Vivekananda Global University, Jaipur

Department of Journalism and Mass Communication

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Leveraging Media Campaigns to Drive Farmer Adoption of AI and IoT for Efficient Precision Agriculture

A Research Study on Digital Transformation in Indian Agriculture

Students	**Supervisor**
Amar Choubey 25tec2se287 Sanskriti 25jmc2jm020 Kinjal Anirudh Ashman	Dr. Pragya Rajput Assistant Professor Department of Journalism & Mass Communication *Vivekananda Global University, Jaipur* Year: 2026

Abstract

Precision agriculture is changing how food is grown around the world. It uses Ai and the Internet of Things (Iot) to help make farming more efficient and productive. Even though these technologies offer many benefits, not many Indian farmers, especially those in dry areas like Rajasthan, are using them. This study looks at how media campaigns, such as TV shows on DD Kisan and social media, can help more farmers adopt these technologies. By reviewing about 20 reports and studies from 2023 to 2026, the study finds that well-targeted media effects can increase the number of farmers using these technologies by 20 to 30 percent. Real examples, like the Fasal Kranti IoT tool, show that using these tools can raise crop yields by 40 percent and cut chemical use by 60 percent across 10,000 acres. The paper suggests a plan that includes short videos, stories of successful farmers, radio programs, and game elements, all in Hindi and other local languages. These findings are important for policymakers, agricultural groups, and media organizations trying to connect advanced farming tools with rural communities. The study also notes that progress will depend on cooperation between government, private companies, and local people. Making these technologies cheaper and easier to understand is key. When farmers feel confident using them, it can lead to stronger, more sustainable farming and better lives over time.

Keywords: Precision agriculture, AI in agriculture, IoT sensors, media campaigns, DD Kisan, farmer adoption, Rajasthan, digital transformation, Fasal Kranti

Introduction

India's farming sector supports over 58% of the people in rural areas, but productivity growth has not kept up with other countries. Most Indian farmers, especially the 86% who are small and marginal, still use old methods that don't work well with today's challenges like changing weather, water shortages, and bad soil. However, AI and IoT technologies offer a promising way to move toward precision farming, which is based on data, uses resources efficiently, and helps increase crop yields.

Precision agriculture, powered by AI and IoT, allows farmers to track things like soil moisture, weather, crop health, and pests in real time. Sensors in the fields send data to AI tools that create useful advice, helping farmers use water, fertilizer, and pesticides only where they are needed. This reduces waste and environmental damage. Some studies say that using IoT and AI can save up to 30% of water and improve crop yields by 15 to 20 percent.

Even though these benefits are clear, adoption rates are still low. Right now, only about 30% of Indian farmers use any digital tools. Barriers include high costs, lack of tech know-how, poor infrastructure, and especially a lack of information that is relevant to their situations. Most farmers don't get to see real-life examples or demonstrations of these technologies working in similar conditions.

That's where media campaigns become very important. TV channels like DD Kisan, which has been providing agricultural content since 2015, reach millions of rural homes that don't have internet access. Social media platforms, especially WhatsApp and Facebook, are also becoming popular in even semi-rural areas, offering another way to spread educational material. Media campaigns that show AI and IoT tools through stories of successful farmers, local-language content, and easy-to-follow tutorials can be a strong way to encourage adoption.

This research, conducted by first-year B.Tech students at Vivekananda Global University, Jaipur, uses desk research to analyze existing studies and suggest an evidence-based media strategy to boost AI and IoT adoption in Indian agriculture, with focus on water-scarce Rajasthan.

Objectives of the Study

The following are the main goals of the study:

1. To explore how AI and IoT technologies support precision farming for small and marginal farmers in India, including a review of results and challenges.
2. To evaluate whether media campaigns, specifically TV programs on DD Kisan and social media content, can meaningfully speed up the adoption of these technologies by farmers.
3. To create practical, evidence-based recommendations for multi-platform media strategies suitable for areas like Rajasthan, where water scarcity and limited digital access are major issues.

Literature Review

3.1 AI and IoT in Indian Agriculture: Documented Impact

The use of AI and IoT in agriculture has attracted growing attention from scholars and policy-makers in South Asia. ScienceDirect (2025) highlights various AI applications, from detecting crop diseases using computer vision to predicting crop yields, showing consistent improvements in production and resource use. NITI Aayog's 2025 report, 'From Fields to Data: IoT-Powered Precision Farming,' offers a detailed synthesis of IoT use in Indian agriculture, emphasizing the central role of sensor networks in supporting data-driven decisions. The Fasal Kranti tool, an IoT-based precision agriculture platform, serves as one of the most impressive case studies of large-scale technology impact. It was deployed across 10,000 acres and led to a 60% drop in chemical use and a 40% increase in crop yields, showing significant economic and environmental benefits. The CEEW (2023) report on precision farming in India supports these findings at a broader level, documenting the existence and effectiveness of precision farming training centers in various states. Government support for this technological shift has been made official through the Agricultural Infrastructure Fund (AIF), which provides targeted funding for the use of drones, sensors,and other smart agriculture equipment. The Indian government's Rs 6,000 crore precision farming scheme, reported by the Indian Express in September 2024, demonstrates strong political support for this initiative. The PIB

(2025) has also documented AI's transformative role in Indian agriculture through policy papers and press releases highlighting success stories at the state level.

3.2 The Role of Media in Technology Adoption

Communication theories help us understand how media influences how people adopt new technologies.

Agenda-setting theory, developed by McCombs and Shaw in 1972, suggests that when the media focuses on a topic, it makes that topic more important in the public's mind. For example, if agricultural AI and IoT technologies are consistently covered in the news in a positive light, farmers are more likely to think about and explore these technologies. Social learning theory, introduced by Bandura in 1977, adds that observing others—like fellow farmers or people they look up to—successfully using a new technology can be a strong motivator for someone to try it themselves.

When applied to agriculture, these theories suggest that visual media showing real farmers in relatable situations using new technologies, presented in local languages through trusted sources, can boost adoption. This idea is supported by research published in PMC in 2024, which showed that digital educational videos helped increase the use of green farming methods in rural communities by making new practices seem safer and more manageable.

DD Kisan, an agricultural TV channel launched by Prasar Bharati in 2015, is a major example of how media can support farming in India. It reaches many rural households that don't have internet access, making it a key platform for sharing farming knowledge. The channel has clearly helped change how people in remote villages think about modern farming practices, setting a strong example for using media to spread technology. Reports from Multitech Publisher in 2025 and CAZRI in 2024 also show how Indian farming is becoming more digital, highlighting the potential of media as a tool to help spread new technologies.

3.3 The Knowledge-Adoption Gap and Media as a Bridge.

Even though more farmers are aware of the benefits of precision agriculture, there is still a gap between knowing about it and actually using it. This is similar to the "privacy paradox" found in cybersecurity studies (Acquisti & Grossklags, 2005), where people know about privacy risks but don't always take

action. In farming, this gap comes from several factors, including seeing technology as too expensive, being nervous about trying new things, and not having chances to see technology in use. Farmers might understand that AI-powered irrigation systems can save water, but without seeing others use it or getting advice, they might not feel confident enough to invest.

Media campaigns that feature farmer stories, content in local languages, and practical demonstrations can help close this gap. A successful example is the NETAFIM drip irrigation campaign, which used farmer testimonials to show that a technology seen as expensive and complex could be adopted. This model can be adapted for AI and IoT tools by making sure the content is relevant and easy to understand.

However, there is still not enough research on how effective media campaigns are for promoting AI and IoT adoption in Indian farming. This study aims to fill that gap.

Problem Statement

Indian agriculture faces several challenges that precision technology can help address, but adoption remains very low,

The Key issues are:

- Climatic and Agronomic Challenges: Farmers in states like Rajasthan deal with dry land, inconsistent rainfall, and low crop yields. These problems are getting worse due to climate change, making traditional farming methods less reliable.
- Structural Constraints: The average Indian farm is very small, usually under 1.5 hectares, making large machines too expensive. However, IoT sensors and AI applications are becoming more affordable and can work well on small farms.
- Low Digital Technology Adoption: Only about 30% of Indian farmers use any digital tools. Adoption of AI and IoT tools is even lower than that.
- Perception Barriers: Many farmers think AI applications and IoT sensors are too expensive and too hard to use. These beliefs, based on incomplete or misunderstood information, are major obstacles that media can help change.

- Information Deficit: There is a lack of easy-to-understand, local-language information about precision agriculture. Without seeing success stories or real examples, farmers don't have a strong reason to change their usual ways.
- Research Gap: While media campaigns have theoretical and practical potential to drive AI and IoT adoption, there isn't enough research specifically looking at how effective they are in the Indian context.

Methodology

This study uses desk research (secondary data), which is appropriate for first-year undergraduate students working with limited resources. The design includes the following:

5.1 Research Design

The study uses a descriptive-analytical approach. Descriptive analysis helps describe the current state of AI/IoT adoption and media engagement in Indian agriculture. Analytical methods, like comparing data from different sources, are used to understand how media campaigns affect how farmers adopt new technologies.

5.2 Data Sources

A total of around 20 papers, government reports, and studies published between 2023 and 2026 were reviewed. Key sources include NITI Aayog, the Press Information Bureau, the Council on Energy, Environment and Water (CEEW), Prasar Bharati, ScienceDirect, PMC, and major Indian newspapers like the Indian Express. Search terms used included 'media campaigns for AI IoT in India farming,' 'precision agriculture India,' 'DD Kisan technology adoption,' 'IoT sensors crop yield India,' and related keywords.

5.3 Data Collection and Synthesis

For each source reviewed, notes were taken on: the benefits of AI and IoT in agriculture, specific statistics (like yield improvements, water savings, and adoption rates), examples of effective media campaigns, real-world campaign applications, and the obstacles to adoption. These notes were then used to find common themes, gaps in evidence, and possible policy recommendations.

5.4 Limitations

As first-year students, the researchers couldn't visit farms, talk to farmers, or do surveys. So this study doesn't include new data on farmer attitudes or actions. All the numbers and findings are based on existing sources and should be viewed with care. Future studies should add primary data through field visits and surveys in areas like Rajasthan to get a more complete picture.

Proposed Media Campaign Implementation Strategy

Based on the literature review and an analysis of successful agricultural communication campaigns, this study suggests a multi-platform media approach to encourage the adoption of AI and IoT among Indian farmers. The strategy is meant to be affordable, easy to understand in local languages, and based on well-proven communication methods.

Strategy	Platform	Target Audience	Expected Impact
Short Video Tutorials (2-min AI app demos)	DD Kisan TV, YouTube	Small & marginal farmers	High reach, practical uptake
Farmer Success Story Features	Facebook, WhatsApp	Rural farming communities	Trust-building, peer motivation
Gamification Campaigns (sensors as prizes)	Social Media + Fairs	Tech-curious youth farmers	Engagement and trial adoption
Village Radio Broadcasts	Community FM/Radio	Remote & offline communities	Bypass internet barriers
Farm Fair Demonstrations (Rajasthan)	On-ground events	Rajasthan farmers	Direct hands-on experience

6.1 Content Strategy

The content strategy focuses on four main types of content, each targeting a specific aspect of the gap between knowledge and its adoption:

- Short Video Tutorials (2 minutes): These videos show farmers how to use AI-based weather forecasting apps or set up basic IoT soil moisture sensors. The videos should show real farmers doing real tasks in real fields, not in labs or studios. The content should have subtitles and be narrated in Hindi and other regional languages like Rajasthani and Marwari.

- Farmer Success Story Features: These are documentary-style features that highlight farmers who used AI and IoT tools and saw real improvements in crop yield, water use, or income. These stories use social proof and inspirational narratives to reduce the fear of adopting new technology. The Fasal Kranti case, where yield went up by 40% over 10,000 acres, is a strong national example; similar stories from Rajasthan should be created.
- Gamification Campaigns: These are incentive-based programs where farmers who try a new technology, such as using an AI crop advice app for 30 days, get entered into a draw for free IoT sensors or subsidized equipment. This approach lowers the financial risk of trying new technology by making the initial step free.
- Village Radio Broadcasts: These are short (5–10 minutes) educational segments aired on All India Radio and community FM stations. They cover useful topics like "How to check soil moisture with a simple sensor" or "Which free AI app gives the best weather forecast for farmers." Radio reaches areas where TV and smartphones are not reliable.

6.2 Platform Strategy

The platform strategy uses DD Kisan TV as the main way to reach a large audience, and supports it with Facebook and WhatsApp for local sharing, YouTube for in-depth learning, and All India Radio for reaching rural communities without internet. Farm fairs and agricultural exhibitions in Rajasthan are important for on-ground demonstrations, which complement media messages with hands-on experience.

6.3 Language and Localization

All campaign content should be available in Hindi at a minimum, with versions in Rajasthani and Marwari for targeted use in Rajasthan.Research shows that content in local languages is the most important factor in engaging farmers with agricultural information. Just translating content isn't enough; it needs to be made locally, with context specific to the region, including local crops and seasons.

Key Statistics at a Glance

The following table summarizes the most important quantitative findings from the literature review, providing a statistical base for the study's conclusions and recommendations.

Metric	Value	Source/Context
Chemical Usage Reduction	60%	Fasal Kranti IoT Tool
Crop Yield Increase (Fasal Kranti)	40%	10,000 acres implementation
Water Savings via IoT/AI	Up to 30%	Precision agriculture studies
Yield Increase (general IoT/AI)	15–20%	Multiple field studies
Farmer Adoption Increase (media)	20–30%	TV/Social media campaigns
Farmers Using Digital Tools	~30%	Current baseline, India
Coverage Area – Fasal Kranti	10,000 acres	Demonstrated scale
Govt. Precision Farming Plan	Rs 6,000 crore	Indian Express, 2024

These statistics show a clear picture: AI and IoT technologies offer significant agricultural benefits; current adoption is much lower than it could be; and media campaigns have a documented, measurable effect on adoption rates. The combination of these three data points is the main evidence behind this study.

Results and Discussion

The synthesis of the reviewed literature leads to five key findings with direct implications for policy and practice:

8.1 Media Effectiveness is Empirically Supported

Digital educational programming—especially videos that present technology as accessible and safe—has been shown to increase the use of green and precision farming methods (PMC, 2024).

The estimated 20–30% increase in farmer adoption linked to media campaigns, while coming from studies with different methods, shows a clear trend. Media campaigns do more than just inform; they change how farmers see the risks of adopting new technology by showing examples of others who have successfully used it.

8.2 Technology Impact is Substantial and Demonstrated

The outcomes of the Fasal Kranti tool—40% higher yields and 60% less chemical use across 10,000 acres—show a strong example of AI and IoT helping agriculture on a large scale.

Broadcasting these results on TV could expand their influence by reaching millions of farmers who don't know about these benefits. The general IoT/AI literature supports these results, with 15–20% yield gains and 30% water savings appearing in several studies.

8.3 Television Provides Critical Offline Reach

A large part of India's rural farming community doesn't have access to internet-based communication. Television—especially DD Kisan with its focus on agriculture—provides the infrastructure to reach these people.

In Rajasthan, where internet access and water availability are both lower than the national average, television is not just helpful; it's the main way to reach these communities. Any media plan that only focuses on social media will miss the most disadvantaged and in-need farmers.

8.4 Language is the Critical Localization Variable

Across the reviewed literature is the finding that local-language content is the most powerful predictor of farmer engagement with agricultural extension materials.

Hindi is a necessary but not sufficient condition for rural reach in Rajasthan; Rajasthani, Marwari, and other local languages should be integral to the content strategy rather than optional add-ons. This finding aligns with broader communication research demonstrating that message reception is fundamentally shaped by linguistic and cultural familiarity.

8.5 On-Ground Demonstration Remains Essential

While media campaigns can create awareness and positive attitudes towards precision technologies, they are most effective when combined with on-site farm demonstration days that offer hands-on learning. Media gives the motivation to try something new; demonstrations give the confidence to adopt it. This suggests that the best strategy is a combination of media and on-ground demonstrations, not media alone.

Conclusion

This study provides strong evidence for using media campaigns strategically to speed up the adoption of AI and IoT technologies in Indian agriculture.

The findings from the literature review lead to four main conclusions:

1. Media campaigns are an effective and cost-efficient way to promote the adoption of precision agriculture technologies. Channels like DD Kisan and social media platforms such as Facebook, WhatsApp, and YouTube help spread knowledge quickly and importantly shift farmers' views of technology from threatening to accessible.
2. AI and IoT technologies offer significant, measurable benefits in agriculture—like up to 40% higher crop yields, 60% reduction in chemical use, and 30% water savings—that make compelling content for media campaigns. These results, shared through testimonials from farmers in local languages, provide the social proof needed to encourage large-scale adoption.
3. The government needs to step in and provide more money for media-based agricultural projects, especially as part of the Rs 6,000 crore precision farming plan. They should support specific AI and IoT programs on DD Kisan, give financial help for creating content in local languages, and make sure that media campaigns work well with the Agricultural Infrastructure Fund's outreach efforts.
4. There's a need for more research, especially direct studies in places like Rajasthan and other areas that don't have much water. This research should check if media campaigns really help farmers adopt new technologies and figure out which formats, languages, and platforms work best for different farming groups.

Media is the link between technology and farmers. Without this connection, even the best precision farming tools will stay out of reach for the farmers who need them most. With this link, India's agriculture can move towards the digital changes needed to feed a growing population, especially as climate conditions get worse.

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