Challenges in Adopting Climate Change Resilience Strategies Among Smallholder Tea Farmers in Sri Lanka

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1. Background and Rationale

Sri Lanka's tea sector plays a vital role in the national economy, contributing significantly to export earnings, rural employment, and livelihood security. The smallholder sector is responsible for more than 70% of national tea production and creates the backbone of the industry, supporting thousands of families across key tea-growing regions. Tea is also deeply embedded in the country's socio-economic and cultural identity, making its sustainability critically important.

However, the tea industry is increasingly vulnerable to climate change. Rising temperatures, erratic rainfall, prolonged droughts, shifting weather patterns, and increased incidence of pests and diseases have severely affected tea yields and quality. Climate-induced soil degradation and water scarcity have further intensified production risks, directly threatening the long-term viability of smallholder tea farming.

To address these risks, several climate change resilience strategies such as shade management, soil and water conservation, drought-resistant cultivars, and improved agroforestry practices have been introduced by Tea research Institute as main government agencies and other research institutions. Despite their potential benefits, the adoption of these strategies among smallholder tea farmers remains relatively low due to multifaceted challenges.

The proposed study seeks to identify and analyze the key challenges that hinder the adoption of climate resilience strategies among smallholder tea farmers in Sri Lanka. The research explored institutional, socio-economic, behavioral, knowledge-related, and resource-based barriers that limit farmers' capacity to adopt recommended practices. Understanding these constraints will help policymakers, extension officers, and development organizations design more effective support programs.

This study is significant as it contributes to building a resilient tea sector capable of withstanding climatic shocks. Insights generated from this research can guide targeted interventions, enhance

farmer adaptability, and ultimately safeguard the livelihoods of smallholder tea producers while ensuring the sustainability of Sri Lanka's globally renowned tea industry.

2. Research Problem

Despite the availability of scientifically proven adaptation and mitigation practices, most smallholder farmers demonstrate low or partial adoption, influenced by institutional, socio-economic, and technical constraints. The key problem addressed in this study is What are the major barriers preventing smallholder tea farmers from effectively adopting climate change resilience strategies in Sri Lanka?

3. Objectives

This study aimed to: Assess awareness and knowledge levels of government-promoted climate resilience strategies, identify socio-economic, institutional, and behavioral constraints affecting adoption, Evaluate farmer and extension officer perceptions regarding the feasibility, cost, and long-term benefits of these strategies and to Recommend a practical and scalable framework to strengthen climate adaptation among smallholders.

4. Methodology

A mixed-methods approach was used and Quantitative survey of smallholder tea farmers in selected high-risk regions (e.g., Matara, Galle, Ratnapura, Nuwara Eliya). Key informant interviews with extension officers and Tea Smallholder Development Authority (TSHDA) representatives.

Evaluation frameworks such as SWOT, Social Impact Assessment (SIA), and Climate Resilience Framework (CRF) to assess strategy effectiveness and internal/external consistency. Descriptive and inferential statistics (Likert-scale analysis, Wilcoxon tests, factor analysis) for quantitative data.

5. Relevance to ERSA 2026 Theme

The proposed study directly links to **"Global Challenges and Regional Responses in a Transition Era"** by examining how a key agricultural region responds to climate vulnerabilities, resource constraints, and institutional gaps. It provides insights for developing regional strategies to enhance resilience and sustainability in climate-stressed economies.