

Seeding Behavior Shifts: Nudging Farmers Through the MINDSPACE Lens in Agriculture in India

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Abstract

India's agricultural sector is facing challenges like low productivity, lack of credit, and inadequate infrastructure, prompting the government to implement policies like subsidies and loan waivers. The agriculture sector faces numerous challenges, necessitating urgent attention. One promising strategy is utilizing behavioral interventions based on the nudge theory. Several countries have successfully implemented nudge interventions to solve agricultural problems, and it is time for India to adopt this approach. The primary objective of this paper is to analyse the use of nudge theory in the agriculture sector in India. The study will provide an overview of the challenges faced by the sector and the existing policies and programs to address them. The paper explores the concept of nudge theory by review the literature on nudge interventions in agriculture and present case studies of successful interventions from other countries. In conclusion, the adoption of nudge interventions in the agriculture sector has the potential to address the pressing issues faced by the sector and improve the lives of millions of farmers in India. This paper will serve as a catalyst for policymakers and stakeholders to embrace this approach and usher in a new era of agricultural development in India.

Keywords: Behavioural Interventions, Agriculture sector, Nudge Perspective, Agricultural Practices

Introduction

One of the crucial areas of the global economy is agriculture. It helps with employment, lowering poverty, increasing GDP, and many other things. India is one of the fortunate nations with a diversity of climates, which leads to a variety of crops and foods that can be exported to other nations, increasing national income through export revenues. Farmers are a valuable labour force that cultivates land and contributes to the production of agriculture.

Farmers and the agricultural industry, however, are dealing with numerous difficulties. With the growth of the industrial sector, the agricultural sector suffers, which causes issues with food security, unemployment, etc. As a result, governments continuously develop policies and initiatives to address these problems. The government's goal with these laws and programmes is to expand the agricultural industry. Yet, there are issues with every policy and programme, such as farmer awareness, acceptability, and application.

These difficulties stem from the psychology of human beings. The government can thus accomplish its objectives by focusing on these psychological factors that influence human decisions. Behavioural economics is crucial in this perspective. Human biases in decision-making are studied by behavioural models and theories, and by highlighting these biases, they produce theories that aid in influencing human behaviour. Nudge is one of the behavioural economics tools that not only exposes human biases but also investigates how to design decisions that will eventually benefit people.

Background of Nudge

Kahneman and Tversky in their work show the peculiarities of human beings. They emphasize how people behave in the real world. But how to influence the behaviour of human beings was less focussed. In this context, Richard Thaler and Cass Sunstein developed the Nudge theory, for which they received the Nobel Prize in Economics. In their book "Nudge: Improving Decisions about Health, Wealth, and Happiness," Thaler and Sunstein (2008) discuss how nudging can be used; how it can help governments frame public policies; and how nudge can change human behaviour. Nudge defined "as the term, in any aspect of the choice architect that alters people's behaviour predictably without forbidding any options or significantly changing their economic incentive"¹. As we seen earlier text that focuses was more on the peculiarities of human nature but Thaler and Sunstein gave the solution for it by introducing the term choice architecture. They emphasize on how choices can be designed so to manipulate the peculiarities of human beings. This will certainly give benefits to the economic agents. As most of the psychologist suggest that human behaviour can be changed through punishments or penalty and to some limit it is working also. But under the Nudge theory, Thaler and Sunstein suggest we should use libertarian paternalism. It consists of two words libertarian which means liberty in decision making while paternalism which suggest that it governs by economic agent. They joined this two concept explaining that policy maker or businesses should design such choices that it benefit for the society as a whole. The choice basket should be such that people cannot deny but to behave as per policy maker. But it has some limitation too that it cannot work for longer or repeatedly. Also too many choices create confusion hence the objectives cannot be achieved.

Review of Literature

Using behavioral theories like nudging can positively influence human behavior, with numerous authors contributing to agriculture through nudge interventions.

In Kenya, Duflo, Kremer, and Robinson (2011)² investigated that tailoring fertiliser subsidies to farmers' behavioral characteristics effectively encourages optimal use of fertilizers, using an experiential method. Duquette et al. (2012)³ studies on farmers with delayed use of Best Management Practices (BMPs) have greater discounted value, impacting agri-environmental program design. However, few studies have examined how incentives affect producer behavior

Kuhfuss et al. (2015)⁴ conducted an online poll and literature review to investigate farmers' participation in the AES (Agri-Environment Scheme), demonstrating that social norms can support farmers in adopting and embracing the new scheme.

Agriculture requires water, causing issues like shortage and waste. Smart meters can reduce waste, while social comparison, norms, and information nudges can encourage solutions. Ferraro et al. (2017)⁵ explore how nudges, and behavioral interventions, can help overcome water security challenges in the US government's water conservation efforts, particularly in agri-environment programs. Chabé-Ferret et al., (2019)⁶ conducted RCT to see how well the social comparison nudgeworks for water conservation

issues. Smart meter installation yields effective results. Also, in the application of RCT Messer et al. (2015)⁷ used RCT to solicit bids for conservation contracts from farmers in Texas, Delaware, and Maryland. The default usage of nudge interventions and social comparison causes an increase in bid rates.

In Europe, the Common Agriculture Policy (CAP) was launched in 1962 which aims to provide food security, farmers' income, environmental protection, etc. Europe's governments are facing challenges in terms of the participation and involvement of farmers. Behaghel et al. (2019)⁸ examined the use of Randomized Controlled Trials (RCTs) in agriculture, specifically the Common Agricultural Policy (CAP) in Europe. They explored the role of nudge in providing farmers with market information and found that societal norms and default choices can encourage participation.

Organic farming, which prohibits the use of pesticides, offers a solution to health-related issues in agriculture. Boun et al. (2020)⁹ promote organic farming in Vietnam through social comparison and information nudging, aiming to promote healthy lifestyles through social norms and informational nudges. In a single-player, multi-period business management game experiment, Peth et al. (2018)¹⁰ studied the impact of two nudge interventions on German farmers: facts and images, and social comparison. They found both effective in promoting environmentally sustainable farming practices, but social comparison was less effective.

Butler et al. (2019)¹¹ suggest that farmers can be convinced by sending messages or reminders about programs and financial possibilities, which can help address agricultural environmental issues. A systematic review was conducted by PalmFoster et al. (2019)¹² on MINDSPACE (Messenger, Incentive, Norms, Defaults, Salience, Priming, Affect, Commitments, and Ego) concerning the agriculture sector. They called it Ag-E MINDSPACE.

Several countries have conducted extensive research on nudge theory in the field of agriculture. Debnath and Bardhan (2020)¹³ investigate nudges in various policies of India, including the agriculture sector, where nudges can be used to harvest crops during a lockdown. However, no proper study on the use of nudge interventions in the agriculture sector in India has been found.

Objectives and Methodology of the Study

The following are the objectives and methodology of the study:

1. To identify nudge interventions in the agriculture sector in select countries.
2. To identify nudge interventions in the agriculture sector in India.
3. To explore areas of application of Nudge interventions in the field of agriculture in India.

The study examines agriculture literature from other countries and India, utilizing government websites, newspapers, and the Public Information Bureau (PIB) for policy and scheme information.

Nudge Interventions in Select Countries

We categorize the use of nudge in the agri-environment sector based on a review of the literature and a study. MINDSPACE cues are explained in Table 1 by Dolan et al (2012)¹⁴. Using this Mindspace cue and a literature review of other countries, we attempt to determine which forms of nudge are used in agriculture in Table 2. Our research is based on the work of Palm Forster et al. (2019), who called their study Ag- E MINDSPACE.

Table 1: MINDSPACE FRAMEWORK

MINDSPACE CUE	BEHAVIOUR
Messenger	Influenced by information with respect to who is communicating.
Incentives	Incentives influence our responses through predictable shortcuts.
Norms	Influenced by others' actions.
Defaults	Choose pre-set options according to their flow.
Salience	Attention is drawn to novel and relevant content.
Priming	Subconscious cues often influence our actions.
Affect	Emotional associations significantly impact our actions.
Commitments	Consistency in public promises and reciprocity are key.
Ego	Self-improvement is achieved through actions.

(Source: Dolan et.al. 2012)

The application of nudge interventions in the agriculture sector will be examined in the study with reference to the country based on this cue.

Table 2: MINDSPACE in relation to the Agriculture sector in select countries

Cue	Country	Area	Nudge interventions
Messenger	Spain	Agriculture Entrepreneur ¹⁵	Promotion of agriculture entrepreneurs by showing celebrities involved
Incentives	U.S	To adopt Best Management Practices(BMP) and provide environmental services, Conservation Reserve Program (CRP)	Providing rewards, incentives
Norms	France, Germany	Use of smart meters for water control	Social norms and comparison, Boomerang effect
Defaults	U.S	Conservation Reserve Program (CRP)	Farmer participation in environment related contracts
Salience	U.S.	Conservation Programs ¹⁶	Information to farmers increases enrolment in conservation programs
Priming	U.S	Conservation Practices	Use of smiley and frownie for participation
Affect	U.S.	Water conservation	Empathy (sending messages with emotions)
Commitments	China	Land use planning ¹⁷	Public commitment and reward behavior
Ego	Tanzania	Best Management Practices (BMP)/ Payment for Environmental Services(PES) ²⁶	Individual initiatives to safeguard the environment

MINDSPACE cues utilized in different nations are shown in Table 2. Different policies and programmes are implemented by different countries. However, some literature demonstrates how these policies and programs can be successful when nudge interventions are used. This research is not the only one; there is also additional literature in which many nations use different nudge interventions in other policies and initiatives. Many studies¹⁸ show that MINDSPACE cues use a combination of two or three cues for a successful outcome.

Agriculture Policies and Schemes in India

To boost the agriculture industry, the Indian government is developing policies and programmes. For the advancement of agriculture, not only the government, but also other economic agents such as NGOs, entrepreneurs, and even the general public, are becoming more aware of the plight of farmers and the agriculture sector. In light of this, the following part describes the organization, people, and government policies and schemes that aid agriculture. In addition, we highlighted the nudge interventions seen in these policies and schemes. These policies and plans are based on the recent years.

One organisation that works with the public and business sectors to accomplish diverse development objectives is The /Nudge Institute. This institute undertakes data collection, report creation, and employs nudge to address a variety of India-related problems. The usage of pesticides, farmer security, farmer income, and other topics are the subject of several publications and research in the field of agriculture. This institute uses a variety of nudges, including giving farmers resources, training, social security, and knowledge.

The problems associated with agriculture are getting worse as the population grows. Government and economic actors are attempting to control the situation in the interest of farmers and agriculture. Pesticide usage, food supply, water-related issues, and inadequate irrigation systems are just a few of the issues that are getting worse every day. Behavioural issues arise during programme and policy implementation. Policies fail because of individuals' or farmers' behavioural attitudes such as ignorance, acceptance of policies, etc. To address these issues, behavioural models and theories are crucial. Using MINDSPACE, the paper points out these cues in policies and schemes.

Our thoughts are greatly influenced by *Messenger* nudges. Many celebrities are actively promoting agriculture in many ways in the realm of agriculture. Nandita Das, is a filmmaker and Indian actress who works to protect water resources. In order to raise awareness about water harvesting and conservation, she worked with the Centre for Science and Environment in New Delhi in 2003. She has also created and directed instructive short videos about rainwater collection. People have a lot of influence on short films because they are brief and direct. John Abraham, one of famous celebrities is in favour of a cause that would give the country's rural areas access to solar energy. In addition, he has joined forces with PETA. Celebrity involvement in socioeconomic issues causes a change in human minds because we admire them. In *Incentive* nudges, farmers are given encouragement in the form of income support through the PM KISAN Scheme, the Pradhan Mantri Fasal Bima Yojana guarantees crop insurance and irrigation facilities are guaranteed under the PM Krishi Sinchai Yojana. Using the Kisan Credit Card and other means, access to institutional credit is made available. Markets all around the country are now accessible to farmers as part of the e-NAM project, allowing them to obtain more lucrative pricing for their produce. According to the PIB report, the umbrella programme Pradhan Mantri Annadata Aay Sanrakshan Abhiyan (PM-AASHA) maintains a strong procurement process while guaranteeing farmers the Minimum Support Price (MSP) for a variety of Kharif and Rabi crops. Also, the government has said that it will designate more

than 325 thousands fertiliser stores to Pradhan Mantri Kisan Samruddhi Kendras. In addition to purchasing seeds and fertiliser, farmers will be able to use these locations to do soil testing and obtain helpful advice on farming practises. Such arrangements, setups, or monetary incentives¹⁹ encourage farmers to become involved in agriculture. Also, the government uses DBT (Direct Benefit Transfer). DBT makes sure that recipients are accurately targeted. To prevent duplicate subsidies, recipients can only link one bank when making fund deposits using their Aadhaar information. It enables the government to communicate with both citizens and programme beneficiaries at the same time. Thus, in order to benefit, farmers must link their bank accounts. Thus, Government officials are contracting with farmers to install smart meters in agricultural areas in order to implement DBT scheme.

One of the Indian states, Andhra Pradesh, began installing smart meters²⁰ in the agricultural sector. Water used for irrigation is displayed through smart meters. This will enable comparisons between farmers' water use and that of other neighbouring farmers. In this state administration, we can observe nudges in terms of *Norms*. To encourage groups of farmers to switch to organic farming²¹, the Paramparagat Krishi Vikas Yojana was established. In the North-Eastern Region, a specific programme has also been introduced to encourage organic cultivation and the export of organic produce. In this situation, a group of farmers can aid in getting the message out.

Agricultural insurance and Agri-Tech, including WINDS, YES-Tech, and CROPIC, are key to financial inclusion and programme trust, with technology enrolment being a common nudge²². Technology-based scheme enrolment is one of the *Default* nudges.

According to *Salience* Nudge, people are more likely to notice innovative, approachable, and straightforward stimuli. Phrase like "Chhota kisan bane desh ki shaan", and "Per Drop Per Crop" are some of the catchy taglines. The e-NAM trading mechanism aims to bring wholesale markets or farm produces market committees (APMCs) on a single electronic platform. Farmers will be able to sell their produce to the best bidders. Increased availability and lower prices of fertilizers will be made possible by the introduction of "One Nation, One Fertilizer under the "Bharat" brand name throughout the entire nation. These catchy taglines encourage people to pursue agricultural and environmental goals.

Priming Nudge influences people through visual and verbal cues. Priming can influence people's conservation behaviour. For this, media and advertising are effective tools. If the media portrays agriculture issues and farmer problems through priming, people's subconscious cues will activate and lead to the desired outcome. In *Affect* Nudge, farmers are considered as "anndaata", which depicts farmers' lives to be dignified as a profession. People's emotions are triggered as their respect for farmers grows. People will take action in support of farmers and the agricultural sector.

Under *Commitments* Nudge, agricultural participants pledge that they understand the organic system of cultivation and commit to adhering to the organic standards. They then obtain Participatory Guarantee System (PGS) certification. This certification ensures that organic farming meets high-quality standards. In *Ego* nudge, we might say that specific villages or people's images are advertised, inspiring people to contribute towards agriculture. Examples include the India Agribusiness Award given to Haryana. Even the sarpanch's and other people's successes have been documented in numerous newspapers and magazines. This satisfies and improves the self-image of agricultural workers.

Recommendations for India

The issue of awareness, acceptability, and application by farmers and people at large in the agricultural policies and programmes can be resolved with nudge interventions. The Indian government is constantly

working to find solutions to agri-environmental problems. In this opinion, there are some recommendations for how nudge interventions can be used in agriculture in the future.

The use of famous people has the potential to influence human minds. Misra (2012)²³ uses statistical tools to assess the impact of celebrities on rural consumers. It has a positive influence. The Indian government should target farmers' minds based on the personalities they prefer. The government should invite such people to assist in resolving many agri-environmental issues. If farmers adopt agri-environmental measures, the government of India should incentivize them with money, education assistance, rewards, and so on.

One of the most well-known nudge techniques is the concept of default options. Policymakers can use this technique in the context of sustainable agriculture to encourage farmers to adopt sustainable practises with minimal effort on their part. Farmers may be automatically registered for government programmes that promote sustainable agricultural practises. Farmers, for example, could be automatically enrolled in programmes that promote sustainable farming practises such as crop rotation or organic farming when they sign up for government subsidies or loans. This means that farmers who do not actively choose to opt out of these programmes will be forced to practise sustainable farming practises.

In certain contexts, using social norms as a nudge strategy to promote sustainable practises can be effective. Social norms are such behavioural rules that are widely accepted and followed by a specific group or society. They have a large influence on individual behaviour, and people tend to conform to them in order to avoid social rejection or gain social approval. As a result, if sustainable practises become the social norm, farmers will be more likely to adopt them.

Through social norms, farmers can be encouraged to adopt sustainable practises. One way to encourage people to embrace sustainable methods is to point out how many farmers in your area already do so. Farmers' adoption of sustainable farming methods can be facilitated by making them the default choice. For instance, choosing to participate in sustainable agriculture methods may be the default choice when farmers register for government programmes. Without exerting additional effort, this encourages farmers to adopt sustainable methods. To encourage farmers to embrace sustainable practises, messages advocating them can be pleasantly worded. For instance, messages should emphasise the benefits of implementing sustainable practises rather than the drawbacks of not doing so.

Jacquemet et al. (2018)²⁴ found swearing a pledge improves coordination and outcomes in strategic situations. Czap et al. (2013)²⁵ tested three frames: neutral, empathetic towards water, and self-interest, finding empathy promotes pollution reduction.

Farmers can be encouraged by giving them advice on how to improve their use of sustainable techniques. Giving farmers information on how their sustainable practises affect soil health or water conservation, for example, may encourage them to continue using these methods.

Nudges are a simple, inexpensive tool for influencing farmers' decision biases, allowing rural areas to adapt policies. In-depth research is crucial for successful implementation.

Conclusion

We are aware of the importance of agriculture in our lives in the economic world. We are dependent on them for food, income, and employment. As a result, securing and promoting the agriculture sector is unavoidable. This paper focuses on the literature on the use of nudges in agricultural practices in various countries. According to observations, there are studies that use nudge interventions in agriculture in foreign countries. The MINDSPACE framework is the focus of the paper. However, there are other nudges

too that have an impact on agriculture. Following that, we concentrate on Indian agricultural policies and schemes in the current scenario. In agricultural policies, the Indian government has not fully implemented the nudge theory. As a result, we try to figure out how these policies and schemes are related to nudge interventions. Furthermore, we make recommendations to promote agricultural policies and schemes. Other nudges that benefit agriculture can also help in this area. This paper only looks at the scope of the nudge. However, there is room for experimentation with nudges in agriculture in the future.

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