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Constraints perceived by paddy cultivators in Theni district, Tamil Nadu

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Abstract

Rice is a critical food crop globally, feeding over 2.7 billion people. In India, rice contributes 10 per cent of agricultural GDP, with 44.6 million hectares under cultivation and a production of 80 million tonnes. However, productivity faces challenges due to climate change, with extreme weather events like floods and droughts threatening food security. This study was conducted in the Theni district of Tamil Nadu, focusing on constraints faced by paddy growers. Data was collected from 60 farmers using interview schedule and analyzed using percentage analysis and Garrett's ranking technique. The study found that heavy damage from birds and rats, high incidence of pests and diseases was the most significant constraints, followed by unavailability of quality seeds, high labor wages, Lack of technical guidance and delayed paddy procurement were also highlighted as critical problems. Based on the findings, the study suggests research prioritization in developing pest-resistant varieties, producing high-quality seeds, promoting mechanization, improving storage infrastructure, stabilizing market prices, and implementing water-efficient irrigation systems. Government intervention in providing credit, subsidies, and better market access is also recommended to support farmers. Addressing these constraints is crucial for ensuring sustainable rice production and enhancing the livelihoods of farmers in the region.

Keywords: Paddy cultivation, constraints, percentage analysis, Garrett's ranking

Introduction

Rice is one of the most important food crops in the world and it is the staple food for over 2.7 billion peoples. 44.6 m ha of area was under rice cultivation with total output of 80 million tonnes and 1855kg/ha of productivity which contributes about 92% of total area and production in India (TNAU Export system) ^[1]. It contributes 10% agricultural GDP. Productivity of paddy has increased with some fluctuations at the rate of 1.53% per annum. Due to climate change, the effect of extreme events such as floods, drought and hailstorms are worsening, threatening national and global food security. "RICE IS LIFE" for almost all the human beings (Meher *et al.*) ^[2]. The United Nations declared 2004 to be the "INTERNATIONAL YEAR OF RICE" (Maheshwar and Sharma, 2011) ^[3]. Indian rice production largely depends on monsoon rains and only 59% area have assured irrigation facilities. The area during first plan was 30.68 m ha and it had reached to 243.64 m ha, during 11th plan which is nearly 42.2% area increased of first plan. The rice production has registered an appreciable increase from 25.30 million tonnes during first plan to 97.05 tonnes during 11th plan, which is nearly four times over the first plan. The yield was 816kg/ha during first plan and increased to 2224kg/ha during 11th plan. Bran and rice

polish are used as livestock feed. Oil processed from the bran for both food and industrial uses. Broken rice is used for brewing, distilling and in manufacturing of starch and rice flour whereas Hulls are used for fuel, packing material, Industrial grinding, fertilizer manufacture and in the manufacture of an industrial chemical called furfural. The straw is being used for feed and also in livestock bedding, roof thatching, mats, garments, packing material and broom straws (Pratap *et al.*, 2020) ^[4].

Objective

To identify the constraints encountered among the paddy growers through personal contact
To prioritize the research area through Percentage analysis and Garrett's ranking technique

Methodology

The study was undertaken in Theni district of Western Zone of Tamil Nadu which has eight blocks. Among the eight blocks, Theni and Aundipatti blocks were purposively selected for the study as it had the highest area under paddy cultivation. One village selected from each block viz., Veerapandi in Theni block and Kunnur in Aundipatti block was purposively selected, as they have more area and

productivity. Thirty respondents were selected randomly from each of the selected village. Total number of respondents selected was 60. Pre-tested and well-structured interview schedule was used for collecting information on paddy cultivation. The study was conducted during the months of May - July 2023. The collected data was analyzed using the following statistical techniques; 1) percentage analysis and 2) Garrett's ranking.

Percentage analysis: It refers to a special kind of rates, percentages are used in making comparison between two or more series of data collected from the respondents. A percentage is used to show the relationship between the series.

Percentage = (No. of respondents/ Total No. of respondents) * 100

The Percentage was calculated to measure variables.

Percentage analysis was used in descriptive analysis for making simple comparison.

Garrett's ranking: Data on problems faced by paddy cultivars was assessed using garret ranking method, which was developed by Garret and Woodworth (1969) [5]. The respondent's preferences were ranked according to several parameters using this procedure. This approach asks respondents to rank all of the elements, and the results of that ranking are then turned into a score value using the formula below,

Percent position = $100(R_{ij} - 0.5)/N_j$

Where,

R_{ij} = Rank given for the i^{th} constraint by the j^{th} individual

N_j = Number of the factors ranked by the j^{th} individual

Results and Discussion

Table 1: Constraints faced by the paddy growers (n=60)

S. No	Problems	Yes	Percent	No	Percent
1	Crop insurance	9	15.0	51	85.0
2	Heavy damages by birds and rats	59	98.3	1	1.7
3	More incidence of pest and diseases	38	63.3	22	36.7
4	Lack of technical guidance	49	81.7	11	18.3
5	More distance of market from village	36	60.0	24	40.0
6	Inadequate credit facilities	18	30.0	42	70.0
7	High labour wages	52	86.7	8	13.3
8	Less fertile and problem soil	15	25.0	45	75.0
9	Non-availability of labourers	48	80.0	12	20.0
10	Non-availability of Inputs in time	17	28.3	43	71.7
11	Lack of transportation facilities	42	70.0	18	30.0
12	Fluctuation in market price	46	76.7	14	23.3
13	Lack of timely procurement of paddy in TNCSC	48	80.0	12	20.0
14	Electricity problem	10	16.7	50	83.3
15	Issues in subsidy distribution system	34	56.7	26	43.3
16	Lack of monsoon	16	26.7	44	73.3
17	Unavailability of good quality seeds	53	88.3	7	11.7

It could be observed from the above table 1 that, heavy damage by birds and rats (98.3%) is identified as a major constraint among the paddy growers in Theni district, it is because of lack proper storage structure and open threshing floor. Unavailability of good quality seeds (88.3%) is reported as second major constraint, as the seeds purchased from local shops has not given assured yield. High labour wages (86.7%) are the third major constraint, as labours find it more difficult to do field operations as the drudgery involved in weeding and transplanting operations in the puddled paddy field is higher. The results are in consonance with the findings of Dineshkumar *et.al* (2024) [6]. Lack of technical guidance (81.7%) is the fourth major constraint as the training given by the agricultural department is not informed priorly to the farmers. Lack of timely procurement of paddy in TNCSC (80.0%) is the fifth major constraint, as

the produces are not procured in time, the produces often are stored in open floor which leads to loss of grains. Fluctuations in price (76.7%) is due to high demand and less supply of the produces. Lack of transportation facilities (70.9%), More incidence of pest and disease (63.3%), Long distance from village to market (60.0%), issues in subsidy distribution system (56.7%) are the other problems reported by the respondents of the study areas.

Garrett's Ranking

A focused group discussion was conducted for paddy farmers in Kunnur village of Aundipatti block. Twenty farmers were actively involved in the discussion, and they ranked the problems they are mainly facing during the paddy cultivation process.

Table 2: Constraints faced by paddy growers in Theni district (n=20)

Constraints	Rank													
	1 th	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th	9 th	10 th	11 th	12 th	13 th	14 th
Labour scarcity	18	1	1	0	0	0	0	0	0	0	0	0	0	0
Lack of information	0	0	0	0	0	0	0	0	0	0	0	14	6	0
High labour wage	18	2	0	0	0	0	0	0	0	0	0	0	0	0
High rate of interest	0	0	0	0	0	0	0	0	0	10	5	3	1	1
High incidence of pest & disease	19	1	0	0	0	0	0	0	0	0	0	0	0	0
Exploitation of middle man	0	0	0	0	9	5	2	1	3	0	0	0	0	0
Lack of irrigation	0	0	0	0	0	0	0	0	3	5	4	8	0	0
Issues in subsidy distribution	0	0	0	0	0	0	0	9	1	8	2	0	0	0
Green leafhopper	15	2	3	1	0	0	0	0	0	0	0	0	0	0
Fluctuation in price	0	14	5	1	0	0	0	0	0	0	0	0	0	0
Undesirable climate condition	0	16	4	0	0	0	0	0	0	0	0	0	0	0
Lack of regulated mark	0	0	0	0	0	0	0	0	3	5	4	8	0	0
Low quality inputs	0	0	0	0	0	5	3	2	1	6	2	1	0	0
Damage of birds and rats	0	0	0	0	0	11	2	4	0	3	0	0	0	0

Table 3: Percent positions and Garret values

Rank	Percent position	Percent value	Garret value
1	100(1-0.5)/14	03.57	85
2	100(2-0.5)/14	10.71	74
3	100(3-0.5)/14	17.85	68
4	100(4-0.5)/14	25.00	63
5	100(5-0.5)/14	32.14	59
6	100(6-0.5)/14	39.28	55
7	100(7-0.5)/14	46.42	52
8	100(8-0.5)/14	53.57	48
9	100(9-0.5)/14	60.71	45
10	100(10-0.5)/14	67.85	41
11	100(11-0.5)/14	75.00	37
12	100(12-0.5)/14	82.14	32
13	100(13-0.5)/14	89.28	26
14	100(14-0.5)/14	96.42	15

Table 4: The calculation to find average score and rank for constraints faced by paddy cultivars in Theni district

Sr. No	Constraints	Total score	Mean score = Total score/20	Rank
1	Labour scarcity	1672	119.42	4
2	Lack of information	604	43.14	14
3	High labour wage	1678	119.85	3
4	High rate of interest	732	52.28	13
5	High incidence of pest & disease	1689	120.64	2
6	Exploitation of middle man	1093	78.07	7
7	Lack of irrigation	744	53.14	12
8	Issues in subsidy distribution	879	62.78	11
9	Green leafhopper	1690	120.71	1
10	Fluctuation in price	1439	102.78	5
11	Undesirable climate condition	1420	101.42	6
12	Lack of regulated mark	1042	74.42	8
13	Low quality inputs	924	66	10
14	Damage of birds and rats	1024	73.14	9

The constraints faced by the paddy growers were ranked through Garette ranking technique. It could be observed from the table 4, that, "Green leafhopper" pest is the major constraint faced by paddy cultivars with highest Garette score of 1690 and a mean score of 120.71. Accordingly, "High incidence of pest and disease attack" with second highest Garette score of 1689 and a mean score of 120.64. The calculation with a mean score of 119.85 and Garette score of 1677 ranked "High labour wages" third. The Garette score of 1672 and mean score of 119.42 ranked "labour scarcity" fourth. The Garette score of 1439 and

mean score of 102.78 ranked "Fluctuations in price" fifth. The mean score of 101.42 ranked "undesirable climatic conditions" sixth. The mean score of 78.07 ranked "exploitation by middleman" seventh. The average score of 74.42 ranked "lack of regulated market" eighth. The mean score of 73.15 ranked "Damage by birds and rats" ninth. The mean score of 70 ranked "Poor quality of inputs" tenth. Issues in subsidy distribution system ranked 11th followed by lack of irrigation (12th) similar results were found by Pathak *et al.* (2023) ^[7], High rate of interest (13th), lack of information (14th).

Prioritization of the research

The following areas may be given priority for research,

- Research should focus on developing resistant varieties with best pest management strategies
- Produce high-quality seeds with all the required characters and well adaptable in all climatic condition which should be affordable by small farmers
- Adopt mechanization and can take the help of FAAS (farming-as-a-service) for cultivation practices
- Government should focus on highly protected public storage infrastructure to avoid post-harvest losses
- Fluctuating price should be stabilized and correct information must be given to all farmers about market activities like arrivals, price etc.
- Water-efficient irrigation technologies and well adoptive cropping systems should be practiced
- Government should help farmers by providing credit facilities and subsidies in order to reduce their financial burden
- Better access to market and cost-effective transport facilities should be focused
- Offer training about digital tools and its services to the farmers

Conclusion

From the study, it was concluded that, the major problem faced by paddy cultivators in paddy cultivation were constraints of heavy damage from birds and rats, high incidence of pests and diseases, Unavailability of good quality seeds and inputs, high labor wages, Fluctuations in price, Lack of technical guidance, delayed paddy procurement, exploitation by middleman, Lack of transportation facilities and undesirable climatic conditions. This study suggests prioritizing research in developing resistant varieties with best pest management strategies, produce high-quality seeds with all the required characters and well adaptable in all climatic condition which should be affordable by small farmers, highly protected public storage infrastructure to avoid post-harvest losses, Water-efficient irrigation technologies and well adoptive cropping systems and Offer training about digital tools and its services to the farmers. Addressing these constraints is crucial for ensuring sustainable rice production and enhancing the livelihoods of farmers in the region.

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