FARMERS' ADOPTION OF NEW TECHNOLOGIES IN PADDY CULTIVATION IN MATHUGAMA DS DIVISION, KALUTARA DISTRICT

By

D.V.C.U. Samarasingha

Department of Biosystems Technology

Faculty of Technology

Eastern University, Sri Lanka

2025

ABSTRACT

Paddy cultivation is a staple among the farming community in Sri Lanka, significantly contribute to rural livelihood and food security. In Mathugama area of Kalutara District farmers manage a substantial portion of paddy farming. However, many continue to rely on traditional practices, which limit their productivity and sustainability. This study aims to investigate the factors influencing the farmers adaptation to technology in paddy farming focusing on socio-economic characteristics, perceived benefits and barriers, and access to information. A total of 100 paddy farmers data was collected through a quantitative survey. The analysis was conducted using SPSS version 27.0 electronic spread sheet program. Before data was transferred to SPSS, Excel was first entered and then aggregated based on numerical order. Regression and ANOVA tests performed to evaluate the relationships between variables such as Socio-Economic Characteristics, Perceived Benefits, Barriers to Adoption, Access to Information and Resources and Adoption of New Technologies. By the R Square (0.691) value, 69.1% of the variation in the dependent variable is explained by the independent variables. The results indicate that 82.5% of respondents were male, with the majority (36.9%) aged 41–60 years and possessing secondary-level education (59.2%). Most farmers (37.9%) had 11–20 years of experience, and 39.8% relied on paddy cultivation as their primary income source. Regression analysis revealed that socio-economic characteristics ($\beta = 0.508$, $p = 0.000$), perceived benefits ($\beta = 0.255$, $p = 0.007$), and access to information ($\beta = 0.198$, $p = 0.021$) significantly influenced technology adoption, while barriers such as high costs and lack of technical support showed no significant impact ($p = 0.648$). Farmers with larger landholdings and higher education levels were more likely to adopt new technologies.

The study concludes that enhancing education, providing targeted financial support, and improving access to training and resources are critical for increasing technology adoption. Recommendations include subsidized equipment, participatory technology development, and gender-sensitive policies to promote sustainable paddy farming. These findings contribute to strategies for improving agricultural productivity and sustainability in Sri Lanka

Keywords: Paddy farming, Technology adoption, Socio-economic barriers

TABLE OF CONTENT

DECLARATION iii
DEDICATION iv
ACKNOWLEDGEMENT v
ABSTRACT vi
TABLE OF CONTENT vii
LIST OF FIGURES x
LIST OF TABLES xi
ABBREVIATION AND SYMBOLS xii
CHAPTER 1 1
1. INTRODUCTION 1
1.1 Background 1
1.2 Problem statement 3
1.3 Research gap 3
1.4 Purpose of study 3
1.5 Objectives of the Study 4
1.6 Research question 5
1.7 Significance of this study 5
1.8 Limitations of this study 6
1.9 Organization of the Report 6
CHAPTER 2 7
2. LITERATURE REVIEW 7
2.1. Introduction to paddy cultivation in Sri Lanka 7
2.1.1. Paddy cultivation in wet zone 7
2.2. Socio economic characteristic on technological adaptation in paddy cultivation 8
2.3. Benefits of adopting to new technologies in paddy cultivation 8
2.4. Barriers of adopting to new technologies in paddy cultivation 8
2.5. Access to information and resources improves adaptation of farmers in paddy farming 9
2.6. Modern technological adaptations in paddy cultivation 9

2.6.1. Land preparation using modern technology in paddy cultivation.... 9
2.6.2. Water management using modern technology in paddy cultivation 9
2.6.3. Fertilizers used in modern paddy cultivation 10
2.6.4. Weed control methods in modern paddy cultivation..... 10
2.6.5. Pest and disease control in modern paddy cultivation 10
2.7. Conceptual framework 11
Chapter 3 13
3. METHODOLOGY 13
3.1. Introduction 13
3.2. Research design 13
3.3. Study area 13
3.4. Target population and sample size 14
3.5. Data and data collection method 14
3.6. Data analysis 16
3.7. Validity 17
3.8. Ethical Consideration 17
CHAPTER 4 18
4. RESULTS AND DISCUSSION 18
4.1. Introduction 18
4.2. Socio-economic Characteristics of Respondents 18
4.2.1. Gender 18
4.2.2. Age 19
4.2.3. Education Level 19
4.2.4. Years of Experience in Paddy Cultivation 20
4.2.5. Land Size 21
4.3. Barriers to the Adoption of New Technologies 23
4.3.1. Main Source of Income 23
4.3.2. Monthly Family Income 23
4.3.3. Type of Involvement in Paddy Cultivation 24
4.4. Adoption of New Technologies 26
4.4.1. Regression Model Summary 26
4.4.2. Model Significance (ANOVA) 26
4.4.3. Influence of Independent Variables 27
4.5. Hypothesis Testing 29
CHAPTER 5 30

5. CONCLUSION AND RECOMMENDATIONS 30
5.1. Findings of the Study 30
5.2. Conclusions of the Study 30
5.3. Recommendations 31
5.4. Suggestion for Future Research 32
REFERENCES 33
ANNEXURES 40
ANNEXUES 01 40
ANNEXUES 02 45