

## **Development of a Systematic Risk Identification and Assessment Method in Water Safety Plan: A Case Study of Pelmadulla Water Supply Scheme, Sri Lanka**

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This study proposes a novel method for risk assessment in Water Safety Plan (WSP). WSP is a management approach proposed by the World Health Organization to ensure the water quality from the source to the consumer. WSP consists of 11 modules that assist to identify and solve water quality issues and possible risks in water source, treatment and supply through an organizational management approach. However it does not provide adequate guidelines for its most critical risk assessment as described in Module 3 - Identify hazards and hazardous events and assess the risks to the water quality. WSP guideline Module 3 proposes a semi quantitative single factor risk assessment. But for a single risk there may be several associated co-risk factors. Therefore this study proposes a systematic risk identification and assessment method by considering co-risks. Furthermore this study evaluates the novel method and old method results. Co-risk factors involved in single risk were identified by using past and current water quality data, consumer opinions and operator opinions through questionnaire surveys and laboratory analysis. Risk assessment was performed with semi-quantitative approach. Results reveal that the new method is capable of identifying and evaluating the risks in a more objective manner and there is a significant difference between then risk ratings obtained through this novel approach and previous methods. Of the 16 hazardous events 10 were identified to be 'high risk' under the previous scheme. The new method has lowered it to 6 high risk hazardous events. The proposed novel method will be more economical in implementation of the WSP as it performs a rigorous assessment of critical hazardous events.

Keywords: Water Safety Plan, Hazardous events, Risk assessment