

Water Safety Planning

Oliver Schmoll



Protocol requirements

- **Article 4 (2a):** Parties shall ensure “adequate supplies of wholesome drinking water which is free from any micro-organisms, parasites and substances which (...) constitute a potential danger to human health.”
- **Article 6 (2):** Parties shall establish “national and/or local targets (...) that need to be achieved or maintained for a high level of protection against water-related disease (...). Targets shall cover, inter alia, (a) the quality of the drinking water supplied, taking into account the Guidelines for Drinking-water Quality of the WHO.”

The Guidelines for Drinking-Water Quality

WHO Guidelines

- **4th edition** published in 2011 (since 1958)
- International **point of reference** for drinking-water regulation
- **Public health benchmark** for safety
- **Rigorous health assessment** of agents in drinking-water



What does “safe water” mean?

- **Access to technology?**
- **Regularly checked?**
- **Compliance with water quality standards?**

What does “safe water” mean?

- Access to technology?

YES

- Regularly checked?

YES

- Compliance with water quality standards?

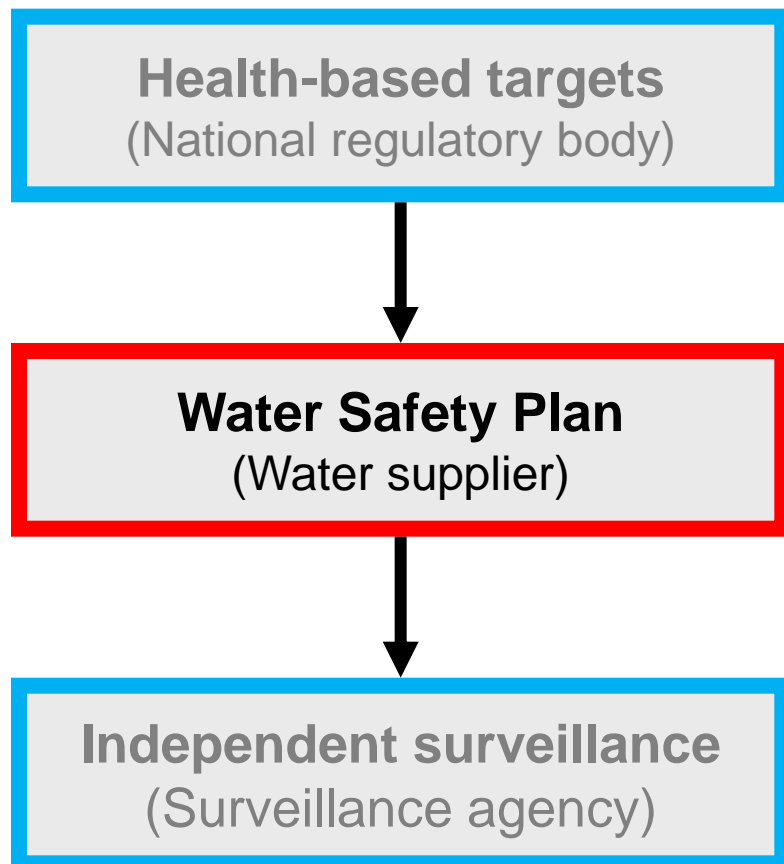
YES



What does “safe water” mean?

- Move away from **over-reliance** on end-product testing:
 - “Too little to late”
 - Outbreaks in absence of faecal indicators
 - No early warning capability
 - No capability to detect short term fluctuations
- Need for **holistic and proactive** approach:
 - Emphasis on prevention
 - Focus on process control

Framework for safe drinking-water



“The **most effective means** of consistently ensuring the safety of a drinking-water supply is through the use of a **comprehensive risk assessment and risk management approach** that encompasses all steps in water supply from **catchment to consumer**. In these Guidelines, such approaches are called **water safety plans**.”

Compliance with WHO Guidelines?

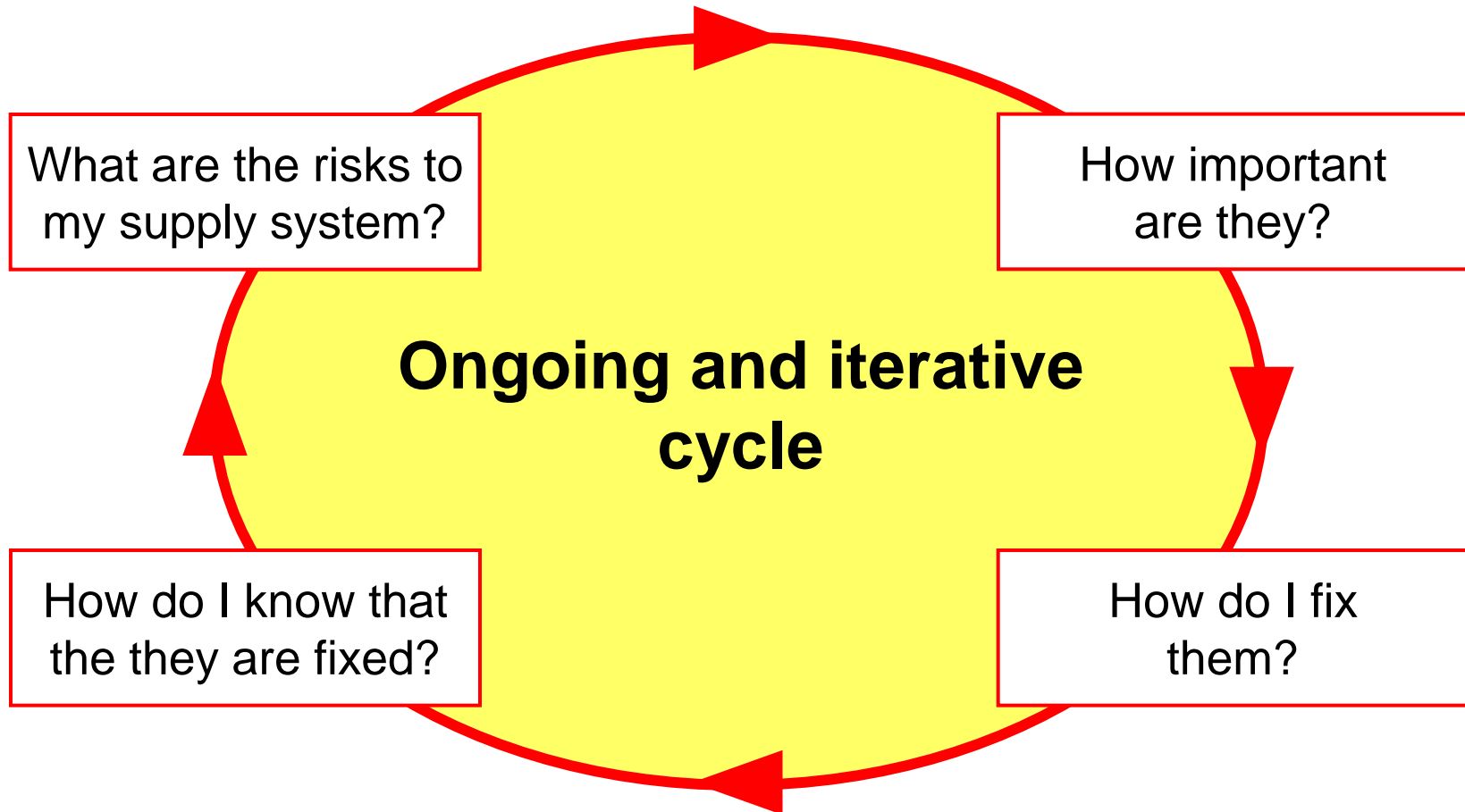
- Compliance with water quality targets
(WHO guideline values)

AND

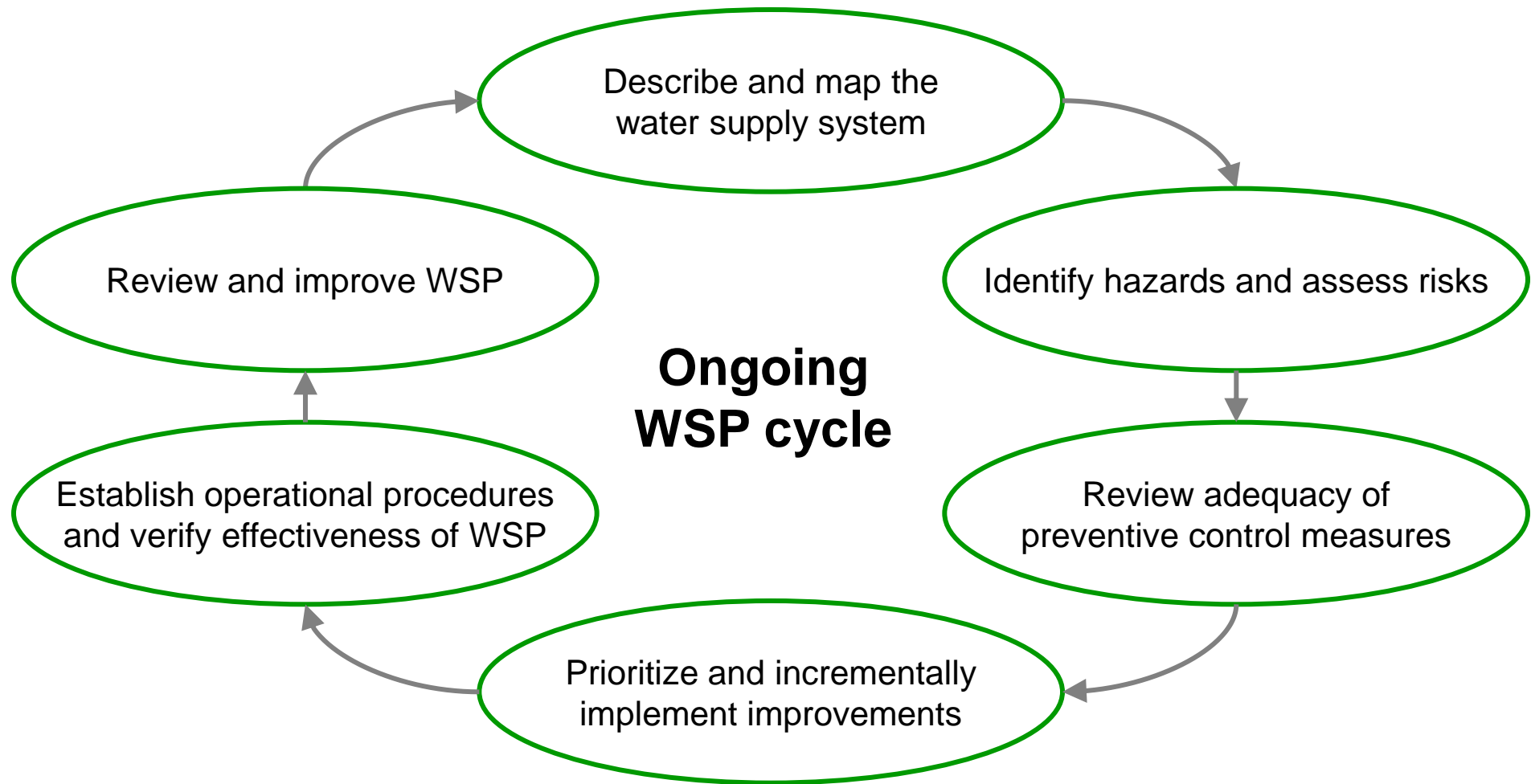
- Application of water safety plans

Water Safety Plan in a nutshell

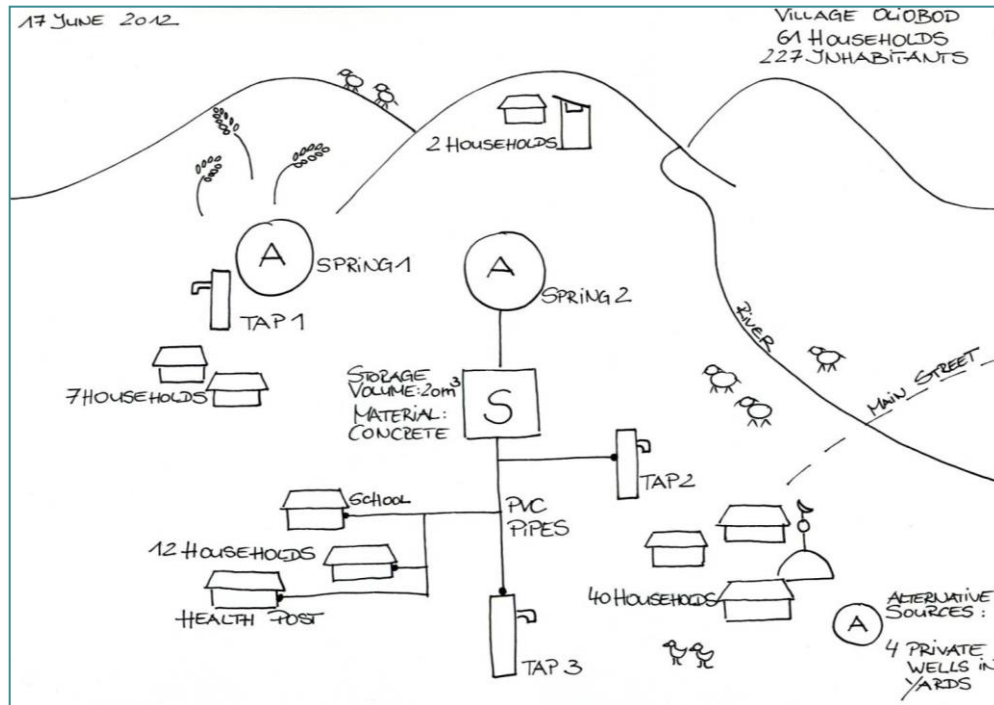
WSP is a piece of thinking!



WSP steps' overview



Map and describe the supply



Source: WHO/Europe 2014

Bring information and knowledge into **one place**:

- General information
- Management
- Catchment, source water and abstraction
- Treatment, storage and distribution
- Collection, water use and household treatment
- Water quality

Step back and analyse

What can go wrong where?	List what hazardous events could happen that may introduce hazards to your system and may make your drinking-water unsafe
What hazards may make the water unsafe?	Identify agents that cause harm to public health
Is this event under control?	List all control measures (barrier to contamination) that are currently in place

Visit system, meet on-site staff & inspect



Photo: Bettina Rickert

SANITARY INSPECTION FORM
 DUG WELL WITH WINDLASS PAGE 1

I. General information:

a. Name of village or town:

b. Location and/or name of dug well:

c. Date of inspection:

d. Weather conditions during inspection:

Note: If there is more than one dug well in your community, or if other water sources are used by the community (e.g. springs, boreholes), carry out sanitary inspections for these sources, too.

Note: If consumers store water in homes, also regularly inspect water storage and handling in homes, using the sanitary inspection form "Collection and Household Containers".

II. Specific questions for assessment:

1. Is there a latrine uphill and/or within 10 metres of the well?	Y/N
2. Is the fence absent, inadequate or faulty?	Y/N
3. Can animals have access within 10 metres of the well?	Y/N
4. Is there any source of other pollution within 10 meters of the well (e.g. animal breeding, cultivation, roads, workshops, waste)?	Y/N
5. Is stagnant water ponding within 3 meters of the well?	Y/N
6. Is the drainage channel absent or cracked, broken or in need of cleaning?	Y/N
7. Is the cement floor or slab absent or less than 2 metres in diameter around the top of the well?	Y/N
8. Are there cracks in the cement floor or slab?	Y/N
9. Is the wall or parapet around the well absent, inadequate or faulty?	Y/N
10. Are the rope and bucket left in such a position that they may become contaminated?	Y/N
11. Do individuals use their own buckets for drawing water from the well?	Y/N
12. Is the well-cover absent, cracked or insanitary?	Y/N

Total score of risk factors as total number of "YES" answers:

III. Results and comments:

a. Sanitary inspection risk score (tick appropriate box):

Very high risk Risk score: 9-12	High risk Risk score: 6-8	Medium risk Risk score: 3-5	Low risk Risk score: 0-2

b. The following important points of risk were noted (continue on back of form if necessary):

- List according to question numbers 1-12
- Provide additional comments

IV. Name and signature of assessors:

Identify hazardous events



Photo: Oliver Schmoll



Photo: Bettina Rickert



Photo: Bettina Rickert



Photo: Oliver Schmoll



Photo: Oliver Schmoll



Photo: Oliver Schmoll

Step back and analyse

How important is this event?

Describe **how often** the event can happen and how severe the **health consequences** would be

Judge to what extent this needs **management attention and improvement**:

Very important: Requires urgent attention & action

Important: Requires attention & action may be taken

Less important: No action required at this time

Improvement planning

What more should be done to bring the event under control?

List any **additional control measures/improvements** needed to bring the situation under control

Establish the **improvement plan** specifying:

- Responsibilities
- Timelines
- Personnel, technical and financial resources required

Monitoring and inspection plan

System component	Monitoring or inspection activity		Limit value or critical condition	Corrective action required
Spring box	What?	<ul style="list-style-type: none"> • Fence • Inspection cover • Spring box structure • Raw water turbidity 	<ul style="list-style-type: none"> • Fence broken • Poor seal or poor fit on inspection cover • Spring box structure cracked or damaged • Turbidity above 5 turbidity units 	Caretaker immediately to: <ul style="list-style-type: none"> • repair fence • repair inspection cover • contact WSP team leader to discuss spring box structure repair options • close valve to prevent any further water from entering system until turbidity drops below 5 turbidity units
	How?	<ul style="list-style-type: none"> • Visual inspection of fence, cover and spring box using the sanitary inspection form • Turbidity tube 		
	When?	<ul style="list-style-type: none"> • Monthly for all visual inspections • Daily for routine turbidity testing • After heavy rains and during snow-melt for turbidity testing 		
	Where?	On site at spring box		
	Who?	Caretaker, Ms Leyla		

Source: WHO/Europe 2014

O & M instructions

Operational or maintenance task	Step-by-step instructions	Who?	When?
Cleaning of water storage tank	<p>Advise consumers of water shut-off</p> <ol style="list-style-type: none"> 1) One week before tank cleaning, ask the WSP team leader to notify consumers of a two-day water shut-off. <p>Clean tank</p> <ol style="list-style-type: none"> 1) Open drain valve, close inlet and outlet valves, and drain tank completely. 2) Dry tank for 1 day. 3) Check for cracks and repair, if necessary. 4) Clean walls with brush and remove silt manually. 5) Close drain valve and open inlet valve (keeping outlet valve closed) to fill tank for about 1 hour. 6) Close inlet valve, open drain valve, and drain tank. 7) Repeat tank filling and draining process until draining water runs clean (usually 1–2 more times). 8) Close drain valve and open inlet and outlet valves to resume service. 	Caretaker, Ms Leyla	Annually (every spring)

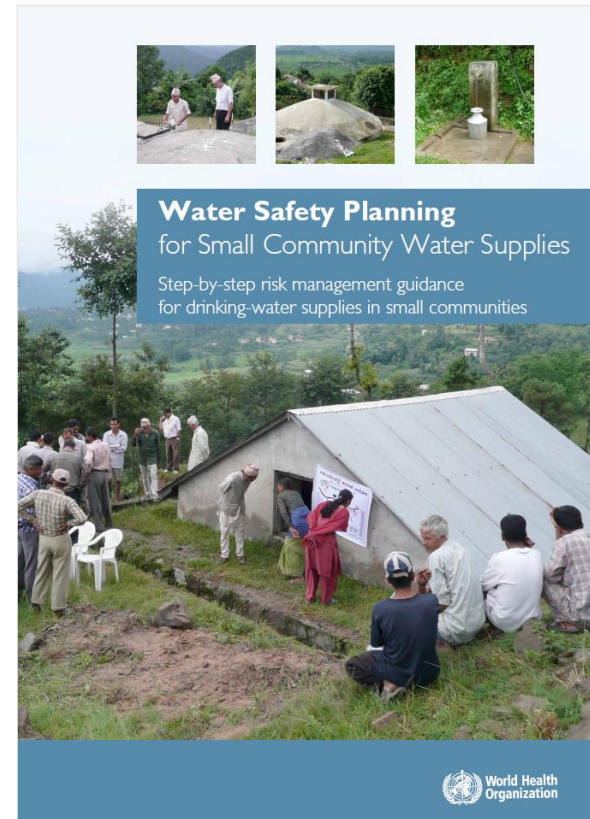
Source: WHO/Europe 2014

Supporting tools: available in Russian



http://whqlibdoc.who.int/publications/2012/9789241548427_rus.pdf

http://whqlibdoc.who.int/publications/2009/9789244562635_rus.pdf



Field guidance



Source: WHO/Europe 2014

<http://www.euro.who.int/en/health-topics/environment-and-health/water-and-sanitation/publications/2014/water-safety-plan-a-field-guide-to-improving-drinking-water-safety-in-small-communities>

Templates to support you



- Template 1-A. WSP team
- Template 1-B. Protocol
- Template 2-A. Map of w
- Template 2-B. Descripti
- Template 3-A. Hazard a
- Template 3-B. Sanitary i
- Template 4. Improveme
- Template 5-A. Complian
- Template 5-B. Operatio
- Template 6-A. Instructi
- Template 6-B. Emergen

Template 3-B Sanitary inspecti

The sanitary inspection forms provide a structured way of documenting WSP task 3.

Sanitary inspections provide useful information for a WSP team in identifying problems with the water supply system. If performed regularly, sanitary inspections can help identify conditions. Sanitary inspection results

This template offers a variety of relevant questions. The following forms will be relevant for your system depending on the abstraction technology used for the local water supply system. The following abstraction technologies are covered by the forms:

- dug well with hand pump (SI form 3)
- dug well with windlass (SI form 4)
- borehole with mechanized pump (SI form 5)
- spring source (SI form 6)
- storage reservoirs (SI form 7)
- public/yard taps and piped distribution (SI form 8)
- collection and household containers (SI form 9)

Page 1 of each inspection form presents a list of typical risk factors associated with the water supply system (e.g. presence of animals, accumulation of debris, damaged infrastructures). The questions are structured to elicit a "Yes" or "No" answer. A "No" answer indicates no or a very low risk. An observation and interviewing of consumers can provide further information.

Page 2 of each inspection form provides a list of questions, as well as further information on how to interpret the results.

Each sanitary inspection form is accompanied by a checklist. Pages 3 and 4 of each inspection form provide a structured way to assist your understanding of each inspection. You should discuss the results of your local health office or local water supply system. The results of the inspections.

The WSP team should carry out sanitary inspections regularly. Sanitary inspections not only support the WSP team in monitoring your control measures but also in identifying

All completed sanitary inspection forms should be kept for

SANITARY INSPECTION FOR DUG WELL WITH HAND PUMP

I. General information

- a. Name of village or town:
- b. Location and/or name of dug well:
- c. Date of inspection:
- d. Weather conditions during inspection:

Note. If there is more than one dug well (such as springs or boreholes), carry out a separate sanitary inspection form "Collection and household containers".

II. Specific questions for assessment

1. Is there a latrine uphill and/c
2. Is the fence absent, inadequate or damaged?
3. Can animals have access with the well?
4. Is there any other source of pollution (e.g. animal breeding, cultivation, etc.) near the well?
5. Is stagnant water ponding within 10 m of the well?
6. Is the drainage channel absent or damaged?
7. Is the cement floor or slab level and free of cracks at the top of the well?
8. Are there cracks in the cement floor or slab?
9. Is the hand pump loose at the top of the well?
10. Is the pump cover missing or damaged?

Total score of risk factors as total

III. Results and comments

- a. Sanitary inspection risk score
 - Very high risk
 - High risk
 - Moderate risk
 - Low risk
- b. Important points of risk noted
 - list according to question number
 - additional comments

IV. Names and signatures of assessors

Date:

Sampling frequency	
Parameter(s) tested and target value(s)	
Sampler	
Sampling locations	
Laboratory at which samples are tested	
WSP team member to whom the results are reported	

Added value reported

Operational & managerial

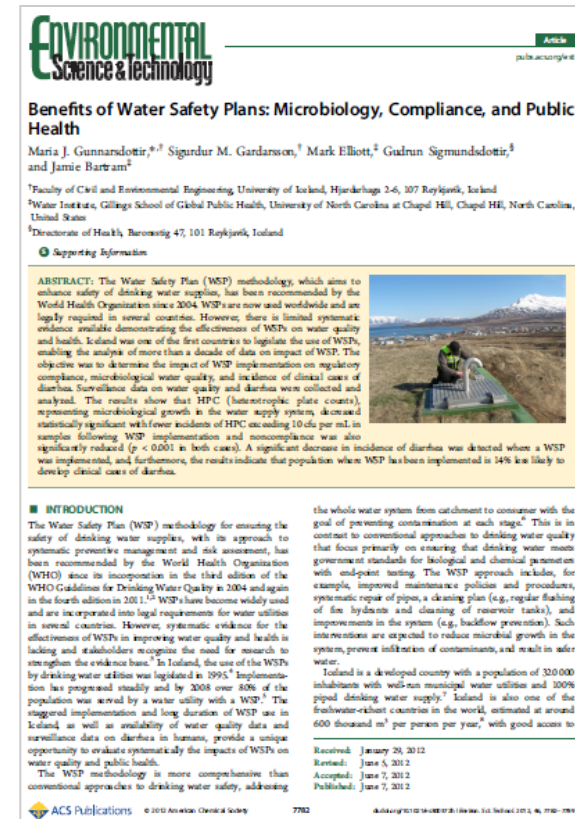
- **More clarity** on supply related risks
- Systematizes and improves **operations**
- Reduction of **incidents**
- Increased **compliance**

- Documents **due diligence**

- Stimulation of multi-stakeholder **cooperation and communication**

Public health

- Evidence on **health gains**:
 - Problem of time scales
 - Significant decrease in diarrhea incidence
 - Population under WSP is 14 % less likely to develop clinical cases of diarrhea



Incremental improvement planning

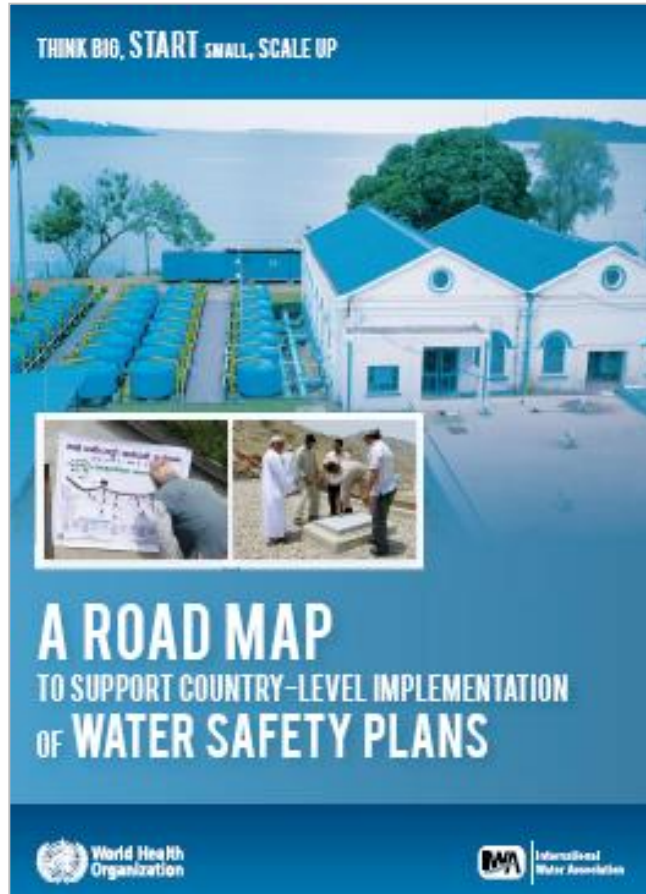
- Provides rationale for **decision making**: helps to focus limited resources and attention
- Short-term **improvements** with own resources:
 - Quick one-off infrastructure fixes
 - Improved monitoring, inspection and maintenance procedures
- Maps need for **additional resources** for long-term investments (e.g. treatment and/or infrastructure upgrades)

Improved access to financing

- Rise of **population's confidence** in water supply (management) and appreciation of improvements
- Increased **willingness to pay** water fee
- WSP supports leverage of **external financial support**: demonstration of proactive approach

Steps towards WSP implementation

Policy roadmap guidance



http://www.who.int/water_sanitation_health/dwq/thinkbig_small.pdf

Pillars for WSP uptake

- **Advocacy:**
 - Sensitize stakeholders and institutions
 - Seek buy-in for long-term implementation strategies
- **Capacity building:**
 - Develop national guidance materials
 - Establish resource centers as hub for technical advice
 - Train national WSP facilitators
 - Establish certified professional education
- **Revise regulations**

Role of pilots

- **‘Nucleus’** of national implementation strategies:
 - Demystify WSP
 - Develop national WSP capacities
 - Gain first hand experience and success stories
- Basis for **evaluation and information** of policy makers:
 - Added value and feasibility in national context
 - Basis for estimating resource and capacity building requirements for scaling-up

Policy and Protocol linkages

WHA resolution 2011

- **National public health strategies** to highlight value of **safe** drinking-water as basis for primary prevention
- **Policy frameworks** to integrate management of water- and sanitation related health risks
- Strengthen implementation of **water safety plans** and contribute to the development of **sanitation safety plans**

SIXTY-FOURTH WORLD HEALTH ASSEMBLY

WHA64.24

Agenda item 13.15

24 May 2011

Drinking-Water, Sanitation and Health

The Sixty-fourth World Health Assembly,

Having considered the report on strategies for the safe management of drinking-water for human consumption;¹

Recalling the Declaration of Alma-Ata on Primary Health Care and the various resolutions stressing the role of improving safe drinking-water, sanitation facilities and hygiene practices in primary health care, environmental health, prevention of waterborne diseases, protection of high-risk communities, infant and young child nutrition, including resolutions WHA39.20, WHA42.25, WHA44.28, WHA45.31, WHA51.17, WHA51.28 and WHA63.23, as well as resolutions EB128.R7 and EB128.R6 concerning respectively draft resolutions on cholera: mechanisms for control and prevention, and on eradication of dracunculiasis;

Recalling further target C of Goal 7 (Ensure environmental sustainability) of the Millennium Development Goals, which calls for reducing by half the proportion of the population without sustainable access to safe drinking-water and basic sanitation by 2015, and the importance of this target for the achievement of other Goals, particularly Goal 4 (Reduce child mortality), 5 (Improve maternal health) and 6 (Combat HIV/AIDS, malaria and other diseases);²

Recognizing that between 1990 and 2008 an estimated 1.77 billion people gained access to improved sources of drinking-water and 1.26 billion gained access to improved sanitation, but deeply concerned that by the end of 2008, 884 million people still lacked access to improved water sources and over 2.6 billion people did not have access to improved sanitation;

Noting the multiple health benefits and economic advantages of a broad public health approach through the expansion of access to safe drinking-water and sanitation, integrating household interventions, a more effective use of resources and the early incorporation of health considerations in the planning and design of water resources development, and recognizing the importance of pursuing these issues for the achievement of strategic objective 8 of the Medium-term strategic plan 2009–2013;

Recalling the International Decade for Action, "Water for Life" 2005–2015, proclaimed by the United Nations General Assembly in resolution 59/217, the International Year of Sanitation, 2008, declared in resolution 61/192; as well as the follow-up resolution 65/153, calling upon all Member

¹ Document A64/24.

² See United Nations General Assembly document A/65/L.1.

Significant momentum

- **WSP widely considered as benchmark** for safe water
- Increasing **policy recognition and uptake** in Europe:
 - Uptake in regulations (e.g. United Kingdom, Belgium, Hungary, Iceland, Switzerland)
 - EU Commission prepares uptake in Drinking Water Directive
 - Voluntary uptake by larger utilities in many countries
 - Promotion by water industry associations

Protocol linkages /1

- Area for national **target setting** (e.g. Hungary, Kyrgyzstan, Republic of Moldova, Tajikistan)
- **Complementary requirement** to “hardware” (infrastructure) investments
- **Cooperation with EBRD** on WSP uptake in infrastructure investment projects

Protocol linkages /2

- **Program of work 2014-2016:** “*Safe and efficient management of water supply and sanitation systems*”:
 - Sensitization and capacity building at national/regional level
 - Strengthening of national legislation
 - Support to demonstration projects
- Alignment with **WHO Biennial Collaborative Agreements**
- Regional capacity building workshop in **24-25 June 2014** in Bishkek, Kyrgyzstan

Thank you



Source: Rod Shaw