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RESEARCH ARTICLE

ECONOMIC ANALYSIS OF THE LEVEL OF ADOPTION OF GAP AMONG THE FARMERS OF FPOS AND CONTRACT FARMING

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Abstract: In the Andhra Pradesh district of NTR, a study was carried out on the adoption of Good Agricultural Practices (GAP) by chilli farmers. A sample size of 45 respondents was chosen from three villages using simple random sampling. The data indicate that the main reason for cultivating chilli in this location was the crop's suitability for the climate and soil. 53.33 percent of the FPO farmers had a high level of adoption, according to the findings, and 46.67 percent had a medium level of adoption. Among noncontract farmers, 30.00 percent had high adoption levels while 37.50 percent had low adoption. It could be inferred that 46.67 and 66.67 percent of the contract farmers and noncontract farmers had medium adoption followed by high adoption. The major reason for the non-adoption of Good Agricultural practices was their high input costs.

Keywords: Adoption index, Chilli, Farmers, Good agricultural practices

INTRODUCTION

Among the most valuable spice crops in the world is chilli, contributing around 40% of the world's production, India is the biggest producer, consumer, and exporter of chilli peppers. China, Thailand, Ethiopia, and Indonesia are the next most important producers. Towards the end of the 16th century, the Portuguese brought chilli to India. Indian chilli is widely recognized for its two important commercial qualities viz., colour and pungency levels.
India has a huge potential to export the numerous kinds of chillies that are needed by diverse markets worldwide. India's export of chillies increased by more than 25% over the fiscal years 2017–18 and 2021–2022. From 4.43 lakh tonnes (lt) in 2017–18 to 5.57 lt in 2021–22, India's chilli exports rose (APEDA).Asian nations like China, Sri Lanka, Malaysia, Bangladesh, Singapore, Thailand, UAE, and so on are the primary destinations for Indian chilli exports. Andhra Pradesh, Telangana, Madhya Pradesh, Karnataka, and West Bengal are the principal chilli-producing states in India. India's production of chilies was estimated to be 15.78 lakh tonnes in 2021–22, compared to 20.49 lakh tonnes in 2020–21, based on the third advance estimates (chilli outlook 2023).
Among the Indian states, Andhra Pradesh was the top producer of chiles in the fiscal year 2023. In that year, more than 627 thousand metric tonnes were produced. Madhya Pradesh and Telangana came after this. In that year, India produced over two million metric tonnes of chillies.
The government of India's Spices Board mandated the sampling and quality testing of chilli and chilli production signs before shipping in order to check for aflatoxin and Sudan I–IV dyes. This has aided India's exports and increased the confidence of foreign purchasers.
The growing concern over food safety and quality has led to a recent evolution of the GAP concept. To achieve specific goals of food security, food quality, production efficiency, livelihood, and environmental protection, GAP offers benefits to farmers and consumers. Growers can currently use a variety of systems, such as Good Agricultural Practices (GAP), Good Manufacturing Practices (GMP), Hazard Analysis Critical Control Points (HACCP), Good Hygiene Practices, etc., to ensure the production of safe food.
The chilli processing companies had direct contracts with farmers in the research area. Farmers supplied them with dried chillies. We have also conducted research on FPO farmers. In order to obtain the

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highest quality chillies, the companies taught their field staff to teach contract farmers and FPO farmers about GAP practices. In light of this, the current study was conducted to measure the adoption level of GAP technologies in the chilli among contract, non-contract, and FPO farmers.

MATERIALS AND METHODS

The NTR district was selected as the study's location. Three villages were chosen from one block in order to compare FPO, contract, and non-contract farmers. FPO and contract farmers were chosen at random from a list provided by processing industries, while non-contract farmers were chosen at random from each village at a rate of fifteen per village. Thus, 45 sample farmers were chosen using a random selection technique.

Adoption index

The good agricultural practices adoption index was employed. Three three-point continuums—full, partial, and nil—with numerical scores of 3, 2, and 1—were used to measure adoption. Using the adoption index, the average score for a particular technology was determined. The average score was divided by the highest possible score on a particular practice, and then multiplied by 100 to arrive at the final result.

Adoption index
Respondents' score = ………………… 100
Total possible score

Garrett's Ranking Technique

It provides the ability to translate constraint and advantage ordering into numerical scores. The primary advantage of this approach over a simple frequency distribution is that the constraints are arranged based on respondents' subjective assessments of their severity. As a result, it's probable that the same number of respondents received different rankings for two or more limitations. Garrett's formula for converting ranks into a percent is Percent position=100 *(Rij–0.5)/Nj Where Rij = rank given for i^{th} constraint byj^{th} individual;

Nj = a number of constraints ranked by j^{th} individual.

The percent position of each rank will be converted into scores referring to the table given by Garrett and Wood worth (1969). The sum of the individual respondents' scores for each element will be divided by the total number of respondents whose scores will be added. These mean scores will be arranged in descending order for each constraint. The constraints will be accordingly ranked by Jimjel *et al*. (2015).

RESULTS AND DISCUSSION

Table 1. Reasons for growing Chilli by Sample Farmers

S.No	Reasons	Contract (n=15)		Non Contract (n=15)		FPO farmers (n=15)	
		Mean score	Rank	Mean score	Rank	Mean score	Rank
1	Skin of the crushed chilli is thick red	50.47	4	51.67	5	48.07	4
2	Peak harvesting season is from December to May	60.73	2	40.00	6	56.00	2
3	ASTA colour value of 50–80 and pungency is 35–45 SHU Suitable for soil and climate	41.73	7	22.67	8	46.53	5
4	Suitable for soil and climate	62.87	1	69.93	1	74.80	1
5	Better price for the produce	49.47	5	62.53	3	53.20	3
6	Suitable for marketing	54.00	3	52.53	4	46.27	6
7	Higher pungency	44.47	6	39.47	7	38.00	8
8	Drought tolerant	34.87	8	62.60	2	38.13	7

In the NTR district, farmers were asked to rank their reasons for growing chillies. Garrett's ranking technique was used to analyze the answer, and the findings are shown in Table 1. For three groups of farmers, the primary reason for cultivating chilli was climate and soil suitability. The results are aligned with the findings conducted by Hussain *et al*. (2021).The contract farmers listed the following three reasons in order of importance: the peak harvesting season, which runs from December to May ,suitability for marketing ,and the thick red skin of the crushed chilli, , and. The major reasons influencing FPO producers were the following: the peak harvesting season, which runs from December to May,better price for the produce, and Skin of the crushed chilli is thick red by Spice Board of India.

Table 2. Adoption level of GAP technologies among FPO farmers, contract and non-contract farmers

Adoption level	Categories	Contract(n=15)			Non-Contract(n=15)			FPO farmers (n=15)		
		Nos	%	Mean score	Nos	%	Mean score	Nos	%	Mean score
Low	<66.67	2	13.33	66.67	0	0	0	0	0	0
Medium	66.67 -79.71	7	46.67	78.05	10	66.67	66.23	7	46.67	77.02
High	>79.71	6	40.00	84.30	5	33.33	72.75	8	53.33	82.97
Total		**15**	**100.00**	**76.34**	**15**	**100.00**	**46.33**	**15**	**100.00**	**53.33**

The adoption level of GAP technologies is presented and discussed in Table2 and Fig1.

It can be deduced that, with mean adoption index scores of 78.05 and 84.30, respectively, that 46.67 and 66.67 percent of contract farmers and noncontract farmers had medium adoption, followed by high adoption, regarding the chilli cultivation practices. The results aligned with the research conducted by Mane (2012), Reddy *et al.* (2018). Conversely, with mean technology scores of 0 and 66.67, zero and 13.33% of them had low adoption levels. FPO farmers had a high adoption rate of 53.33 percent and a medium adoption rate of 46.67 percent. The results aligned with the findings of Sharma *et al.* (2015).

Knowledge limits the action of the individual; hence probable reason for the majority of the respondents to fall under the medium adoption category in the case of contract and noncontract farmers might be due to the medium to high knowledge possessed by the majority of the respondents. The results are outlined with the result of Divya and Shiva Kumar (2014). Whereas most of the FPO farmers fall under the high adoption category.

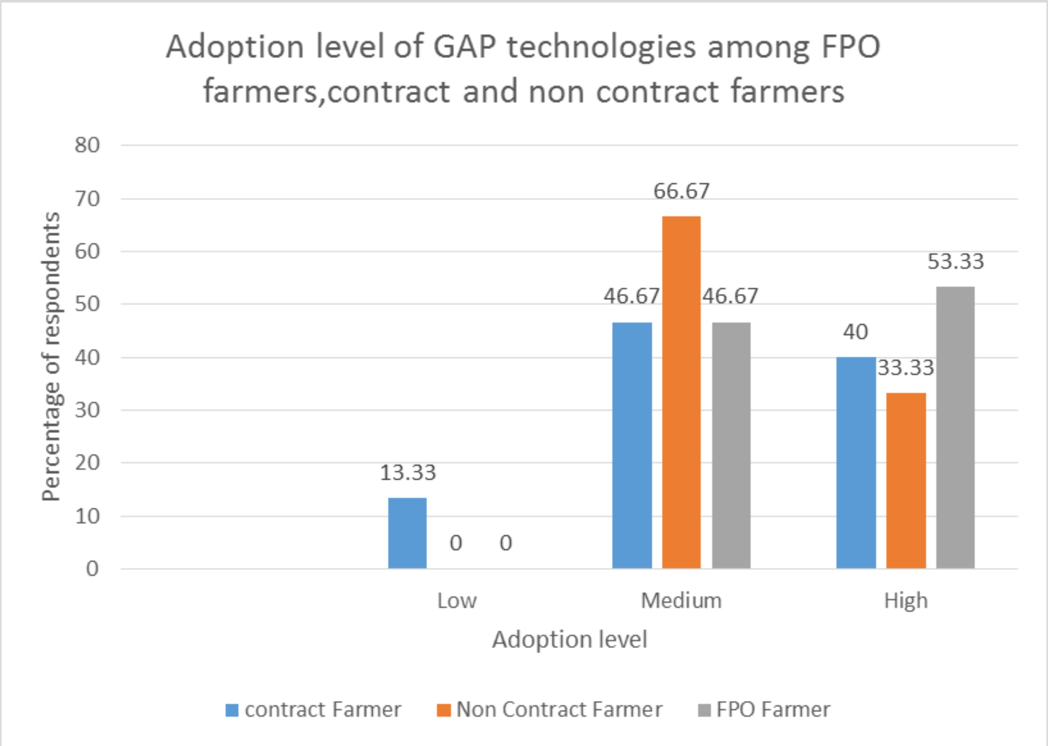

Fig 1: Adoption level of GAP technologies among FPO farmers, contract and non-contract farmers

Practise wise adoption of GAP technologies in chilliis presented in Table 3.

Table 3. Practice wise adoption of GAP technologies in chilli cultivation

S.No	Good Agricultural Practices	Contract farmers (n=15)	Non contract farmers (n=15)	FPO farmers (n=15)
1.	Certifiedseedsfromauthorizedsource	73.33	66.67	100
2.	SeedTreatmentmethod	66.67	60.00	86.67
3.	FollowingNurserycultivation	93.33	86.67	93.33
4.	Customized fertilizer application	93.33	86.67	100.00

5.	Customized pesticide application	100.00	93.33	100.00
6.	By using integrated pest management kits (Sticky traps,Pheromonetraps,Neem oil)	80.00	26.67	100.00
7.	By using integrated crop management kits (Trichoderma,Pseudomonas,Beauveria)	86.67	13.33	100.00
8.	Avoidingapplyingchemicalsafter flowering topodformationperiod	86.67	80.00	100.00
9.	Pickingthe pod upwardswhile harvesting	100.00	80.00	100.00
10.	Restrictinganimals,includinglivestock, poultryorpets,toroamincropareas,especiallynear harvest time	13.33	13.33	13.33
11.	Excludingrodents, insects,andotherpests fromgrowingareas	100.00	86.67	100
12.	Reduction in weedicides	80.00	66.67	93.33
13.	By using drip or sprinkler irrigation	80.00	53.33	86.67
14.	Customized frequency of irrigation	100.00	86.67	73.33
15.	Giving wages as per government norms	20.00	20.00	13.33
16.	Engage the child labour or not	0.00	6.67	0.00
17.	Reduction in chilli drying over bare soil	100.00	66.67	93.33
18.	Increase in adoption of chilli drying over silpaulin	93.33	66.67	100.00
19.	Increase in adoption of chilli drying over foldable chilli dryer	80.00	93.33	100.00
20.	Cleaning and sanitizing harvest containers before use	86.67	80.00	100.00
21.	Avoiding harvest of chillies within 120 days of chemical application	80	80.00	100.00
22.	Excluding field debris from packing and storage facilities by cleaning the outsides of harvest bins and requiring workers to wear clean clothes in these areas	93.33	80.00	93.33
23.	Using new and unused bags to pack products for further transport and sale	100	100.00	100.00

Among the various GAP technologies, more technologies are followed by FPO farmers, compared to contract farmers. There was less/niladoption in the use of child labour among contract, non-contract and FPO farmers. The results are outlined with the findings by Manaswietal (2020).

Table 4. Constraints Faced by Farmers in Adopting Good Agricultural Practices (GAP).

S.No	Constraints	Non-adopters	
		Meanscore	Rank
1	High input costs	70.93	I
2	High labour charges	54.73	II
3	Low market prices	45.60	III
4	Less land holding	42.80	IV
5	Lack of knowledge and training	35.33	V

The reasons why they did not adopt Good Agricultural practices (GAP) were ranked by farmers. Garrett's ranking technique was used to analyse the answer, and the findings are shown in Table 4. The primary reason for non adoption of Good Agricultural practices was their high input costs. The non-adopters also listed high labour costs, low market prices, less land holdings, and a lack of knowledge and training as contributing factors.

CONCLUSION

It can be concluded that three groups of farmers in the Andhra Pradesh district of NTR grew chillies primarily because their Suitable for soil and climate. A high degree of adoption was reported by over half of the FPO farmers (53.33 per cent), followed by a medium level (46.67 per cent). The survey also found that FPO farmers had a greater degree of adoption. The employment of child labour by contract, noncontract, and FPO farmers has been less common. The main reason for non adoption is the high cost of inputs. Strengthening technology transfer initiatives to popularise GAP practices by the relevant extension agencies is necessary to lower input and labour costs.

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