Plant Sci. Arc.
Plant Science Archives
An International Journal of Plant Biology

Original Research Article
ISSN 2518-6965
www.plantarc.com

Level of Adoption of Rice Production Technology: A Study of North Bihar

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Citation: Mala Kumari (2017). Level of Adoption of Rice Production Technology: A Study of North Bihar. *Plant Science Archives.* **03-06. DOI: https://doi.org/10.51470/PSA.2017.2.2.03**

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Received 09 March 2017 | Revised 14 April 2017 | Accepted 17 May 2017 | Available Online July 07 2017

ABSTRACT

The present study was conducted in the Samastipur district of North Bihar, focusing on two randomly selected rice-growing blocks out of the district's 20 blocks. From each block, two villages were randomly chosen, resulting in a total sample of four villages. The study involved 160 rural farm women, categorized into marginal, small, and medium-scale farmers. The research assessed the level of adoption of eleven improved rice production practices, including land preparation, ploughing, puddling, use of high-yielding variety seeds, seed treatment, nursery raising, transplanting, integrated nutrient management, integrated pest management, water management, chemical weed control, and post-harvest operations. The findings revealed significant differences in the adoption levels of these practices among the three categories of rural farm women.

Keywords: *Level of adoption, rural farm women, rice production technology, North Bihar*

Introduction

In India, the rural economy primarily hinges on agriculture, livestock, and household activities. Agriculture, the backbone of the nation's economy, employs between 44-50% of the country's population and contributes significantly to the GDP, accounting for approximately 18-20% [1-5]. In North Bihar, rice stands as the principal food crop, forming the core of the region's agricultural practices and providing sustenance to millions of people. Rural farm women play a crucial role in the rice-based farming system, actively participating in a range of activities that generate both employment and income. Their contributions span various roles, from unpaid family labor to paid wage work, either within the household or outside, through the exchange of goods and services. By investing valuable work hours, these women provide essential financial support to their families, highlighting their critical position in the agricultural workforce [6-9].

As noted by [10-14], "The adoption of proven technology by farmers is of utmost importance to change agents, as it directly influences the economic and social benefits to farm women." Adoption refers to the process by which an individual or decision-making unit starts to implement a new technology or practice. According to [4] adoption is defined as the decision to fully embrace a new idea as the most effective course of action. At the individual farmer level, the adoption of technology is believed to result from how effectively various influencing factors are leveraged. When individuals are exposed to new technology, numerous elements—whether behavioral, psychological, or socio-economic—can either accelerate or hinder the pace and extent of adoption.

Studies conducted in developing countries highlight that these factors often act as barriers to technological adoption in agriculture [15-25]. Therefore, the adoption of any given technology by rural farm women is shaped by a complex interplay of visible and underlying factors. In the case of rice farming, productivity is largely contingent on the degree to which recommended crop production technologies are adopted. Understanding the level of adoption of scientific rice cultivation practices is thus critical for improving productivity, especially in the Samastipur district of North Bihar.

Methodology

The study was conducted in the Samastipur district of North Bihar, which comprises 20 blocks. For this research, two rice-growing blocks were randomly selected. From each of these blocks, two villages were chosen, resulting in a total sample of four villages. To gather data, 40 farm families from each of the selected villages were identified through a proportionate stratified random sampling technique based on their landholdings. This brought the total sample size to 160 participants. Data collection was carried out using a well-structured, pre-tested interview schedule that focused on various key variables of the study. The level of adoption of rice production technologies was measured by categorizing responses into two groups: full adoption and non-adoption of the recommended practices. A score of 1 was assigned for full adoption, while a score of 0 was given for non-adoption, based on the responses to each statement provided to the participants.

Results and Discussion

The yield of paddy is influenced by various factors, including land preparation, ploughing, puddling, use of high-yielding variety seeds, seed treatment, nursery raising, transplanting, integrated nutrient management, integrated pest management, weed control through weedicides, and post-harvest operations. To assess the adoption level of these improved rice production technologies, an attempt was made to measure the extent to which these practices have been implemented by farm families. The results of this assessment are presented in Table 1.

Table 1. Level of Adoption of Various Components of Improved Rice Production Technology Among Farm Women

S. N.	Technologies	Level of adoption in percentage			
		Marginal (*f*=66)	Small (*f*=74)	Medium (*f*=20)	pooled (*f*=160)
1.	Land preparation	27 (40.90)	32 (43.24)	7 (35.00)	66 (41.25)
2.	Ploughing & puddling	Nil	Nil	Nil	Nil
3.	Use of HYV seeds	44 (66.66)	50 (67.56)	15 (75.00)	109 (68.12)
4.	Seed treatment	Nil	Nil	Nil	Nil
5.	Raising of nursery	45 (68.18)	49 (66.21)	14 (70.00)	108 (67.50)
6.	Transplanting	46 (69.69)	52 (70.27)	13 (65.00)	111 (69.37)
7.	Integrated nutrient management	42 (63.63)	48 (64.86)	12 (60.00)	102 (63.75)
8.	Integrated pest management	26 (39.39)	31 (41.89)	10 (50.00)	67 (41.87)
9.	Water management	33 (50.00)	37 (50.00)	8 (40.00)	78 (48.75)
10.	Chemical weed control	0	0	0	0
11.	Post-harvest operation	63 (95.45)	72 (97.27)	18 (90.00)	153 (95.62)
	Overall adoption scores	29.63 (44.89)	33.72 (45.57)	8.81 (44.09)	72.18 (45.11)

Table 1 illustrates that the highest level of adoption among rural farm women was observed in post-harvest operations (95.62%), followed by transplanting (69.37%), use of high-yielding variety seeds (68.12%), nursery raising (67.50%), and integrated nutrient management (63.75%). Conversely, the lowest adoption levels were seen in land preparation (41.25%), integrated pest management (41.87%), and water management (48.75%). It is evident from the data that farm women primarily adopted technologies that were simpler and better suited to their circumstances. Notably, certain practices such as ploughing and puddling, seed treatment, and chemical weed control measures were not adopted at all by the rural farm women. The data further highlights variation in adoption levels across different categories of rural farm women for various rice production technologies.

For marginal farm women, the highest level of adoption was recorded in post-harvest operations (95.45%), followed by transplanting (69.69%), nursery raising (68.18%), use of high-yielding variety seeds (66.66%), integrated nutrient management (63.63%), water management (50.00%), land preparation (40.90%), and integrated pest management (39.39%). For small farm women, post-harvest operations also showed the highest level of adoption (97.27%), followed by transplanting (70.27%), use of high-yielding variety seeds (67.56%), nursery raising (66.21%), integrated nutrient management (64.86%), water management (50.00%), land preparation (43.24%), and integrated pest management (41.89%). For medium farm women, the highest level of adoption was observed in post-harvest operations (90.00%), followed by the use of high-yielding variety seeds (75.00%), nursery raising (70.00%), transplanting (65.00%), integrated nutrient management (60.00%), integrated pest management (50.00%), water management (40.00%), and land preparation (35.00%).

Ranking of selected practices of rice production technology on the basis of level of adoption

The level of adoption of selected rice production practices was ranked according to the extent of adoption among the three different categories of rural farm women, as well as based on pooled data from both Kalyanpur and Pusa blocks. Table 2 presents the rankings of all selected rice production practices for these categories based on the pooled data. The highest level of adoption was observed in post-harvest operations, which ranked first. The remaining practices were ranked in descending order: transplanting, use of high-yielding variety seeds, nursery raising, integrated nutrient management, water management, integrated pest management, and land preparation.

For marginal farm women, the highest adoption was also found in post-harvest operations, followed by transplanting, nursery raising, use of high-yielding variety seeds, integrated nutrient management, water management, land preparation, and integrated pest management. Similarly, among small farm women, the highest level of adoption was recorded in post-harvest operations, followed by transplanting, use of high-yielding variety seeds, nursery raising, integrated nutrient management, water management, land preparation, and integrated pest management.

For medium farm women, the highest level of adoption was observed in post-harvest operations, followed by the use of high-yielding variety seeds, nursery raising, transplanting, integrated nutrient management, integrated pest management, water management, and land preparation.

Table 2. Ranking of selected practices of improved rice production technology on the basis of level of adoption.

Practices		Category of rural farm women							
		Marginal (*f*=66)		Small (*f*=74)		Medium (*f*=20)		Pooled (*f*=100)	
		Level of Adoption	Rank	Level of Adoption	Rank	Level of Adoption	Rank	Level of Adoption	Rank
1.	Land preparation	40.90	VII	43.24	VII	35	VIII	41.25	VIII
2.	Ploughing and pudding	0		0		0		0	
3.	Use of High Yielding Variety seeds	66.66	IV	67.56	III	75.00	II	68.12	III
4.	Seed treatment	0		0		0		0	
5.	Raising of nursery	68.18	III	66.21	IV	70.00	III	67.50	IV
6.	Transplanting	69.69	II	70.27	II	65.00	IV	69.37	V
7.	Integrated nutrient management	63.63	V	64.86	V	60.00	V	63.75	V
8.	Integrated pest management	39.39	VIII	41.89	VIII	50.00	VI	41.87	VII
9.	Water management	50.00	VI	50.00	VI	40.00	VII	48.75	VII
10.	Chemical weed control	0		0		0		0	
11.	Post – harvest operation	95.45	I	97.27	I	90.00	I	95.62	I

However, practices such as chemical weed control and seed treatment techniques require greater emphasis to enhance the knowledge and skills of rural farm women. Adoption rates for practices like post-harvest operations, transplanting, use of high-yielding variety seeds, nursery raising, and integrated nutrient management were significantly higher, exceeding 60%, compared to other rice production practices. Therefore, it can be concluded that technologies perceived as simpler to implement were adopted more quickly by rural farm women.

The adoption of other practices, specifically water management, integrated pest management, and land preparation, among farm women was also low and requires immediate attention to enhance the adoption of these technologies. The lower levels of adoption in these practices are a significant concern. To improve the knowledge and skills of rural farm women, effective skill-oriented training programs should be organized, facilitating their active involvement in rice production technology, it is evident that all three categories of rural farm women exhibit differing overall levels of adoption concerning the eleven selected practices of improved rice production technology.

Conclusion

The study highlights the varying levels of adoption of improved rice production technologies among rural farm women in the Samastipur district of North Bihar. It is evident that while practices such as post-harvest operations, transplanting, and the use of high-yielding variety seeds are widely adopted, critical areas like water management, integrated pest management, and land preparation remain significantly underutilized. The findings suggest that the adoption of agricultural technologies is influenced by the simplicity and applicability of these practices to the local context. To enhance the overall adoption levels, targeted interventions such as skill-oriented training programs are essential. These initiatives can empower rural farm women with the knowledge and skills necessary to effectively implement various agricultural practices. Addressing the gaps in adoption not only benefits the farm women themselves but also contributes to the overall productivity and sustainability of rice production in the region. Future efforts should focus on creating an enabling environment for technology transfer and adoption to maximize the economic and social benefits for rural communities.

References

1. Soni SN, Pathak RK, Kashikar RK. Socio-economic study to analyse constraints in adoption of modern technology by various socio-economic groups in district sugar (M.P.) World agril. Econ and rural socio. Abstrc. 2001;42(12):1019-1020.
2. Niranjana C. Characterization of bacteriocin from lactic acid bacteria and its antibacterial activity against Ralstonia solanacearum causing tomato wilt. Plant Science Archives; c2016.
3. Rajula C. Constraints of Arid farm women in Grain storage TNAU. J of Extn. Edn. 1999;9(3):2156
4. Monika Tandon, Sawhney HK. Participation of farm women in Agriculture, TANU. Journal of Extension Education. 1999;10(2):2386-2395.
5. Sisodia JS. Involvement of rural women in agriculture: A study of Chambal command area of Madhya Pradesh. Indian Journal of Agricultural Economics. 1985;40(3):223-30.
6. Baliyan K. Factors Affecting Participation of women in household decision making: Implication for family Welfare and Agriculture Development, Socio-Economic voices, 2014, PP: 1-11
7. Behera B, Behera AC. Gender Issues: The Role of Women in Agriculture Sector in India, International Journal of Marketing, Financial Service & Management Research. 2013;2(9). ISSN:2277-3622,
8. Chowdhry S. Invisible Activities of Rural Women, Kurukshetra. 2004;52(9).
9. Chauhan NM. Participation of tribal farm women in animal husbandry. Paper presented in: Seminar on Participatory Approach in rural Development on 31st, at JAU, Junagarh, Gujurat, 2009.

10. Chauhan NM. Role performance of tribal farmwomen in agriculture and animal husbandry in Gujarat, Karnataka Journal Agricultural Science. 2011;24(5):672-674.

11. Chayal K, Dhaka BL, Poonia MK, Tyagi AVA, Verma SR. Involvement of Farm Women in Decision- making in Agriculture, Stud Home Com Science. 2013;7(1):35-37.

12. Das L. Work Participation of Women in Agriculture in Odisha, IOSR Journals of Humanities and Social Science. 2015;20(7):66-78.

13. Davis K, Franzel S, Hildebrand P, Place N. Extending Technology among Small –Scale Farmers in Meru: Ingredients for Success in Farmer Groups. Proceeding of the 20th Annual Conference of Association for International Agricultural and Extension Education (AIAEE), Dublin, Ireland, 2004, Pp: 902-13.

14. Devi SR, Singh LK. Women's Role in Agriculture and Allied Fields in Manipur, Indian Journal of Hill Farming. 2015;28(2):154-157.

15. FAO. World Livestock - Livestock in food security. Rome, FAO, 2011.

16. Kalyani KS, Krishnamurthy V, Rao CC, Kumari NA. Role Performance of Tribal Women in Agriculture: A Study in Agency Area of East Godavari District, Andhra Pradesh, J. Dairying, Foods and H.S. 2011;30(3):221- 224.

17. Lal R, Khurana A. Gender issues: The role of women in agriculture sector, ZENITH International Journal of Business Economics & Management Research. 2011;1(1). ISSN: 2249 8826

18. Mulugeta M, Amsalu T. Women's role and their decision making in livestock and household management, Journal of Agricultural Extension and Rural Development. 2014;6(11):347-353.

19. Narayan MD, Radhika S, Rani BJ. Role and constraints of women in dairying Growth towards women empowerment, International Journal of Scientific Research. 2015;4(1):452-454.

20. Bhuwaneshwari, S.V. B. Role of Tribal Women in the conservation of Agro-biodiversity, Ph.D. Thesis, TNAU, Coimbatore (TN), India. 2005.

21. Dash, D., Kumar, B., & Mahra, G. S. Mass Media Usage by Rural Youth in Agriculture in Udham Singh Nagar District of Uttarakhand. Indian Research Journal of Extension Education, 2017;17(2), pp. 9-13.

22. Hassan, M. Z. Y., Luqman, M., Ashraf, S., Yasin, M., and Raza, M. M. Constraints of rural youth involvement in agricultural activities in the Punjab, Pakistan: Redefining youth policy. Journal of Agricultural Research.2016; 54(4), pp. 861-871.

23. Oinam, T. & Sudhakar, B. (2014). Adoption of recommended paddy practices by the farmers of Bishnupur district of Manipur State. EPRA Journal of Economic and Business Review, 2014; 2(7).

24. Prashanth, P. (2011). A study on adoption of organic farming in cotton in Karimnagar district of Andhra Pradesh, M.Sc. (Ag.) Thesis, Acharya N G Ranga Agricultural University, Hyderabad, India. 2011.

25. Sourabh, S. & Ojha, K. S. Constraints in adoption of vermicompost technology. Progressive Research, 2013;8, pp. 500-503. Published at CABI digital library.

26. Mala Kumari 2003 PhD thesis https://krishikosh.egranth.ac.in/server/api/core/bitstreams/92fa3772-f5e0-4973-bec0-f0728ec0d19c/content