

**INVESTIGATING COMMUNITY RESILIENCE TO CLIMATE
CHANGE: APPLICATION OF ECONOMIC MODELS**

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Master of Science (Major Component of Research)

Department of Building Economics

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DECLARATION OF THE CANDIDATE AND SUPERVISOR

I declare that this is my own work, and this thesis/dissertation 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. I retain the right to use this content in whole or part in future works (such as articles or books).

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(Nadeetharu B. K. M.)

The above candidate has carried out research for the Master's thesis under my supervision. I confirm that the declaration made above by the student is true and correct.

Name of the Supervisor: Prof. Udayangani Kulatunga

Signature: *UOM Verified Signature*
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Date: 30.09.2023

To my loving mother...

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ABSTRACT

Climate change is a significant issue in the present which impacts the economic status of communities by affecting their livelihoods. To investigate the problems of climate change on communities, economic models of climate change can be regarded as a suitable application, as they provide the parameters and climatic conditions to be considered. Thus, this study aimed to contribute to enhancing the community's resilience to the economic impacts of climate change in Sri Lanka through the application of economic models. Five climatic conditions, seven firsthand influences of climate change, and 25 parameters under four categories to determine economic impacts have been identified through a systematic literature review. This research adopts interpretivism philosophy and pace through a qualitative research approach to derive an abductive conclusion. Data collection has been conducted in four stages; preliminary interviews, focus group discussions, key informant interviews and expert interviews respectively. Stages 01 and 04 of data collection followed the survey strategy while Stages 02 and 03 aligned with case studies within low country wet zone tea and paddy industries. The findings were analysed using content analysis, and cross-case analysis. Finally, two causal loop diagrams (CLDs) have been developed for two cases. The findings revealed temperature and rainfall as the two main climatic conditions varying in Sri Lanka, while low country wet zone mainly suffers from rainfall variations. Despite the benefit of lowering the irrigation cost, climate change poses common and unique challenges for both tea and paddy growers. Six and four strategies for building resilience have been identified for tea and paddy growers respectively. Seven and six closed loops have been identified within the CLDs for tea and paddy respectively. The findings provide an influential understanding for decision makers to derive policies and the developed CLDs can be benchmarked in system dynamic models.

Keywords: Climate change, Economic impacts, Livelihoods, Causal loop diagrams (CLDs), Systematic Literature Review (SLR)

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LIST OF ABBREVIATIONS

ADB	: Asian Development Bank
CLD	: Causal Loop Diagram
EPA	: Environmental Protection Agency
GDP	: Gross Domestic Product
IPCC	: Intergovernmental Panel on Climate Change
PICO	: Problem Intervention Comparator Outcome
PRISMA	: Preferred Reporting Items for Systematic Reviews and Meta-Analyses
R&D	: Research and development
RRDI	: Rice Research and Development Institute
SLR	: Systematic Literature Review
UN	: United Nations
WMO	: World Meteorological Organization

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