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Socio-Economic Dynamics and Production Challenges in Paddy Cultivation in Kerala: An Investigative Perspective

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Abstract

Rice holds a prominent status among the chief grains of India, including Kerala, where paddy cultivation plays a crucial role in food security and rural livelihoods. This study investigates the dynamics of paddy cultivation in Kerala, with a dual focus on understanding the socio-economic background of cultivators and identifying prevalent production challenges. Using field surveys, interviews, and secondary data, the study examines factors such as landholding patterns, labour availability, access to technology, irrigation facilities, and economic viability. It also explores external pressures including climate variability, pest infestations, and market fluctuations that affect productivity. The findings highlight the interplay between socio-economic constraints and production challenges, revealing gaps in policy support, resource allocation, and knowledge dissemination. These insights are expected to inform policymakers, agricultural planners, and development agencies in designing targeted interventions and sustainable strategies to enhance paddy productivity, improve cultivators' livelihoods, and promote resilient agricultural practices in Kerala.

Key Words: Grain, Socio-Economic Challenges, Sustainable Development, Kharif Crop, Cultivation.

INTRODUCTION

The agricultural industry plays a crucial role in fostering economic development in India. India stands as the world's second-largest rice producer and the foremost exporter of rice globally. The production has witnessed a substantial growth, surging from 53.6 million tons in FY 1980 to 120 million tons in FY 2020-21. Rice holds a prominent status among the chief grains of India and Kerala as well, with the country boasting the largest area under rice cultivation. Serving as one of the principal food crops, rice stands out as the dominant crop in India, making the country one of the foremost producers of this vital crop. Rice cultivation in India is primarily concentrated in rain-fed regions characterized by substantial annual rainfall. This geographical preference makes rice fundamentally a Kharif crop in the country. Rice cultivation can also extend to irrigated areas in regions with lower rainfall, ensuring a diversified approach to its growth in India.

In South India, agriculture stands as the predominant occupation, with approximately 5.31 crore people actively involved in agricultural and allied activities as of 2021. In the fiscal year 2018-19, the growth rate of the agriculture and allied sector experienced a decline, registering (-) 0.5 percent compared to the 1.7 percent growth observed in the previous year, 2017-18 in Kerala. Within the cultivated areas, food crops, including rice, tapioca, and pulses occupied 10.15 percent of the total cropped area. On the other hand, cash crops such as cashew, rubber, pepper, coconut, cardamom, tea, and coffee constituted a significant portion, amounting to 62.1 percent of the total cropped area. This distribution reflects the varying significance of food and cash crops in the agricultural landscape during the specified year. In the fiscal year 2019-20, the Department of Agriculture implemented several key initiatives aimed at enhancing the agricultural sector. These

initiatives encompassed an integrated food crop production program with a primary focus on boosting rice production. Additionally, there was a concerted effort towards the holistic development of the coconut sector through the implementation of Keragramams. The department also prioritized the production and distribution of high-quality planting seed varieties. Another significant initiative involved the comprehensive cultivation of fallow lands, with active participation from the community. These measures collectively aimed at fostering sustainable growth and development in the agricultural sector within the specified period.

OBJECTIVES OF THE STUDY

1. To study the socio-economic background of paddy cultivators in Kerala.
2. To identify the problems related to paddy production encountered by the cultivators.

HYPOTHESIS

H0: There is no significant difference in the production problems of paddy cultivation among the different categories of paddy cultivators in Kerala.

H0: There is no significant difference in the production problems faced by paddy cultivators and their year of experience in doing paddy cultivation.

H_O: Agro-climatic changes have no impact on the production problems faced by the paddy cultivators in Kerala.

METHODOLOGY

This study was conducted in the three selected districts of Kerala namely, Alappuzha, Palakkad and Thrissur. These districts were selected due to their high potential for paddy production. The research utilized primary data to achieve its objectives, collected through a well-structured questionnaire. A total of 738 paddy-growers were chosen for the study, from the selected districts based on the combined production of paddy over a period of fifteen years. The collected data pertained to the socioeconomic characteristics of the participants and the challenges they encounter in paddy production. The collected data obtained from the study were analysed by using M.S Excel and SPSS package. Descriptive statistics, such as mean, frequency, and percentage, were employed to present the socioeconomic characteristics of the farmers.

RESULTS OF DATA ANALYSIS

Table 1

Frequency Table of Socio-Economic Variables

Age	**Frequency**	**Percent**	**Category of Farmers**	**Frequency**	**Percent**
Less than 30	062	08.40	Marginal Farmers	202	27.40
30 – 40	234	31.70	Small Farmers	351	47.60
40-50	314	42.60	Medium Farmers	104	14.10
Above 50	128	17.30	Large Farmers	081	10.90
Total	**738**	**100.00**	**Total**	**738**	**100.00**
Year of Experience	**Frequency**	**Percent**	**Land Holdings**	**Frequency**	**Percent**
Less than 5 years	084	11.4	Landless	0	0
5 – 10 years	211	28.5	1 – 2 Acre	202	27.40
Above 10 years	443	60.1	2 – 4 Acre	351	47.60
Total	**738**	**100.0**	4 – 10 Acre	104	14.10
Reasons for selecting paddy cultivation	**Mean**	**Rank**	Above 10 Acre	081	10.90
The product has a Ready Market	4.34	2	**Total**	**738**	**100.00**
It gives more Profit	0.55	9	**Family Type**	**Frequency**	**Percent**
Expertise in Paddy Farming	4.19	3	Nuclear	531	71.90
The product has a Steady Demand	4.79	1	Joint	207	28.10
No other cultivation is possible in the same field	3.62	5	**Total**	**738**	**100.00**
Family Consumption	3.44	6	**Cultivation per Year**	**Frequency**	**Percent**
Stable Price	1.73	8	1	276	37.40

Motivation and support from Government and other Agencies	2.57	7	2	411	55.70
Family-owned Business	4.01	4	3	051	06.90
Source of seed	**Frequency**	**Percent**	**Total**	**738**	**100.00**
Self-produced	422	57.10	**Agricultural Asset Owned**	**Frequency**	**Percent**
Purchased from other farmers	071	09.60	Pump set	738	100.00
Exchange from neighbour farmers	053	07.20	Tractor	427	57.85
Supplied by credit society	192	26.10	Paddy harvesting machine	198	26.82
Total	**738**	**100.00**	Livestock	601	81.43
			Well and irrigation structure	738	100.00
			Basic plough tools	738	100.00

Source: Primary Data.

It is clear from the Table 1 that out of 738 respondents, 202 (27.46 percent) farmers were belongs to marginal farmers category who holds 1-2 acres of land. 314 (42.6 percent) farmers belong to the age group of 40 years to 50 years; 422 (57.10 percent) farmers were used self-grown seeds for further cultivation and 211 (28.5 percent) farmers were having farming experience of 5-10 years. All the selected respondents (738) hold basic plough tools, well and irrigation structure. 276 (37.4 percent) cultivate paddy once in a year, 531 farmers belong to nuclear family and the major reason for selecting the paddy cultivation by the farmers is that it has a steady demand in the market (4.79).

Table 2

Clustering the Production Problems Faced by the Paddy Cultivators in Kerala using EFA

Factor	Parameters	Rotated Factor Loadings
Factor 1: Labour related problems 21.37 % of Variance	Non availability of labour for paddy cultivation (PP1)	.870
	High wage rate (PP16)	.782
	Productivity of labour is not satisfactory (PP17)	.766
	Wastage of time by labourers (PP24)	.656
	Higher commission to agents/ dealers (PP25)	.651
	Unhealthy labour management relationship exists among the farmers (PP26)	.649
	Labour cost is very high and sometimes unaffordable (PP21)	.672
Factor 2: Raw material-based problems 17.91 % of Variance	Non availability of seeds, fertilisers and irrigation facility (PP2)	.801
	Frequent increase in price of raw material makes it unaffordable to continue cultivation (PP4)	.796
	Scarcity of raw material often leads to low-capacity utilization (PP5)	.754
	Inadequate storage facilities for materials are a major production problem (PP9)	.741
	Raw materials are subject to frequent price fluctuations which affects production (PP10)	.716
Factor 3: Finance related problems 14.62 % of Variance	Lack of adequate finance (PP3)	.796
	Non availability of finance at proper time affects production (PP6)	.726
	High rate of interest is charged by banks and financial institution (PP8)	.657
	Banks and financial institutions make delay in disbursement of funds (PP11)	.570
	Complex procedure in getting finance (PP14)	.769
	Find difficulty in providing security for getting finance (PP15)	.861
	Problem of Inadequacy of working capital (PP18)	.637
	Complex procedure in getting subsidy (PP19)	.552
	Sale on credit affects my present earnings (PP22)	.621
	Low credit period allowed by the suppliers make difficulties (PP23)	.698
Factor 4: Production cost related problems 11.85 % of Variance	Higher cost of raw material is a major problem related to production (PP7)	.768
	Increase in the cost of production (PP13)	.743
	High cost of technology (PP20)	.811
	High cost of production (PP27)	.653
	Maintenance cost of technology is very high (PP35)	.632
	Pesticides are expensive and scarce (PP42)	.601
	Chemicals to destroy diseases are expensive and scarce (PP44)	.574
Factor 5: Cultivation based problems 9.88 % of Variance	Problematic pests (PP39)	.741
	Pests reduce crops yields and quality (PP40)	.701
	Lack of farm implements and equipment (PP41)	.836
	Diseases reduces yield (PP43)	.777
Factor 6: Technology related problems 4.52 % of Variance	Inadequate facilities for waste disposal make difficulties (PP28)	.877
	Procurement of latest technology includes seed, tools, machines whose cost is high (PP29)	.764
	Lack of proper training in using latest technology (PP30)	.742
	Inadequate irrigation facilities (PP31)	.666

	Existing capacity utilization is not satisfactory (PP32)	.598
	Difficulty to acquire new technology (PP33)	.622
	Existing technology used is old which reduces productivity (PP34)	.671
Factor 7: Quality management related problems 3.22 % of Variance	Wastage and poor quality of seeds is major issue in cultivation (PP12)	.642
	Low quality and expensive seed (PP36)	.722
	Lack of knowledge to preserve and choose right seed (PP37)	.711
	Inadequate knowledge on disease and pest management (PP38)	.707
Total Variance Explained: 83.37 % Variance		

Source: Primary Data.

Table 2 presents a breakdown of the 44 production problem parameters encountered by paddy cultivators. From these, seven distinct factors have been identified, collectively explaining 83.37 percent of the total variance in production challenges faced by paddy cultivation. These seven factors are: labour-related problems (21.37 percent), raw material-based issues (17.91 percent), finance-related challenges (14.62 percent), production cost-related concerns (11.85 percent), cultivation-related difficulties (9.88 percent), technology-related issues (4.52 percent), and quality management-related problems (3.22 percent). The loading patterns of these factors reveal strong associations among the parameters, indicating that all these variables contribute significantly to the production problems experienced by paddy cultivators in Kerala.

H0: There is no significant difference in the production problems of paddy cultivation among the different categories of paddy cultivators in Kerala.

Table 3

Difference in Production Problems of Paddy Cultivation Among the Different Categories of Paddy Cultivators in Kerala: ANOVA

Production Problems of Paddy Cultivation X Categories of Farmers	**Label**	**Sum of Square**	**Df**	**Mean Square**	**F**	**Sig.**
	Between Groups	47.902	3	15.96	69.39	.000*
	Within Groups	167.911	734	0.23		
	Total	215.813	737			

Source: Primary Data. *5% level of significance

Table 3 depicts the outcomes of an ANOVA conducted to assess the notable variations in production problems within distinct categories of paddy cultivators. The computed p-value for the production problems of paddy cultivation (F value = 69.39) indicates a substantial disparity among the diverse categories of paddy cultivators in Kerala, given that the p-value (.000) is below 0.05. Consequently, the null hypothesis is rejected, affirming a noteworthy difference in the production

problems encountered by various categories of paddy cultivators in Kerala. Post Hoc analysis further reveals that small farmers encounter more significant challenges in production, finance, and production cost compared to other categories of farmers.

H0: There is no significant difference in the production problems faced by paddy cultivators and their year of experience in doing paddy cultivation.

Table 4

Difference in Production Problems Faced by the Paddy Cultivators and their Year of Experience in doing Paddy Cultivation: ANOVA

	Label	Sum of Square	Df	Mean Square	F	Sig.
Production Problems of Paddy Cultivators X Year of Experience	Between Groups	22.561	2	11.28	56.4	.000*
	Within Groups	147.289	735	.200		
	Total	169.85	737			

Source: Primary Data. *5% level of significance

Table 4 provides a summary of the results from an ANOVA applied to examine the significant differences in production problems experienced by paddy cultivators based on their years of experience in paddy cultivation. The calculated p-value for production problems faced by paddy cultivators (F value = 56.4) indicates that there is a significant difference among the years of experience in paddy cultivation, as the p-value (.000) is less than 0.05. Consequently, the null hypothesis is rejected, affirming a notable difference in the production problems faced by paddy cultivators based on their years of experience. Specifically, farmers with fewer years of experience in paddy cultivation encounter more production problems compared to other categories of farmers.

H0: Agro-climatic changes have no impact on the production problems faced by the paddy cultivators in Kerala.

Table 5

Regression Model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.802	.643	.634	.238
Predictors: (Constant), Rainfall (X_1), Temperature (X_2), Usage of fertilizers and pesticides (X_3), Soil Fertility (X_4), Labour Scarcity (X_5), Input Cost (X_6)				
Dependent Variable: Production problems faced by the paddy cultivators in Kerala				

Source: Primary Data.

The model summary Table 5 provides an overview of the regression model's overall predictability. The Adjusted R2 value, standing at 0.634, signifies that the six independent variables related to agro-climatic changes collectively exert a 63.4 percent influence on the dependent variable. This observation underscores the fact that agro-climatic changes significantly impact the production problems faced by paddy cultivators in Kerala during paddy cultivation.

Table 6

ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	**Regression**	19.651	6	3.27	18.16	.000*
	Residual	132.889	731	0.18		
	Total	152.541	737			

Source: Primary Data. * 5 Percent level of significance

As indicated in Table 6, the ANOVA results show a p-value of 0.000 (F value = 18.16), which is less than 0.05, signifying the statistical significance of the regression model. Consequently, the null hypothesis is rejected, affirming a significant relationship between the variables examined in the hypothesis. This finding underscores that the variables related to agro-climatic changes are closely associated with the production problems.

Table 7

Coefficients of Multiple Regression Analysis

Model	Variables	UC		SC	T	Sig.
		B	SE	Beta		
1	(Constant)	2.073	.100		14.685	.000*
	Rainfall	.601	.084	.586	6.456	.000*
	Temperature	.605	.081	.597	8.334	.000*
	Soil Fertility	.729	.097	.714	12.711	.000*
	Usage of fertilizers and pesticides	.581	.076	.562	7.597	.001*
	Input Cost	.544	.069	.549	4.778	.002*
	Labour Scarcity	.689	.088	.677	10.187	.001*
Dependent Variable: Production problems faced by the paddy cultivators in Kerala						

Source: Primary Data. * 5 Percent level of significance

The coefficient Table 7 highlights that variables related to agro-climatic changes, namely rainfall (Beta Coefficient = 0.586, Sig = .000), temperature (Beta Coefficient = 0.597, Sig = .000), usage of fertilizers and pesticides (Beta Coefficient = 0.562, Sig = .001), soil fertility (Beta Coefficient = 0.714, Sig = .000), labour scarcity (Beta Coefficient = 0.677, Sig = .001), and input cost (Beta Coefficient = 0.549, Sig = .002), exert a significant impact on the production problems faced by paddy cultivators in Kerala. The fact that all the significant values of the predictor variables are less than 0.05 indicates their substantial influence. Notably, soil fertility and labour scarcity emerge as the variables with the highest significant impact on the production problems encountered by paddy cultivators in Kerala. Consequently, it can be concluded that agro-climatic changes have a noteworthy and significant impact on the production challenges faced by paddy cultivators in the region.

FINDINGS OF THE STUDY

1) 202 (27.46 percent) farmers were belonging to marginal farmers category.
2) 314 (42.6 percent) farmers belong to the age group of 40 years to 50 years.
3) 57.10 percent farmers were used self-grown seeds for further cultivation.
4) 211 (28.5 percent) farmers were having farming experience of 5-10 years.
5) All the selected respondents (738) hold basic plough tools, well and irrigation structure.
6) 276 respondents cultivate paddy once in a year.
7) 531 farmers belong to nuclear family.
8) The major reason for selecting the paddy cultivation by the farmers is that it has a steady demand in the market (4.79).
9) It is found that small farmers faced more finance and production cost related problems than that of other categories of farmers.
10) It is identified that the farmers having less years of experience in doing paddy cultivation faced more production problems than that of other categories of farmers.
11) It reveals that the soil fertility and labour scarcity have the highest significant impact on the production problems faced by the paddy cultivators in Kerala in doing the paddy cultivation.

CONCLUSION

The study demonstrates that problems in connection with labour, raw material, finance and cost of production are the major production issues encountered by the paddy cultivators in Kerala. The study reveals that lack of funding at the right time has an impact on production, which leads to a problem with inadequate working capital. As a result, paddy farmers in Kerala have trouble covering costs related to production, labour, and raw materials, which, in turn, has an impact on their ability to make a profit. It is also identified that small farmers faced more production

problems, more finance problems and production cost related problems than that of other categories of farmers. It is also identified that the farmers having lesser years of experience in doing paddy cultivation faced more production problems than that of other categories of farmers. At the same time agro-climatic changes have 63.4 percent influence on the production problems. Thus, it is concluded that the agro-climatic changes have impact on the production problems faced by the paddy cultivators in doing the paddy cultivation.

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