P-ISSN: 2618-0723
E-ISSN: 2618-0731

NAAS Rating (2025): 5.04
www.extensionjournal.com

International Journal of Agriculture Extension and Social Development

Volume 8; Issue 9; September 2025; Page No. 464-466

Received: 06-05-2025
Accepted: 10-06-2025

Indexed Journal
Peer Reviewed Journal

Constraint analysis in paddy (*Oryza sativa* l) crop in Karimnagar district of Telangana State

[1]Neelam Venkateshwar Rao, [2]Pamela Satpathy, [3]N Kishore Kumar, [4]J Vijay, [5]L Mahesh, [6]D Sreenivasa Reddy, [7]G Prabhakar, [8]A Prashanthi, [9]G Venugopal, [10]AR Reddy and [11]Shaik N Meera

[1] Senior Scientist and Head, Krishi Vigyan Kendra, Jammikunta, Karimnagar, Telangana, India

[2] District Collector & Magistrate, Karimnagar, Telangana, India

[3]Assistant Professor, Agriculture College, Warangal, PJTAU, Telangana, India

[4-9]SMSs in Krishi Vigyan Kendra, Jammikunta, Karimnagar, Telangana, India

[10]Principal Scientist, ICAR-ATARI-X, Hyderabad, Telangana, India

[11]Director, ICAR- ATARI-X, Hyderabad, Telangana, India

DOI: https://www.doi.org/10.33545/26180723.2025.v8.i9g.2442

Corresponding Author: Neelam Venkateshwar Rao

Abstract

The present study aims to conduct a comprehensive constraint analysis of paddy production technologies in Karimnagar district of Telangana State. The Krishi Vigyan Kendra (KVK) in Karimnagar has been functioning as a pivotal resource and knowledge centre for promoting advanced paddy cultivation practices among farmers. Since its inception, the KVK has been actively involved in disseminating technologies such as soil test-based fertilizer application, cultivation of green manure crops prior to paddy transplantation, improved nursery management, introduction of high-yielding and disease-resistant varieties, weed control, balanced fertilizer application, efficient water management, integrated pest and disease management, direct seeding using drum seeders, zinc deficiency correction, integrated nutrient management (INM), integrated pest management (IPM), and seed production of both varietal and hybrid types.

For this study, a total of ninety (90) farmers practicing paddy cultivation were purposively selected to identify and analyse the constraints they face in adopting and implementing these production technologies. The study recorded various challenges encountered by farmers in paddy production and systematically classified them. Based on the severity and frequency of these issues, prioritized recommendations were developed to enhance technology adoption and improve productivity.

Keywords: Constraint analysis of farmers, paddy production technologies

Introduction

Rice (*Oryza sativa* L.) is widely regarded as the "global grain" and serves as the primary staple food for more than half of the world's population. It is the dominant cereal crop in India, cultivated across nearly all states, and plays a critical role in ensuring national food security and sustaining the livelihoods of millions of rural households. The phrase "rice is life" aptly reflects its significance in the Indian context, as it underpins both nutritional and economic stability. Globally, rice is cultivated in over 110 countries, underscoring its importance as a key food crop.

Rice not only contributes substantially to national food and livelihood security but also generates significant foreign exchange through exports. In India, rice accounted for approximately 20% of the total agricultural exports in 2014-15 and 17.7% in 2015-16 (Directorate of Economics and Statistics, 2016), highlighting its importance in the country's agricultural trade.

Constraint analysis is a useful tool for identifying the underlying, psychological, and situational perceptions related to existing conditions within any system or community. It enables policymakers and agricultural extension agencies to better understand the challenges and concerns faced by stakeholders, thereby facilitating targeted interventions to enhance productivity and technology adoption. In this context, given the importance of paddy cultivation in Karimnagar district, the present study focuses on analyzing the constraints faced by farmers in the adoption and application of paddy production technologies in the region.

Methodology

An ex-post facto research design, complemented by an exploratory research approach, was employed in this study, as the phenomena under investigation had already occurred and the researcher had no direct control over the influencing factors. Karimnagar district of Telangana State (formerly Andhra Pradesh) was purposefully selected as the study area due to its prominence in paddy cultivation. Within the district, a sample of 90 paddy-growing farmers was randomly chosen from 15 villages adopted by the Krishi Vigyan Kendra (KVK), Jammikunta.

Data were collected using an open-ended schedule, which was administered to the selected farmers to identify both the constraints they face and their suggestions for improving paddy cultivation practices. The collected responses were systematically categorized and grouped based on frequency and percentage analysis. Subsequently, the constraints and suggestions were ranked according to their prominence, providing a structured understanding of the major issues and potential interventions in paddy production.

Results and Discussion

The following are the problems and suggestions expressed by the paddy farmers:

Table 1: Problems expressed by the paddy farmers, n = 90

S. No	Problems	F	%	Rank
1	Ruling fine grain variety BPT 5204 is highly susceptible to pests and diseases leading to higher cost of cultivation	52	86.67	1
2	Untimely water availability and non-availability of labour resulted delayed transplantations.	52	86.67	1
3	Less awareness on farm mechanization especially on rice transplanter.	50	83.33	6
4	Stem borer in rice is a major problem and reduces the yields.	52	86.67	1
5	SRI is a good technology which requires less water but transplanting and weeding is laborious.	42	70.00	13
6	Due to shortage of labour, weeding is difficult and costly.	52	86.67	1
7	In command area salinity is the major problem which reduces yields	50	83.33	6
8	Soil fertility is less, usage of fertilizers is increasing year by year leads to higher cost of cultivation.	49	81.67	9
9	Stem rot disease and panicle mite is becoming major problem resulting lower yields.	52	86.67	1
10	Deep ploughing in saline soils with tractors leads to increasing the salinity and reduces yields	42	70.00	13
11	Improper water management especially more water in command area leads to sulphide injury and high incidence of pest and diseases resulted lower yields	44	73.33	11
12	In hybrid seed production, pollination requires more labour and increases cost of cultivation	43	71.67	12
13	High cold incidence in rabi increases the crop duration and fertilizer usage	50	83.33	6
14	Majority of the farmers are harvesting the paddy crop with harvesters, after harvesting fodder collection with labour requires more labour and time	49	81.67	9

Table 1 presents the ranking of the various constraints faced by farmers in paddy cultivation, based on the frequency with which they were reported. The most frequently reported constraint, ranked first by 86.67% of the respondents, was the high susceptibility of the widely cultivated fine-grain variety BPT 5204 to pests and diseases, along with issues such as delayed transplanting, stem borer incidence, weed infestation, stem rot, and panicle mite attacks. The second most significant problem, reported by 83.33% of the farmers, was limited awareness of farm mechanization and the adverse effects of command area salinity on yields, as well as increased crop duration and fertilizer requirements due to high cold incidence during the rabi season.

The third-ranked constraint (81.67%) included declining soil fertility, the escalating use of fertilizers resulting in higher cultivation costs, and the dependence on harvesters for crop cutting, which, coupled with labour-intensive fodder collection post-harvest, increased time and labour requirements. The fourth constraint, cited by 73.33% of farmers, was improper water management, particularly excessive water application in command areas leading to sulphide injury and higher pest and disease incidence, thereby reducing yields.

Further, 71.67% of respondents identified challenges associated with hybrid seed production, where pollination is labour-intensive and adds to the cost of cultivation. The final group of problems, ranked lower but still significant, included issues such as deep ploughing of saline soils with tractors, which exacerbates soil salinity and decreases yields, and the laborious nature of the System of Rice Intensification (SRI), which, despite its water-saving benefits, requires extensive transplanting and weeding (reported by 70.00% of farmers).

Table 2: Suggestions expressed by the paddy farmers, n = 90

S. No	Suggestions	F	%	Rank
1	Extension scientists should assess the newly developed fine grain varieties for its suitability with pest, disease tolerance and cooking quality.	47	78.33	1
2	Assess the technologies of direct seeding in rice with drum seeder and aerobic rice in farmer fields.	41	68.33	4
3	Create awareness by conducting demonstrations on rice transplanter in collaboration with Department of Agriculture	39	65.00	7
4	Conduct large scale demonstrations on Bio Intensive Pest Management aspects in collaboration with Department of Agriculture.	41	68.33	4
5	Assess the transplanters and power weeders to reduce the drudgery.	31	51.67	9
6	Conduct demonstrations and create awareness through trainings on usage of post emergence herbicides. Assess the performance of new post emergence herbicides in farmer fields	46	76.67	2
7	Conduct demonstrations and create awareness through trainings on saline soils management in collaboration with Department of Agriculture.	38	63.33	8
8	Assess and refine the soil test based fertilizer application methodology in farmer fields	31	51.67	9
9	Assess the new molecules and refine the doses for control of emerging pests and diseases.	46	76.67	2
10	Demonstrate the usage of rotovators and power tillers in saline soils for shallow ploughing to avoid the	29	48.33	13

	salinity problem			
11	Educate the farmers through trainings on water management aspects especially on alternate wetting and drying or rotational irrigation water application to increase the water use efficiency	31	51.67	9
12	Assess the alternate methods of pollination with ropes to reduce the labour cost in farmer fields	29	48.33	13
13	Assess the cold tolerant varieties and its suitability to the district	40	66.67	6
14	Assess the performance of fodder bailers and its suitability	30	50.00	12

It was seen from 2 that ranks were allotted to all the suggestions based on number of farmers expressed corresponding suggestion.

The farmers also provided several key suggestions to address the constraints faced in paddy cultivation. The most frequently recommended intervention, supported by 78.33% of the respondents, was that extension scientists should evaluate newly developed fine-grain varieties. This was followed by the need to conduct large-scale demonstrations on weed management and assess new molecules while refining dosage recommendations for controlling emerging pests and diseases, as suggested by 76.67% of farmers.

Additionally, 68.33% of respondents emphasized the importance of assessing direct seeding techniques and conducting large-scale demonstrations on integrated weed and pest management (BIPM). A further 66.67% recommended evaluating cold-tolerant rice varieties, while 65.00% suggested creating awareness through demonstrations on rice transplanting in collaboration with the Department of Agriculture. Managing saline soils through demonstration projects and awareness programs, also in partnership with the Department of Agriculture, was highlighted by 63.33% of the farmers.

Several suggestions focused on reducing labour intensity and improving resource use efficiency. These included assessing the use of transplanters and power weeders, refining soil test-based fertilizer application methods in farmers' fields, and educating farmers through training programs on water management techniques particularly alternate wetting and drying or rotational irrigation practices to enhance water use efficiency endorsed by 51.67% of respondents. Furthermore, 50.00% of farmers recommended assessing the performance and suitability of fodder bailers, while 48.33% suggested demonstrations on the use of rotavators and power tillers for shallow ploughing in saline soils, as well as exploring alternate pollination methods using ropes and drones to reduce labour costs.

Conclusion

Strengthening agricultural extension services, supported by robust research initiatives and conducive government policies, is critical for educating farmers on modern cultivation practices and promoting the adoption of export-oriented fine grain paddy varieties that offer pest resistance, disease tolerance, and superior cooking quality. The dissemination of technologies such as direct seeding, aerobic rice cultivation, machine sowing, and water-saving practices particularly alternate wetting and drying through information and communication technologies (ICT) and reinforced extension mechanisms is expected to accelerate technology adoption.

Labour-saving innovations, including rope pollination techniques and drone-assisted operations, coupled with timely access to quality inputs such as seeds, fertilizers, and pesticides at affordable prices, are essential to improving farm efficiency. Additionally, establishing fair and reliable market linkages, expanding credit access, and strengthening crop insurance schemes will enhance farmer income and build resilience against production and market-related risks.

An integrated approach that combines ICT-enabled extension services, supportive policy frameworks, and dependable service delivery systems will not only improve productivity and resource use efficiency but also contribute to enhancing the global competitiveness of Indian rice in international markets.

References

1. Balamatti AM. A study on paddy cultivation pattern of Siddhi farmers and their socio-economic characteristics, Yellapur, Karnataka [MSc (Ag.) thesis]. Dharwad: University of Agricultural Sciences; 1993.
2. Bhat PL. A study to identify the determinants of yield gaps and constraints in paddy cultivation of Jammu and Kashmir State [MSc (Ag.) thesis]. Hyderabad: Andhra Pradesh Agricultural University; 1994.
3. Khansuleman M. Critical analysis of eco-friendly technologies in rice cultivation - a study in an adopted village Kondubhotla Palem [MSc (Ag.) thesis]. Hyderabad: Acharya NG Ranga Agricultural University; 1999.
4. Patil VG. A critical analysis of technological gap and constraints in the adoption of improved rice cultivation practices in Konkan region, Maharashtra State [PhD thesis]. Dharwad: University of Agricultural Sciences; 1990.
5. Rao NV, Ratnakar R, Jain PK. Impact of Farmer Field Schools in KVK adopted villages on level of knowledge and extent of adoption of improved practices of paddy. J Res ANGRAU. 2012;40(1):35-41.
6. Rao NV, Jain PK, Kumar NK, Reddy MJ. Knowledge mapping on rice (*Oryza sativa* L.) production technologies by the farmers of Karimnagar district in Telangana State. J Res ANGRAU. 2017;45(2):108-116.
7. Ramesh P, Govind S. Adoption of organic farming practices in paddy. J Extn Educ. 2001;37(3-4):91-94.
8. Reddy TSP. A differential innovation, decision and attitude of rice growing farmers towards eco-friendly technologies in Andhra Pradesh - a critical analysis [PhD thesis]. Hyderabad: Acharya NG Ranga Agricultural University; 2003.