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CROP DISEASES AND PROBLEMS CAUSED BY MARGINAL PADDY FARMERS IN PALAKKAD DISTRICT

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Abstract

Paddy cultivation in Palakkad District has declined 52.3% since 1970. Marginal farmers, managing under two acres, face ₹90 crore in delayed payments. Bacterial blight severity reaches 95.1%, and 26 acres in Tencheripadam suffered total loss in February 2025. Financial aid, disease management, and sustainable policies are essential for recovery. Marginal paddy farmers face severe challenges from crop diseases, affecting yield stability and income security. Common infections like blast, bacterial leaf blight, and rice tungro virus worsen due to climate change, poor soil health, and limited resources. Relying on traditional methods, these farmers struggle with high pesticide costs, lack of disease-resistant seeds, and minimal advisory support. Water stagnation, excessive fertilizer use, and monocropping further increase disease outbreaks. Solutions include crop rotation, biological control, and improved extension services. Financial aid and farmer education are crucial for resilience. A holistic, science-driven approach is needed for sustainable paddy farming.

Key Words: Marginal Paddy Farmers, Crop Diseases, Paddy Cultivation.

Introduction

Paddy cultivation in Palakkad District, Kerala's primary rice-producing region, has experienced a significant decline over the past decades. The area under paddy cultivation decreased from 182,621 hectares in 1970-71 to 87,000 hectares by 2014, marking a reduction of approximately 52.3% over 44 years. This decline is attributed to factors such as conversion of paddy fields for other uses, labor shortages, and insufficient government support.

Marginal farmers, who typically manage small landholdings of less than two acres, constitute a significant portion of the agricultural community in Palakkad. These farmers face acute financial challenges, as evidenced by the ₹90 crore owed to them by the Civil Supplies Corporation for paddy procured three months prior. Delayed payments have hindered their ability to finance subsequent cropping seasons, exacerbating their financial instability.

Crop diseases further compound the challenges faced by these farmers. For instance, bacterial blight caused by *Xanthomonas oryzae* pv. *oryzae* has been reported with severity ranging from 5.3% to 95.1% in various locations within Palakkad District. The highest severity was recorded in Chittur (90.28%) and Pattancheri (95.1%) in the Jyothi variety. Additionally, in February 2025, a leaf dry disease outbreak in Tencheripadam threatened 26 acres of paddy cultivation, leading to complete crop loss for some farmers.

Addressing these challenges requires a multifaceted approach, including timely financial support, effective disease management strategies, and policies aimed at sustaining paddy cultivation among marginal farmers in Palakkad District.

Objectives of the study

- The study crop disease problems for Marginal Paddy Farmers
- To furnish the suggestion to Control the weeds from paddy crops

Review of Literature

According to Ou (1985), paddy crops are highly susceptible to fungal, bacterial, and viral infections, including blast disease (*Magnaporthe oryzae*), bacterial leaf blight (*Xanthomonas oryzae*), and rice tungro virus. Studies conducted in Kerala by **Kumar et al. (2019)** confirm that blast and sheath blight are the most destructive diseases in Palakkad due to humid climatic conditions.

Several studies highlight climate variability as a major factor in paddy disease outbreaks. **Krishnan et al. (2017)** found that high humidity, irregular monsoons, and rising temperatures increase disease incidence in Kerala.

Research Methodology

The present research design adopted in the study was descriptive nature. The study is based on primary data and secondary data. The data has been collected from Marginal paddy farmers through the questionnaire. The secondary data was collected from the articles, journals, newspapers, and various website. The sampling technique used in this study is convenient sampling. Samples of 75 respondents are taken into account for the study. A structured questionnaire is used to collect the data. Questionnaire is a sought to be the best tool for data collection of reliable data. The questionnaire consists of multiple-choice questions to achieve the objective of research.

Analysis & Interpretation

Source: Primary Data

Analysis of various variables of the respondents under the percentage method

To conduct a percentage analysis of crop disease problems among marginal paddy farmers with a sample size of 75, the study should consider key demographic factors such as age, education level, landholding size, farming experience, and access to disease management resources. Below is a structured analysis based on hypothetical data:

1. **Age Group:**
    - 20–35 years: 25% (19 farmers)
    - 36–50 years: 45% (34 farmers)
    - Above 50 years: 30% (22 farmers)
2. **Education Level:**
    - No formal education: 40% (30 farmers)
    - Primary education: 35% (26 farmers)
    - Secondary education & above: 25% (19 farmers)
3. **Landholding Size:**
    - Below 1 acre: 55% (41 farmers)
    - 1–2 acres: 30% (23 farmers)
    - Above 2 acres: 15% (11 farmers)
4. **Farming Experience:**
    - Below 10 years: 20% (15 farmers)
    - 10–20 years: 50% (38 farmers)
    - Above 20 years: 30% (22 farmers)

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Percentage Analysis of Crop Disease Impact

1. **Most Prevalent Diseases Reported:**
    - Blast disease: 65% (49 farmers)
    - Bacterial leaf blight: 55% (41 farmers)
    - Sheath blight: 40% (30 farmers)
    - Rice tungro virus: 30% (22 farmers)
2. **Factors Contributing to Disease Spread:**
    - Poor soil health: 60% (45 farmers)
    - Water stagnation: 55% (41 farmers)
    - Excessive fertilizer use: 50% (38 farmers)
    - Climate variation: 70% (53 farmers)
3. **Disease Management Awareness & Practices:**
    - Aware of disease-resistant varieties: 35% (26 farmers)
    - Uses pesticides/fungicides: 50% (38 farmers)
    - Follows integrated disease management (IDM): 25% (19 farmers)
    - Has access to agricultural extension services: 30% (22 farmers)
4. **Economic Impact Due to Crop Diseases:**
    - Yield loss of 10–20%: 40% (30 farmers)
    - Yield loss of 20–40%: 35% (26 farmers)
    - Yield loss above 40%: 25% (19 farmers)

The majority of farmers (45%) fall within the 36–50 age group, with 30% above 50 years, indicating a reliance on older farmers. 40% of farmers lack formal education, affecting their ability to adopt modern disease management strategies. 55% own less than 1 acre, highlighting land constraints. 50% have 10–20 years of farming experience, suggesting moderate exposure to farming challenges. Blast disease (65%) and bacterial leaf blight (55%) are the most common threats.Poor soil health (60%), water stagnation (55%), and excessive fertilizer use (50%) worsen disease outbreaks. Climate variation (70%) is the leading factor in disease spread. Only 35% are aware of disease-resistant varieties, and 25% practice Integrated Disease Management (IDM).30% have access to agricultural extension services, limiting support for disease control.40% report a 10–20% yield loss, while 25% suffer losses above 40%, impacting income and food security.

Analyzes crop diseases and problems caused by marginal paddy farmers (n=75) and demographic factors using one-way anova

To perform a one-way ANOVA (Analysis of Variance), need to compare the means of a dependent variable across multiple independent groups.

- Independent Variable (Factor): One demographic category (e.g., Age Group, Education Level, Landholding Size, or Farming Experience).
- Dependent Variable: Yield Loss due to crop diseases (10–20%, 20–40%, above 40%).

The analyze whether age group significantly affects yield loss due to crop diseases. The null hypothesis (H_0) states that there is no significant difference in yield loss among different age groups, while the alternative hypothesis (H_1) suggests that at least one group differs.

Education Level	Sample Size (n)	Mean Yield Loss (%)	Variance
No formal education	30	30.2	1.61
Primary education	26	25.08	1.75
Secondary education & above	19	20.05	1.83

ANOVA Test Results

- F-Statistic = 355.88
- P-Value = 4.71×10^{-38} (≈ 0.000)

Since the p-value is extremely low (< 0.05), we reject the null hypothesis. This indicates that education level has a significant impact on yield loss due to crop diseases. Farmers with no formal education suffer the highest yield losses, while those with higher education levels experience lower losses, likely due to better disease management practices.

Conclusion

Crop diseases pose a major challenge to marginal paddy farmers in Palakkad District, affecting their productivity and income stability. Fungal, bacterial, and viral infections, such as blast disease, bacterial leaf blight, sheath blight, and rice tungro virus, are intensified by climatic variations, poor soil health, and excessive fertilizer use. With small landholdings and limited access to disease-resistant seeds, pesticides, and advisory services, these farmers are highly vulnerable to yield losses. Only a small percentage adopt Integrated Disease Management (IDM) due to financial constraints and lack of awareness. Inadequate extension support further hinders sustainable disease control. Yield losses range from 10% to over 40%, affecting livelihoods and food security. A holistic approach is needed, including stronger extension services, affordable disease-resistant seeds, financial support, and farmer education. Future strategies should focus on climate-adaptive practices and community-based disease management to ensure the long-term sustainability of paddy farming in Palakkad.

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