A STUDY ON PRODUCTION PROBLEMS USING SIMPLE PERCENTAGE AND FACTOR K-MEANS ANALYSIS METHODS

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ABSTRACT

To assess the problems of paddy cultivators, a research study is conducted in Mattathur Panchayath, Padasekarasamithies. By adopting simple random sampling method 130 respondents are selected from registered farmers and interview schedule method is adopted for the collection of primary data. A simple percentage and factor analysis are used to analyse the collected data. The result of the study discloses that “High cost of labour”, “Non-availability of machinery”, “Water scarcity”, and “Low yields” form important problems of paddy cultivation.

Keywords: Analysis, K-Means, Agriculture, seasons, farmers.

I. INTRODUCTION

Agriculture sector plays an important role in Indian Economy and it is considered as the backbone of India. India is the second largest producer in the world, next to China. Kerala is one of the leading rice growing State in India and it is endowed with all favourable climatic conditions suitable for rice production. Among the several agricultural activities like fishing, milk production, horticulture etc, paddy cultivation is vital among them. It provides livelihood and food security to majority of the population. It occupies 7.46% of the total cropped area of the state (Economic review 2016).

Problems of paddy cultivation are same across the country, but degree of the problems depend upon the regions and seasons of cultivation. The production of paddy in Kerala is falling due to non-remunerative returns, high cost of labour and with poor productivity. The area of paddy cultivation decreased by 77.83% during the year 2017-18 as compared to that of year 1975-76 (Agricultural Statistics 2017-18). The paddy fields throughout Kerala are facing excessive threats. Majority of land proprietors experience that constant paddy cultivation isn't economically viable and they seek to shift into greater remunerative plants and cropping patterns. Paddy is one of the major crops of Thrissur District and livelihood for a large number of people. So, majority of the population is involved in this field.

The major difficulties faced by farmers regarding production of paddy are high cost of labour, non-availability of machinery, shortage of water, high cost of inputs, high cost of fertilizers and pesticides, change in climate, scarcity of finance, inefficient fungicides etc. Thus, this study is conducted for knowing the problems faced by farmers in Mattathur Panchayath and provides adequate suggestions for the improvement of production.

II. REVIEW OF LITERATURE

In [1-2] have enumerated the degree of espousal of mechanized farming by the paddy growers, the use of extension tools and techniques in farming, its benefits and constraints. Respondents are selected through multi stage random sampling technique. Although, mechanized farming has resulted in drastic reduction in cost, paddy growers have suffered from lack of machinery and equipment, insufficient training mechanism and the mismatch in farmers’ requirement and availability of loans.
In [3-5] have discerned issues endured by rural farmers in paddy cultivation. Mass reduction in number of farmers, migration of youth in search of jobs in other sectors, irrigation problems and weak distribution of agricultural aids and subsidies are the paramount problems faced by farmers. The government has implemented economic transformation programmes and regional development project and a programme namely SCORE for the agricultural development.

In [6-8] has investigated the economic degree of the farmers. The study has analysed the factors influencing the choice of agriculture and reasons for the inferior economic level of the farmers. The scope of the cultivation, application of modern technology in the paddy field and the problems in farming and marketing are the major areas of concern. The study has suggested the application of modern technology can be used to make more profits in the agricultural sector. Then, the farmers will be economically sound.

In [9-11] has revealed that the production of paddy in Kerala has declined and the area of cultivation is also reduced. Fragmented landholding, shortage of labour, high labour cost are the problems faced by the farmers.

In [12-14] have reported that both early and late harvesting of paddy is detrimental, resulting in higher yield loss. Transportation, handling and vermin attack in case of stored grains are the post harvesting failures, whereas, the pre-harvesting failures are incidents of pests, diseases and weeds. The major suggestions are to reduce the cost of production and alteration of Government agencies for expert advice to solve farm-related problems.

In [15] has identified labour shortage and low price for paddy are the major constraints and opined mechanisation as the best remedy to overcome the challenges. High yielding variety seeds will improve the production.

In [16-17] have studied the resource productivity of paddy with reference to three villages of Bhadra command, namely Devarabelakere, Bevinahalli and Jigali-Kumbalur. The total cost of cultivation is found to be Rs. 37,275/hectare. The net income is Rs. 24,325/hectare and the B-C ratio is below one. The higher cultivation cost is incurred for seeds, manures, fertilisers and plant protection chemicals. Labour and inputs are the main factors affected by paddy cultivation. After introducing mechanical paddy harvesting, the harvesting, threshing and winnowing cost are comparatively very lesser.

From the review of literature, it is ascertained that previous studies have been carried out for the problems of paddy cultivators in district level[22][23]. Not many studies have been carried out to measure the problems in a Panchayath and Padasekarasamithies. Hence, in this article an earnest effort has been made to ascertain the major production problems faced by paddy cultivators in Mattathur Grama Panchayath.

A. Statement Of Problem

Large number of farmers are directly or indirectly involved in production and marketing of paddy. Paddy cultivators have been facing various problems relating to production and marketing. Their product does not fetch them sufficient price. So, they are forced to take loans from banks and private agencies. Due to the non-profitability nature of paddy cultivation, farmers are not able to repay the loans at right time. Price reduction, increased cost of cultivation, non-availability of labour, lack of water facilities, attitudes of the new generation towards paddy cultivation etc. severely affect the farmers for rejecting this field.

B. Objectives

1. To know the socio-economic profile of the farmers.

2. To know about the problems regarding to production of paddy cultivation in Mattathur Grama Panchayath.

3. To offer suitable suggestions for solving the problems in production of paddy cultivation in Mattathur Grama Panchayath.

C. Scope of The Study

This study will be useful to know about the socio-economic conditions of the farmers, especially in the area of age, gender, marital status, education, source of income, residence, land used for paddy cultivation and experience in paddy cultivation. This study analyses problems of paddy cultivators regarding cultivation.
III. METHODOLOGY FOR THE STUDY

A. Data
The study depends on primary data. A Well-structured interview schedule, is used to collect data from the cultivators. Secondary data collected through Articles, Journals, Newspapers, Mannuthy Agriculture University and various websites.

B. Sampling
Total number of Padasekarasamithies in Mattathur Grama panchayath is 19. Among these ten Padasekarasamithies are selected purposively because of a greater number of registered farmers cultivated in these Padasekarasamithies. They are Attakuzhi, Avittappilly, Chempuchira, Ithupadam, Kodunga, Koplipadam, Mattathur, Vaspuram Padasekarasamithies and Chazhikadu Karshaka Samithies. By adopting simple random sampling method 130 respondents are selected from registered farmers.

C. Tools of analysis
By making use of simple percentage and Factor analysis, the collected data are analysed

D. Period of study
The study was conducted from October 2019 to January 2020.

E. Limitations Of The Study
The following limitations are imposed on the present study

1. For the study only the farmers who are registered in Ten Padasekara samithies are selected for the study. Therefore, the findings of the study may not be applicable to other places.

2. Majority of the respondents have answered information from their own view point and it cannot be hundred percentage accurate.

F. Significance Of The Study
This study analysed the problems of paddy cultivators in Mattathur padasekarasamithies in Thrissur District of Kerala. It was based on the view of the registered farmers of the padasekarasamithies. It would greatly help the padasekarasamithies members to overcome the various problems. This will also help the policy makers of the government level to frame suitable policies to improve their paddy cultivation.

IV. ANALYSIS AND INTERPRETATION

TABLE I
Socio-Economic Profile of the Paddy Cultivators

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Particulars</th>
<th>Total 130</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No.</td>
</tr>
<tr>
<td>1</td>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Male</td>
<td>112</td>
</tr>
<tr>
<td>1</td>
<td>Female</td>
<td>18</td>
</tr>
<tr>
<td>2</td>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Up to 30</td>
<td>31</td>
</tr>
<tr>
<td>2</td>
<td>31 – 50</td>
<td>52</td>
</tr>
<tr>
<td>2</td>
<td>Above 50</td>
<td>47</td>
</tr>
<tr>
<td>3</td>
<td>Marital Status</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Married</td>
<td>116</td>
</tr>
<tr>
<td>3</td>
<td>Single</td>
<td>14</td>
</tr>
</tbody>
</table>
### Table 1. Shows the demographic profile of farmers in Mattathur Panchayath, Thrissur District.

Gender detail shows 112 (86%) farmers are male and 18 (14%) farmers are female. Thus, majority of the farmers are male.

Regarding the age of farmers 31; (23%) farmers are up to the age of 30 years, 52 (40%) farmers age ranges between 31-50 years and the remaining 47 (37%) farmers are above the age of 50 years. Thus, majority of the farmer’s age ranges from 31-50 years.

About the marital status 116 (90%) farmers are married and 14 (10%) farmers are single. Thus, majority of the farmers are married.

Education details show that 4 (4%) farmers are illiterate, 38 (29%) farmers are educated up to SSLC, 46 (35%) farmers have completed H. Sc. and the remaining 42 (32%) farmers are under graduates. Thus, majority of the farmers are educated up to H. Sc.
Regarding the area of residence, 24 (18%) farmers reside in semi-urban areas, and the remaining 106 (82%) farmers reside in rural areas. Thus, the majority of the farmers are residing in rural areas.

About the family size, 24 (18%) farmers have up to 3 members in their family, 59 (45%) farmers have 4 members in their family, and the remaining 47 (37%) have above 4 members in their family. Thus, the majority of the farmers have four members in their family.

Regarding the main source of income; 8 (6%) farmers primarily depend on business, 65 (80%) farmers depend on agricultural income, 14 (11%) are self-employed, 21 (16%) earn from government jobs, and the rest 22 (17%) earn from private jobs. Thus, the majority of the respondents are earning from agriculture.

Yearly income details show that 28 (22%) farmers earn up to Rs. 1,00,000 per year, 39 (30%) farmers earn between Rs. 1,00,001-2,00,000 per year, and the remaining 63 (48%) farmers earn more than 2,00,000 per year. Thus, most of the farmers earn above 2,00,000 per year.

About the experience in paddy cultivation; 12 (9%) farmers have up to 5 years of experience, 19 (15%) farmers have 6-8 years of experience, 99 (76%) farmers have more than 8 years of experience in paddy cultivation. Thus, the majority of the farmers have more than 8 years of experience in paddy cultivation.

Regarding land used by the farmers; 32 (24%) farmers have up to 75 Cents of paddy field, 26 (20%) farmers have 76-150 Cents, 39 (31%) farmers have 151-200 and the remaining 33 (25%) farmers have more than 200 Cents.

### A. Farmers' Problems towards Paddy cultivation

Factor Analysis is used to identify the prominent production problems faced by paddy cultivators. As a pre-analysis test for the suitability of the whole sample for factor analysis, Kaiser-Meyer-Olkin (KMO) and Bartlett’s Test of Sphericity are used. KMO and Bartlett’s test results are found to be greater than 0.70. Thus, the information gathered is sufficient for the use of factor analysis. In addition, the large Bartlett’s Sphericity test values (352.028, df: 66, Sig=0.000) and KMO statistics (0.745) indicate the appropriateness of factor analysis i.e., the sample is adequate.

#### TABLE II

<table>
<thead>
<tr>
<th>Problems</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>High cost of labour</td>
<td>.753</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-availability of machinery</td>
<td>.739</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water scarcity</td>
<td>-.677</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low yields</td>
<td>-.502</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-availability of variety seeds</td>
<td>-.822</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High cost of fertilizers</td>
<td>.763</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of finance</td>
<td>.640</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change in climate</td>
<td>.808</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pest attack</td>
<td>-.573</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural calamities</td>
<td>.783</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decrease in fertility of soil</td>
<td></td>
<td>.524</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------------------</td>
<td>---------</td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Eigen Values</strong></td>
<td>3.061</td>
<td>1.775</td>
<td>1.393</td>
<td>1.183</td>
</tr>
<tr>
<td><strong>% of Variance</strong></td>
<td>25.507</td>
<td>14.791</td>
<td>11.608</td>
<td>9.859</td>
</tr>
<tr>
<td><strong>Cumulative % of Variance</strong></td>
<td>25.507</td>
<td>40.298</td>
<td>51.906</td>
<td>61.765</td>
</tr>
</tbody>
</table>

**B. Findings**

Four factors are identified by locating Eigen values greater than unity. Factors which have a component loading of 0.5 and above are said to be significant problems that affects production of paddy by farmers. From the rotated component matrix, it can be seen that “High cost of labour”, “Non-Availability of machinery”, “Water scarcity”, and “Low yields” have a component loading of 0.5 and above. Hence, these four variables form first factor.

In the second factor, “Non-availability of variety seeds”, “High cost of fertilizers”, and “Lack of finance” are found to be important.

In the third factor, “Change in climate” and “Pest attack” are found to be significant.

In the fourth factor, “Natural calamities” and “Decrease in fertility of soil” are found to be significant.

Factor one contributes to a tune of 25.507 per cent towards production of paddy problems. The other factor contributes namely, 14.791, 11.608 and 9.859 towards production problems of paddy in their order. The total cumulative percentage of factors by these four factors towards production problems accounts for 61.765 per cent.

**C. Suggestions**

- The result of factor analysis (Table No. 2) discloses that high cost of labour is a major factor which influence production problem. So, applying machineries instead of labour and own effort can reduce the labour cost.

- Provide loans and subsidies for purchasing machineries to padasekarasamithies.

- Government should provide adequate provisions for Irrigation facilities to the needy farmers according to their needs.

- Provide high yielding variety of seeds according to the interest of the farmers.

- Provide agricultural loans at concessional rate and subsidy. Ensure adequate supporting price.

- Provide required fertilizer at concessional rate.

- Provide insurance coverage to paddy field for protecting natural calamities and climate change.

- Provide a special training to farmers for proper crop management.

**V. CONCLUSION**

Paddy cultivation is one of the important sources of income and providing occupation to the rural families in Mattathur Grama panchayath, Thrissur District. Padasekarasamithies are playing an important role in the development of paddy cultivation. In the study area paddy cultivation is mainly done by male farmers who reside in rural areas. The study observes that cultivators are affected by high cost of labour, non-availability of machinery, water scarcity, low yields, non-availability of variety seeds etc. Thus, the survival of paddy cultivation depends on support extent by padasekarasamithies and Government respectively. Padasekarasamithies provide necessary assistance like participation in decision making, information sharing etc., thereby helping paddy cultivators succeed in their cultivation. Most of the paddy cultivators expect financial assistance, training programmes and making availability of quality seeds etc. Hence, the State government also may offer necessary facilities to the paddy cultivators what they expected.
The present study has been carried out to find out the production problems encountered by paddy cultivators in Mattathur Grama Panchayath. The future researchers may carry out a study on ascertaining the lev of awareness and satisfaction about the schemes. A study on paddy impact of Covid -19 on paddy cultivation may also be carried out.

REFERENCES