embu WSP</u> has been working mainly on 1) replacement of large customers' faulty meters, 2) use of the Open Data Kit (ODK) form prepared for activities around customer meters, 3) identification of the cause of excessively fluctuating production meter readings and monthly NRW ratio, 4) establishment of the 6 distribution zones (DZs) and 23 district metered areas (DMAs) planned with GIS for NRW monitoring including the accuracy tests of existing bulk meters and sorting of all the customers by DZs and DMA, 5) maximum pressure measurement with pressure gauges and a ODK form in priority zones and installation of better pressure reducing valves (PRVs), and 6) implementation of minimum night flow measurement and step test for narrowing down the areas causing a large volume of leakage.</p> <p><u>Meru WSP</u> has been working mainly on 1) identification of the illegal self-reconnections and failed disconnections (due to faulty stop cocks) whose water consumptions have not been billed for a long time due to stopped meters, 2) preparation and improvement of ODK forms for various</p>



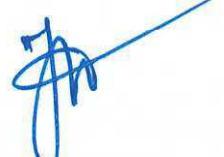




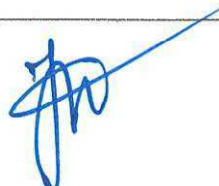
NRW activities including those around customer metres, 3) establishment of the 2 additional DZs and 25 DMAs planned with GIS for NRW monitoring including the replacement of all the faulty zonal meters and improvement of meter reading / billing system for accurate calculation of the total billed consumption in each DMA, 4) trial for introducing pressure tests on new service connections with hand pumps and a ODK form, 5) trial for involving meter readers in the customer-to-customer abnormal sound survey with listening sticks for efficient leak reduction, 6) continuation of daily abnormal flow monitoring and weekly minimum night flow measurement with step test, and 7) maximum pressure measurements with gauges and a ODK form in a priority DZ and the initial considerations for reducing pressure based on the measurements.

Nyahururu WSP has been working mainly on 1) improvement of the newly introduced integrated management system having many functions effective for NRW management (e.g. meter reading with smartphones having GPS antenna, abnormal consumption report, task management for burst and leak repair, etc.), 2) the replacement of faulty meters with active accuracy tests using calibrated buckets, 3) development of their GIS database including the plan of establishing 5 DZs and 39 DMAs in a way fully utilizing the existing bulk meters, 4) accuracy tests of existing bulk meters, 5) maximum pressure measurement over the entire service area with gauges, and 6) efficient leak detection through minimum night flow measurement with step test and a wide use of listening sticks.

Nakuru WSP has been working mainly on 1) replacement of all the large customers' meters (i.e. more than 100 m<sup>3</sup>/month on average), 2) reduction of illegal connections, 3) additional creation of a large DMA having multiple inlet pipelines, 4) replacement of asbestos cement pipes with



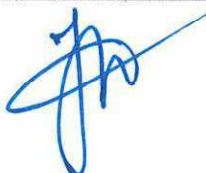
	<p>HDPE pipes, 5) introduction of minimum night flow measurement with step test and a wide use of listening sticks for efficient leak detection, and 6) improvement of GIS database including the utilization of mobile GIS for the improvement.</p> <p>Although the support from the JICA team to <u>the other Pilot WSPs</u> is still limited, there have been some remarkable improvements recently in those Pilot WSPs. For example, Mavoko WSP has been replacing many faulty customer meters and improving their GIS layers. Eldoret WSP has introduced a robust computerized system for customer management, meter reading and billing, and the WSP has been conducting follow-up activities based on the abnormalities reported with the system every month.</p>
4-6 Each Pilot WSP evaluates and analyzes implementation results and revises the plans.	<p>As explained under 4-3 &amp; 4-4, the new integrated draft templates are currently being used by Pilot WSPs with support of JICA experts, to review their activities in the last financial year, to revise their medium-term plan and to prepare their new annual plan for this financial year.</p> <p>The JICA team has been analyzing the meter reading/billing data (e.g. of the last 12 months) collected from Pilot WSPs in order to encourage the participation of their commercial departments in the planning and implementation of NRW reduction activities. The results of these analyses typically show continuous estimates of even large customers' consumptions resulting from a huge number of faulty meters.</p>
4-7 Each Pilot WSP produces the NRW reduction activity report annually.	
4-8 Each Pilot WSP holds regular NRW reduction meetings attended by relevant departments of WSP.	
<b>Output 5</b>	
5-1 MWS NRW Unit organizes NRW related regular meetings in cooperation with other relevant organizations.	JICA Expert team made 2 presentations at the WASPA Benchmarking workshops in February and April 2018. The topics of presentations were on Work flow approach being implemented by the 2 Leading WSPs with assistance from the JICA Experts Output 4 team.
5-2 WASREB compiles case studies/ lessons learnt about NRW reduction activities.	Planned for Phase 3.





### 1-3 Achievement of Output

Output 1: Promotion and coordination of NRW reduction activities by MWS NRW Unit are strengthened.	
1-1 All County representative participate NRW related seminar(s).	Representatives from 37 Counties participated in Kenya Water Summit where NRW management was presented as one of the key issues.
1-2 NRW reduction campaigns are conducted semi annually.	<ul style="list-style-type: none"> <li>Sensitization campaign for school children was conducted by EWASCO on Mar. 19 and 23<sup>rd</sup> when they learnt about water treatment process, water conservation and illegal water use (water theft). The students were also encouraged to discuss these matters with their parents</li> <li>NRW Unit exhibited on during World Water Day in Taita Taveta on March 22<sup>nd</sup>, 2018.</li> <li>NRW Unit exhibited during Rapid Results Initiative launch on 24th May where the President of Kenya was briefed on NRW issues.</li> </ul>
1-3 NRW reduction annual reports are produced.	The final draft of 1st NRW reduction annual report has been completed and will be printed in August 2018.
Output 2: Use of NRW reduction standards by Urban WSPs are promoted by WASREB	
2-1 NRW reduction standards are revised by year X.	(X will be decided during the 4 <sup>th</sup> JCC)
2-2 Revised NRW reduction standards are disseminated to all Urban WSPs through workshop(s).	(Activity is planned for Phase 3)
Output 3: NRW related training capacity of KEWI is strengthened.	
3-1 KEWI conducts NRW reduction courses with contents incorporating on-site trainings and revised course materials.	Ongoing.
3-2 Evaluations by the NRW course participants is higher than before the revision of course materials.	Ongoing.
3-3 X % of NRW course participants formulate the work plans.	Upon the completion of 2nd Joint Training, analysis will subsequently be done.
Output 4: NRW planning and/or implementation capacity of pilot Urban WSPs is enhanced.	





4-1 More than X of pilot Urban WSPs continuously make the annual NRW reduction plan based on the review of previous years implementation.	X will be decided at the 4 <sup>th</sup> JCC meeting in July, 2018.
4-2 More than X of pilot Urban WSPs continuously implement the annual NRW reduction plan formulated in 4-1.	
4-3 More than X of pilot Urban WSPs are able to implement skills and activities that pilot Urban WSPs were not able to adopt prior to the Project.	
4-4 More than X of pilot Urban WSPs are able to implement priority activities indicated in the NRW reduction plan.	
4-5 More than X of pilot Urban WSPs train all personnel of NRW reduction section.	

Output 5: Experiences and knowledge of NRW reduction activities are shared among Urban WSPs.

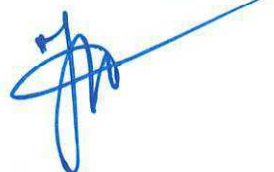
5-1 Case study and lessons learnt of Output 4 and other NRW activities are compiled and disseminated.	Output 4 team made presentations on their progress during WASPA's benchmarking meetings.
5-2 Regular meeting(s) of NRW is/are organized three times a year.	Activities will be conducted later in Phase 2.

#### 1-4 Achievement of the Project Purpose

Project Purpose: A NRW reduction support mechanism is established for Urban WSPs to implement NRW reduction Activities.	
Indicator	Achievement
X of Pilot Urban WSPs continue achieving target set by the annual NRW reduction plan for two years.	Pilot WSPs will set their own targets in early Phase 2. X will be determined at the 4 <sup>th</sup> JCC meeting

#### 1-5 Changes of Risks and Actions for Mitigation

Delay in procuring the NRW equipment for Pilot WSPs has hindered the implementation of NRW reduction plans of Pilot WSPs. This has lowered the efficiency of technical transfer by JICA experts to support Pilot WSPs. To mediate this, the JICA experts had to borrow the required NRW equipment from other WSPs or institutions. Lack of equipment will seriously reduce the continuity and future sustainability of NRW reduction activities of the pilot WSPs. In other words, after the currently trainings between May and July 2018, the Pilot WSPs cannot implement the skills learnt without their own equipment. Especially, activities involving leakage detection technology will be difficult to implement





without the equipment. The JICA experts request the MWS NRW Unit to ensure the procurement of equipment as soon as possible.

**1-6 Progress of Actions undertaken by JICA**

JICA has been providing 2 project vehicles. Representatives from Kenya office have been attending JCC meetings.

**1-7 Progress of Actions undertaken by GoK**

As mentioned above, the procurement of the equipment has been postponed to the fiscal year 2018-2019. GoK has been requested to be more vigilant on procurement so as not to affect other activities of the Project.

**1-8 Other remarkable/considerable issues related/affect to the project (such as other JICA's projects, activities of counterparts, other donors, private sectors, NGOs etc.)**

**(1) Inter-Governmental Water Sector Coordination Framework**

MWS and the Council of Governors signed the Inter-Governmental Water Sector Coordination Framework at the Kenya Water Summit on 1<sup>st</sup> March, 2018. The Framework paves a way for a clear mechanism to steer the envisaged County Water Bills to be in line with the Constitution and the new Water Act 2016 which defines clearly the mandate of both National and County Governments.

**(2) Cooperation to JICA's program for receiving trainees from Kigali Water in Rwanda**

Collaborating with a request from JICA, the Project C/Ps received two trainees from Kigali Water in Rwanda and implemented JICA's third country training program in Kenya. The program was implemented successfully from 7<sup>th</sup> to 10<sup>th</sup> May 2018.

**2 Delay of Work Schedule and/or Problems (if any)**

There are following delays of activities during the reporting period.

2-1 Detail	2-2 Cause	2-3 Actions Taken
Publishing of the 1st NRW annual report	Budget for the last quarter was suddenly cut by the Treasury Department.	NRW Unit prepared a budget which was approved in July 2018.





Framework of Cooperation (FOC) between County Government and Pilot WSP	As mentioned in 1-8 above Intergovernmental water sector coordination framework was signed between the ministry of water and sanitation and the council of governors during the Kenya water summit and in this regard the FOC document was no longer necessary based on the implementation of the intergovernmental water sector coordination framework.	—
Procurement of the equipment required for the implementation of NRW reduction activates at WSPs.	As mentioned in 1-5 above.	As mentioned in 1-5 above.

**2-4 Roles of Responsible Persons/Organization (JICA, GoK etc.)**

Indicated above.

**3 Modification of the Project Implementation Plan**

**3-1 PDM and PO**

PDM ver.2 and PO ver. 2 have been proposed as per the attached sheet.

**3-2 Other modifications on detailed implementation plan**

*(Remarks: The amendment of R/D and PDM (title of the project, duration, project site(s), target group(s), implementation structure, overall goal, project purpose, outputs, activities, and input) should be authorized by JICA HDQs. If the project team deems it necessary to modify any part of R/D and PDM, the team may propose the draft.)*

**4 Preparation of GoK Outlook after completion of the Project**

No preparations have been discussed for after the Project so far.





**Project Design Matrix**

Project Title: Project for Strengthening Capacity in Non-Renewable Water Reduction

Implementing Agency: MWS,WASREB,KEWI

Target Group: Urban WSPs

Period of Project: Sept. 2016-Aug. 2021

Project Site: The entire country of Kenya

Version 2

Dated 31<sup>st</sup> July 2018

Pilot Site: Eldoret, Embu, Kisumu, Kilifi-Mariakani, Mavoko, Meru, Nakuru, Nvabururu, Ruiru-Juja

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption	Achievement	Remarks
<p><b>Overall Goal</b> Under NRW reduction support mechanism, Urban WSPs enhance NRW reduction activities.</p>	<p>1. 6 of Urban WSPs participate knowledge sharing activities established by the Project. 2. 6 of pilot Urban WSPs continue achieving target(s) set by the NRW reduction plan. 3. NRW annual report is continuously produced and disseminated.</p>	<p>MWS NRW Unit annual reports Pilot WSPs NRW reduction plans</p>	<p>NRW reduction remains as priority of MWS and WSPs.</p>		
<p><b>Project Purpose</b> A NRW reduction support mechanism is established for Urban WSPs to implement NRW reduction activities.</p>	<p>6 of pilot Urban WSPs continue achieving targets set by the NRW reduction plan for two years.</p>	<p>NRW reduction plans Platform (online) Impact reports Project reports JCC meeting minutes</p>	<p>NRW reduction remains as priority of MWS and WSPs.</p>		
<p><b>Outputs</b> 1. Promotion and coordination of NRW reduction activities by MWS NRW Unit are strengthened.</p>	<p>1-1 All County representatives participate NRW related seminar(s). 1-2 NRW reduction campaigns are conducted semi annually. 1-3 NRW reduction annual reports are produced.</p>	<p>Materials for County seminar List of seminar participants Campaign materials NRW reduction annual reports Project reports JCC meeting minutes</p>	<p>NRW Unit staff positions are fulfilled.</p>		
<p>2. Use of NRW reduction standards by Urban WAPs are promoted by WASREB.</p>	<p>2-1 NRW reduction standards are revised by year 2020. 2-2 Revised NRW reduction standards are disseminated to all Urban WSPs through workshop (s).</p>	<p>Revised NRW reduction standards Workshop program and list of participants Project reports JCC meeting minutes NRW reduction annual reports</p>	<p>Current WASREB's role and authority remains.</p>		
<p>3. NRW related training capacity of KEWI is strengthened.</p>	<p>3-1 KEWI conducts NRW reduction courses with contents incorporating on-site trainings and revised course materials. 3-2 The average score of the participants before and after the NRW reduction course is higher after the implementation of the NRW reduction course.</p>	<p>Revised course materials Revised course syllabus Course participants' test scores Project reports JCC meeting minutes NRW reduction annual reports Trace studies</p>	<p>KEWI continues to offer NRW short courses.</p>		
<p>4. NRW planning and/or implementation capacity of pilot Urban WSPs is enhanced.</p>	<p>4-1 More than 8 Pilot WSPs formulate NRW reduction plans 4-2 More than 6 Pilot WSPs self-review their achievements of previous year's NRW reduction plans and compile activity reports. 4-3 Based on 4-2, more than 6 Pilot WSPs continuously formulate annual NRW reduction plans. 4-4 More than 6 Pilot WSPs continuously implement NRW reduction plan formulated in 4-1. 4-5 More than 6 Pilot WSPs are able to use skills and/or implement activities which they could not employ before the project 4-6 The amount of NRW in the selected distribution zones indicates decreasing tendency</p>	<p>NRW reduction plans IMPACT reports Project reports JCC meeting minutes</p>	<p>Trained personnel do not leave WSPs Drastic climatic changes such as draught will not affect the water resources.</p>		
<p>5. Experiences and knowledge of NRW reduction activities are shared among Urban WSPs.</p>	<p>5-1 Results and lessons from Output 4 and NRW activities are shared during WASPA meetings at least 3 times a year. 5-2 A NRW thematic workshop is organized every year. 5-3 3 brief notes are produced during the Project.</p>	<p>Compiled lessons learnt NRW regular meeting minutes and list of participants Project reports JCC meeting minutes NRW reduction annual reports Brief notes</p>	<p>NRW reduction remains as priority of WSPs.</p>		
<b>Inputs</b>					
<b>Activities</b>					
<p>1.1 MWS NRW Unit, in cooperation with WASREB, produces NRW annual reports which include NRW reduction data. 1.2 MWS NRW Unit plans and implements NRW reduction sensitization activities for the Counties. 1.3 MWS NRW Unit plans and implements NRW reduction campaigns. 1.4 MWS NRW Unit conducts reviews of KEWI NRW courses. 1.5 MWS NRW Unit conducts reviews of WASREB's NRW reduction activities. 1.6 MWI NRW Unit ensures the budget for the support mechanism based on its NRW reduction Mid-term vision. 2.1 WASREB conducts a survey of the usages of current NRW reduction standards. 2.2 Based on the survey result as well as Outputs 4 and 5, WASREB revises the NRW reduction standards. 2.3 WASREB promotes revised NRW reduction standards through workshop(s). 2.4 WASREB incorporates the review results of NRW reduction activities by MWS NRW Unit in their activities. 2.5 WASREB monitors and evaluates the usages of revised NRW standards. 3.1 KEWI studies current status of NRW reduction courses and its challenges. 3.2 KEWI reviews NRW reduction training strategies and course contents. 3.3 KEWI, in collaboration with leading WSPs (Embu and Meru, etc.), conducts on-site NRW trainings. 3.4 KEWI reflects on-site NRW trainings into NRW course contents and materials. 3.5 KEWI incorporates the results of review by MWI NRW Unit into NRW course contents. 3.6 KEWI conducts trace studies of NRW reduction course participants. 4.1 The Project team conducts a survey of Urban WSPs and selects pilot Urban WSPs. 4.2 Each pilot WSP conducts analyses of current NRW reduction activities and identifies its challenges. 4.3 Each pilot WSP identifies measures to solve challenges. 4.4 Each pilot WSP formulates the NRW reduction plan including financial plan. 4.5 Each pilot WSP implements the NRW reduction plan. 4.6 Each pilot WSP evaluates and analyzes implementation results and revise plans. 4.7 Each pilot WSP produces the NRW reduction activity report annually. 4.8 Each pilot WSP holds regular NRW reduction meetings attended by relevant departments of WSP 5.1 The Project presents results and lessons of Output 4 and other NRW activities during WASPA meeting. 5.2 The Project holds NRW thematic workshops in coordination with WASPA. 5.3 The Project team produces brief notes</p>	<p>1.1 All County representatives participate NRW related seminar(s). 1-2 NRW reduction campaigns are conducted semi annually. 1-3 NRW reduction annual reports are produced. 2-1 NRW reduction standards are revised by year 2020. 2-2 Revised NRW reduction standards are disseminated to all Urban WSPs through workshop (s). 3-1 KEWI conducts NRW reduction courses with contents incorporating on-site trainings and revised course materials. 3-2 The average score of the participants before and after the NRW reduction course is higher after the implementation of the NRW reduction course. 4-1 More than 8 Pilot WSPs formulate NRW reduction plans 4-2 More than 6 Pilot WSPs self-review their achievements of previous year's NRW reduction plans and compile activity reports. 4-3 Based on 4-2, more than 6 Pilot WSPs continuously formulate annual NRW reduction plans. 4-4 More than 6 Pilot WSPs continuously implement NRW reduction plan formulated in 4-1. 4-5 More than 6 Pilot WSPs are able to use skills and/or implement activities which they could not employ before the project 4-6 The amount of NRW in the selected distribution zones indicates decreasing tendency 5-1 Results and lessons from Output 4 and NRW activities are shared during WASPA meetings at least 3 times a year. 5-2 A NRW thematic workshop is organized every year. 5-3 3 brief notes are produced during the Project.</p>	<p>MWS NRW Unit annual reports Pilot WSPs NRW reduction plans NRW reduction plans Platform (online) Impact reports Project reports JCC meeting minutes Materials for County seminar List of seminar participants Campaign materials NRW reduction annual reports Project reports JCC meeting minutes Revised NRW reduction standards Workshop program and list of participants Project reports JCC meeting minutes NRW reduction annual reports Revised course materials Revised course syllabus Course participants' test scores Project reports JCC meeting minutes NRW reduction annual reports Trace studies NRW reduction plans IMPACT reports Project reports JCC meeting minutes Compiled lessons learnt NRW regular meeting minutes and list of participants Project reports JCC meeting minutes NRW reduction annual reports Brief notes</p>	<p>The Japanese Side 1. Experts 2. Equipment/Tools/ Materials 3. Japan or third country training</p>	<p>The Kenya Side 1. Counterpart personnel 2. Equipment/Tools/ Materials 3. Facility/Office Space 4. Budget for activities</p>	<p>Pre-Conditions &lt;Issues and countermeasures&gt;</p>

Note: "X" is the indicator that will be decided after the project commencement.

6

MT

Plan of Operation (Version 2)

Project Title: Strengthening Capacity of Non-Revenue Water Reduction		Date: 31 <sup>st</sup> July, 2018																						
		1st Year					2nd Year					3rd Year					4th Year					5th Year		
Inputs	Expert	Year		1st Year		2nd Year		3rd Year		4th Year		5th Year		Remarks	Issue	Solution								
		Plan	Actual	I	II	III	IV	I	II	III	IV	I	II				III	IV						
<p><b>Expert</b></p> <p>Chief Advisor / NRW management. (Mr. Masayuki Taguchi)</p> <p>NRW reduction specialist. (Mr. Noboru Saito)</p> <p>Water distribution network (Mapping &amp; Network analysis) (Mr. Shojo Mori)</p> <p>Flow, Pressure and Leakage monitoring 1. (Mr. Junichi Takahashi)</p> <p>Flow, Pressure and Leakage monitoring 2. (Mr. Shinichi Sakamoto)</p> <p>Customer management / Billing collection 1. (Mr. Toshio Kano)</p> <p>Customer management / Billing collection 2 (Mr. Naoki Harada)</p> <p>Training management / training strategy (Mr. Satoshi Shibasaki)</p> <p>Information / Public relation management (Ms. Hiroko Sugimoto)</p> <p>Other experts if necessary</p> <p><b>Equipment</b></p> <p>Training in Japan or third country</p> <p><b>In-country Training</b></p>																								
<b>Activities</b>																								
<b>Sub-Activities</b>																								
<p><b>Output 1: Promotion and coordination of NRW reduction activities by MWI NRW Unit are strengthened.</b></p> <p>1.1 MWS NRW Unit, in cooperation with WASREB, produces NRW annual reports which include NRW reduction data.</p> <p>1.2 MWS NRW Unit plans and implements NRW reduction sensitization activities for the Counties.</p> <p>1.3 MWS NRW Unit plans and implements NRW reduction campaigns.</p> <p>1.4 MWS NRW Unit conducts reviews of KEWI NRW courses.</p> <p>1.5 MWS NRW Unit conducts reviews of WASREB's NRW reduction activities.</p> <p>1.6 MWS NRW Unit ensures the budget for the support mechanism based on its NRW reduction Mid-term vision.</p>																								
<p><b>Output 2: Use of NRW reduction standards by Urban WASPs are promoted by WASREB.</b></p> <p>2.1 WASREB conducts a survey of the usages of current NRW reduction standards.</p> <p>2.2 Based on the survey result as well as Outputs 4 and 5, WASREB revises the NRW reduction standards.</p> <p>2.3 WASREB promotes revised NRW reduction standards through workshop(s).</p> <p>2.4 WASREB incorporates the review results of NRW reduction activities by MWS NRW Unit in their activities.</p> <p>2.5 WASREB monitors and evaluates the usages of revised NRW standards.</p>																								
<p><b>Output 3: NRW related training capacity of KEWI is strengthened.</b></p> <p>3.1 KEWI studies current status of NRW reduction courses and its challenges.</p> <p>3.2 KEWI reviews NRW reduction training strategies and course contents.</p> <p>3.3 KEWI, in collaboration with leading WASPs (Embu and Meru, etc.), conducts on-site NRW trainings.</p> <p>3.4 KEWI reflects on-site NRW trainings into NRW course contents and materials.</p> <p>3.5 KEWI incorporates the results of review by MWI NRW Unit into NRW course contents.</p> <p>3.6 KEWI conducts trace studies of NRW reduction course participants.</p>																								
<p><b>Output 4: NRW planning and/or implementation capacity of pilot Urban WASPs is enhanced.</b></p> <p>4.1 The Project team conducts a survey of Urban WASPs and selects pilot Urban WASPs.</p> <p>4.2 Each pilot WSP conducts analyses of current NRW reduction activities and identifies its challenges.</p> <p>4.3 Each pilot WSP identifies measures to solve challenges and formulates the NRW reduction plan.</p> <p>4.4 Each pilot WSP formulates the annual NRW reduction plan including financial schedule based on the NRW reduction plan.</p> <p>4.5 Each pilot WSP implements the annual NRW reduction plan.</p>																								
<p>1) ISB Preparation and Applications</p> <p>2) Zoning and NRW Monitoring</p> <p>3) Leakage Management</p> <p>4) Customer Meter Management</p> <p>4.6 Each pilot WSP evaluates and analyzes implementation results and revise plans.</p> <p>4.7 Each pilot WSP produces the NRW reduction activity report annually.</p> <p>4.8 Each pilot WSP holds regular NRW reduction meetings attended by relevant Joint Urban WASP</p> <p><b>Output 5: Expertise and knowledge of NRW reduction activities are shared among Urban WASPs.</b></p> <p>5.1 The Project present results and lessons of Output 4 and NRW reduction activities during WASPA meetings.</p> <p>5.2 The Project holds NRW thematic workshops in coordination with WASPA.</p> <p>5.3 The Project team produces brief notes.</p>																								
<b>Duration / Phasing</b>																								
<b>Monitoring Plan</b>																								
<p>Joint Coordination Committee</p> <p>Submission of the Monitoring sheet</p> <p>Joint Monitoring</p>																								
<b>Report/Documents</b>																								
<p>Work Plan</p> <p>Project Progress Report</p> <p>Project Completion Report</p>																								
<b>Public Relations</b>																								
<b>Responsible Organization</b>		Japan GOK																						
<b>Achievements</b>																								
<b>Issue &amp; Countermeasures</b>																								
<b>Remarks</b>																								
<b>Issue</b>																								
<b>Solution</b>																								

Note: ●: Main person in charge ○: Person concerned



## Annex-4 ATTENDANCE LIST

S/NO.	NAME	ORGANIZATION	POSITION
1.	ENG. SAO ALIMA	MWS	ACTING WATER SECRETARY
2.	MR. ANTONY AMBUGO	WASPA	CEO
3.	MR. AMAMEISHI SHINJIRO	JICA KENYA	SENIOR REPRESENTATIVE
4.	MR. TAGUCHI MASAYUKI	JICA	CHIEF ADVISOR
5.	MR. HEZEKIAH MWARUA	KIMAWASO	MANAGING DIRECTOR
6.	MR. EMMANUEL KARAVINA	KIMAWASCO	TECHNICAL MANAGER
7.	VALARIE MKAMBE	KIMAWASCO	BUSINESS DEVT' MANAGER
8.	MS. PATRICIA WANJERI	WASPA	
9.	MR. PETER MWANGI	NYAHUWASCO	TECHNICAL SERVICES MANAGER
10.	DR. PAUL MURGOR	ELDOWAS	MANAGING DIRECTOR
11.	MR. TIMOTHY BETT	ELDOWAS	HEAD OF COMMERCIAL SERVICES
12.	STEPHEN PSIWA	ELDOWAS	HEAD OF FINANCIAL SERVICES
13.	MR. GILBERT KIPCHUMBA MUTAI	NAWASSCO	AG. TECHNICAL MANAGER
14.	ENG. MOSES ODHIAMBO JURA	KIWASCO	HEAD OF TECHNICAL SERVICES
15.	MR. JOB LIECH	KIWASCO	NON-REVENUE WATER ENG.
16.	MR. GEOFFREY OPIYO	KIWASCO	PLANNING DESIGN & CONSTRUCTION
17.	MR. WALTER MOSETI	KEWI	NRW COORDINATOR
18.	MR. JESSE AMBUNDO	MAVWASCO	TECHNICAL MANAGER
19.	MS. JANE NGUGI	RUJWASCO	WATER DISTRIBUTION
20.	MS. MARY MWANGI	RUJWASCO	TECHINICAL MANAGER
21.	ENG. DANIEL NGUGI	WASREB	ENGINEER
22.	MR. RICHARD CHERUIYOT	WASREB	INSPECTORATE SERVICES MANAGER
23.	MR. SILAS NDATHO	MEWASS	IN CHARGE NRW
24.	MR. ROBERT MIRURI	MEWASS	AG. MANAGING DIRECTOR
25.	HAMILTON KARUGENDO	EWASCO	MANAGING DIRECTOR
26.	JOSEPH MAINA	EWASCO	IN CHARGE NRW
27.	MR. ANDERSON KIOI	MWS	NRW UNIT
28.	MS. PATRICIA MUTUA	MWS	NRW UNIT
29.	JACINTA NCOORO	MWS	SAOA
30.	MR. WATARU TAKASHIMA	JICA KENYA	PROJECT FORMULATION ADVISOR
31.	MR. MIYAGAWA MASAHIRO	JICA KENYA	REPRESENTATIVE
32.	MR. JOHN GITAU	JICA KENYA	PROGRAMME OFFICER
33.	MR. MORI SHOZO	JICA	JICA EXPERTS TEAM
34.	MS. SUGIMOTO HIROKO	JICA	JICA EXPERTS TEAM

Anx4-1



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35.	MR. SAITO NOBORU	JICA	JICA EXPERTS TEAM
36.	MR. SHIBAZAKI SATORU	JICA	JICA EXPERTS TEAM
37.	MR. HARADA NAOKI	JICA	JICA EXPERTS TEAM
38.	MR. CHARLES MAINGI	JICA	JICA EXPERTS TEAM
39.	MR. EVANS GITAH	JICA	JICA EXPERTS
40.	MS. KELLYJOY MURUNGI	JICA	JICA EXPERTS

Anx4-2



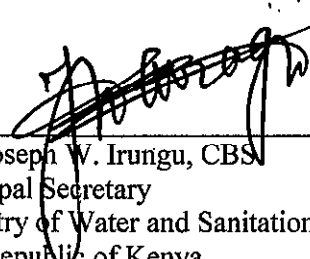
MINUTES OF MEETING  
OF  
THE FIFTH JOINT COORDINATION COMMITTEE MEETING  
ON  
THE PROJECT FOR  
STRENGTHENING CAPACITY IN NON-REVENUE WATER REDUCTION  
AGREED UPON BETWEEN  
JAPAN INTERNATIONAL COOPERATION AGENCY  
AND  
MINISTRY OF WATER AND SANITATION  
THE REPUBLIC OF KENYA

8<sup>th</sup> March, 2019, Nairobi

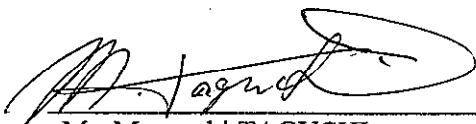
石 田 康 二 郎

for

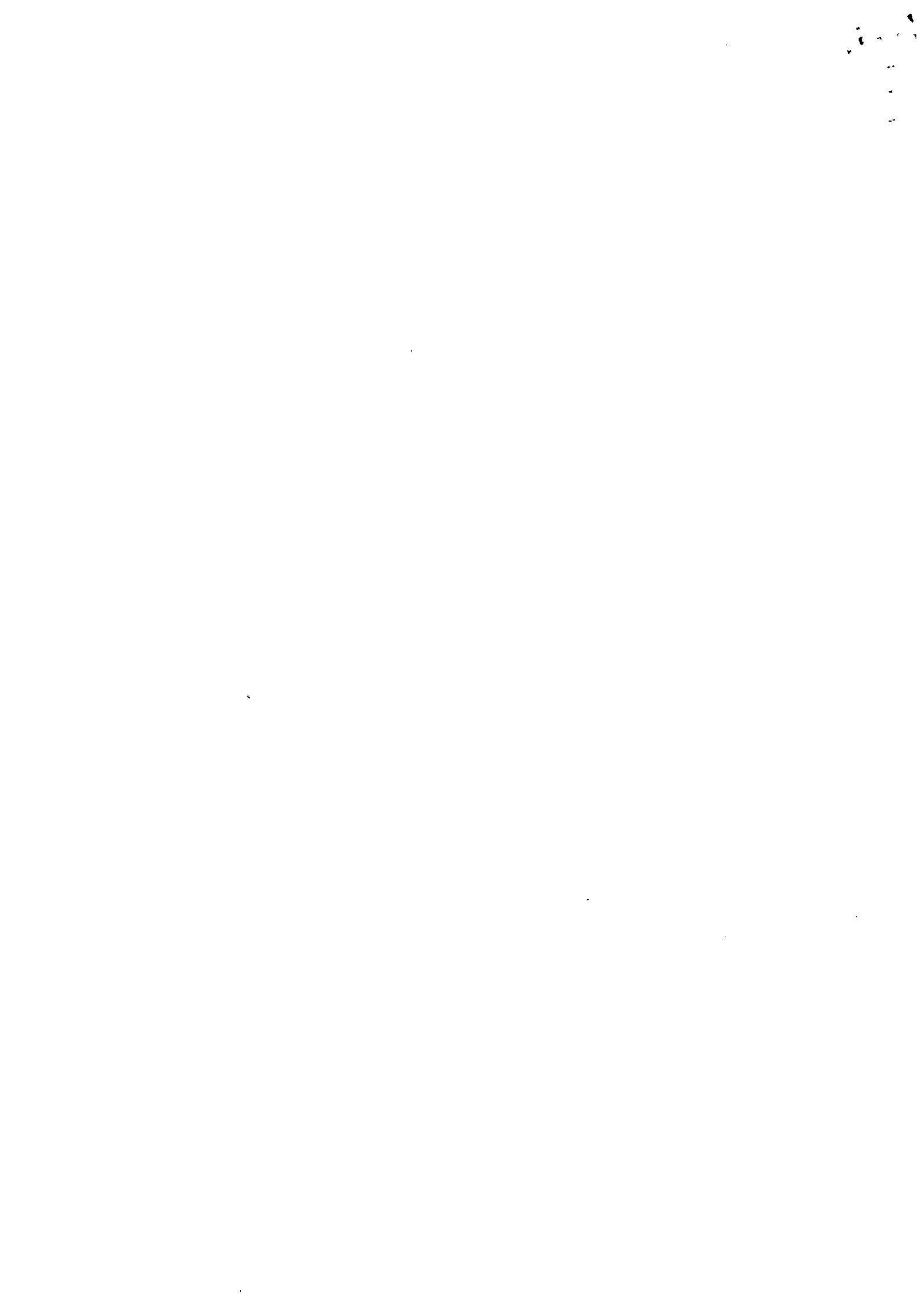
Mr. Katsutoshi KOMORI  
Chief Representative  
JICA Kenya Office



Mr. Joseph W. Irungu, CBS  
Principal Secretary  
Ministry of Water and Sanitation  
The Republic of Kenya



Mr. Masayuki TAGUCHI  
Chief Advisor  
JICA Expert Team



In accordance with the Record of Discussion (hereinafter referred to as the “R/D”) signed on 7<sup>th</sup> March, 2016 between the Ministry of Water and Irrigation, later renamed the Ministry of Water and Sanitation (hereinafter referred to as “MWS”) and Japan International Cooperation Agency (hereinafter referred to as “JICA”) on “The Project for Strengthening Capacity in Non-Revenue Water Reduction” (hereinafter referred to as “the Project”), the 5<sup>th</sup> Joint Coordination Committee (hereinafter referred to as the “5<sup>th</sup> JCC”) of the Project was held on 6<sup>st</sup> February, 2019. All members of the 5<sup>th</sup> JCC reviewed the overall Progress of the Project and also exchanged opinions on major issues.

The major points of discussions and agreements are summarized as follows:

### **1. Result of Project Monitoring Sheet Ver. 5**

The 5<sup>th</sup> JCC confirmed the contents of the Project Monitoring Sheet Version 5 (covering the period from July 2018 to January 2019), which was presented at the 5<sup>th</sup> JCC (refer to Annex-1).

### **2. Other Issues Discussed in the 5<sup>th</sup> JCC Meeting.**

1) The JICA Expert Team made a presentation about the current achievement of each Output of the Project Design Matrix (PDM) of the Project, the challenges and the way forward for the latter half period of the Phase 2 Project which will end at the end of September, 2019. It was unanimously agreed that all the counterparts (C/Ps) shall continue collaborating with each other for good results to be obtained on the completion of the Phase 2 Project.

2) JICA expressed deep regret due to the un-procured NRW detection equipment which MWS had agreed in the last JCC meeting to procure by September 2018 and it was still unknown when this commitment would be fulfilled. MWS apologized to C/Ps and committed to procure them within this February.

3) MWS also apologized for the delay in editing the first version of the NRW Annual Report and committed to complete it within this February.

4) KEWI requested MWS to continue the budgetary support for the renovation of the NRW detection training platform. MWS expressed that it had allocated some budget in the last fiscal year and similarly this year; and that it will continue allocating till the completion of the platform.

5) JICA suggested that MWS NRW Unit shall prepare its annual work plan to avoid any delay of activities such as preparation of NRW Annual Report and sensitization activities. MWS agreed to consider the suggestion and also expressed its willingness to recruit young staff to join the NRW unit to sustainably promote the NRW reduction in this Project.

6) Embu WSP raised a point in the meeting that NRW management is not taught in universities in Kenya so far and this might be the reason the sensitization and dissemination of NRW reduction is slow. MWS responded that KEWI is currently offering related training courses and would raise the issue with



universities.

7) JICA proposed that the C/Ps should present achievements of the Outputs, in numbers and also in percentages for the audiences to understand magnitude of the achievements. The NRW Unit of MWS responded that it will in future use numbers and percentages as much as possible in the presentation of the achievements.

8) JICA also recommended that the functions or roles of JCC and Project Implementation Committee (PIC) should be defined clearly in order to avoid duplication of theme in each meeting for effective time management. It was unanimously agreed that discussions will continue among C/Ps to clarify the functions and roles to be undertaken by JCC and PIC in future meetings.

### **3. Schedule of the Next JCC Meeting**

The 6<sup>th</sup> JCC meeting was agreed to be held in August 2019.

END

Annex-1: Project Monitoring Sheet Ver. 5

Annex-2: Attendance list





**TO CR of JICA Kenya OFFICE**

**PROJECT MONITORING SHEET Ver. 5**

**Project Title: THE PROJECT FOR STRENGTHENING CAPACITY IN NON-REVENUE WATER REDUCTION (Phase 2)**

**Version of the Sheet: Ver. 5 (Term: Jul 2018 – Jan 2019)**

**Name: Masayuki TAGUCHI**

**Title: Chief Advisor**

**Submission Date: Jan 31, 2019**

**I. Summary**

**1 Progress**

**1-1 Progress of Inputs**

**Input by Japanese Side**

Total Man Months (M/M) hereunder are calculated from 1st July, 2018 to 31st January, 2019.

**Experts:**

- Mr. Taguchi: From 8<sup>th</sup> Jul to 28<sup>th</sup> Sep, from 13<sup>th</sup> Jan to 1<sup>st</sup> Mar (3.40 M/M)
- Mr. Mori: From 17<sup>th</sup> Jun to 2<sup>nd</sup> Aug, from 1<sup>st</sup> Oct to 29<sup>th</sup> Nov, (2.10 M/M)
- Mr. Sekimoto: From 13<sup>th</sup> May to 11<sup>th</sup> Jul, from 20<sup>th</sup> Oct to 25<sup>th</sup> Nov (1.60 M/M)
- Mr. Shibazaki: From 2<sup>nd</sup> Jul to 14<sup>th</sup> Sep (2.50 M/M)
- Mr. Harada: From 24<sup>th</sup> Jun to 3<sup>rd</sup> Aug, from 14<sup>th</sup> Oct to 22<sup>nd</sup> Nov (2.47 M/M)
- Ms. Sugimoto: From 1<sup>st</sup> Jul to 31<sup>st</sup> Jan; but working upon requirement of the Project (1.20 M/M)
- Mr. Saito: From 23<sup>rd</sup> Jul to 24<sup>th</sup> Aug, From 14<sup>th</sup> Jan to 15<sup>th</sup> Feb (1.70 M/M)
- Mr. Takahashi: From 26<sup>th</sup> May to 24<sup>th</sup> Jul, From 10<sup>th</sup> Sep to 24<sup>th</sup> Oct (3.50 M/M)
- Mr. Kano: From 4<sup>th</sup> Nov to 18<sup>th</sup> Nov (0.50M/M)

Man Month (M/M) during the said period:

Experts: 18.97 M/M

Local staff: 21.00 M/M

**Input by Kenyan Side**

Project CPs: Number of Counterpart (CP) members that participated in the reporting period is 104 representing the following organizations.

MWS (5), WASREB (5), KEWI (10), WASPA (5), Meru WSP (10), Embu WSP (11)

Nyahururu WSP (9), Nakuru WSP (8), Ruiru-Juja (6), Mavoko (7), Eldoret (8), Kisumu (10), Kilifi-Mariakani (10)

Facilities: Project office at MWS and KEWI as well as regular meeting rooms were provided. Vehicles for Kenyan C/Ps' field visits were provided.

Project implementation costs: The traveling costs and per diem for MWS/KEWI staff were provided by MWS.

### 1-2 Progress of Activities

Activity	Progress
<b>Output 1</b>	
1-1 MWS NRW Unit, in cooperation with WASREB, produces NRW annual reports which include NRW reduction data.	Contract awarded for the design and printing of the first NRW annual report and the draft printing of the report has been submitted for comments and corrections. Launching of the report will be done once the printed copies are delivered.
1-2 MWS NRW Unit plans and implements NRW reduction sensitization activities for the Counties.	After Kenya Water Summit held in March 2018, the first sensitization meeting has been proposed to be held in Nakuru in collaboration with the County Government of Nakuru. Planning and consultations for it are still on going.
1-3 MWS NRW Unit plans and implements NRW reduction campaigns.	<ul style="list-style-type: none"> <li>• NRW Unit co-organized NRW activities during Nairobi International Trade Fair with Nairobi Water in October 2018. Over 600 children and youth participated in water saving/NRW activities.</li> <li>• An exhibition booth was prepared at WASPA's high level seminar in Embu town in Nov 2018 where the NRW Unit explained to the visitors about the NRW reduction activities.</li> <li>• School visits to Water Treatment Plants have been held in Embu and Meru WSPs respectively in September 2018.</li> </ul>
1-4 MWS NRW Unit conducts reviews of KEWI NRW courses.	KEWI is revising the Non-Revenue Water course contents incorporating reviews from the MWS NRW Unit and other counterparts.

PM Form 3-1 Monitoring Sheet Summary

1-5 MWS NRW Unit conducts reviews of WASREB's NRW reduction activities.	The second editorial committee meeting for revising NRW Standards was held in September 2018. MWS NRW Unit participates in the committee and supports it to implement the agreed Work plan. The questionnaire for collecting information from WSPs on the usage of the Standards has been finalized and ready to be administered to the WSPs.
1-6 MWS NRW Unit assures the budget for the support mechanism based on its NRW reduction mid-term vision.	Budget for the Project is approved by the MWS Principal Secretary and is being allocated in due time for implementation of the activities.

**Output 2**

2-1 WASREB conducts survey of the usage of current NRW reduction standards.	The content of the questionnaire was finalized and shall be administered through an online program (Monkey survey) which was developed in order to fast track analysis. This questionnaire shall complement the NRW audit that WASREB previously carried out on nine WSPs.
2-2 Based on the survey result as well as Output 4 and 5, WASREB revises the NRW reduction standards.	The ToR, Work plan and Budget agreed in the 2 <sup>nd</sup> Editorial Committee meeting were submitted to MWS for approval and implementation. The 3 <sup>rd</sup> editorial committee meeting was held in February 2019 to expedite the various activities necessary for revising the NRW Standards.
2-3 WASREB promotes revised NRW reduction standards through workshop(s).	To be implemented in the 3 <sup>rd</sup> Phase.
2-4 WASREB incorporates the review results of NRW reduction activities by MWS NRW Unit in their activities.	MWS NRW Unit is collaborating with WASREB in the analysis of the questionnaire and in subsequent editorial committee meetings.
2-5 WASREB monitors and evaluates the usage of revised NRW standards.	To be implemented in 3 <sup>rd</sup> Phase.

**Output 3**

3-1 KEWI studies current status of NRW reduction courses and its challenges.	Completed in Phase 1
3-2 KEWI reviews NRW reduction training	The training team is reviewing the materials for use in

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strategies and course contents.	training by considering the comments raised in the 4 <sup>th</sup> joint training review meeting, e.g. improving training methodologies, NRW ethics, work flow and NRW standards. The countermeasures will be adopted and used in the 5 <sup>th</sup> Joint training course.
3-3 KEWI, in collaboration with leading WSPs (Embu and Meru, etc.), conducts on-site NRW trainings.	The 4 <sup>th</sup> OJT Joint Training was conducted during 13 <sup>th</sup> – 18 <sup>th</sup> Aug. (Lecture classes at KEWI Nairobi) and 27 <sup>th</sup> Aug.-1 <sup>st</sup> Sep. 2018 (On-site Training at EWASCO). The 5 <sup>th</sup> Joint Training is scheduled for March 2019.
3-4 KEWI incorporates on-site NRW trainings into NRW course contents and materials.	Reviewed OJT materials were used for the 4 <sup>th</sup> Joint Training. The 5 <sup>th</sup> On-site Joint Training is scheduled for March 2019 at EWASCO
3-5 KEWI incorporates the results of review by MWS NRW Unit into NRW course contents.	KEWI has incorporated the comments made during the 4th Joint training review by MWS NRW Unit/ JICA/ 3rd party evaluators into NRW course contents and structure. Review report on 4th Joint training was completed and will be shared to other C/Ps.
3-6 KEWI conducts trace studies of NRW reduction course participants.	Trace study tools are reviewed and will be used to sample representative of the participants during the implementation based on the work plan.

**Output 4**

4-1 The Project team conducts a survey of Urban WSPs and selects pilot Urban WSPs.	Activity was completed in Phase 1.
4-2 Each Pilot WSP conducts analyses of current NRW reduction activities and identifies its challenges.	Activity was completed in Phase 1.
4-3 Each Pilot WSP identifies measures to solve challenges.	Kisumu and Mavoko had prepared detailed plans while Meru, Nyahururu, Nakuru & Ruiru-juja had prepared simpler plans. Embu & Eldoret are still working on the formulation of plans using the new template. The progress of Kilifi-Mariakani has not been confirmed yet.
4-4 Each Pilot WSP formulates the NRW reduction plan including financial plan.	The status of planning above was shared with WASREB on November 19.
4-5 Each Pilot WSP implements the NRW	In Embu WSP, plans are underway to have the faulty

## PM Form 3-1 Monitoring Sheet Summary

reduction plan.

production meter replaced.

They have so far collected and uploaded pressure data from 30no. pressure points in zone 2 using ODK which will later be useful for the pressure management exercise in the zone. They have also started the exercise of procuring pressure reduction valves for the same.

They have also developed and adopted meter standard specifications for R-200 meters to be used for procurement and have so far tested 40 new meter samples.

Large and small customer meter survey on stalled and mal-functional meters is on-going and have so far tested 174 small customer meters, replaced the faulty ones and netted 4no. illegal connections and the appropriate action taken.

Nyahururu, Nakuru, Ruiru-Juja & Mavoko WSPs have been setting up improvised meter test benches and will be trained on their usage soon.

Kisumu WSP has been working on the Hydraulic Zoning where so far, the desktop review is complete and is now awaiting the acceptance by the management for implementation to commence.

Minimum Night Flow measurements are also on going where they recently worked on the 8" Chiga pipeline. As a result, mapping and repair of the physical leaks found is complete and the active underground leakage detection exercise is scheduled to start in January 2019.

Meru, Nyahururu, Nakuru and Ruiru-juja are mainly

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	<p>concentrating on large customer monitoring, Step testing and Minimum Night Flow measurements (e.g. Zone 4 lower in Meru, Bondeni Estate in Nakuru and Rwathia and Agostino line in Nyahururu).</p> <p>Killfi – Mariakani is mainly dealing with customer meter servicing, testing and replacement of the mal-functional meters.</p>
<p>4-6 Each Pilot WSP evaluates and analyzes implementation results and revises the plans.</p> <p>4-7 Each Pilot WSP produces the NRW reduction activity report annually.</p>	<p>All the 9 pilot WSPs evaluated and analyzed their plan in the year before. All the WSPs except for Embu, Eldoret and Killfi-Mariakani formulated their mid-term and annual plans using the new planning template which was newly designed by the JICA Expert Team and is currently under trial at the Pilot WSPs. The three aforementioned WSPs are working on finalizing their plans. The results of the planning have also been shared with WASREB.</p>
<p>4-8 Each Pilot WSP holds regular NRW reduction meetings attended by relevant departments of WSP.</p>	<p>The JICA team has focused on analyzing the meter reading/billing data (e.g. of the last 12 months) at all the Pilot WSPs as a first step for the WSPs to commence activities to reduce their commercial losses. The JICA team also emphasized to have inter-departmental meetings in order to share the results and countermeasures needed to improve collaboration among the various departments concerned. The results of these analyses typically show continuous estimates of even large customers' consumptions resulting from a huge number of faulty meters. The JICA team made this the main topic at the inter-departmental meetings in all the WSPs and all the staff in the meetings were astonished by results of the analysis showing the current high levels of estimation carried out in the billing exercise in each of the WSPs. As an example, in Ruiru-Juja, coordination between the different sections involved in Non-revenue water reduction and the Non-Revenue water section is slowly improving.</p>

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	<p>Meru, Embu, Nyahururu, Nakuru, Kisumu, Mavoko, Eldoret and Kilifi-Mariakani hold regular meetings normally attended by relevant departments mainly to evaluate the progress made and to strategize on the way forward based on the results of the monthly entire NRW figures.</p> <p>The meetings among the relevant departments in the WSPs are continuing and the members of the WSPs are realizing the effectiveness of the inter-departmental meetings.</p>
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**Output 5**

5-1 The project presents results and lessons of Output 4 and other NRW activities during WASPA meetings.	JICA Expert team supported a High-Level Panel Meeting which was organized by WASPA in Embu on Oct 30 <sup>th</sup> 2018. Subsequently, NRW reduction trainings were conducted with the support of JICA Experts until 2 <sup>nd</sup> Nov, 2018.
5-2 The Project holds NRW thematic workshops in coordination with WASPA.	Plan is to be discussed for realization of workshop in early 2019.
5-3 The Project team produces brief notes.	Draft of the 1 <sup>st</sup> brief note (Japanese) has been completed. After checks by JICA, translation to English will commence

**1-3 Achievement of Output**

**Output 1: Promotion and coordination of NRW reduction activities by MWS NRW Unit are strengthened.**

1-1 All County representative participate NRW related seminar(s).	<ul style="list-style-type: none"> <li>Representatives from 37 Counties participated in Kenya Water Summit where NRW management was presented as one of the key issues.</li> <li>County representatives participated in WASPA's High Level Training held in late Oct to early Nov 2018.</li> </ul>
1-2 NRW reduction campaigns are conducted semi annually.	<p>1. Events of school visits to water treatment plants (WTP) have been implemented 3 times as follows:</p> <ul style="list-style-type: none"> <li>Twice in Embu in March 2018 and September 2018.</li> </ul>

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	<ul style="list-style-type: none"> <li>• Once in Meru in September 2018</li> </ul> <p>2. Nairobi International Trade Fair in October 2018</p>
1-3 NRW reduction annual reports are produced.	Draft of NRW Annual report version 1 was submitted to NRW Unit and the printing process is in progress.
<b>Output 2: Use of NRW reduction standards by Urban WSPs are promoted by WASREB</b>	
2-1 NRW reduction standards are revised by 2020.	WASREB is progressively promoting usage of the current NRW Standards by WSPs and also carrying out a survey on the usage of NRW Standards designed by the Editorial Committee.
2-2 Revised NRW reduction standards are disseminated to all Urban WSPs through workshop(s).	Planned for Phase 3.
<b>Output 3: NRW related training capacity of KEWI is strengthened.</b>	
3-1 KEWI conducts NRW reduction courses with contents incorporating on-site trainings and revised course materials.	Completed
3-2 The average score of the participants on the test conducted after the NRW reduction course is higher than before the implementation.	<p>The comprehensive result of the tests conducted in the courses are indicated as shown below: -</p> <p>1<sup>st</sup> Joint Training 74.2% to 75.4%</p> <p>2<sup>nd</sup> Joint Training 76.4% to 77.5%</p> <p>3<sup>rd</sup> Joint Training 71.8% to 73.9%</p> <p>4<sup>th</sup> Joint Training 73.8% to 78.5%</p>
<b>Output 4: NRW planning and/or implementation capacity of Pilot WSPs is enhanced.</b>	
4-1 More than 8 Pilot WSPs formulate NRW reduction plans.	<p>All 9 Pilot WSPs have prepared their annual activity plan reports. As of December, Kisumu and Mavoko had prepared detailed plans while Meru, Nyahururu, Nakuru &amp; Ruiru-Juja had prepared simpler plans.</p> <p>Embu, Eldoret and Kilifi-Mariakani are still working on the formulation of plans using the new template.</p> <p>Testing, servicing and replacement of faulty meters by the pilot WSPs is on-going as one of the key activities to curb commercial losses.</p>
4-2 More than 6 Pilot WSPs self-review their achievements of Previous year's NRW reduction plans and compile activity report.	
4-3 Based on 4-2, more than 6 Pilot WSPs continuously formulate annual NRW reduction plans.	
4-4 More than 6 Pilot WSPs continuously implement NRW reduction plan formulated in 4-1.	
4-5 More than 6 Pilot WSPs are able to use skills and/or implement activities which they could not employ before the project.	
4-6 The amount of NRW in the selected	
	The overall NRW figure in the selected zones is



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distribution zones indicates decreasing tendency.	reducing through carrying out activities such as step testing, minimum night flow measurement and servicing and replacement of customer meters
<b>Output 5: Experiences and knowledge of NRW reduction activities are shared among Urban WSPs.</b>	
5-1 Results and lessons from Output 4 and NRW activities are shared during WASPA meetings at least 3 times a year.	<ul style="list-style-type: none"> <li>• NRW Benchmarking workshop in February 2018</li> <li>• NRW Benchmarking workshop in April 2018</li> <li>• High level panel discussion in November 2018</li> </ul>
5-2 A NRW thematic workshop is organized every year.	Planning Ongoing
5-3 3 brief notes are produced during the project.	Version 1 (Japanese) is complete.

**1-4 Achievement of the Project Purpose**

**Project Purpose: A NRW reduction support mechanism is established for Urban WSPs to implement NRW reduction Activities.**

Indicator	Achievement
6 Pilot Urban WSPs continue achieving target set by the NRW reduction plan for two years.	6 Pilot WSPS have identified targets from their reduction plans which they are currently working on. The six are; Embu, Meru, Nyahururu, Nakuru, Ruiru-Juja and Kisumu.

**1-5 Changes of Risks and Actions for Mitigation**

Procurement of the NRW equipment for Pilot WSPs has not been completed. This has hindered NRW reduction activities in all the Pilot WSPs. This has lowered the efficiency of technical transfer by JICA Experts to support the Pilot WSPs. Therefore, JICA Experts have continued to borrow the NRW equipment from Narok and Kapsabet WSPs. Lack of equipment will seriously reduce the continuity and future sustainability of NRW reduction activities of the pilot WSPs. The JICA Experts request the MWS NRW Unit to ensure the procurement of equipment as soon as possible.

**1-6 Progress of Actions undertaken by JICA**

JICA has been providing 2 project vehicles. Representatives from Kenya office have been attending JCC meetings.

**1-7 Progress of Actions undertaken by GoK**

As mentioned above, the procurement of the equipment has been delayed. GoK has been requested to be more vigilant on procurement so as not to affect other activities of the Project.

**1-8 Other remarkable/considerable issues related/affect to the project (such as other JICA's projects, activities of counterparts, other donors, private sectors, NGOs etc.)****(1) Cooperation to JICA's program for third country training to visit Kigali Water in Rwanda.**

Collaborating with a request from JICA, two Project C/Ps from EWASCO travelled with a JICA Expert Team member to Kigali Water in Rwanda to implement JICA's third country training program. The program was implemented successfully from 4<sup>th</sup> to 9<sup>th</sup> November, 2018.

**2 Delay of Work Schedule and/or Problems (if any)**

There are following delays of activities during the reporting period.

<b>2-1 Detail</b>	<b>2-2 Cause</b>	<b>2-3 Actions Taken</b>
Publishing of the 1st NRW annual report.	There was a delay in the disbursement of the budget in the first quarter of fiscal year 2018-2019, but this was harmonized in the second quarter. The disbursement of the budget is controlled by the National Treasury.	The JICA Expert team requested the MWS repeatedly about the budget disbursement.
Procurement of the equipment required for the implementation of NRW reduction activates at WSPs.	As mentioned in 1-5 above.	As mentioned in 1-5 above.

**2-4 Roles of Responsible Persons/Organization (JICA, GoK etc.)**

Indicated above.

### 3 Modification of the Project Implementation Plan

#### 3-1 PDM and PO

PDM ver.2 and PO ver. 2 were confirmed in the 4<sup>th</sup> JCC Meeting held in August 2018. Revision of the Record of Discussions (R/D) is in process for PDM ver. 2 and PO ver. 2.

#### 3-2 Other modifications on detailed implementation plan

*(Remarks: The amendment of R/D and PDM (title of the project, duration, project site(s), target group(s), implementation structure, overall goal, project purpose, outputs, activities, and input) was authorized by JICA HDQs. If the project team deems it necessary to modify any part of R/D and PDM, the team may propose the draft.)*

### 4 Preparation of GoK Outlook after completion of the Project

No preparations have been discussed for after the Project so far.



## Annex-2 Attendance list

**5<sup>th</sup> Joint Coordination Committee for The Project for Strengthening Capacity in Non-Revenue Water Reduction**

NO.	NAME	ORGANIZATION	POSITION
1.	ENG. SAO ALIMA	MWS	AG. WATER SECRETARY
2.	MR. DAVID MABONGA	MWS	PROJECT COORDINATOR
3.	MR. ANDERSON KIOI	MWS	NRW UNIT
4.	MS. PATRICIA MUTUA	MWS	NRW UNIT
5.	DR. LEUNITA SUMBA	KEWI	DIRECTOR
6.	MR. WALTER MOSETI	KEWI	NRW COORDINATOR /TRAINER
7.	ENG. RICHARD CHERUIYOT	WASREB	INSP. SERVICES MANAGER
8.	MS. EDDAH WAMBUI	WASPA	E.O
9.	MR. ROBERT MIRURI	MEWASS	GM
10.	MR. SILAS NDATHO	MEWASS	HEAD OF NRW UNIT
11.	MR. FELIX GITONGA	EWASCO	HTS
12.	MR. JOSEPH IRUNGU	EWASCO	NRW SUP.
13.	MR. HEZEKIAH MWARUA	KILIFI-MARIAKANI	MD
14.	MR. EMANNUEL KARAVINA	KILIFI-MARIAKANI	TM
15.	MR. ERNEST CHEA	KILIFI-MARIAKANI	CBDM
16.	MR. JOSEPH MAIYO	ELDORET	WTDM
17.	MR. BERNARD MWAURA	NYAHURURU	MD
18.	MR. PETER MWANGI	NYAHURURU	TM
19.	ENG. JOB LIECH	KISUMU	NRW ENGINEER
20.	MS. MARY MWANGI	RUIRU-JUJA	TM
21.	MR. MICHAEL GITAU	RUIRU-JUJA	IN-CHARGE NRW
22.	MR. GILBERT MUTAI	NAKURU	AG. TM
23.	MR. JOHN WACHIRA	NAKURU	S O&M
24.	MR. SHINJIRO AMAMESHI	JICA KENYA OFFICE	SENIOR REPRESENTATIVE
25.	MR. WATARU TAKASHIMA	JICA KENYA OFFICE	PROJECT FORMULATION ADVISOR
26.	MR. MASAHITO MIYAGAWA	JICA KENYA OFFICE	REPRESENTATIVE

27.	MR. JOHN GITAU	JICA KENYA OFFICE	PROGRAM OFFICER
28.	MS. STELLA NDWIGA	MAVOKO	FM
29.	MR. JAMES NYAUMA	MAVOKO	NRW OFFICER
30.	MR. MASAYUKI TAGUCHI	JICA	CHIEF ADVISOR
31.	MR. NOBORU SAITO	JICA	JICA EXPERTS TEAM
32.	MS. HIROKO SUGIMOTO	JICA	JICA EXPERTS TEAM
33.	MR. EVANS GITAHI	JICA	JICA EXPERTS TEAM
34.	ENG. GEORGE KARANJA	JICA	JICA EXPERTS TEAM
35.	MR. CHARLES MAINGI	JICA	JICA EXPERTS TEAM
36.	MS. KELLYJOY GAKII	JICA	JICA EXPERTS TEAM

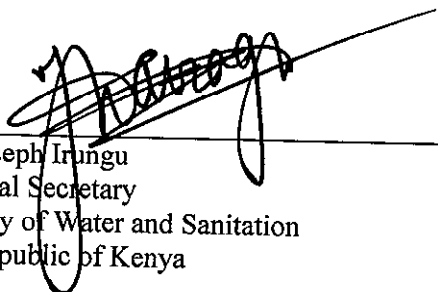
Date: 6<sup>th</sup> February 2019 Venue: Sarova Panafric Hotel

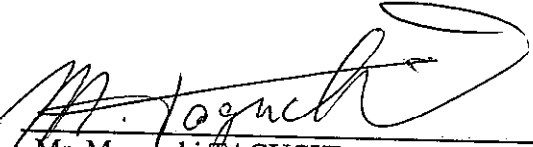
MINUTES OF MEETING  
OF  
THE SIXTH JOINT COORDINATION COMMITTEE MEETING  
ON  
THE PROJECT FOR  
STRENGTHENING CAPACITY IN NON-REVENUE WATER REDUCTION  
AGREED UPON BETWEEN  
JAPAN INTERNATIONAL COOPERATION AGENCY  
AND  
MINISTRY OF WATER AND SANITATION  
THE REPUBLIC OF KENYA

5<sup>th</sup> August, 2019, Nairobi

小森 克俊

Mr. Katsutoshi KOMORI  
Chief Representative  
JICA Kenya Office

  
Mr. Joseph Irungu  
Principal Secretary  
Ministry of Water and Sanitation  
The Republic of Kenya

  
Mr. Masayuki TAGUCHI  
Chief Advisor  
JICA Expert Team

In accordance with the Record of Discussion (hereinafter referred to as the "R/D") signed on 7<sup>th</sup> March, 2016 between the Ministry of Water and Irrigation, later renamed the Ministry of Water and Sanitation (hereinafter referred to as "MWS") and Japan International Cooperation Agency (hereinafter referred to as "JICA") on "The Project for Strengthening Capacity in Non-Revenue Water Reduction"(hereinafter referred to as "the Project"), the 6<sup>th</sup> Joint Coordination Committee (hereinafter referred to as the "6<sup>th</sup> JCC") of the Project was held on 5<sup>th</sup> August, 2019. All members of the 6<sup>th</sup> JCC reviewed the overall Progress and implementation of the Project, and also exchanged opinions on major issues.

The major points of discussions and agreement are summarized as follows:

### **1. Result of Project Monitoring Sheet Ver. 6**

The 6<sup>th</sup> JCC confirmed the contents of the Project Monitoring Sheet Version 6 (covering the period from February 2019 to September 2019), which was as presented at the 6<sup>th</sup> JCC (Refer to Annex-1). In accordance with the Progress Monitoring Sheet, the JICA Expert Team made a presentation about the current achievements and progress of each Output of the Project Design Matrix (PDM) to the participants. The participants further discussed about the issues related to the Project by reviewing the presentation. As a result, all the counterparts (C/Ps) expressed their satisfaction on the project achievements and unanimously accepted the contents of the Project Monitoring Sheet.

### **2. Other Issues discussed in the 6<sup>th</sup> JCC Meeting.**

- 1) JICA appreciated the MWS effort in procuring the leak detection equipment for the pilot WSPs which were targeted in the 2<sup>nd</sup> phase of the Project and for handing them over to the respective WSPs. However, during the last procurement, some equipment were not purchased because the offered price from the supplier exceeded the ceiling amount estimated by the Ministry. JICA requested the MWS to procure similar equipment for the 3 Pilot WSPs, that will be incorporated in the Project from the 3<sup>rd</sup> phase, in the first quarter of the fiscal year 2019/2020. The MWS concurred with JICA to purchase the leak detection equipment as required together with the ones excluded in the previous procurement.
- 2) JICA requested the MWS to make an action plan of the NRW Unit and implement activities such as publishing of the NRW annual report, Counties sensitizations, NRW reduction seminars, etc. taking into account experiences acquired in the 2<sup>nd</sup> phase of the Project. The MWS promised that the NRW Unit will formulate its action plan by the end of August 2019 and will implement the activities as planned. The MWS expressed its intention to produce NRW annual report ver.2 within this year.
- 3) As requested in the 5<sup>th</sup> JCC meeting JICA again requested that the MWS continues to support Kenya Water Institute (KEWI) to reform the currently unused facility of pipe network arrangement to a leak detection training platform. The MWS responded that the first disbursement of the total amount requested was released to KEWI but the second disbursement was canceled due to budget cuts. However, the MWS pledged to support KEWI to completion of the training platform.
- 4) The Head of Technical Services (HTS) Embu WSP enquired how the Ministry will assist the



WSPs in cases where their pipelines are destroyed by road contractors. The MWS responded that it will take up the matter with the PS who will send an invitation letter to the counterparts for them to discuss the issue at a national level. COG requested to be included in the said meeting to deliberate on the issue in question.

- 5) JICA Experts team advised the pilot WSPs to continue formulating their NRW Reduction plan using the new improved template introduced by Output 4 and choose target activities from the annual plan as their targets to be achieved within the year by the end of August 2019. The members of the pilot WSPs unanimously agreed on it.
- 6) JICA recommended that the template for NRW Reduction plan should be incorporated in the new NRW Management Standards which WASREB was revising through the editorial committee. This was agreed upon by the MWS.
- 7) The MWS expressed its appreciation to JICA for the positive results realized by the Pilot WSPs through implementing the relevant activities in collaboration with JICA experts. JICA also expressed its satisfaction and confirmed that the Project had been progressing efficiently as evidenced in their field visits to some pilot WSPs and discussions among the CP organizations and the Pilot WSPs. Therefore, the MWS and JICA agreed that the Project will proceed to the 3<sup>rd</sup> phase and the remaining 3 pilot WSPs will join the Project and start their activities like other pilot WSPs had been doing in the 2<sup>nd</sup> phase.

### **3. Schedule of the Next JCC Meeting**

The 7<sup>th</sup> JCC meeting was scheduled for February 2020.

END

Annex-1: Project Monitoring Sheet Ver. 6

Annex-2: Attendance list



Annex-1 Project Monitoring Sheet

**TO CR of JICA Kenya OFFICE**

**PROJECT MONITORING SHEET Ver. 6**

**Project Title: THE PROJECT FOR STRENGTHENING CAPACITY IN NON-REVENUE WATER REDUCTION (Phase 2)**

**Version of the Sheet: Ver. 6 (Term: Feb. 2019 – Jul. 2019)**

**Name: Masayuki TAGUCHI**

**Title: Chief Advisor**

**Submission Date: Aug 5, 2019**

**I. Summary**

**1 Progress**

**1-1 Progress of Inputs**

**1) Input by Japanese Side**

Terms of assignments and the total man-months (M/M) covering from 1st February to 31st July, 2019.

Experts:

Mr. Taguchi: From 13<sup>th</sup> Jan to 11<sup>th</sup> Mar, from 31<sup>th</sup> Mar to 11<sup>th</sup> May, from 14<sup>th</sup> Jul to 31<sup>st</sup> Aug (4.93 M/M)

Mr. Saito: From 14<sup>th</sup> Jan to 15<sup>th</sup> Feb, From 23<sup>th</sup> Jul to 21<sup>st</sup> Aug (2.10 M/M)

Mr. Mori: From 1<sup>st</sup> Apr to 30<sup>th</sup> April, from 9<sup>th</sup> Jun to 7<sup>th</sup> Jul (1.97 M/M)

Mr. Takahashi: From 3<sup>rd</sup> Jun to 17<sup>th</sup> Jul (1.50 M/M)

Mr. Sekimoto: From 12<sup>th</sup> May to 8<sup>th</sup> Jun (0.93 M/M)

Mr. Harada: From 16<sup>th</sup> Jun to 24<sup>th</sup> Jul (1.30 M/M)

Mr. Shibazaki: From 17<sup>th</sup> Feb to 17 Apr, From 19<sup>th</sup> May to 30<sup>th</sup> Jun, From 31<sup>st</sup> Jul to 24<sup>th</sup> Aug (4.27 M/M)

Ms. Sugimoto: From 1<sup>st</sup> Feb to 31<sup>st</sup> Jul; randomly working upon requirement of the Project (2.05 M/M)

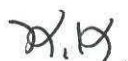
Total Man Month (M/M) during the said period:

Experts: 19.05 M/M

Local staff: 18.00 M/M

**2) Input by Kenyan Side**

Project CPs: Number of Counterpart (CP) members that participated in the reporting



period is 124 representing from the following organizations.

MWS (5), WASREB (5), KEWI (10), WASPA (4), Meru WSP (10), Embu WSP (11)  
Nyahururu WSP (9), Nakuru WSP (8), Ruiru-Juja (6), Mavoko (7), Eldoret (8), Kisumu  
(10), Kilifi-Mariakani (10), CoG (2), Counties (5), Other WSP (14)

Facilities: Project office at MWS and KEWI as well as regular meeting rooms were provided. Vehicles for Kenyan C/Ps' field visits were provided.

Project implementation costs: The traveling costs and per diem for MWS/KEWI staff were provided by MWS.

### 1-2 Progress of Activities

Activity	Progress
<b>Output 1</b>	
1-1 MWS NRW Unit, in cooperation with WASREB, produces NRW annual reports which include NRW reduction data.	<ul style="list-style-type: none"> <li>Printing of the first NRW annual report was completed in May 2019. Up-loading of the report to the homepage of MWS has been done in July. Report launching preparation is in progress.</li> <li>NRW Unit has drafted the format for submitting articles for 2nd annual report and has shared with counterparts .</li> </ul>
1-2 MWS NRW Unit plans and implements NRW reduction sensitization activities for the Counties.	<p>After attending the Kenya Water Summit held in March 2018:</p> <ul style="list-style-type: none"> <li>NRW Unit participated in the World Water Day activities held in Kakamega on 22<sup>nd</sup> March 2019</li> <li>The Unit held the first sensitization meeting in Nakuru on 28<sup>th</sup> March 2019, in collaboration with the County Government of Nakuru.</li> </ul>
1-3 MWS NRW Unit plans and implements NRW reduction campaigns.	<ul style="list-style-type: none"> <li>NRW unit exhibited in the 3<sup>rd</sup> WASPA's International Conference &amp; Expo held from 8<sup>th</sup> -10<sup>th</sup> May 2019</li> <li>Plans to roll out NRW school campaigns and introduce students to meter reading starting with Nakuru WSP are underway.</li> </ul>
1-4 MWS NRW Unit conducts reviews of KEWI NRW courses.	<ul style="list-style-type: none"> <li>KEWI is revising the Non-Revenue Water course contents incorporating reviews from the MWS NRW Unit and other counterparts.</li> <li>KEWI conducted the 5<sup>th</sup> joint classroom training in</li> </ul>

	<p>March 2019. 16 participants from 7 WSPs attended. Understanding of the course by participants was at 73% for classroom and 76% for OJT on average.</p> <ul style="list-style-type: none"> <li>Follow up survey of the previous trainees was conducted in Nyahururu and Nakuru WSPs in April 2019.</li> </ul>
1-5 MWS NRW Unit conducts reviews of WASREB's NRW reduction activities.	<p>Editorial committee meetings to revise NRW Standards have been continuing on a monthly basis from February and 8 meetings of the committee were held by July 2019.</p> <p>As a part of the Committee members NRW Unit is reviewing the chapters of the standard allocated and such contribution to the Committee is continuing till the completion of the new NRW Standard.</p>
1-6 MWS NRW Unit assures the budget for the support mechanism based on its NRW reduction mid-term vision.	<p>Budget for the year 2018/2019 was approved by the MWS Principal Secretary. The Treasury scaled down the third quarter allocation and it adversely affected the planned activities.</p>
<b>Output 2</b>	
2-1 WASREB conducts survey of the usage of current NRW reduction standards.	<p>The questionnaire for the survey was administered through an online program (Monkey survey) to fast track analysis. 41 out of 66 WSPs had responded to the questionnaire. The Committee analyzed them and the results were shared among the committee members. The questionnaire shall complement the NRW audit that WASREB previously carried out on nine WSPs in 2018.</p>
2-2 Based on the survey result as well as Output 4 and 5, WASREB revises the NRW reduction standards.	<p>The ToR, Work plan and Budget was revised and circulated. Each member of the editorial committee was allocated chapters to revise based on their competence. In July 2019 the revised chapters were submitted and are in the process of being consolidated. With the help of Mr. Mori (JICA Experts Team), members adopted the overall water supply area approach instead of the DMA approach used in the previous NRW Standard. The new standard will be made in two volumes: - the NRW Reduction Guidelines</p>

*M. Vaguel*

*M. D.*

Form 3-1 Monitoring Sheet Summary

	(by combining the previous guidelines and manual) and the NRW Reduction Handbook. The case studies will be featured in the NRW Annual Reports or in other reports published by other organizations.
2-3 WASREB promotes revised NRW reduction standards through workshop(s).	To be implemented in the 3 <sup>rd</sup> Phase.
2-4 WASREB incorporates the review results of NRW reduction activities by MWS NRW Unit in their activities.	MWS NRW Unit collaborated with WASREB in the analysis of the questionnaire and continues to do likewise in editorial committee meetings.
2-5 WASREB monitors and evaluates the usage of revised NRW standards.	To be implemented in 3rd Phase.
<b>Output 3</b>	
3-1 KEWI studies current status of NRW reduction courses and its challenges.	Completed in Phase 1
3-2 KEWI reviews NRW reduction training strategies and course contents.	The training team is reviewing the materials for use in training by considering the comments raised in each joint training review meeting, e.g. improving training methodologies, NRW ethics, work flow and NRW standards. The revised materials were adopted and used in the 5 <sup>th</sup> & 6 <sup>th</sup> Joint training course.
3-3 KEWI, in collaboration with leading WSPs (Embu and Meru, etc.), conducts on-site NRW trainings.	KEWI conducted the 5 <sup>th</sup> joint classroom training in KEWI from 4 <sup>th</sup> – 8 <sup>th</sup> and OJT in Embu from 18 <sup>th</sup> – 23 <sup>rd</sup> March 2019 and the 6 <sup>th</sup> was from 3 <sup>rd</sup> – 7 <sup>th</sup> June 2019 (classroom in KEWI) and from 17 <sup>th</sup> – 23 <sup>rd</sup> June 2019 (OJT in Embu).
3-4 KEWI reflects on-site NRW trainings into NRW course contents and materials.	Reviewed OJT materials were used in the 5 <sup>th</sup> and 6 <sup>th</sup> Joint Training.
3-5 KEWI incorporates the results of review by MWS NRW Unit into NRW course contents.	KEWI has incorporated the comments made during each Joint training by MWS NRW Unit/ JICA/ 3rd party evaluators into NRW course contents and structure. A review meeting for the 6 <sup>th</sup> Joint training will be held in August 2019 and the report will be prepared after it.
3-6 KEWI conducts trace studies of NRW reduction course participants.	Trace study for two WSPs was conducted on 1 <sup>st</sup> and 2 <sup>nd</sup> April 2019, where Nyahururu and Nakuru WSPs participated.

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<b>Output 4</b>	
4-1 The Project team conducts a survey of Urban WSPs and selects pilot Urban WSPs.	Activity was completed in Phase 1.
4-2 Each Pilot WSP conducts analyses of current NRW reduction activities and identifies its challenges.	Activity was completed in Phase 1.
4-3 Each Pilot WSP identifies measures to solve challenges.	All the 9 Pilot WSPs prepared detailed plans for 2018/2019 financial year and are in the process of preparing the same for 2019/2020 using the new simplified template as well as reviewing the activities they had planned in the just concluded financial year (2018/2019).
4-4 Each Pilot WSP formulates the NRW reduction plan including financial plan.	
4-5 Each Pilot WSP implements the NRW reduction plan.	<p>In Embu WSP, the faulty production meter was replaced and two new meters installed. However, they are still in the process of monitoring their behavior so as to establish their accuracy.</p> <p>They have so far collected and uploaded pressure data from 30no. pressure points in zone 2 using ODK which will later be useful for the pressure management exercise in the zone. They have also started the exercise of procuring pressure reduction valves for the same.</p> <p>They have also developed and adopted meter standard specifications for R-200 meters to be used for procurement. So far, 40 new meter samples from the ones supplied have been tested and found to be okay.</p> <p>Large and small customer meter survey on stalled and mal-functional meters is on-going. So far 174 small customer meters have been tested and replaced the faulty ones. In addition, 4no. illegal connections have been netted during the term from February to July 2019</p> <p>Nyahururu, Nakuru, Ruiru-Juja &amp; Mavoko WSPs have</p>





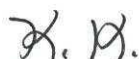
	<p>been setting up improvised meter test benches which they were trained on how to use and are now using them to test customer meters</p> <p>Kisumu WSP has been working on the Hydraulic Zoning where so far, the desktop review is complete and is now awaiting the acceptance by the management for implementation to commence.</p> <p>Minimum Night Flow measurements were conducted with the help of JICA Experts (Mr. Sekimoto and Mr. Takahashi) at Kanyamedha zone As a result, mapping and repair of the physical leaks found is complete and the active underground leakage detection exercise is ongoing. The flows dropped from 37m<sup>3</sup>/hour to the current 9m<sup>3</sup>/hour.</p> <p>Meru, Nyahururu, Nakuru and Ruiru-juja are mainly concentrating on large customer monitoring, Step testing and Minimum Night Flow measurements (e.g. Zone in Meru, Manyani and unsurveyed estates in Nakuru and Manguo estate in Nyahururu).</p> <p>Kilifi – Mariakani is mainly dealing with customer meter servicing, testing and replacement of the mal-functional meters.</p>
<p>4-6 Each Pilot WSP evaluates and analyzes implementation results and revises the plans.</p>	<p>All the 9 pilot WSPs are currently in the process of evaluating and analyzing their plans for the just concluded financial year 2018/2019 and are</p>
<p>4-7 Each Pilot WSP produces the NRW reduction activity report annually.</p>	<p>formulating their plans for the just started financial year 2019/2020 using the newly improved templates with the assistance of the JICA Experts. (They are expected to have completed by end of July 2019) The plans will also be shared with WASREB.</p>
<p>4-8 Each Pilot WSP holds regular NRW reduction meetings attended by relevant departments of WSP.</p>	<p>After the JICA Expert Team focused on analyzing the meter reading/billing data (e.g. of the last 12 months) at all the Pilot WSPs as a first step for the WSPs to</p>

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	<p>commence activities to reduce their commercial losses. The results of these analyses typically showed continuous estimation of even large customers' consumptions. After the results were shared with the related staff of WSPs at their interdepartmental meetings, the WSPs decided to work on the accounts billed on estimation by prioritizing the large consumers. The findings show that there has been an increase in billing in most of the pilot WSPs except Kilifi–Mariakani which is to be supported intensively in the 3<sup>rd</sup> phase. The interdepartmental meetings are now being held every month in all the pilot WSPs where they get to discuss and share important issues related to NRW reduction to evaluate the progress made and to strategize on the way forward based on the results of the monthly entire NRW figures.</p> <p>.The members of the WSPs are realizing the effectiveness of the monthly inter-departmental meetings.</p>
<b>Output 5</b>	
5-1 The project presents results and lessons of Output 4 and other NRW activities during WASPA meetings.	WASPA's 3 <sup>RD</sup> Conference & Expo 2019 was held on 8 <sup>th</sup> to 10 <sup>th</sup> May at KICC with a total of 600 delegates including exhibitors. MWS NRW Unit had participated in it by opening an exhibition booth on NRW reduction.
5-2 The Project holds NRW thematic workshops in coordination with WASPA.	1 <sup>st</sup> thematic workshop is planned to be held on 6 <sup>th</sup> August. The theme was decided on "Illegal water use" through a questionnaire survey to the C/Ps.
5-3 The Project team produces brief notes.	1 <sup>st</sup> brief note was completed in June 2019. It is possible to access it by internet on JICA's homepage.




**1-3 Achievement of Output**

Output 1: Promotion and coordination of NRW reduction activities by MWS NRW Unit are strengthened.	
1-1 All County representative participate NRW related seminar(s).	<ul style="list-style-type: none"> <li>Representatives from 37 Counties participated in Kenya Water Summit where NRW management was presented as one of the key issues.</li> <li>County representatives participated in WASPA's High Level Training held in late Oct to early Nov 2018.</li> <li>1<sup>st</sup> Regional County sensitization workshop conducted on 28<sup>th</sup> March, 2019 in Nakuru County. Attendees were the COG and the neighboring 5 counties (Nakuru, Bomet, Nyandarua, Narok and Kericho) and WSPs in the same Counties.</li> </ul>
1-2 NRW reduction campaigns are conducted semi-annually.	<ol style="list-style-type: none"> <li>Events of school visits to water treatment plants of pilot WSPs have been implemented 3 times as follows:                             <ul style="list-style-type: none"> <li>Twice in Embu in March 2018 and September 2018.</li> <li>Once in Meru in September 2018</li> </ul> </li> <li>Nairobi International Trade Fair in October 2018</li> <li>NRW exhibited in the 3<sup>rd</sup> WASPA's International Conference &amp; Expo held from 8<sup>th</sup> -10<sup>th</sup> May 2019</li> </ol>
1-3 NRW reduction annual reports are produced.	1 <sup>st</sup> NRW annual report was completed in May 2019.
Output 2: Use of NRW reduction standards by Urban WSPs are promoted by WASREB	
2-1 NRW reduction standards are revised by 2020.	WASREB is making the progress for revising the current NRW reduction Standards through the Editorial Committees. The revising work is in progress and it will be completed in the 3 <sup>rd</sup> Phase of the Project.
2-2 Revised NRW reduction standards are disseminated to all Urban WSPs through workshop(s).	Planned for Phase 3.
Output 3: NRW related training capacity of KEWI is strengthened.	
3-1 KEWI conducts NRW reduction courses with contents incorporating on-site trainings and revised course materials.	Completed
3-2 The average score of the participants on the test conducted after the NRW reduction course is higher than before the	The comprehensive result of the tests conducted in the courses are indicated as shown below: -

implementation.	<p>1<sup>st</sup> Joint Training 74.2% to 75.4%</p> <p>2<sup>nd</sup> Joint Training 76.4% to 77.5%</p> <p>3<sup>rd</sup> Joint Training 71.8% to 73.9%</p> <p>4<sup>th</sup> Joint Training 73.8% to 78.5%</p> <p>5<sup>th</sup> Joint Training 71.6% to 77.8%</p> <p>6<sup>th</sup> Joint Training 75.2% to 79.3%.</p>
<b>Output 4: NRW planning and/or implementation capacity of Pilot WSPs is enhanced.</b>	
4-1 More than 8 Pilot WSPs formulate NRW reduction plans.	All 9 Pilot WSPs had prepared the 1 <sup>st</sup> annual activity plan reports as of December 2018 by using templates compiled for NRW planning then are formulating the plans of year 2019-20 by using newly revised templates as of July 2019 (Expected to finish formulating the plans by end of July 2019).
4-2 More than 6 Pilot WSPs self-review their achievements of Previous year's NRW reduction plans and compile activity report.	
4-3 Based on 4-2, more than 6 Pilot WSPs continuously formulate annual NRW reduction plans.	
4-4 More than 6 Pilot WSPs continuously implement NRW reduction plan formulated in 4-1.	During the Phase 2 of the Project 6 Pilot WSPs are continuing the activities as they planned. These 6 Pilot WSPs have been implementing the NRW reduction activities including step testing, minimum night flow measurement and servicing, 1 year data analysis of customer meter reading and billing, and recording the NRW reduction related works on ODK or Kobo tool/box, free computer software.
4-5 More than 6 Pilot WSPs are able to use skills and/or implement activities which they could not employ before the project.	
4-6 The amount of NRW in the selected distribution zones indicates decreasing tendency.	Some Pilot WSPs have made clear tendencies to reduce the NRW volume and ratio through their activities trained in the Project.
<b>Output 5: Experiences and knowledge of NRW reduction activities are shared among Urban WSPs.</b>	
5-1 Results and lessons from Output 4 and NRW activities are shared during WASPA meetings at least 3 times a year.	<ul style="list-style-type: none"> <li>• NRW Benchmarking workshop in February 2018</li> <li>• NRW Benchmarking workshop in April 2018</li> <li>• High level panel discussion in November 2018</li> <li>• Validation workshop was held in Feb 2019</li> </ul>
5-2 A NRW thematic workshop is organized every year.	1 <sup>st</sup> thematic workshop is planned to be held on 6 <sup>th</sup> August 2019 and the theme will be "Illegal water use".
5-3 3 brief notes are produced during the project.	Version 1 of brief note was completed in June.

**1-4 Achievement of the Project Purpose**

Project Purpose: A NRW reduction support mechanism is established for Urban WSPs to implement NRW reduction Activities.

Indicator	Achievement
6 Pilot Urban WSPs continue achieving target set by the NRW reduction plan for two years.	6 Pilot WSPs have started their 2 <sup>nd</sup> year activities as they planned. They are making efforts to achieve their targets set in their plans. The six are; Embu, Meru, Nyahururu, Nakuru, Ruiru-Juja and Kisumu.

**1-5 Changes of Risks and Actions for Mitigation**

Procurement procedure for the NRW equipment for 3 Pilot WSPs, which are participating in the Project in the 3<sup>rd</sup> Phase need to be completed at the early stage of 2019/20 financing year. A review of the implementation of this procedure suggests that there may be a risk of delay of procurement procedure and this would hinder NRW reduction activities in all the 3 Pilot WSPs and lower the efficiency of technical transfer by JICA Experts to support these Pilot WSPs. Therefore, JICA Experts request the MWS NRW Unit to ensure the procurement of equipment as soon as possible.

**1-6 Progress of Actions undertaken by JICA**

JICA has been providing 2 project vehicles. Representatives from Kenya office have been attending JCC meetings.

**1-7 Progress of Actions undertaken by GoK**

Assuring timely budgetary allocation is the most important actions undertaken by GoK to affect the progress of the activities of the Project. Therefore, it is strongly recommended that GoK should make MWS NRW Unit to formulate its annual action plan and manage the disbursement timely in accordance with the plan

**1-8 Other remarkable/considerable issues related/affect to the project (such as other JICA's projects, activities of counterparts, other donors, private sectors, NGOs etc.)**

There is no particular activity around the Project in the reporting period.




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## 2 Delay of Work Schedule and/or Problems (if any)

There are following delays of activities during the reporting period.

2-1 Detail	2-2 Cause	2-3 Actions Taken
Publishing of the 2 <sup>nd</sup> NRW annual report.	Due to the delay for the 1 <sup>st</sup> NRW annual report, which was completed in April 2019, work for preparation of 2 <sup>nd</sup> report has been commenced after the completion of the 1 <sup>st</sup> one.	JICA Experts are supporting the NRW Unit to take proper actions as per planned by their annual action plan.
Procurement of the equipment required for the 3 <sup>rd</sup> Phase's Pilot WSPs to carry out the NRW reduction activities.	As mentioned in 1-5 above.	As mentioned in 1-5 above.

### 2-4 Roles of Responsible Persons/Organization (JICA, GoK etc.)

Indicated above.

## 3 Modification of the Project Implementation Plan

### 3-1 PDM and PO

PDM ver.2 and PO ver. 2 were officially agreed by JICA the MWS on January 22, 2019 and the Revision of the Record of Discussions (R/D) was also signed by the Principal Secretary of the National treasurer on May 27, 2019.

### 3-2 Other modifications on detailed implementation plan

*(Remarks: The amendment of R/D and PDM (title of the project, duration, project site(s), target group(s), implementation structure, overall goal, project purpose, outputs, activities, and input) was authorized by JICA HDQs. If the project team deems it necessary to modify any part of R/D and PDM, the team may propose the draft.)*

## 4 Preparation of GoK Outlook after completion of the Project

No preparations have been discussed for after the Project so far.

Annex-2 Attendance list

**THE PROJECT FOR STRENGTHENING CAPACITY IN NON-REVENUE WATER REDUCTION**

**MEETING: 6<sup>TH</sup> JCC DATE: 5<sup>TH</sup> AUGUST 2019 VENUE: SILVER SPRINGS HOTEL**

S/NO.	NAME	ORGANIZATION	POSITION
1.	ENG. SAO ALIMA	MWS	WATER SECRETARY
2.	ENG. VICTOR NJERU	MWS	HEAD, NRW UNIT
3.	MR. ANDERSON KIOI	MWS	NRW UNIT
4.	MS. PATRICIA MUTUA	MWS	NRW UNIT
5.	MR. DAVID NG'ETICH	KEWI	DEPUTY DIRECTOR
6.	MR. WALTER MOSETI	KEWI	NRW COORDINATOR /TRAINER
7.	ENG. PETER NJAGGAH	WASREB	DIRECTOR TECHNICAL SERVICES
8.	ENG. DANIEL NGUGI	WASREB	SENIOR ENGINEER
9.	MS. EDDAH WAMBUI	WASPA	E.O
10.	MR. ROBERT MIRURI	MEWASS	GM
11.	MR. SILAS NDATHO	MEWASS	HEAD OF NRW UNIT
12.	MR. CHRIS KABERIA	MEWASS	TM
13.	H.M. KARUGENDO	EWASCO	CEO
14.	MR. FELIX GITONGA	EWASCO	HTS
15.	MR. JOSEPH IRUNGU	EWASCO	NRW SUP.
16.	MR. HEZEKIAH MWARUA	KILIFI-MARIAKANI	MD
17.	MR. EMMANUEL KARAVINA	KILIFI-MARIAKANI	TM
18.	MR. ERNEST CHEA	KILIFI-MARIAKANI	CM
19.	MR. ROBERT MUNGA	KILIFI-MARIAKANI	NRW OFFICER
20.	DR. PAUL MUGOR	ELDOROT	MD
21.	MR. JIMMY KEMBOI	ELDOROT	HTS
22.	MR. JOSEPH MAIYO	ELDOROT	NRW HEAD
23.	MR. BERNARD MWAURA	NYAHURURU	MD
24.	MR. PETER MWANGI	NYAHURURU	TM

*M. Tapud*

*M. B.*

*J.P.*

25.	MR. JOB LIECH	KISUMU	NRW ENGINEER
26.	MS. MARY MWANGI	RUIRU-JUJA	TM
27.	MR. MICHAEL GITAU	RUIRU-JUJA	IN-CHARGE NRW
28.	MR. ZADRIAN ANGWENYI	RUIRU-JUJA	NRW TECHNICIAN
29.	MS. ANNPATRIZ MWIHAKI	COG	
30.	MS. MAGARET KINYANJUI	NAKURU	TM
31.	MR. GILBERT MUTAI	NAKURU	DISTRIBUTION MANAGER
32.	MR. YOSHIAKI YOKOTA	JICA- HEADQUATERS	SENIOR ADVISOR
33.	MS. TOMOKO MATSUNAGA	JICA- HEADQUATERS	PROJECT COORDINATOR
34.	MR. MASAHITO MIYAGAWA	JICA - KENYA OFFICE	REPRESENTATIVE
35.	MR. WATARU TAKASHIMA	JICA- KENYA OFFICE	PROJECT FORMULATION ADVISOR
36.	MR. JOHN GITAU	JICA - KENYA OFFICE	PROGRAM OFFICER
37.	MR. MICHAEL MANG'ELI	MAVOKO	MD
38.	MR. JAMES K. NYAUMA	MAVOKO	NRW OFFICER
39.	MR. MASAYUKI TAGUCHI	JICA	CHIEF ADVISOR
40.	MR. NOBORU SAITO	JICA	JICA EXPERTS TEAM
41.	MR. SATOSHI SHIBAZAKI	JICA	JICA EXPERTS TEAM
42.	MS. HIROKO SUGIMOTO	JICA	JICA EXPERTS TEAM
43.	MR. GEORGE KARANJA	JICA	JICA EXPERTS TEAM
44.	MR. CHARLES MAINGI	JICA	JICA EXPERTS TEAM
45.	MS. KELLYJOY GAKII	JICA	JICA EXPERTS TEAM

*M. Taguchi*

*[Signature]*

29.12.

MINUTES OF MEETING  
OF  
THE SEVENTH JOINT COORDINATION COMMITTEE MEETING  
ON  
THE PROJECT FOR  
STRENGTHENING CAPACITY IN NON-REVENUE WATER REDUCTION  
AGREED UPON BETWEEN  
JAPAN INTERNATIONAL COOPERATION AGENCY  
AND  
MINISTRY OF WATER & SANITATION AND IRRIGATION  
THE REPUBLIC OF KENYA

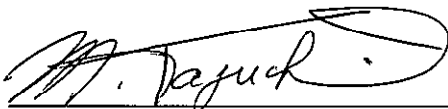
5<sup>th</sup> February, 2020, Nairobi

小森 克俊

Mr. KOMORI Katsutoshi  
Chief Representative  
JICA Kenya Office



Mr. Joseph IRUMU  
Principal Secretary  
Ministry of Water & Sanitation and Irrigation  
The Republic of Kenya



Mr. TAGUCHI Masayuki  
Chief Advisor  
JICA Expert Team

In accordance with the Record of Discussion (hereinafter referred to as the "R/D") signed on 7<sup>th</sup> March, 2016 between the Ministry of Water and Irrigation, which was renamed the Ministry of Water and Sanitation in February 2018, and again reorganized as the Ministry of Water & Sanitation and Irrigation (hereinafter referred to as "MWS&I") in October 2019, and Japan International Cooperation Agency (hereinafter referred to as "JICA") on "The Project for Strengthening Capacity in Non-Revenue Water Reduction" (hereinafter referred to as "the Project"), the 7<sup>th</sup> Joint Coordination Committee (hereinafter referred to as the "7<sup>th</sup> JCC") of the Project was held on 5<sup>th</sup> February, 2020. All members of the 7<sup>th</sup> JCC reviewed the overall progress and implementation of the Project, and also exchanged opinions on major issues. The major points of discussions and agreement are summarised as follows:

### **1. Approval of Work Plan 3**

The 7<sup>th</sup> JCC approved the contents and schedule of Work Plan 3 (Refer to Annex-1)

### **2. Approval of Project Monitoring Sheet Ver. 7**

The 7<sup>th</sup> JCC confirmed the contents of the Project Monitoring Sheet Ver. 7 (covering the period from August 2019 to January 2020), which was presented to the 7<sup>th</sup> JCC (Refer to Annex-2). In accordance with the Progress Monitoring Sheet, the JICA Expert Team made a presentation about the current achievements and progress of each Output of the Project Design Matrix (PDM) in the JCC. The participants further discussed the progress of the Project through the Monitoring Sheet Ver. 7. As a result, all the counterparts (C/Ps) unanimously approved the contents of the Project Monitoring Sheet.

### **3. Other Issues discussed in the 7<sup>th</sup> JCC Meeting**

#### **1) Confirmation of issues which were described on the M/M of 6<sup>th</sup> JCC**

JICA Expert team requested the Kenyan side to clarify the following issues which were raised in the 6<sup>th</sup> JCC meeting held on 5<sup>th</sup> August, 2019. MWS&I responded to each issue as follows,

Issue 1: MWS&I would procure the leak detection equipment, which consisted of the ones to be used by 3 Pilot WSPs which will participate in the 3<sup>rd</sup> Phase and for the ones excluded in the previous procurement, within the 1<sup>st</sup> quarter of fiscal year 2019/2020.

➤ MWS&I responded that the procurement was conducted in late January and that the equipment would be delivered by April 2020.

Issue 2: MWS&I was to share with JICA an action plan of NRW reduction activities for 2019/2020 with budget allocation plan but JICA had not received it yet. Therefore, JICA Expert team requested for the plan to reach them by the end of February.

Issue 3: MWS&I would continue to financially support KEWI's plan to reform an unused facility for pipe network training in the campus to a platform for leak detection training.



- MWS&I reported that budget for the same had been allocated to KEWI.

Issue 4: In relation to a proposal made by Head of Technical Services of Embu WSP regarding destruction of water pipelines by road construction works, the MWS&I was to hold a meeting with the relevant Ministries and government departments in order to solve the issue.

- MWS&I responded that a meeting shall be arranged to discuss the issue with relevant institutions such as COG and the Ministry of Transport and Infrastructure. The meeting shall be held in the course of the year.

## 2) Producing and disseminating NRW Annual Report

JICA Expert team informed the meeting that NRW annual report should be produced and disseminated continuously for promotion of NRW reduction activities in Kenya since it is described as an indicator of Overall Goal in the Project Design Matrix (PDM). However, only the 1<sup>st</sup> version of the report was published in May 2019 during Phase 1 and 2. In order to undertake this objective in future, the expert team proposed that MWS&I NRW Unit should formulate a concrete plan for producing the report, preferably by the end of February 2020. The MWS&I agreed to task the NRW Unit to prepare the plan. The JICA Expert team requested the Ministry to share the Plan after preparing. MWS&I NRW Unit reported that the next Annual report (2018/2019) was in the process of getting published and the 1<sup>st</sup> draft would be ready by the end of March 2020.

## 3) Proposal for establishing a reliable system to disseminate NRW reduction activities to other WSPs countrywide after the Project is over.

JICA Expert team pointed out the following observations on the present capacities of the main C/P institutions to disseminate the NRW reduction activities to other WSPs countrywide after the Project is over:

- Although MWS&I was expected to play a vital role as the driving organisation in dissemination and promotion of the NRW reduction activities countrywide, NRW Unit so far does not have adequate capacity to facilitate all WSPs to implement the activities across the country.
- Editing of the new NRW Management Standards, which WASREB was undertaking, was very significant. However, after completion of the new standards, information sharing with the WSPs through normal dissemination in seminars or workshops would not be sufficient to cover the activities incorporated into the Standards.
- NRW reduction short course which KEWI improved in Phase 2 was well formulated for anybody to acquire basic level knowledge and technologies on NRW reduction. However, as mentioned above, WASREB was in the process of editing the new NRW Management Standards into which several new techniques would be incorporated. The Expert team gave the following as examples of techniques which WSPs would be required to undertake as licensing conditions by WASREB:

- (i) Preparing NRW reduction annual and mid-term plans by utilising a newly formulated planning and review template.
- (ii) Analysing customer meter readings and billing data for at least one year, identifying problems and implementing appropriate countermeasures.
- (iii) Mapping using GIS and other applications like Kobo Toolbox to identify pipeline and appurtenance location and information, recording facility maintenance work, customer management, etc.

Since the aforementioned techniques target higher level management staff of WSP, they were not incorporated into KEWI's NRW reduction short course.

In view of the present circumstances, JICA Expert team observed that the Kenyan side had challenges in dissemination of NRW reduction activities to other WSPs countrywide by itself without support from JICA Expert team.

After discussing above issues, a consensus was reached by all the participants that a working group in charge of formulating a concrete work plan should be constituted in order to promote the NRW reduction activities countrywide. It was also decided that a meeting with the representatives of 5 C/Ps, including MWS&I, WASREB, KEWI, WASPA, COG and JICA Expert team should be held within February 2020 to expedite formulation of the work plan. The formulated work plan was agreed to be presented in the next JCC meeting to be held in August 2020.

#### 4) Organisational strengthening of MWS&I NRW Unit

JICA suggested that MWS&I NRW Unit should take lead in the dissemination of the project activities and the 4 C/Ps should also affirm their commitment to be part of the dissemination working group.

MWS&I made their commitment to increase funding of the NRW Unit to facilitate implementation of their activities. The Ministry reported that they were keen on training NRW Unit staff so as to be able to sustain their activities. The MWS&I also made commitment to budget for the procurement of NRW management equipment every year in the future to support WSPs in NRW reduction. The MWS&I emphasized that the Principal Secretary of the Ministry was committed to supporting the WSPs to conduct the NRW reduction activities. MWS&I explained that they were planning to scale-up NRW Unit into a division and later to a department by the end of the Project in 2021.

#### 5) Reminding Pilot WSPs to effectively utilise their NRW reduction annual plans

JICA Expert team emphasized the importance of the agreement made in 6<sup>th</sup> JCC that NRW reduction annual plan formulated by each Pilot WSP using new template should be incorporated into the new NRW Management Standards and then disseminated countrywide. The Expert team, therefore, reminded the WSPs that there were special columns prepared for reporting on quarterly review of the activities planned in the template. It became apparent that most of the pilot WSPs had not understood the template despite the fact that WASREB had

officially accepted the template to be used by the pilot WSPs for quarterly reporting on the achievement of their activities.

Moreover, JICA Expert team requested that all the 9 Pilot WSPs should review their achievements in the last two quarters against the special annual targets which they decided in August 2019 and make proper arrangements for the subsequent half year period in order to satisfactorily achieve the targets by the end of the year.

All the Pilot WSPs understood the request and promised to conduct the review and submit the review report to the Expert team by the end of February 2020.

6) Other issues

MWS&I enquired from the members the preferable topic for the next thematic workshop. Through the discussion the members agreed on 'smart meters', 'instant billing' and 'culture change' on metering work. Eldoret WSP was requested to prepare a report on the various perspectives of smart meters in the next thematic workshop to be held in August 2020.

END

Annex-1: Work Plan 3

Annex-2: Project Monitoring Sheet Ver. 7

Annex-3: Attendance list

Annex-1: WORK PLAN 3



**PROJECT FOR STRENGTHENING CAPACITY  
IN NON-REVENUE WATER REDUCTION**

**IN**

**THE REPUBLIC OF KENYA**

**WORK PLAN 3**

**JANUARY 2020**

**KYOWA ENGINEERING CONSULTANTS CO.,  
LTD.**

**TSS TOKYO WATER CO., LTD.  
TOKYO WATERWORKS INTERNATIONAL CO.,  
LTD.**

A handwritten signature in blue ink, consisting of a stylized 'J' followed by a series of loops and a long horizontal stroke.

A handwritten signature in blue ink, appearing to be 'J.K.' with a flourish.

A handwritten signature in blue ink, appearing to be 'M.D.' with a flourish.

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Location of Project Sites

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**ABBREVIATIONS**

ABBREVIATIONS	FULL NAME
AFD	Agence Française de Developpment
CoG	Council of Governors
CP	Counter Part
DMA	District Metered Area
FOCs	Framework of Cooperation
GIS	Geographic Information System
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GoJ	Government of Japan
GoK	Government of Kenya
ICT	Information and Communication Technology
JCC	Joint Coordination Committee
JICA	Japan International Cooperation Agency
KEWI	Kenya Water Institute
KEWASNET	Kenya Water and Sanitation CSOs Network
KfW	Kreditanstalt für Wiederaufbau
M/M	Minutes of Meeting
MOUs	Memorandum of Understanding
MWI	Ministry of Water and Irrigation
NGOs	Non-Governmental Organisations
NRW	Non-Revenue Water
O&M	Operations & Maintenance
PDCA	Plan Do Check Act
PDM	Project Design Matrix
PIC	Project Implementation Committee
PO	Plan of Operation
R/D	Record of Discussion



## **Chapter 1 Outline of the Project**

### **1.1 Background of the Project**

Approximately 80% of the land of the Republic of Kenya (hereinafter referred to as “Kenya”) is arid and semi-arid. The Kenyan people are reportedly experiencing “water stress” because of the decrease of the available water resource per person caused by the population growth. The Government of Kenya (hereinafter referred to as “GoK”) has recognized the reduction of Non-Revenue Water (NRW) as a priority issue to be addressed for the effective use of water resources.

Due to the water reforms in 2002, Water Service Providers (hereinafter referred to as “WSPs”) were established as financially independent organizations and many of them have autonomously taken NRW reduction measures for financial reasons. As a result, according to the annual report issued by the Water Service Regulatory Board (hereinafter referred to as “WASREB”) in December 2015, the national average NRW ratio, which was 60% in 2010, had been reduced to approx. 42% by 2015. However, many challenges still need to be solved in order to achieve the goal of reducing the NRW ratio to 25% by 2030.

The Government of Japan (hereinafter referred to as “GoJ”) has implemented the “Project for Management of Non-Revenue Water in Kenya (2010 to 2014)” (hereinafter referred to as “the Previous Project”) together with three grant aid projects, the “Project for Augmentation of Water Supply System in Kapsabet Town (2007 to 2010),” “Project for Improvement of the Water Supply System in Embu and the Surrounding Areas (2010 to 2013)” and “Project for Augmentation of Water Supply System in Narok Town (2013 to 2016).” As results of these projects, the facilities of Embu, Narok and Kapsabet WSPs have been improved and their capacity to reduce NRW has been improved in the pilot areas of the Previous Project. In addition, a short-term training course on NRW reduction was established at the Kenya Water Institute (hereinafter referred to as “KEWI”). Although an organizational structure required for WSPs to prepare a plan for NRW reduction was established by achieving the outputs in the Previous Project, only a few WSPs are implementing NRW reduction activities in accordance with their plans. This may be because the plans have been prepared without consideration of capacities for implementing actual work, and the financial or human resources of WSPs were not fully taken into account. Therefore, it is necessary to develop a support system for WSPs to reduce NRW in accordance with realistic plans for fully utilizing the outputs of the Previous Project.

Against this background, it was necessary to establish a support system enabling WSPs to continuously reduce NRW by strengthening WSPs and the organizations associated with them. Thus, the “Project for Strengthening Capacity in Non-Revenue Water Reduction” (hereinafter referred to as “the Project”) was requested by the GoK to the GoJ in 2014.

In response to the request of the GoK, JICA implemented a detailed design survey for the Project in 2015 and reached an agreement with the Ministry of Water and Irrigation (hereinafter referred to as

“MWI”) with respect to the cooperation framework on 4 December, 2015 (Minutes of Meeting, hereinafter referred to as “M/M”). On the basis of this result, in March 2016, the Record of Discussion (hereinafter referred to as “R/D”) was signed and exchanged among three parties, namely, MWI, the National Treasury and the JICA Kenya Office. The Ministry of Water and Irrigation was reorganized in February 2018 to the Ministry of Water & Sanitation (hereinafter referred to as “MWS”) and again reorganized in October 2019 to the Ministry of Water & Sanitation & Irrigation (hereinafter referred to as “MWS&I”).

In light of these circumstances, Phase 1 of this Project was implemented from September 2016 to August 2017 and Phase 2 was done from November 2017 to September 2019 then Phase 3 began in October 2019. Upon the commencement of Phase 3, this report was prepared as Work Plan 3 for explaining the various activities to be implemented, challenges or way forward.

## 1.2 Outline of the Project

### (1) Modification of PDM

The Project consists of activities and indicators clearly described in the Project Design Matrix (PDM) and the Plan of Operations (PO) included in the R/D agreed between JICA and MWS&I. In view of the survey results, activities implemented by the pilot WSPs in the phase 2 and current status of water supply sector in Kenya, revision of the PDM was approved at the 4th Joint Coordination Committee Meeting conducted in August 2018. Table 1.1 shows the revision details in contrast with the original descriptions.

Table 1.1 Contents of the PDM modifications

Contents	Indicators (Original)	Indicators (modified)
Name of Organisation	Ministry of Water and Irrigation, MWI	Ministry of Water and Sanitation & Irrigation, MWS&I
Overall Goal	<ol style="list-style-type: none"> <li>X of Urban WSPs participate knowledge sharing activities established by the Project.</li> <li>X of pilot Urban WSPs continue achieving target(s) set by the annual NRW reduction plan.</li> </ol>	<ol style="list-style-type: none"> <li>6 of Urban WSPs participate knowledge sharing activities established by the Project.</li> <li>6 of pilot Urban WSPs continue achieving target(s) set by the annual NRW reduction plan.</li> </ol>
Project Purpose	X of pilot Urban WSPs continue achieving targets set by the annual NRW reduction plan for two years.	6 of pilot Urban WSPs continue achieving targets set by the NRW reduction plan for two years.
Output 2	2-1 NRW reduction standards are revised by year X.	2-1 NRW reduction standards are revised by year 2020.
Output 3	<ol style="list-style-type: none"> <li>3-2 Evaluations by the NRW course participants is higher than before the revision of course materials</li> <li>3-3 X% of NRW course participants formulate the work plans.</li> </ol>	<ol style="list-style-type: none"> <li>3-2 The average of score of the participants on the test conducted after the NRW reduction course is higher than before the implementation.</li> <li>3-3 Deleted.</li> </ol>

Contents	Indicators (Original)	Indicators (modified)
Output 4	<p>4-1 More than X of pilot Urban WSPs continuously make the annual NRW reduction plan based on the review of previous year's implementation.</p> <p>4-2 More than X of pilot Urban WSPs continuously implement the annual NRW reduction plan formulated in 4-1.</p> <p>4-3 More than X of pilot Urban WSPs are able to implement skills and activities that pilot Urban WSPs were not able to adopt prior to the Project.</p> <p>4-4 More than X of pilot Urban WSPs are able to implement priority activities indicated in the NRW reduction plan.</p> <p>4-5 More than X of pilot Urban WSPs train all of NRW personnel.</p>	<p>4-1 More than 8 pilot WSPs formulate NRW reduction plan.</p> <p>4-2 More than 6 pilot WSPs self-review their activities of previous year's NRW reduction plan and compile activity report.</p> <p>4-3 Based on 4-2, more than 6 pilot WSPs continuously formulate annual NRW reduction plan.</p> <p>4-4 More than 6 pilot WSPs continuously implement NRW reduction plan formulated in 4-1.</p> <p>4-5 More than 6 pilot WSPs are able to use skill and/or implement activities which they could not employ before the Project.</p> <p><u>(4.6 Added)</u></p> <p>4-6 The amount of NRW in the selected distribution zones indicates decreasing tendency.</p>
Output 5	<p>5-1 Case study and lessons learnt from Output 4 and other NRW activities are compiled and disseminated.</p> <p>5-2 Regular meeting(s) of NRW is/are organized three times a year.</p>	<p>5-1 Results and lessons from Output 4 and NRW activities are shared during WASPA meetings at least 3 times a year.</p> <p>5-2 A NRW thematic workshop is organized every year.</p> <p>5-3 3 Brief notes are produced during the Project.</p>
Activities for Output 1	-	<p><u>(1.6 Added)</u></p> <p>1-6 MWS&amp;I NRW unit ensures the budget for the support mechanism based on its NRW reduction Mid-term vision.</p>
Activities for Output 4	<p>4.3 Each pilot WSP identifies measures to solve --challenges and formulates the NRW reduction plan.</p> <p>4.4 Each pilot WSPs formulates the annual NRW reduction plan including financial schedule based on the NRW reduction plan.</p> <p>4.5 Each pilot WSP implements the annual NRW reduction plan.</p>	<p>4.3 Each pilot WSP identifies measures to solve challenges.</p> <p>4.4 Each pilot WSPs formulates the NRW reduction plan including financial plan.</p> <p>4.5 Each pilot WSP implements the NRW reduction plan.</p>
Activities for Output 4	<p>5.1 MWI NRW Unit organizes NRW related regular meetings in cooperation with other relevant organizations.</p> <p>5.2 WASREB compiles case studies/lessons learnt about NRW reduction activities.</p>	<p>5.1 The Project presents results and lessons of Output 4 and other NRW activities during WASPA meeting.</p> <p>5.2 The Project holds NRW thematic workshops in coordination with WASPA.</p> <p><u>(5.3 Added)</u></p> <p>5.3 The Project team produces brief notes.</p>

Table 1.2 Outline of the Project (modified)

Item	Outline of the Project
Overall Goal	Under NRW reduction support mechanism, Urban WSPs enhance NRW reduction activities.
Project Purpose	A NRW reduction support mechanism is established for Urban WSPs to implement NRW reduction activities.
Project Output and Activities	<p><b>[Output 1]</b> Promotion and coordination of NRW reduction activities by MWS&amp;I NRW Unit is strengthened.</p> <p>1-1 MWS&amp;I NRW Unit, in cooperation with WASREB, produces NRW annual reports which</p>

Item	Outline of the Project
	<p>include NRW reduction data.</p> <p>1-2 MWS&amp;I NRW Unit plans and implements NRW reduction sensitization activities for the Counties.</p> <p>1-3 MWS&amp;I NRW Unit plans and implements NRW reduction campaigns.</p> <p>1-4 MWS&amp;I NRW Unit ensures the budget for the activities based on the NRW reduction annual plan for each output</p> <p>1-5 MWS&amp;I NRW Unit conducts reviews of KEWI NRW courses.</p> <p>1-6 MWS&amp;I NRW Unit conducts reviews of WASREB's NRW reduction activities.</p> <p><b>【Output 2】</b> Use of NRW reduction standards by Urban WSPs is promoted by WASREB.</p> <p>2-1 WASREB conducts survey on the usage of current NRW reduction standards.</p> <p>2-2 Based on the survey result as well as Output 4 and 5, WASREB revises the NRW reduction standards.</p> <p>2-3 WASREB promotes revised NRW standards through workshop(s).</p> <p>2-4 WASREB incorporates the review results of NRW reduction activities by MWS&amp;I NRW Unit in their activities.</p> <p>2-5 WASREB monitors and evaluates the usage of revised NRW standards.</p> <p><b>【Output 3】</b> NRW related training capacity of KEWI is strengthened.</p> <p>3-1 KEWI studies current status of NRW reduction courses and its challenges.</p> <p>3-2 KEWI reviews NRW reduction training strategies and course contents.</p> <p>3-3 KEWI, in collaboration with leading WSPs (Embu and Meru, etc.), conducts on-site NRW trainings.</p> <p>3-4 KEWI reflects on-site NRW trainings into NRW course contents and materials.</p> <p>3-5 KEWI incorporates the results of review by MWS&amp;I NRW Unit into NRW course contents.</p> <p>3-6 KEWI conducts trace studies of NRW reduction course participants.</p> <p><b>【Output 4】</b> NRW planning and/or implementation capacity of pilot Urban WSPs is enhanced.</p> <p>4-1 The Project team conducts a survey of Urban WSPs and selects pilot Urban WSPs.</p> <p>4-2 Each Pilot WSP conducts analysis of current NRW reduction activities and identifies its challenges.</p> <p>4-3 Each Pilot WSP identifies measures to solve challenges.</p> <p>4-4 Each Pilot WSP formulates the NRW reduction plan including financial plan.</p> <p>4-5 Each Pilot WSP implements the NRW reduction plan.</p> <p>4-6 Each Pilot WSP evaluates and analyses implementation results and revises the plans.</p> <p>4-7 Each Pilot WSP produces the NRW reduction activity report annually.</p> <p>4-8 Each Pilot WSP holds regular NRW reduction meetings attended by relevant departments of WSP.</p> <p><b>【Output 5】</b> Experiences and knowledge of NRW reduction activities are shared among Urban WSPs.</p> <p>5-1 The Project presents results and lessons of Output 4 during WASPA meeting.</p> <p>5-2 The Project holds NRW thematic workshops in coordination with WASPA.</p> <p>5-3 The Project team produces brief notes</p>
Target Areas	Pilot WSPs* <sup>1</sup> selected from areas under the eight former Water Services Boards in Kenya(hereinafter referred to as "WSB". It was decided to be abolished within 3 years by Water Act 2016)
Cooperating Organization	MWS&I, WASREB, KEWI, Pilot WSP, WASPA (Water Service Provider Association)
Implementing Organizations	MWS&I, WASREB, KEWI

Figure 1.1 shows process chart of the activities upon each Output for project achievement. The outputs achieved on each project indicator during Phases 1 and 2 are described in detail in Chapter 2 of this report.

**(2) Project period**

The project is divided into three phases. The implementation period for each phase is shown in Table 1.3.

Table 1.3 Duration of each Phase

	Duration
Phase 1	October 2016 – September 2017
Phase 2	October 2017 – September 2019
Phase 3	October 2019 – September 2021

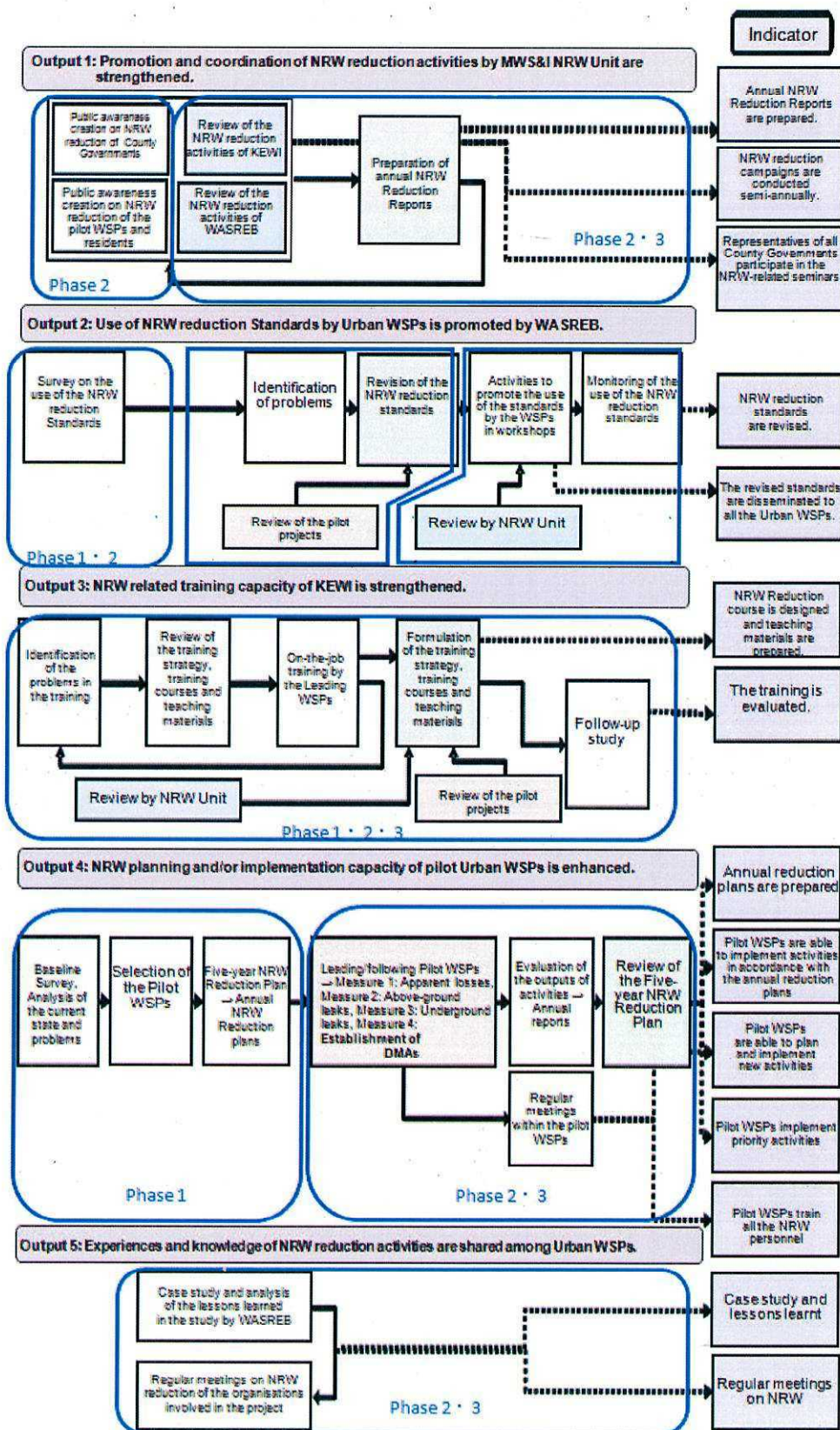


Figure 1.1 Activity Process for Achieving the Project Outputs

### 1.3 Project Implementation Structure

#### 1.3.1 Organizations Relating to the Project

To describe the organizations relating to this Project, Fig. 1.2 shows the counterparts (hereinafter referred to as “C/Ps”) and their related organizations involved in the implementation of the Project and Table 1.4 shows the outline of each organization.

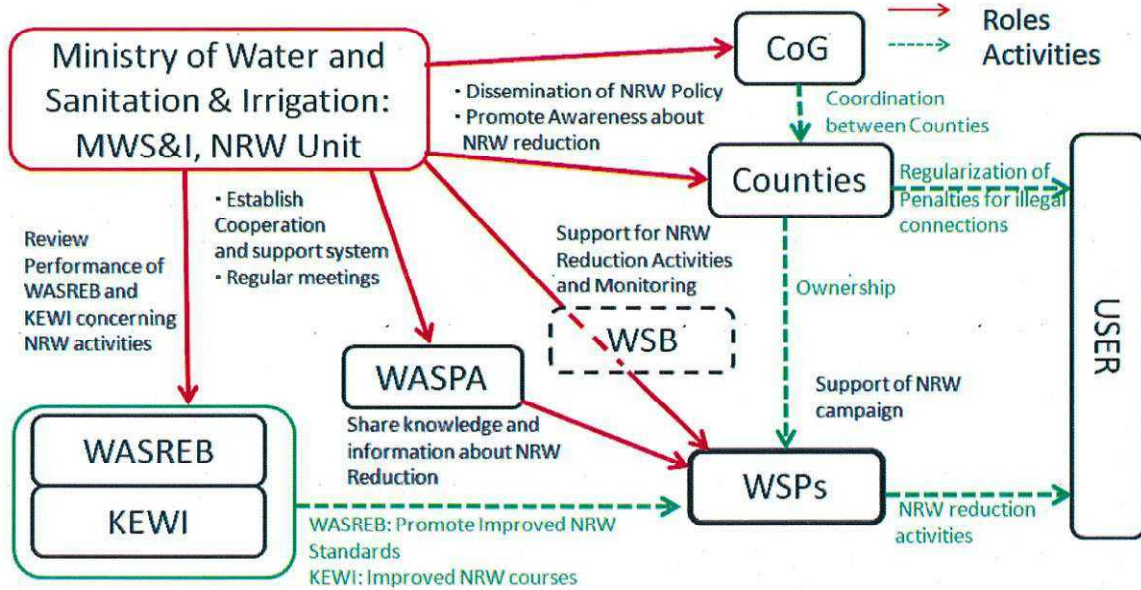


Figure 1.2 Organizations Related to the Project

Table 1.4 Outlines of Related Organizations

	Name of organization	Type of organization	Basis of establishment	Relation with outputs of activities	Responsibilities in the Project
1	MWS&I Non-Revenue Water Unit	Unit with a special mission within the central government ministry	Circular of February 2016	Output 1	Responsible organization of this Project in charge of development, activity promotion, awareness-raising, communication and dissemination of NRW strategy
2	Water Services Regulatory Board (WASREB)	Organization affiliated with MWS&I	Former Water Act 2002	Output 2	Revision and dissemination of the NRW reduction standards
3	Kenya Water Institute (KEWI)	Educational institute under MWS&I	KEWI Act 2001	Output 3	Education of NRW reduction technologies, guidance to WSPs
4	Water Service Providers Association (WASPA)	Industry association	Societies Act (CAP 108)	Output 5	Communication and dissemination of NRW information, dissemination of related technologies
5	Water Service Provider (WSP)	Independent commercial company	Former Water Act 2002	Output 4	Implementation of NRW reduction activities, production of outputs
6	County	Local government body	Revised Constitution of 2010	Target of Output 1	Jurisdiction of and support to WSPs, raising the awareness of residents
7	Council of Governors (CoG)	Federation of county governors	Revised Constitution of 2010	Target of Output 1	Expansion of NRW reduction activities to the whole county
8	Water Services Board (WSB)	Local office of MWS&I	Established in accordance with the former Water Act and disbanded in accordance with the new Water Act		Functions as a branch office of MWS&I to support WSPs for 3 years until the completion of transfer of authority

Fig. 1.2 shows the roles and responsibilities of the MWS&I NRW Unit, which is the responsible organization of this project, and its related organizations. WASREB and KEWI, apart from MWS&I, are major C/Ps of this project on the central government side. WASPA is a private organization whose members mainly consist of WSPs across the country implementing the water supply business. Considering the activities carried out so far and collaborative relationship with WSPs in the past and its organizational capacity, WASPA is regarded as a semi C/P that may act as a partner for communication and information sharing activities. WSPs are local companies operating urban water supply services and since they carry out NRW reduction activities as part of their routine work, they are responsible for producing the NRW reduction effects in Kenya. As a result of the revision of the new Water Act in 2016, it was decided that the ownership of water supply facilities used by WSPs and the jurisdiction of water supply services be transferred from WSBs under MWS&I to the county governments. Since three years will be required to complete the transfer of authority, a favourable relationship should be established between the county governments and WSPs. CoG, which is a federation of county governors, is an organization to negotiate with the central government,



coordinating among the counties and representing their interests. The county governments indirectly receive the benefit from the support activities to WSPs, which are implemented in this project. As such, raising the awareness and information sharing with regard to the NRW reduction activities should be carried out through CoG. The outline, roles and responsibilities of each organization are described in the following.

**(1) MWS&I NRW Unit**

MWI (Ministry of Water and Irrigation) was reorganized in April 2015 as a result of integration of the Ministry of Environment, Water and Natural Resources and the Irrigation Department, which was split from the Ministry of Agriculture. MWI was the principal C/P in the beginning of the Project, but it was reorganized as the Ministry of Water and Sanitation (MWS & I) in February 2018 and again transformed to the Ministry of Water and Sanitation & Irrigation (MWS&I) in October 2019. The organization chart, which is shown in Fig. 1.3, is a draft as of August 2019 and it is not officially approved. MWS&I is headed by the Cabinet Secretary, who is followed by the Chief Administrative Secretary and the Principal Secretary and it consists of two directorates, namely, the Directorate of Water and Sanitation and the Directorate of Shared Service. All the technical personnel belong to the Directorate of Water and Sanitation, which consists of six departments, namely, the Water Development Department, the Sanitation Management Department, the Water Research Innovation Department, the Water Storage and Flood Control Department, the Water Resources Department and the Trans boundary Water Department. The MWS&I NRW Unit belongs to the Water Sector Coordination Division under the Water Development Department and its establishment was officially announced in February 2016 for the purpose of managing the formulation of policies and strategies for NRW reduction in Kenya and efforts for NRW reduction. The head of the MWS&I NRW Unit holds important posts such as the Director of Water and Sanitation and the Water Secretary of MWS&I, and he also serves as the project manager of this Project. In the MWS&I NRW Unit, under the project manager, there is an engineer who was assigned in July 2019 and a coordinator and two staff members are assigned under the engineer.

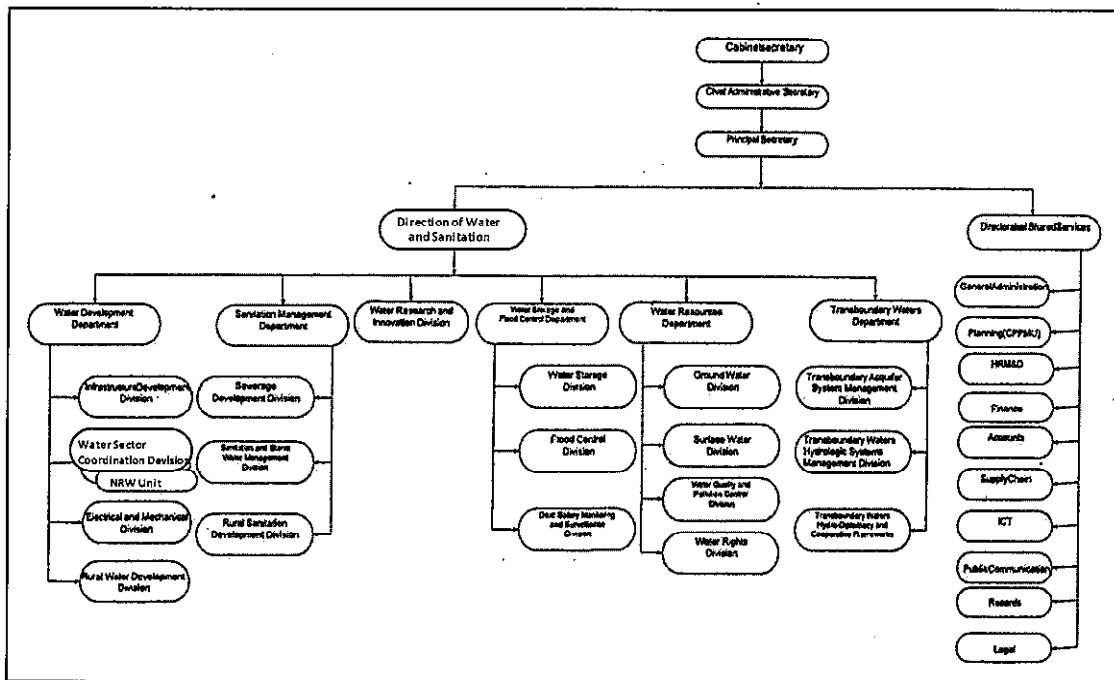


Figure 1.3 Organization Chart of MWS&I (It was confirmed on 17 Jan. 2020 that there is no amended Fig. yet for the new organization after it changed to MWS&I.)

In the Project, the MWS&I NRW Unit is mainly responsible for indirectly supporting the NRW reduction activities of WSPs, collaborating with WASREB and KEWI and coordinating with counties that are owners of WSPs. It also indirectly drives the NRW reduction activities of WSPs by implementing awareness-raising activities for NRW reduction.

## (2) WASREB

WASREB is a public corporation, which was established in March 2003 as a regulatory and supervisory organization for water supply and sewerage services in accordance with the enforcement of the former Water Act 2002. Its major tasks are as follows:

- Issuing of water supply business license and periodic monitoring
- Establishment and revision of standards relating to water supply services, monitoring of water consumption
- Fixation of water rates
- Handling of complaints on water supply services and giving advice pertaining to customer protection and response
- Monitoring and evaluation of the implementation status of the national water services strategy

- Collection, evaluation and verification of performance indicators from WSPs and information disclosure
- Provision of information and giving advice to the minister

WASREB prepares rules to regulate water and sewerage service providers, which include the revision of the NRW reduction standards, and requires WSPs to abide by these rules. Also, it issues water supply business licences to WSBs before the enforcement of the Water Act 2016, the license is now issued directly to WSPs, collects and verifies water supply service data (performance indicators including NRW ratio) from WSPs on a quarterly basis and compiles them into the impact report, which is published annually. In addition, based on the result of the impact report, it selects and honours excellent WSPs of the year.

As shown in Fig. 1.4, WASREB has four departments, namely, the Technical Services Department, the Legal & Enforcement Department, the Consumer & Public Affairs Department and the Corporate Services Department under the Chief Executive Officer (hereinafter “CEO”).

The Technical Services Department is mainly responsible for development of technical guidelines and systems for setting water rates, inspection of water quality, etc. and management of sector information. The Legal & Enforcement Department is in charge of assurance, monitoring, evaluation and facilitation of legal enforcement. The Consumer & Public Affairs Department is responsible for facilitating the understanding and participation of stakeholders including public relations and customer response. The Corporate Services Department is in charge of financial affairs and human resources management. WASREB has 35 members of staff (as of March 2017) and tasks pertaining to the NRW reduction measures are mainly performed by the Inspectorate Services Division of the Technical Services Department.

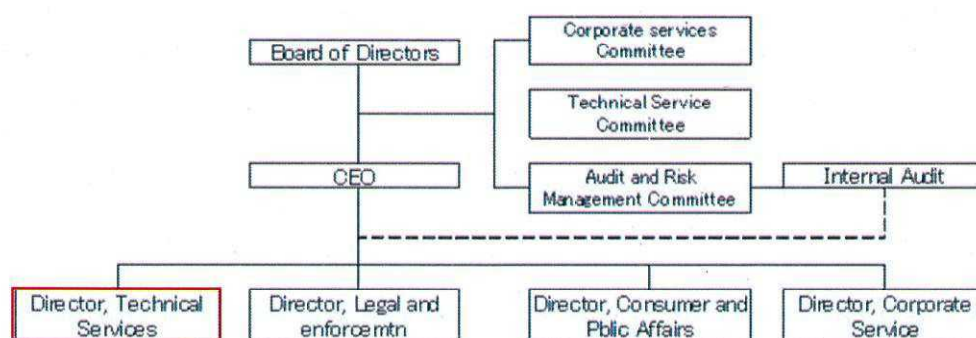


Figure 1.4 Organization Chart of WASREB

In this project, WASREB is responsible for surveying the usage of the NRW reduction standards, preparing the draft of revised standards based on the results of the survey and the outputs of pilot

activities, and promoting the dissemination of the revised standards.

### (3) KEWI

KEWI is a national institute for education and research concerning water supply and water resources, which was established in accordance with the KEWI Act 2001. It is engaged in human resource development, consulting and research and development for the water sector. The management of KEWI consists of a director, three deputy directors and three managers. The Academic Affairs Department that lecturers belong to is divided into four divisions, which are the Water and Wastewater Engineering Division, the Water Resources and Environmental Management Division, the Electro-Mechanical Division and the IT Management Division. The features of KEWI are as follows:

- It is the only educational institute specialized in water approved by MWS&I and the Ministry of Education Science and Technology (MoEST).
- It conducts NRW reduction training and GIS training for NRW reduction, which is a critical issue in the country.
- In addition to the 2-year Certificate Course and the 3-year Diploma Course, it offers a variety of short training courses.
- The graduation rate is 84% and the job placement rate is over 70 to 75%.

In response to the NRW reduction activities, KEWI has established an NRW Unit. As shown in Fig. 1.4, the NRW Unit belongs to the Water and Waste water Engineering Division and the Short Courses Division and it consists of three full-time lecturers and seven other members. The full-time lecturers teach not only the short training courses on NRW reduction but regular long courses.

In this project, KEWI is responsible for planning and implementing training course to provide education as necessary for the NRW reduction activities to WSPs, while collaborating with the leading WSPs (Meru, Embu) for the purpose of the implementation of more practical and effective training.

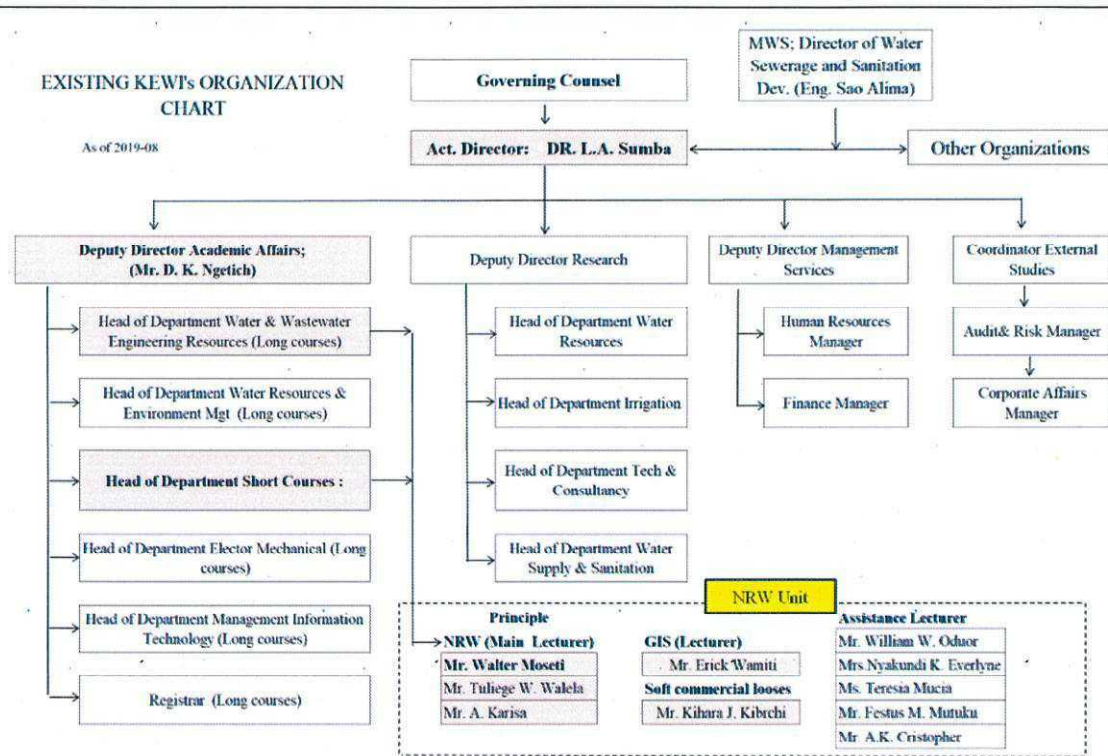


Figure 1.5 Organization of KEWI and the NRW Unit

**(4) Pilot WSPs (including leading WSPs)**

WSP is a public corporation engaged in the provision of water and sewerage services and operation and maintenance of the facilities in an area where the population is relatively dense. After the management transfer from WSBs to the county governments resulting from the enforcement of the new Water Act, it provides services by renting the water supply facilities, etc. from the relevant county.

Pilot WSPs are expected to acquire skills and knowledge concerning the preparation, implementation and evaluation of NRW reduction plans under the support and guidance of Japanese experts to carry out the NRW reduction activities.

Leading WSPs refers to Meru WSP and Embu WSP. Since they have the experience that their water supply facilities were developed and skills in technical guidance for facility operation management improved as a result of JICA projects implemented in the past As compared to other pilot WSPs, these WSPs are eager to work on NRW reduction and clearly perceive the causes and problems of NRW. Moreover, they are highly motivated to provide technical support to other WSPs. As such, it is assumed that the NRW reduction activities in Kenya as a whole will be revitalized by providing additional support to their activities to improve the skills in NRW reduction and encouraging them to share their skills and know-how with the other pilot WSPs.

#### **(5) WASPA**

WASPA was established in 2002 for the purpose of supporting the revitalization of water supply services by promoting the cooperation, collaboration and information sharing among the WSPs under the former Water Act. It is an industry association similar to Japan Water Works Association. The budget of WASPA comes from membership fees from the members and financial assistance from foreign donors, such as the Netherlands Development Organization (*Stichting Nederlandse Vrijwilligers*: SNV) and the German Federal Enterprise for International Cooperation (*Deutsche Gesellschaft für Internationale Zusammenarbeit*: GIZ). Also, in collaboration with Vitens-Evides International (VEI), which is a Dutch NGO, it regularly holds interactive learning workshops on NRW reduction measures, GIS, fee collection, customer response, etc. for skill improvement of the member WSPs. In addition, regular meetings are organized by the managing directors (MDs) of WSPs and industry representatives every two months to discuss activity implementation report, its sectoral topics (progress of NRW reduction measures, revision of Water Act, etc.) and policies for future activities among others, thereby facilitating the communication among the members.

In this project, WASPA is responsible for providing the opportunities to share the experience and lessons learned from the activities of Output 4 with the other WSPs while cooperating with the MWS&I NRW Unit.

#### **(6) Counties**

In accordance with the trend of decentralization resulting from the revision of the constitution in 2010, 47 county governments were born to cover the whole country in 2014. Under the former Water Act established in 2002, the jurisdiction of the county governments was limited to the development and operation of small-scale water supply facilities, such as rural water supply system, and on-site sanitation facilities. However, after the establishment of the new Water Act, it was decided that the county governments should also have jurisdiction over the development and operation of water and sewerage facilities of a larger scale, which was under the jurisdiction of WSBs. Accordingly, it is expected that the counties will bear the responsibility for strengthening the capabilities of WSPs and providing guidance and support to WSPs for the development and implementation of the expansion plan of water and sewerage facilities, which was borne by WSBs in the past. Nevertheless, officers in charge of water service sector in the counties should understand how NRW reduction is important since they do not have sufficient skills and experience to guide their WSPs.

#### **(7) WSBs**

In accordance with the former Water Act, the country was divided into eight regions and WSBs were established to control the WSPs in each region. However, under the new Water Act of 2016, in

accordance with the decentralization resulting from the revision of the constitution, it was decided that the management of WSP be transferred from WSBs to the relevant county governments. As such, the ownership and management right of the assets (including the debts) used by WSP including water supply facilities should be transferred from WSBs to each relevant county. WSBs are under abolishment currently and it will function as a local office of MWS&I after their abolishment. However, in the case of WSPs providing services over multiple counties, the management will be transferred to the Water Works Development Agency (WWDA), which will be newly formed, instead of the county. The water supply business licenses that WASREB previously issued to WSBs will be directly granted to WSPs.

### 1.3.2 Operating Structure of the Project

The operating structure of the Project is shown in Fig. 1.6. The Joint Coordination Committee (JCC) has been established as the decision-making body of the Project and the Project Implementation Committee (PIC) is a platform to coordinate and preside over the implementation of the activities of the Project. These organizations make up the structure to operate the activities of the Project.

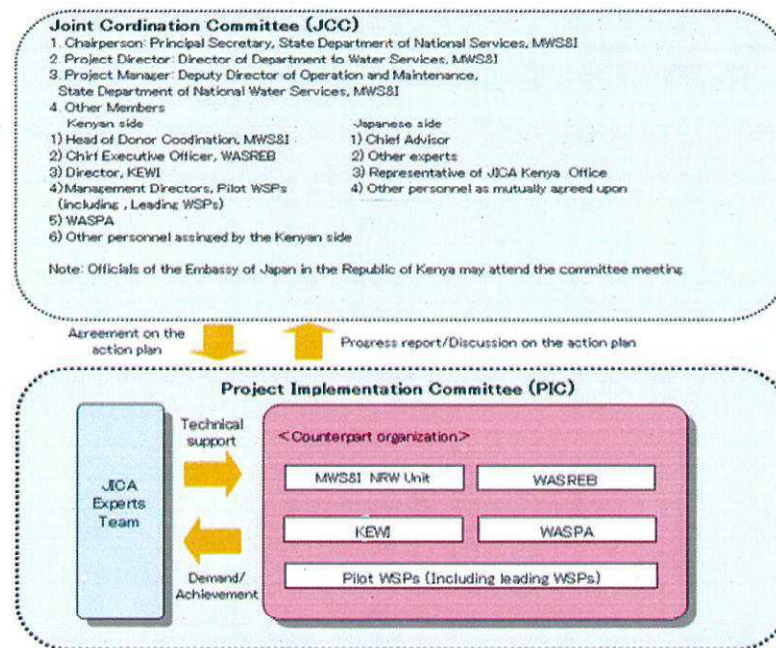


Figure 1.6 Project Operating Structure

With respect to JCC and PIC, their roles and responsibilities in the implementation of this project, and the constituent members are detailed below.

### **(1) Joint Coordination Committee (JCC)**

As mentioned earlier, JCC is a decision-making body to ensure the smooth implementation of the Project. The members of JCC consist of the C/Ps of the Kenyan side involved in the project activities, Japanese experts and the representative of JICA Kenya Office. The roles and responsibilities of JCC are as follows:

- Approval of the work plan prepared at the beginning of each phase
- Approval of the project monitoring result
- Approval of the modifications of PDM and PO
- Discussion of budget allocation and other important matters concerning the implementation of the Project

### **(2) Project Implementation Committee (PIC)**

PIC is a platform to jointly manage the progress of the Project and discuss the planning and implementation of activities carried out in the Project. It is composed of the Kenyan side C/Ps responsible for coordinating and implementing the activities and the Japanese experts.

### **(3) Project Team**

The project is implemented by the project team shown in Table 1.5. The support system by Japanese experts on the project team is shown in Table 1.6. The project director (Water Secretary, MWS&I), who is supported by the project manager (Director of Water Sewerage and Sanitation Development, MWS&I), assumes the overall responsibility of the Project. The project manager manages the implementation of the Project and assumes the responsibilities in the administrative and technical aspects. Since May 2018, the project manager has been promoted to the position of the Water Secretary MWS&I. The management team and the action team implement the activities to achieve the outputs of the Project with the support of the Japanese experts.



Table 1.5 Project Team Members

Project Group	Role and duty	Member	No. of members
Project Director	Person in charge of the supervision of the Project	Water Secretary, MWS&I	1
Project Manager	Implementation management, verification of the achievement and outcomes of activities, solving issues regarding implementation	Director of Water, Sewerage and Sanitation Development, MWS&I	1
Management Team	Implementation/Participation and monitoring concerning the Project activities Participation in JCC/PIC meetings	<ul style="list-style-type: none"> <li>• NRW Unit (MWS&amp;I)</li> <li>• WASREB (CEO/TM/Technical Officer)</li> <li>• KEWI (CEO/Deputy Director/Lecturer)</li> <li>• Leading/Pilot WSPs (MD)</li> </ul>	3 3 3 Each 1
Action Team	Implementation of activities related to Output 4	Staff members in charge of NRW reduction activities of the Leading and Pilot WSPs	around 5~10

Table 1.6 Support System for the Project Team provided by Japanese Experts

Output	C/P organization	JICA Expert <sup>*)</sup>
Output 1	NRW Unit/MWS&I	Chief Adviser/NRW Management 1 NRW Reduction Specialist 2 Information/Public Relation Management
Output 2	WASREB	Chief Adviser/NRW Management 1 NRW Reduction Specialist 2
Output 3	KEWI	NRW Reduction Specialist 2 Training Management/Training Strategy
Output 4	NRW Unit/MWS&I WASREB, KEWI Leading and Pilot WSPs	Chief Adviser/NRW Management 1, NRW Reduction Specialist 2, Water distribution Network (Mapping & Network analysis), Flow/Pressure and Leakage Monitoring, and Customer management/Billing collection
Output 5	NRW Unit/MWS&I WASREB, WASPA	Chief Adviser/NRW Management 1 NRW Reduction Specialist 2 Information/Public Relation Management

Note: Descriptions of Japanese experts are experts from 1.3.4 Japanese Experts of this chapter.

### 1.3.3 Operating Methodology of the Project and Reports

The operating methodology of the Project includes an effective use of the monitoring sheet. The monitoring sheet was created through the collaborative work between the MWS&I NRW Unit and the Japanese experts and submitted during the meetings of JCC to manage the progress of the Project and discuss the challenges in the activities.

Table 1.7 Monitoring Sheets and Reports to be prepared in Phase 3

Title	Time of submission
Work Plan 3	Within 3 months after commencement of Phase 3
NRW Annual Report	To be Issued by MWS&I NRW Unit as follows, Version 2018/19 around March 2020 Version 2019/20 around March 2021
Monitoring Sheet Ver. 7	Within 6 months after the submission of Monitoring Sheet Ver. 6
Monitoring Sheet Ver. 8	Within 6 months after the submission of Monitoring Sheet Ver. 7
Monitoring Sheet Ver. 9	Within 6 months after the submission of Monitoring Sheet Ver. 8
Monitoring Sheet Ver. 10	Within 6 months after the submission of Monitoring Sheet Ver. 9
Revised NRW Standards	Around June 2020
Progress Report 3	Upon the completion of Phase 3

#### 1.3.4 Undertakings and Inputs by the Kenyan Side

Undertakings by GoK were agreed upon in R/D signed on March 7, 2017, between the MWS&I and JICA. Upon the commencement of Phase 3, it is necessary for GoK to reconfirm the undertakings agreed in the R/D.

##### (1) Ensuring Effective Utilization of Technologies and Knowledge Acquired from the Project

GoK will take necessary measures to:

- a) Ensure that the technologies and knowledge acquired by the Kenya nationals as a result of Japanese technical cooperation contribute to the economic and social development of Kenya, and that the knowledge and experience acquired by the personnel of Kenya from technical training as well as the equipment provided by JICA will be utilized efficiently in the implementation of the Project; and
- b) Grant privileges, exemptions and benefits to the JICA experts and their families, which are no less favourable than those granted to experts and members of the missions and their families of third countries or international organisations performing similar missions in the Republic of Kenya.

## **(2) Undertakings by MWS&I**

The MWS&I will take necessary measures to implement the following activities in collaboration with Pilot WSPs and the County Governments which are responsible for such Pilot WSPs.

- a) To involve County Governments for smooth implementation of the Project;
- b) To acquire budget for NRW Reduction activities of the Pilot WSPs, and
- c) To confirm and agree on the inputs and undertakings of the Pilot WSPs.

## **(3) Undertakings by GoK**

GoK will take necessary measures to:

- a) Provide security-related information as well as measures to ensure the safety of the JICA experts;
- b) Permit the JICA experts to enter, leave and stay in the Republic of Kenya for the duration of their assignments therein and exempt them from foreign registration requirements and consular fees.
- c) Exempt the JICA experts from taxes and any other charges on the equipment, machinery and other material necessary for the implementation of the Project;
- d) Exempt the JICA experts from income tax and charges of any kind imposed on or in connection with any emoluments or allowances paid to them and/or remitted to them from abroad for their services in connection with the implementation of the Project; and
- e) Meet taxes and any other charges on the equipment, machinery and other material, referred to in II-7 of R/D, necessary for the implementation of the Project; and
- f) GoK will bear claims, if any arise, against the JICA experts resulting from, occurring in the course of, or otherwise connected with, the discharge of their duties in the implementation of the Project, except when such claims arise from gross negligence or wilful misconduct on the part of the JICA experts.

## **(4) Input by MWI, WASREB, KEWI and Pilot WSPs**

MWS&I, WASREB, KEWI and the Pilot WSPs will take necessary measures to provide at their own expense:

- a) Assignments of counterpart personnel and support staff;
- b) Payment of per-diem (daily allowance, transportation fee and accommodation fee) to the counterpart personnel;
- c) Suitable office space with necessary equipment in MWS&I, KEWI and the Pilot WSPs;
- d) Utility charges such as electricity, water supply, if any;

- e) Supply or replacement of machinery, equipment, instruments, vehicles, tools, spare parts and any other materials necessary for the implementation of the Project other than the equipment provided by JICA;
- f) Costs of activities for Public sensitizations and campaigns by MWS&I;
- g) Survey cost on the usage of current NRW reduction Standards by WASREB;
- h) Expense for training of the Pilot WSPs at KEWI (short term course);
- i) Expense for On-site Training of the Pilot WSPs by KEWI;
- j) Expense for On-site Training of Trainers (ToT) in the Pilot WSPs;
- k) Expense for NRW activities of the Pilot WSPs;
- l) Information in obtaining medical service;
- m) Available data (including maps and photographs) and information related to the Project; and
- n) Necessary facilities to the JICA experts for the remittance as well as utilisation of the funds introduced into Kenya in connection with the implementation of the Project.

The main undertakings and inputs to be met by the Kenyan side are summarised in Table 1.8.

Table 1.8 Undertakings and Inputs to be provided by the Kenyan Side

Work to be Implemented	Organizations involved in the project				
	MWI	WASREB	KEWI	County	WSP
Utilization of the project outputs	•	•	•	•	•
Provision of privileges to the Japanese experts	•				
Guidance to County Governments for their involvement in the project	•				
Guidance to the pilot WSPs to allocate budget to the NRW reduction activities	•				
Provision of security information to the Japanese experts and means to ensure their safety	•				
Issuance of the residence permits to the Japanese experts and their exemption from paying consular	•				
Exemption of the Japanese experts from paying taxes and levies	•				
Exemption of the Japanese experts from taxation on their salaries and allowances	•				
Responses to the inconveniences encountered by the Japanese experts in the project activities	•				
Appointment of the counterpart personnel and support staff	•	•	•		•
Payment of allowances (per diem, transport allowance, accommodation allowance) of the counterpart personnel	•	•	•		•
Provision of an office for the project activities	•		•		•
Provision of the materials and equipment to be used in the project activities not to be provided by JICA and their	•	•	•		•
Implementation of the campaigns and awareness creation activities and payment of its cost by MWI	•			•	•
Cost of a survey on the use of the NRW reduction standards to be conducted by WASREB		•			
Cost of the training of the pilot WSPs at KEWI			•	•	•
Cost of the on-the-job training of the pilot WSPs by KEWI			•	•	•
Cost of the on-the-job TOT of the pilot WSPs			•	•	•
Cost of the NRW reduction activities taken by the pilot WSPs			•	•	•
Provision of medical information	•	•	•	•	•
Data and information (including maps and photographs) for the implementation of the projects	•	•	•	•	•
Assistance required for the Japanese experts to receive money transferred from Japan in Kenya	•			•	•

## Chapter 2 Activities Implemented During Phase 2

### 2.1 Status of Project Activities in Each Output

The PDM was agreed upon in the amended Record of Discussion (R/D) signed in January 2019 and accepted by 4<sup>th</sup> JCC in August 2019. The Overall Goal and the Project Purpose in the PDM and the indicators of each Output are shown in Table 1.1 and 1.2 described in the Chapter 1. The Project has passed about three years out of five years, the entire period of the Project, and the Project has been stably realizing achievements required by PDM. In the first year of the Project, the first phase, a baseline survey was conducted which grasped the current conditions of NRW reduction activities in Kenya and established a Non-Revenue Water Reduction support mechanism. During the same period, two Leading WSPs and 7 Pilot WSPs, which were expected to be the main players of the NRW reduction activities, were selected in collaboration with the C/Ps. These Leading and Pilot WSPs were selected as at least one representative from each region of former 8 WSB's jurisdictions to lead the NRW Reduction activities in Kenya. It is also aimed that enhancement and improvement of NRW reduction capacity and of organizational functions will be realized in WSPs in Kenya through implementation of the Project activities.

The detailed activities implemented in Phase 2 were reported in the Project Progress Report (Phase 2) formerly submitted. This Chapter focuses the achievement of each Output in accordance with indicators defined by the PDM.

### 2.2 Achievement of Each Output

Achievement status of each Output of the Project is stated in Table 2.1. The project has already achieved in some of the outputs to the level of the indicator to some extent and the activities will be continued in Phase 3 so that the Pilot WSPs can implement by themselves to ensure the activities take root in the WSPs field works. (Note; The meaning of the marks in Table 3.1 are: ○: Achieved, △: Under way, and ×: Not yet started.

Table 2.1 Achievement status of Each Output

Output	Indicator	Level of achievement	Challenge or ways forward
Output 1: Promotion and coordination of NRW reduction activities by MWS&I NRW Unit are strengthened.	1-1 All county representatives participate NRW related seminar(s).	△	Implementation of NRW sensitization workshop will be continued in Phase 3 and all counties will participate.
	1-2 NRW reduction campaigns are conducted semi annually.	△	Public campaigns targeting school children are on going with the support of NRW Unit
	1-3 NRW reduction annual reports are produced.	△	The first report was produced and are aiming at timely issuance of annual report

Output 2: Use of NRW reduction standards by Urban WSPs are promoted by WASREB	2-1 NRW reduction standards are revised by year 2020.	△	WASREB has established an editorial committee that has been holding regular meetings for revising the Standards to produce the NRW Standards by the middle of 2020
	2-2 The revised NRW reduction standards are disseminated to all Urban WSPs through workshops.	×	Dissemination will be planned by the same committee in Phase 3 and activities will be managed by WASREB.
Output 3: NRW related training capacity of KEWI is strengthened	3-1 KEWI introduces a NRW reduction course including on-site training and revised training materials.	○	KEWI has reviewed the former training course and revised the course by incorporating lectures and OJT into the new one. It has conducted 6 training courses in Phase 2 successfully.
	3-2 The average score of the participants in the test conducted after the NRW reduction course is higher than before the course.	○	In all the 6 training courses conducted, the average score of the post-course tests were higher than the pre-course tests.
Output 4: NRW planning and/or implementation capacity of pilot Urban WSPs is enhanced.	4-1 More than 8 pilot WSPs formulate NRW reduction plan.	○	JICA Expert team formulated a template for preparing annual NRW reduction plan for WSPs in 2017/2018 and introduced it to the 9 Pilot WSPs and supported them to prepare their plans. In 2018/2019 the team improved the template and the 9 Pilot WSPs have succeeded in preparing their NRW reduction plan for 2019/2020.
	4-2 More than 6 pilot WSPs self-review their activities of previous year's NRW reduction plan and compile activity report.	○	To prepare the annual NRW reduction plan, each WSP has to review the related activities in the year before. Therefore, all the 9 Pilot WSPs had prepared their review reports in accordance with a form for review report which the Expert team recommended.
	4-3 Based on 4-2, more than 6 pilot WSPs continuously formulate annual NRW reduction plan.	○	In accordance with instruction of the Expert, all 9 Pilot WSPs had continuously prepared their annual NRW reduction report for the year 2019/2020.
	4-4 More than 6 pilot WSPs continuously implement NRW reduction plan formulated in 4-1.	○	Depending on their newly prepared annual plan, all the 9 Pilot WSPs are continuously implementing their NRW reduction activities.
	4-5 More than 6 pilot WSPs are able to use skill and/or implement activities which they could not employ before	○	Depending on support by the Expert team 6 Pilot WSPs have succeeded in adopting new technologies or analyzing skills which they had not used before the Project. Even the

	the Project.		other 3 Pilot WSPs, which are planned to start receiving full-scale supporting Phase 3 have been using the analysis skills for commercial loss reduction and achieving good results in reducing such losses.
	4-6 The amount of NRW in the selected distribution zones indicates decreasing tendency.	△	Pilot WSPs such as Kisumu, Nakuru, Nyahururu, and Ruiru-juja are obtaining good results showing a trend of reducing NRW after implementation of the activities in the Project. JICA Kenya office has provided bulk meters for selected 3 WSPs to assist in NRW reduction in Embu, Nakuru, and Nyahururu which the WSPs installed in June 2019. Therefore, the analysis of the trend in each WSP will be carried out in Phase 3.
Output 5: Experiences and knowledge of NRW reduction activities are shared among Urban WSPs.	5-1 Results and lessons from Output 4 and NRW activities are shared during WASPA meetings at least 3 times a year.	○	Information on the Project has been presented more than twice a year in WASPA meetings.
	5-2 A NRW thematic workshop is organized every year.	△	The first thematic workshop was held in August, 2019. Similar workshops will be held every year.
	5-3 3 brief notes are produced during the Project.	△	The 1 <sup>st</sup> version of the brief note was produced in May 2019. The 2 <sup>nd</sup> and 3 <sup>rd</sup> ones will be produced in the Phase 3.

### 2.2.1 Output 1

The objective of Output 1 is "Functions of MWS&I NRW Unit are established and strengthened". The Output has the following 3 Indicators,

#### (1) Indicator 1-1: All County representatives participate NRW related seminar(s).

In March 2018, MWS&I and CoG co-organized Kenya Water Summit. 37 Counties out of 47 were represented in the Summit. During the Summit, the ministry presented the definition and status of NRW in Kenya, importance of reducing NRW as basic information on NRW. In March 2019, the NRW Unit organized a regional county sensitization workshop hosted by Nakuru County. Six counties (Nakuru, Nyandarua, Narok, Kericho, Bomet and Uasin-Gishu) were invited, and three county officers participated in the workshop. The NRW Unit will continue implementing similar workshops, targeting seven or eight regions so as to cover all the country and ensure that county representatives gain knowledge on NRW reduction.

**(2) Indicator 1-2: NRW reduction campaigns are conducted semi-annually.**

The NRW Unit conducted 2 types of campaigns: 1) Campaigns conducted by the NRW Unit and 2) The NRW Unit supporting WSPs to conduct their NRW campaigns. The following table shows the campaigns conducted in Phase 2.

Table 2.2 Conducted NRW Campaign

Date	Location	Implementation organization	Activities & title of the event
March, 2018	Taita Taveta County	NRW Unit	Poster exhibition on NRW reduction at the World Water Day 2018
March, 2018	Embu	Embu WSP	Schools' visits to WTP
May, 2018	Nairobi	NRW Unit	Poster exhibition during Rapid Result Initiative event
September 2018	Embu	Embu WSP	Schools' visits to WTP
September 2018	Meru	Meru WSP	Schools' visits to WTP
October 2018	Nairobi	NRW Unit-Nairobi WSP	Poster exhibition at the Nairobi International Trade Fair
March 2019	Kakamega County	NRW Unit-Kakamega County WSP	Poster exhibition at the World Water Day 2019
May 2019	Nairobi	NRW Unit	Poster exhibition during the WASPA's 3 <sup>rd</sup> International conference
July 2019	Embu	Embu WSP	Schools' visits to WTP

**(3) Indicator 1-3: NRW reduction annual reports are produced.**

Compilation of 1<sup>st</sup> NRW Management Annual Report is completed and distributed. The report was officially launched in August 2019.

**2.2.2 Output 2**

The objective of Output 2 is "Use of NRW reduction standards by Urban WSPs is promoted by WASREB". The Output has the following 2 Indicators and approaches, which were recognized to be incorporated into the new NRW Management Standards due to their importance through the activities of Output 4, are described in (3) of this Chapter.

**(1) Indicator 2-1: NRW reduction standards are revised by year 2020.**

The NRW Reduction Standards Editorial Committee was initiated and the first committee meeting held in June 2018. The committee meeting was held nine times up to August 2019 to revise the Standards. As at the end of August, revision is still underway, but the monthly committee meeting will continue in order to complete the revision by June 2020. Thereafter, the final version will be



completed by around October 2020 through collection at stakeholder meetings. During the revision, it is particularly challenging to incorporate activities related to Output 4 into the standards since cooperation by an Expert in charge of these activities is necessary in order to ease explanations about the issues for the users.

**(2) Indicator 2-2: The revised NRW reduction standards are distributed to all the Urban WSPs through workshops.**

After the completion, workshops will be organized for the WSPs across the country to disseminate the revised Standards. The Revision Committee will also formulate the dissemination plan, but it is anticipated that the plan will be formulated in the middle of Phase 3.

**(3) Approaches recognized to be incorporated into NRW Management Standards through the Activities of Output 4**

This Project is based on the reflection that the approach, adopted in the conventional NRW reduction projects, of “implementing the NRW reduction activities as the Pilot Project in one or few DMAs (district metered areas) and developing the especially effective activities to the all the DMAs by increasing the number of DMAs based on the obtained effects and lessons” was inappropriate for almost all WSPs (with above 35% or more of NRW) in Kenya in which the countermeasures against commercial losses (including meter reading and analysis of billing data) were insufficient. In overview of the conventional projects, even though a certain NRW ratio was successfully reduced by cost and labor input and hydraulically isolating the DMAs, the hydraulic isolation of DMAs became difficult in the aspects of cost and technology in the subsequent stage of further development. There were many cases in which even if a DMA was isolated, it was left in an incomplete state because of complicated pipe connections which were not recorded in drawings, and of reconnection of isolated points to solve the water shortage. Even if the water leak detection is made concentrated on small-scale DMAs, it could not contribute to the visible reduction of the NRW ratio in all the WSPs, and it would be difficult to motivate the WSP side.

For these reasons, in this Project, each pilot WSP was assisted by taking the following preferable measures as the countermeasures for reduction of commercial losses with no high costs:

- (i) Identifying the large customers who should be preferentially attended and unbilled customer;
- (ii) Improving the places of installing customer meters and meter reading conditions; and
- (iii) Maintenance of customer meters, and accuracy test and replacement of defective meters.

As the countermeasures against physical losses, the assistance is provided in taking into consideration the changeover from the assistance in the unit of small-scale DMAs which it is difficult to develop to all the DMAs to that in the unit of water supply area. For example, a relatively wide water supply zone is selected

as a pilot area, and it is checked that such water supply zone can be divided into many sub-zones temporarily by means of gate valves. Then, the step test is made in the entire water supply area when the night time minimum flow is measured in order to specify the sub-zones with many water leaks and rampant water theft in the nighttime based on the nighttime flow in each sub-zone. The assistance was provided so that the workers can realize the effective and efficient water leak detection by specifying the leak points and repeating the repair work preferentially in such specified sub-zones. In order to maintain such system and root the activities in each WSP, it is required that:

- (i) Managing Director (MD) of each WSP and the managers of related departments fully understand the NRW measures and can demonstrate the leadership for them;
- (ii) NRW Section/Unit which takes charge of formulation of the NRW reduction plans by involvement of various departments/sections and undertakes the coordination of reviews is organized by full-time staff members as the team for implementing the activities; and
- (iii) The members concerned of related departments/sections hold the joint meetings regularly to share the effects and problems of their activities within each WSP.

As the result of the activities made in Phase 2 under the above orientation, it is supposed that many pilot WSPs have demonstrated the remarkable results as described above.

Based on the experience in such, Output 4 recommended cases of NRW reduction activities by stage as summarized in Table 2.3 so that each WSP can make the NRW reduction activities in an efficient and sustainable way. These are included in the NRW management standards under revision in the activity for Output 2, and adopted as the guideline for WSPs in Kenya after the revision. In formulating the NRW reduction plan in each WSP in practice, it is necessary to make the current state analysis sufficiently and determine the activities to be implemented, but the recommended activity cases by stage are intended for many WSPs to understand the orientation of the effective approach.

Table 2

### 3 Examples of Main NRW Reduction Activities recommended in accordance with Ranges of NRW Ratio (expected to be incorporated into new NRW Management Standards)

Stage	Approx. Range of NRW %	Recommended NRW Reduction Measures
1st	$\geq 40\%$ (or unreliable NRW ratio)	<ul style="list-style-type: none"> <li>◆ Establish the accuracy of the production meters by testing &amp; replacing or calibrating if found faulty or not sufficiently accurate,</li> <li>◆ Eliminate major commercial losses by testing customer meters (and replacing faulty meters with better meters) &amp; identifying illegal uses (starting with large customers and then medium customers)</li> <li>◆ Eliminate customers without meters and the unbilled users identified through a customer identification survey (CIS), and</li> <li>◆ Reduce the time taken to repair bursts, surface leaks &amp; overflows</li> </ul>
2nd	$< 40\%$ & $> 30\%$	<ul style="list-style-type: none"> <li>◆ Strengthen the 1st stage measures listed above (e.g. establish routines),</li> <li>◆ Isolate distribution zones &amp; district metered areas (DMAs) with accurate bulk meters for NRW monitoring,</li> <li>◆ Reduce underground leaks by step testing, acoustic survey &amp; pressure reduction in priority areas (this leak reduction can be carried out as a pilot project),</li> <li>◆ Map bursts &amp; leaks and monitor their re-occurrences,</li> <li>◆ Introduce better pipe materials and fittings for new pipelines and service connections (e.g. HDPE or uPVC class D and E), and</li> <li>◆ Minimize commercial losses (including those at smaller customers &amp; data handling errors) by improving meter reading &amp; billing systems &amp; their uses</li> </ul>
3rd	$\leq 30\%$ & $> 24\%$	<ul style="list-style-type: none"> <li>◆ Strengthen the 2nd stage measures listed above,</li> <li>◆ Reduce underground leaks in other areas, and</li> <li>◆ Start replacing the pipes for which stopping of bursts &amp; leaks is difficult</li> </ul>
4th	$\leq 24\%$ & $> 20\%$	<ul style="list-style-type: none"> <li>◆ Strengthen the 3rd stage measures listed above,</li> <li>◆ Accelerate and complete pipe replacement</li> </ul>
5th	$\leq 20\%$	<ul style="list-style-type: none"> <li>◆ Strengthen the 4th stage measures listed above,</li> <li>◆ Maintain the facilities and skills to sustain the low NRW ratio</li> </ul>

Note: The approx. % range of NRW for each stage corresponds to that of commercial viability criteria for each level included in WASREB Guideline on Clustering of WSPs (August 2018).

#### 2.2.3 Output 3 (completed in Phase 2)

The objective of Output 3 is “NRW related training capacity of KEWI is strengthened”. The Output has the following 2 Indicators.

##### (1) Indicator 3-1: KEWI introduces a NRW reduction course including on-site training and revised training materials.

KEWI organized new NRW reduction Joint training in Phase 1 of the Project (April 2017) and conducted the first training in June 2017. Training programs from the second joint training onwards fall in Phase 2 of the Project. The joint training was conducted six times in total by June 2019. The

table below shows the content of the training before the Project was started, points of improvement in the first on-site training and the content of the sixth and final on-site training.

Table 2.4 Process of Improving of the Joint Training of KEWI

	Course contents before Project	Contents of 1 <sup>st</sup> Joint Training	Contents of 6 <sup>th</sup> Joint Training
period	5 days (4 day for lecture + 1 day for OJT in near WSP)	11 days (5 days for lecture + 6 days for OJT in Embu WSP)	Same as the left.
Text books	No text book to issue to trainees. Handouts were prepared by copying related documents.	Reference data or handouts prepared by lecturers in charge were issued on the final day of the course.	Revised text books revised were issued to trainees at every program in the course.
Subjects of lecture course	Basic concept on NRW reduction technology selected by each lecturer.	11 subjects newly prepared through support of JICA Expert.	20 subjects by the same.
Subject of OJT	No text book to issue to trainees.	9 subjects newly prepared through support of the Expert.	11 subjects by the same.
Manner of OJT	Visit to facilities of near WSPs and technology demonstrations.	Field work exercise on NRW reduction at DMA in Embu WSP and training of related technology using actual equipment.	Same as the left.
Manner of Evaluation	Questionnaire for the trainees	Conducting brief test to trainees pre and post of the training to evaluate the efficiency of the course	Same as the left + third party evaluator's comments
Review Reports	—	KEWI has held review meetings after joint training and comments, suggestions, or ideas for the next joint training were compiled in the review report on every joint course.	

Improvements have been made to the joint training under the assistance of the experts through discussions with the Director and Vice Directors as well as the teaching staff of KEWI. The results as described in the table below, which have been achieved through training review, improvement of teaching plan and textbook and training implementation by KEWI staff demonstrate that the capabilities of KEWI have improved through the activities.

**(2) Indicator 3-2: The average score of the participants on the test conducted after the NRW reduction course is higher than before the course.**

Brief tests to trainees were conducted before and after the lecture course and OJT course respectively in every Joint training. The results of the test of the 6 joint trainings are shown in Table 2.5. With regard to comparison of pre and post training tests in the lecture (classroom) course for the 1<sup>st</sup> training, the average score of post-training test was lower than the pre-training test by 0.9% only. On the other

hand, with regard to the same in OJT course, for the 6<sup>th</sup> training, the score of the post-training test was lower than the pre-training test by 0.4% only. For combined score in both lecture and OJT, the post-training test scores were higher than the pre-training test scores. Further, with regard to the average scores the combined lecture and OJT course, all the post-training test scores were higher than the pre-training test score of the same joint training. Therefore, Indicator 3-2 was fulfilled satisfactorily.

Table 2.5 Results of pre and post-training brief tests conducted every at Joint Training

Comprehensive evaluation														
Joint Training	1st		2nd		3rd		4th		5th		6th		Average	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Classroom (Ave)	73.8%	72.9%	74.0%	77.9%	67.7%	71.5%	75.0%	78.4%	68.2%	78.5%	70.9%	79.5%	71.6%	76.4%
OJT(Ave)	74.5%	78.0%	77.2%	79.6%	75.8%	76.4%	71.5%	77.0%	75.1%	77.1%	79.5%	79.1%	75.6%	77.9%
Average	74.2%	75.5%	75.6%	78.8%	71.8%	73.9%	73.3%	77.7%	71.7%	77.8%	75.2%	79.3%	73.6%	77.2%
Difference	↗	1.3%	↗	3.2%	↗	2.2%	↗	4.5%	↗	6.1%	↗	4.1%	↗	3.5%

#### 2.2.4 Output 4

The objective of Output 4 is “NRW planning and/or implementation capacity of pilot Urban WSPs is enhanced”. The Output has the following 6 Indicators.

##### (1) Indicator 4-1: More than 8 pilot WSPs formulate NRW reduction plan.

JICA Expert team formulated a template for preparing annual NRW reduction plan for WSPs in year 2017/2018 with reference to the former annual plan template. Through implementation of the supporting works in the same year the Expert team analyzed the problems of the former template and improved it as a new template. Thereafter the Expert team proposed the new template to pilot WSPs to formulate the annual NRW reduction plan for year 2018/2019 and all the 9 Pilot WSPs succeeded in formulation. However, there were still difficulties in preparing the plan by the WSPs due to the many activities to be referred and the complicated contents of the form of the template. The Expert team improved the template again from the users’ comments and recommendations. In April 2019 the Expert team again supported the Pilot WSPs to prepare the annual plan for year 2019/2020 with newly improved planning template. Consequently, all the 9 Pilot WSPs had completed their annual NRW reduction plan successfully by August 2019. In Phase 2 the Expert team was consulting with WASREB with regard to the template for annual NRW reduction plan and WASREB generally agreed to incorporate the template into the NRW Management Standards which are under revision by the editorial committee.

##### (2) Indicator 4-2: More than 6 pilot WSPs self-review their activities of previous year’s NRW reduction plan and compile activity report.

As mentioned above, the Pilot WSP reviewed their activities at the end of every year. All the 9 Pilot

WSPs have completed their annual NRW reduction plans for year 2019/2020 using the new template. The Expert team has received the plans for year 2019/2020 and review report of the year before.

**(3) Indicator 4-3: Based on 4-2, more than 6 pilot WSPs continuously formulate annual NRW reduction plan.**

As mentioned above, based on the experience of the year before, all 9 Pilot WSPs have formulated their annual NRW reduction plan for year 2019/2020 more voluntarily than before.

**(4) Indicator 4-4: More than 6 pilot WSPs continuously implement NRW reduction plan formulated in 4-1.**

As mentioned above, 6 Pilot WSPs targeted in Phase 2 have started their yearly activities in accordance with their new annual NRW reduction plan for year 2019/2020. Remaining 3 Pilot WSPs which will receive assistance from the Expert team are also expected to be able to perform well in Phase 3.

Achievement and challenges of all the 9 Pilot WSPs recognized through activities in Phase 1 and 2 are as described in Table 2.6 and 2.7 which should be considered in order to formulate the supporting program in Phase 3 for each WSP.

Table 2.6 Pilot WSPs which succeeded in getting down significantly their Monthly NRW Ratio by Full-scale Assistance in Phase 2 and Possible Factors for Their Success

WSP*	Current state of NRW reduction after the JICA experts began full-scale implementation of the assistance	Recent activities considered very effective in NRW reduction
Kisumu WSP (Fourth)	Since April 2018 (when the experts completed the analysis of the meter reading and billed volume of all customers for 12 months), the monthly NRW ratio in the entire water supply area has decreased by 11% (from 41 to 30%) and the total billing has increased by approx. 10 million shillings per month.	Close monitoring of water usage by some of the large customers with electromagnetic flowmeters intended to reduce the metering errors and water theft, the accuracy test of customer meters of the other large and medium-scale customers, replacement of defective meters, etc.
Nakuru WSP (Fifth)	Since July 2018 (after the organizational reform assisted by the experts), the monthly NRW ratio in the entire water supply area has decreased by 14% (from 41 to 27%) and the total billing has increased by approx. 13 million shillings per month.	organizational reform, replacement of defective meters of large and medium-scale customers, water leak detection in Southern Water Distribution Zone, installation of a water meter for each connection in residential areas in the county, replacement of old and dilapidated pipes in Central Water Distribution Zone and the customer identification survey (CIS)
Nyahururu WSP (25th)	Since October 2017 (in the beginning of Phase 2 when the remarkable improvement of the activities emerged after the assistance in the planning in Phase 1), the monthly NRW ratio in the entire water supply area has decreased by 10% (from 45 to 35%) and the total billing has increased by approx. 20 million shillings per month.	Introduction of a new system (integrated software for customer meter reading, fee charging, management of complaints and reports, personnel management, etc.) for the participatory NRW reduction planning, increase in user fee revenue, rapid responses to bursts of pipelines and water leaks
Ruiru-Juja WSP (17th)	Since April 2018 (when the experts completed the analysis of the meter reading and billed volume of all customers), the monthly NRW ratio in the entire	Reduction in the probability of underestimating water usage by customers with the improved use of the existing meter reading and billing system,

	water supply area has decreased by 10% (from 54 to 44%) and the total billing has increased by approx. 15 million shillings per month.	increase in the number of meter readers, relocation of customer meters to locations near the boundaries of customers' premises, etc.
Eldoret WSP (Second)	Since July 2018 (after the analysis of the meter reading and billed volume of all customers by the experts and the assistance of them in the organizational reform), the monthly NRW ratio in the entire water supply area has decreased by 14% (from 50 to 36%) and the total billing has increased by approx. 5 million shillings per month.	Organizational reform, relocation of customer meters for the prevention of water theft, use of high-performance customer meters, patrol for detecting water leaks on the ground, replacement of old asbestos pipes and PVC pipes that have ruptured repeatedly, etc.

Table 2.7 Pilot WSPs whose NRW Volume & Ratio has not Reduced and their possible reasons

WSP	Problems and their causes identified in the assistance activities
Embu WSP (12th)	The monthly NRW ratio in the whole water supply area has fluctuated significantly between 10% and 60% because of problems of the bulk meters (e.g., air in the meter) which are used for measuring the volume of purified water. Therefore, it is not possible to evaluate accurately how much the recent NRW reduction activities has reduced NRW. The volume of water flowing from the old facility in the treatment plant to the water main through a bypass pipeline had not been measured until October 2018. This fact makes it impossible to evaluate NRW reduction appropriately. Since the WSP installed two bulk meters for measuring the volume of purified water correctly at places where the air would not enter them with its own budget in May 2016, it has become possible to evaluate the effect of the activities on NRW with the monthly changes in the volume of NRW and NRW ratio. Because a bulk meter procured by JICA Kenya Office was installed in Zone 2 in June 2019, it will be possible to analyze the effect of activities for reducing water leaks being implemented in Zone 2 in more detail
Meru WSP (33rd)	Because some of the bulk meters used for measuring the volume of purified water have not been functioning normally, estimated flow rate has been used for the calculation of the monthly NRW ratio in the whole water supply area in the last three years. Therefore, the ratio has fluctuated frequently between 19% and 28%. For example, in a period in which water demand (billed volume) increases (e.g., the dry season), an actual supply volume should also increase. However, as some of the bulk meters are not functioning, the billed volume is partially estimated from the average monthly supply volume in the past. Therefore, the total supply volume in a month in which the billed volume increases is smaller than that calculated with actual flow rate. Because this underestimation has often caused temporally and repeated falls of the calculated NRW ratio, it is not possible to evaluate the effect of the recent NRW reduction activities implemented by Meru WSP. Because the monthly billed volume has not been calculated correctly with the existing billing system of Meru WSP either (a margin of error of at least 7%), the NRW ratio has been underestimated by 6 to 10%. It will be necessary to replace the defective bulk meters immediately and modify the calculation methods used in the billing system.
Mavoko WSP (35th)	Because of the repeated droughts, the treatment plant has not been operated, customer meters have not been read or fees have not been charged in many months in the last three years. Therefore, the monthly volume of NRW and NRW ratio has fluctuated frequently between 10% and 70%. Because of the fluctuation, it has not been possible to evaluate the NRW reduction activities of this WSP correctly. The treatment capacity of the plant is scheduled to be increased with financial assistance from the Government of Belgium by early 2020. Once the capacity has increased, the increased capacity is expected to ensure sufficient supply volume, stable operation of the water supply service and monitoring of the progress in NRW reduction. Meanwhile, the increase in the supply volume and period may lead to the increase in the water distribution pressure, which may increase ruptures of water pipes and water leaks.

Kilifi-Mariakani WSP (15th)	Although approximately 50% of the monthly NRW ratio has been maintained for the last three years, the ratio seems to have decreased slightly last year. However, because some of the bulk meters which measure the volume of bulk water supply from Coastal WSB are defective, the supply volume has been estimated partly and, thus, NRW may not have actually decreased. The NRW Unit was established and its head was appointed in Phase 2. However, because no other staff has been appointed to the unit, the WSP is unable to implement NRW reduction activities. The NRW Unit including GIS Unit will have to be staffed immediately.
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**(5) Indicator 4-5: More than 6 pilot WSPs are able to use skill and/or implement activities which they could not employ before the Project.**

All the 9 Pilot WSPs have currently implemented skills or activities such as formulation of annual NRW reduction plan with the newly introduced template. They understood efficiently their importance of analysis on the accuracy of customer meters and they are now conducting simple accuracy tests actively for customer meters by using calibrated buckets on site. Nakuru and Kisumu WSPs have succeeded in improving measures for the large customer meters but there are some WSPs facing difficulties to check accuracy of meters bigger than 50mm dia. with flanges. For such WSPs the Expert team will continue to support them to overcome the challenge. With regards to GIS data management and its effective use, Nyahururu and Mavoko WSPs have been trained at the beginning of the Project and can now maintain by themselves. Only Kilifi-Mariakani WSP is still at an insufficient level in GIS management and, so the Expert team will support it. Further, 6 pilot WSPs targeted in Phase 2 can now conduct leakage detection by Minimum Night Flow measurement (QMNF) combined with step tests and trace leakages using listening sticks. However, Ruiru-Juja WSP was not well trained due to short training period supported by the Expert team. The Expert team will continue full-scale support program for the other 3 Pilot WSPs (Eldoret, Mavoko and Kilifi-Mariakani WSPs), which will join the Project in Phase 3, including Ruiru-Juja WSP as well. In Meru and Embu WSPs where they have large elevation gaps due to their topographical characteristics, water pressure measurement is being conducted in the wide area for effective pressure management to minimize water leakage.

**(6) Indicator 4-6: The amount of NRW in the selected distribution zones indicates decreasing tendency.**

Pilot WSPs such as Kisumu, Nakuru, Nyahururu, and Ruiru-Juja are achieving good results and show a trend of reducing NRW after implementing the activities in the Project. JICA Kenya office has provided bulk meters for selected 3 WSPs, such as Embu, Nakuru and Nyahururu WSPs, to assist in NRW reduction trend and these WSPs installed them by themselves in June 2019. In this regard, the analysis and confirmation of the NRW reduction trend in such WSPs will be carried out in the Phase 3.



### **2.2.5 Output 5**

The objective of Output 5 is “Experiences and knowledge of NRW reduction activities are shared among Urban WSPs.”. The Output has the following 3 Indicators.

**(1) Indicator 5-1: Results and lessons from Output 4 and other NRW activities are shared during WASPA meetings at least 3 times a year.**

The activities of Output 4 were shared during WASPA’s benchmarking workshops in April and October in 2018. At the bi-monthly meeting of WASPA in March 2019, the project showed a video introducing primary schools’ visit to Water Treatment Plant of Embu WSP. Some WSP’s representatives expressed their interests to replicate the similar activities.

**(2) Indicator 5-2: A NRW thematic workshop is organized every year.**

The first thematic workshop was held in August 6, 2019 with “illegal water use” as the workshop theme. The NRW Unit solicited the topic of the workshop from the members during JCC meeting. Then the NRW Unit consulted WASREB and PIC members about the program of the workshop. About 80 people participated at the workshop from 29 WSPs which was more than expected with an active discussion among the participants on illegal water use.

**(3) Indicator 5-3: The brief notes are issued 3 times during the project**

The first version of the brief note was produced in May 2019. The 2nd and 3rd ones will be produced in Phase 3.

## **2.3 Other Activities**

### **2.3.1 Regional technical cooperation in Kenya and Rwanda**

The first regional technical cooperation between Kenya and Rwanda was held in May 2018. Two officials visited to Kenya for 5 days accompanied by a JICA expert. During the visit, the delegation had meetings with Kenyan counterparts such as MWS&I, WASREB, KEWI and WSPs from Nairobi, Embu, Nyeri etc. They have learnt about situation of Kenyan water sector and exchanged views on issues facing each country.

The Second regional technical cooperation was conducted in November 2018 in Kigali City, Rwanda. Two main workers from Embu WSP went to Rwanda to participate the program from 4<sup>th</sup> to 9<sup>th</sup> November. A JICA expert in charge of field NRW reduction accompanied them. In addition to Kenya and Rwanda, C/Ps from Malawi participated in this cooperative function.

### 2.3.2 Equipment procurement by the MWS&I

MWS&I has been continuing with procurement of leak detecting equipment for the Pilot WSPs needed for training of physical loss reduction in Phase 2. The JICA Expert team has been providing support to the WSPs for two years from 2017. There were difficulties of clear procurement procedures in the Ministry but the equipment were finally procured in May 2019 and delivered to the WSPs in July 2019. Similar work will be carried out by the Ministry again for WSPs in Phase 3. Therefore, MWS&I is expected to implement the work as quickly as possible based on the experience gained in Phase 2.

### 2.3.3 Counterpart Training in Japan

The Second C/P training in Japan was conducted in December 2018. 8 C/P members, consisting of one technician from each of the 6 targeted WSPs in Phase 2, and a trainer each from KEWI and WASPA participated in a two-week program.

## 2.4 Project Purpose and Overall Goal

### 2.4.1 Project Purpose

The Project Purpose is “A NRW reduction support mechanism is established for Urban WSPs to implement NRW reduction activities.” This has one indicator and its achievement is as follows;

#### Indicator:

Six of the pilot Urban WSPs continue achieving targets set by the NRW reduction plan for two years.

#### Achievement:

As described above, formulation of NRW reduction annual plan was continued for two years by using the template for formulation of the plan with the assistance of the project team. In this plan all the pilot WSPs decided their own targets which will be worked with their emphasis in this planned year. This was also intended that the pilot WSPs can easily give feedback on their achievement against their annual targets. Each pilot WSP is implementing the activities in accordance with the plan.

### 2.4.2 Overall Goal

The Overall Goal of the Project is “Under NRW reduction support mechanism, Urban WSPs enhance NRW reduction activities”. The Goal’s indicators are intended to be realized around 3 years after the project is finished. The indicators (there are three) and the present achievement are as mentioned below;

**(1) Indicator 1-1: Six of the Urban WSPs participate in knowledge sharing activities established by the Project.**

**Achievement:**

Six pilot WSPs have already participated in the NRW reduction activities through the implementation of the Project. The remaining three pilot WSPs will participate in the training programs in Phase 3. In order to disseminate the NRW activities to the whole country, the 9 pilot WSPs shall become core bodies for transferring the technology and knowledge of NRW reduction to WSPs located in the same area. Further, it is essential for dissemination of the activities to collaborate among activities such as 1) revising the NRW management Standards, 2) sustaining KEWI's NRW training course widely among WSPs, and 3) sharing information of good practices on NRW reduction activities through WASPA's meetings or other similar functions. These activities shall be more activated by the leadership of MWS&I NRW Unit and the Expert team will support the Unit more strongly in Phase 3.

**(2) Indicator 1-2: Six of the pilot Urban WSPs continue achieving target(s) set by the annual NRW reduction plan.**

**Achievement:**

Nine pilot WSPs have already formulated the NRW reduction plan with the assistance of the experts. In accordance with the priority set by themselves, each WSP is implementing the activities based on the plan. During the transition period to the new fiscal year in Kenya (July 2019 to June 2020), activities of the previous fiscal year were reviewed and the annual plan for the new fiscal year prepared. This was the second time for each pilot WSP to use the excel sheet type template proposed by the project team. As the template was significantly improved from the one used for formulating the plan for the previous fiscal year, the nine WSPs formulated the plan relatively smoothly and by the end of August 2019 they set their targets to be achieved through the activities of the year. Activities to achieve these targets have already been initiated now.

**(3) Indicator 1-3: Annual NRW reduction reports are continuously produced and distributed.**

**Achievement:**

The first annual NRW report was completed in May 2019. The report was uploaded to the MWS&I's website ([www.water.go.ke](http://www.water.go.ke)) in July and a report launching meeting was held on August 15<sup>th</sup>. The NRW Unit is collecting articles for the next issue aiming at issuing the report during the World Water Day in March.

## Chapter 3 Measures for Project Implementation and Operation

### 3.1 Challenges of Project Implementation

In order to systematically and effectively promote NRW reduction activities, it is important to proceed with these activities while respecting the independence of the C/P agencies and WSPs who assume responsibilities for the activities. Below are the issues in Project implementation and operation stated for each organization carrying out their activities.

#### (1) Challenges of MWS&I NRW Unit

✓ *Strengthening cooperation between members promoting NRW reduction activities*

For the last three years, the workforce of the MWS&I NRW Unit has comprised three members of staff under the coordinator, namely, two male staff who will reach retirement age in a few years and one female staff. They have been co-working with JICA Experts. Through the working their work capacities have been improved on the execution of budget allocation, procurement of equipment, production of NRW annual report, conducting sensitization workshops, coordination with related agencies, etc., however, their basic attitude for the works is on the basis of waiting for orders from the top. The experts have been encouraging them to work more voluntarily. The female staff in the NRW Unit especially is working devotedly and has improved her skills to some extent.

In July 2019, a middle ranking engineer, who has more capacity for the work of the ministry than the other staff, was deployed. According to the Project Director, the plan is to make the new engineer to manage the whole work as the chief of the NRW Unit. The recruitment of young engineers that was called for in the JCC minutes throughout Phase 2 is ongoing. In the vision of the Project Director, motivation will be given to the Unit by promoting the NRW Unit to the status of an NRW Department in near future. By raising the motivation of the Unit staff towards work and capacity strengthening, it is expected that the Kenyan NRW reduction plan will be stimulated under the strong leadership of MWS&I while keeping an eye on future trends. In order to support his perspective, it is also important that the Expert team will enhance the capacity and motivation of the NRW Unit's staff more effectively and encourage them to work out more voluntarily.

#### (2) Challenges of WASREB

✓ *Construction of activity implementing systems related to NRW reduction standards revision*

It is one of the most important issues for sustaining the support mechanisms for NRW reduction, to revise the NRW Management Standards which is initiated by WASREB. Among the C/P institutions WASREB only has experienced staffs from the previous project, so WASREB has a possibility to address this work suitably. However, because of the limited number of staff, they are

also working on license qualification assessment, water tariff revisions, and examinations of WSP reports, etc., which means they are incredibly busy. Among selected few members, WASREB appointed an engineer, who is around the age of 40, as the chairman of the editorial committee for revising NRW Management Standards. He is well motivated and full of insights into NRW reduction. However, the editorial committee meeting is often postponed, which causes delays in activities. The editorial committee must proceed based on the achievement gained in the previous meeting but no meetings are held because the chairman cannot attend the meeting due to his multiple duties in WASREB. Because the chairman of the committee cannot be replaced by other members, henceforth, it will be important to reduce the workload of the WASREB staff members since the standards revision work is reaching its most intense point. The JICA team will support WASREB by giving priority in deployment of the Experts on this work and putting more manpower of local staff into the same.

### (3) Challenges of KEWI

#### ✓ *Shift to regular training courses*

KEWI started to conduct joint training in Phase 1 and a total of 6 trainings were held by the end of Phase 2. KEWI is able to formulate a flow of activities, including planning, implementation, review and improvement based on a PDCA cycle. However, among the trainers at KEWI, activities are mainly implemented by the Chief lecturer, who is directly responsible for the Project, with support from the Director of KEWI. It is anxious that the other trainers are not necessarily motivated to take part. From now on, joint training on NRW reduction will be conducted as a regular training course of KEWI and trainees will be widely gathered through advertisement and invitations targeting general WSP staff. The assets acquired by KEWI through the Project include techniques, cooperation systems with leading WSPs, and the production of numerous textbooks and it is expected that the effective use of these assets will contribute to the promotion of the national NRW reduction activities from now on.

#### ✓ *Demand for a new training program expected from KEWI*

In the Project, revision of WASREB's NRW Management Standards is ongoing. In the new standards, the issues will include techniques and methods, etc. to be newly introduced as effective ones gained through the activities of Output 4 in the Project. These techniques and methods include use of templates for the functional production of NRW reduction plans, analysis of read consumed water volume on customer meters and billed water volume data in connection with commercial loss countermeasures, methods to improve discovery of situations like incorrect meter readings, meter accuracy checks using cheap and simple handmade devices; provision of water supply facility mapping, and customer data management using free GIS software. By using these techniques, it is expected that an improvement will be made to manage functions that have been difficult to implement before among WSPs. The aim of these techniques is to achieve highly-reliable data

management so that WASREB can evaluate WSP activities and therefore, disseminate the techniques to WSPs throughout Kenya. After the NRW management standards have been revised, it will be essential for all the WSPs to use these techniques. For that reason, popularization of these techniques will require special new training. From this perspective, C/Ps should cooperate with the WSPs as key members of the NRW reduction support system. Then KEWI, as provider of NRW reduction training course, is greatly expected to formulate and provide new training courses dealing specially with such new techniques and methods. C/Ps should discuss from now on how to realize such measures and submit their results to JCC meeting for recognition as a decision of the Project

#### (4) Challenges of Pilot WSPs

##### ✓ *Formulation and implementation of practical NRW reduction plan by WSPs*

It is expected that the experience acquired through activities in Phase 2 will effectively work among the targeted pilot WSPs in Phase 3. However, based on experience from Phase 2, it was found that WSPs with comparatively advanced technology stuck to their traditional work methods and were highly resistant to newly introduced technologies. Therefore, the supportive effects by the experts tended to have no direct realization. Conversely, there were some pilot WSPs like Nyahururu and Nakuru WSPs, with less experience that produced NRW reduction effects in a relatively short time by following the instructions of the Experts. In the Project, each WSP announced the results and outputs gained through their activities at the monthly PIC meetings and, in an environment of mutual encouragement of the meeting, the aim is to increase and maintain motivation based on sharing such experiences of how investing funds and manpower leads to a greater increase in billed amounts. Through the presentation in PIC meetings the pilot WSPs were often observed as being very proud about the massive results that are being achieved. Through such experiences of how the pilot WSPs behaved, the effects of the approach adopted in this Project are being felt useful for WSPs throughout Kenya.

On the use of the template for NRW reduction planning (in order to improve the bad practice of making impractical plans on paper only), the Project finds it important that WSPs, should review the previous year, organize various tasks for implementation for each level of activities, and prioritize on works to be arranged for the next fiscal year based on their own decision whether each of the prioritized task is to be sufficiently implemented or not to be implemented. For example, while making plans for one year, the previous year activities are reviewed, and if they didn't go well, the causes of failure are identified. In addition, the review is made on the appropriateness of the choice of modes and methods used, or the number and ability of the personnel mobilized in order to make improvements. The FY 2019/2020 plan was the second annual plan produced using the template, and, as a result of improving the template, pilot WSPs have said that it became easier to use. However, as always, the general staff of WSPs feel that this job is a burden, and therefore it

is necessary to continue improving the template to be widely used. Although the part of capacity self-assessment was unified into the new template prepared for 2019/2020-year plan by using macro program of excel sheet, the Expert will discuss on how it is useful or not with Pilot WSPs in early stage of Phase 3. If WSPs' opinions are not positive, the combination with self-assessment part and planning ones will be reconsidered. On the other hand, there are still some WSPs which have organizational problems for fulfilling their tasks on NRW reduction. In the case of Ruiru-Juja WSP NRW Unit was organized but the unit was not recognized widely in the WSP and a line of command to the Unit is not established clearly. In such circumstances, collaboration among the related sections or department was not sustained and a lot of NRW activities planned have been kept without any actual works. And in Kilifi-mariakani WSP it was confirmed while making their NRW reduction Plan that the manpower to be loaded to the NRW reduction activities are insufficient. Therefore, the Expert team thinks that we shall continue assisting the WSPs to address such problems in the next Phase.

1) Organization

In order to successfully implement the NRW reduction in WSPs in Kenya, it is essential to strengthen the organization of the NRW Section/Unit which is often installed in the technical department (including its separation from the department in charge of operation and maintenance, and expansion of water supply system, and assignment of a sufficient number of full-time staff members), and to fully involve the commercial department in it. If such organizational reform is enforced, the activities such as patrol of ground leaks water theft detection and identifying of unbilled customers, which are easy but need a considerable number of personnel, are activated to allow the NRW ratio to be reduced by about 10%.

2) Customer meter control

The rate of customer meter installations has reached 100% in many WSPs in Kenya. Actually, there are many meters which are out of operation, have unrecadable dials, or have low accuracy, and many WSPs frequently and continuously under estimate billed volumes because the accurate meter reading is impossible. Therefore, it is necessary to improve the control of the customer meters, but the meters of the small-scale customers consuming less water cannot reduce the NRW volume and increase the billed water charges even if they are improved. Therefore, it is necessary, especially, that the policy of improving the control of the large customer's meters is shared within each WSP. For state inspection, maintenance, accuracy test and replacement of the customer meters, it is necessary to link up the NRW Section/Unit, the department in charge of repair and installation of customer meters, and the section in charge of meter reading and billing within the commercial department. Therefore, the organizational reform as described above and the reinforced linkup of related departments/sections are indispensable. By improving the control of customer meters, it will be possible to reduce the NRW ratio by about 10 to 15%.

3) Prevention of water theft and limited replacement of repeatedly burst pipes

In addition to the customer meter control as mentioned above, it is possible to further reduce the NRW ratio by about 5 to 10% by sealing the joints before and after each customer meter for water theft prevention (against meter tampering or reversal, or illegal connection on the ground) and by limited replacement of water pipes which repeatedly burst.

4) Water leak detection and reduction of water distribution pressure

First, it is expected to reduce the NRW ratio to about 30% through the NRW reduction activities which are implemented relatively easily as described above. At the time point when the NRW ratio can be reduced to such level, the importance of underground leak reduction by the leak detection and distribution pressure control requiring relatively high technology will increase. As it is difficult to make the facility improvement requiring intensive works and a lump sum of costs for the entire water supply area, it is necessary to develop it gradually from areas with higher priority in maintaining a high level of awareness for a long period. For this purpose, in the initial stage of activity, it is important to fully arouse the motivation of each WSP by placing the focus on the reduction of commercial losses and demonstrating the NRW reduction effects visibly (for example, the substantial reduction of NRW ratio in the entire WSP).

5) NRW monitoring

It is also necessary to reinforce the monitoring of the NRW ratio and others gradually as the commercial loss countermeasure is making progress. For such reinforcement, the conditions of monitoring the NRW volume and ratio in each area should be improved in zoning the water distribution system in stages (which is isolated into water distribution zones, which are divided into sub-zones, namely DMAs if necessary). By so doing, it is easy to specify the areas in which the NRW reduction activities should be implemented preferentially because such areas have high NRW volume or ratio. If the capacity of specifying such preferential areas is enhanced by zoning, it is possible to realize the water leak reduction effectively by the water leak detection in step tests and the water pressure control using pressure reducing valves. For this purpose, it is necessary to make efforts for reinforcement of NRW monitoring during the period of transition from the stage in which mainly the commercial loss reduction measure is taken to the stage in which the focus is placed on the underground water leak reduction.

6) Mapping of waterworks facilities using GIS

In Kenya, there is only a limited number of WSPs in which the information on water infrastructure and piping routes is prepared as the GIS data. In many WSPs, many accurate drawings have gotten scattered and lost and their conditions of maintenance is poor. For the maintenance of piping route facilities, the records of the laying year, size and material of each pipe, and its past break-off and leak damages (including points) are indispensable. Therefore, it is necessary to implement the mapping of waterworks facilities in the entire water distribution area using any free GIS software



as soon as possible. Further, it is also necessary to prepare the plan of improving the zoning of the water distribution system using the GIS so that the water leak detection and distribution pressure control in the unit of water distribution area as described above can be started from the high priority areas for gradual facility improvement.

### **3.2 Efforts made for the Implementation of the Project**

The efforts incorporated into the implementation of the Project are as follows.

#### **(1) Application of PIC leading to increased motivation**

In the PIC meetings in Phase 2, it was often observed that some of pilot WSPs presented proudly their good results or outputs obtained by implementing the particular activities learnt through the Project. In the meantime, it might encourage the other pilot WSPs to have similar activities in their WSPs. It means PIC meetings have a role of venue for sending significant information and stimulation of the WSPs members receiving them. Therefore, the project will use the PIC meetings as such a beneficial opportunity in Phase 3, too. It is also expected for the PIC meetings to play a role for enhancing the motivation of the pilot WSPs to activate the NRW reduction mood.

#### **(2) Adoption of approaches that raise motivation for engagement to NRW reduction activities**

It can be supposed from the support activities in the Project that roughly half of the NRW amount is commercial loss in Kenya. The accuracy of the water meter declines as it gets older and they tend to give a lower measurement of water used than the actual amount, but replacement of the customer meters after some years. However, at least such cases in which defective customer meters are left for years without any attention should be eliminated. As meter readers cannot make meter-reading because the water meters are on private residential sites surrounded by fences, the amount of water used is based on assumption. There have been repeated cases in which, even if the meter is working, the meter reader reports a low value that suits the convenience of the resident, etc. so that accurate consumption is left unknown, resulting in WSPs making bills for very low amounts, which results in a loss of income. In the Project, in order to analyse the possibility of the occurrence of such flaws and injustices, the billed amounts for one year for all customers of WSPs were obtained and analysed. As a result, the ratio of water meters that were read accurately in one-year period was as low as 10-30% of the total customers, depending on the pilot WSPs. In other words, more than 70-90% are being billed based on assumptions, at least once a year. In particular, in the case of major customers using 300m<sup>3</sup> or more a month, mistakes in estimated values lead to major price differences. These results were split into five groups of customer water usage, ranging from the group with the largest usage amount at 300m<sup>3</sup> or more to the smallest amount at 6m<sup>3</sup> or less. At each WSP, these results were presented at a meeting attended by the MDs, department heads, NRW managers and zonal managers to make them understand the extent to which their WSPs were collecting fees so carelessly,

and amount of loss it is leading to. As a result, MDs and management staff were shocked, and they ordered staff to investigate the meter situation immediately so that the water meters of major customers were checked within a few days and defective meters replaced or repaired. In every area, there were ten or more major customers where problems were suspected, and countermeasures worked out to limit the expense in time and money, which led to an increase in the WSPs billed water amount and hence major increase in income. After becoming aware of this issue, measures are now being taken independently to check the accuracy of customer water meters, make replacements and change the location of installation, etc.

In this way, the motivation of the companies is raised because the effects of the activities appear in a visible format compared to the early stage of NRW countermeasures. In some pilot WSPs, there were cases in which income increased by 10% or more within a few months. However, it is clear that such effects cannot be expected to continue forever, but the opportunity for everyone from WSPs executives to on-site employees to work together on this initiative is stimulating the entire organization, which is expected to have good effect on organizational management later on.

### **3.3 Lessons Learned through Project Activities**

The lessons learned through project activities are as follows.

#### **(1) Unreliable provision of water detection equipment**

In order to support pilot WSPs activities, MWS&I planned for the provision of water leakage detection equipment in Phase 1, which was finally achieved halfway through Phase 2. The equipment that has already been supplied was distributed to 6 WSPs targeted by the Project Phase 2. In the Project, the study team received Japan-made equipment supplied in Phase 1 from JICA, but this alone was insufficient for the 6 WSPs. For that reason, equipment was borrowed from Narok WSP and Kapsabet WSPs that had received related equipment from past Projects implemented by JICA. With the equipment being borrowed as local training progressed, and, in order to improve and establish the methods that had been taught, the equipment was loaned for a fixed period as it is essential for the equipment to be used independently. At first, the plan was to supply the equipment within about 6 months, but this was later delayed due to procedural errors in MWS&I. The uncertainty of allocating a budget also had an effect, but the existing equipment purchasing procedures in public bodies in Kenya are not clearly understood. Equipment models that are distributed in the domestic market by agencies in Kenya were selected for this Project, and cooperation with the procurement department of MWS&I was underway, but at some period of time, it was found that the bidder was cooperating with a distributor of Japanese equipment to purchase expensive Japan-made equipment. Moreover, because they were transported by air due to time limitations, the costs became excessive and the situation was such that it was no longer possible to purchase the planned equipment. A request has been made for

the same equipment to be supplied to the 3 pilot WSPs in Phase 3 early in the year, and both the NRW Unit and the experts are negotiating with the procurement department. Although such unexpected situations may occur this time as well, the dilemma is that it cannot be expected that the situations will get better even if this is stated in the minutes of the JCC with the signature of PS.

**(2) Uncertainty of budget provision by MWS&I NRW Unit**

In preparation for the implementation of this project, the MWS&I NRW Unit secured a budget of 60 million Ksh for NRW reduction activities in the fiscal year (2016/2017; budget year is July to June). The following year, 65 million Ksh should have been secured, followed by 70 million the year after. The first year was affected by the presidential election, but it was said that the budget was cut by the government in the second half of the year. However, there were no major events in the 3<sup>rd</sup> year, but the budget was cut in the fourth quarter. Accordingly, the provision of the budget for printing the NRW management annual report, which was yet to be completed, was delayed. Further, the purchase of the above-mentioned water leak detection equipment was barely scraped through as it was in the framework for the third quarter. Also, the National Treasury is unable to allocate a budget in the 1<sup>st</sup> quarter after the start of the new fiscal year, it seems that the only option is to schedule the purchase or disburse the budget for the activities in the second and third quarters.

The NRW Unit has now submitted the budget plan for the year 2019/2020. It was confirmed that the purchase amount for the water leak detection equipment for pilot WSPs in Phase 3 is in the second quarter, which is during the period of the Project contract renewals; so the concern is that it will be difficult to give support to MWS&I during this period. Also, although County sensitization activities and campaigns targeting residents scheduled for the previous year have been moved to Phase 3 due to the budgetary arrangement difficulties, there is a concern that they will be delayed until the second quarter. Since even MWS&I cannot manage its budget approved by the National Treasury, the project side cannot assist with this matter. Therefore, the Expert team will try to approach the higher officers as much as possible with a strong support from JICA Kenya office.

**(3) Organization of full-time NRW Unit/Section staff at WSPs**

One of the important lessons learned in the Project was that it is essential to ensure the organization of full-time NRW Units/Sections in order for WSPs to implement NRW reduction activities. It is needed to identify the responsibilities and relationship of the sections or departments related to the NRW reduction activities such as meter reading, billing, service pipe connection and maintenance of pipeline. This is because if the class of the chief of the NRW unit is lower than the other related sections or departments, the case, in which the collaboration among the related sections or departments is not implemented effectively, can often happen and bring serious difficulties for the implementation of the activities. At the start of the Project, in general, in all of the WSPs, staff implemented NRW

reduction activities while also working on other duties. In this case, it becomes a huge burden for the staff members, and other duties frequently take priority, which has an evil effect on NRW reduction activities. In such cases, JICA Experts often have to hold discussions in order to obtain the understanding of executives, including MDs. Also, even MDs do not have experience of NRW reduction work, so there is often a lack of understanding about the extent of this burden. In such cases, no results can be expected no matter how much explanation is given. Instead, it is important to clearly show the effects of NRW reduction activities (increase in income, etc.). For MDs and other executives, financial improvement is the most important issue, so it is incredibly persuasive. However, it is difficult to reach the level of NRW ratio of 30% or less with the reduction of commercial loss alone, which is easy to understand among WSPs, and later it will be necessary to shift the importance to techniques to reduce physical losses along with accompanying explanations. Also, although organizations are important, in the case of organizations that have no sense of duty, it is recommended to have inter-sectional or departmental meetings among the members concerned with the participation of the top management for discussing how to eliminate the difficulties facing them. Through the meetings it is expected for the participants to share the aims as the common mission and to have good results by their collaboration. In order for meter readers or plumbers not to commit illegal manners or actions, reinforcement of consciousness improvement and the punishment rules of the WSP are important. Moreover, provision of allowance system for the workers to be involved in minimum night flow measurement or leak detection work in the night is also important to keep a good motivation in the NRW reduction of WSPs.

## Chapter 4 Phase 3 Plan

### 4.1 Policy for Activities in Phase 3

This Project aims to establish a support mechanism for NRW reduction in Kenya's water service sector as shown in Figure 4.1. The JICA experts support strengthening the capacity of the Pilot WSPs in NRW reduction planning and implementation (Output 4). The results of Output 4, its process and case studies will be incorporated into the revision of the NRW Standards (Output 2). The improved NRW practical course at KEWI provides chances for WSP staff to gain practical skills and knowledge in NRW reduction (Output 3). MWS&I plays a role in coordinating the support organizations for NRW reduction (actors), formulates policies and prepares and distributes budgets. MWS&I also conducts sensitization activities and releases NRW management reports which includes cross-cutting information from various actors (Output 1) and shares information on good examples through various media (Output 5).

The Project objective is considered when WSPs continue formulating realistic NRW reduction plans and implement them, and the capacities of supporting organizations for NRW reduction are enhanced. When each Output is achieved, the aggregate results of the Outputs are expected to lead to the achievement of the Project purpose. Activities to be implemented in Phase 3 are described in Chapter 4.2.

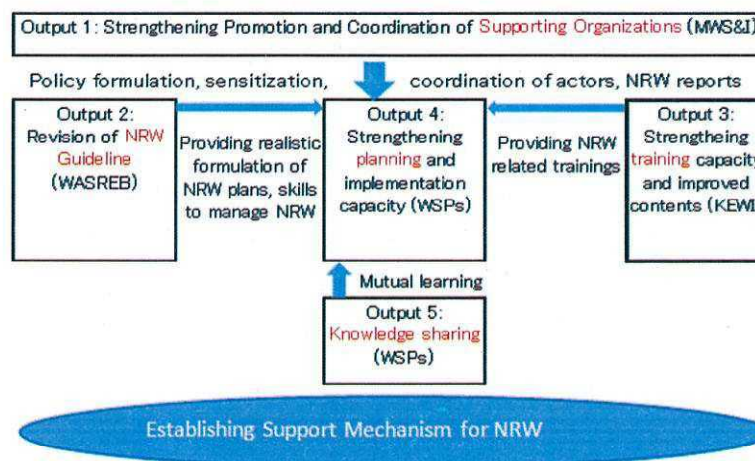


Figure 4.1 Establishing a support mechanism in the water service sector

## 4.2 Activities to be implemented in each Output

### 4.2.1 Output 1

#### (1) Production of NRW Management Annual report (Activity 1.1 of Output 1)

Based on the plan prepared in Phase 2, MWS&I NRW Unit will produce the NRW Management Annual Report. In the next version of the report, the contents will be focused on more activities of pilot WSPs and other WSPs. The annual report will be produced as follows,

- Version 2018/19 in March 2020,
- Version 2019/20 in March 2021

#### (2) NRW Sensitization for County Governments (Activity 1.2 of Output 1)

Based on the plan prepared in Phase 2, the NRW Unit will implement sensitization workshops for the counties as soon as the MWS&I budget is disbursed. The issues raised from the previous workshop and thematic workshop (eg. Needs for county regulations on unauthorised water use) will be incorporated into the workshop content. The workshop plan is shown in Table 4.1.

Table 4.1 NRW Sensitization workshop plan for County Governments

	Counties to be targeted	WSPs (Very Large, Large, Medium)	Location and timing
1	Laikipia, Isiolo, Nyeri, Meru, Garissa	Nanyuki, Nyahururu, Isiolo, Nyeri, Othaya-Mukurweini, Tetu-Aberdare, Mathira Meru, Imetha, Tuuru, Garissa	Nanyuki (implemented in November, 2019)
2	Kisumu, Siaya, Vihiga Migori, Homa-Bay, Kisii, Kakamega, Busia	Kisumu, Sibo, Migori, Homa-bay, Gusii, Kakamega, Busia, Amatsi	Kisumu (from January to March, 2020)
3	Muranga, Kirinyaga Tharaka-Nithi, Embu	Muranga South, Muranga, Gatamathi, Kiriyanga, Nithi, Embu, Ngandori Nginda Ngagaka, Embu, Kyeni	Muranga (from January to March, 2020)
4	Nairobi, Kiambu	Nairobi, Thika, Gatundu, Karuri, Kiambu, Limuru, Gitunguri, Gatanga Ruiru-Juja Kikuyu	Nairobi (after August, 2020)
5	Machakos, Kitui Makueni, Kajiado Turkana	Mavoko, Machakos, Kitui, Kibwezi-Makindu, Oloolaiser, Nol Turesh-Loitokitok, Lodwar	Machakos (after August, 2020)
6	Mombasa, Kwale, Taita Taveta, Kilifi	Mombasa, Kwale, Tavevo, Malindi, Kilifi-Mariakani	Mombasa (after August, 2021)
7*	Lamu, Tana River, Samburu, Wajir, Bugoma, Trans Nzoia, West Pokot, Elgeyo Marakwet, Nyamira, Baringo, Nandi, Mander, Masarbit		

#### (3) NRW Campaign (Activity 1.1 of Output 1)

The NRW Unit will continue supporting pilot WSPs to implement NRW campaigns which are appropriate for the particular WSPs. The Unit will encourage WSPs to continue already implemented campaigns such as primary students' visits to water production or supply facilities. Also,

the Unit will continue NRW sensitization activities such as NRW poster exhibition in public events such as the World Water Day in every March, Nairobi International Trade Fair in October, etc.

**(4) Securing the annual budget for NRW reduction by the MWS&I NRW Unit (Activities 1.4 of Output 1)**

Based on an evaluation of the relevancy of the content and scale of activities with regard to the annual plan submitted by each C/P, annual budgets will be compiled by the time the MWS&I budget is formulated.

**(5) Review of NRW reduction activities by KEWI and WASREB (Activities 1.5 & 1.6 of Output 1)**

The MWS&I NRW Unit will review the outputs from activities by KEWI and WASREB at the end of the Kenyan fiscal year and will make suggestions in order to establish an effective activity plan for the next fiscal year. Regarding activities of KEWI in Phase 3, participation to PIC and JCC will be requested and systems will be formed to assist with support mechanisms to NRW reduction activities.

**4.2.2 Output 2**

**(1) Reviewing of the NRW Reduction Standards (Output 2.2 to 2.4)**

The Editorial Committee of the NRW Management Standards will continue to revise the standards as implemented in Phase 2 for preparing a draft version by the middle of 2020. And the new standards will be completed following any revisions/adjustments through stakeholder meetings by the end of the same year. In 2021, activities to publicize the standards will be developed in order to gain far-reaching recognition.

**(2) Survey on User's opinions or suggestions on the new NRW Management Standards**

The Editorial Committee will discuss and decide the methodology for survey on user's opinions or suggestions on usage of new NRW Management Standards. Then it will implement the survey or monitoring subsequently.

**4.2.3 Output 3 (Supporting of Activities of Output 3 was completed in Phase 2)**

**(1) Implementation of joint training of KEWI**

KEWI has completed the short-term training course on NRW reduction activities with the support of JICA Experts as the basic level one in Phase 1 and 2. KEWI will continue implementing the same training courses as one of its regular short training courses to WSPs during Phase 3. The project will support supplementally for KEWI to improve the course contents during Phase 3.

**(2) Contributing to establish special courses to be required due to the completion of new NRW Management Standards by WASREB**

Upon completion of the NRW Management Standards which are currently being revised in Activities for Output 2, reforms of various conventional methods including the management method of the water supply service, the method of formulating the annual plan, and customer management, etc. will be required to all the WSPs. These methods are, in other words, to be considered as the prerequisites of licensing for implementation of water supply services by WSP, therefore, all the WSPs will be required to deploy personnel and systems with a certain degree of knowledge and experience on NRW reduction activities. For that reason, it is highly expected that KEWI will play an important role to make a greater contribution to disseminate such new methods through providing a new short-term course. Project also expects that KEWI will continue collaborating deeply with the Editorial Committee to compile the new Standards.

#### 4.2.4 Output 4

##### **(1) Supporting the production of the NRW reduction plan, reviewing it, holding inter-department meetings of WSPs (Activities 4.3, 4.4, 4.6, 4.7 and 4.8)**

Support will be continued for leading WSPs and pilot WSPs to produce NRW reduction mid-term and annual plans, which was implemented during Phase 2, in order for each WSP to continue the same activities by themselves. Project team will try to make all the Pilot WSPs aware that there is a column for reviewing their achievement against the plan, the template for formulating of the annual plan. The column in the template was intended to be useful for WSPs to apply for quarterly reporting to WASREB. Therefore, Project team will encourage the Pilot WSPs to familiarize and habituate to use the template for formulating the annual plan. During Phase 2 Pilot WSPs had implemented a work flow of the activities from planning, implementing, reviewing and improving by initiation of NRW Unit and reports on the activities were also prepared by the Unit. The Pilot WSPs are holding monthly or weekly meetings and sharing challenges, way-forwards, measures to be done and responsibilities, etc. In Phase 3 Project team will support the Pilot WSPs to continue the activities sustainably in accordance with the necessity of each Pilot WSP.

##### **(2) Improvement of NRW reduction techniques of the Pilot WSP (Activities 4.5)**

Based on the supporting plans on NRW reduction techniques for each WSP, Project team will provide guidance to Pilot WSPs by means of effective training. Through such concept the various NRW-reduction-related activities were re-classified into the following four categories in accordance with the departments that implemented them to assist many sections involved in the NRW reduction of the pilot WSPs in the detailed capacity self-assessment and planning based on the results of the assessment.

- [A] Improvement of organizational structure and motivation of the staff, PDCA cycle and procurement



[B] GIS, zoning, NRW monitoring and water balance analysis

[C] Reduction in commercial losses (including errors in data handling, errors in meter accuracy and water theft)

[D] Reduction in physical losses (including pipe bursts, water leaks and overflow).

More over aiming at raising ownership and motivation and also establishing an active and sustainable structure of Pilot WSPs, Project team will support the activities shown in Table 4.2 during Phase 3 in accordance with actual status of NRW reduction capacities of each Pilot WSP. Among activities in the Table, the activities completed or continuing in Phase 2 are marked as black circles or squares (● or ■) and the ones to be implemented in Phase 3 are marked as white circles or squares (○ or □).

Table 4.2 Main NRW-related Activities implemented or to be implemented in Phase 3 by Project Team (Part of Categories A&B)

Category	Main Assisted Activities	Timing of Assistance, WSB Area & Pilot WSP									Note
		Mainly Phases 1 & 2		Mainly Phase 2				Mainly Phase 3			
		Meru	Embu	LVS Kisumu	RV Nakuru	Athi Ruiru/J uja	Northern Nyahurur u	Tnnathi Mavoko	LVN Eldoret	Coast Kilifi- Matiakani	
[A] Organizational Structure, Sensitization, PDCA Cycles & Procurement	1) Capacity Self-Assessment (one opportunity to learn new activities by using checklists, etc.)	●	●	●	●	●	●	■	■	■	Every year for the last 2 years
	2) Preparation of Medium-term/Annual NRW Reduction Plans	●	●	●	●	●	●	■	■	■	Every year for the last 3 years
	3) Preparation of Annual Activity Review Sheet	●	●	●	●	●	●	■	■	■	Every year for the last 2 years
	4) Monthly inter-departmental Meetings for NRW Reduction	●	●	●	●	●	●	■	■	■	Supporting through PICs as well
	5) Organizational Improvement		●	●	●	●			■	■	Including the improvement of coordination between NRW-related technical & commercial sections
	6) Selection & Procurement of NRW-related Survey Equipment, Customer Meters, Bulk Meters, etc.	●	●	●	●	●	●	■	■	■	Lecture & discussion on the selection, and procurement by MWS, WSP, JICA Kenya Office & JICA Experts
	7) Internal Standardization of Service Connections including the Use of HDPE Pipes	●	●		●		●		■	□	Leak tests using hand pumps will be promoted after the introduction of HDPE pipes
[B] GIS, NRW Monitoring, Zoning & Water Balance Analysis	1) Creation/revision of Base Maps covering Whole Service Area for Desktop & Mobile GIS	●	●	●	●	●	●	■	■	■	GIS-related activities which need the targeting of whole service area and continuous engagement
	2) Initial Establishment of GIS Data for Water Supply Facilities						●	■	■		
	3) Improvement of GIS Data for Water Supply Facilities	●	●	○	●	●	●	■	□	□	
	4) Utilization of GIS Data using Free Software	●	●	●	●	●	●	□	□	■	
	5) Improvement of the Accuracy of Bulk Meters	●	●		●		●			□	Conducted especially in Embu WSP
	6) Planning of the Zoning of Entire Distribution Networks	●	●	●		●	●	□	□	□	The distribution systems in Nakuru WSP have been divided into 5 zones with support from VET.
	7) Establishment of Zonal NRW Monitoring System (e.g. using software module or Excel)	●	●	○		○	●	□	□	□	
	8) Checking the Credibility of Water Balance Table created by International Consults, etc.		●	●					■		Their credibility was confirmed to be very low.
	9) Analysis on WSP's Monthly Data of Main Performance Indicators for the Last 3 Years or More (as an alternative of water balance table)	●	●	●	●	●	●	■	■	■	Including analysis by zone and with additional factors in Kisumu, Nakuru, Nyahururu & Kilifi-Matiakani.

Table 4.2(2/2) Main NRW-related Activities implemented or to be implemented in Phase 3 by Project Team (Part of Categories C&D)

Category	Assisted Activity	Timing of Assistance, WSP Area & Pilot WSP									Note
		Mainly Phases 1 & 2		Mainly Phase 2				Mainly Phase 3			
		Tana		LVS	RV	Athi	North orn	Tanathi	LVN	Coast	
		Meru	Embu	Kisumu	Nakuru	Ruiru- Juja	Nyahur- uru	Mavoko	Eldoret	Kilifi- Mariakani	
[C] Reduction of Commercial Water Losses (i.e. Data Handling & Meter Accuracy Errors, and Illegal Uses)	1) Categorization of All the Customers by Average Billed Consumption over 12 Months or More, and Analysis of Frequency & Continuity in Estimating Customer Consumption by Comparing Metered & Billed Consumption (the underestimation of large customers' consumption increases NRW significantly)	●	●	●	●	●	●	■	■	■	Targeting the Entire Service Area from the Beginning while Prioritizing Larger Customers
	2) Accuracy Test and Replacement of Large & Medium Customers' Faulty Customer Meters	●	●	●	●	●	●	□	□	□	
	3) Analysis of Meter Reading & Billing Data for One Month to Confirm the Reduction of Estimated Consumption	●	●	●	●	○	●	□	□	□	
	4) Customer Identification Survey (CIS) including the Collection of Coordinates at Customer Meters		●	●	●	●	●	■		□	
	5) Identification & Prevention of Illegal Water Use (including illegal reconnections)	●	●				●			□	
	6) Installation, Improvement & Use of Hand-made Meter Test Bench	●			●	●	●	■		□	
	7) Improvement of Customer Metering (including the preparation of training materials for meter readers)	●	●	●	●	●	●	□	□	□	
	8) Smart Metering (e.g. use of multifunctional ultrasonic & electromagnetic flow meters, radio transmission of meter reading results, etc.)			●		●			■		
[D] Reduction of Physical Water Losses (i.e. Bursts, Leaks & Overflows)	1) Minimum Night Flow Measurement & Step Test in Pilot Areas	●	●	●	●	●	●	□	□	□	First in Pilot/Priority Areas, then Expansion over Other Areas if Necessary
	2) Leak Detection using Listening Sticks, etc.	●	●	●	●	●	●	□	□	□	
	3) Use of the Logging Functions of portable UFM (and/or alternative video recording technique)	●	●	●	●	●	●	□	□	□	
	4) Measurement of Water Pressure	●	●	○	●	●	●	□		□	
	5) Pressure Improvement in Distribution Systems (including the pressure reduction to decrease leak)	●	●	●			●			□	
	6) Use of Data Collection Software (Kobo Toolbox/Collect) for Recording of Bursts & Leaks	●	○			○	○	□	□	□	
	7) Replacement of the Old Pipes Especially Causing Large Leaks and Frequent Bursts						●	□	□	□	Viewing all the pipelines to identify priority pipes to replace

[Note] ●: Activity of the 6 WSPs (main targets of Phases 1 & 2) which JICA Experts have already supported or have been supporting.  
 ○: Activity of the 6 WSPs (main targets of Phases 1 & 2) which JICA Experts have intention to support in Phase 3 based on the WSP's needs.  
 ■: Activity of the remaining 3 WSPs (main targets of Phases 3) which JICA Experts have already supported or have been supporting.  
 □: Activity of the remaining 3 WSPs (main targets of Phase 3) which JICA Experts have intention to support in Phase 3 based on the WSP's needs.

#### **4.2.5 Output 5**

##### **(1) Continuation of knowledge sharing at the WASPA's regular meetings (Activities 5.1)**

The project will continue sharing the results of Outputs and case studies during WASPA's regular meetings and benchmarking workshops.

##### **(2) Implementation of Thematic workshops (Activities 5.2)**

Based on the experience acquired in Phase 2, the project will formulate and implement thematic workshops by incorporating suggestions from C/P and WSPs. The next thematic workshop will be planned in August, 2020.

##### **(3) Production of Project Brief Notes (Activities 5.3)**

Brief Notes will be published twice during Phase 3 (mid-2020 to mid-2021).

#### **4.2.6 Other activities to be implemented in Phase 3**

##### **(1) Supporting Regional Cooperation of Water Services Entities in East Africa**

Project Team will support the holding of a seminar planned in Kenya in the year 2020. The participating countries are Kenya, Rwanda, and Malawi.

##### **(2) Training in Japan**

Based on the training in Japan held in Phase 2, a similar training will be implemented for technicians in charge of NRW reduction from some Pilot WSPs. The training intends that the trainees can obtain applicable knowledge and skills on NRW reduction through lectures combined with theories, participatory exhibitions and site observations in the various institutions and companies in Japan. Tentative program of the training is shown in Table 4.3 which is scheduled in early December, 2020.

Table 4.3 Training in Japan for Technicians in charge of NRW reduction in some Pilot WSPs

Program	Lecturer	Themes	Period (days)
Orientation and Briefing	JICA, TSS	Orientation of the Program	1
Lectures	Tokyo Water Works Bureau and related Institutions and firms	Lecture; Water Service in Japan (Strategy, financial balance, water tariff, regulation) NRW managing technology	1
Site inspection of Treatment plant and related facilities	Tokyo Water Works Bureau and related Institutions and firms	Site inspection; Water treatment plant and water supply operation center, Sustomer service center, etc.	3
Inspection of construction site of Water Meters or other measuring equipment	Tokyo Water Works Bureau and related Institutions	Site inspection, Construction management, Mapping system, etc.	2
Lecture and inspection of pipe manufacturing process	Manufacturer	Selection of pipes and fittings materials and Site inspection on Manufacturing process of pipes and fittings	1
Lecture and inspection of valvs manufacturing process	Manufacturer	Selection of valves and related materials and Site inspection on Manufacturing process of valves and related materials	1
Lecture and inspection of water meters manufacturing process	Manufacturer	Selection of customer meters and related fittings and Site inspection on Manufacturing process of meters and related fittings	1
Day off or transporting			4
Total days			14

### (3) Procurement of Equipment by Project Team

In relation to indicator 4.6 of RD of the project "The amount of NRW in the selected distribution zones indicates decreasing tendency", JICA Kenya office has procured and delivered 4 bulk meters for measuring water supply volume for some specially selected service zones of 3 Pilot WSPs in Phase 2. Upon this occasion it is also supposed to procure 2 pressure releasing valves (PRV) for the zone where NRW can be reduced by installing them for water pressure reduction in the pipelines, however, it was not realized. In Phase 3 the Project Team has to procure the PRVs instead of JICA Kenya office based on confirmation of the current situation and making plans for number of PRVs, installation areas, etc. Upon acceptance on the plan by JICA the team can buy them at the local market.

### 4.3 Activity Schedule for Phase 3

The activity schedule for Phase 3 for implementing the above activities is shown in the work plan table in Table 4.4.



Table 4.4 | Table 4.4 Work Plan for Phase 3

Phase		3rd Phase																							
Year		2019						2020						2021											
Month	Expert Name	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
	Chief Adviser/NRW management 1 Mr.Masayuki TAGUCHI																								
	NRW reduction specialist 2 Mr.Noboru SAITO																								
	Water distribution Network (Mapping & Network analysis) Mr.Shozo MORI																								
	Flow, Pressure and Leakage Monitoring (No.1) Mr.Junichi TAKAHASHI																								
	Flow, Pressure and Leakage Monitoring (No.2) Mr.Shinichi SEKIMOTO																								
	Customer and Billing Management (No.1) Mr.Toshio KANO																								
	Customer and Billing Management (No.2) Mr.Naoki HARADA																								
	Information/Public relation management Ms.Hiroko SUGIMOTO																								
Expert Assignment		Activity Plan																							
	Promotion and coordination of NRW reduction activities by MWS NRW Unit are strengthened.																								
	1.1 MWS NRW Unit, in cooperation with WASREB, produces NRW annual reports which include NRW reduction data.																								
	1) To collect information for NRW annual report in cooperation with WASREB.																								
	2) To produce a plan for the report including budget and authorize it in the MWS.																								
	3) To consult the plan of the report with JICA and to feedback the result to the plan.																								
	4) To collect the related data, articles and photos for editing the report.																								
	5) To edit the report.																								
	6) To print the report.																								
	7) To launch and deliver the reports in collaboration with WASPA or other functions.																								
	8) To review the content of the report and a work procedure taken in the previous year.																								
	9) To reproduce a plan for the NRW annual report for the next year.																								
	1.2 MWS NRW Unit plans and implements NRW reduction sensitization activities for the Counties.																								
	1) To collect related information for producing a plan for sensitization activities.																								
	2) To produce a plan for sensitization workshops including budget.																								
	3) To make preparatin works for the sensitization workshop in accordance with the plan.																								
	4) To conduct the sensaization workshop every year.																								
	5) To review the past sensitization plan and to feedback the results to the next plan.																								
	6) To revise the same plan considering above reviews and feedback → to go to 3) above.																								
	1.3 MWS NRW Unit plans and implements NRW reduction campaigns.																								
	1) To collect related information for producing a plan for public campaign in pilot WSPs.																								
	2) To produce a plan for the public campaign in pilot WSPs including budget.																								
	3) To make preparatin works for the public campaign in accordance with the plan.																								
	4) To conduct the public campaign in accordance with the plan twice a year.																								
	5) To review the past public campaign plan and to feedback the results to the next plan.																								
	6) To revise the same plan considering above reviews and feedback → to go to 3) above.																								
	1.4 MWS NRW Unit ensures the budget for the activities based on the NRW reduction annual plan for each output																								
	1) Each C/P applys budget for its activities to MWS NRW Unit based on its annual plan.																								
	2) The NRW Unit analyzes and finalizes the budget.																								
	3) The NRW Unit ensures necessary budget for various activities to be done by the C/Ps.																								
	4) To disburse the budget in accordance with the authorized schedule by the MWS.																								
	1.5 MWS NRW Unit conducts reviews of KEWI NRW courses.																								
	1) To collect related information for reviewing KEWI's NRW training course.																								
	2) To conduct annual review for KEWI NRW courses based on the data collected.																								
	3) To recommend KEWI to improve the NRW course based on the results of the review.																								
	1.6 MWS NRW Unit conducts reviews of WASREB's NRW reduction activities.																								
	1) To collect related information for reviewing WASREB's NRW activities.																								
	2) To conduct annual review for WASREB's NRW activities based on the data collected.																								
	3) To recommend WASREB to improve the NRW activities based on the above reviewing.																								
	Use of NRW reduction standards by Urban WSPs are promoted by WASREB.																								
	2.1 WASREB conducts survey of the usage of current NRW reduction standards.																								
	2.2 Based on the survey result as well as Output 4 and 5, WASREB revises the NRW Reduction Standards.																								
	1) To produce a plan for revision of the Standards including the policy and measures.																								
	2) To abstract and identify the revising points of the Standards.																								
	3) To conduct revision of the Standards.																								
	4) To print the documents of the new Standards.																								
	2.3 WASREB promotes desismination of the revised NRW standards through workshop(s).																								
	1) To produce a plan for desismination of the new Standards.																								
	2) To deliver the new Standards through the manners of workshops or Web-site, etc.																								
	2.4 WASREB incorporates the review results of NRW reduction activities by MWS NRW Unit in their activities.																								
	1) To review the plan of revising the Standards based on the suggestion of NRW Unit.																								
	2) To report the results of the above review to MWS NRW Unit.																								
	2.5 WASREB monitors and evaluates the usage of revised NRW standards.																								
	1) To make a plan for monitoring and evaluation on usage of the new Standards by WSPs.																								
	2) To conduct the above monitoring and report the results to MWS NRW Unit.																								







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**Annex-2: PROJECT MONITORING SHEET VER. 7**  
**TO CR of JICA Kenya OFFICE**

**PROJECT MONITORING SHEET Ver. 7**

**Project Title: THE PROJECT FOR STRENGTHENING CAPACITY IN NON-REVENUE WATER REDUCTION (Phase 3)**

**Version of the Sheet: Ver. 7 (Term: Aug. 2019 – Jan. 2020)**

**Name: Masayuki TAGUCHI**

**Title: Chief Advisor**

**Submission Date: Feb 5, 2020**

**I. Summary**

**1 Progress**

**1-1 Progress of Inputs**

**Input by Japanese Side**

Total Man Months (M/M) hereunder are calculated from August, 2019 to January, 2020. In case MM of experts in Phase 3 exceeds beyond the end of January, M/M until the ending day of the dispatch is counted.

Expert	Phase 2	Phase 3
Mr. Taguchi	From 14 <sup>th</sup> Jul. to 31 <sup>nd</sup> Aug (1.63 M/M)	From 6 <sup>th</sup> Nov. to 15 <sup>th</sup> Dec., from 12 <sup>th</sup> Jan. to 8 <sup>th</sup> Mar. (3.23 M/M)
Mr. Saito	From 23 <sup>rd</sup> Jul. to 21 <sup>st</sup> Aug (0.97 M/M)	From 21 <sup>st</sup> Jan. to 20 <sup>th</sup> Feb. (1.03 M/M)
Mr. Mori	-	From 27 <sup>th</sup> Nov. to 18 <sup>th</sup> Dec.(0.73 M/M)
Mr. Sekimoto	-	-
Mr. Harada	-	From 19 <sup>th</sup> Nov. to 18 <sup>th</sup> Dec. (1.00 M/M)
Mr. Takahashi	-	From 15 <sup>th</sup> Jan. to 15 <sup>th</sup> Mar. (2.03 M/M)
Mr. Shibazaki	From 31 <sup>st</sup> Jul. to 24 <sup>th</sup> Aug (0.83 M/M)	-
Ms. Sugimoto	13 days from 5 <sup>th</sup> Aug. to 30 <sup>th</sup> Aug. by working on requirement of the Project (0.63 M/M)	-

Total	4.06 (M/M)	8.02 (M/M)
Local staff: 2 Engineers, 1 Secretary	From 1 <sup>st</sup> Aug. to 30 <sup>th</sup> Sep. (6.0 M/M)	From 7 <sup>th</sup> Nov. to 31 <sup>st</sup> Jan. (11.4 M/M)

### Input by Kenyan Side

Project CPs: Number of Counterpart (CP) members that participated in the reporting period is 104 representing the following organizations.

MWS&I (6), WASREB (5), KEWI (10), WASPA (5), Meru WSP (10), Embu WSP (11) Nyahururu WSP (9), Nakuru WSP (8), Ruiru-Juja (6), Mavoko (7), Eldoret (8), Kisumu (10), Kilifi-Mariakani (10)

Facilities: Project office at MWS&I and KEWI as well as regular meeting rooms were provided. Vehicles for Kenyan C/Ps' field visits were provided.

Project implementation costs: The traveling costs and per diem for MWS&I/KEWI/WASREB staff were supposed to be provided by MWS.

### **1-2 Progress of Activities**

Activity	Progress
<b>Output 1</b>	
1-1 MWS&I NRW Unit, in cooperation with WASREB, produces NRW annual reports which include NRW reduction data.	Articles for 2 <sup>nd</sup> version of the annual report 2018/2019 are being collected. This report is intended to be published in March, 2020.
1-2 MWS&I NRW Unit plans and implements NRW reduction sensitization activities for the Counties.	2 <sup>nd</sup> County sensitization workshop was held in Nanyuki town in November, 2019. The 3 <sup>rd</sup> one is under preparation in Kisumu city in near future.
1-3 MWS&I NRW Unit plans and implements NRW reduction campaigns.	School visits to Water Treatment Plants were held by Embu WSP on 23 <sup>rd</sup> January 2020. Other WSPs, such as Meru, Murang'a, Nakuru rural and Mathira are preparing the same.
1-4 MWS&I NRW Unit conducts reviews of KEWI NRW courses.	KEWI 's Non-Revenue Water course was reconstituted by suggestions and recommendations given by the MWS&I NRW Unit and other counterparts.
1-5 MWS&I NRW Unit conducts reviews	Revision of WASREB's NRW management standards is

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of WASREB's NRW reduction activities.	ongoing in collaboration with MWS&I NRW Unit and other C/Ps.
1-6 MWS&I NRW Unit assures the budget for the support mechanism based on its NRW reduction mid-term vision.	Budget for the NRW related activities for 2019/2020 was approved by the MWS&I Principal Secretary. The activities are being implemented in accordance with an action plan prepared by the NRW Unit.
<b>Output 2</b>	
2-1 WASREB conducts survey of the usage of current NRW reduction standards.	Completed in Phase 2.
2-2 Based on the survey result as well as Output 4 and 5, WASREB revises the NRW reduction standards.	The revision work of the Standards is ongoing by the Editorial Committee. It is intended to complete the new standards I around May 2020.
2-3 WASREB promotes revised NRW reduction standards through workshop(s).	To be implemented after the completion of the new standards.
2-4 WASREB incorporates the review results of NRW reduction activities by MWS&I NRW Unit in their activities.	MWS&I NRW Unit is collaborating with WASREB as the members of the editorial committee.
2-5 WASREB monitors and evaluates the usage of revised NRW standards.	The methodology of the monitoring and evaluation will be decided in the editorial committee and implemented in 3rd Phase.
<b>Output 3</b>	
3-1 KEWI studies current status of NRW reduction courses and its challenges.	Completed in Phase 1
3-2 KEWI reviews NRW reduction training strategies and course contents.	Completed in Phase 2
3-3 KEWI, in collaboration with leading WSPs (Embu and Meru, etc.), conducts on-site NRW trainings.	OJT at EWASCO was combined into the reconstituted NRW reduction short training course. The course is now being conducted as a regular course of KEWI.
3-4 KEWI reflects on-site NRW trainings into NRW course contents and materials.	Completed in Phase 2.
3-5 KEWI incorporates the results of review by MWS&I NRW Unit into NRW course contents.	Completed in Phase 2.
3-6 KEWI conducts trace studies of NRW	KEWI conducted some trace studies for trainees of

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reduction course participants.	WSPs in Phase 2 as reported in the progress report 2.
<b>Output 4</b>	
4-1 The Project team conducts a survey of Urban WSPs and selects pilot Urban WSPs.	Activity was completed in Phase 1.
4-2 Each Pilot WSP conducts analyses of current NRW reduction activities and identifies its challenges.	Activity was completed in Phase 1.
4-3 Each Pilot WSP identifies measures to solve challenges.	The all 9 pilot WSPs formulated their own NRW reduction annual plan 2019/2020 then each of them decided their annual targets to be achieved during the year.
4-4 Each Pilot WSP formulates the NRW reduction plan including financial plan.	
4-5 Each Pilot WSP implements the NRW reduction plan.	<p>In Embu WSP, collecting and uploading of pressure data from the selected pressure points in zone 2 using ODK was done which will later be useful for the pressure management exercise in the zone. They are waiting for PRVs to be procured so that they can be fixed in their rightful places.</p> <p>They have planned to conduct Minimum Night Flow measurement in zone 2 by the end of this month to establish the amount of water loss.</p> <p>Large and small customer meter survey on stalled, opaque and mal-functional meters is on-going. They have bought 2000no.meters for this exercise and have so far replaced 400no.meters which were found to be faulty after servicing and testing.</p> <p>Data clean up is on going and have started with those accounts that have not been billed for over 6 months.</p> <p>They are in the process of procuring Air valves for replacement and this is after they noticed that they are losing a lot of water on leaking air-valves along main and service lines.</p>





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	<p>Nyahururu, Nakuru, Ruiru-Juja and Kilifi-Mariakani WSPs have set up their improvised meter test benches which they are currently using to test meters after were trained on their usage by the JICA expert team.</p> <p>Nyahururu WSP is currently conducting a customer Identification Survey at Rumuruti scheme which is meant to assist in data clean up, location and identification of customer meters which will assist them to improve on their billing.</p> <p>Eldoret WSP has recently acquired some new leak detection equipment which they are to start using soon after the training on how to use by the JICA team.</p> <p>They are also concentrating on meter testing, resizing, relocation and replacement of the stalled and faulty meters prioritizing the large consumers which seems to be yielding some good results with an improvement in billing of at least 3 to 4 times on the acted-on connections.</p> <p>Meru, Nyahururu, Nakuru, Kisumu and Ruiru-Juja are mainly concentrating on large customer monitoring, Step testing and Minimum Night Flow measurements (e.g. Nyalenda and Dunga areas in Kisumu, Zone 8 lower in Meru, Naka Estate in Nakuru and Manguo Estate in Nyahururu). Kilifi – Mariakani is mainly dealing with customer meter servicing, testing and replacement of the mal-functional meters. So far 95 of the planned 300 customer meters have been replaced as at end of December 2019. Replacement of some of their old dilapidated AC pipes is on going with the World Bank funding the replacement of pipeline service mains to the customer premises mainly at BOFA area.</p>
<p>4-6 Each Pilot WSP evaluates and analyzes implementation results and revises the plans.</p>	<p>All the 9 pilot WSPs formulated their NRW reduction plans for 2019/2020 in July 2019 after evaluation and analysis of the previous year. Each pilot WSP is to</p>

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4-7 Each Pilot WSP produces the NRW reduction activity report annually.	evaluate and report the progress to WASREB as the progress as at end of the second quarter. The activities will be continued in accordance with the reviewed plans.
4-8 Each Pilot WSP holds regular NRW reduction meetings attended by relevant departments of WSP.	The all 9 pilot WSPs are holding inter-departmental meetings including staff of the relevant departments on a monthly basis. The members of the WSPs are realizing the effectiveness of the inter-departmental meetings.
<b>Output 5</b>	
5-1 The project presents results and lessons of Output 4 and other NRW activities during WASPA meetings.	JICA Expert team supported a High-Level Panel Meeting which was organized by WASPA in Embu on Oct 30 <sup>th</sup> 2018. Subsequently, NRW reduction trainings were conducted with the support of JICA Experts until 2 <sup>nd</sup> Nov, 2018.
5-2 The Project holds NRW thematic workshops in coordination with WASPA.	1 <sup>st</sup> NRW thematic workshop was held in August 2019 highlighting on illegal use of water. It was highly praised by the participants. 2 <sup>nd</sup> workshop is planned to be held around August 2020.
5-3 The Project team produces brief notes.	Draft of 2 <sup>nd</sup> brief note (Japanese) will be completed in May 2020.

**1-3 Achievement of Output**

Output 1: Promotion and coordination of NRW reduction activities by MWS&I NRW Unit are strengthened.	
1-1 All County representative participate NRW related seminar(s).	NRW Unit made a plan for county sensitization and implemented it as planned. The 2 <sup>nd</sup> seminar was held in Nanyuki Town in November, 2019.
1-2 NRW reduction campaigns are conducted semi annually.	Embu WSP facilitated a school visit to its Water Treatment Plants on 23 <sup>rd</sup> January 2020 as the first case among some candidate WSPs.
1-3 NRW reduction annual reports are produced.	2 <sup>nd</sup> NRW Annual report is intended to be complete in March, 2020.
Output 2: Use of NRW reduction standards by Urban WSPs are promoted by WASREB	
2-1 NRW reduction standards are revised	Editorial Committee is working on producing new







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by 2020.	standards around May 2020.
2-2 Revised NRW reduction standards are disseminated to all Urban WSPs through workshop(s).	A plan for dissemination of the standards will be discussed in the Editorial Committee before completion of the standards.
<b>Output 3: NRW related training capacity of KEWI is strengthened.</b>	
3-1 KEWI conducts NRW reduction courses with contents incorporating on-site trainings and revised course materials.	Completed in Phase 1.
3-2 The average score of the participants on the test conducted after the NRW reduction course is higher than before the implementation.	Achieved satisfactorily in Phase 2.
<b>Output 4: NRW planning and/or implementation capacity of Pilot WSPs is enhanced.</b>	
4-1 More than 8 Pilot WSPs formulate NRW reduction plans.	All 9 Pilot WSPs formulated the plans for the financial year 2019/2020 in June 2019 and are now implementing them. Before formulation of the current plans, each pilot WSP reviewed the activities done in the previous year.
4-2 More than 6 Pilot WSPs self-review their achievements of Previous year's NRW reduction plans and compile activity report.	
4-3 Based on 4-2, more than 6 Pilot WSPs continuously formulate annual NRW reduction plans.	
4-4 More than 6 Pilot WSPs continuously implement NRW reduction plan formulated in 4-1.	
4-5 More than 6 Pilot WSPs are able to use skills and/or implement activities which they could not employ before the project.	All 9 Pilot WSPs have now adapted and are using various skills and activities newly introduced in accordance with Experts' support or guidance.
4-6 The amount of NRW in the selected distribution zones indicates decreasing tendency.	The pre-selected zones or areas by the Expert team for trials in some Pilot WSPs will have the activities implemented during this phase as planned.
<b>Output 5: Experiences and knowledge of NRW reduction activities are shared among Urban WSPs.</b>	
5-1 Results and lessons from Output 4 and NRW activities are shared during WASPA meetings at least 3 times a year.	Expert team provided a lecture in WASPA's NRW Benchmarking workshop of held in Nyeri town in November 2019. The team introduced a good example about analysis of customer meter reading and billing data and the significant role it played in reducing commercial losses in Nakuru WSP.

5-2 A NRW thematic workshop is organized every year.	Planning Ongoing
5-3 3 brief notes are produced during the project.	Version 1 (Japanese) is complete.

**1-4 Achievement of the Project Purpose**

Project Purpose: A NRW reduction support mechanism is established for Urban WSPs to implement NRW reduction Activities.	
Indicator	Achievement
6 Pilot Urban WSPs continue achieving target set by the NRW reduction plan for two years.	In August 2019 6 Pilot WSPs set up their own special targets to be achieved during the year 2019/2020. The six WSP are; Embu, Meru, Nyahururu, Nakuru, Ruiru-Juja and Kisumu. They have reviewed their half year achievement and reported to Expert team as per annex 1.

**1-5 Changes of Risks and Actions for Mitigation**

Procurement of the NRW equipment for Pilot WSPs has not been implemented as promised in the 6<sup>th</sup>JCC. This is a real risk that will affect NRW reduction activities especially for 3 Pilot WSPs which joined full scale in Phase 3. By January 2020 JICA Experts team had returned NRW detecting equipment to Narok and Kapsabet WSPs which kindly had been lending the project in Phase 2. Therefore, there is a serious concern on insufficient technical transfer for the 3 Pilot WSPs during Phase 3. JICA Experts therefore requests the MWS&I NRW Unit to ensure the procurement of equipment as soon as possible.

**1-6 Progress of Actions undertaken by JICA**

JICA has been providing continuously 2 project vehicles. Representatives from JICA Kenya office have been attending JCC meetings.

**1-7 Progress of Actions undertaken by GoK**

As mentioned above, the procurement of the equipment has been delayed for Phase 3. GoK is requested to be more vigilant on procurement so as not to affect the activities of the Project.

**1-8 Other remarkable/considerable issues related/affect to the project (such as other JICA's projects, activities of counterparts, other donors, private sectors, NGOs etc.)**

Participation to the Executive Forum for Sustainability of Urban Water Service in Sub-Saharan Africa held on 13<sup>rd</sup> and 14<sup>th</sup> November, 2019 in Rwanda.

This forum was conducted by about 100 participants from 8 countries in Africa. 3 MDs of Pilot WSPs such as Embu, Kisumu, and Nakuru participated representing Kenyan project with Mr. Taguchi, Expert team. The forum consists of presentations from all the representatives of 8 countries with its keynote presenter, Mr. Matsumoto JICA Tokyo head quarters on the 1<sup>st</sup> day and group discussions on several themes on the 2<sup>nd</sup> day. It became a very meaningful and valuable experience for every participant. There are many opinions for the same forum to be continued in future among the participants.

**2 Delay of Work Schedule and/or Problems (if any)**

There are the following delays of activities during the reporting period.

2-1 Detail	2-2 Cause	2-3 Actions Taken
Procurement of the equipment required for the implementation of NRW reduction activates at WSPs.	As mentioned in 1-5 above.	As mentioned in 1-5 above.

**2-4 Roles of Responsible Persons/Organization (JICA, GoK etc.)**

Indicated above.

**3 Modification of the Project Implementation Plan**

**3-1 PDM and PO**

None in 7<sup>th</sup> JCC.

**3-2 Other modifications on detailed implementation plan**

*(Remarks: The amendment of R/D and PDM (title of the project, duration, project site(s), target group(s), implementation structure, overall goal, project purpose, outputs, activities, and input) was authorized by JICA HDQs. If the project team deems it necessary to modify any part of R/D and PDM, the team may propose the draft.)*

**4 Preparation of GoK Outlook after completion of the Project**

Discussion has to be done among C/Ps for dissemination of the NRW reduction in entire country (Kenya) including supporting system for all the other WSPs after the Project.



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**Annex-3: ATTENDANCE LIST****7<sup>th</sup> JCC MEETING**

S/No	Name	Organization	Position
1.	Eng. SAO ALIMA	MWS&I	Water Secretary
2.	Eng. VICTOR NJERU	MWS&I	NRW HEAD
3.	Eng. CHEPYEGON CHEMERIL	MWS&I	NRW UNIT
4.	Mr. ANDERSON N. KIOI	MWS&I	NRW UNIT
5.	Ms. PATRICIA MUTUA	MWS&I	NRW UNIT
6.	Mr. GODFREY KINGWEI	MWS&I	INTERN
7.	Mr. MIYAGAWA Masahito	JICA KENYA	SENIOR REPRESENTATIVE
8.	Mr. YASUDA Tomoyuki	JICA KENYA	SENIOR REPRESENTATIVE
9.	Ms. YOSHII Yumiko	JICA KENYA	REPRESENTATIVE
10.	Mr. JOHN GITAU	JICA KENYA	PROGRAMME OFFICER
11.	Ms. MERCY MOROGO	COG	
12.	Ms. MAUREEN ADHIAMBO	COG	
13.	Eng. DANIEL NGUGI	WASREB	TECHNICAL OFFICER
14.	Mr. ANTONY AMBUGO	WASPA	CEO
15.	Mr. DAVID NG'ETICH	KEWI	DEPUTY DIRECTOR
16.	Mr. WALTER MOSETI	KEWI	LECTURER
17.	Eng. FELIX G. MUTUURA	EWASCO	HTS
18.	Mr. JOSEPH IRUNGU	EWASCO	NRW SUP
19.	Mr. ROBERT MIRURI	MEWASS	GM
20.	Mr. WILLIAM MWENDA	MEWASS	NRW OFFICER
21.	Mr. JOSEPH GITAU	NYAHUWASCO	TM
22.	Mr. HEZEKIAH MWARUA	KIMAWASCO	MD
23.	Mr. PASCAL JIRA	KIMAWASCO	TM
24.	Mr. ROBERT GATATA	KIMAWASCO	HNRW
25.	Dr. PAUL MURGOR	ELDOWAS	MD

D.K.

26	Mr. ALEX KEMBOI	ELDOWAS	NRW OFFICER
27	Mr. JOB LIECH	KIWASCO	NRW ENGINEER
28	Ms. MARY MWANGI	RUJWASCO	TM
29	Mr. ZADRIAN ANGWENYI	RUJWASCO	HNRW
30	Ms. ELIZA NDUTA	RUJWASCO	GIS
31	Mr. MICHAEL MANGELI	MAVWASCO	MD
32	Mr. JAMES NYAUMA	MAVWASCO	HNRW
33	Mr. LEONARD MUTAI	NAWASCO	ILLEGAL USE SUP.
34	Mr. JOHN WACHIRA	NAWASCO	O&M SUP.
35	Mr. TAGUCHI Masayuki	JICA EXPERT	CHIEF ADVISOR
36	Mr. SAITO Noboru	JICA EXPERT	
37	Mr. GEORGE KARANJA	JICA EXPERT	
38	Mr. CHARLES MAINGI	JICA EXPERT	
39	Ms. KELLYJOY GAKII	JICA EXPERT	

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