Water safety planning
What have we learned so far?

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THE NEED FOR WATER SAFETY PLANNING
As part of its SDG monitoring, the JMP estimates that 2 billion people drink water that is faecally contaminated (WHO & UNICEF, 2017). WHO remains concerned that close to 30% of the global population lack access to safely managed drinking-water services and 829,000 people continue to die annually from poor WASH (Prüss-Ustün et al., 2019). Consequently, WHO has identified “safely managed water” as a priority and one of its Organization-wide impact targets (WHO, 2018).

To tackle this, WHO has been intensely promoting a water safety plan (WSP) approach, which is the centre-piece recommendation of its Guidelines for Drinking-water Quality (WHO, 2017). Through the WSP approach, the water supplier undertakes a risk assessment and prioritization exercise from the source water through to treatment, distribution and consumer practices, putting in place control measures to ensure that the prioritized risks are controlled and implementing a regular system of monitoring to ensure that control measures continue to work.

WATER SAFETY PLAN UPTAKE & IMPACTS
Water safety plans1 have been implemented in at least 93 countries, with 46 countries reporting to have policies or regulations in place that promote or require WSPs (WHO, 2017).

A systematic assessment of the impacts of WSPs implemented at 99 sites in 12 countries in the Asia-Pacific region identified a number of benefits, which are summarized in the table below. These and other WSP impacts have been reported in numerous publications (including Gunnarsdóttir et al., 2012; Byleveld et al., 2016; Setty et al., 2017; Kumpel et al., 2018; WHO & IWA, 2018).

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1 Or an equivalent risk assessment and risk management approach.
WSP benefits

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<tr>
<th>Improved system operations and management (12 countries, 95% of all sites)</th>
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<td>Infrastructure improvements (10 countries, 86% of all sites)</td>
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<tr>
<td>Leveraging of donor funds (9 countries, 39% of all sites)</td>
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<tr>
<td>Increased stakeholder communication and collaboration (10 countries, 66% of all sites)</td>
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<td>Reductions in unaccounted for water (UFW) (7 countries, 21% of all sites)</td>
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<td>Increased water quality testing (11 countries, 65% of all sites)</td>
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<tr>
<td>Increased monitoring of consumer satisfaction (11 countries, 33% of all sites)</td>
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(from Kumpel et al., 2018)

REFLECTIONS

While there is clear evidence of widespread WSP uptake and a broad range of benefits realized, WHO continues working to better understand how to increase the effectiveness, impact and sustainability of WSP implementation. Some candid observations and ideas for future WSP programme strengthening are described below.

Variability in WSP impact and effectiveness reveal improvement opportunities. Significant differences can be seen in the effectiveness of WSPs on the ground, and there are some characteristics common to more and less successful WSPs that highlight improvement opportunities. Consider the actual (but anonymized) WSP experiences described in the Country X and Country Y text box below.

Country X: WSPs are a practical tool guiding day-to-day operations

The WSP process in Country X has focused heavily on improving system operations. While WSPs have also driven important infrastructure improvements (and leveraged donor funds for these improvements), the most impressive and impactful changes have been operational in nature. Across sites, the WSP process brought to light significant deficiencies in operator capacity and prioritized the provision of critical training and tools. Technical training programmes were designed and delivered on-site to strengthen knowledge and confidence in essential operational tasks, such as chlorine batching and dosing, and operators trained at one site were engaged to support training at other sites. Equipment to measure chlorine, pH and turbidity was provided, as was training in designing and carrying out routine water quality monitoring programmes to inform and guide system operations. Simple and concise standard operating procedures (SOPs) were developed for key tasks. These investments have resulted in greatly improved operator capacity and morale, which have in turn greatly improved system operations. Not surprisingly, these WSP sites are home to some of the most exciting WSP impacts measured, including a 46% increase in microbiological compliance at one site and a 26% increase at another.

Country Y: WSPs are externally driven and lack genuine supplier support

WSPs in Country Y are generally comprehensive and reflect thorough training in WSP steps and considerable effort by the water suppliers. WSPs have driven infrastructure improvements and have attracted donor funds for these improvements. Routine audits by the water service authority and the surveillance agency to enforce regulatory requirements drive regular updates and enhancements of the WSPs. However, WSPs have generally not been embedded into routine system operations in a meaningful way. In some cases, operations are guided by other risk management systems, such as ISO, and integration of the various management systems has not taken place. Although the WSPs are strong on paper, the scope of implementation in practice has been limited, and maintenance of the WSPs is largely externally driven. As the practical value of the WSPs to the suppliers is limited, active implementation and impacts have also been limited.
Critical reflection on these and other country experiences reveals important opportunities to improve future WSP programming, including:

1. **A WSP's role as an operations and management tool should be emphasized.** There can be a tendency for WSPs to focus primarily on risk assessment and improvement planning rather than also giving due attention to the ongoing operations, management, monitoring and review aspects of water safety planning. It is the latter elements of a WSP (or the “back end”) that underpin effectiveness and sustainability, making clear that water safety planning is not a one-off event intended only to identify and address current problems, but instead relies on a long-term commitment to improved system management. The “back end” of a WSP facilitates its integration into routine operations and therefore warrants more emphasis in WSP training and auditing programmes.

2. **WSP directives must be complemented by genuine supplier support.** WSP requirements alone, even where enforced, will not necessarily drive meaningful WSP implementation in practice. It is possible for a WSP to meet all minimum objective requirements and yet be of little practical use to the supplier. The most effective WSPs encountered are consistently those implemented by suppliers who are genuinely convinced of the WSP’s value. Ideas to achieve a better balance between top-down WSP directives and bottom-up supplier support are being explored. These include:
   a. **Targeted advocacy:** Generate and share WSP impact assessment data on indicators of particular interest to suppliers.
   b. **Rapid cycling:** Facilitate an iterative approach to water safety planning that focuses on “quick wins” initially (i.e. high reward from limited investment) to build support for water safety planning and inspire greater depth of development in subsequent iterations.
   c. **Integration of management systems:** Support the integration of WSPs with other risk management tools, such as ISO, to improve understanding that WSPs are not a competing approach but rather a framework to build on existing good practice and to fill gaps (e.g. source water protection).
   d. **Pragmatic auditing:** Encourage pragmatic WSP auditing that demonstrates the practical value of WSPs rather than a pedantic auditing approach that serves to reinforce negative perceptions of WSPs as an extra workload.

Support is needed to ensure rural WSP effectiveness and sustainability. While WSPs have proven to be successful for larger utilities, there have been practical issues applying WSPs to certain small systems. For example, the traditional six step approach promoted by WHO for community-managed piped supplies has proven challenging to apply to individual point sources (e.g. wells and boreholes). Further thinking is needed on how to optimally adapt the WSP approach for the wide variety of system and management types in rural settings, including “village level” water safety planning where individual supplies are prevalent and better integration of sanitary inspection forms into the WSP process. There is also a need to ensure that WSP activities are streamlined with related government and development partner programmes to avoid mixed messaging; this is particularly critical in rural settings, where there are often a number of partners supporting various
There is also a clear need for additional rural WSP guidance materials and practical tools to help stakeholders navigate these and other common challenges.

**Surveillance programmes need strengthening.** Surveillance programmes (including WSP auditing) underpin WSP sustainability by allowing enforcement of regulatory requirements and providing incentive and ongoing support to suppliers. However, many countries face important challenges in the successful implementation of surveillance. There are technical hurdles to overcome, including issues related to capacity, equipment and data management. Also, commitments in principle need to be matched by allocation of adequate human resources and sustainable funding, which will require a new level of political support. The SDG indicator “safely managed drinking-water” provides an opportunity to galvanize political support for WSPs and surveillance, as SDG monitoring should drive continued surveillance strengthening and with deficiencies in water quality and service delivery revealed, underscoring the need for WSPs.

**Further funding is required to maximize impact and sustain WSPs.** The Global Status Report on Water Safety Plans indicates that 80% (47 of 59) of countries raised concerns related to financing WSPs, including covering costs associated with WSP development and the implementation of improvement plans (WHO, 2017). These findings indicate that financial barriers, both real and perceived, pose an important hurdle to water safety planning. Although WSP development and implementation do not necessarily involve significant costs, the WSP process can indeed reveal that costlier system improvements are needed through the systematic risk assessment and prioritization process. There is a need to better support countries in accessing funding for infrastructure improvements identified through water safety planning, in addition to ensuring sustainable financing of surveillance programmes as highlighted above. Climate resilient water safety planning should be promoted as a systematic approach for leveraging funds from non-traditional WASH and health sector funding sources, such as multilateral climate funds such as the Green Climate Fund, Global Environment Facility, etc. There is also a need to ensure water quality is given due consideration in country consultations on WASH financing.

**APPLYING LESSONS LEARNED**

To help ensure that future water safety planning efforts benefit from these and other lessons learned over the last 15 years of practice, the following materials are being currently developed or updated by WHO to reflect key learnings:

- **WSP manual:** The WSP Manual (WHO & IWA, 2009) is currently being revised to reflect inputs from dozens of WSP experts, including recommendations on many of the topics addressed here (e.g. increased attention to the “back end” of the WSP process, rapid cycling, integration with other management systems).

- **Global WSP training package:** The standardized WSP training package (WHO & IWA, 2012) is being updated and will closely align with the revised WSP manual, therefore also addressing many of the learnings covered here.

- **WSP impact assessment guide:** To support improved understanding and advocacy of WSP benefits, a practical tool to guide WSP impact assessment is under development.

- **Sanitary inspection (SI) forms:** SI forms are currently being updated to maximize their utility as a risk assessment tool, particularly for small
water supply systems. As part of this update, alignment with the WSP principles and process is being strengthened.

**Guidelines for small drinking-water supplies:** Volume 3 of the Guidelines for Drinking-water Quality (WHO, 1997), which acknowledges and addresses the particular challenges faced by small water supplies, is currently being updated. Several of the issues addressed here will be covered in the updated guidance, including optimizing WSPs for small systems, strengthening surveillance programmes and addressing funding shortfalls.

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**REFERENCES**


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