International Training of Trainers on Urban Climate Resilient Water Safety Plan
(CR-WSPs for Urban water supplies)
Capacity building training for implementation of the project

16-19 Dec. 2014

Intercontinental International Hotel, Addis Ababa, Ethiopia

Summary Report:

Background

Water sector is one of different sectors affected by weather variability and climate change. Climate change and variability impact water sector with significant consequences. In Ethiopia, climate change is expected to intensify the already high hydrological variability and frequency of extreme events. Given a large part of the country is arid or semi-arid and highly prone to drought and desertification, a further decrease in precipitation could increase the frequency and intensity of droughts in the country. Reduction in rainfall may cause reduce ground water recharge, which would significantly reduce its contribution to stream flow. Recurrent flooding can have also long-term negative effects on agriculture and destroying basic social services including existing water supply schemes. Water born disease mainly diarrhea, including outbreak of AWD in the past and malnutrition are also among the major public health problems linked to weather variability and climate change.

Despite the country has water quality standards, no regular water quality control, monitoring & surveillance is in place except in ad hoc situation mainly due to lack of resources , knowledge and technical skill gaps from national down to schemes level among the water & health sector , & other competing priority. Ad hoc water quality surveillance in most cases following outbreak events. It is clear that traditional way of relying on end pipe water supply testing alone is not enough to ensure water safety. Thus, Water Safety Plan approach is instrumental in the continuous management of risks to water safety from catchment to consumer that help the community manage risks that threaten the water supply, taking steps (over time) to improve and sustain water safety using available resources.

As a capacity building this high level training of trainers is organized for the first time in the country that will definitely contribute to and bring the desired knowledge and technical skills in the design and implementation of Climate Resilient Water Safety Plan in the country. In order to enhance the capacity of the country in the area of climate adaption for the health sector, Ethiopia is among the four countries targeted for building adaptation to climate change in health in least developed countries through resilient WASH WHO/DFID project for over 3 years(2013-2016). The project constitutes 4 main outputs, of which output 3 is Climate - resilient Water Safety Plans (WSPs) design and implementation.

DAY ONE

Waltaji, from WHO Country Office, Co-facilitator of the training, welcome participants and invite Mrs. Semunesh Golla, Hydrology and Water Quality Directorate Director, Ministry of Water, Irrigation and Energy (MoWIE) to made opening remark/speech and highlighting the importance of designing and implementing Climate Resilient Water safety Plan approach in the country involving risk assessment and management of water supply from catchment to point of use. She also underlines that capacity at all level is one of the identified gap to design and implement Climate Resilient Water Safety Plan approach in the country. Hence, WHO/DFID support project titled 'Building Adaptation to Climate Change in Health in least developed countries through resilient WASH' has provided good opportunity to provide high level training of trainers organized for the first time in the country that will definitely contribute to capacity building of technical personnel as it bring about the desired knowledge and technical skills in the design and implementation of Climate Resilient Water Safety Plan in the country. Finally she expresses her wish that all participants and facilitators have successful training time.

Mrs. Semunesh also briefly present overview of Water Safety Plan in Ethiopia highlighting the following major points:

- Ethiopian Water Sector Policy and its fundamental principles
- Gaps in water quality including ad hoc water quality control, monitoring & surveillance in the country, lack of systematic & comprehensive water quality/safety management, low community involvement for water quality/ safety in terms of risk factor identification & mitigation.
- Some of common risks to drinking water in Ethiopia
- Water Safety Plan initiatives in Ethiopia: Joint Technical Review and Multi Sector Forum-5(MSF-5) prioritize water quality as one of major area of discussion and action. Hence, Government and WASH development partners reached consensus to address issue of water quality through implementing Water Safety Plan approach.
- Progresses made on design and implementation of Climate Resilient Water Safety Plan including policy and guideline development, developing concept note and detail plan of action on Climate Resilient Water Safety Plan pilot implementation, Capacity Building trainings, establishment of active climate resilient Water Safety Plan technical working group etc.
- Next step in the implementation of pilot Climate Resilient Water safety plan including: finalize, validate & get endorsed 3 documents on CR-WSP, conduct regional assessments related to Vulnerability & Adaptation, Implementation of CR-WSPs pilot on 6 selected water supply schemes, finalize training package for both Urban and Rural Water Safety Plan through support from WHO HQ, Continue/cascade capacity building trainings using contextualized CR-WSPs guidelines and training packages, etc.
- In conclusion Mrs. Semunesh underlined that Water Safety Plan is instrumental from catchment to point of use for drinking water supply service improvement including quality of water supply.

Mrs. Semunesh Golla, Hydrology and Water Quality Directorate Director, Ministry of Water, Irrigation and Energy

Angella, Core facilitator of the training from WHO HQ, presented the overall workshop overview and introduction to Water Safety Plan. She addresses the following:

- Briefly introduce her self-having ample practical experiences on Water Safety Plan design and implementation in general in different countries.
- Acknowledged Mrs. Semunesh, Hydrology and Water Quality Directorate Director, Ministry of Water, Irrigation and Energy for her brief and excellent presentation on the overview of WSPs in Ethiopia clearly indicating that WSP design and implementation is actually taking off in Ethiopia highlighting major points.
- Participants introduce each other through pairing with new colleague and briefly introduce one another to the larger group.
- Training objectives briefly presented including:
    - Get comfortable with the “nuts and bolts” of WSPs
    - Get familiar with WSP training package for future use
    - Learn from each other

Angella, Core facilitator of the training from WHO HQ

Agenda: Annex A

Participants: Annex B

- Ministry of Water, Irrigation and Energy
- Ministry of Environment and Forest
- Ministry of Health
- National Meteorology Agency
- Ethiopian Institute of Water Resources
- Addis Ababa Water and Sewerage Authority
- Bishoftu town water supply and sewerage service Enterprise
- Oromia Water, Mine, and Energy Resource Bureau
- SNNPR Water Resource development Bureau
- Amhara Water Resource Development Bureau
- Ethiopian Public Health Institute
- WHO Ethiopia
- Participants from Tanzania

1. The presentation focuses/geared on 10 steps of a Water Safety Plan.
   - On the first day the following steps of a WSP has been addressed:
     - Step 2. Describe the water supply system
     - Step 3. Identify the hazards and hazardous events
     - Step 4. Determine & validate control measures, assess & prioritize risk
   - In each step of a WSP, standardize and clear presentation was done using developed training materials by the facilitator considering the context of Ethiopia. Hence, the training program is based on a WSP document that has been developed by Ministry of Water, Irrigation and Energy with support from WHO. Ethiopia's "CR-WSP

implementation guidelines for urban systems" are based on a global reference document that has been customized to best suit the national context.

- In each step of a WSP, practical group exercises and thorough discussion was made to clearly understand and internalize the essence. This approach provide good opportunity to learn from one another
- Each participant is also provided with participant's handbook to facilitate the training.
- Introduction on WSP was also briefly presented focusing on the following points:
    - WSP Background
    - What is a WSP?
    - WSP approach with 3 Key objectives including:
        - Minimize contamination of source water
        - Reduce or remove contamination by treatment
        - Prevent contamination during storage, distribution & consumer practices
    - Why do we need WSPs? , limitations of relying on water testing alone and the need in bridging the gap between "improved" water supplies and "safe" water supplies
    - Benefits of a WSP

- **Step 2. Describe the water supply system**

  In this step the following key issues were addressed:
    - The main objective is to provide a detailed, up-to-date description of the complete water supply system, including system maps and diagrams.
    - Key actions include:
        - Identify intended users and uses of water
        - Provide detailed system information (including diagrams)
- **Step 3. Identify the hazards and hazardous events**

  In this step the following key issues were addressed:
    - The objective is to identify hazards/hazardous events that may threaten the safety and security of the water supply (i.e. consider what could go wrong, where and how).
    - Common hazardous events
    - Be specific in identifying hazardous event. A good hazardous event identification shall follow the formula of X happens *(to the water supply system)* because of Y.
    - When identifying hazards, consider each step in the water supply chain and ask:
        - What could potentially go wrong at this location? (What is wrong now, what has gone wrong in the past, and what could possibly go wrong in the future?)
    - The process of hazard identification should involve:
        - Field visits/site inspections
        - Desktop review of system diagrams
        - Consideration of past events/issues
- **Step 4. Determine & validate control measures, assess & prioritize risk**

  In this step the following key issues were addressed:
    - The objective is to identify existing control measures that protect against the hazards identified, validate the effectiveness of those controls measures, and assess risk to determine improvement needs.
    - Key actions include:
        - Identify existing control measures
        - Validate control measures
        - Assess risk

- Here real life practical exercises have been given to each group using prepared A3 size Risk Assessment Matrix used throughout the training session. Each group also presented their work to the larger group for further discussion so that all participants can understood and conceptualize key actions to be taken in determine, validate existing control measures, assess and prioritize risk.
- Risk = Likelihood X Consequence

Participants on group exercise

Day TWO

2. Pop Quiz given to participants so that they will work individually. After they completed, it was also reviewed and participants had good chance to test themselves on what has been done on the first day of the training and also to highlight important points in brief.

- Following the Pop Quiz, Step 5, 6, and 7 of a WSP has been addressed in the morning session:
- **Step 5. Develop, implement and maintain an improvement plan**

  In this step the following key issues were addressed:
  - The objective of this step is to develop, implement and maintain a detailed improvement plan to address all significant risks requiring additional control.
  - Following Step 3 and 4 of a WSP, Step 5 will be done to develop a detailed improvement plan to address the risks that require additional control measures.
  - A detailed improvement plan should consider:
    - Specific action to be undertaken
    - Responsible party
    - Due date
    - Budget
    - Resource constraints (financial, human)
    - Short-, medium- and long-term priorities
  - Practical examples and improvement planning exercises given to participants to understand on how best develop, implement and maintain an improvement plan to control identified hazards.

- There are some improvements that can be implemented immediately at little or no cost, while other improvements may require significant resources.
- The incremental improvement plan can be an excellent tool to attract government and external supporters to provide funding assistance.
- As the improvement plan is implemented, the following has to be updated as it is a continuous cycle.
  - The risk assessment table and
  - The improvement plan

- **Step 6. Define monitoring of the control measures**

  In this step the following key issues were addressed:
  - The objective of this step is to define and carry out a control measure monitoring plan (or operational monitoring plan) to confirm that control measures are working as intended.
  - Control measure monitoring (or operational monitoring) is helpful:
    - To confirm that the control measure continues to work
    - To allow for timely action to be taken in the event of a deviation to prevent water quality targets from being compromised
  - Practical examples and plenary exercise given to complete operational monitoring of rapid sand filter performance for each process step of water supply system mainly on the catchment, and water treatment plant.

- **Step 7. Verify the effectiveness of the WSP**

  In this step the following key issues were addressed:
  - The objective of this step is to demonstrate that drinking water quality standards are being met, consumers are satisfied and the WSP is complete, up-to-date and effective.
  - Verifying the effectiveness of a WSP include 3 important components
    - Compliance Monitoring
    - Auditing and
    - Consumer satisfaction
  - Example from Lao PDR was presented on how auditing is increasingly important and implemented in a WSP.
  - Different examples were also presented in particular experiences from Bhutan so that participants clearly understood and differentiate what operational monitoring and compliance monitoring refers.
  - Validation is different from Verification
  - Verification triangle game was given to participants so that they can match key terms with the definitions that enable participants to clearly know how verification process can be done in a WSP through understanding 3 basic components.

3. Field visit to Bishoftu water supply system and gain practical experience with some of the core steps of a WSP.
   - Field Trip instruction given by the trainer including:
     - Draw a system schematic, including as much system detail as possible. If necessary, create Level 1 and Level 2 drawings (group choice).
     - For each major process step visited (catchment/source, treatment works, storage/distribution and tap stands), should make observations and ask questions of staff in order to:

- Identify at least three hazardous events at each major process step ("X happens because of Y")
- Document existing control measures for each hazardous event (if any)
- Validate the effectiveness of those controls (may require imagination!)
- Assess the risk of each hazardous event

(In other words, complete the risk assessment table…) and

- Each group to deliver a 10 minute presentation on field trip findings. Groups should be prepared to present their system schematics and their risk assessment tables.
- Before the field trip, a participant (Mr. Degefu) from Bishoftu town water supply and sewerage service enterprise provided 10 minutes brief overview of the Bishoftu water supply system, including specific sites / process steps to be visited…

Field visit at Shimbra meda well filled site, during Bishoftu town water supply system visit

Presenting field visit findings using system schematic drawing and completing Risk Assessment table

Day Three

- The field visit provided participants to see practical aspect of what has been presented and discussed theoretically in the training. Each group has presented their findings using the risk assessment matrix including details of system schematic presentation that gives chance to learn one from the other.
- Risk assessment building blocks exercises has been given to each group so that they can properly construct risk assessment table and to correctly match/fit the given heading row of the risk assessment table and three listed examples accordingly.

4. Water Safety Plan Application briefly presented by Dr. Samuel Godfrey, Chief of WASH section, UNICEF Ethiopia.
    - He has briefly presented steps of a WSP process and practical application of WSP tool including experiences from Uganda and India WSP implementation. He focused mainly on distribution among different elements of the water supply system.

- **Step 8. Prepare management procedures**

  In this step the following key issues were addressed:
    - The objective of this step is to document management procedures to be followed during normal conditions, incident situations and emergencies, e.g. standard operating procedures (SOPs) and emergency response plans.
    - All systems require instructions on how to operate. It is important to have relevant management procedures clearly defined and accessible for use.
    - As brainstorm activities participants were asked to mention activities for which SOPs could be developed such as water sampling, water testing, pump maintenance, etc.

- **Step 9. Supporting Programs**

  In this step the following key issues were addressed:
    - The objective of this step is to develop supporting programs that contribute to drinking water safety
    - Examples of supporting programs include; consumer education, laboratory quality control, creating WSP awareness, operator training, equipment calibration etc.
    - A participant from Addis Ababa Water and Sewerage Authority briefly presented on how they are monitoring hazards to the water supply system in general and water quality monitoring practices in particular that enable participants to see practical examples of supporting programs in place.

- **Step 1. Assemble WSP team**
    - Mr. Yared presented on how best WSP team is formulated focusing on the following points:
        - Ethiopian approach to develop WSP teams at multiple levels; the importance of Advocacy
        - Identification and formation of Technical Working Group (TWG), and WSP team
        - Organization, roles and responsibilities of TWG, WSP team at all levels
        - Each group was asked to list members of a utility WSP team in their respective area with defined roles and responsibilities. This provides good opportunity to discuss and clearly identify possible WSP team members with expected responsibilities at utility level.

- **Step 10. Review WSP regularly**

  In this step the following key issues were addressed:

  - The objective of this step is to ensure that the WSP is up-to-date and effective and ensure that it reflects lessons learned from incidents and near misses.
  - WSP team should meet regularly to review all aspects of the WSP to ensure that the WSP is accurate and effective.
  - Participants were asked to specify WSP steps affected due to changes of activities made as a result of WSP revision. This exercise helps participants to understand the importance of regular WSP revision.

5. Angella briefly explain the importance of conducting baseline assessment/collecting baseline data to see the impact of WSP; to know the value added as a result of WSP implementation. Angella also shared revised water safety plan impact assessment data collection guidance note/tool to collect the necessary data for selected pilot CR-WSP implementation areas / water supply schemes for both urban utilities and community managed schemes.

Day Four

6. Mr. Waltaji, co-facilitator of the training, from WHO- Ethiopia Country Office did presentations on the following major issues:
   a. Overview of Climate Change

- The main objectives of this session include:
  - To create awareness among the participants on terms related to climate change and its impact on water supply
  - To get familiar with the climate change risk to water supply in Ethiopia
  - To facilitate how climate change impact risk will be considered in WSPs approach/ steps
- As brainstorming exercise participants were asked with the following key questions and discussed thoroughly to understand the issues
  - What is the relationship between Climate Change and Weather?
  - What are the climate characteristics?
  - How do we know change in climate characteristics observed and change to be occurred in the future(2100)
  - What are the distinctions between natural climate fluctuations & climate change?
  - What do we mean by Water Resource
  - Reliability of Water Supplies Services as to:
    - Coverage, Quantity, Quality, Reliability/ Continuity, Risk identification & management, Affordability
  - Water Supply infrastructure
  - Operation & management
  - Demand & Supply

- After having the above brainstorming exercise and brief presentation by the trainer, participants clearly understand the following main issues on
  - Definition , overview of Weather and Climate Change
  - Summary of Impact to Water Resource, Water supplies infrastructure , Quantity & Quality

- Hydrometeorology of Ethiopia as presented by Sahle Tefera from National Meteorology Agency (NMA). The presentation highlights the following points
  - The climate system
  - The greenhouse effect
  - Global climate change trend
  - Hydrological system and climate change of Ethiopia
  - Addis Ababa rainfall scenarios
  - Consequence of increased urban flood in Addis Ababa City
  - Climate change trend in Ethiopia in the last 50 years
  - Projected climate change in Ethiopia for the year 2030, 2050, 2080
  - Increased water demand due to temp increase in Addis Ababa
  - Impact of climate change on Ethiopian Hydrology
  - Current joint Water and National Meteorology Agency(NMA) work to address the climate change impact on water sector

b. Integrating Climate Resilient to Water Safety Plan

- The main objectives of this session include:
  - To consider additional and existing risks that climate change poses or exacerbated to drinking water safety when applying the water safety plan approach
  - To integrate climate change to the 10 steps of WSP
- Brief presentation was made to clearly understand that in a Water Safety Plan; climate change is just one of many risks that affects safety of drinking water supply that need to examine all risks to water supply from catchment to consumer.
- In the presentation live examples was given to show clearly on how we can best integrate climate resilient to each steps of a Water Safety Plan (10 steps of a WSP).
- Finally, as the next step participants were given chance to express their expectation following this training and general reflection on the training. Hence, participants from different partners including participants from Tanzania are all aware of what has to be done next to successfully design and implement Climate Resilient Water Safety Plan in selected areas of the country.

Mr. Waltaji Terfa, Co- facilitator of the training from WHO Country Office- Ethiopia

Action Points:

- Participants from different sectors and partners need to share brief report of the training output so that they can engage and support the implementation of WSP in the country.
- Participants from three pilot Regions for the design and implementation of Climate Resilient Water Safety Plan should also prepare and submit report to their respective Bureau besides arranging briefing session to relevant staffs.
- Each pilot region to finalize selection of CR-WSP implementation site/area as per the criteria communicated earlier by Ministry of Water, Irrigation and Energy.
- Ministry of Water, Irrigation and Energy and WHO to provide technical support to each pilot regions in the selection of sites, design and implementation of CR-WSP.
- Cascade similar training on CR-WSP in the pilot regions and selected woreas/districts
- Conduct baseline data collection in each selected sites/schemes as per the prepared Water Safety Plan Impact assessment data collection guidance note developed by WHO-HQ.
- Finalize and validate three documents on CR-WSP (Climate Resilient Water Safety Strategic Framework, Climate Resilient Water Safety Plan implementation guideline for both urban utility managed & rural/small community water supplies). Ministry of Water, Irrigation and Energy to share the aforementioned documents to regions before the advocacy and/or validation workshop at national level.
- Conduct Advocacy workshop at national level and similarly to be done in selected pilot regions and woredas.
- Conduct Vulnerability and Adaptation assessment to the water sector based on the climatic zones of the country.
- Organize training of trainers on rural Climate resilient Water Safety Plan(community managed water supplies).

Annex A: Agenda

Training of Trainers on Climate-Resilient Water Safety Plan
16-19 December 2014, Addis Ababa

DAY 1 (TUESDAY, 16 DECEMBER)	
08:30 - 09:00	Registration
09:00 - 09:15	Welcome remarks ***and opening***
09:15 - 09:35	Overview of WSPs in Ethiopia
09:35 - 10:20	Workshop overview & introduction to WSPs
10:20 - 10:40	Tea break
10:40 - 12:30	System description (Step 2) and hazards (Step 3)
12:30 - 13:30	Lunch
13:30 - 15:10	Hazards (Step 3 continued) & control measures / validation (Step 4)
15:10 - 15:30	Tea break
15:30 - 16:50	Risk assessment (Step 4 continued)
16:50 -17:00	Field trip announcement
DAY 2 (WEDNESDAY, 17 DECEMBER)	
08:30 - 09:00	Activity
09:00 - 10:10	Improvement plans (Step 5) and operational monitoring plans (Step 6)
10:10 - 10:20	Leg stretch
10:20 - 11:15	Verification (Step 7)
11:15 - 11:30	Field trip information and instructions
11:30 - 12:30	Lunch
12:30 - 17:00	Field trip
DAY 3 (THURSDAY, 18 DECEMBER)	
08:30 - 08:45	Activity
8:45 - 09:30	Preparation of group presentations
09:30 - 10:20	Group presentations
10:20 - 10:40	Tea break
10:40 - 11:15	Group presentations
11:15 - 12:20	Management procedures (Step 8) and supporting programs (Step 9)
12:20 - 12:30	Practical example of supporting program (Addis Ababa)
12:30 - 13:30	Lunch
13:30 - 13:55	WSP team (Step 1)

13:55 - 15:10	WSP review (Step 10) and activity
15:10 - 15:30	Tea break
15:30 - 16:50	Activities and wrap up
16:50 - 17:00	Introduction of Day 4 and link to WSPs
DAY 4 (FRIDAY, 19 DECEMBER)	
08:30 - 09:10	Introduction to Climate Change
09:10 - 09:45	Hydrometeorology in Ethiopia
09:45 - 10:20	The issue of Climate change and Water in Ethiopia
10:20 - 10:40	Tea break
10:40 - 12:30	Applying the Water Safety Plan approach to identify, manage and mitigate risks to drinking-water safety associated with climate change
12:30 - 13:30	Lunch
13:30 - 14:30	Continued…Applying the WSPs approach
14:30 - 14:45	Impact of Climate Change on Addis Ababa Water Supply
14:45 - 15:10	Group exercises on climate change risk
15:10 - 15:30	Tea break
15:30 - 15:45	Preparation of group exercises presentation
15:45 - 16:10	Group presentation
16:10 - 16:25	Wrap-up and way forward
16:25 - 16:30	Closing

Annex B: List of participants

S/N	Name of Participant	Organization	Email	Telephone
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