

Workshop : Milano, 15 January 2016

WATER SAFETY PLANS: Managing Drinking-water Quality for Public Health

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International Water Association (IWA)

- **The International Water Association is a global reference point for water professionals, spanning the continuum between research and practice and covering all facets of the water cycle.**
- **Through its network of members and experts in research, practice, regulation, industry, consulting and manufacturing, IWA is in a better position than any other organisation to help water professionals create innovative, pragmatic and sustainable solutions to challenging global needs.**
- **The strength of IWA lies in the professional and geographic diversity of its membership - a global mosaic of national, corporate and individual member communities.**

Water crisis

- More than 70% of California is currently in an extreme drought
- Brazil's drought is the worst in 80 years with Sao Paulo rationing water for 22 million people
- Istanbul's water reservoirs are at 22% capacity
- China has nearly 20% of world population but only 7% of the world's fresh water

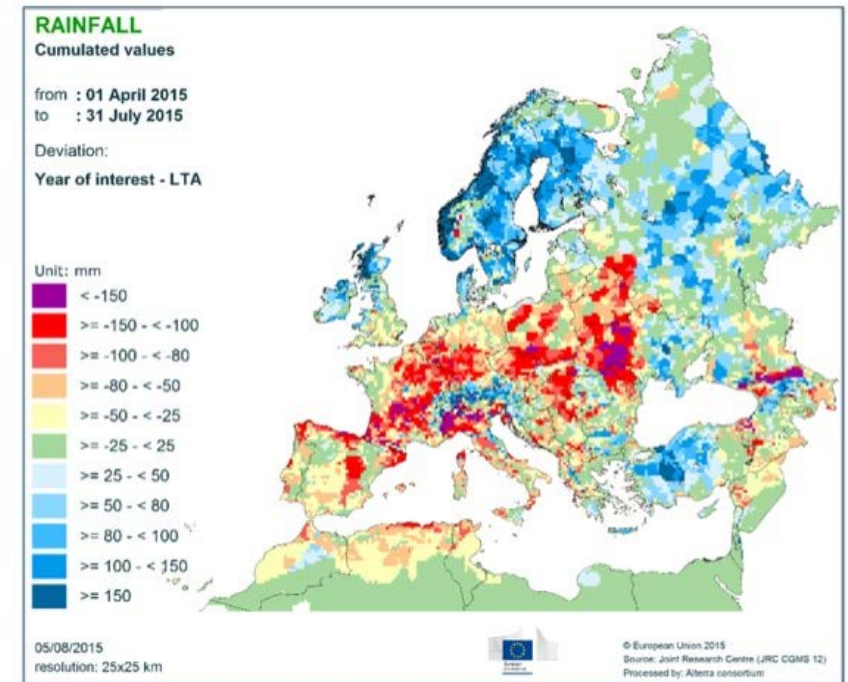
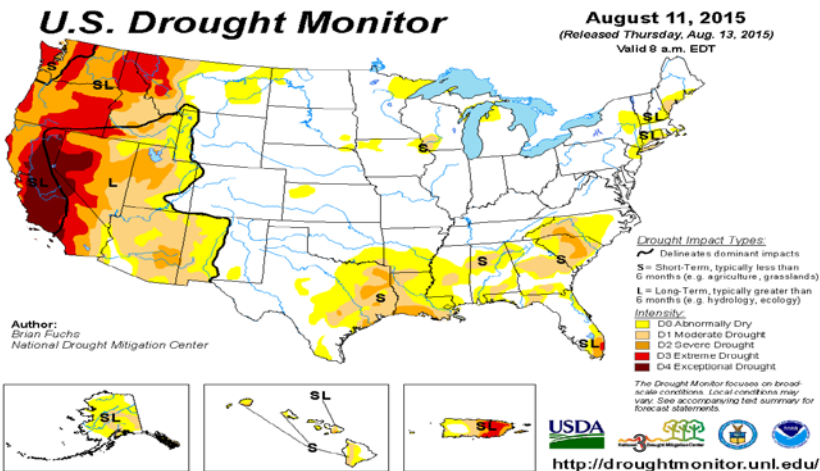
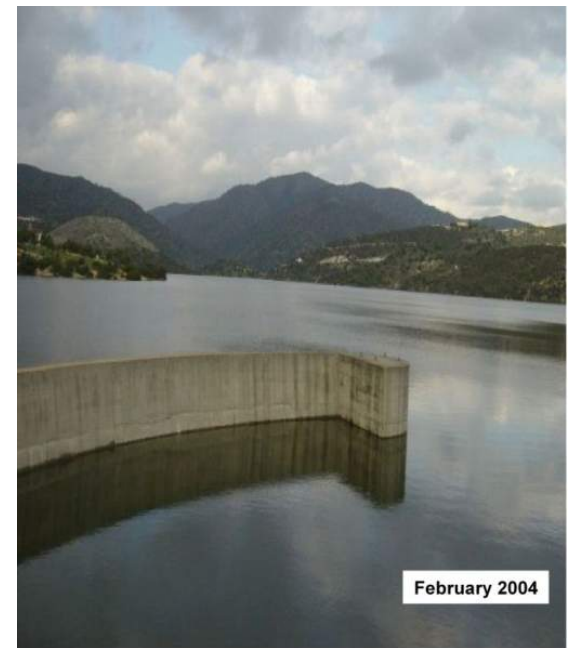


Figure 2: Map of departures (in mm) from the Long-term Average (LTA) of cumulated rainfall between April and July 2015. Source: JRC-MARS database

Water crisis

- **Water scarcity** is a major issue in many parts of the world.
- **Water efficiency** is yet far to be achieved by many water utilities worldwide
- **Inadequate water, sanitation and hygiene** continue to pose a major threat to human health.
- **Climate Change (CC)** is negatively affecting the Earth's population in a multitude of ways.
- **Water is the # 1 Risk according to the Global Risk 2015 report**



Yermasogia Reservoir, Lemesos - Cyprus



Some water regulation in Europe

- EU Water Framework Directive (WFD) 2000
- A Blueprint to Safeguard Europe's Water Resources 2012
- CIS Work Programme 2013-2015
- EC Final REE Report – October 2013
- “Good Practices on Leakage Management” CIS Working Group Programme of Measures WFD (Adopted by EU in Jan. 2015)
- **EU Directive 2015/1787: Water Safety Plan**



WSP: Reconsidering traditional approaches

- Drinking-water suppliers are usually required to verify that the **quality of water supplied to consumers meets specific numerical standards.**
- Yet, by the time tests are completed and results indicate the water is not safe to drink; thousands of people may have already consumed the water and become sick. **Notification comes too late.**
- Moreover even with frequent monitoring, the vast majority of water distributed to consumers will never be tested. Therefore an over reliance on so called **end-of-pipe monitoring is both inadequate and can be expensive.**



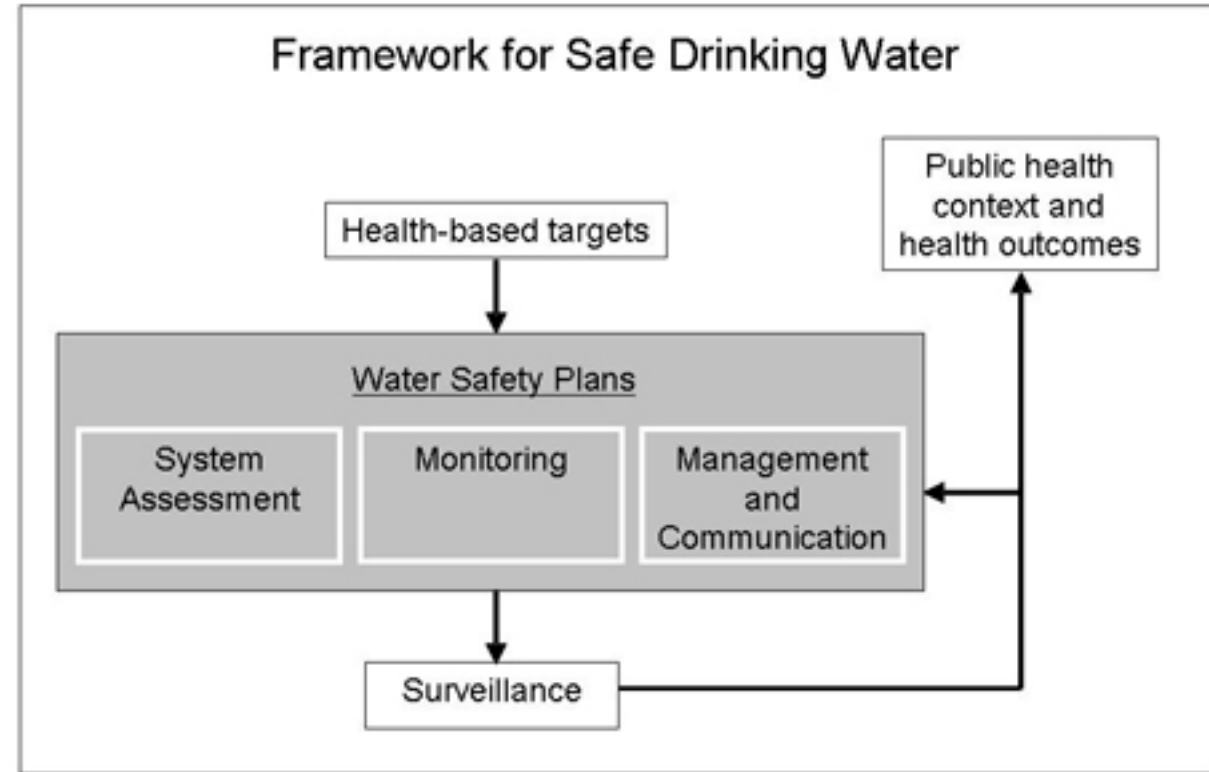
An over-emphasis on end-product testing misuses resources

- Studies have shown (Mac Kenzie et al., 1994 and Risebro et al., 2007) that **water meeting typical end-of-pipe standards, may in fact, cause disease.**
- Furthermore, **testing for an ever-growing number of chemical contaminants that may be of limited health concern or not even present in water is clearly not an optimal use of resources.**
- **An over-emphasis on end-product testing can be expensive, time-consuming and of limited benefit.**



Shifting to a modern WSP approach will reduce disease

- For these reasons, the **WHO Guidelines for Drinking-water Quality** and the **IWA Bonn Charter** recommend **pro-active efforts to reduce risks and prevent contamination before water reaches the consumer.**
- This can be achieved by **shifting emphasis of drinking-water quality management to a holistic risk-based approach** that covers the catchment-to-consumer.
- **Such an approach is called WSPs.** Widespread implementation of WSPs can contribute to reducing the portion of the global disease burden attributed to poor drinking-water and inadequate sanitation and hygiene.



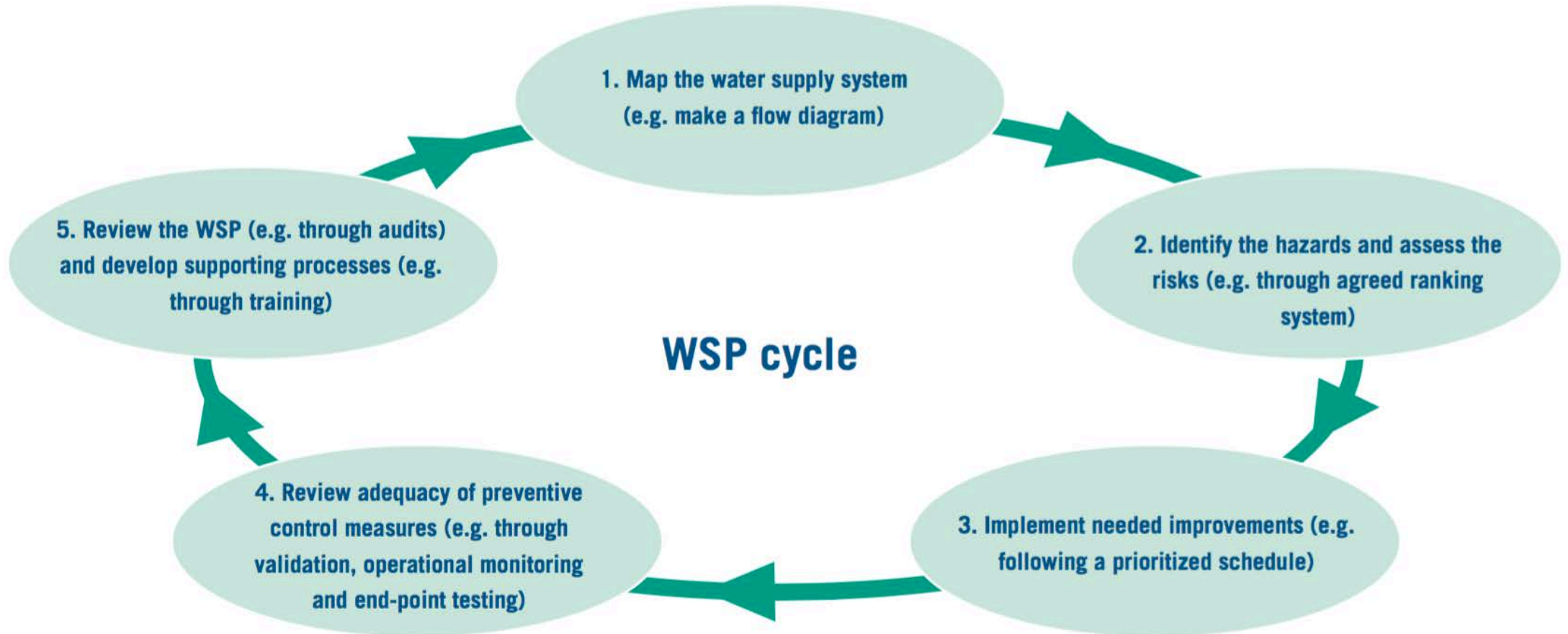
The health burden

- **Inadequate water, sanitation and hygiene continue to pose a major threat to human health.** These risk factors contribute to millions of unnecessary deaths each year, including **1.8 million diarrhoeal related deaths in children less than 5 years of age.**
- Those who survive this disease are often affected by other consequences, including malnutrition, inhibited growth and impaired cognitive development.
- It is estimated that **860,000 children** under the age of 5 die each year as an indirect or direct result of malnutrition caused by **lack of sufficient water, sanitation and hygiene** (Prüss-Ustün et al., 2008).



Water Safety Plan (WSP) cycle

Adapted and simplified from WSP Manual (Bartram et al., 2009)



Decision-making framework for all stakeholders

- The **WSP approach allows for appropriate institutions to work together to make well-informed decisions** related to the strategic, financial, operational and legal aspects of drinking-water quality management.
- Such stakeholder cooperation that is an implicit part of WSPs, for example, **facilitates the identification of appropriate barriers to contamination that does not overly focus on expensive treatment processes, but rather considers a range of options that may result in improved raw water quality and maintenance of quality post-treatment.**



Enhancing existing practice for water suppliers

- **Some components of a WSP** – such as the establishment of standard operating procedures – **are common practice** to many water suppliers; however
- **they are often developed in isolation** without consulting key stakeholders or considering the entire water supply chain from catchment-to-consumer.
- Furthermore, **formal documentation and clear allocation of responsibilities** of such procedures **are sometimes lacking.**
- **Implementation of WSPs can help a water supplier to:**
 - **establish more efficient operational procedures,**
 - **respond quicker to incidences and**
 - **improve knowledge management of the entire water supply system.**

Practice-oriented standards and regulations to better protect public health

- **Incorporating the WSP approach into policies, legislations and regulations can complement existing standards and regulations which specify microbial, chemical and physical parameters for drinking-water quality.**
- **Such a shift in standards or regulations will require an appropriate surveillance agency to not only monitor against numerical standards but also audit drinking-water quality management practices to ensure compliance.**
- **In contrast to traditional monitoring, the WSP approach enables feedback to ensure that the water supplier's ability to manage risks to human health continuously improves. It also provides a more certain indication that the supplied water is indeed safe.**

Informing capital investment requirements

- The implementation of WSPs will include the **production of an investment/upgrade plan.**
- Such a plan will **identify short, medium and long-term improvement needs** which can include upgrading existing water supply systems to ensure drinking- water quality is not compromised due to inadequate infrastructure.
- As this identification is based on a **robust risk assessment** of the system, it provides a **reliable means for governments, donor agencies and international financing institutes to better maximise capital investments.**



Maximising capital investments

- An **estimated US\$ 52 billion** (Bartram and Hutton, 2008) is needed annually to maintain and renew existing facilities for populations already with water supply or sanitation coverage and with **only around 25% of that finance available**, rational capital investment is more needed than ever.
- **Current investments in water and sanitation often neglect or underestimate costs associated with operating and maintaining system improvements, such as infrastructure.**
- **Identification of capital investment requirements should therefore be based on a systematic analysis of the water supply system that prioritises upgrade needs based on risk assessment and implements them incrementally over the long-term.**

Internationally recognized approach

- Recognizing these benefits, **WSPs are increasingly being promoted** by all stakeholders, including governments, donors and NGOs.
- **Water suppliers continue to implement WSPs across the globe.**
- In order to improve water management practices and consequently public health, stakeholders should familiarize themselves with the WSP approach, appreciate its benefits, and **take action in a coordinated way.**

Further information is available at : www.wsportal.org and at:
www.who.int/water_sanitation_health/dwq/en/.

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Thanks for your attention !

GRAZIE !

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