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Media influence in agriculture practices and scopes for non-chemical agricultural messages

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Abstract

Non-chemical agricultural methods can improve soil health, conserve ecology and enhance biodiversity, and are more sustainable. Media messages trigger a change in farmers' attitudes that needs to be studied to understand their practices. This study used the Diffusion of Innovation theory to figure out how farmers accept chemicals in farming practices from the media and how the chemicals impact the environment. The objective is to understand how media influence farmers towards chemical fertilizers and pesticides, to find out which media has been widely used by farmers, and to find out which the popular medium has provided information about non-chemical agricultural methods (NCAM). A stratified sampling technique was used, and fifty small farmers were selected for the survey. The key findings suggested that effective media use by the farmers shift to agricultural practices now and then through media influences on that Non-Chemical Agricultural Methods (NCAM) messages are redefined through survey methodology.

Keywords: Non-chemical agriculture; media influence; diffusion of innovation; sustainable development; communication strategy

1. Introduction

Today, people are facing more challenges on food security, extending to good nutrition, environment, enhancing biodiversity and resilience towards climate change. In this circumstance, there is a need to identify new avenues. There are many discourses in avoiding chemical usage and concerns of ecology in agriculture practices (Robbins et al., 2001). Natural farming, Holistic farming, Permaculture, Bio-farming, Bio-dynamic farming, and Organic farming are the methods that recommend inputs instead of chemicals and that can be denoted as Non-chemical agricultural methods (NCAM). Farmers are doing any of the above agricultural methods in which it could bring in the NCAM paradigm covering all traditional and modern ideas, which could revive the environment. Debates and arguments are there within the NCAM ideologies to position one method as best, where the real challenge is the expansion of NCAM practices instead of chemical-based agriculture.

The information on NCAM is deemed necessary for farmers to explore NCAM practices and scopes for NCAM information. Since information and communication play a dual role, farmers, as a consequence, need to identify the right message. The communication efforts are made in agriculture to increase production and influence farmer's practices (Walter, 1992). The adoption of chemicals to increase food production has neglected ecological concerns, leading them to consider that as a conventional agricultural practice. The use of chemicals and pesticides have a significant impact on environment (Meena & Mishra, 2020).

NCAM helps to improve soil health, conserve ecology and enhance biodiversity, which is more sustainable for farmers. Hence, measuring media influence and farmers' needs must be taken into account to align communication programmes with the effective media tools currently used by the farmers based on NCAM communication needs.

The objective of the study is to understand how media influenced farmers towards chemical fertilizers and pesticides, to find out which media has been widely used by farmers, and to find out which the popular media have provided information about NCAM.

There have been various literature reviews and previous studies related to this research. They are particularly concerning the utilization of Information and Communication Technology (ICT) and the role of mass media in the advancement of agricultural practices and environmental issues. An ICT-based support system can provide more quality information that is accurate and timely. Different components of the extension system of extension workers must improve the semi-arid tropics to handle climate change (Balaji et al., 2007).

The roles of mass media in agriculture development are

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discussed with the importance of radio, television, newspaper and farm magazine and their effects on agriculture through effective communication (Kavaskar, 2003). On the other hand, within the realm of environmental issues, there has been a growing recognition of the importance of transitioning towards constructive journalism in reporting various environmental concerns in mass media. The study revealed that embracing positive psychology and solution-oriented approaches is in harmony with ethical principles, specifically in the realm of environmental advocacy (Sanal & Aram, 2023).

Conventional communication is often meant as radio, television, newspaper, and advertising agencies, while agriculture extension is beyond those mediums that need two way communication to help them and make understanding of their practices (Alan Roger, 1993). ICT tools fill the void that traditional agriculture extension works lack in addressing (Sigdel et al., 2022).

The acceptance of social media is a significant step for extension workers to reach out a large number of clients and colleagues timely and effectively. The ICT-based agriculture development strategy provides opportunities to perform extension work in better ways and leads farmers to access agriculture information and improve communication among the farmers in Bangladesh (Chowdhury & Ganpat, 2018).

Knowledge transfer initiative (KTI) among the farmers in the southwest of England to all farm practices (organic farmers, female farmers, or dairy farmers). This study showed a change in attitude by reinforcing a planned communication effort (Garforth et al., 2004).

The reach of information by interpersonal and mass media methods on farmers is more among young farmers. They tend to prefer computer-based assistance, and large-size (more than 250 acres) crop farmers prefer publication, computer-based assistance and mass communication methods (Riesenberg & Gor, 1989).

The need for political will ‘tool kit’ concept strategy needs to incorporate top-down, and bottom-up approaches to integrate multimedia and interpersonal communication. Meanwhile, personal and environmental approach integration is the ultimate goal towards sustainable development through strategic communication (Waisbord, 2014).

Seasonal climate forecast aims to improve communication strategy to access climate information from radio, mobile phone, extension workers, farm field demonstrations and farm field schools to reduce the delay in getting information (Churi et al., 2012). The drought and strong wind alteration are the important climatic information in semi-rural areas in Tanzania.

By reviewing the literature, it is evident that the evolution of ICT has significantly transformed conventional communication efforts to be more focused and strategic. It emphasises the need for two-way communication to enable a new set of practices. Similarly, strategic communication will help for the development of sustainable agriculture. Therefore, understanding the communication preferences of farmers becomes a paramount for the extension workers. By recognising the evolving landscape and adopting strategic communication, agricultural practices could align more effectively by understanding the needs of both farmers and sustainable development initiatives.

2. Methodology

The Diffusion of Innovation (DOI) Theory served as the framework for this investigation. The earliest social science theory DOI coined in 1962 by E. M. Roger in the communication sector, describes how an idea or product gathers steam and diffuses (or spreads) within a particular population or social system over time (Benoit, 1964). DOI is about adopting any new idea, behaviour, or product as part of a social system for information from that to the new set of information that is something different from an unusual purchase to a new product, acquiring and performing a new behaviour.

Those who adopt innovations sooner than those who acquire them later have different traits in understanding the traits of the target demographic that will facilitate or impede the acceptance of the invention when promoting it to that group. A population group tends to fall into the middle of the five adopter categories and comprehend the traits of the target demographic and various tactics used to promote innovations in different adopter categories.

Rogers explained the process and stressed that, in most cases, the initial adopters of a new idea are receptive to it. An early innovator "spread the word," a critical mass forms as more and more people become receptive to it. The population are gradually exposed to the novel idea or product until it reaches a saturation point. All five categories of innovation include innovators, early adopters, early majority, late majority, and laggards. In the sixth group, non-adopters will be introduced gradually. The first five categories are displayed in the bell shape. Figure 1.

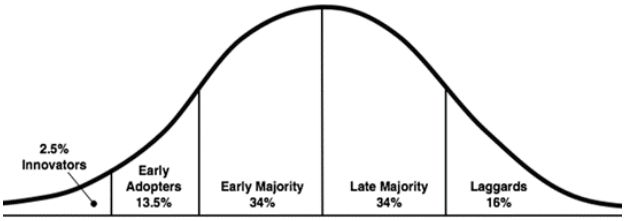

Fig. 1. Five categories of Diffusion of innovation

From this theoretical perspective, this study intended to find out how chemical-based agriculture practices adopted by farmers through media had a change in attitude towards agricultural practices of farmers. This study also aimed to identify the popular media among farmers in the present-day scenario. The programmes on non-chemical agricultural practices can be redefined based on the present scenario. Innovation in media messages on non-chemical farming could initiate a new cycle of communication efforts to ensure a safe environment and save the planet for future generations. NCAM communication will be a sustainable change in attitude among farmers to help to revive nature.

Data set were collected for this study using stratified sampling techniques; 50 samples were collected in Kilvenbakkam village of Nemili block in Ranipet District. The village consists of 542 households covering the agricultural land of 257.49 hectares and 1400 working populace, 70% of which rely on agriculture work and work as the small farmers. Questionnaires based on the theoretical framework with the demographic profile were prepared focusing on small farmers, three main thematic carries three questions. This aimed to explain the media influencing chemical agriculture, and behaviour change of farmer’s practices. That was explained descriptively by associating with the percent as mentioned by the E.M. Rogers compared with the use of chemical fertilizer

adoption stage and media tools informing about chemical fertilizers. The responses given by the farmers are inferred with percentage distribution.

Along with that, the current effective media tools used by the farmers were studied, based upon the need for communication about NCAM. Redefining messages based on the effective medium, and their impact is projected to provide a positive outcome from media tools that would enhance soil health and biodiversity based on the bell curve DOI explained that might initiate the stages of adoption for NCAM practices.

Table 1. The variable and question for data collection

Categories to the framework	Thematic area	Questions
Media influencing chemical agriculture	Media Influence (MI)	MI 1: Which media has a message to support the chemical agriculture method?
		MI 2: Are you aware of any non-chemical agricultural methods?
		MI 3: How did you convince and accept to do chemicals in agricultural practice?
Behaviour change of farmer's practices	Behaviour Change (BC)	BC 1: Do you belong to an agricultural tradition?
		BC 2: What type of agriculture method do you follow?
		BC 3: When was the last time you engaged in chemical-free agriculture?
Media that is widely in use and impact of influence.	Media in Use (MU)	MU 1: Do you notice any changes in soil fertility, water salinity, and the environment after using chemicals from the past years?
		MU2: Your source for investment?
		MU3: Which medium gives more information about non-chemical agricultural methods?

3. Results and Discussion

50% of farmers stated they access agricultural information from television and added information about chemical methods initially from television programmes. A fair average of 33.3 % chose the new media in the current scenario. Merely, 8.3 % equal number share radio and print media that share information about chemical farming.

Nearly 83.3 % of the farmers stated that they know about non-chemical methods but they prefer chemical practices for having more yield. An average of 16.7% shared that they do not know about non-chemical farming.

61.1% of the farmers mentioned no information source about the non-chemical methods and hence adopted chemical practice methods. 13.9% were not interested in the media information on chemical practice. Family influences are visible to 5.6% rely on chemical practices similar to 5.6% share chemical-based agriculture for high yield. Only 2.8 % preferred limited use of urea-based communication exchange. 13.9% did not prefer chemical use. A consistent 8.3% answered 'No' to the need for chemical-based agricultural practices without any influence. A minimal 2.8% of farmers accepted that they do chemical practice out of interest. These answers were achieved by open-ended questions and thus reflected the phenomenon among the farmers.

86.1% of farmers stated they have been practising farming as a tradition. The remaining 13.9 % shared that they have newly gotten into the profession. This study showed that the majority of farmers are traditionally engaged in agriculture.

72.2% of the farmers practiced the chemical method, while the remaining 27.8 % employed the non-chemical one. From the previous data set the majority of farmers belonging to agriculture as tradition have shifted to chemical farming practices. This indicated the change in behaviour among the farmers.

The study found that nearly 50% of farmers had farmed without using fertiliser 40 years ago, while another 30.6 % had lastly engaged in non-chemical cultivation about 30 years ago. Less average of 5.6% population stopped using chemical fertilizers around 10 years ago and 11.1% of farmers said that they had been practising non-chemical farming for 5 years. Only 2.8% of farmers followed agriculture as a tradition.

63.9 % of the farmers noticed soil fertility, water salinity, and environmental changes after using chemicals. About 22.2% said that they did not find any changes while 13.9% shared that these may have changed. From this, one can see that the use of chemicals changes the soil fertility and water salinity.

Only 16.7% of farmers had economic independence and the majority of the farmers have taken loans to control the cultivation cycle and they continue the practice as routine to repay them. The dependency of the farmers' economy is controlled by many factors such as small finance, agriculture gold loan, and advances from the commission agents and finance.

47.2% of farmers reported watching TV for non-chemical-based agricultural information, and some programs on NCAM were seen informative for them in the current scenario. Television is the medium that influences farmers as it has been used since the beginning of green revolution initiatives to ensure food security, encouraging chemical and pesticide-based agriculture. The expected outcome was achieved in which 63.9% of farmers noticed environmental changes after adopting chemical-based agriculture. From the derived data, television may have influenced any existing negative impacts. While the present most influential media is television, making it suitable for NCAM messages to emphasize positive effects. At the same time, 44.4% said that they found social media useful sometimes. Only a few farmers mentioned newspapers (5.6%), and only (2.8%) mentioned the radio.

Television was found as the popular medium for accessing information on non-chemical agricultural practices contributing to 47.2%, and social media at 44.4% access for non-chemical agriculture messages. Printed media and radio

stood at lower average at 5.6% and 2.8 %, respectively.

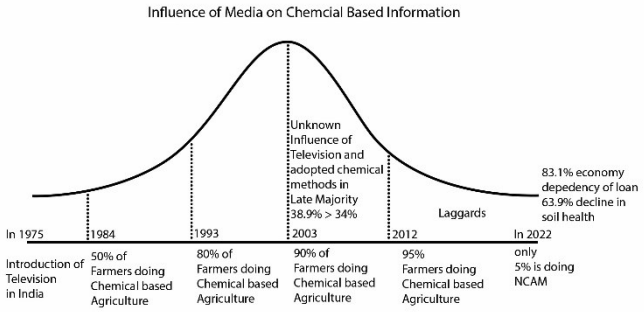

Fig. 2. Media's influence on chemical-based information

A significant finding emerged from the responses in which many farmers were doing non-chemical agriculture practices 40 years after the initial stage when Green Revolution-based programmes had just begun to broadcast. The varying percentages establish the subliminal impact of television programmes on farmers and changes in their attitude (Figure2). Only 8.3 % of farmers responded that they received information from the printed media. This percentage was similar those responding that they access radio for agriculture information. An average of 50% agreed with television influence, and an average of 33.3% agreed with social media influence. This also highlighted the increasing reach and influence of television in high agricultural communication in the present scenario. The impact of television continues, but the impact has begun from the television evolution. Television allowed the farmers to adopt chemicals and change in the behaviour of farmers' practices.

16.8% of farmers consciously accepted chemical practices for higher yield and other factors such as family pressure, self-interest and to limit urea. An average of 22.2% of farmers did not prefer and did not need chemical-based information. Almost an average of 61.1% of farmers stated that they relied on chemical-based agriculture messages since they did not have information on non-chemical agriculture. An average of 86.1% of farmers belonged to traditional agricultural families and were familiar with non-chemical practices marked awareness of 83.3% among them, and an average of 72.2% continued to do chemical-based agriculture. Based on demographic data average of 69.1% of farmers continued agriculture even today. In very low average 30.9% entrance of the next generation is seen in the agriculture sector (Figure 3).

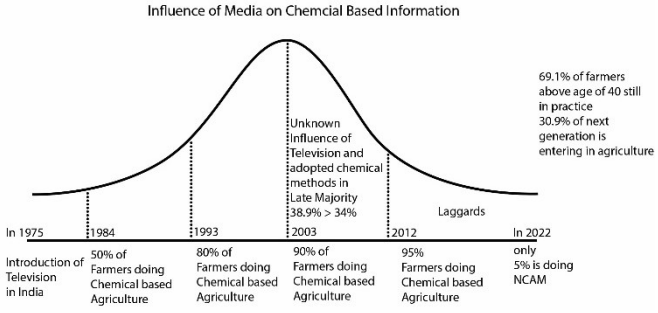

Fig. 3. The impact of media and change in behaviour and environment

Social media and TV had a higher impact on farmers in information sharing and could be effectively used to fulfil the need for communication on NCAM. Farmers with traditional knowledge and NCAM experience needed to promote the advantages of NCAM and explained the disadvantages of chemical usage in the environment using those media (Figure 4). Effective social media and TV messages for NCAM will have a similar impact due to information as in the earlier days, and that needs to be redefined with NCAM messages to create a similar impact in the future.

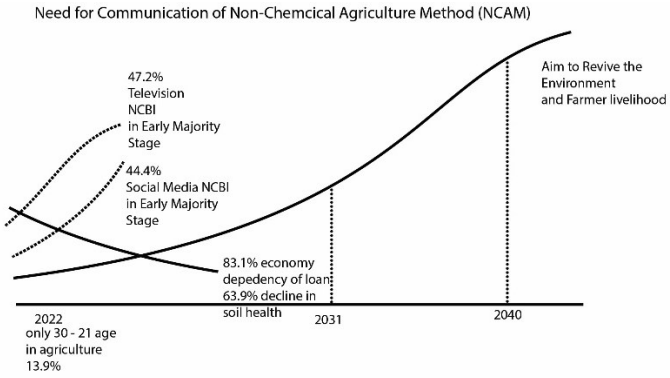

Fig. 4. Innovation in a message on NCAM in TV and Social media

4. Conclusion

Almost all the farmers involved in chemical-based agriculture belong to the agriculture tradition. The farmer's adoption of chemical-based agriculture and change in attitude modified through television programmes had a higher impact. In correlation to the Diffusion of Innovation theory, farmers are in the 'Laggard stage' based upon their economic practice as they are dependent on the financial aspects. Social media has an increasing influence, and the decline of television programmes also indicates the 'laggard stage' of television. The farmers' adoption of chemical-based agriculture has a higher impact and may increase the environment if the practice keeps on going. Farmers' traditional knowledge has diminished due to media influence as initiated during the Green Revolution phase as seen from the datasets driven by farmers. There was an increasing influence of social media (44.4%), equal to TV (47.2%), indicating the emergence of social media. Therefore, the influence of TV is also there, and TV should reinitiate programmes on NCAM. The present 'Laggard' stage is due to the TV; the same TV can have a similar positive impact on redefining programmes with NCAM messages. Economic factors also played a role in farmers' dependence on credit to seek financial support (83.1%). Also from the farmers' observation of the environment after chemical use, a notable percentage of decline in soil health was noticed (63.9%), which resembled the 'Laggard' stage. This scenario showed a need for communication to start the innovation cycle towards non-chemical methods with environmental concerns. Most of the natural methods are successful and not shared showing a need for the farmers to learn from the success stories and not from opinion-makers. Television could be used as effective tools as it has hierarchy for fact check. Whereas social media may see as opinion makers and influencer's but it can help for farmers' peer to peer interactions. So, the farmers involved in non-chemical agriculture should be used as change agents' via social media to build confidence among other farmers to take up non-chemical agriculture. If NCAM practices are adopted by all farmers, it is expected that they will lead to a better life for both farmers and nature, contributing to the revival of the environment.

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