

Development of Community Based
Flood Risk Reduction Package for Kalutara District

By

Karannagoda Mudalige Dona Prasadhi Jayathilaka

This dissertation was submitted in partial fulfillment for the Degree of Master of Science
in Forestry and Environment Management

Faculty of Graduate Studies
University of Sri Jayewardenepura

Nugegoda, Sri Lanka

2014

DECLARATION

The work described in this thesis was carried out by me under the supervision of Dr. P.B. Dharmasena and Dr. Priyan Perera and a report on this has not been submitted in whole or in part to any university or any other institution for another Degree/Diploma.


.....

K.M.D.P. Jayathilaka

Date: 2015-05-08

We certify the above statement made by the candidate is true and that this thesis is suitable for submission to the university for the purpose of evaluation.

Signature
Supervisor

Dr. P.B. Dharmasena
National consultant,
Field Crops Research and Development Institute,
Mahailuppallama.

Date ...2015-05-08.....

Signature
Supervisor

Dr. Priyan Perera,
Department of Forestry and Environmental Science,
University of Sri Jayawardenepura,
Nugegoda,
Sri Lanka.

Date8./5./2016.....

Dedicated

To

My beloved parents, husband, daughter and son who support to

achieve the best in my life

Table of Contents

<i>Table of Content</i>	<i>i</i>
<i>List of Tables</i>	<i>vii</i>
<i>List of Figures</i>	<i>ix</i>
<i>List of Plates</i>	<i>x</i>
<i>List of Abbreviations</i>	<i>xi</i>
<i>Acknowledgement</i>	<i>xii</i>
<i>Abstract</i>	<i>xiii</i>

Chapter 01: Introduction

1.1	Floods in Sri Lanka	1
1.2	Sri Lanka disaster management act	2
1.3	Community based disaster management	5
1.4	From at risk to disaster resilience	5
1.5	Disaster management cycle	7
1.5.1	Mitigation	7
1.5.2	Preparedness	7
1.5.3	Emergency responses	8
1.5.4	Recovery	8
1.6	Objectives of the research	8

Chapter 02: Literature Review

2.1	An overview of natural disasters in Sri Lanka	9
2.2	Role of community	10
2.3	Important of community based disaster management(CBDM)	12
2.3.1	CBDM in Latin America	12
2.3.2	CBDM in Asia	12
2.4	Community based disaster management models	14
2.5	Previous disaster management projects	21
2.6	Disaster management studies and publications	23

Chapter 03: Methodology

3.1	Concepts	29
3.2	Kaluthara district	29
3.2.1	Climate	30
3.2.2	Recent flood affected areas in Kaluthara district	31
3.3	Study locations	33
3.4	Field study and package development	35
3.4.1	Conceptual package	35
3.5	Data collection	42
3.5.1	Social map	42
3.5.2	Seasonal calendar	43

3.5.3	Venn diagram	44
3.5.4	Impact diagram	46
3.5.5	SWOT analysis	46

Chapter 4: Result

4.1	Socio-economic status of five GN Divisions	48
4.2	Income generation sources	49
4.3	Institutional structure	50
4.4	Infrastructure and services	51
4.5	SWOT analysis	55
4.5.1	Strengths	55
4.5.2	Weaknesses	56
4.5.3	Opportunities	56
4.5.4	Threats	57
4.6	Develop flood risk reduction package for five GN divisions	57
4.6.1	Strategies identified for Palawaththa package development	58
4.6.2	Prioritized activities in the Palawaththa DRR package	59
4.6.3	Strategies identified for Molkawa package development	61
4.6.4	Prioritized activities in the Molkawa DRR package	62
4.6.5	Strategies identified for Midalana package development	64
4.6.6	Prioritized activities in the Midalana DRR package	65

4.6.7	Strategies identified for Lewwanduwa package development	67
4.6.8	Prioritized activities in the Lewwanduwa DRR package	68
4.6.9	Strategies identified for Girikola package development	70
4.6.10	Prioritized activities in the Grikola DRR package	71
4.7	Develop flood risk reduction package for Kaluthara District	73
4.7.1	Prioritized activities in the Kaluthara District DRR package	74
	Chapter 05: Discussion	75
	Chapter 06: Conclusion	88
	Chapter 07: Recommendation	89
	References	91
	Appendices	95

LIST OF TABLES

3.1	Study location for disaster	33
3.2	Participatory activities to collect information required for the study	47
4.1	Socio-economic status	48
4.2	Income generation sources	49
4.3	Responsibilities and activities of different institutes and organizations	50
4.4	Suggested activities for Palawaththa Package	58
4.5	Suggested activities for Molkawa Package	61
4.6	Suggested activities for Midalana Package	64
4.7	Suggested activities for Lewwanduwa Package	67
4.8	Suggested activities for Girikola Package	70
5.1	Degree of effectiveness of different PRA tools	81

LIST OF FIGURES

1.1	Spatial distributions of floods (1974 – 2008)	4
2.1	Categorization of disaster management models	16
3.1	Monthly rainfall distribution in WL2 region	31
3.2	Divisional secretariats on Kalutara district	32
3.3	Selected DS Divisions and GN Divisions in the Kalutara District	34
3.4	Conceptual package for Disaster Risk Reduction	37
3.5	Problem analysis phase of the package	39
3.6	Need identification phase of the package	41
3.7	Need assessment phase of the package	41
4.1	Flood risk reduction package for Palawaththa GN Division	60
4.2	Flood risk reduction package for Molkawa GN Division	63
4.3	Flood risk reduction package for Midalana GN Division	66
4.4	Flood risk reduction package for Lewwanduwa GN Division	69
4.5	Flood risk reduction package for Girikola GN Division	72
4.6	Community based flood risk reduction package of Kaluthara District	74

LIST OF PLATES

1.1	Flood in Palindanuwara DS Division	08
5.1	Construction by blocking Munamalwaththa canal and Palawaththa river	112
5.2	Inappropriate settlement and deforestation near stream	112
5.3	People scape from flood on Midalana GN Division	113
5.4	Flooded paddy lands in Midalana GN Division	114
5.5	Flooded the main road on Lewwanduwa GN Division	115
5.6	People scape from flood on Lewwanduwa GN Division	115

LIST OF ABBREVIATIONS

AUDMP	Asian Urban Disaster Mitigation Program
ADPC	Asian Disaster Preparedness Center
CBDRR	Community Based Disaster Risk Reduction
CBO	Community Based Organization
DMC	Disaster Management Center
DRR	Disaster Risk Reduction
INGO	International Non-Government Organization
JOCV	Japan Overseas Cooperation Volunteers
NBRO	National Building Research Organization
NGO	Non-Government Organization
PRA	Participatory Rural Appraisal
TOT	Training Of Trainers

ACKNOWLEDGEMENTS

I sincerely wish to express my gratitude and thanks to my supervisors Dr. P. B. Dharmasena, Consultant/FAO, Field Crops Research and Development Institute, Mahalluppallama, and Dr. Piyan Perera, Senior Lecturer, Department of Forestry and Environmental Sciences, University of Sri Jayawardenepura for their continuous guidance and encouragement.

I would like to express my gratitude to Divisional secretaries Mrs. W.S.M.K.Silva (Mathugama), Mr.H.A.K. Pushpakumara (Agalawaththa), Mr Dasitha Niroshana (Walallawita), Mrs. Irangani Weerasingha (Bulathsinhala) and Mrs. S.T.A. Gamage (Palinda Nuwara) for providing information for my study.

My special thanks also go to Mrs Sriyani Gamage, District coordinator, Disaster Management Center, Kalutara. for providing information for my study.

I would like to express my gratitude to citizen on Molkawa, Lewwanduwa, Girikola, Palawaththa and Midalana GN Divisions who provide support for conducting PRA tools and collect information.

I would like to give special thanks to Grama Sewa Niladari Mr G.S.Premarathna (Molkawa), Mr.J.K.Siripala (Lewwanduwa), Mr.K.H.S.Ananda (Palawaththa), Mr K.S.Jayasinghe (Girikola) ,Mrs W.H.J.Kumari(Midalana) for providing me information.

**Development of Community Based
Flood Risk Reduction Package for Kalutara District
Karannagoda Mudalige Dona Prasadhi Jayathilaka**

ABSTRACT

This study aimed at identifying and developing a specific disaster risk reduction package with community consultation and participation to strengthen the communities at risk due to disasters by adding to and improving the existing knowledge and capabilities on Disaster Risk Reduction. The study was carried out from April to September 2014 in heavily flooded five GN Divisions in five Divisional Secretariats Agalawaththa, Palinda Nuwara, Mathugama, Walallawita and Bulathsinhala in the Kaluthara District. Study was planned to collect majority of data through the use of selected set of Participatory Rural Appraisal (PRA) tools.

In addressing the information emerged due to flood, the community has come up following suggestions. Proper planning with a rapid need assessment exercise is an essential pre-requisite for an emergency program, emergency needs program should include other community needs in addition to food related aspects, assessments of water requirement and groundwater availability should be made before planning the number of wells and their spatial distribution, establishment of a community level mechanism to read, understand and disseminate the alert levels and decision making process for evacuation at community level (local level early warning system), need of proper coordination between data collectors, Govt. Departments, and the community, responsibility of implementation activities must give to community based organization, management and improvement of river

environment, apply proper cultivation practices on upper catchments, prohibit land filling beside the river.

The study was conducted in the Kaluthara District. Its climate, soil type, vegetation, crops, infrastructure, institutional structure, socio-economic status, livelihood etc. were somewhat similar. Therefore, SWOT analysis from the five GN Divisions (strengths, weaknesses, opportunities and threats) yielded very similar results. The study considered only the case of flood. The entire package emerged and the subsequent priority exercise has lined up similar activities to implement. This can be due to the fact that the flood causal factors for the entire area are unique. This has led to develop one common package for the flood risk reduction. The conceptual Disaster Risk Reduction package was synthesized as a blend of existing modeling approaches such as, traditional models, logical models and expansion and contraction models.

These five GN Divisions have good infrastructure facilities, like electricity, transport, water, education, health and communication. But most of the people living in flood prone areas are not having the required financial strength.

Prioritized needs will further subject to a feasibility check in a community forum, and the most suitable activity will be selected for implementation. The research this point onwards, will focus on how each of the locations adopted the conceptual model discussed above to their respective local contexts.