USER REQUIREMENTS TO SUPPORT FUNCTIONAL CHARACTERISTICS OF A DIGITAL EARLY WARNING SYSTEM FOR DAM FAILURES IN SRI LANKA

Lichini Nikesha Kumari Weerasinghe

(218067K)

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Department of Building Economics

University of Moratuwa

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Dr. Menaha Thayaparan
Dissertation Supervisor

Signature of the supervisor: *UOM Verified Signature* Date: 12/10/2022

Prof. Terrence Fernando
Dissertation Supervisor

DEDICATION

To my beloved Parents and Sisters.....

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ABSTRACT

User Requirements to Support Functional Characteristics of a Digital Early Warning System for Dam Failures in Sri Lanka

Dam failure is one of the most prominent disasters which created very bad impacts on humans as well as the properties. In terms of reducing the impacts of dam failures, early warning systems (EWS) play a major role by creating linkages between the dam safety procedures and the dam stakeholders. Currently, Sri Lanka is using a manual EWS for dam failures, and as a developing country, need to change for a digitalised EWS that consists of a digital platform for dam failures with the aim of reducing the impacts and increasing efficiency and the accuracy. Therefore, this study intends to enhance the functional characteristics of a digital EWS to reduce the impacts of dam failures in Sri Lanka.

The study takes an interpretivism stance in the research philosophy, where qualitative survey was the main research strategy. Semi structured interviews and focus group discussions formed the primary data collection techniques. Manual content analysis and user story analysis were used to identify the causes and impacts of dam failures, functional characteristics of the EWS with supporting system views, user requirements for an effective EWS for dam failures, and the characteristics of the digital platform to support the functional characteristics of the EWS used for dam failures in Sri Lanka. Empirical findings revealed that design, technical, and management causes act as the internal causes for dam failures while natural disasters, and human and animal acts act as the external causes for the dam failures. The loss of human life, social, environmental, economic, institution and political impacts were identified as the impacts of dam failures in Sri Lanka. The main functional characteristics considered for the design of the EWS were identified as forecasting and evaluating the risks, monitoring and detection, and warning and evacuation. Accordingly, data, community, communication, institution or stakeholder, and technology are the system views that support the functional characteristics of the EWS. However, thirty-two (32) user requirements were identified through the focus group discussion, and accordingly, the features were analysed for the digital platform for the EWS of dam failures in Sri Lanka. Finally, a framework has been developed by incorporating all the findings of the study. Hence, that will be beneficial to reduce the impacts of the dam failures in Sri Lanka by making speed and accurate warnings.

Keywords: Causes, Characteristics, Dam failure, Digital Platform, Early Warning System (EWS), Impacts, User Requirements

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ABBREVIATIONS

EWS	-	Early Warning System

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