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THE CONTINUING EFFECTS OF TECHNOLOGICAL PROGRESS ON AGRICULTURE FARMERS

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ABSTRACT

The impression of technology on agriculture comprises various fields, such as fertilizers, pesticides, seed technical developments, and more. New advances in the field of bioengineering and genetic alteration have led to increased pest resistance and enhanced crop production.

The implementation of machinery has resulted in improved cultivating and harvesting processes, as well as a noteworthy decrease in the need for manual labor. The developments in methods of irrigation and infrastructure for transportation, coupled with the reduction of waste generated by industrial machinery, are clearly observable across various sectors.

The variety of soil microorganisms is disrupted by agricultural technologies such as pesticides and land clearing, despite the fact that soil microbes play an essential part in the recycling of nutrients. It is possible for agrochemicals to cause contamination of the air, water, and eutrophication when they are used in excessive amounts.

By 2050, predictions specify that the global population will reach 9 billion, a situation that will likely present challenges associated with the reduction of agricultural land and the problem of food waste. Technology possesses the capacity to assist in addressing these challenges, consequently diminishing foreign exchange losses, augmenting productivity, and improving the livelihoods of farming communities.

Despite the considerable distance India must traverse to fully embrace contemporary agricultural methods, there exists an urgent necessity to enlighten farmers regarding the benefits of such practices. To forge a more promising future, it is imperative to transcend the confines of outdated mindsets and archaic traditions.

The integration of technology within the agricultural sector holds the promise of transforming India into a self-sufficient nation, reducing its dependence on external resources.

Keywords: Technology, Agriculture, Microorganisms, Challenges, and Transforming

1. INTRODUCTION

y from small wandering groups scattered around the world to a landscape dominated by the ever-expanding human food print. The surge in human population was facilitated only by ongoing breakthroughs in agricultural technologies that have increased agricultural production.

In India, agriculture is generally dependent on nature, but when we talk about climate change and global warming issues, they make farming uncertain and unpredictable. To increase farmers' profitability and income, it is crucial to educate them about modern technology and innovative farming practices in agriculture.

Invention in agriculture is powerful developments in farming practices, consequential in minimized possessions and enhanced efficiency. This has a positive impact on farmers. In the 21st century, much has changed in Indian agricultural practices over the years. In current farming strategies Indian farming is a mix of both traditional methods and modern technology.

Both traditional and modern methods have transformed crop cultivation, resulting in more efficient resource management techniques in agriculture. Technology's influence on agriculture today is undeniable. Researchers, scientists, engineers, and farmers are continuously working hard to innovate or develop new technologies and strategies that help solve farming, crop, and livestock problems.

Modern agricultural development and technologies, such as drones, sensors, machines, devices, and information technology, operate very differently from those of earlier farming days. Today's agricultural practices regularly use sophisticated technologies, which include floating images, robots, drones, weather and moisture sensors, and GPS technology.

The continuous development in modern precision agriculture and robotic systems makes agricultural methods safer, profitable, efficient, and more naturally approachable.

2. LITERATURE REVIEW

Madhu Shekar et al., "Analysis of Farmer's Perception and Usage of Social Media in Agriculture," International Journal of Bio-resource and Stress Management, 2023.

The paper by MadhuShekar et al. (2023) explores the significance of social media as a vital source of agricultural information for farmers in Telangana, India. This study is timely due to the growing reliance on digital technologies in agriculture and the need for effective communication to improve farming practices. Utilizing an ex-post facto research design, the authors examine farmers' usage patterns, preferences, and frequency of social media engagement.

Agriculture is a vital sector in India, significantly contributing to the economy and employing a large portion of the population. However, traditional agricultural extension services face challenges, including limited access to information for farmers (Shanmukha et al., 2022). The National Sample Survey Organization (2014) noted that many farmers lack reliable sources of agricultural information, making social media a promising alternative for disseminating knowledge and connecting farmers with extension agents (Carr & Hayes, 2015; Joshi & Dhaliwal, 2019). This study was conducted from June 2021 to February 2022 across twelve villages in Bhuvanagiri and Jangaon districts, involving 120 farmers selected through purposive and random sampling.

Data were collected via structured interviews focusing on social media usage patterns, preferences, and perceived benefits. The findings revealed that 84.16% of farmers used mobile phones or social media for agricultural information, with YouTube being the most preferred platform (67.50%) followed by WhatsApp (44.17%). The study highlights the significant role of social media in enhancing communication among farmers and suggests that improving digital literacy could further benefit agricultural practices.

The study revealed that 47.5% of respondents were middle-aged, with 80% having at least a high school education; 84.16% utilized mobile phones or social media for agricultural information. YouTube was the most popular platform for sharing information (67.5%), followed by WhatsApp (44.17%), and most farmers reported using social networking sites daily.

The analysis indicated positive correlations between social media usage and factors such as education level and farm size, while age and farming experience had negative correlations.

Venkat Ananth (2021), Tractor to Twitter: How farmers developed their social media plan to convey their views

The article highlights the crucial role of social media in the Indian farmers' protests, particularly through the strategies employed by the Bharatiya Kisan Union (BKU) and other farmer groups. This review summarizes key themes related to digital activism and its impact on public discourse.

The farmers' protests in India illustrate the power of digital activism, as grassroots organizations like the Bharatiya Kisan Union (BKU) effectively use social media platforms to communicate and mobilize support. Through their Facebook page, which has over 312,000 followers, the BKU disseminates vital updates and counters misinformation, demonstrating a proactive approach essential for shaping public perception during protests.

Recognizing the threat posed by false narratives, the farmers established an IT cell to monitor and debunk misleading claims, emphasizing the importance of counter-narratives in maintaining legitimacy. The farmers' robust online presence has also reshaped public discourse surrounding agricultural policies in India, as opposing narratives struggle to define the farmers effectively, indicating a shift in how these protests are perceived.

Abhishek Beriya (2020), Digital Agriculture: Challenges and Possibilities in India, ICT India Working Paper

The paper "Digital Agriculture: Challenges and Possibilities in India" by Abhishek Beriya examines how digital technologies can enhance agricultural productivity and farmer incomes in India. It highlights the need for efficient agricultural practices to improve low farmer incomes, emphasizing the role of Information and Communication Technologies (ICT).

Beriya defines Digital Agriculture as an integration of concepts like Precision Agriculture, Smart Farming, and Agriculture 4.0. These approaches utilize technologies such as IoT, AI, and data analytics to optimize farming practices and resource management.

The paper highlights several innovative applications of digital agriculture currently utilized in India, including AgroPad, an AI tool for rapid soil and water testing; Plantix, a mobile app for diagnosing plant diseases via image recognition, now accessible through WhatsApp; and farm equipment rental services like Trringo and EM3 Agriservices, which allow farmers to rent machinery on a pay-per-use basis.

Additionally, drones are employed for effective locust control and mapping properties under the Swamitva scheme, which helps farmers access formal financial services. These applications demonstrate how digital tools can tackle significant challenges in resource management, disease control, and technology access for farmers.

Beriya identifies several challenges to implementing digital agriculture in India, including cost barriers, as high technology expenses limit adoption among smallholder farmers; technological literacy, where many farmers lack the skills to effectively use digital tools; infrastructure issues, particularly poor internet connectivity in rural areas that hampers progress; and a lack of policy support, highlighting the need for government initiatives to foster the growth of digital agriculture.

Adil Yousaf (2024), The Impact of Social Media on Agriculture: Bridging the Gap between Farmers and Consumers

Adil Yousaf's article, "The Impact of Social Media on Agriculture: Bridging the Gap between Farmers and Consumers," explores how social media is transforming the agricultural sector. It highlights the ways platforms like Facebook and Instagram enhance interactions between farmers and consumers, promote sustainable practices, and improve marketing strategies.

A key point in the article is that social media helps bridge the gap between farmers and consumers. By sharing real-time updates about their farms through photos and videos, farmers can foster trust and transparency. This direct engagement allows consumers to better understand food production, which is essential for building strong relationships.

Social media also plays a crucial role in promoting sustainable agriculture. Farmers can educate their audiences about eco-friendly practices, such as organic farming and water conservation. Increased awareness through social media can lead to greater consumer support for sustainable products.

Social media empowers farmers to advocate for their industry by sharing personal stories and addressing challenges. This engagement can influence policy discussions, enabling farmers to have a voice in important decisions affecting agriculture.

3. METHODOLOGY

3.1. OBJECTIVES OF THE STUDY

- **Role of Social Media:** To explore how social media and information technology influence agri-business.
- **Future Scope:** To assess the potential future applications of social media in agricultural marketing.
- **Current Applications:** To identify various social media tools utilized in India's agri-business sector.

3.2. RESEARCH GAP/ LIMITATIONS

- **Geographical Limitations:** The research is focused on urban regions of India, which may not accurately reflect the experiences and challenges faced by rural farmers who may have different access to technology and resources.

- **Digital Divide:** There exists a significant digital divide between urban and rural areas, affecting internet access and digital literacy, which can skew the findings and limit the generalizability of the results to all farmers in India.
- **Resistance to Change:** Some farmers might resist adopting new technologies due to traditional practices or skepticism about their effectiveness, which could affect participation rates and data reliability.
- **Short-Term Focus:** The study may overlook long-term impacts as farmers might focus on immediate benefits rather than considering future implications of adopting digital advancements.

3.3. RESEARCH METHODOLOGY

Research methodology refers to the systematic approach used to conduct research, outlining the steps for data collection and analysis. This study employs a descriptive survey method, which analyzes current conditions and relationships among variables without manipulation. The focus is on understanding the present state of social media's impact on agri-business marketing in India.

3.4. COMPONENTS OF METHODOLOGY

- **Research Method:** Descriptive survey to interpret existing data and relationships.
- **Sampling:** A sample of 100 farmers will be surveyed to generalize findings.
- **Data Collection Tools:** Utilization of Likert scales for measuring responses, alongside dichotomous and nominal questions.
- **Statistical Techniques:** Various statistical methods will be applied to analyze the collected data.

3.5. SCORING

Respondents' scores will be calculated based on their responses to a Likert scale ranging from "strongly disagree" to "strongly agree," as well as through dichotomous questions (Yes/No) and nominal questions without order. High scores will indicate stronger agreement with the study's objectives.

3.6. RESULTS

3.6.1. USES OF SOCIAL MEDIA

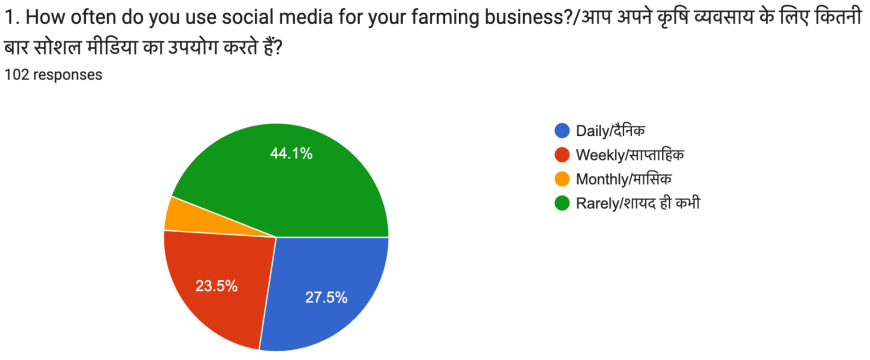

CHART 01

The responses indicate that a significant portion of farmers (52%) uses social media either daily or weekly, suggesting a strong engagement with these platforms. However, a notable 45 respondents (approximately 37%) report using social media rarely, indicating that while some farmers are actively leveraging these tools, a considerable number may not be fully utilizing them for their farming business. This disparity could reflect varying levels of digital literacy or access to technology among different age groups or regions.

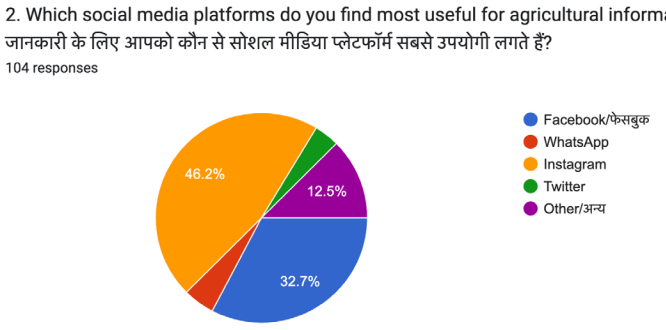

CHART 02

Instagram emerges as the most favored platform for agricultural information, with 48 responses, highlighting its visual appeal and effectiveness in showcasing farming practices. Facebook is also popular, but WhatsApp and Twitter have significantly lower usage among respondents. The "Other" category suggests that some farmers may be using niche platforms or local forums, indicating a diverse approach to sourcing agricultural information.

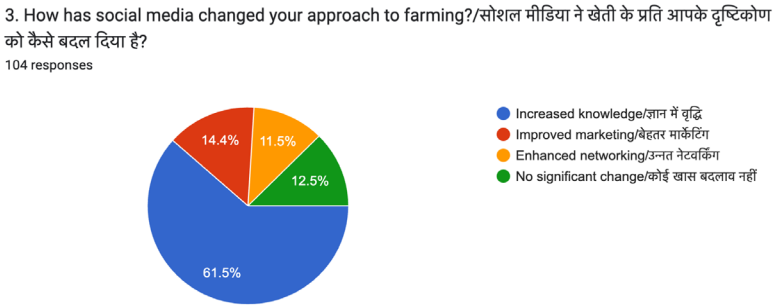

CHART 03

The overwhelming majority (64 respondents) report that social media has increased their knowledge about farming, demonstrating its role as an educational tool. While improved marketing and enhanced networking are acknowledged, they are less emphasized, suggesting that the primary benefit perceived by farmers is knowledge acquisition rather than business development or community building.

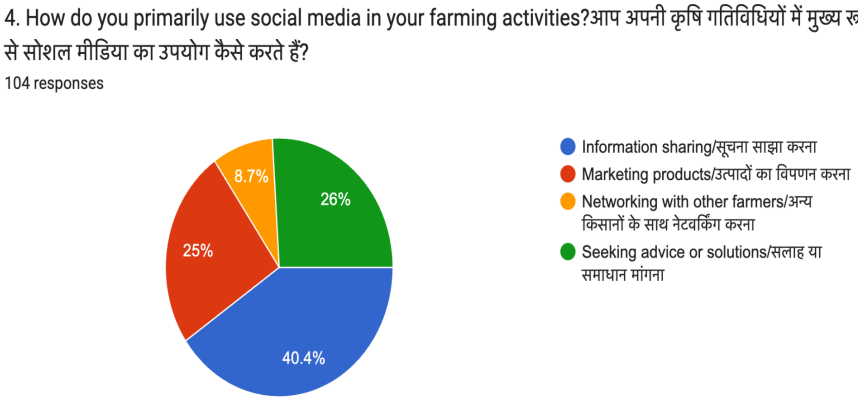

CHART 04

Information sharing is the predominant activity on social media among farmers (42 responses), reinforcing the idea that these platforms serve as vital sources of knowledge. Marketing is also important but less prevalent than expected,

which may indicate a focus on education over direct sales. Networking and seeking advice have lower response counts, suggesting that while these functions exist, they are not the primary motivations for using social media.

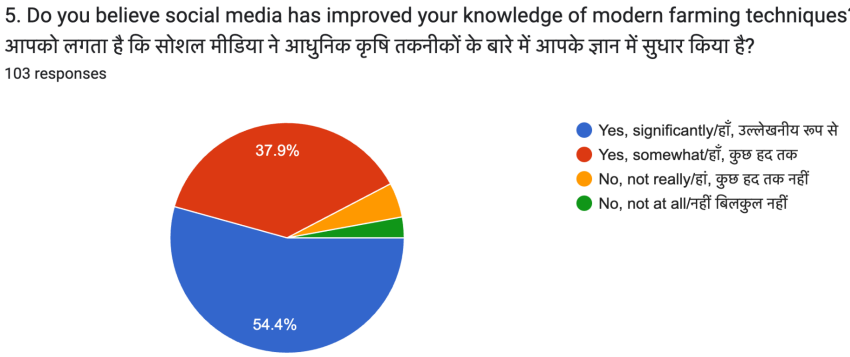

CHART 05

A strong majority (95 respondents) believe that social media has improved their understanding of modern farming techniques. This finding supports the earlier conclusion about the educational value of social media in agriculture. The low number of negative responses indicates that most farmers recognize the benefits of these platforms in enhancing their knowledge base.

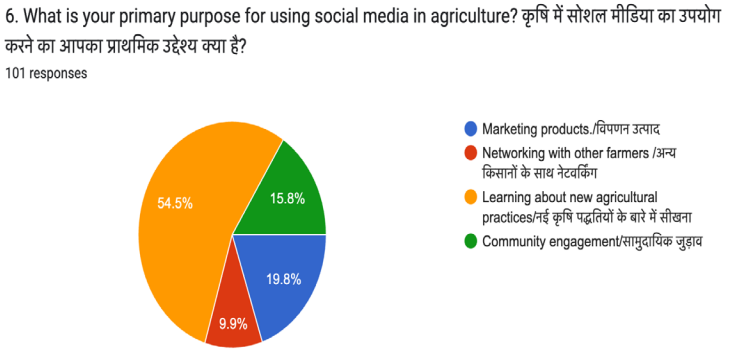

CHART 06

Learning about new agricultural practices is clearly the primary purpose for using social media among respondents (55 responses), further emphasizing its role as an educational tool. Marketing and networking are secondary purposes, which aligns with previous findings that suggest knowledge acquisition is prioritized over direct sales efforts.

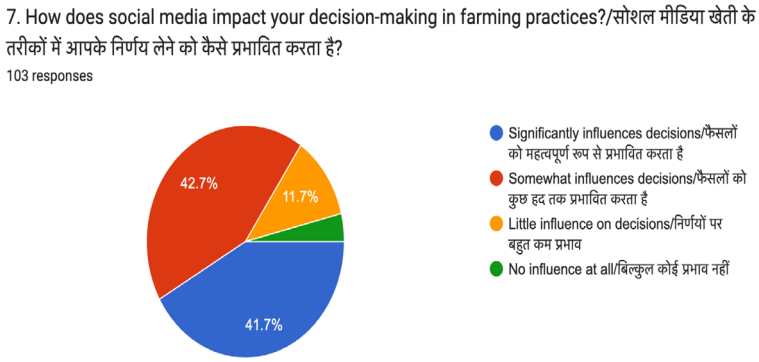

CHART 07

The results show that social media significantly influences decision-making for a combined total of 87 respondents (43 + 44), indicating that these platforms play an important role in shaping farming practices. The small number of respondents reporting little to no influence suggests that most farmers consider social media a valuable resource in their decision-making processes.

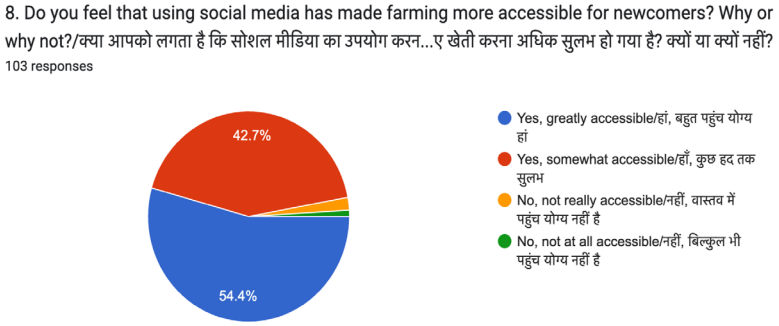

CHART 08

A substantial majority (98 respondents) feel that social media has made farming more accessible for newcomers. This positive perception indicates that digital platforms can lower barriers to entry in agriculture by providing essential information and support to new farmers.

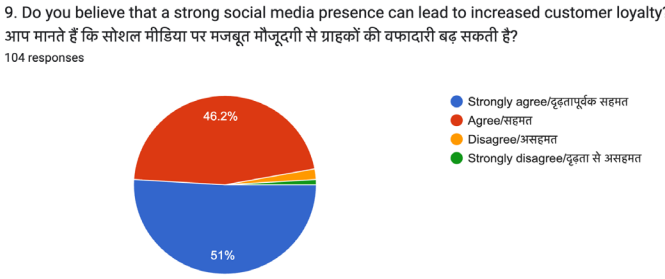

CHART 09

The overwhelming consensus (101 respondents) supports the notion that a strong social media presence can enhance customer loyalty. This finding highlights the importance of digital engagement in building lasting relationships with customers in agribusiness.

3.6.2. IMPACT OF SOCIAL MEDIA IN AGRICULTURAL ADVERTISING AND MARKETING

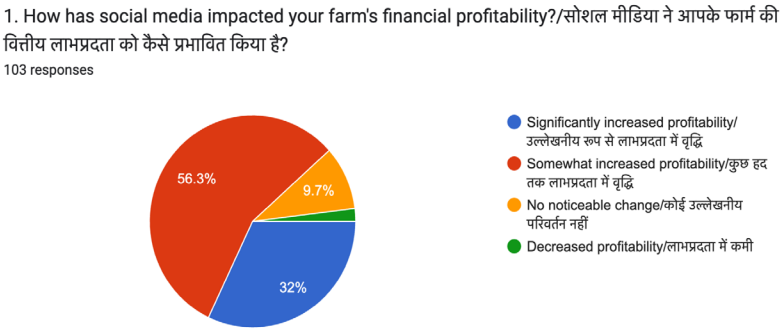

CHART 10

A majority of respondents (91 of 103) report that social media has positively influenced their farm's profitability, with 58 indicating a somewhat increased profitability. This suggests that social media serves as an effective tool for

enhancing financial outcomes in agriculture. The low number of respondents reporting decreased profitability (2) indicates that negative impacts are rare.

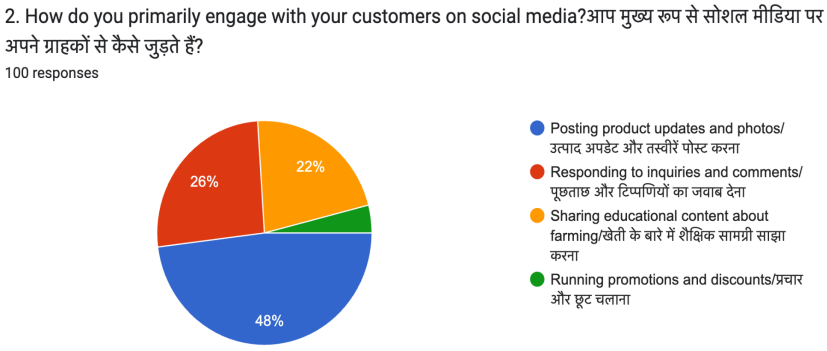

CHART 11

The primary method of engagement is through posting product updates and photos, which highlights the importance of visual content in attracting customer interest. Responding to inquiries is also significant, indicating a focus on customer service. The low engagement through promotions suggests that while discounts may be less frequent, they are not the main strategy.

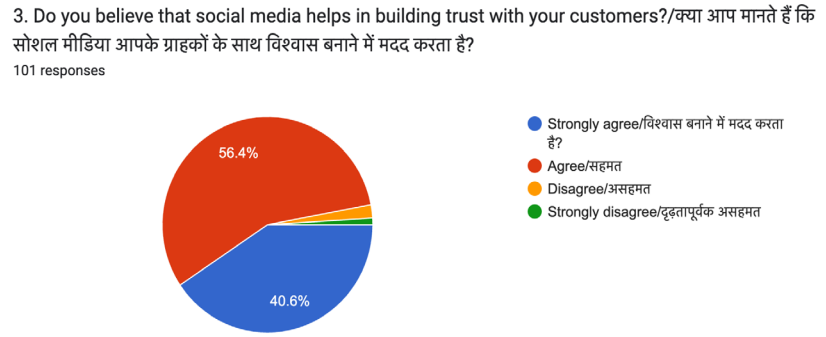

CHART 12

An overwhelming majority (98 out of 101) believe that social media plays a crucial role in building trust with customers. This reflects the platform's potential to foster relationships and transparency between farmers and consumers, essential in the agricultural sector.

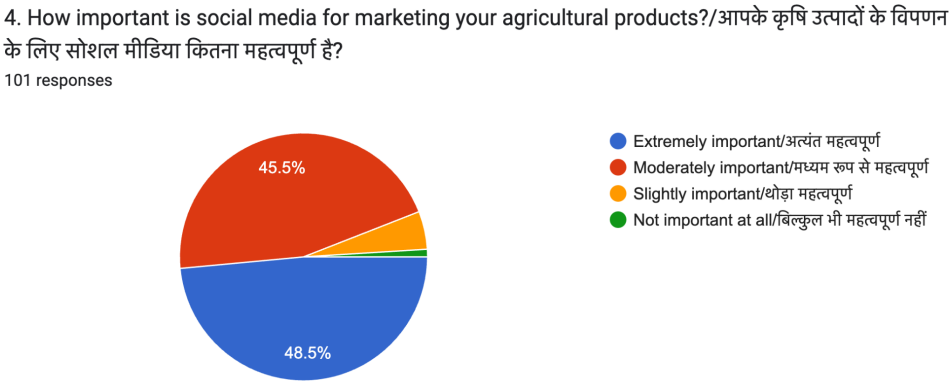

CHART 12

The responses indicate a strong consensus on the importance of social media for marketing agricultural products, with nearly all respondents considering it at least moderately important. This underscores the necessity for farmers to leverage social media as a marketing tool.

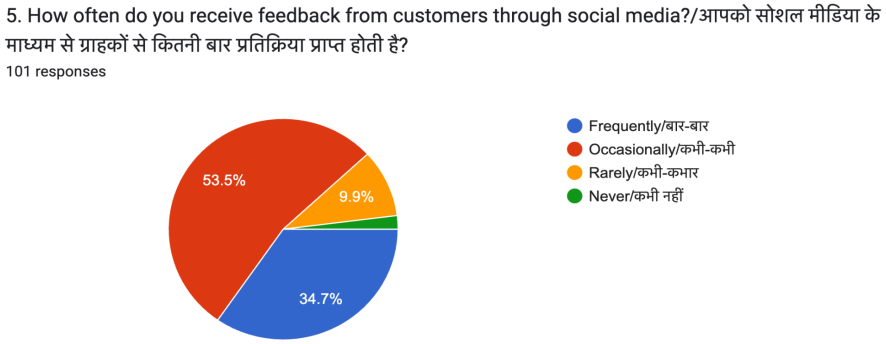

CHART 13

Most respondents receive feedback from customers either frequently or occasionally, suggesting that social media serves as an effective channel for communication and feedback collection. This interaction can help farmers adapt their practices based on customer preferences.

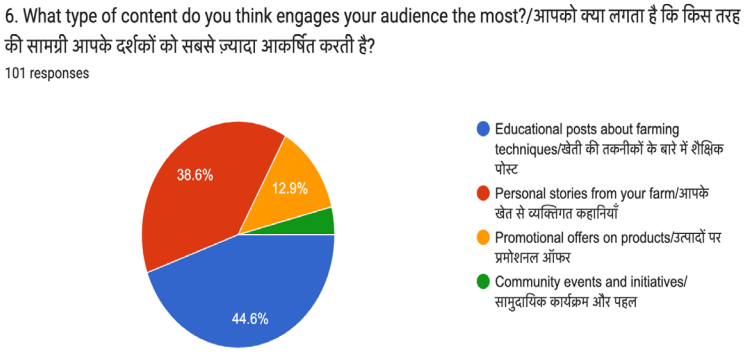

CHART 13

Educational content is identified as the most engaging type, emphasizing the audience's interest in learning about farming practices. Personal stories also resonate well, indicating that authenticity plays a vital role in engagement.

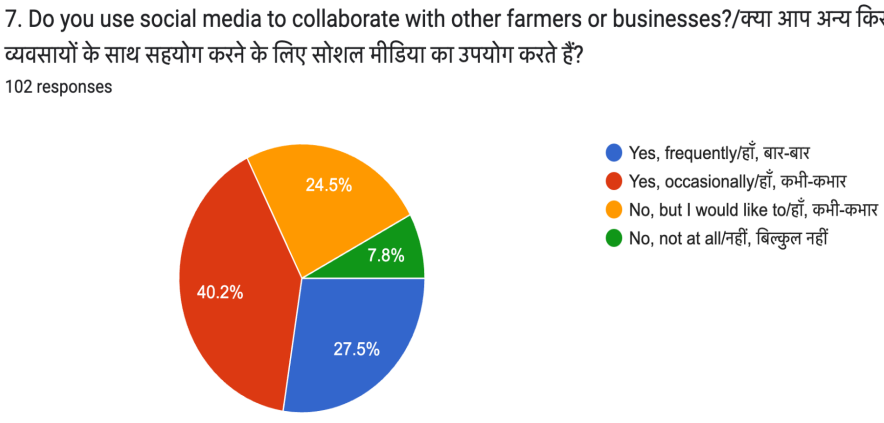

CHART 14

A significant portion of respondents engages in collaboration through social media, which fosters community and resource sharing among farmers. The number expressing interest in collaboration suggests potential growth opportunities in this area.

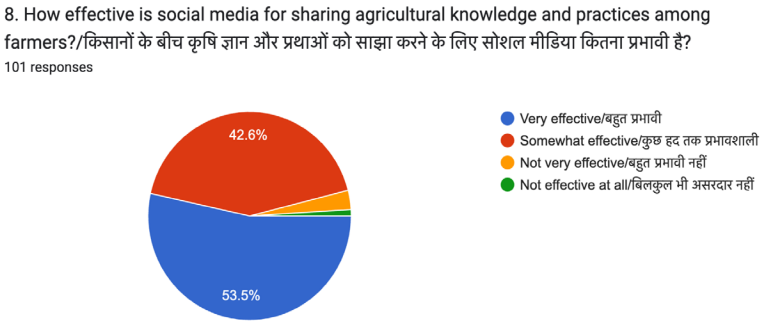

CHART 15

The consensus is that social media is highly effective for sharing agricultural knowledge, with only four respondents indicating any level of ineffectiveness. This highlights the platform's role as a valuable resource for knowledge dissemination within the farming community.

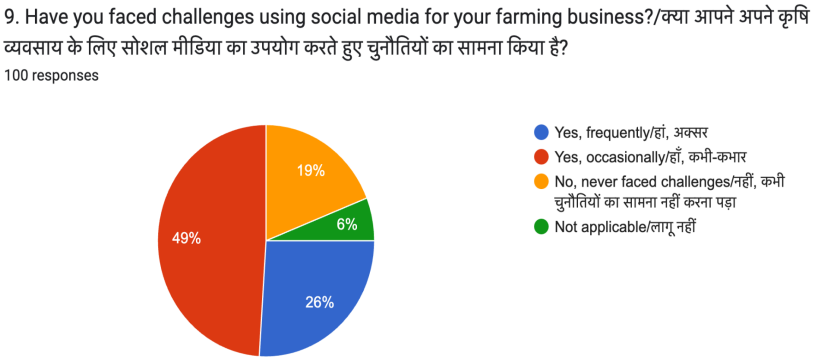

CHART 16

While many farmers face challenges using social media (75 out of the total), a notable number have not encountered issues. This indicates that while there are hurdles to overcome—such as time constraints or technical skills—many farmers are still able to navigate these challenges successfully.

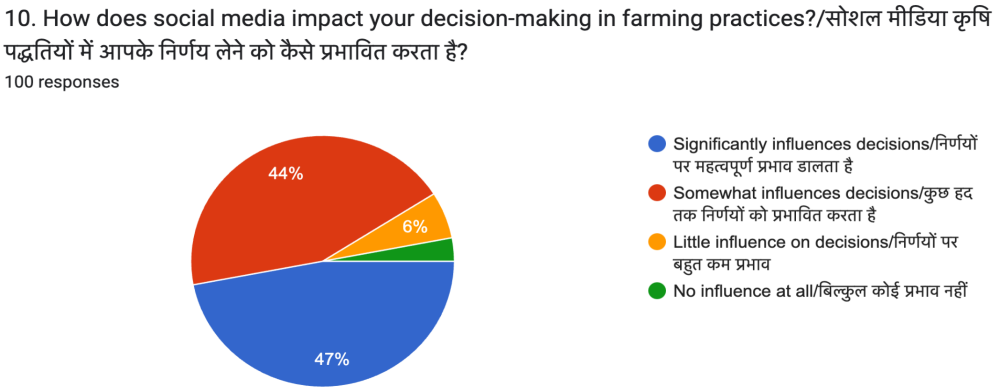

CHART 17

Social media significantly influences decision-making for most farmers (91 out of the total), suggesting its role as an essential tool in shaping farming practices based on trends and peer insights shared online.

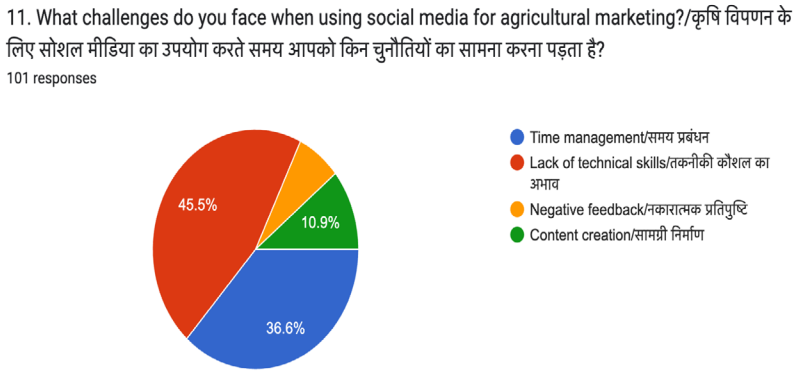

CHART 18

The primary challenges identified are time management and lack of technical skills, indicating areas where farmers may need support or training to enhance their social media marketing effectiveness.

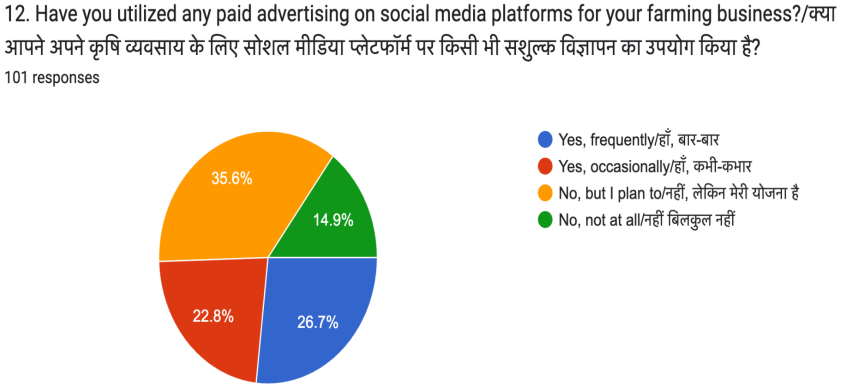

CHART 19

A significant number plan to utilize paid advertising in the future (36), reflecting an awareness of its potential benefits for reaching broader audiences despite current low usage rates.

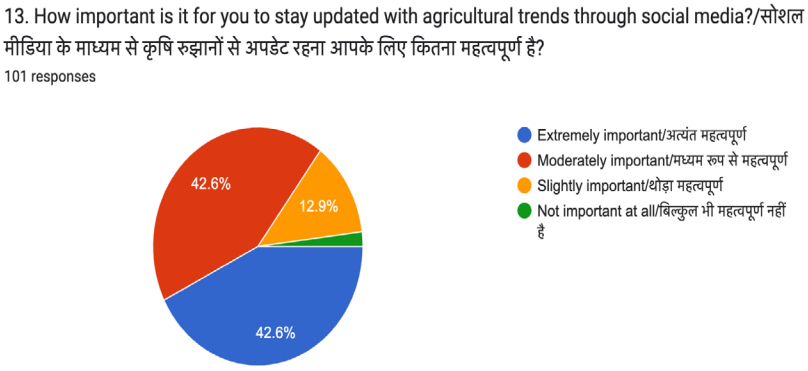

CHART 20

Staying updated with agricultural trends is deemed crucial by respondents, reinforcing the idea that social media serves not just as a marketing tool but also as an essential source of industry knowledge.

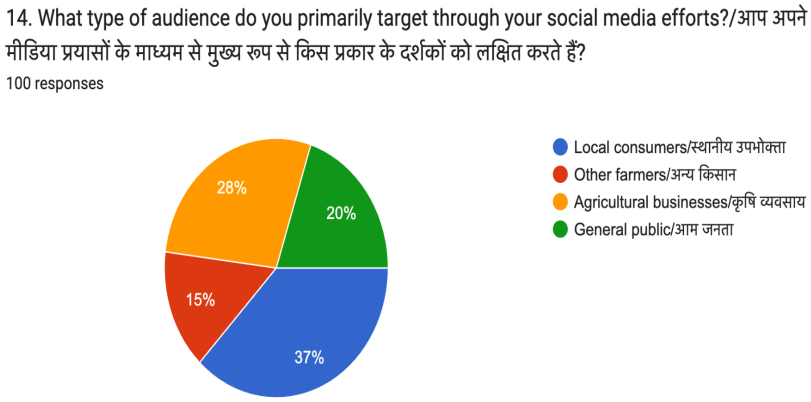

CHART 21

The primary target audience is local consumers (37), highlighting a community-focused approach in marketing efforts while still engaging with other stakeholders like agricultural businesses.

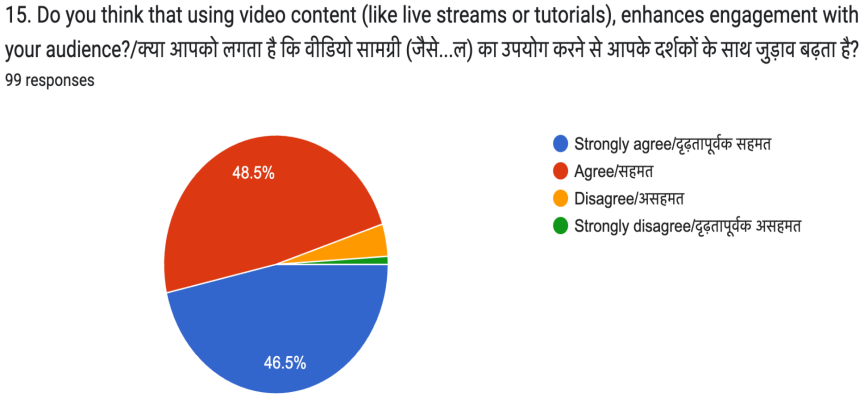

CHART 22

There is strong support for video content enhancing engagement (94 out of total), suggesting that farmers recognize its effectiveness in capturing attention and conveying information more dynamically.

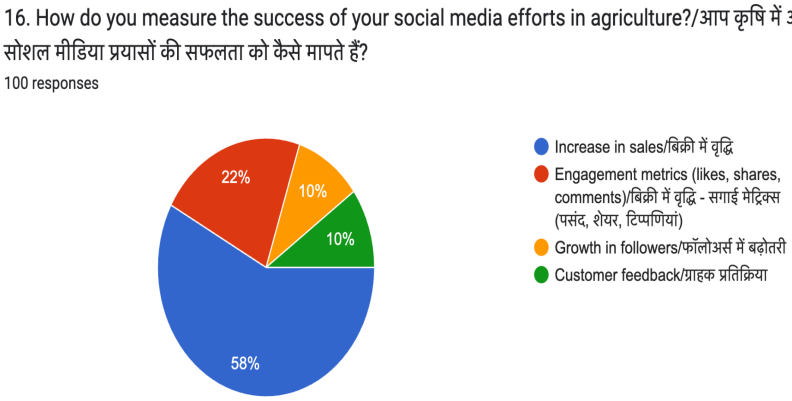

CHART 23

The most common metric for success is an increase in sales (58), indicating a clear focus on financial outcomes as a measure of effectiveness for social media strategies over other engagement metrics.

4. DISCUSSION

The study concludes that social media plays a crucial role in the farming industry, providing essential knowledge to many farmers in India. Most farmers utilize social media to access a wide range of agricultural information, including scientific, educational, and technological resources such as training, agrochemicals, and tech updates.

Improving farmers' digital literacy and implementing initiatives by both governmental and non-governmental organizations to enhance rural connectivity and provide reliable information are vital for maximizing the benefits of social media in agriculture. Furthermore, investing in infrastructure to boost internet connectivity in rural areas is essential for expanding access to digital platforms. The potential integration of advanced technologies like artificial intelligence and blockchain also presents exciting opportunities for future advancements.

With user-friendly features on smartphones and laptops, social media facilitates quick communication of diverse information. However, to better serve various stakeholders, there is a need for increased organizational use of these platforms.

Additionally, the findings indicate that most farmers view social media positively as a convenient and cost-effective source of agricultural information. Facebook emerges as the most popular platform among farmers in the study area, with many using it daily. There is a call for developing online marketing applications for agricultural products to help farmers connect with reputable suppliers and customers both locally and globally.

5. CONCLUSION

Social media has the potential to significantly enhance the agriculture sector by boosting production, promoting sustainable development, and improving agricultural marketing. However, barriers such as poor internet connectivity and a lack of awareness and experience hinder its effective use. Systematic training is essential to help farmers leverage social media for better agricultural outcomes, ultimately improving their lives.

Popular platforms like Facebook, WhatsApp, and YouTube are widely used for information sharing across various agricultural subsectors, including crop farming, dairy, and goat farming. This presents a valuable opportunity for stakeholders to benefit from modern agricultural practices.

Additionally, a generational gap affects social media adoption among farmers. Our research indicates that older farmers often struggle with the technical aspects of smartphones and social media.

CONFLICT OF INTERESTS

None.

ACKNOWLEDGMENTS

None.

REFERENCES

Abiri, R., Rizan, N., Balasundram, S. K., Shahbazi, A. B., & Abdul- Hamid, H. (2023). Application of digital technologies for ensuring agricultural productivity. Heliyon, 9(12), e22601, https://doi.org/10.1016/j.heliyon..e22601

Abhishek Beriya (2020), Digital Agriculture: Challenges and Possibilities in India, ICT India Working Paper https://csd.columbia.edu/sites/default/files/content/docs/ICT%20India/Papers/ICT_India_Working_Paper_35.pdf

Mishra, A., Malik, J. S., & Bhavesh. (2024). Constraints faced by paddy farmers in adoption of climate smart agricultural practices: A comparative study. Indian Journal of Extension Education, 60(2), 95–99. https://doi.org/10.48165/IJEE.2024.602RN1

Madhu Shekar et al., "Analysis of Farmer's Perception and Usage of Social Media in Agriculture," International Journal of Bio-resource and Stress Management, 2023 https://www.researchgate.net/publication/377773087_Analysis_of_Farmer%27s_Perception_and_Usage_of_Social_Media_in_Agriculture

Mittal, S., Padmaja, S. S., & Ajay, A. (2018). Agricultural information and knowledge network in rural India: a case of Bihar. The Journal of Agricultural Education and Extension, 24(5), 393–418. https://doi.org/10.1080/1389224x.2018.149187

Adil Yousaf (2024), The Impact of Social Media on Agriculture: Bridging the Gap between Farmers and Consumers https://medium.com/@adilyousaf540/the-impact-of-social-media-on-agriculture-bridging-the-gap-between-farmers-and-consumers-61226d6bea6b

Morgan, D. L. (1993). Qualitative content analysis: A Guide to Paths not Taken. Qualitative Health Research, 3(1), 112–121.
https://doi:10.1177/104973239300300107 10.1002/abio.370040210

Venkat Ananth (2021), Tractor to Twitter: How farmers developed their social media plan to convey their views https://m.economictimes.com/news/politics-and-nation/tractor-to-twitter-how-farmers-developed-their-social-media-plan-to-convey-their-views/articleshow/80075943.cms

Abdullahi, M., 2021, Impact of Mass Media in Agriculture: An Overview https://www.abrinternationaljournal.org/articles/impact-of-mass-media-in-agriculture-an-overview-110379.html

Kaur, G., 2021, The Role of Social Media in Agricultural Development: A Study https://journalajaees.com/index.php/AJAEES/article/view/2167

Zhang, Y., & Wang, Y., 2024, Exploring the Role of Social Media in Agricultural Innovation: A Review https://www.nature.com/articles/s41599-024-03877-7

Yousaf, A., 2023, The Benefits of Social Media Platforms Used in Agriculture for Information Dissemination
https://www.researchgate.net/publication/380286953_The_Benefits_of_Social_Media_Platforms_Used_in_Agriculture_for_Information_Dissemination

Al-Mamun, A., & Hossain, M., 2024, Digital Transformation in Agriculture: The Role of Social Media Platforms
https://www.sciencedirect.com/science/article/pii/S2666154324003235

Babu, R., & Kumar, S., 2022, The Influence of Social Media on Agricultural Practices: Evidence from Farmers in India
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0309675

Chen, L., & Liu, X., 2024, Assessing the Impact of Social Media on Agricultural Productivity: A Case Study Approach
https://www.nature.com/articles/s41598-024-64049-w

ICSSR Study Team, 2023, Study on the Impact of Social and Digital Media Initiatives Among Farmers in UT Puducherry https://www.icssr.org/study-impact-social-and-digital-media-initiatives-among-farmers-ut-puducherry