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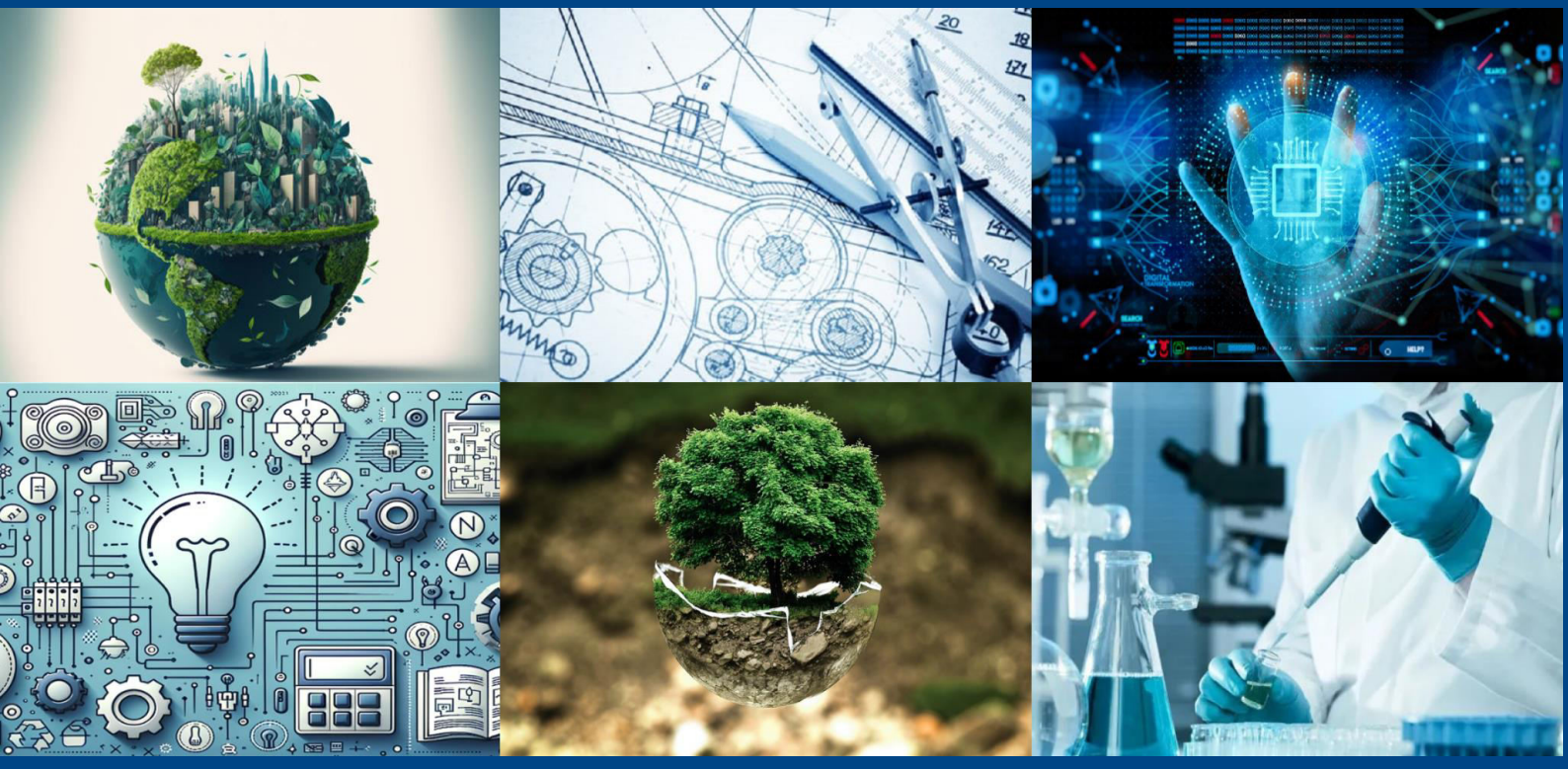

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A Study of Changing Farming Patterns and Farmer Buying Behaviour in Buldhana District

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ABSTRACT: This study examines the changing farming habits and purchasing patterns of farmers in Maharashtra's Buldhana district, highlighting technology adoption, sustainable agriculture techniques, and purchasing choices. Drawing from data collected from 73 farmers, the research identifies major influencers of contemporary farming, including mechanization, mobile apps, and water-saving technologies. Yet it also recognizes major hindrances to its widespread implementation, including financial costs, low awareness, and restricted availability of resources.

Furthermore, the study analyzes the determinants of farmers' buying behaviour, which encompass price responsiveness, quality of the product, and word-of-mouth and dealer recommendations. Government schemes such as PM-KISAN and Kisan Credit Cards (KCC) are also observed to have a notable impact on buying behaviour. The study concludes by providing suggestions for policy interventions targeted at overcoming adoption constraints and enhancing sustainable agriculture, presenting useful insights for policymakers and agricultural institutions that aim to enhance productivity and sustainability across the region.

KEYWORDS: Farming practices, Farmer purchasing behaviour, Buldhana district, Technology adoption, Sustainable agriculture, Government programs, Agricultural mechanization, Mobile farming apps, Water-saving technologies, Agricultural input purchases, PM-KISAN, Kisan Credit Card (KCC).

I. INTRODUCTION

Agriculture is an extremely important sector in the Indian economy, especially for rural India, where it serves as a livelihood source for the majority of its population. Over the past decades, the scene in agriculture has seen significant modifications owing to progress in technology, changes in the market scenario, changing government policy, and the challenges posed by climate. In places such as Buldhana, Maharashtra, such changes are gaining momentum as farmers more and more adopt new-age technologies and practices for enhancing productivity and ensuring sustainable longevity. Simultaneously, farmer buying habits in terms of farm inputs like seeds, pesticides, equipment, and fertilizers are also being re-shaped against these developments.

Buldhana district of Maharashtra, with its majority composition as an agriculture region, offers a singular context in which one can examine factors contributing to the above changes. Local farmers are embracing new technologies like mechanized tools, drip irrigation, and farming smartphone apps, while integrating sustainable strategies like organic agriculture and water harvesting practices. Though interest in the technologies is there, most farmers encounter challenges such as high financial demands, inadequate technical expertise, and limited availability of resources. This research aims to analyze the changing patterns of farming in Buldhana and identify the reasons behind farmers' buying behaviour. Through an investigation of these issues, the research hopes to make meaningful contributions towards the role of technological advancements, government initiatives, and social reasons in determining the future of farming in the district. The findings of this research are expected to inform policies, extension, and marketing policies that address constraints and support sustainable agricultural development of farmers in the region.

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▪ **Objectives**

1. Examine adoption of Technological Advancements
2. Assess the Adoption of Sustainable Practices
3. Analyse Farmers' decision making process
4. Identify impact of opinion leaders and reference groups
5. To identify types of Government schemes availed

II. LITERATURE REVIEW

1. Technological Advancements and Farming Practices:

The adoption of modern farming technologies has been a key focus in recent agricultural research. According to Raj (2018), technological innovations such as mechanized equipment, drip irrigation, and precision farming are significantly improving agricultural productivity and resource management. In particular, the use of mobile apps and digital platforms has emerged as a tool for farmers to access real-time information, weather updates, and guidance on pest control and irrigation (Sharma et al., 2020). A study by Singh et al. (2019) found that farmers using mobile technology reported higher crop yields and better management practices. However, the adoption of these technologies remains uneven due to barriers like high initial investment costs, lack of awareness, and insufficient technical knowledge (Sharma, 2017).

2. Sustainable Farming Practices:

Sustainable farming practices have gained increasing attention as concerns over environmental degradation, water scarcity, and soil health rise. Several studies emphasize the importance of sustainable methods such as organic farming, crop rotation, and Integrated Pest Management (IPM) in maintaining long-term soil health and improving yields. In a study by Patel et al. (2016), farmers who adopted organic farming methods in Maharashtra reported not only higher profits but also improved soil fertility. Similarly, water conservation techniques like rainwater harvesting and drip irrigation are highlighted as crucial for addressing water scarcity, particularly in regions like Buldhana, which faces erratic rainfall patterns (Reddy & Ramaswamy, 2020). Despite the benefits, farmers often encounter challenges in adopting these practices, including high initial costs and lack of support from local agricultural institutions (Jadhav, 2018).

3. Farmer Buying Behaviour and Decision-Making:

Farmers' purchasing behaviour has been shaped by a complex array of factors, including price sensitivity, product quality, peer recommendations, and government support. Studies on agricultural marketing and buying behaviour indicate that price is often the most significant factor influencing purchasing decisions (Rathore & Singh, 2017). However, the reputation of the brand, quality of the product, and advice from dealers and fellow farmers also play critical roles (Singh, 2021). Additionally, government schemes such as PM-KISAN and Kisan Credit Cards (KCC) are found to have a considerable impact on farmers' ability to purchase inputs and adopt new technologies (Nair et al., 2019).Research by Kumar & Singh (2020) highlights that the availability of subsidies and credit facilities often leads to an increase in the adoption of modern farming practices.

4. Influence of Opinion Leaders and Reference Groups:

Social networks and opinion leaders, such as fellow farmers, agricultural officers, and dealers, play a crucial role in shaping farmers' decisions. According to Verma & Kumar (2015), peer influence is one of the most important factors driving the adoption of new technologies in rural areas. Farmers tend to rely heavily on the experiences and recommendations of other farmers within their community when making decisions about crop choices, seed purchases, and technology adoption. In some cases, agricultural extension officers and government initiatives serve as key sources of information, particularly in regions where traditional knowledge might limit the understanding of newer farming practices (Bansal & Tiwari, 2018).

5. Government Schemes and Policies:

Government schemes have been critical in promoting agricultural development and technology adoption in India. Programs such as PM-KISAN, the National Mission on Sustainable Agriculture, and Kisan Credit Cards (KCC) provide financial support, subsidies, and credit facilities to farmers, helping to reduce their financial constraints. A

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study by Singh (2020) found that government subsidies significantly influenced the purchasing behaviour of farmers in rural areas, leading to increased adoption of mechanized farming tools and advanced irrigation systems. However, the effectiveness of these schemes depends on the accessibility of information, the bureaucratic process, and the willingness of farmers to engage with these programs (Patel & Kumar, 2017).

6. Challenges in Adoption and the Way Forward:

Despite the availability of modern farming technologies and government support, several challenges impede their widespread adoption in rural areas. High initial costs, lack of awareness, and technical skills remain significant barriers for farmers, particularly small-scale farmers (Dixit & Sharma, 2021). Additionally, there is a need for targeted interventions, including agricultural extension services, awareness programs, and easier access to credit facilities to encourage greater adoption of sustainable farming practices (Singh & Kumar, 2021). Studies suggest that bridging the knowledge gap and providing adequate resources can help enhance farmers' decision-making capabilities, ultimately contributing to improved agricultural productivity and sustainability (Verma, 2018).

III. METHODOLOGY METHOD OF DATA COLLECTION

- Surveys and Questionnaires

To collect quantitative data on farmers' practices, preferences, and purchasing Behaviour related to seeds and fertilizers.

- Interviews

To gain in-depth qualitative insights into farmers' experiences, decision-making Processes, and attitudes towards technological advancements and sustainable Practices.

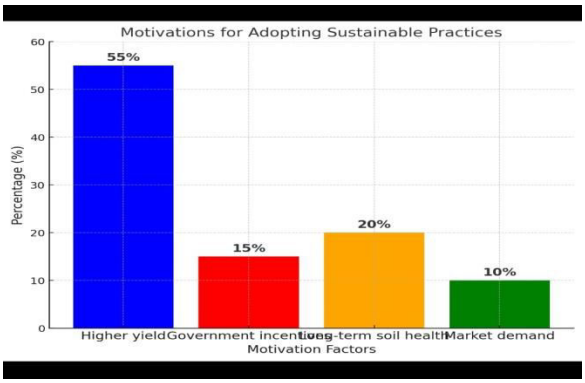
- Field Observations

Sample Size: 100 (No. of Respondent)

Sampling Techniques : Cluster Sampling

Data analysis:

Bar Chart for motivation for adapting sustainable practices



The chart illustrates the primary motivations behind farmers' use of sustainable practices. Most (55%) prioritize increased yields, highlighting economic value. Approximately 20% cite soil health as a priority, demonstrating growing environmental concern. 15% are motivated by government incentives, indicating the necessity for better policy enforcement. Market demand is the lowest at 10%, reflecting low consumer-driven incentive. In general, the statistics emphasize that although profitability is the primary stimulus, improved support and awareness can also enhance sustainable agriculture.

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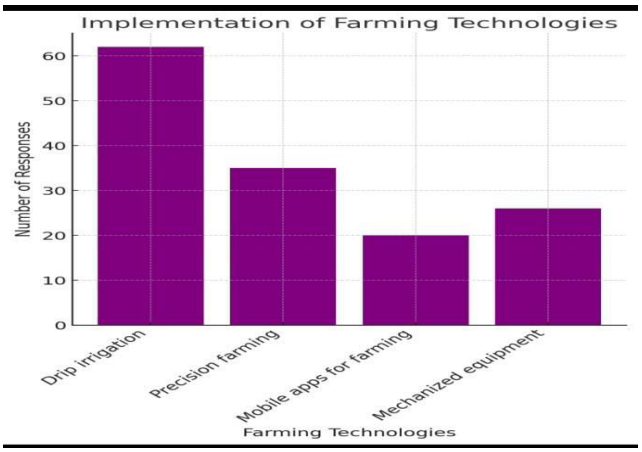
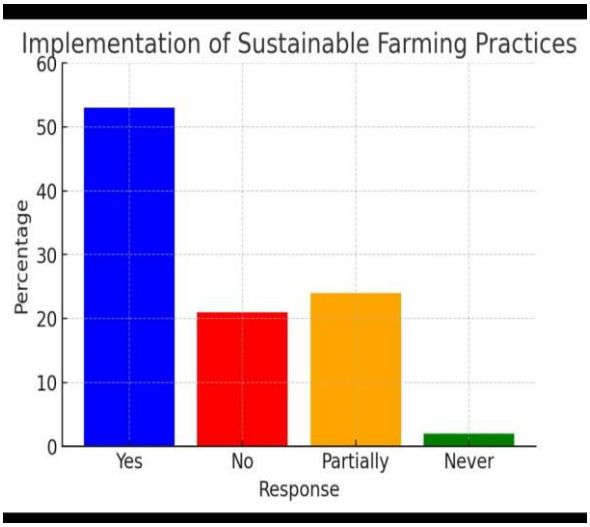
Bar Chart for implementation Modern Farming Technologies



The figure shows the use of different farm technologies. Drip irrigation has the highest adoption, reflecting maximum emphasis on water conservation. Precision farming is moderately adopted, reflecting increasing interest in optimizing resources. Mechanized farm equipment is adopted by a few farmers, while conventional methods still exist. Farming mobile apps have the least adoption, reflecting limited availability or awareness. Generally, even with the takeup of current technologies, space for greater support and awareness remains for improving usage.

Bar Chart for implementation of sustainable farming practices



The chart indicates the number of farmers who have embraced sustainable agriculture. Most, more than 50%, have incorporated these approaches, which is a positive indication. Approximately 20% have not yet accepted them, but another proportion apply them to some extent, which means there are challenges to complete adoption. Few have never thought about sustainability. The results indicate that although advancement is seen, additional resources and facilitation can increase adoption.

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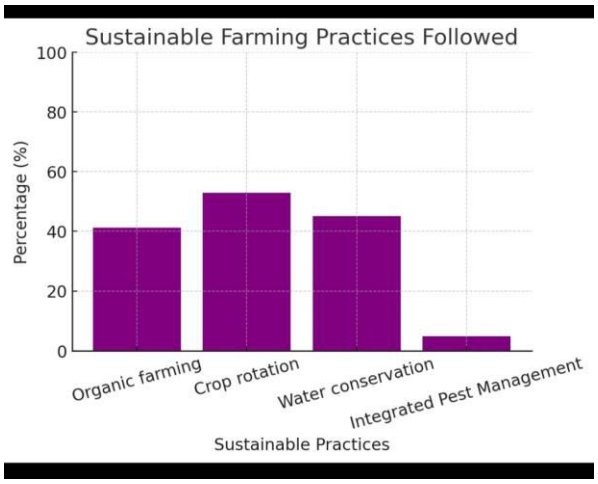
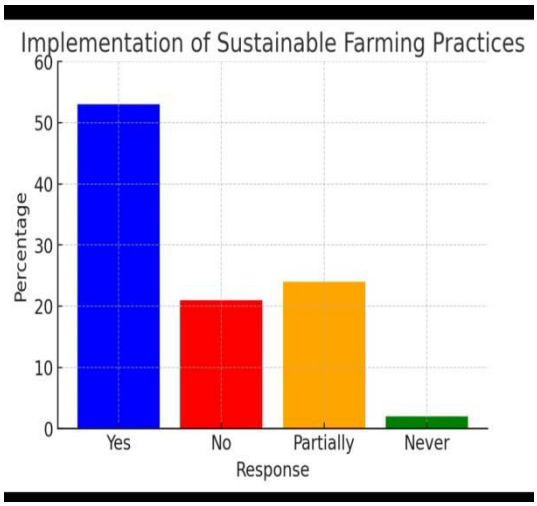
Bar chart for sustainable farming practices followed



The chart illustrates the use of different sustainable agricultural practices. Crop rotation is most practiced, showing measures to maintain soil health. Conservation of water is also widely used, emphasizing efficient use of water. Organic agriculture is followed by a large section of farmers, showing the change towards natural processes. IPM has the lowest adoption, showing the lack of awareness and incentive for pest management alternatives.

Bar Chart for implementation farming practices



The line graph signifies the level to which farmers adopted sustainable farming methods. More than half of the interviewees have embraced these methods fully, showing a positive change towards sustainability. A sizeable segment has partially adopted them, reflecting the changes are still happening. Still, a majority of them have not adopted these techniques yet, reflecting that there needs to be greater awareness and facilitation. A minority of farmers have always operated using sustainable methods, underlining the necessity for focused efforts to promote further take-up.

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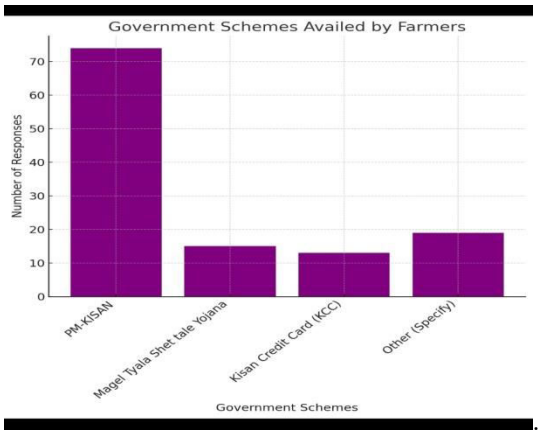
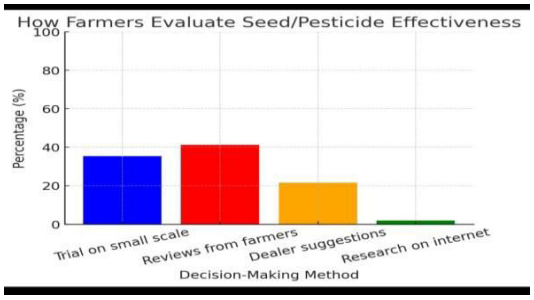
Bar Chart for Influence of Government Schemes



The graph shows the usage of different government schemes by farmers. PM-KISAN is the most widely used scheme, reflecting its extensive reach and influence. Other schemes, including Magel Tyala Shet Tale Yojana and the Kisan Credit Card (KCC), have been used by a relatively smaller group of farmers. Moreover, a significant number of respondents have used other unspecified schemes, reflecting the wide variety of government assistance available to farmers.

Bar Chart for evaluation of seeds / pesticide



The graph illustrates the different methods farmers use to evaluate the efficacy of seeds and pesticides. The most popular method is depending on advice from other farmers, followed by small-scale testing. Recommendations from dealers also play a role, while fewer farmers use online research as a guide. This information points to the importance of peer reviews and field testing in agricultural decision-making.

IV. FINDINGS

The information collected offers significant observations on the changing farming trends and buying habits of farmers in Buldhana district. A very large percentage of the respondents (74 %) were men, which indicates that men make most of the farming-related decisions in the area. While 60 % of the farmers have accepted modern farming technologies, an appreciable percentage (17%) has not accepted these technologies, and 4% are still unaware, which means there is a lack of proper awareness and access to these innovations.

Sustainable activities like crop rotation (52.9%) and water conservation (45.1%) are widely practiced, but IPM adoption is low (9.4%), indicating continued overdependence on chemical pesticides. For seed and pesticide choice, peer advice (41.2%) and local-scale trials (35.3%) are the primary determinants, while internet research is seldom undertaken (only 2%). This indicates a dearth of digital literacy and restricted exposure to credible agriculture information. In terms of scheme enrollment through government schemes, PM-KISAN is most used (72.5%), followed

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by other valuable programs, i.e., Magel Tyala Shet Tale Yojana and Kisan Credit Card (KCC) at 13.7% each. It is perhaps a reflection of poor awareness or a cumbersome process.

In general, the results reflect a slow transition towards modern and sustainable agriculture, but there are technology adoption gaps, awareness gaps of sustainability practices, decision-making gaps, and gaps in access to government assistance. These gaps may be filled by targeted interventions, farmer education programs, and enhanced access to agricultural inputs.

V. CONCLUSION

The study on changing farming techniques and farmer buying behavior in Buldhana district reveals a transition towards modern and sustainable agriculture with a gradual increase. While more than half of the farmers (56.8%) have adopted modern farm technology, a major section is still constrained by awareness as well as accessibility issues, reflecting the necessity for greater outreach and training activities. The research further discloses that most farmers still bank on the conventional decision-making system, 41.2% relying on suggestions from friends, while other digital tools continue to be unused (only 2% consult online research).

Practices like sustainable agriculture methods of crop rotation (52.9%) and water conservation (45.1%) are prevalent, but the application of Integrated Pest Management (IPM) is extremely low (9.4%), highlighting the lack of adequate education on environment-friendly methods of pest control. Moreover, although the PM-KISAN scheme has high enrollment (72.5%), other government schemes are not that popular, possibly because they face problems of awareness and accessibility.

To overcome these issues, it is essential to introduce farmer education schemes, digital literacy programs, and focused policy interventions. Creating awareness regarding new farming technologies, sustainable agriculture, and government schemes will enable farmers to take informed decisions, enhance productivity, and enhance their economic resilience. By providing systematic training, making government assistance easier to access, and enhancing advisory services, the agricultural economy in Buldhana can shift towards long-term development and sustainability.

VI. SUGGESTIONS FOR IMPROVEMENT

For promoting the uptake of new farming methods and strengthening decision-making by farmers, there are a number of priority areas that need attention. In the first instance, awareness and facilitation of access to new agricultural technologies need to be done. This could be done through training activities at the grassroots level, farm demonstrations, and collaboration with agricultural specialists. Most farmers are not aware or are reluctant to embrace new technologies because of the lack of understanding. Government institutions, agricultural schools, and private organizations must come together to fill this gap in understanding. Secondly, encouraging sustainable farming practices, particularly Integrated Pest Management (IPM), is essential. The low adoption rate of IPM shows that farmers still rely on chemical pesticides. To promote the adoption of sustainable and inexpensive pest control practices, programs such as workshops, bio-pesticide subsidies, and campaigns emphasizing the long-term benefit of maintaining soil health should be initiated.

Enhancing digital literacy is also critical. Currently, only a low percentage of farmers use the Internet for making decisions. Introducing them to online platforms, mobile applications, and government farm portals is crucial. Training through live experience so that farmers learn how to access and use these technologies can make them better-informed decision-makers for seeds, chemicals, and farm methods.

Further, making government schemes more accessible and available is imperative. Though PM-KISAN enjoys high take-up, other beneficial schemes are not utilized because they are not well known or because application is cumbersome. Efforts to simplify procedures, set up local facilitation centres, and spread awareness through cooperatives and self-help groups of farmers can overcome these impediments.

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Lastly, the strengthening of peer networks and advisory systems will enhance decision-making. As most farmers believe in peer advice, establishing organized farmer groups, conducting interactive meetings, and establishing mentorship programs with veteran farmers can help disseminate useful knowledge. Through these measures, farming in Buldhana district can be made more efficient, sustainable, and economically profitable, ultimately benefiting the farming community and increasing productivity.

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