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Adoption, Awareness and Constraints of Drone Technology in Chilli Farming: A Study in Kurnool District, Andhra Pradesh

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Chilli (*Capsicum annuum*) is a widely cultivated crop known for its pungent flavour and culinary versatility. It is one of the important commercial spice crops in India, contributing significantly to farmers' income and agricultural exports. With the rapidly increasing population and rising demand for food, the adoption of modern agricultural technologies has become essential to improve productivity and efficiency in crop production. The traditional methods used by farmers were not sufficient to fulfil these requirements; thus, new automated methods such as drone technology were introduced. Drone technology plays a crucial role in precision agriculture by enabling efficient pesticide spraying, crop monitoring, and better resource management. In this study, the socio-economic profile of chilli farmers, adoption and awareness level of drone technology, and constraints in its adoption were examined using a sample of 160 farmers (80 adopters and 80 non-adopters) in Kurnool district, Andhra Pradesh. Analyses included simple tabular analysis and weighted mean score. The results revealed that the majority of chilli farmers had a medium level of awareness and adoption of drone technology. The major constraints identified were inadequate size of land holdings, lack of knowledge and technical skills, inadequate training and demonstrations, high initial cost of drones, and limited payload capacity. Although drone technology has significant potential to enhance efficiency, reduce labour dependency, and improve productivity in chilli farming, its adoption remains moderate due to these constraints. Therefore, policy interventions such as organizing regular training programmes, strengthening extension services, promoting custom hiring centres, and providing financial support through subsidies or credit facilities are essential to enhance the adoption of drone technology among chilli farmers.

(***Key words:*** *Adoption, Awareness, Chilli, Constraints, Drone, Socio-economic profile*)

Agriculture is a fundamental sector that not only sustains human life but also drives economic growth, particularly in countries like India, where approximately 70% of the population relies on farming for their livelihoods. In rural areas, where agriculture is deeply embedded in the cultural fabric, traditional farming practices have long been the norm. However, the Indian agriculture sector is now on the cusp of a significant technological transformation, driven by the integration of advanced technologies such as Global Positioning System (GPS) and Artificial Intelligence (AI). This technological revolution is particularly relevant for the cultivation of high-value commercial and horticultural crops, such as chillies (*Capsicum annuum* L.). Chilli is most widely used and universal spice of India, which belongs to the "Solanaceae" family. The nutritive value of chilli is excellent, chillies are rich in vitamins, especially in vitamin A and C (Nalla *et al.,* 2023). Every 100 gm of dried pods yield about 160 calories of energy through 36 gm carbohydrates, 18 gm proteins, 16 gm fat, 480 mg calcium, 3.1 mg phosphorous, 31 mg iron, 2.5 mg niacin, 640 I.U. vitamin 'A' and 40 mg vitamin 'C' (Ali *et al.,* 2025). Chilli is one of the most important spices globally, renowned for its vibrant red color, due to the pigment "capsanthin," and its heat, attributed to the compound "capsaicin." Andhra Pradesh, and specifically the Kurnool district, is a major hub for chilli production in India, contributing significantly to both domestic and international markets. The adoption of drone technology in chilli farming emerges as a promising innovation. Drones offer precision agriculture solutions, enabling farmers to monitor crops more efficiently, manage resources better, and optimize yields. By providing high-resolution aerial imagery, drones can help in early detection of pests and diseases, assess crop health, and facilitate targeted interventions, thereby reducing the reliance on manual labour and improving overall farm

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productivity (Canicattì and Vallone, 2024; Vysali and Mishra, 2024).

In recent years, drone technology has become increasingly popular in the agricultural sector. Drones provide many benefits to farmers, including increased efficiency, better yields and lower operational costs. However, there are concerns that farmers may be reluctant to adopt drone technology due to the possibility of job loss or lack of knowledge and training. There are benefits of drone technology in the agricultural sector, but challenges can deter farmers from adopting it (Aliloo *et al.,* 2024; Kushwaha *et al.,* 2023).

In recent times, several announcements by the Government of India have focused on promoting drones in the agriculture sector. According to the Indian federal budget of 2022-23, the government is eager to use the word 'Kisan' drone to understand the farmer as well as promote the agricultural sector in the country. Farmer drones are being promoted for crop evaluation, digitization of land records and use of pesticides and nutrients. Some specific drone applications are pesticides, soil and crop nutritional spraying, soil samples, farm animal monitoring, real-time aerial imagination and sensor data collection, yield estimate, etc. (Costopoulou *et al.,* 2022). Recent reviews have demonstrated that agricultural drones are evolving from simple sensing platforms to integrated decision-support tools capable of improving crop monitoring, precision irrigation, nutrient management, targeted spraying, and yield prediction. However, wider adoption still depends on overcoming technical limitations, data integration challenges, regulatory requirements, and farmers' capacity to effectively use drone-based technologies (Arsenoaia *et al.,* 2026).

Previous studies have demonstrated the growing importance of drone technology in modern agriculture due to its potential to improve precision farming, reduce labour requirements, optimize pesticide application, and enhance crop productivity (Aliloo *et al.,* 2024; Costopoulou *et al.,* 2022; Kushwaha *et al.,* 2023). Research has also shown that socio-economic characteristics such as age, education, land holding size, income, risk orientation, and access to information significantly influence farmers' adoption of agricultural technologies (Badekhan and Devi, 2018; Peer *et al.,* 2020; Samyuktha *et al.,* 2022). Similarly, studies on water-soluble fertilizers, sprinkler irrigation systems, and bio-fertilizers reported that farmers generally exhibit medium to high levels of awareness and adoption, although adoption is constrained by financial limitations, inadequate technical knowledge, insufficient training, and small land holdings (Achudan *et al.,* 2019; Davra, 2019; Maru *et al.,* 2019; Vaish, 2019). Despite the increasing interest in agricultural drones, most previous studies have primarily focused on the technical performance, benefits, and general adoption of drone technology or on farmers' socio-economic characteristics in different crops. Limited empirical research has specifically examined the awareness, adoption level, and constraints associated with drone technology among chilli growers under Indian conditions, particularly in coastal state of India like Andhra Pradesh. Furthermore, studies integrating socio-economic characteristics with farmers' awareness, adoption behaviour, and constraints toward drone technology in chilli cultivation remain scarce. To address these research gaps, the present study was undertaken in Kurnool district of Andhra Pradesh with the objectives of analysing the socio-economic profile of chilli farmers, assessing their awareness and adoption level of drone technology and identifying the major constraints affecting its adoption.

The objectives of this research were to analyse the socio-economic profile of chilli farmers, assess the level of awareness and adoption of drone technology in chilli farming, and identify the constraints and suggestions related to the adoption of drone technology. By addressing these aspects, the study aimed to understand the factors influencing the adoption of drone technology among chilli farmers and to provide insights that could help promote the effective use of this technology for improving efficiency and sustainability in chilli cultivation.

MATERIALS AND METHODS

Sampling design

The present study followed a descriptive research design to analyse the adoption, awareness and constraints related to drone technology among chilli farmers. Multi-stage sampling was adopted as per the objective of the study. In the first stage of sampling, Kurnool district of

Andhra Pradesh was selected purposively because it is one of the major chilli-growing districts of the state, where chilli cultivation is undertaken on a large scale and contributes significantly to farmers' livelihoods. The district has witnessed increasing adoption of modern agricultural technologies, including drone-based pesticide spraying and crop monitoring, making it an appropriate location to assess farmers' awareness, adoption and constraints related to drone technology. Furthermore, the presence of service providers offering drone-based agricultural operations in the district facilitated the identification of both adopters and non-adopters of drone technology (Aliloo *et al.,* 2024; Costopoulou *et al.,* 2022; Vysali and Mishra, 2024). In the second stage, Nandikotkur and Kallur talukas were selected randomly. In the third stage, four villages were selected randomly from each taluka, and from each village, 20 chilli farmers (10 adopters and 10 non-adopters) were selected randomly. Thus, a total sample of 160 chilli farmers (80 adopters and 80 non-adopters) was selected for the study.

Analytical tools

To achieve the first objective, the socio-economic characteristics of chilli farmers, such as age, education, farming experience, land holding size, and annual income, were analysed using frequency and percentage analysis. To address the second objective, the level of awareness and adoption of drone technology among chilli farmers was examined using simple tabular analysis along with frequency and percentage methods. For the third objective, the constraints faced by farmers in the adoption of drone technology were analysed using the weighted mean score method. The weighted mean score was calculated by multiplying the frequency of responses with the assigned scores for each category and dividing the total by the number of respondents, which helped in ranking the constraints based on their severity. To categorize the level of awareness, each positive response was assigned a score of one, while a negative response was assigned a score of zero. The total awareness score for each respondent was converted into a percentage. Based on the overall awareness score, the respondents were classified into three categories: low awareness (up to 33.33%), medium awareness (33.34-66.66%), and high awareness (above 66.66%). Similarly, the adoption level was categorized using the same percentage intervals into low, medium, and high adoption levels.

Frequency and percentage

Simple averages and percentages methods were extensively used to analyse the collected data. This method is used for socio-economic profile, adoption and awareness level of drone technology.

Weighted mean score

Weighted mean was used to calculate constraints faced by farmers in adoption of drone technology. Weighted mean was calculated by total sum of the scores desired by multiplying frequency with the assigned scores to the category and then dividing it by the total number of respondents. This was used in converting frequency into a comparative level for each preference. Weighted mean score was worked out with the following formula (Patel *et al.,* 2017).

$$\text{Weighted mean score} = \frac{P_1\text{x}3+P_2\text{x}2+P_3\text{x}1}{N}$$

RESULTS AND DISCUSSION

Socio-economic profile of the farmers

The data presented in Table 1 illustrated the distribution of adopters and non-adopters across different variables. In the context of the agriculture sector, age plays a significant role. The survey of 160 individuals reveals that the majority, 47.50%, fall within the 18 to 35 age range. Those above 50 years old constitute 28.12%, while the 36-50 age group comprises 24.18%. Notably, young individuals (65%) were the predominant adopters of new agricultural technologies, whereas older individuals (38.75%) and middle-aged individuals (31.25%) are more often non-adopters. It is clear that more young age farmers are ready to adopt new technologies than middle age and old age farmers as most of them are educated and aware of technology in agriculture to some extent.

Gender distribution showed a marked male dominance in agriculture, with 83.75% of the surveyed population being male and only 16.25% female. Among adopters, 77.50% are male, compared to 22.50% female, while non-adopters showed an even higher male percentage (90%). It is clear that more male farmers were adopters of drone technology than female farmers. The number of female farmers was also less because most females are involved in household activities.

Educational attainment highlighted that 30.63% of the surveyed individuals were illiterate, 28.75% have secondary education, 25.63% have primary education, and only 11.25% have higher secondary education. The smallest group consisted of those with graduate-level education or higher (5.5%). Among adopters, those with up to primary education and illiterate individuals each make up 30%, whereas non-adopters were primarily illiterate (31.25%) or had secondary education (30%). It is clear that the education level between adopters and non-adopters had slight differences only; hence, it is not significant in the adoption of drone technology. Occupational engagement indicated that 50.62% of the respondents were involved solely in agriculture, while 49.38% engage in both agriculture and animal husbandry. Adopters tend to be more focused on agriculture (62.50%), whereas non-adopters were more diversified, with 61.25% involved in both sectors. It is clear that most farmers engaged in only agriculture adopted the drone technology than the farmers who were engaged in both agriculture and animal husbandry as there is no much use of drones in animal husbandry.

Income levels showed that 43.75% of the individuals surveyed had an annual income up to 2 lakhs, 42.5% earned between 2 to 4 lakhs, and 13.75% earned above 4 lakhs. Adopters generally had medium income (47.50%), while non-adopters were predominantly in the low-income category (50%). It is clear that the most of farmers who had annual income of more than 2 lakhs (medium and high) adopted drone technology than the farmers having an annual income below 2 lakhs, as the adoption of technology needs more money than traditional methods. Family structure revealed that 69.38% of the farmers live in nuclear families, while 30.63% live in joint families. Adopters were more likely to belong to nuclear families (75.00%), while non-adopters were fairly split, with a slight preference for joint families (36.25%). It is clear that most of the farmers who belonged to nuclear families adopted drone technology than joint families, as nuclear families are more independent in making the decision compared to joint families.

Land holdings showed that 31.25 % of respondents had marginal land holdings (up to 1 hectare), 21.25% had small holdings (1 to 2 hectares), 17.50% had medium holdings (2 to 4 hectares), and 30% had large holdings (more than 4 hectares). A significant portion of adopters had large land holdings (52.50%), compared to non-adopters, who were primarily marginal land holders (55%). It is clear that most of the farmers who were having more land holding (large) adopted drone technology than other farmers (marginal, small, medium) as drone technology reduces the time and labour for the farmers having more land. Irrigation sources showed a predominant reliance on bore-wells (45.63%), followed by rivers (18.13%), open wells (12.5%), canals (12.5%), and other sources (11.25%). The source of irrigation was not significant for the adoption of drone technology. Farming experience indicated that the majority of individuals (51.25%) have 6 to 12 years of farming experience. This experience distribution was more pronounced among adopters (55%), while non-adopters were more evenly spread across all experience categories. This suggested that a moderate level of experience may encourage adoption of new technologies.

Social participation showed that 44.37% of respondents did not participate in social activities, while 23.75% were involved in gram panchayats, 20% in farmer groups, and 11.88% in the cooperative sector. Adopters were more likely to participate in gram panchayats (38.75%) and farmer groups (30.00%), while non-adopters had lower participation rates. Most of the farmers who adopted drones were more involved in social participation than non-drone-adopted farmers as social participation makes the farmers aware of ongoing activities of farming which benefits them. Exposure to mass media was moderate, with 36.88% of the sample reporting medium exposure, 35% reporting high exposure, and 28.12% reporting low exposure. Both adopters and non-adopters showed similar patterns, though adopters slightly edge towards higher exposure. Most of the farmers who had adopted drones had medium to high mass media exposure which was significant for adoption of drones between adopters and non-adopters. Risk orientation showed that 56.88% of respondents had a medium level of risk orientation, 22.50% had a low level, and 20.62% had a high level. Adopters tend towards medium risk orientation (62.50%), while non-adopters were more risk-averse (45% have low risk orientation). This suggested that willingness to take risks may correlate with the adoption of new technologies. Economic motivation showed that 59.38% of respondents have medium economic motivation, 21.25% had low motivation, and 19.37% have high motivation. Adopters showed higher economic motivation, with 37.50% falling into the high motivation category, compared to only 1.25% among non-adopters. This indicates that economic drive may play a crucial role in the decision to adopt new technologies.

The findings indicate that younger farmers were more likely to adopt drone technology than middle-aged and older farmers because they are generally more receptive to technological innovations, possess better digital literacy, and are more willing to experiment with modern farming practices, whereas older farmers often rely on conventional methods due to their long farming experience and limited exposure to emerging technologies. Similar findings were reported by Peer *et al.* (2020) and Samyuktha *et al.* (2022). Male farmers constituted the majority of drone adopters, reflecting the prevailing farming structure in rural areas where men are primarily responsible for investment and mechanization decisions, which agrees with the findings of Badekhan and Devi (2018). Although education did not show a marked difference between adopters and non-adopters, better-educated farmers were relatively more aware of drone technology and its benefits. Farmers with larger land holdings were more likely to adopt drones because the technology becomes economically viable over larger operational areas, resulting in savings in labour, time, and input costs, which is in agreement with Achudan *et al.* (2019). Similarly, farmers with higher annual income, stronger economic motivation, greater social participation, and higher mass media exposure showed greater adoption, indicating that better access to financial resources and agricultural information enhances technology acceptance. Comparable relationships between awareness, information exposure, and adoption of agricultural technologies were reported by Maru *et al.* (2019) and Vaish (2019).

Adoption and awareness of drone technology among chilli farmers

Adoption of drone technology among chilli farmers

Adoption refers to the process by which individuals begin using a new technology or innovation in their farming practices. In the present study, the adoption level was assessed only among the farmers who had already adopted drone technology (n = 80). The responses to

Table 1. *Socio- economic profile of farmers (n=160)*

Description of variables	Frequency and percentage		
	Adopters	Non-adopters	Overall
Age wise distribution of farmers			
18-35 (young)	52 (65.00)	24 (30.00)	76 (47.50)
36-50 (middle)	14 (17.50)	25 (31.25)	39 (24.38)
Above 50 (old)	14 (17.50)	31 (38.75)	45 (28.12)
Gender wise distribution of farmers			
Male	62 (77.50)	72 (90.00)	134 (83.75)
Female	18 (22.50)	8 (10.00)	26 (16.25)
Education wise distribution of farmers			
Illiterate	24 (30.00)	25 (31.25)	49 (30.63)
Up to primary education	24 (30.00)	17 (21.25)	41 (25.63)
Up to secondary	22 (27.50)	24 (30.00)	46 (28.75)

Up to higher secondary	6 (7.50)	12 (15.00)	18 (11.25)
Graduate and above	4 (5.00)	2 (2.50)	6 (3.75)
Occupation wise distribution of farmers			
Agriculture	50 (62.50)	31(38.75)	81 (50.62)
Animal husbandry	0 (00.00)	0 (00.00)	0 (00.00)
Both	30 (37.50)	49 (61.25)	79 (49.38)
Annual Income distribution of farmers			
Low (up to ₹2,00,000)	30 (37.50)	40 (50.00)	70 (43.75)
Medium (₹2,00,000 to ₹4,00,000)	38 (47.50)	30 (37.50)	68 (42.50)
High (above ₹4,00,000)	12 (15.00)	10 (12.50)	22 (13.75)
Classification of farmers based on size of family			
Joint	20 (25.00)	29 (36.25)	49 (30.63)
Nuclear	60 (75.00)	51 (63.75)	111 (69.38)
Land holdings wise distribution of farmers			
Marginal (up to 1 ha)	6 (7.50)	44 (55.00)	50 (31.25)
Small (above 1 ha to 2 ha)	13 (16.25)	21 (26.25)	34 (21.25)
Medium (above 2 ha to 4 ha)	19 (23.75)	9 (11.25)	28 (17.50)
Large (more than 4 ha)	42 (52.50)	6 (7.50)	48 (30.00)
Classification of farmers based on source of irrigation			
Open-well	12 (15.00)	8 (10.00)	20 (12.50)
Canal	12 (15.00)	8 (10.00)	20 (12.50)
River	18 (22.50)	11(13.75)	29 (18.13)
Bore-well	26 (32.50)	47 (58.75)	73 (45.63)
Other	12 (15.00)	6 (7.50)	18 (11.25)
Farming experience wise distribution of farmers			
1-5 years	12 (15.00)	20 (25.00)	32 (20.00)
6-12 years	44 (55.00)	38 (47.50)	82 (51.25)
Above 12 years	24 (30.00)	22 (27.50)	46 (28.75)
Social participation wise distribution of farmers			
Gram panchayat	31 (38.75)	7 (8.75)	38 (23.75)
Co-operative sector	15 (18.75)	4 (5.00)	19 (11.88)
Farmers group	24 (30.00)	8 (10.00)	32 (20.00)
No participation	10 (12.50)	61 (76.25)	71 (44.37)
Mass media wise exposure distribution of farmers			
Low	23 (28.75)	22 (27.50)	45 (28.12)
Medium	28 (35.00)	31 (38.75)	59 (36.88)
High	29 (36.25)	27 (33.75)	56 (35.00)
Risk orientation wise distribution of farmers			
Low	0 (00.00)	36 (45.00)	36 (22.50)
Medium	50 (62.50)	41 (51.25)	91 (56.88)
High	30 (37.50)	3 (3.75)	33 (20.62)
Economic motivation-wise distribution of farmers			
Low	0 (00.00)	34 (42.50)	34 (21.25)
Medium	50 (62.50)	45 (56.25)	95 (59.38)
High	30 (37.50)	1 (1.25)	31 (19.37)

(Source: Field survey, 2024)

seven adoption-related statements were used to estimate the overall level of adoption. As presented in Table 2, the overall adoption level of drone technology among chilli farmers was 59.11%, indicating a moderate level of adoption. The findings also suggest that although adopters are willing to continue using drone technology, they still face challenges related to training, technical support and investment, indicating the need for institutional support to enhance effective adoption. It has been observed through survey that a growing awareness among farmers regarding agricultural technologies. Furthermore, an increasing number of farmers are expressing interest in adopting technology for agricultural purposes in the future.

Awareness of drone technology among chilli farmers

Awareness relates to the level of knowledge or familiarity individuals or communities have regarding a specific technology, concept, or issue. The overall awareness of drone technology among chilli farmers is shown in the below Table 3. Table 3 shows the awareness of drone technology in chilli farming among farmers. From the table 3 it is clear that awareness of drone technology is 55.99%, which indicates medium level of awareness. It became evident that farmers who possess awareness about drone technology are more than those who have adopted it. This is primarily due to incomplete understanding of its benefits and limited knowledge about the technology itself.

Table 2. *Adoption of drone technology* (n = 80)

Sr. No.	Statements	Yes (%)	No (%)
1	Have you ever used drones for chilli farming?	100	0
2	Are you currently using drones for any agricultural activities, including chilli farming?	100	0
3	Are you planning to continue drone technology for chilli farming in the future?	92.50	7.50
4	Would you be willing to invest in drone technology for chilli farming if provided with the necessary support and resources?	10	90
5	Do you know any other chilli farmers who are using drones for their farming activities?	100	0
6	Have you received any training specifically on the use of drones in agriculture?	7.50	92.50
7	Do you have access to technical support or assistance for operating drones on your farm?	3.75	96.25
Mean		59.11	40.89

Constraints and suggestions in adoption of drone technology

A study was conducted to identify the constraints faced by chilli farmers in adopting drone technology and to develop suitable suggestions for improving its adoption. The data was gathered from 160 farmers and the table below shows the mean score and rank of different constraints faced by the farmers. The above Table 4, indicates different mean scores for constraints in the adoption of drone technology. Majorly, the inadequate size of land holdings for the adoption has got highest mean score of 2.02 followed by lack of knowledge and skill about drone technology (1.99), inadequate training and demonstrations (1.97), high initial cost (1.93) and limited payload capacity (1.90).

Based on the identified constraints and field observations, several measures are suggested to enhance the adoption of drone technology in chilli farming. Regular training programmes, field demonstrations,

Table 3. *Awareness of drone technology* (n = 160)

Sr. No.	Statements	Yes (%)	No (%)
1	Are you aware of the existence of drone technology in agriculture, specifically for chilli farming?	63.75	36.25
2	Do you know the potential benefits of using drones in chilli farming, such as crop monitoring and pest detection?	56.25	43.75
3	Are you familiar with the different types of drones available for agricultural purposes?	54.37	45.63
4	Do you know the recommended methods for applying drones in chilli farming?	50.00	50.00
5	Are you aware of the regulatory requirements or restrictions related to the use of drones in agriculture?	59.37	40.63
6	Do you know where to access training or educational resources on drone technology for chilli farming?	58.12	41.88
7	Are you familiar with the costs associated with purchasing and operating drones for chilli farming?	51.25	48.75
8	Do you know how drones can contribute to improving the productivity and profitability of chilli farming?	60.62	39.38
9	Are you aware of any government initiatives or support programs promoting the adoption of drone technology in agriculture?	62.50	37.50
10	Have you ever participated in any workshops, seminars, or events related to drone technology in agriculture?	43.75	56.25
Mean		55.99	44.01

Table 4. *Constraints faced by farmers in the adoption of drone technology*

Sr. No.	Constraints	Score	Rank
1.	High initial cost	1.93	IV
2.	Lack of knowledge and skill about drone technology	1.99	II
3.	Inadequate size of land holdings for the adoption	2.02	I
4.	Inadequate training and demonstrations	1.94	III
5.	Limited payload capacity	1.90	V

and farmer awareness campaigns should be organized to improve technical knowledge and operational skills related to drone use. Establishing custom hiring centres at the village or block level would enable small and marginal farmers to access drone services without making substantial investments. Financial support through subsidies, low-interest credit facilities, and government incentive schemes would help reduce the burden of the high initial investment cost. Extension agencies should strengthen advisory services by providing timely technical guidance and information regarding government support programmes. Furthermore, improving drone payload capacity and promoting location-specific drone service models can enhance operational efficiency and encourage wider adoption among chilli growers.

CONCLUSION

Drone provides several benefits to farmers in the agricultural sector, including increased efficiency, better yields and low costs. However, there are also concerns about job loss and lack of knowledge and training that can withdraw farmers by adopting this technique.

Agricultural technology in India has undergone significant transformation over the past few decades, driving productivity and sustainability in the sector. Traditional farming practices have increasingly been supplemented by modern technologies such as precision agriculture, remote sensing, and advanced irrigation systems. The introduction of high-yield variety seeds, coupled with improved fertilizers and pesticides, has boosted crop production. Drone technology is rapidly transforming agriculture in India, offering innovative solutions to enhance productivity and sustainability. Based on these findings, it can be concluded that the study shows that the adoption and awareness level of drone technology in chilli farming is at a medium level. The study recommends strengthening farmer training, expanding extension services, promoting custom hiring centres, improving access to financial support through subsidies and credit, and enhancing technical support to overcome the identified constraints and accelerate the adoption of drone technology in chilli farming.

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CONFLICTS OF INTEREST

Authors declare that no competing interest exist.

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