

**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 - CRS₁ and CRS₂) 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 (CRS₁) 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 CRS₂ the response stage shows lower scores in many of the selected regions. Similarly, using the values of the proposed two matrices (CRS₁ and CRS₂), 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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TABLE OF CONTENTS

Declaration	i
Abstract	ii
Acknowledgements.....	iii
Table of Contents.....	iv
List of Figures.....	vii
List of Tables.....	ix
List of Abbreviations	xi
1.0 Introduction and Structure of the Thesis	1
1.1 Background	1
1.2 Problem statement	5
1.3 Scope of study	5
1.4 Research objectives	6
1.5 Outcomes	6
1.6 Arrangement of the thesis	6
2.0 Literature Review.....	8
2.1 Introduction.....	8
2.2 Important aspects of community resilience	8
2.2.1 Terminology.....	8
2.2.2 Definitions for the term resilience.....	10
2.3 Existing resilience measurement approaches.....	11
2.3.1 Mayunga Method.....	11
2.3.2 REDI Scorecard.....	13
2.3.3 Disaster Resilience Scorecard for cities.....	14
2.3.4 Sendai Framework of Action	16
2.3.5 Holistic Community Resilience Framework.....	17
2.3.6 Sustainable Development Goals.....	17
2.3.7 INFORM Risk index.....	17
2.3.8 Model of area-picture of potential threats.....	18
2.3.9 I2UD’s framework for climate change adaptation and resilience	20
2.3.10 PEOPLES Resilience Framework	21
2.3.11 City Resilience Framework.....	21

2.3.12 Community Resilience Framework of Sri Lanka	21
2.4 Summary of the important tools and frameworks	22
3.0 Research Methodology.....	25
3.1 Introduction	25
3.2 Methodology flow chart.....	25
4.0 Development of the Tool to Measure Community Resilience	26
4.1 Introduction	26
4.2 Process of the development of the resilience measurement tool.....	26
4.3 Concept related to community capitals.....	27
4.3.1 Social Capital	27
4.3.2 Economic Capital	28
4.3.3 Physical Capital.....	28
4.3.4 Human Capital.....	28
4.3.5 Environmental Capital	28
4.4 Different phases of disaster management	28
4.4.1 Disaster Mitigation	28
4.4.2 Disaster Preparedness	29
4.4.3 Disaster Response.....	29
4.4.4 Disaster Recovery.....	29
4.5 Development of list of Indicators to measure resilience	29
4.6 Expert Survey.....	30
4.7 Method of Measurement	35
4.8 Definition of the indicators under main phases of DM	36
4.9 Definition of method of measurement.....	41
4.9.1 Social Resilience	41
4.9.2 Economic Resilience	46
4.9.3 Physical Resilience	49
4.9.4 Human Resilience.....	53
4.9.5 Environmental Resilience	55
4.10 Output Matrices	58
5.0 Case Studies – Application of the Tool.....	60
5.1 Introduction	60
5.2 Output Matrix for CRS ₁	61
5.2.1 Overall Resilience.....	61
5.2.2 Resilience for Floods	64
5.2.3 Resilience for Droughts	67
5.3 Output Matrix for CRS ₂	69

5.4 Summary of the study.....	75
5.4.1 Community Resilience Score 1 (CRS ₁).....	75
5.4.2 Community Resilience Score 2 (CRS ₂).....	75
6.0 Discussion, Conclusions and Recommendations.....	77
6.1 Introduction.....	77
6.2 Discussion.....	77
6.2.1 Identification of the relevant indicators.....	77
6.2.2 Development of the resilience measurement tool.....	78
6.2.3 Applicability of the resilience measurement tool.....	78
6.3 Conclusions.....	80
6.4 Limitation.....	80
6.5 Recommendations for future work.....	80
7.0 References.....	82

LIST OF FIGURES

Figure 1.1: Top 10 countries in the world in terms of absolute losses due to disasters (billion US\$) 1998 – 2017.....	1
Figure 1.2: Top 10 countries in terms of average annual percentage losses relative to GDP.....	2
Figure 1.3: Deaths from floods 1974 – 2018.....	3
Figure 1.4: Houses destroyed, Houses Damaged 1974 – 2018.....	3
Figure 1.5: Affected Population from Floods 1974 – 2018	3
Figure 1.6: Affected population from droughts 1974-2018	4
Figure 1.7: Affected population from land-slides 1974-2018.....	4
Figure 1.8: Relationship between community resilience and disaster resilience	5
Figure 1.9: Structure of the dissertation.....	7
Figure 2.1: Community Disaster Resilience Framework (CDRF)	12
Figure 2.2: Relationship between the community capitals and disaster phases	13
Figure 2.3: The model of area/picture of potential threats.....	19
Figure 2.4: I2UD Resilience framework.....	20
Figure 2.5: Sri Lankan community resilience framework	22
Figure 3.1: Research methodology flow chart	25
Figure 4.1: Development process of the resilience measurement tool	26
Figure 4.2: Fields of expertise of the experts	31
Figure 4.3: Level of agreement for the social capital indicators	31
Figure 4.4: Level of agreement for the economic capital indicators	32
Figure 4.5: Level of agreement for the physical capital indicators	32
Figure 4.6: Level of agreement for the human capital indicators.....	33
Figure 4.7: Level of agreement for the environmental capital indicators.....	33
Figure 5.1: Overall resilience of the selected regions.....	63
Figure 5.2: Overall Resilience Score – Negative	64
Figure 5.3: Resilience for Floods – Positive	65
Figure 5.4: Resilience to Floods – Negative	66

Figure 5.5: Resilience for Drought – Positive 67

Figure 5.6: Resilience for Drought – Negative 68

Figure 5.7: The overall resilience scores for different regions under main four phases of
disaster management 74

LIST OF TABLES

Table 2.1: Summary of the tools/frameworks used in the development of the CRS tool	22
Table 4.1: Initially identified indicators.....	30
Table 4.2: Refined list of indicators.....	34
Table 4.3: The number of indicators relevant to floods and droughts.....	34
Table 4.4: List of indicators for measuring resilience	36
Table 4.5: Definition of the measurement criteria for indicators under the social capital	41
Table 4.6: Definition of the measurement criteria for indicators under the economic capital.....	46
Table 4.7: Definition of the measurement criteria for indicators under the physical capital.....	49
Table 4.8: Definition of the measurement criteria for indicators under the human capital	53
Table 4.9: Definition of the measurement criteria for indicators under the economic capital.....	55
Table 4.10: Output matrix for the CRS ₁	58
Table 4.11: Output matrix for the CRS ₂	59
Table 5.1: Number of Indicators used for the evaluation of overall resilience	61
Table 5.2: Colour code used in the matrices	61
Table 5.3: Overall resilience scores - Positive	62
Table 5.4: Overall Resilience Score – Negative.....	63
Table 5.5: Resilience for floods – Positive	64
Table 5.6: Resilience for Floods – Negative.....	66
Table 5.7: Resilience for Drought – Positive	67
Table 5.8: Resilience for Drought – Negative.....	68
Table 5.9: Overall resilience of Sri Lanka under different phases of disaster management	69

Table 5.10: Overall resilience of Kurunegala District under different phases of disaster management.....	69
Table 5.11: Overall resilience of Colombo District under different phases of disaster management.....	70
Table 5.12: Overall resilience of Kurunegala DSD under different phases of disaster management.....	70
Table 5.13: Overall resilience of Polpithigama DSD under different phases of disaster management.....	71
Table 5.14: Overall resilience of Ahatuweawa DSD under different phases of disaster management.....	71
Table 5.15: Overall resilience of Abanpola DSD under different phases of disaster management.....	72
Table 5.16: Overall resilience of Maho DSD under different phases of disaster management.....	72
Table 5.17: Overall resilience of Kolonnawa DSD under different phases of disaster management.....	73
Table 5.18: Overall resilience of Kaduwela DSD under different phases of disaster management.....	73
Table 6.1: Major findings from the case studies	79

LIST OF ABBREVIATIONS

<u>Abbreviation</u>	<u>Description</u>
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