Water Safety Plans

in eastern Europe, the Caucasus and central Asia

Summary of a workshop on building capacities for the development of water safety plans

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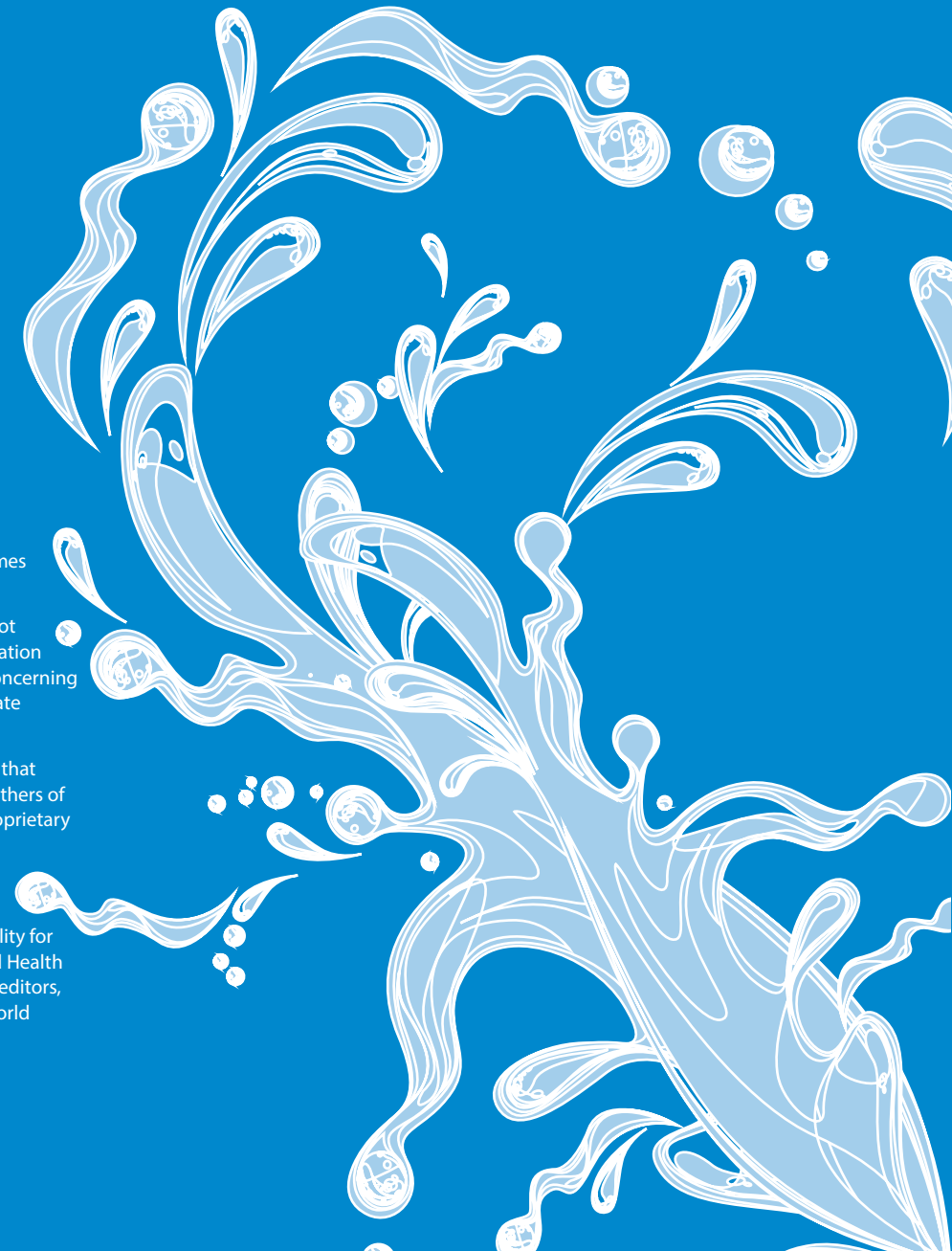

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The WHO Regional Office for Europe held a workshop entitled "Building capacities for the development of water safety plans" on 24–25 June 2014 in Bishkek, Kyrgyzstan. This was intended to support implementation of the 2014–2016 programme of work of the United Nations Economic Commission for Europe (UNECE) and WHO Protocol on Water and Health to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes.

The primary purpose of the workshop was to increase understanding of and support for water safety plans (WSPs) by raising awareness among national governments to the WSP approach, its benefits and the lessons learned. It also had a longer-term vision of building the foundations for a sustainable scale-up of WSP implementation in countries of eastern Europe, the Caucasus and central Asia (EECCA). A new WSP field guide in English and Russian was launched at the workshop; this provides hands-on advice for communities and local institutions working on rural water supplies.

The workshop was attended by 78 delegates from the water and health sectors, including participants from 12 EECCA countries and a broad range of international organizations and nongovernmental organizations (NGOs). It was organized in cooperation with the WHO Country Office, Kyrgyzstan, WHO headquarters and UNECE, and was financially supported by the German Federal Ministry for Environment, Nature Conservation, Building and Reactor Safety and the Federal Environment Agency via the Advisory Assistance Programme for Environmental Protection in the Countries of Central and Eastern Europe, the Caucasus and Central Asia.

The WSP approach

Availability of acceptable and safe drinking-water in sufficient quantity is a key prerequisite for good health, economic development and sustainable family livelihoods. The WSP approach, recommended by the WHO Guidelines for drinking-water quality since 2004, is the most effective way of ensuring continuous provision of safe drinking-water.

While analyses of drinking-water quality are a valuable source of information, safe drinking-water cannot be ensured by testing alone. Samples may be taken, sent to the laboratory and analysed, but before the results are available consumers will already have drunk the water. Laboratory testing can only indicate the quality of a small amount of water at a single point in time; it can only tell whether safe drinking-water has been supplied, not prevent the supply of unsafe water; and it cannot indicate whether a water supply is at risk of becoming contaminated and where that contamination may originate from. Water quality testing is too little and comes too late in the water supply process to protect public health adequately from risks related to unsafe drinking-water.

In contrast, the WSP approach focuses on prevention and proactive risk management of drinking-water supplies from catchment to consumer. WSPs are developed at the level of an individual water supply – they are a tool to help utility providers and communities managing the safety of their water supply to do so effectively.

The WSP approach is an integral part of the framework for safe drinking-water of the WHO Guidelines for drinking-water quality (Figure 1). WSPs are at the centre; they are guided by health-based targets and feed into a system of independent surveillance.

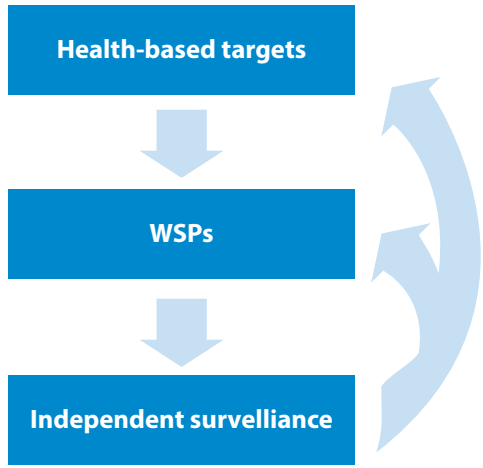

Figure 1. The simplified WHO framework for safe drinking-water

Source: Adapted from WHO (2011). Guidelines for drinking-water quality – fourth edition. Geneva: World Health Organization.

The WSP approach triggers a cycle of continuous improvement of drinking-water supplies. It promotes proactive thinking about the safety of a water supply by asking the following questions.

- What are the risks to my drinking-water supply?
- How important are these risks?
- How do I reduce these risks to an acceptable level?
- How do I know the drinking-water that I am supplying is safe?

In order to facilitate this way of thinking, the WSP approach consists of a series of systematic steps that are applicable for all types and sizes of drinking-water supply systems (Figure 2).

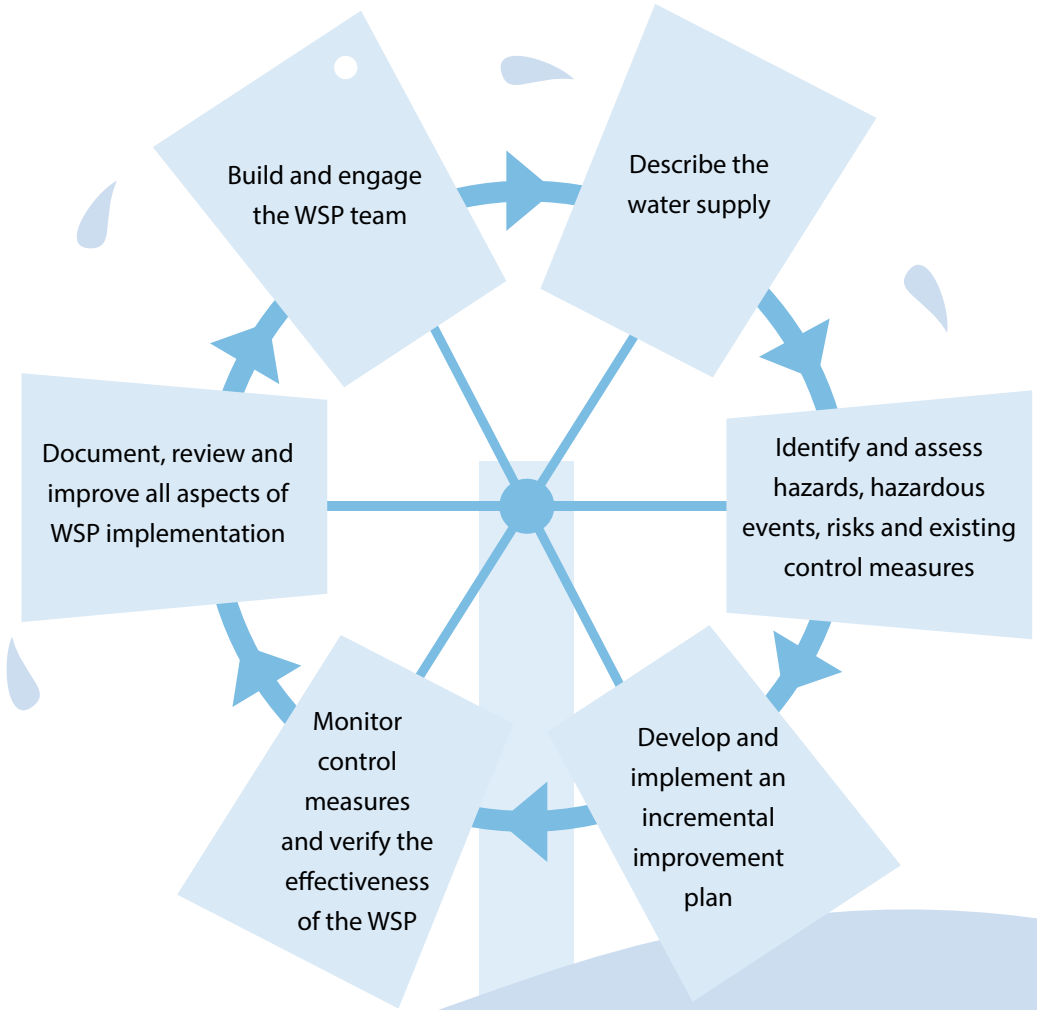

Figure 2. Basic version of the WSP cycle

Source: Adapted from WHO (2012). Water safety planning for small community water supplies: step-by-step risk management guidance for drinking-water supplies in small communities. Geneva: World Health Organization.

Benefits of WSP implementation

WSP development and implementation leads to a range of benefits, eventually resulting in improved health. A study from Iceland[1] has shown that a population that is serviced by water supplies using the WSP approach is 14% less likely to develop clinical cases of diarrhoea. Diarrhoeal diseases caused by unsafe drinking-water still represent a significant health burden. In low- and middle-income countries in the WHO European Region, 10 diarrhoea deaths a day can be attributed to inadequate water, sanitation and hygiene.[2] The WHO global burden of disease researchers estimate that a transition in access from basic piped water supplies to systematically managed piped supplies could account for a significant reduction in diarrhoeal disease risk in low- and middle-income countries.[3]

Countries in the WHO European Region that have experience of WSPs report additional benefits (Figure 3).

1 Gunnarsdottir MJ, Gardarsson SM, Elliott M, Sigmundsdottir G, Bartram J (2012). Benefits of water safety plans: microbiology, compliance and public health. Environ. Sci. Technol. 46(14):7782–7789 (http://pubs.acs.org/doi/full/10.1021/es300372h, accessed 15 August 2014).

2 Prüss-Üstün A, Bartram J, Clasen T, Colford JM Jr, Cumming O, Curtis V et al. (2014). Burden of disease from inadequate water, sanitation and hygiene in low- and middle-income settings: a retrospective analysis of data from 145 countries. Trop Med Int Health 19(8):895–905 (http://onlinelibrary.wiley.com/doi/10.1111/tmi.12329/full, accessed 13 July 2014).

3 Wolf J, Prüss-Ustün A, Cumming O, Bartram J, Bonjour S, Cairncross S et al. (2014). Assessing the impact of drinking water and sanitation on diarrhoeal disease in low- and middle-income settings: systematic review and meta-regression. Trop Med Int Health 19(8):928–942 (http://onlinelibrary.wiley.com/doi/10.1111/tmi.12331/pdf, accessed 15 August 2014).

Regulatory benefits include:

- better information from WSPs, to inform surveillance activities;
- increased knowledge-sharing and cooperation between water suppliers and local or national governments;
- improved legislation to support or strengthen associated regulation (e.g. resource protection, water allocation, consumer health, wastewater discharge, land use, and so on).

Institutional benefits include:

- increased awareness, knowledge and understanding among staff of water suppliers of the supply system and prevailing risks;
- improved cooperation and communication among water supply staff;
- increased consumer confidence in the drinking-water supplied.

Investment benefits include:

- support for decision-making about upgrade and improvement needs, thereby enabling better targeting of investments;
- increased access to and allocation of funds from national, state or local government budgets.

Water quality benefits include:

- improved drinking-water quality (e.g. through compliance with water quality regulations);
- a reduction in the number and severity of drinking-water related incidents;
- improved source water protection.

Operational benefits include:

- improved managerial and standard operating procedures;
- improved operational monitoring;
- improved record-keeping and data collection.

Figure 3. Additional WSP benefits

Countries' experiences of WSPs

Scaling up adoption of the WSP approach at the policy and service-provider levels shows significant momentum. More than a third of all countries in the WHO European Region have experience with the WSP approach, ranging from pilot projects and scale-up strategies to enforceable regulations on WSPs or similar risk-management approaches.

Enforceable legislation exists in Belgium, Hungary, Iceland, Switzerland and the United Kingdom. In England and Wales, for example, the regulator has actively encouraged the water industry to adopt a WSP approach on an informal basis since 2004. In 2007 the regulations were amended so that risk assessment and risk management from catchment to tap became a mandatory requirement for all supplies. Under the current regulations, all large water utility providers are required to report summary information from these risk assessments to the regulator for review.

In Portugal the drinking-water regulator encourages water suppliers to implement WSPs, but it is not yet an enforceable requirement. This "soft law" approach is intended to facilitate progression from a recommendation to a legal requirement, permitting the suppliers to implement WSPs in a step-by-step manner and to share their experiences with the regulatory agency for consideration in policy-making.

Several EECCA countries have worked with the WSP approach; some have gained experience through pilot projects. In Tajikistan, for example, the Ministry of Health and Social Protection and the State Sanitary Epidemiological Service aim at incremental uptake of WSPs to strengthen the population's health. As an initial step, WSP facilitators were trained and WSP projects were carried out in two pilot communities. These pilots confirmed the feasibility of implementing WSPs in rural Tajikistan and led to immediate improvements in the water supplies of the respective communities. As a result of the project, a step-by-step field guide has been developed in Tajik to assist rural communities in implementing their WSPs. On the basis of the experience gained

from these pilot WSPs, the NGO Oxfam GB now includes the WSP approach in its project cycles. It aims to support the scale-up of WSPs in Tajikistan in 18 rural water schemes by 2017, including conducting training for WSP facilitators of local health offices and NGOs. The European Bank for Reconstruction and Development (EBRD) also envisages including WSPs in its "Tajik Water II" project. Its aim is to evaluate the feasibility of integrating the WSP approach's provisions into the cycle of EBRD infrastructure investment projects in order to identify risks and mitigation measures related to health and safety. The basis for evaluation will be one or two demonstration pilots; these are to be built into planned projects in small-town water supplies in northern Tajikistan.

NGOs have promoted implementation of WSPs for rural water supplies in Kyrgyzstan. Some of the projects were linked to investment planning strategies because, while high proportions of the population have access to piped supplies, the quality of the infrastructures is deteriorating; this has led to poor drinking-water quality and, in turn, low willingness to pay among consumers. Other NGO projects have focused on involving schoolchildren in water safety planning projects and presenting the local WSP to all community members. Both types of project have resulted in immediate benefits and improvements to the supplies; in the latter case, this was achieved through increased transparency for the community regarding priority improvement needs. The Kyrgyz Sanitary Epidemiological Service is a strong supporter of WSPs and is keen to promote them whenever and wherever possible. To complement the NGO activities, the Kyrgyz public authorities are planning to implement WSPs for urban supplies (see Table 1 in the section "The Protocol on Water and Health can support national policy-making on WSPs").

In the Republic of Moldova, an order was issued on the development of a model WSP for the city of Orgeyev in 2007. The local water utility company created a WSP team, including members of the local government, the company's senior management and heads of divisions (such as from the water supply, sewerage, treatment and technology departments), as well as representatives from public health and environmental authorities. The WSP team assessed the status of the water supply system and risk factors that could adversely affect the supply. Through joint discussions the

team identified measures for improvement; these included, for example, building new pipelines to supply 100% of the population with piped water and improving water supply management through staff training. On the basis of the improvement plan, the World Bank provided the city with a credit of 2.5 million US dollars. The experience gained from this pilot project will serve as an example for other cities in the Republic of Moldova, as developing WSPs is one of the targets for implementation of the Protocol on Water and Health (see Table 1 in the section "The Protocol on Water and Health can support national policy-making on WSPs"). An ordinance has been drafted to establish a task force to develop and implement WSPs in the Republic of Moldova.

As a first step towards implementing WSPs in Georgia, the National Centre for Disease Control and Public Health conducted a situation assessment of the water quality of small supply systems in two districts. In the context of this assessment, local authorities and community members were able to learn about the WSP approach and its added value, and were provided with WHO guidance materials translated into Georgian.

Creating an enabling environment

Policy-makers can take several steps to create an enabling environment for WSP uptake and implementation at the national level; these are based on good practice and lessons learned from around the world. The WHO document *Think big, start small, scale up: a road map to support country-level implementation of water safety plans* provides further guidance on the topic (see the section "Overview of WHO resources on WSPs"). Developing and implementing a national strategy for WSP adoption can best be managed by establishing a multisectoral steering committee to guide and oversee the various steps of the process.

At the country level it is important that key stakeholders first learn about WSPs and their benefits. WHO and its partners can support Members States by organizing advocacy and capacity-building workshops to help participants learn about WSPs and share their experiences. WHO has published various resources and tools on WSPs, including training materials and case studies that promote learning about WSPs at all levels (see the section "Overview of WHO resources on WSPs").

Implementation of WSP pilot projects is an important step for WSP uptake at the national level. Pilot projects demonstrate the feasibility of WSP implementation and the possible benefits in the national context and help to build WSP expertise within the country. They can also help to identify barriers to uptake and the human and financial resources required, as well as considerations that will need to be made to tailor the WSP approach to national circumstances and practices. Initial WSP projects can also be undertaken with assistance from outside the country. UN-Habitat, for instance, promotes water operator partnerships, which foster not-for-profit peer-to-peer support between water operators from different countries. WSPs can be the focus of a water operator partnership if agreed upon by the partnering stakeholders.

Experiences and lessons learned from WSP pilot projects will inform the formulation of a national scale-up strategy and ongoing support mechanisms. These include organizing sustainable training

for trainers, facilitators and auditors for WSPs, as well as developing customized WSP tools and resources that ensure national relevance and quality and consistency of WSP training.

A WSP scale-up strategy needs to consider policy and regulatory instruments. To prepare WSP-related regulations, regulators can encourage water suppliers to gain experience with WSPs, even if they are not yet stipulated by law. Most countries have drinking-water regulation in place; requirements for WSP implementation can be included in the existing regulatory frameworks by adapting current instruments or establishing new ones. In order to do this in a sustainable way, a baseline assessment should be conducted to analyse the implications of WSP requirements in terms of human resources, as well as institutional roles and responsibilities. To establish a regulatory push for WSP implementation, a range of policy and regulatory instruments can be used – for example, laws, sanitary norms and standards. As with the design of any new policy, it is also important to assess the costs of requiring WSP implementation and securing access to financial support. Once WSPs are in place, financial management usually becomes easier because WSPs will help to identify needs for improvement and priorities for investment.

Particularly if WSPs are required by regulations, it is important that the regulatory agency establishes an auditing mechanism as a means to verify the quality of the WSPs that water suppliers have developed and to stipulate further improvement. The regulatory agency needs to consider several questions in the process of such auditing.

- Who should be tasked with auditing WSPs?
- What will be the focus of the audits?
- Who will oversee the implementation of the outcomes of the audit?

In order to address these issues, WHO is preparing a guidance document for countries wishing to implement a WSP auditing scheme.

The Protocol on Water and Health can support national policy-making on WSPs

In all countries in the WHO European Region some type of drinking-water regulation is already in place; many countries have established policies and programmes that aim at improving access to and quality and sustainability of drinking-water supply services. These form a good starting point for WSP uptake.

The target-setting process under the Protocol on Water and Health also provides a good basis for WSP policy-making at the national level. The Protocol is the first international instrument to link prevention and reduction of water-related disease and the sustainable use of water resources. Strengthening national capacities to enable long-term WSP uptake has been identified as a priority under the Protocol's 2014–2016 programme of work.

According to Article 6 of the Protocol, Parties are required to adopt national targets for the quality of drinking-water supplied, the levels of performance by water-supply systems and the application of recognized good practice to the management of water supplies, among others. To this end, several Parties and countries currently preparing to accede to the Protocol have already identified the introduction and scale-up of WSPs as an area for target setting (Table 1). Parties that have already established and published targets might also consider updating them to include WSP-related targets. Such targets would represent one important component of a national WSP scale-up strategy.

Table 1. Examples of WSP-related targets set under the Protocol

Country	WSP-related targets
Armenia[a]	• Develop methodology and legal basis for WSPs by 2016 • Develop and implement WSPs in five communities by 2020
Hungary	• Promote good practice in water-supply management (indicator: number of water supplies using WSPs)
Kyrgyzstan[b]	• Organize development and approval of WSPs for two cities (Bishkek and Osh) by 2015 • Organize development and approval of WSPs for other cities and regional centres by 2020
Republic of Moldova	• Set up WSPs for all cities and other settlements with populations of over 5000 people by 2020
Tajikistan[a]	• Develop WSPs in five major cities by 2015 • Develop WSPs in 30 rural communities by 2017

[a] Country is not a Party to the Protocol; targets have been drafted in the context of the Protocol but not yet officially adopted.

[b] Country is not a Party to the Protocol; targets have been set in the context of the Protocol and officially adopted.

WSPs for small water-supply systems

The WSP approach is a flexible tool that can be applied to both large and small systems. Definitions of "small" supplies vary from country to country. Some define small supplies according to the type of technology (e.g. centralized versus non-centralized) or type of management (e.g. individual supplies, municipality-managed or community-managed supplies) involved, others by the number of people served or the amount of water delivered. Despite the varying definitions, the distinct feature of small water-supply systems is that they usually face similar managerial, personnel and financial challenges, often resulting in poor drinking-water quality and thus public health concerns.

- Small supplies are sometimes not regulated or the regulatory responsibility is scattered across several ministries.
- Surveillance is often restricted due to limited staffing at the responsible agency and the sheer number and remoteness of supplies.
- Small supplies have limited access to sustainable financing, while having relative larger capital costs per unit than larger supplies.
- Operators of small systems may be undertrained or may operate the system in addition to having many others tasks in the community; alternatively, nobody may be officially responsible for managing the supply at all.

In spite of these challenges, good progress has been made in implementing WSPs for small systems in the WHO European Region and globally.

WSPs are considered very beneficial for small systems because they facilitate quick operational wins, long-term improvements and good management by providing simple starting points. In order to promote WSP implementation in small systems, a number of factors need to be considered.

- Operators of small supplies may require external advice and support from WSP facilitators (e.g. from local health or water offices) to learn about the WSP approach and implement a WSP for their systems.
- Funding for identified infrastructure improvements may need to be made available from external sources.
- Resource protection measures and local sanitation practices require special attention in the context of WSPs for small systems, especially where centralized waste-water management is absent and inadequate sanitation endangers source water quality.
- Easy-to-understand practical guidance materials and templates in the local language are needed.

Workshop outcomes: building blocks and support needs for WSP implementation

At the "Building capacities for the development of water safety plans" workshop, delegates of several EECCA countries discussed the building blocks for successful implementation and scale-up of WSPs and the associated support needs with international WSP experts. The main outcomes can be summarized as follows.

- **National advocacy:** to build broad political support in countries, advocacy needs to be increased at the national level, particularly targeting high-level decision-makers. Such advocacy activities need to communicate clearly the public health and institutional benefits of the WSP approach, as well as the financial implications. Advocacy activities will typically require external support, in particular in terms of expertise, including from international organizations.
- **Learning across countries:** in order to facilitate national policy uptake of WSPs, examples of regulations, norms and standards for WSPs from other countries should be shared as a basis for national consultations. Similarly, experiences from other countries should be made available and analysed so that lessons can be learned and shared.
- **Building capacity at the country level:** to scale up WSP implementation it is important for countries to build their own WSP experiences and resources, including developing pilot projects and WSP trainers. Training will be required for water operators, as well as for local government staff who may facilitate WSP implementation. This will also involve developing materials in the local language and making them available to users. Financial resources are necessary to cover the costs of these activities.
- **International guidance:** to provide a starting point for national policy-making, international guidance on how to integrate policies on WSPs into existing drinking-water regulation, as well as on how environmental and sanitation aspects can be addressed when creating policies or implementing WSPs, should be provided.

The support needs identified will inform and guide future WSP-related activities of the WHO Regional Office for Europe and under the 2014–2016 programme of work of the Protocol on Water and Health.

Overview of WHO resources on WSPs

WSP resource		Details
	WHO (2011). Water safety plans. In: Guidelines for drinking-water quality – fourth edition. Geneva: World Health Organization http://www.who.int/water_sanitation_health/publications/2011/dwq_guidelines/en/	WSP implementation is a core element of the WHO Guidelines for drinking-water quality, the international point of reference for developing effective drinking-water regulation that protects public health. Chapter 4 of the Guidelines focuses on the key elements of WSPs. The fourth edition of the Guidelines is only available in English; the third edition, however, is also available in French, Russian (partly) and Spanish.
	WHO and International Water Association (IWA) (2010). Think big, start small, scale up: a road map to support country-level implementation of water safety plans. Geneva: World Health Organization http://www.who.int/water_sanitation_health/dwq/WSP/en/	This document provides guidance to countries on how to introduce and scale up the implementation of WSPs. It is mainly targeted at governments and regulatory entities tasked with developing or revising drinking-water quality regulation. It is available in English and Russian.
	WHO and IWA (2009). Water safety plan manual: step-by-step risk management for drinking-water suppliers. Geneva: World Health Organization http://www.who.int/water_sanitation_health/publication_9789241562638/en/	This step-by-step manual facilitates the practical implementation of the WHO Guidelines for drinking-water quality. It guides the reader through the WSP approach and contains detailed information on all WSP steps, providing a range of case studies. The manual is available in English, Russian, French, Spanish, Georgian and Polish.

WSP resource		Details
	WHO (2012). Water safety planning for small community water supplies: step-by-step risk management guidance for drinking-water supplies in small communities. Geneva: World Health Organization http://www.who.int/water_sanitation_health/publications/2012/water_supplies/en/index.html	This step-by-step manual helps the reader to understand the WSP approach in the context of small community water supplies. It is intended to complement the 2009 step-by-step manual, which places more emphasis on large supplies. It is primarily targeted at local government officials and NGOs supporting drinking-water supply activities. The manual is available in English and Russian.
	WHO (2014). Water safety plan: a field guide to improving drinking-water safety in small communities. Copenhagen: WHO Regional Office for Europe 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	This field guide provides a step-by-step introduction to the WSP approach. It offers hands-on advice and a range of ready-to-use templates to assist communities and local institutions working on rural water supply to develop and implement their own WSPs. The field guide is available in English and Russian.
	WHO and IWA (2012). Water safety plan training package. Geneva: World Health Organization http://www.wsportal.org/ibis/water-safety-portal/eng/home	This is an online platform that supplements WSP publications and the activities of WHO and its partners by providing an extensive range of practical tools, case studies and peer-to-peer support networks. The portal is operated in English and Spanish.
	WHO and IWA (2012). Water safety plan training package [website]. Geneva: World Health Organization http://www.who.int/water_sanitation_health/publications/wsp_training_package/en	This package is designed to be used by trainers facilitating training based on the WSP manual; prior knowledge and understanding of WSPs are required. It consists of a facilitator handbook, a participant workbook and accompanying PowerPoint presentations. The training package is only available in English.

WSP resource		Details
	WHO and IWA (2013). Water safety plan quality assurance tool [website]. Geneva: World Health Organization http://www.who.int/water_sanitation_health/publications/wsp_qa_tool/en/index1.html	This quality assurance tool is for use by a WSP team or an external assessor with a good understanding of WSPs. It is to be used on the level of a water supply where a WSP has been implemented. The tool helps to ensure that key elements in the WSP process are not overlooked, that the WSP remains up to date and that it is effective. The tool is available in English, French, Icelandic, Portuguese, Russian and Spanish; the user manual is only available in English.
	WHO (2011). Water safety in buildings. Geneva: World Health Organization http://www.who.int/water_sanitation_health/publications/2011/9789241548106/en	This publication explains how to apply the WSP approach in the context of buildings. It is available in English and French.
	WHO (2014). Water safety in distribution systems. Geneva: World Health Organization http://www.who.int/water_sanitation_health/publications/Water_Safety_in_Distribution_System/en/	This publication is intended for water suppliers and regulators who are already familiar with the WSP approach. It will help to enhance risk management and investment planning for their water distribution systems. The document is only available in English.

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