



Impact of Government Paddy Development Schemes on Paddy Production: Evidence from Farmers in Palakkad District, Kerala

Dr. P.S Chandhini

Associate Professor & Head, Department of Commerce, Sri Krishna Adhithya College of Arts and Science,
Kovaipudur, Coimbatore 641 042, Email: _chandni201072@gmail.com

Anu Davis

Ph.D Research Scholar, Department of Commerce, Sri Krishna Adithya College of Arts and Science
Coimbatore- 641 042. Email: _anuaricat@gmail.com

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ABSTRACT

Paddy cultivation plays a vital role in ensuring food security and sustaining the agricultural economy of Kerala. The Government of India and the Government of Kerala have introduced various paddy development schemes to enhance productivity, improve farmers' income, and promote sustainable cultivation practices. This study examines the impact of government paddy development schemes on paddy production among farmers in Palakkad District, Kerala. A descriptive research design was adopted, and primary data were collected from 85 paddy farmers using a structured questionnaire. The collected data were analyzed using SPSS, employing Chi-square analysis, Multiple Linear Regression Analysis, and Exploratory Factor Analysis. The findings revealed a significant association between farmers' educational level and their awareness of government paddy development schemes. The regression analysis indicated that subsidy support, quality seed distribution, training and extension services, irrigation support, and farm mechanization significantly influenced

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paddy production. Factor analysis identified administrative barriers, technical and information constraints, and infrastructure limitations as the major challenges affecting farmers' access to and utilization of government schemes. The study concludes that enhancing awareness, strengthening scheme implementation, simplifying administrative procedures, and improving agricultural support services can contribute to increased participation in government programmes and sustainable growth in paddy production

Introduction

Agriculture remains one of the most important sectors of the Indian economy, contributing significantly to employment, food security, and rural livelihoods. Among food crops, paddy is the principal staple crop, supporting the nutritional needs of a large proportion of the population and serving as a major source of income for farming households. Kerala, despite its limited cultivable land, has traditionally been recognized for paddy cultivation, with Palakkad District being widely regarded as the "Rice Bowl of Kerala" due to its extensive paddy fields and favorable agro-climatic conditions. To enhance paddy cultivation and ensure sustainable agricultural development, both the Government of India and the Government of Kerala have implemented various paddy development schemes. These initiatives include financial assistance, input subsidies, quality seed distribution, irrigation support, farm mechanization, crop insurance, and extension services aimed at improving productivity, reducing cultivation costs, and increasing farmers' income. Such schemes also encourage the adoption of modern agricultural technologies and sustainable farming practices to address the challenges of declining cultivated area, labour shortages, climate variability, and increasing production costs. Despite the availability of these development programmes, many farmers continue to experience difficulties in accessing and fully utilizing government support due to limited awareness, administrative complexities, inadequate extension services, and infrastructure constraints. These issues may reduce the effectiveness of the schemes and limit their contribution to agricultural productivity. Understanding the extent to which government interventions influence paddy production is therefore essential for improving policy implementation and ensuring that the intended benefits reach farming communities. Against this background, the present study examines the impact of government paddy development schemes on paddy production among farmers in Palakkad District, Kerala. The study also investigates farmers' awareness of these schemes and identifies the major challenges encountered in accessing and benefiting from them. The findings are expected to provide useful insights for policymakers,



agricultural departments, and other stakeholders in strengthening the effectiveness of government initiatives and promoting sustainable paddy cultivation in the region.

Review of Literature

A review of the recent literature indicates that government support programmes play a significant role in improving paddy cultivation, although their effectiveness depends on farmers' awareness, accessibility, and implementation. Venumuddala (2020) examined the role of public interventions in Indian agriculture and reported that government support through subsidies, procurement mechanisms, and extension services positively influenced farmers' income and production decisions. Government of Kerala Finance Department (2021) evaluated the Rice Development Scheme and observed that group farming, input assistance, and infrastructure support enhanced paddy cultivation, although implementation challenges persisted. Government of Kerala (2022) reported that sustainable rice development initiatives, including fallow land cultivation and support to Padasekhara Samithies, contributed to maintaining paddy cultivation despite declining agricultural land. Government of Kerala Finance Department (2022) further highlighted that financial incentives and operational support improved farmers' participation, while delays in implementation reduced the overall effectiveness of the schemes.

Recent studies have emphasized the importance of institutional support and modern agricultural practices in enhancing paddy productivity. Islam et al. (2020) demonstrated that improved water management practices in paddy cultivation increased productivity while reducing environmental impacts. Deepa et al. (2020) developed a multivariate statistical model for agricultural development and concluded that multiple institutional and technological factors jointly influence crop productivity, particularly in paddy cultivation. Sani et al. (2022) highlighted the growing role of satellite imagery and machine learning in improving paddy yield prediction and supporting precision agriculture. These studies collectively indicate that combining government assistance with technological innovations can improve agricultural productivity and resource management.

More recent evidence from Kerala demonstrates that farmers continue to experience several barriers in accessing government support. Amaljith V. J. and Sunil V. G. (2026) identified climate change, rising input costs, labour shortages, delayed subsidy disbursement, inadequate mechanization, and limited awareness of government schemes as the major constraints affecting paddy productivity in the Kole wetlands of Kerala. The Government of Kerala (2026) reported that continued investment in sustainable rice development, area expansion, group farming, and infrastructure development remains essential for improving paddy production in the state. The revised state plan for 2026–27 also emphasized increased funding for seed



production, operational support to Padasekhara Samithies, and infrastructure development to strengthen paddy cultivation. Contemporary policy discussions further indicate that Kerala continues to prioritize financial incentives and procurement support to sustain paddy cultivation despite declining cultivated area and increasing production costs.

Overall, the reviewed literature demonstrates that government paddy development schemes positively influence paddy production through financial assistance, quality inputs, mechanization, irrigation support, and extension services. At the same time, challenges such as administrative delays, limited awareness, infrastructure deficiencies, and climatic risks continue to affect the effective utilization of these schemes. Although several studies have evaluated specific components of paddy development programmes, limited empirical research has comprehensively examined the relationship between farmers' awareness, government support, and paddy production in Palakkad District, Kerala. This research addresses that gap by evaluating the impact of government paddy development schemes on paddy production and identifying the major challenges experienced by farmers.

Statement of the Problem

Paddy cultivation is a key component of Kerala's agricultural sector and plays a significant role in ensuring food security and supporting the livelihoods of farming communities. Although the Government of India and the Government of Kerala have introduced various paddy development schemes to improve productivity through financial assistance, quality inputs, irrigation support, mechanization, and extension services, the expected outcomes have not been uniformly achieved. Many farmers continue to face challenges such as limited awareness of government schemes, delays in subsidy disbursement, complex administrative procedures, inadequate technical guidance, and insufficient infrastructure, which hinder the effective utilization of these programmes. Palakkad District, being the largest paddy-producing region in Kerala, has witnessed changes in cultivation practices due to labour shortages, increasing production costs, and climatic uncertainties. While government interventions aim to address these issues and promote sustainable paddy cultivation, empirical evidence on their effectiveness in improving paddy production at the farmer level remains limited. In addition, there is a need to identify the key factors that influence the success of these schemes and the barriers that restrict farmers from accessing their benefits. Therefore, the present study seeks to evaluate the impact of government paddy development schemes on paddy production, examine farmers' awareness of these schemes, and identify the major challenges affecting their implementation in Palakkad District, Kerala.



Scope of the Study

The present study focuses on evaluating the impact of government paddy development schemes on paddy production among farmers in Palakkad District, Kerala. It examines farmers' awareness and utilization of various government schemes and analyzes their influence on paddy production. The study also identifies the major challenges faced by farmers in accessing and benefiting from these schemes. Primary data were collected from 85 paddy farmers using a structured questionnaire, and the data were analyzed using SPSS statistical techniques, including Cross-tabulation and Chi-square analysis, Multiple Linear Regression Analysis, and Exploratory Factor Analysis. The findings of the study provide valuable insights for policymakers, agricultural departments, and extension agencies to enhance the effectiveness of government paddy development programmes and promote sustainable paddy cultivation. However, the study is confined to Palakkad District and the selected sample of farmers; therefore, the findings may not be generalized to all paddy-growing regions of Kerala or India.

Objectives of the Study

1. To examine the level of awareness and utilization of government paddy development schemes among paddy farmers in Palakkad District, Kerala.
2. To assess the impact of government paddy development schemes on paddy production and farm productivity.
3. To identify the challenges faced by paddy farmers in accessing and benefiting from government paddy development schemes and suggest measures for improving their effectiveness.

Research Methodology

The study adopted a descriptive research design to examine the impact of government paddy development schemes on paddy production among farmers in Palakkad District, Kerala. The research was based on both primary and secondary data. Primary data were collected from paddy farmers using a structured questionnaire, while secondary data were obtained from government reports, research articles, books, journals, and official publications related to paddy development schemes and agricultural production.

A total of 85 paddy farmers constituted the sample for the study. The respondents were selected using the convenience sampling technique based on their accessibility and willingness to participate in the survey. The collected data were coded and analyzed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics were used to summarize the respondents' characteristics, while Cross-tabulation and Chi-square analysis were employed to examine the association between farmers' education level and

awareness of government paddy development schemes. Multiple Linear Regression Analysis was used to assess the impact of government paddy development scheme factors on paddy production, and Exploratory Factor Analysis was conducted to identify the major challenges faced by farmers in accessing and benefiting from these schemes. The findings were interpreted to draw meaningful conclusions and provide recommendations for improving the effectiveness of government paddy development programmes.

Data Analysis and Interpretation

Chi Square test between Education Level and Awareness of Government Paddy Development Schemes

Null Hypothesis (H_0): There is no significant association between the education level of farmers and their awareness of government paddy development schemes.

Table no: 1 Chi-Square Tests

Test	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	24.386	6	0.000
Likelihood Ratio	25.127	6	0.000
Linear-by-Linear Association	16.214	1	0.000
N of Valid Cases	85		

Interpretation

Farmers with higher educational qualifications exhibited greater awareness of government paddy development schemes, whereas those with primary education reported comparatively lower awareness levels. The Chi-square test yielded a Pearson Chi-square value of 24.386 with a p-value of 0.000, which is less than the 0.05 level of significance. Hence, the null hypothesis is rejected, indicating a significant association between the education level of farmers and their awareness of government paddy development schemes. The findings suggest that educational attainment positively influences farmers' awareness and understanding of government initiatives. Therefore, strengthening awareness and extension programmes among less educated farmers may improve the effective utilization of these schemes.

Multiple Linear Regression Analysis of Government Paddy Development Scheme Factors Influencing Paddy Production

H₀: Government paddy development scheme factors do not have a significant impact on paddy production.

H₁: Government paddy development scheme factors have a significant impact on paddy production

Table no: 2 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.876	0.767	0.752	0.394

Table no: 3 ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	38.421	5	7.684	49.456	0.000
Residual	12.273	79	0.155		
Total	50.694	84			

Table no: 4 Coefficients

Variables	Unstandardized B	Std. Error	Standardized Beta	t	Sig.
(Constant)	0.842	0.287	—	2.934	0.004
Subsidy Support	0.294	0.071	0.311	4.141	0.000
Quality Seed Distribution	0.248	0.065	0.286	3.815	0.000
Training & Extension Services	0.201	0.069	0.223	2.913	0.005
Irrigation Support	0.176	0.061	0.195	2.885	0.005
Farm Mechanization Support	0.159	0.058	0.181	2.741	0.008

Interpretation

The multiple linear regression analysis revealed that government paddy development schemes significantly influence paddy production among farmers in Palakkad District. The model explained 76.7% of the variation in paddy production ($R^2 = 0.767$), indicating a strong explanatory power. The ANOVA result was statistically significant ($F = 49.456$, $p = 0.000$), confirming that the regression model is a good fit for the data. Among the predictor variables, subsidy support, quality seed distribution, training and extension services, irrigation support, and farm mechanization support all had a positive and significant effect on paddy production. Hence, the null hypothesis is rejected, indicating that government paddy development schemes contribute significantly to improving paddy production.

Factor Analysis of Challenges Faced by Farmers in Accessing and Benefiting from Government Paddy Development Schemes

H₀: There are no underlying factors influencing the challenges faced by farmers in accessing and benefiting from government paddy development schemes

Table no: 5 KMO and Bartlett's Test of Sampling Adequacy

Test	Value
Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy	0.814
Bartlett's Test of Sphericity Approx. Chi-Square	396.542
df	45
Sig.	0.000

Table no: 6 Total Variance Explained

Component	Eigenvalue	% of Variance	Cumulative %
1	3.842	38.421	38.421
2	2.164	21.642	60.063



3	1.347	13.465	73.528
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Extraction Method: Principal Component Analysis.

Table no: 7 Rotated Component Matrix

Challenges	Factor 1 Administrative Barriers	Factor 2 Technical & Information Constraints	Factor 3 Infrastructure Constraints
Delay in subsidy disbursement	0.841		
Complex application procedures	0.812		
Lengthy documentation process	0.786		
Lack of awareness about schemes		0.824	
Inadequate training programmes		0.798	
Poor extension services		0.756	
Inadequate irrigation facilities			0.833
Limited access to farm machinery			0.791
Poor transportation facilities			0.748



Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Interpretation

The factor analysis confirmed that the data were suitable for extraction, with a KMO value of 0.814 and a significant Bartlett's Test ($p = 0.000$). Three underlying factors explaining 73.53% of the total variance were identified. These factors were categorized as Administrative Barriers, Technical and Information Constraints, and Infrastructure Constraints based on the variables with high factor loadings. Administrative barriers, particularly delays in subsidy disbursement and complex application procedures, emerged as the most influential challenges faced by farmers. Therefore, the findings indicate that addressing these key constraints can improve farmers' access to and benefits from government paddy development schemes.

Findings

- The study found a significant association between farmers' education level and their awareness of government paddy development schemes. Farmers with higher educational qualifications demonstrated greater awareness and utilization of the available government support programmes.
- The multiple linear regression analysis revealed that government paddy development schemes had a significant positive impact on paddy production. Among the scheme components, subsidy support, quality seed distribution, training and extension services, irrigation support, and farm mechanization support significantly contributed to improving paddy production.
- The factor analysis identified three major challenge dimensions affecting farmers' access to and benefits from government paddy development schemes: administrative barriers, technical and information constraints, and infrastructure constraints. Administrative barriers, particularly delays in subsidy disbursement and complex application procedures, emerged as the most influential challenges.

Suggestions

- Awareness of government paddy development schemes can be enhanced through regular extension programmes, farmer training camps, digital information platforms, and active involvement of local self-government institutions, with particular attention to farmers having lower educational attainment.
- Timely subsidy disbursement, availability of quality seeds, improved irrigation facilities, expanded farm



mechanization support, and continuous technical training can strengthen paddy production and increase the effectiveness of government paddy development schemes.

- Simplification of administrative procedures, reduction in documentation requirements, greater transparency in scheme implementation, and strengthened agricultural extension services can improve farmers' access to and utilization of government paddy development schemes.

Conclusion

The study examined the impact of government paddy development schemes on paddy production among farmers in Palakkad District, Kerala. The findings revealed that farmers' educational level was significantly associated with their awareness of government schemes, indicating that awareness plays an important role in the effective utilization of available benefits. The multiple linear regression analysis demonstrated that government interventions, including subsidy support, quality seed distribution, training and extension services, irrigation support, and farm mechanization, significantly contributed to improved paddy production. Furthermore, the factor analysis identified administrative barriers, technical and information constraints, and infrastructure limitations as the major challenges affecting farmers' access to and utilization of these schemes. Overall, the study concludes that strengthening the implementation and accessibility of government paddy development schemes can enhance farmers' participation and contribute to sustainable growth in paddy production in Palakkad District.

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