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Study of potential risks in a rural water supply scheme for a sustainable development of a Water Safety Plan (WSP): a case study of Madola Community Water Supply Scheme (RWSS), Sri Lanka

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Developing a Water safety plan (WSP) involves undertaking risk assessment at each step of Rural Water Supply Schemes (RWSS). This approach ensures the safe access to drinking water from catchment to consumer and sustainability of operation of RWSS. Hence, the present study was conducted in Madola Grama Niladhari Division (GND) in Kegalle District, Sri Lanka, with the objective of studying potential risks in the water supply scheme to develop a sustainable WSP. A semi quantitative risk assessment was followed from 02-07-2018 to 09-07-2018 to identify and prioritize all potential hazardous in each component of the existing RWSS from catchment to water distribution. Criteria such as significance, magnitude and frequency of occurrence were considered when ranking the risk level of hazards with regards to low, medium and high scales. Thereby, potential hazards in each component of RWSS were subjected to proper decision making by suitable mitigation measures towards water conservation. The semi quantitative assessment reveal that (15%) of high risk hazardous, (25%) of moderate risk hazardous and sixty (60%) low risk hazardous were observed. Further, high risk hazardous sources were recognized as sewage contaminations from wild animals from catchment, possibility of access of animal and illegal entering of people and contamination through breakings of distribution network. Stability of intake well foundation, operational failures of distribution network, failures of storage tanks, knowledge gaps of water sanitation and hygiene (WASH) practices were identified as medium risk hazards while deforestation, surface runoff, soil erosion and chemical contamination by agricultural activities and insufficiency of water were the potent low risk sources in the catchment. As recommendations, immediate actions are required to construct barrier/fence in intake structure, catchment protection activities such as tree planting, community awareness on proper agricultural and soil conservation within micro catchments and rehabilitation of storage tanks/pipe network are highlighted. Furthermore, enhancing knowledge and awareness on (WASH) practices of people, proper operation and maintenance programs measures can be applied to minimize identified hazards. Thus, it is important to follow the WSP of Madola RWSS to maintain the long-term viability of rehabilitation activities

Keywords: Safe access to drinking water, semi quantitative Risks Assessment, potential Hazardous Mitigation, Catchment to Consumer

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