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Adoption behaviour of farmers towards Natu tobacco production technology in Rajahmundry block in east Godavari district of Andhra Pradesh

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Abstract

Agriculture plays a vital role in India's economy, contributing significantly to GDP and employing nearly half the workforce. In Andhra Pradesh, the Natu tobacco variety is of notable economic importance. This study examines the adoption behavior of farmers towards Natu Tobacco Production technology in Rajahmundry Block, East Godavari District, using a descriptive survey method involving 120 respondents. The socio-economic profile reveals a predominance of middle-aged farmers (60%) with basic education (46.67%), alongside diverse caste and family structures and predominantly small landholdings. The study found that while 47.50% of respondents show moderate adoption of the technology and 30.84% demonstrate high adoption, 21.66% have low adoption levels, indicating limited use of production technology. Factors such as age, education, landholding size, and economic status affect adoption, with high extension contracts being crucial for disseminating agricultural innovations. The findings highlight the need for targeted interventions, including customized training and resource support, to overcome barriers and enhance adoption rates, thereby contributing to the advancement of sustainable farming practices and agricultural development.

Keywords: Adoption behavior, farmers, Natu tobacco production technology

Introduction

Agriculture is a cornerstone of the Indian economy, contributing significantly to the Gross Domestic Product (GDP) and employing nearly half of the Indian workforce. Among various crops, tobacco holds substantial economic importance, with Andhra Pradesh being a major producer, particularly of the Natu variety. This traditional variety, known for its distinctive flavor and quality, is predominantly grown in the East Godavari district. The region's unique agro-climatic conditions, including soil type, temperature, and rainfall patterns, make it ideal for Natu tobacco cultivation, which is highly valued in the market for products like bidis.

The Central Tobacco Research Institute (CTRI) in Rajahmundry, Andhra Pradesh, plays a crucial role in advancing tobacco cultivation practices in India. As part of the Indian Council of Agricultural Research (ICAR), CTRI focuses on crop improvement, pest and disease management, soil and water conservation, and sustainable agricultural practices. These efforts have significantly enhanced Natu tobacco production technology, improving both productivity and quality. The adoption of modern agricultural technologies recommended by CTRI, such as high-yielding varieties and integrated pest management, is essential for increasing crop productivity and sustainability. Understanding the adoption behavior of farmers towards

Natu tobacco production technology is vital for several reasons. It helps identify the factors that influence farmers' decisions to adopt or reject new technologies, the barriers they face, and the socio-economic factors affecting their ability to implement these practices. This knowledge aids in developing targeted interventions to promote best practices, enhancing productivity and sustainability in Natu tobacco farming. Additionally, insights from such studies can guide similar agricultural research in other regions, contributing to the broader field of agricultural extension and technology adoption.

Research Methodology

Research Design

This study utilizes a descriptive research design to evaluate farmers' adoption behavior towards Natu tobacco production technology in Rajahmundry Block, East Godavari District, Andhra Pradesh. This approach systematically collects data on socio-economic profiles, knowledge, attitudes, adoption levels, and challenges faced by farmers. Both quantitative and qualitative techniques are employed, including structured questionnaires, interview schedules, focus group discussions (FGDs), and key informant interviews (KIIs) to gain comprehensive insights into adoption factors and constraints.

Locale of Study

The research is conducted in the Rajahmundry Block of East Godavari District, Andhra Pradesh, a region prominent for its agricultural activities and tobacco cultivation. East Godavari spans approximately 10,807 square kilometers, bordered by Visakhapatnam, West Godavari, and the Bay of Bengal. Rajahmundry Block's fertile soils and favourable climate make it ideal for diverse crop cultivation, including Natu tobacco. The area's tropical climate, characterized by hot summers, mild winters, and monsoon rains, supports robust agricultural productivity. The socio-economic profile of the farming community here includes small, marginal, and medium-scale farmers, with a relatively high literacy rate aiding in the adoption of new agricultural practices.

Sampling and Sampling Procedures

Selection of District: The research is conducted in Andhra Pradesh, specifically choosing East Godavari district due to the maximum area under Natu tobacco cultivation and researcher's familiarity with local customs and language, which facilitates accurate data collection.

Selection of Block: Rajahmundry Block is selected through purposive sampling due to maximum area coverage of Natu tobacco cultivation and for its active engagement in agricultural training programs related to Natu tobacco production.

Selection of Villages: Five villages—Pedapudi, Dowleswaram, Rajanagaram, Seethanagaram, and Korukonda—are chosen purposively based on maximum area under Natu Tobacco Cultivation. From each village, 24 respondents are randomly selected, totalling 120 respondents for the study.

Methods of Data Collection

Data is collected using a pre-tested, structured interview schedule. Each respondent is interviewed personally, and their responses are recorded. The collected data is categorized, tabulated, and analyzed using SPSS 16 software, with results presented in tables for clarity and effectiveness.

Results and Discussion

Socio – economic profile of the respondents

Table 1: Distribution of Respondents on the basis of their socio – economic status index

Category	Sub-Category	Frequency	Percentage
Age	Young (<35)	28	23.33
	Middle (36-55)	72	60.00
	Old (>55)	20	16.67
Education	Illiterate	10	8.33
	Primary School	22	18.33
	Middle School	56	46.67
	High School	15	12.50
	Intermediate	12	10.00
	Graduate and above	5	4.17
Caste	General	30	25.00
	OBC	35	29.17
	SC	22	18.33
	ST	33	27.50
Family Size	Small (up to 4 members)	65	54.17
	Medium (5-8 members)	41	34.17
	Large (above 8 members)	14	11.67
Family Type	Nuclear	85	72.83
	Joint	35	29.17
Housing Pattern	Mud House	15	12.50
	Semi Cemented	40	33.33
	Cemented	65	54.17
Landholding	Marginal (<1 ha)	40	33.33
	Small (1 to 2 ha)	60	50.00
	Medium (2 to 4 ha)	15	12.50
	Large (>4 ha)	5	4.17
Occupation	Agriculture	30	25.00
	Agriculture + Labour	70	58.33
	Agriculture + Business	8	6.67
	Agriculture + Service	12	10.00
Annual Income	< 1 Lakh	40	33.33
	1 Lakh - 2 Lakh	72	60.00
	> 2 Lakh	8	6.67
Extension Contacts	Low (10-12)	32	26.67
	Medium (13-15)	25	20.83
	High (16-18)	63	52.50
Source of Information Utilized	Low (11-18)	35	29.17
	Medium (19-25)	55	45.83
	High (26-32)	30	25.00

The socio-economic profile of the respondents reveals that a majority are middle-aged (60%), with educational backgrounds at the middle school level (46.67%), and diverse caste representation, primarily OBC (29.17%). Most respondents live in nuclear families (72.83%) and small-sized households (54.17%). Economically, 54.17% reside in cemented houses, and half have small landholdings (1-2 hectares). The majority (58.33%) combine agriculture with labor work, and 60% earn between 1-2 lakh rupees annually. Extension contacts are high for 52.50% of respondents, and information source utilization is moderate, with 45.83% in the medium category. This profile indicates a stable,

moderately educated, and economically challenged farming community with varying degrees of engagement with extension services and information sources.

Adoption of Natu Tobacco Production technology by the respondents

The level of adoption of Natu Tobacco Production technology by the respondents, was obtained on three – point continuum scale viz. Fully Adopted, Partially Adopted, Not Adopted with respective scores 3,2,1 and the data have been presented in,

Table 2: Distribution of respondents on the basis level of adoption of Natu Tobacco Production technology by the respondents.

S. No.	Activities	FA (f, %)	PA (f, %)	NA (f, %)
A	Farming Practices			
1	Following any Crop Rotation Method	55(45.83)	40(33.33)	25(20.83)
2	Willing to use any Latest varieties	45(37.50)	50(41.67)	25(20.83)
3	Prefer Organic farming for your Crop	40(33.33)	35(29.17)	45(37.50)
4	Following Integrated Farming System	50(41.67)	45(37.50)	25(20.83)
B	New Technology			
5	Thinking to Adopt Precision Agriculture	30(25.00)	50(41.67)	40(33.33)
C	Management Practices			
6	Using Bio-fertilizers on your crop	45(37.50)	55(45.83)	20(16.67)
7	Protecting crop by Mulching	50(41.67)	40(33.33)	30(25.00)
8	Using Bio-pesticides on your crop	40(33.33)	50(41.67)	30(25.00)
D	Post - Harvest Technology			
9	Using Tobacco harvesting Machines	60(50.00)	45(37.50)	15(12.50)
10	Adopted priming Method of harvesting	55(45.83)	40(37.50)	25(20.83)
11	Prefers to Mechanical Dryer for your crop	50(41.67)	45(37.50)	25(20.83)
12	Adopted stalk cutting methods of harvesting	40(33.33)	50(41.67)	30(25.00)

FA – Fully Adopted, PA – Partially Adopted, NA – Not Adopted, f – frequency, % – Percentage

The table represents the distribution of respondents based on their level of adoption of Natu Tobacco Production technology across various activities. The activities are categorized into four sections: Farming Practices, New Technology, Management Practices, and Post-Harvest Technology. For each activity, the table shows the percentage of respondents who fully adopted (FA), partially adopted (PA), or did not adopt (NA) the specified practices. The percentages reflect how prevalent each practice is among the respondents. It shows 45.83% of respondents fully adopted crop rotation methods, while 20.83% did not adopt this practice at all. The data shows that a significant portion of respondents has embraced practices like using bio-fertilizers, precision agriculture, and integrated farming systems, although a considerable percentage also remain hesitant or only partially adopt these technologies. In the Post-Harvest Technology section, the data reveals a strong inclination towards the adoption of tobacco harvesting machines, with 50% of respondents fully adopting them. Similarly, the priming method of harvesting and the use of mechanical dryers are also widely accepted, with adoption rates ranging from 41.67% to 45.83%. On the other hand, there is still some reluctance in adopting newer practices like precision agriculture and stalk cutting methods, where a significant percentage of respondents are either only partially adopting or not adopting these practices at all. Overall, the table suggests that while there is a positive trend toward the adoption of new technologies and practices, there remains a portion of respondents who are either resistant or slow in integrating these advancements

into their farming activities. Similar findings also reported by Narayanaswamy (2017) ^[8].

Overall, adoption of Natu Tobacco Production technology by the respondents

Respondents' Overall, adoption of Natu Tobacco Production technology by the respondents on the basis of total score the respondents were divided into three categories namely – Low, Medium and High and frequency has been given in Table 3.

Table 3: Level of Adoption

Level of Adoption	Frequency	Percentage
Low (30 - 35)	26	21.66
Medium (36 - 40)	57	47.50
High (41 - 45)	37	30.84
Total	120	100.00

The table presents the overall adoption of Natu Tobacco Production technology among the respondents, categorized into three levels based on their total adoption scores: Low (30-35), Medium (36-40), and High (41-45). Out of 120 respondents, 26 (21.66%) fall into the Low adoption category, indicating limited use or awareness of the technology. A significant portion, 57 respondents (47.50%), are in the Medium category, suggesting a moderate level of adoption and engagement with the technology. The High adoption category includes 37 respondents (30.84%), demonstrating a strong commitment to and utilization of Natu Tobacco Production technology. This distribution

highlights that while a majority of respondents have adopted the technology, there remains a considerable group with low adoption levels, indicating potential areas for further

education and support. Similar findings also reported by Murthy (2016) [6].

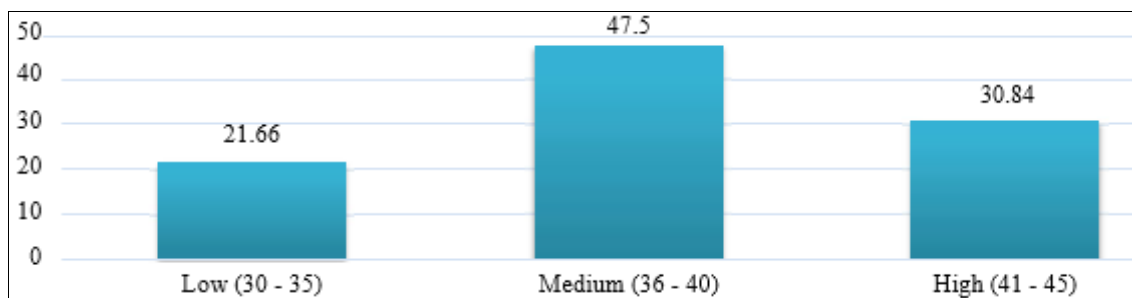


Fig 1: Level of Adoption towards Natu Tobacco Production Technology

Association between selected independent variables with Adoption behavior of the respondents towards Natu Tobacco Production Technology

Table 4: Association between selected independent variables with Adoption behavior of the respondents towards Natu Tobacco Production Technology

S. No.	Variables	Correlation Coefficient (r)
1	Age	0.862
2	Education	0.869
3	Caste	0.922
4	Family Size	0.749
5	Family Type	0.811
6	Housing Pattern	0.783
7	Landholding	0.778
8	Occupation	0.792
9	Annual Income	0.747
10	Extension Contacts	0.819
11	Source of Information Utilized	0.891

*= Correlation is significant at the 0.01% level of probability

**= Correlation is significant at the 0.05% level of probability

The table shows the correlation between various independent variables and the respondents' adoption behavior of respondents towards Natu Tobacco Production Technology. The correlation coefficients (r) indicate that all variables have a positive relationship with attitude, with caste ($r = 0.922$), education ($r = 0.869$), and age ($r = 0.862$) having the strongest correlations, suggesting these factors significantly influence respondents' attitudes. Other factors like family size, family type, and landholding also show strong positive correlations, indicating their influence on the adoption decision. Overall, higher values in these variables generally correspond to a more favorable towards adopting the technology.

Conclusion

It is concluded that the socio-economic profile of Natu tobacco farmers in Rajahmundry Block, revealing that a majority are middle-aged, moderately educated, and economically challenged with small landholdings and nuclear families. Although 47.50% of respondents exhibit moderate adoption of Natu Tobacco Production Technology, significant portions either fully adopt or lag behind in embracing modern agricultural practices. The association analysis reveals strong positive correlations between adoption behavior and key variables such as caste,

education, and age, underscoring the critical role these factors play in influencing the adoption of sustainable farming technologies.

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