

# Water Safety Plans – a risk management approach from catchment to consumer



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# Flood and Drought Management Tools project



- Implemented by UNEP and executed by IWA and DHI
- Duration 2014 to 2018
- Development of technical tools to improve the ability to address floods and droughts in the planning process at basin and local scale.



Project web-page: <http://fdmt.iwlearn.org>

# Agenda



1. ***An overview of Water Safety Plans*** by Kizito Masinde (Programmes Officer, IWA)
2. ***Challenges, successes and lessons learned in WSP implementation*** by George Odero (Water Production Manager, KIWASCO, Kisumu, Kenya )
3. Additional questions from the audience
4. Info on upcoming webinars

# FLOOD & DROUGHT MANAGEMENT TOOLS



## Water Safety Plans: A risk management approach from catchment to consumer

Presented by:

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# The Flood and Drought Management Tools Project

## WSP support

Overview system components and assist with risk management of the water supply system

## Flood and drought assessment

- Climate analysis for catchment
- Drought assessment (drought indices)
- Climate based flood indices

## Catchment indicator selection

Support the water utility with selection of indicators for catchment related issues, e.g. climate change, drought or flood.

## Basin IWRM planning

Evaluate water availability or reliability of water demands to be met by the water utility or different sectors within the basin.

To learn more visit: <http://fdmt.iwlearn.org>

# What is Water Safety Planning?

It is a **comprehensive risk assessment and risk management approach** that encompasses all steps in the water supply from catchment to consumer



# What is Water Safety Planning?

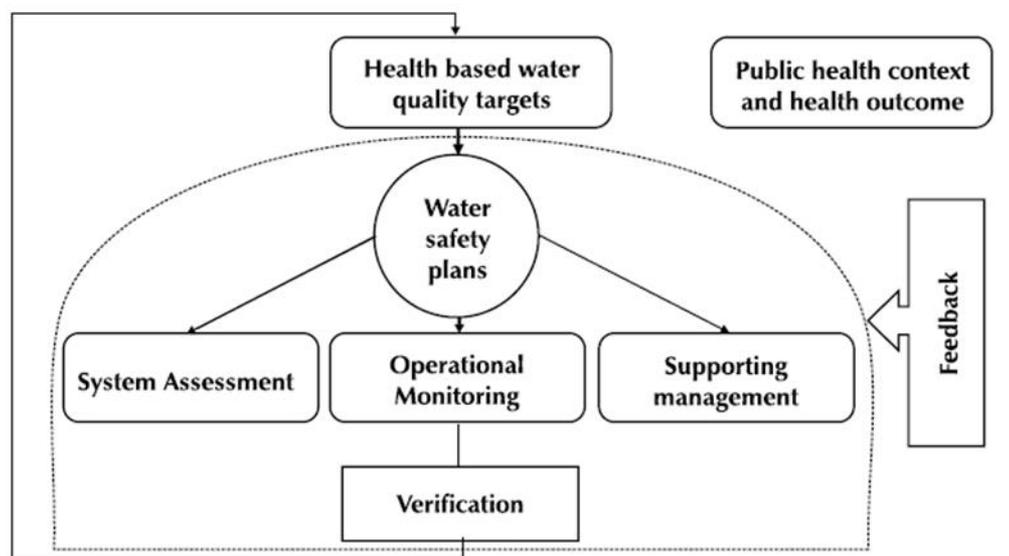
A proactive management system that ensures continuous supply of safe drinking-water by:

- knowing the system thoroughly
- identifying where problems might occur
- putting barriers and management systems in place to stop problems before they happen
- making sure all parts of the water supply system work properly

# What is Water Safety Planning?

The aim of a Water Safety Plan is to consistently ensure the safety and acceptability of a drinking-water supply

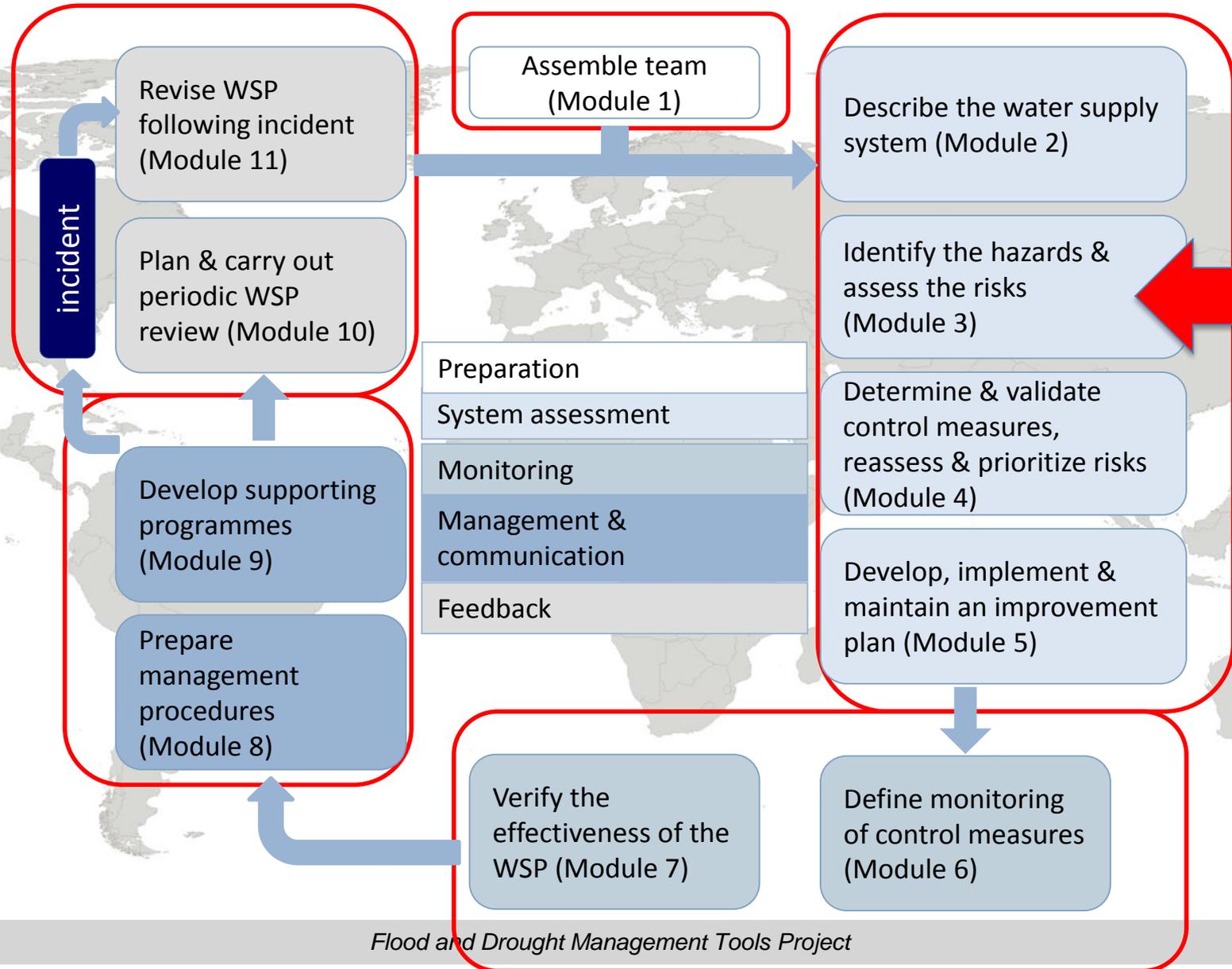
WSP is health driven



Objectives:

- Minimise contamination of source water
- Reduce or remove contamination by treatment
- Prevent contamination during storage, distribution and handling

# The Water Safety Plan Approach



# 1. Assemble the WSP Team

Establishment of a qualified, dedicated team is a prerequisite to securing the technical expertise needed to develop a Water Safety Plan

The team might include:

- managers, engineers, water quality control staff, technical staff involved in day-to-day operation
- stakeholders



## 2. Describe the water supply system

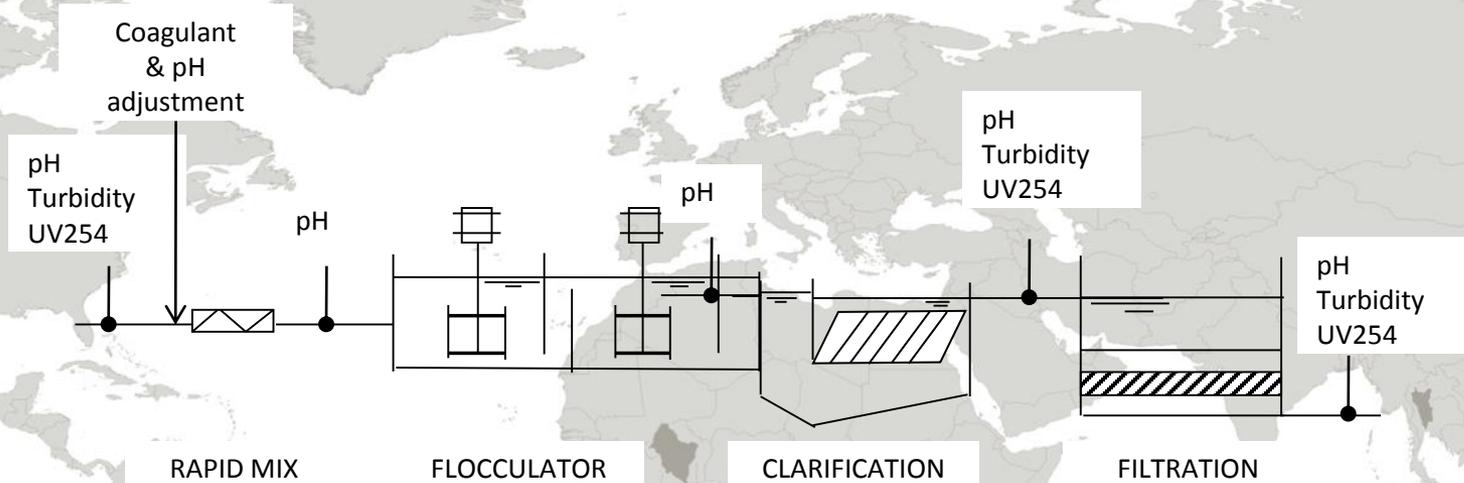
Objective is to provide sufficient information:

- to understand the subsequent water quality risk assessment
- to identify where the system is vulnerable to hazardous events

### **Outputs:**

- A detailed up-to-date description of the water supply system, including a flow diagram
- An understanding of water quality currently being provided by the utility
- Identification of the users and uses of the water

## 2. Describe the water supply system

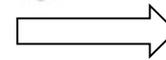
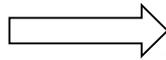


A flow diagram should be developed which captures all the elements of the water supply system in sufficient detail (validated on-site)

# 3. Identify hazards and hazardous events and assess the risks

The objective is to identify:

- all hazards and hazardous events that could result in the water supply being, or becoming, contaminated, compromised or interrupted
- all potential biological, physical and chemical hazards associated with each component and/or hazardous events in the drinking water supply that can affect the safety of the water



**Example:** Heavy rainfall (hazardous event) may promote the introduction of microbial pathogens (hazards) into the source water

# 3. Identify hazards and hazardous events and assess the risks

Main output is a description of what could go wrong and where through:

- Site visits / inspection
- Analysis of flow diagram
- Desk studies – historical data (e.g. flood events), predictive information



Assessment of risks

- Qualitative approach
- Semi-quantitative approach (likelihood and consequence matrix)

## 4. Determine and validate control measures, reassess and prioritise the risks

Objective is to:

- identify all existing control measures
- validate the effectiveness of the control measures
- re-assess the risk after considering the existing controls

Outputs include:

- Identification of the controls in place
- Validation of the effectiveness of the controls
- Identification and prioritisation of insufficiently controlled risks

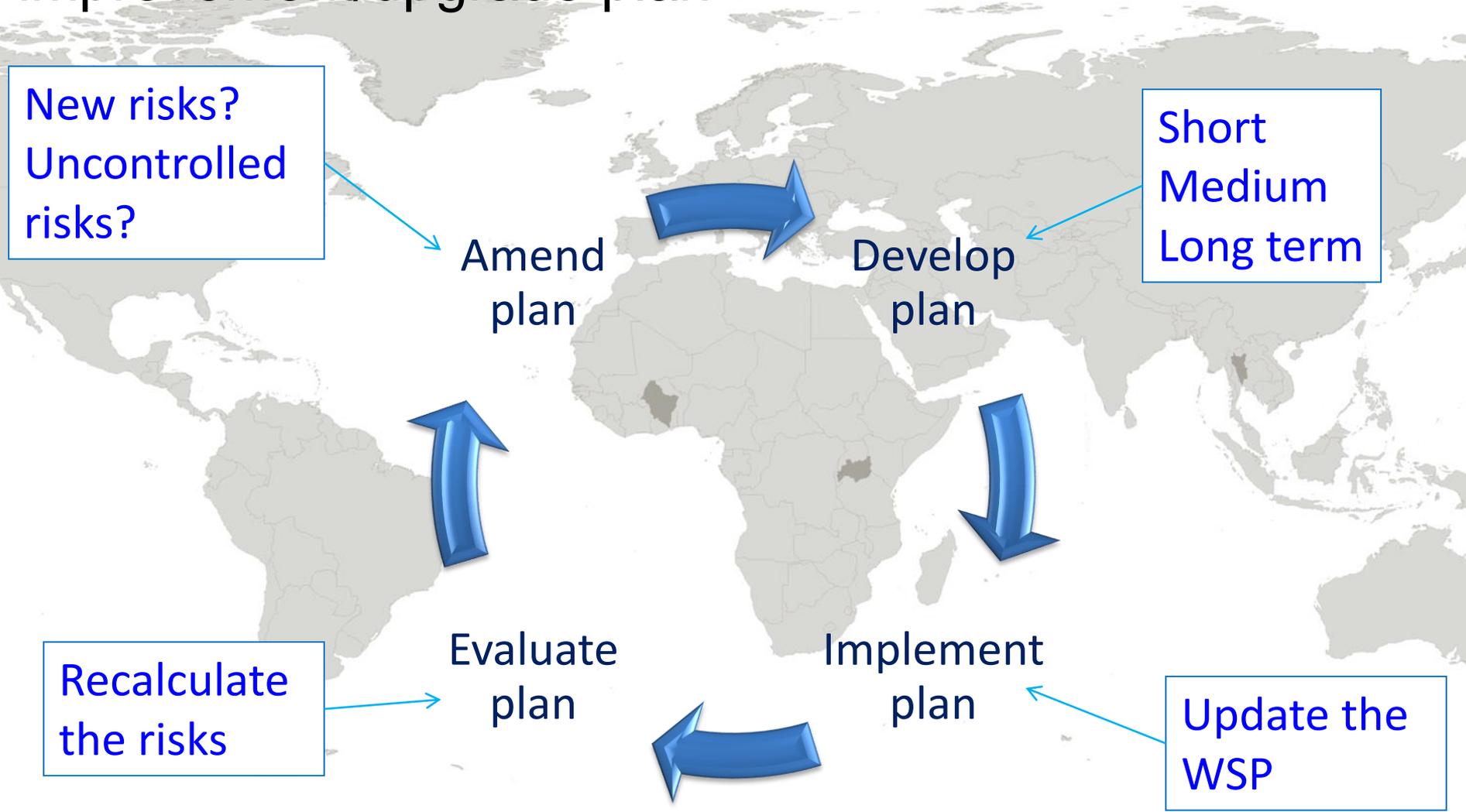
## 5. Develop, implement, and maintain an improvement/upgrade plan

An Improvement plan is an action plan for new or future operational controls or any other improvements

- Required due to absent or ineffective control measures
- Based on the prioritised risks

**It should consider:** Specific action to be undertaken, Responsible party, Due date, Budget, Resource constraints (financial, human), Short-, medium- and long-term priorities

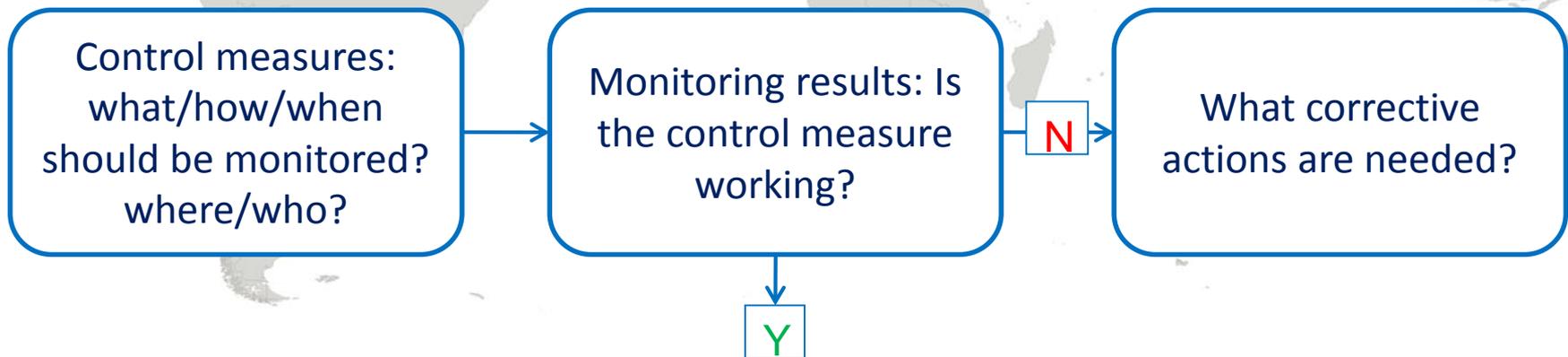
# 5. Develop, implement, and maintain an improvement/upgrade plan



## 6. Define monitoring of the control measures

The objective of this step is to:

- identify and define operational monitoring (including operational limits) of targeted control measures;
- establish procedures which demonstrate that the controls are working as planned; and
- establish corrective actions when operational targets are not met.



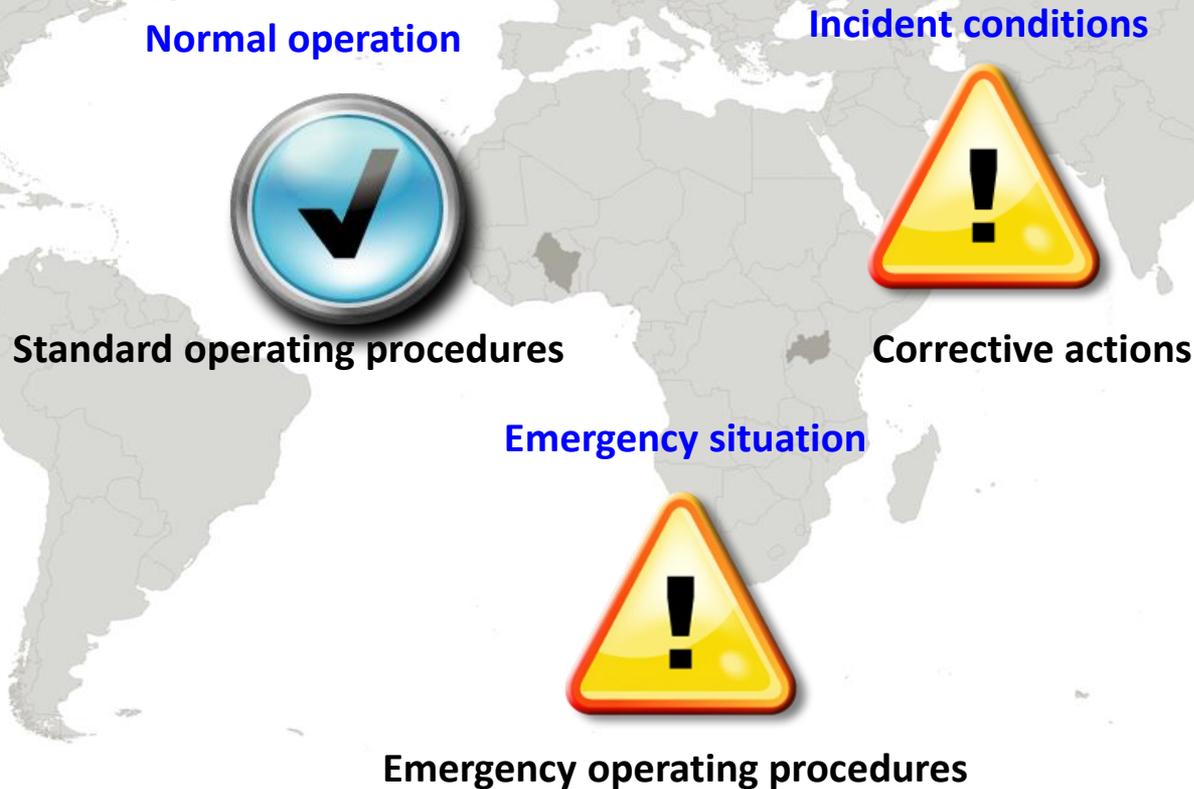
## 7. Verify the effectiveness of the WSP

Objectives include:

- build a body of evidence that water produced by the water supply system is compliant with the supplier's water quality objectives
- confirm that the WSP is being implemented in practice, as intended and designed
- confirm the appropriateness of the adopted operational limits in controlling the identified risks

# 8. Prepare management procedures

Management procedures are documented actions to be followed during normal conditions and in incident or emergency situations



# 9. Develop supporting programmes

Supporting programmes are activities that support the development of people's skills and knowledge, and their capacity to manage systems to deliver safe water



# WSP review and feedback procedures

Consists of modules 10 & 11:

Module 10: Plan and carry out periodic review of the WSP

Module 11: Revise the WSP following an incident

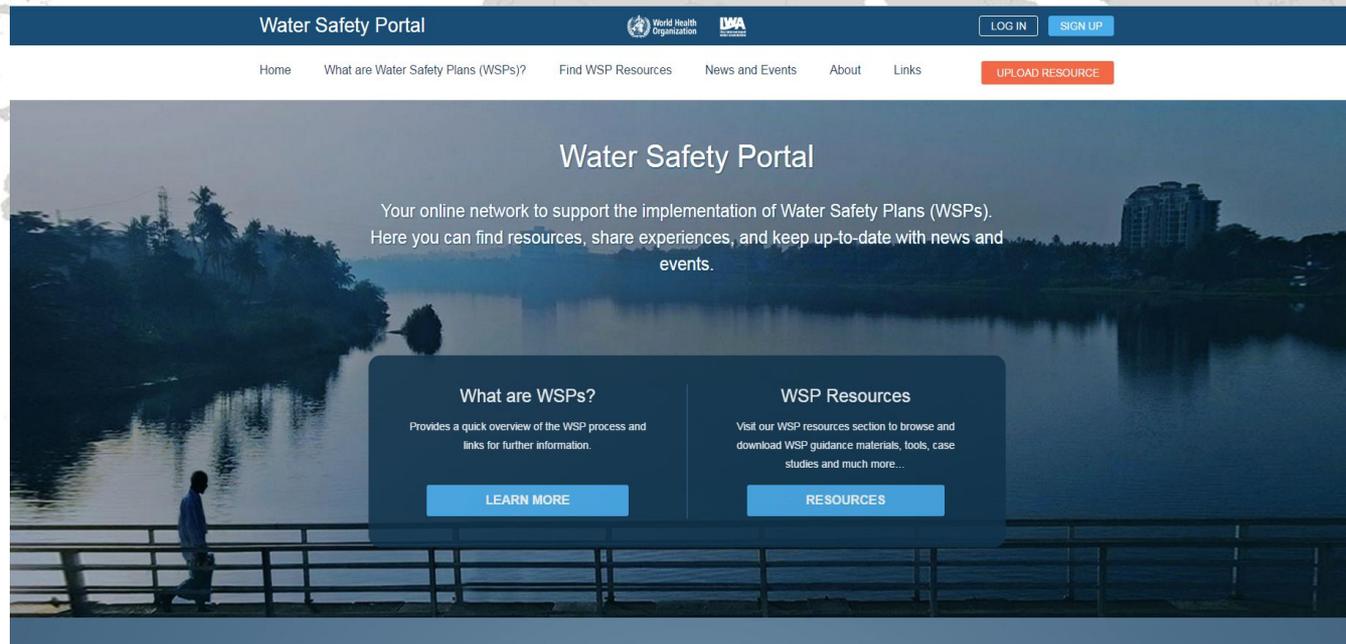


# Acknowledgements

Various materials including manuals and presentations prepared by the World Health Organisation in collaboration with the International Water Association have been used to prepare this presentation.

They can be obtained from the Water Safety Portal:

<http://www.wsportal.org/>



Water Safety Portal

World Health Organization IWA

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UPLOAD RESOURCE

## Water Safety Portal

Your online network to support the implementation of Water Safety Plans (WSPs). Here you can find resources, share experiences, and keep up-to-date with news and events.

**What are WSPs?**  
Provides a quick overview of the WSP process and links for further information.  
[LEARN MORE](#)

**WSP Resources**  
Visit our WSP resources section to browse and download WSP guidance materials, tools, case studies and much more...  
[RESOURCES](#)

# Development and implementation of water safety plan, Kisumu water and sewerage Co experience



Presentation by George Oluoch Odero,  
Water Safety Plan (WSP) Team Leader.



# Presentation outline.

1. Background, Water Operator Partnership (WOP) and role in the development of the WSP.
2. Development and implementation of WSP in KIWASCO, Challenges experienced and Lessons learnt
3. Challenges
4. Lessons learnt and Suggestion for further improvement.

# Background.

- ▶ With the facilitation of the international Water association (IWA), a Water Operator Partnership (WOP) was signed between Kisumu Water and Sewerage Company (KIWASCO), National water and Sewerage Company- Jinja area, and Mwanza urban water and sanitation Authority (MWAUASA) in December 2012.
- ▶ The objective of the WOP was to assist the partners develop and implement a WSP through a peer to peer support. There were site visits by the WSP team members in all the three utilities to assist each other with the WSP development.
- ▶ With the facilitation of IWA, the WSP team was trained on the development of the WSP.
- ▶ The objective of the WOP was achieved as all the utilities because all the utilities developed and implemented their WSPs.

# Development of WSP in KIWASCO

- ▶ We followed the WHO manual on the development of WSP using the 11 modules.
- ▶ A multi - disciplinary team was formed to steer the process, the people appointed had the required skills and experience in all the stages of water supply from the catchment, treatment, distribution and users.
- ▶ The core team comprised of people in the organization with authority to make decisions.
- ▶ The team was given some duties including, treatment, distribution, customers/users, procurement/ finance/ administration ,stakeholders engagement and communication.
- ▶ The team was formally appointed by the CEO and formally introduced to the entire staff.

# Development of WSP , Cont'

- ▶ The team organized for many site visits to carry out hazard identification. This was followed by other desk studies and development of the document using the information obtained during the site visits.
- ▶ The supply description was done for our two water supplies and both were included in the WSP document.
- ▶ There a series of sensitizations of the staff members to help them understand the new concept and ensure that they effectively participate in the implementation.
- ▶ We contacted the selected stakeholders and had a meeting with them , to get them involved in the development and implementation of the WSP.

# Development of WSP , Cont'

- ▶ The WSP components especially the upgrade plan was integrated in the work plan and budgets done to help in the implementation.
- ▶ For the implementation and continuity, the development and implementation was included in all the staff targets in the Balance Score Cards, and staff were appraised on how they faired with the implementation of the WSP during the Bi-annual appraisal process.
- ▶ IWA organized an external audit of the development and implementation of the WSP in may 2015, the recommendations of the audit has helped us improve on our WSP implementation.
- ▶ Our audit and risk team have been leading the internal audit process and with WSP team leader have been periodically reporting to top management the progress of the WSP implementation. We are in the process of integrating the WSP with the organization risk register.

# Challenges

- ▶ Getting all the team members to participate in all the sessions was difficult because of other important assignment in the organization.
- ▶ When the sessions were on, the assignment was proving to be time consuming.
- ▶ The tasks of doing all the hazard identification, ranking, proposing control measures, etc. were too tedious and in the beginning since not all members were sufficiently trained, was difficult. The tables were so many and this at times were confusing other members.
- ▶ Getting the stakeholders involvement was very challenging as some had not understood the WSP approach, and some had other interests.

## Challenges cont'

- ▶ Consistency in the team has been a challenge, due staff movement, getting the new members on board and them having the right skills to continue with the process has been slow. This affects continuity.
- ▶ The huge financial requirements to implement some upgrade plan, slowed some implementation.
- ▶ For component of the plan that involve the participation other partners like asset development being undertaken by the water boards, we have very control and influence.

## Lessons learnt and way forward.

- ▶ Staff sensitization and training to be done consistently to help new staff to be inducted quickly. The capacity of internal auditors to be built to ensure that they execute WSP audit effectively.
- ▶ A need to classify stakeholders and start with the core ones then bring on board the rest, as engaging all of them at once may be very difficult.
- ▶ Fully integrate the WSP with the overall organization risk management plan, and the risk register.
- ▶ Buy-in by all staff at all levels is necessary, and when preparing budgets WSP shall be used, this shall further help in the WSP implementation.

▶ Any questions, suggestions.

# Audience questions

# Upcoming FD webinars

- #1: Use of satellite data for drought and flood management (Technical presentation)
- #2: Drought management today - cases from Asia (January 12, 2017)
- #3: Drought early warning and assessment, experiences from Ghana (February 28, 2017)
- #4: Water Safety Plans –link water utilities with basin planning processes (March 15, 2017)
- #5: Basin planning – the climate change challenge (April 25, 2017)

Dates and recordings on  
<http://www.unepdhi.org/fd-webinars>

- Questions/comments to Maija Bertule [mabe@dhigroup.com](mailto:mabe@dhigroup.com)
- Webinar recording and slides on YouTube (UNEP-DHI) and <http://www.unepdhi.org/fd-webinars>
- Short feedback survey in follow-up email – please take 5 minutes to fill in – we value your opinion!

### **Future webinars in the series**

- Feedback and suggestions for future topics welcome!

**Thank you for attending!**