

CLIMATE-SMART AGRICULTURE IN CASCADED TANK VILLAGE SYSTEMS: ADOPTION AND ECONOMIC VIABILITY IN THE CLIMATICALLY VULNERABLE HOTSPOT OF *HOROWPATHANA*

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Frequent and unpredictable climatic events severely impact agriculture in Sri Lanka's dry zone, necessitating the adoption of Climate-Smart Agriculture (CSA) as a crucial strategy for adaptation and productivity enhancement. While CSA is recognized for its context-specific applicability and is promoted through various mechanisms in the dry zone, further research is needed on its practical implementation within the cascaded tank village systems in identified climatic hotspots, where farming livelihoods are highly vulnerable to increasing climatic variability. This study examines the adoption of CSA technologies and practices, financial feasibility, and barriers to adoption. Conducted in two major cascaded tank village systems in the *Horowpothana* climatic hotspot, primary data was collected from 200 farming households using a structured and pre-tested questionnaire through multistage proportionate random sampling. Data analysis involved descriptive statistics, composite indices, and cost-benefit analysis (CBA). Results revealed that 88.5% of respondents are familiar with CSA and comprehend its triple benefits: enhancing agricultural productivity, adaptability to climate conditions, and mitigating climate change. About 43.5% of households utilize at least one CSA technology, and all households engage in at least one CSA practice. The most prominent CSA technology used by 43.5% of households is sprinkler systems for cultivating chili, groundnut, and watermelon. Practices such as crop rotation, diversification, and the cultivation of short-duration crops are widely valued for their effectiveness. Higher yields, economic diversification, and food security drive CSA adoption. The CBA emphasizes the benefits of CSA over conventional farming, particularly in pest and disease management, water use efficiency, and labour reduction. Government subsidies and financial support play a significant role in facilitating CSA adoption. However, major obstacles exist, such as wildlife interference and elevated input costs. This study highlights the crucial role of CSA in adapting to climate risks in Sri Lanka's dry zone, indicating high awareness but inconsistent adoption and proposing policies to overcome critical barriers.

Keywords: Climate adaptability, Cost-Benefit Analysis, Climate change mitigation, Dry-zone agriculture