DEVELOPMENT OF A RESILIENCE MEASUREMENT TOOL TO EVALUATE THE COMMUNITY RESILIENCE

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DECLARATION

I declare that this is my own work and this thesis does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any other University or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

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Abstract

The frequency of disasters and emergencies has increased rapidly during the past few decades and it is necessary to conduct more research in this field to improve the knowledge levels and capacities of individuals/systems. And subsequently this can assist policy makers. Instead of managing disasters after the outbreak, in the present situation the researchers are more concerned about improving the resilience of communities to face impacts. Under this background, methods to measure community resilience are vital because it can be used to identify the vulnerable communities and resilience scores can be used in the decision-making process. To assist the process, this research aims to develop a universal tool to quantify the levels of resilience of communities to the impacts.

From the literature, indicators which are relevant to resilience measurements were listed, suitable indicators were filtered and then the method of measurement was defined. Overall, 108 indicators have been listed on this scorecard under five main capital domains, including, social, economic, physical, human and environmental. This list was sent to the experts and the index was refined based on the expert comments. To provide the resilience score, two types of scoring methods (Community Resilience Scores - CRS_1 and CRS_2) have been introduced in this dissertation where the first method uses a general approach to calculate the resilience and the second method uses a more descriptive approach including the four main disaster management phases (Mitigation, Preparedness, Response and Recovery). The scoring method has been defined to calculate the overall resilience, resilience to floods and resilience to droughts. The method has not validated yet and open for researchers to test this method.

However, applicability of the tool is explained using a few case studies and these cases show the overall resilience values, values for resilience for floods and droughts in some selected regions in Sri Lanka. From the case studies, the overall resilience values (CRS_1) show that social and environmental resilience is higher in the rural areas compared to the urban areas while the economic and physical resilience is higher in the urban areas compared to the rural areas. According to the CRS_2 the response stage shows lower scores in many of the selected regions. Similarly, using the values of the proposed two matrices (CRS_1 and CRS_2), gaps in the major capital domains in a given administrative region can be identified and this is important to undertake further developments and for allocation of resources. The proposed scoring method can be used to prepare resilience level maps and to identify vulnerable regions as well.

The study can be extended to improve the index to measure the resilience to other disasters, including hurricanes, landslides, tsunamis and other coastal hazards.

Key words: Disaster resilience; Resilience index; Resilience measurements; Resilience evaluation; Indicators

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LIST OF ABBREVIATIONS

Abbreviation	Description
CDRF	Community Disaster Resilience Framework
REDI	Resilience to Emergencies and Disasters Index
SDGs	Sustainable Development Goals
CRS	Community Resilience Score
DSD	Divisional Secretariat Division
DM	Disaster Management
DRR	Disaster Risk Reduction
CRS	Community Resilience Score