Paper 03
Water Safety Plans for Small Communities in Sri Lanka

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INTRODUCTION

Delivery of safe drinking water is vital for protecting public health and promoting a more secure livelihood in a country. At present assessment of safety of water in community water supply systems is limited to occasional water testing. Service by Public Health Inspectors is vital on this regard in Sri Lanka. However a pro-active approach to water safety is not happening in the rural water sector at present. The author being recently trained by WHO for implementing Water Safety Plans (WSPs) in Urban Sector has observed this gap and an effort is made to evaluate the present situation, challenges and to propose a way forward.

HIGHLIGHTS

- The WSP outline for urban water supplies currently implemented is briefly described.
- The WSP outline for community water supplies is briefly described.
- The two WSP outlines are compared with the objective of achieving a way forward for community WSP development.

Present Approach and the Water Safety Plan

The present approach for achieving safety of water is "End Product Testing". This is to test water after treatment, within the distribution system and at the consumer's tap. This traditional method has the shortcomings in a water supply system such as too little results and too late for preventive action. The water safety plan approach provides a management tool for improving safety of water and adopting multiple barrier risk management approach using control measures. The final outcome is continuous safety and quality assurance of drinking water.

WSP for Urban Water Supply Schemes

The World Health Organization (WHO), in their Guidelines for Drinking Water Quality (WHO, 2011) concludes that end product testing is not sufficient to guarantee safe drinking water to consumers. Instead, WHO recommends planning and implementation of effective WSPs for ensuring safety of drinking water. Accordingly WHO has published "Water Safety Plan Manual-Step by step risk management for drinking water suppliers", an eleven module manual for Urban Water Supply Schemes (Bartram et al, 2009). Its outline is as shown in Figure 1 below.

The advantage of WSP over end product testing is that WSP concentrates on ensuring the processes involved in delivering safe drinking water are operated properly and are under full control at all times. In addition WSP also addresses the issues of providing an organized and structured system to minimize the chance of failure through oversight or lapse of management. This process developed helps to increase the consistency with which safe water can be supplied and provides contingency plans to respond to system failures or unforeseeable hazardous events.

Critical Constraints and Key Challenges

The water safety plan is always location specific. Therefore it should be developed by regional operational staff following the principles. This is why training is essential for implementation of water safety plans.

Some of the constraints for WSP development are limited data availability, unplanned development, poor sanitation, weak system knowledge, equipment and human resource availability.

Background of Community Water Supplies Sri Lanka

Sri Lanka is a country with a population of 20.2 million where around 81.7% is rural community.

National Water Supply & Drainage Board has 22 District Water Supply and Sanitation Units to manage its Rural Water Sector. Rural Water Supply coverage of Sri Lanka stands at 10.9%. At present there is a National Policy for Rural Water and Sanitation Sector (Ministry of Urban Development, Construction & Pubic Utilities, 2001) where rural areas are defined as "Grama Niladhari Division" (GND) in which population is less than 6,000. It defines the minimum water requirement as 40 liters per capita per day and limits the maximum hauling distance to 200m in flat terrain with suitable adjustments for steep terrains.

At present, safety of rural community water is checked by NWSDBN Regional offices and public health inspectors (PHIs) of the Ministry of Health, Sri Lanka. Implementing Water Safety Plans could be considered as an upgrading of the current system with a much systematic and well documented and self controlled pro-active process.

Basics of WSP for Community Water Supply Schemes

WHO proposes six task WSP process for community water supply schemes as detailed in the Figure 2 below. Risk management by improvement plans is an important activity of a WSP. Refer Table 1 and Figure 3 for risk matrix and the need for an improvement plan on control measures.

OUTCOME

Outcome of this paper is dissemination of basic knowledge on WSP and comparison of implementation strategies proposed by WHO for urban and community water supply systems to a cross section of multi-disciplinary technical staff which is essential for successful implementation of the WSPs. The summarized comparison of urban and community WSPs is given in Table 2. In general the community WSP is a simplified version of urban WSP especially with respect to risk assessment and prioritization.

CONCLUSION

WSP could be viewed as a very useful participatory management tool to achieve, not only safe water but also process optimization, climate resilience and disaster risk reduction. WSP promotes teamwork towards safe water provision. WSP is a knowledge based tool which could provide best outcome of individuals by integrating their experience into output oriented activities with acquired subject knowledge. Further, it orients multi-disciplinary individuals to work together towards the common goal of safe water supply to the consumer.

At present National Water Supply & Drainage Board has developed six urban WSPs in Sri Lanka under WHO guidance since 2012. Now it is high time to introduce WSPs into the community water supply sector with the guidance provided by WHO. The author strongly believes that awareness is essential to initiate such activity with this effort as a part of it.

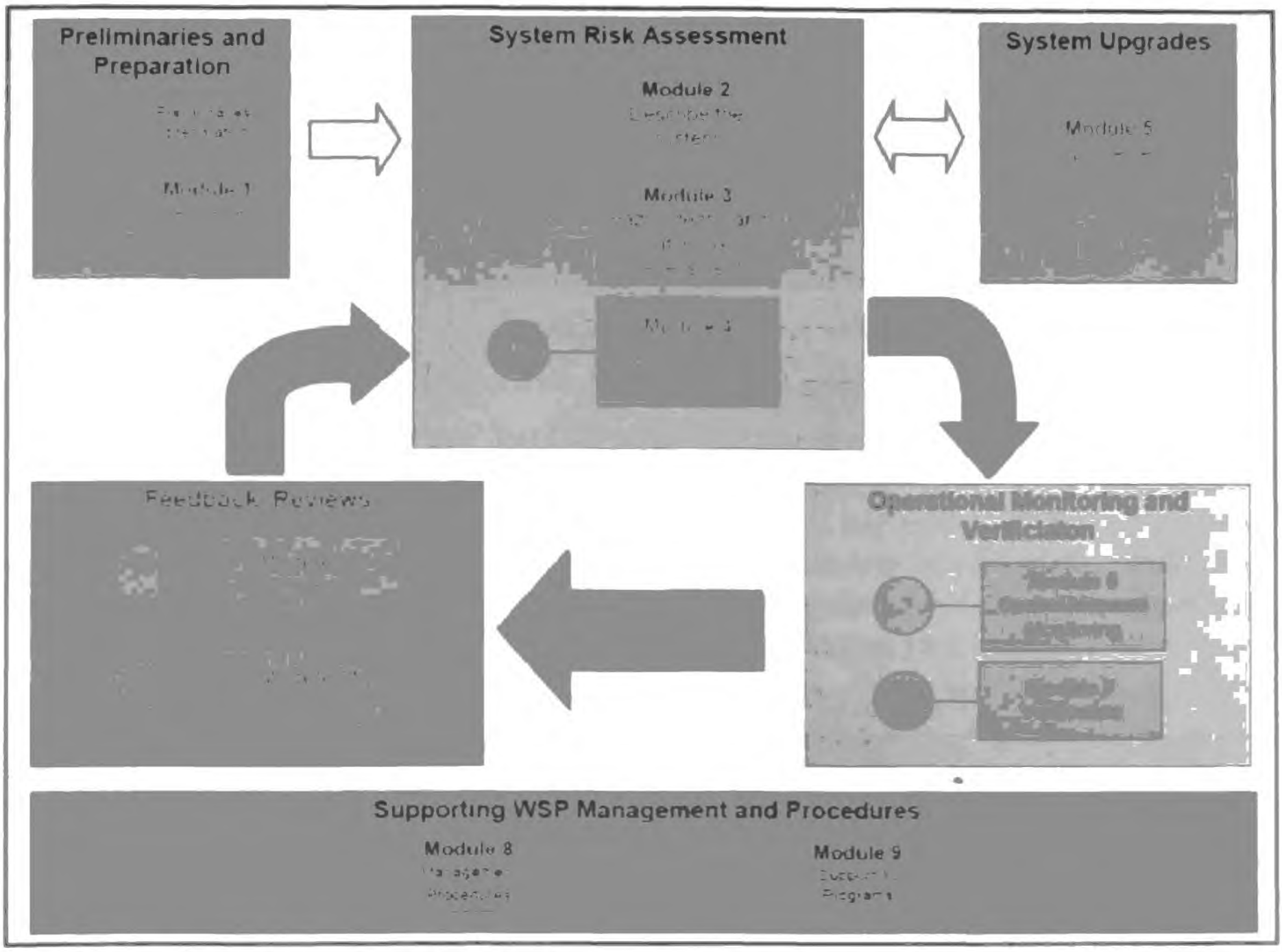

Figure 1- The outline of eleven module WSP (Bartram et al., 2009)

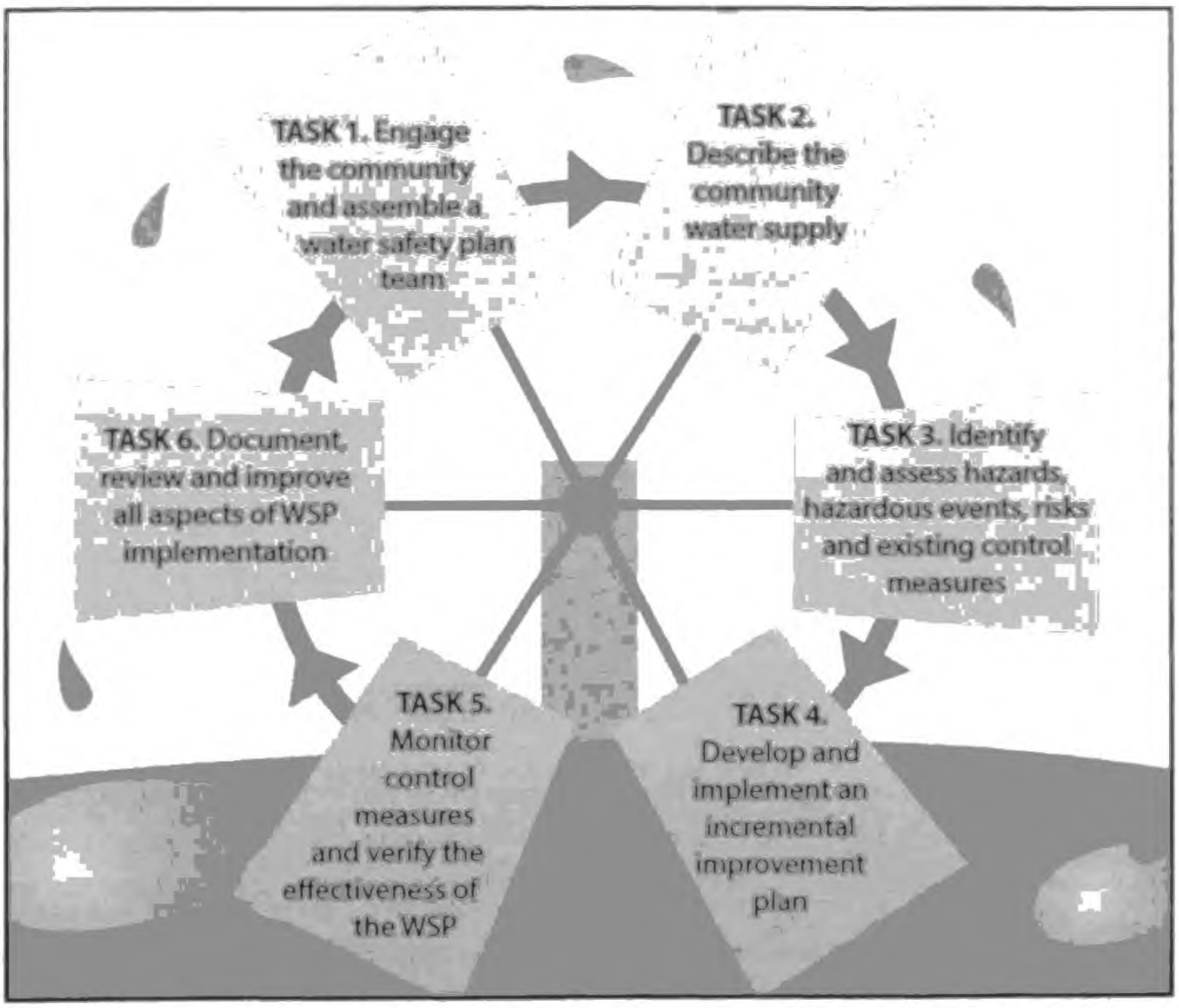

Figure 2: The six Task "Water Safety Plans" for Small Community Water Supply Schemes (WHO, 2014)

Example risk matrix for the risk ranking approach

		Severity/consequences		
		No/minor impact	*Moderate impact*	*Major impact*
Likelihood	*Likely*	Medium	High	High
	Possible	Low	Medium	High
	Unlikely	Low	Low	Medium

Table 1 - Risk Matrix for community water supply systems

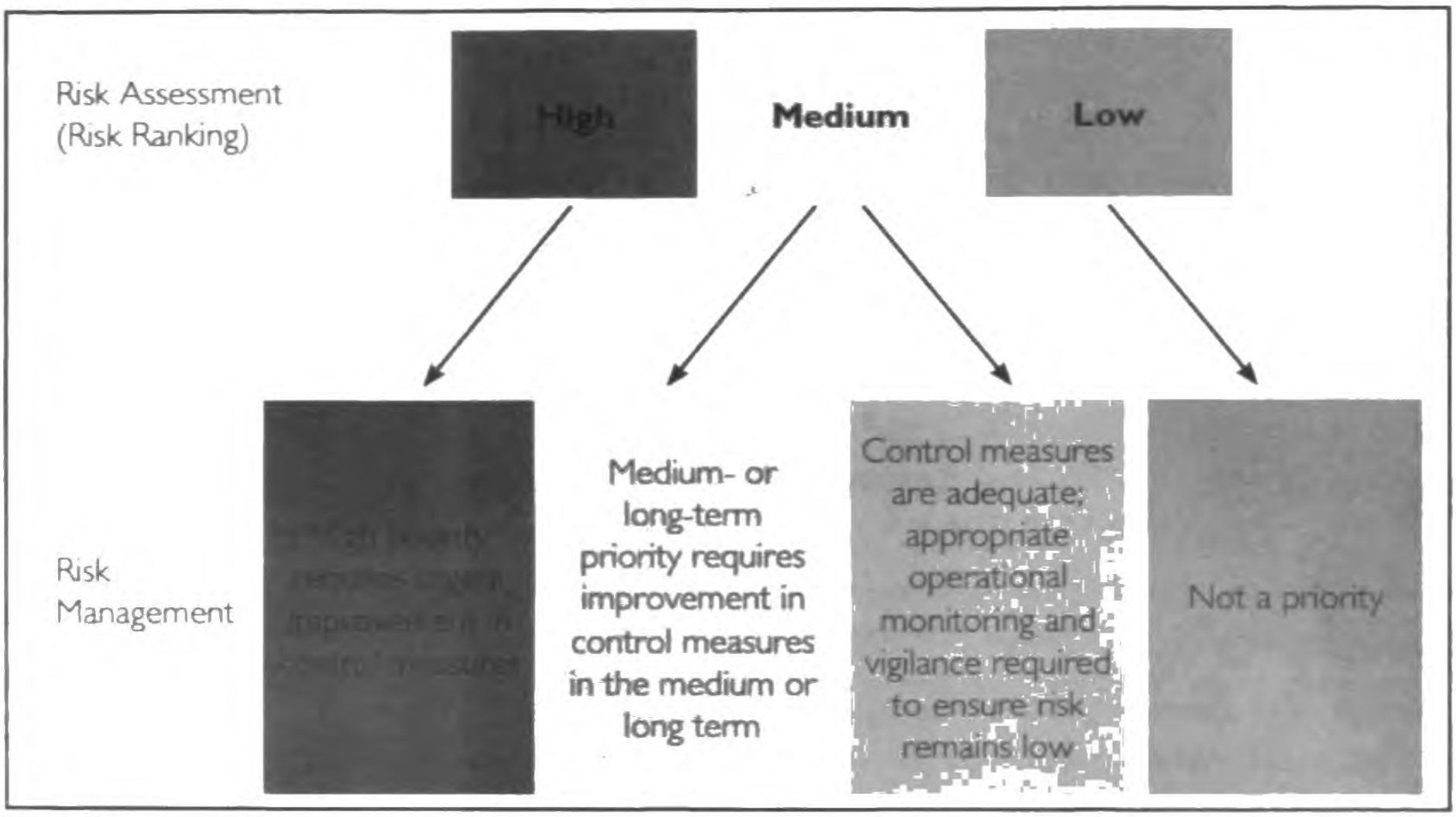

Figure 3 - Need for improvement plans

6 WSP tasks *(2012 WHO WSP manual for small supplies)*	**5 WSP Stages**	**11 WSP modules** *(2009 WHO/IWA WSP manual)*
Task 1: Engage the community and assemble a WSP team	Preparation	Module 1: Assemble team and identify stakeholders
Task 2: Describe the community water supply	System assessment	Module 2: Describe the water supply system
Task 3: Identify and assess hazards, hazardous events and existing control measures		Module 3: Identify the hazards& assess the raw risks
Task 4: Develop and implement and incremental improvement plan		Module 4: Determine & validate control measures, reassess & prioritize risks
		Module 5: Develop, implement & maintain an improvement plan
Task 5: Monitor control measures and verify the effectiveness of the WSP	Monitoring	Module 6: Define monitoring of control measures
		Module 7: Verify the effectiveness of the WSP
Task 6: Document, review and improve all aspects of WSP implementation	Management & communication	Module 8: Prepare management procedures
		Module 9: Develop supporting programmes
	Feedback & improvement	Module 10: Plan & carry out periodic WSP review
		Module 11: Revise WSP following incident

Table 2- Comparison of Urban and community WSPs (Rinehold, A., 2014)