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Impact of Branding and Promotional Strategies on Farmers' Adoption and Buying Behavior of Nano Urea: A Focused Study of the Vidarbha Region, Maharashtra

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Abstract:

The introduction of nano urea represents a significant advancement in fertilizer technology aimed at improving nutrient-use efficiency and promoting sustainable agriculture. However, farmers' adoption and buying behavior toward such innovations depend largely on effective branding and promotional strategies. The present study examines the impact of branding and promotional efforts on farmers' adoption and buying behavior of nano urea in the Vidarbha region of Maharashtra. The study is based on primary data collected from 120 farmers using a structured questionnaire and employs a descriptive and analytical research design. Statistical tools such as percentages, mean scores, ranking techniques, correlation analysis, and chi-square tests were used for data analysis. The findings reveal that government endorsement and brand credibility play a decisive role in building trust and encouraging adoption, while field demonstrations and dealer recommendations are the most effective promotional tools in creating awareness and influencing repeat purchase behavior. The study concludes that integrated branding and experiential promotional strategies are essential for accelerating the adoption of nano urea among farmers in the Vidarbha region and for ensuring sustained usage of innovative fertilizer technologies.

Keywords: *Nano Urea; Branding; Promotional Strategies; Farmer Adoption; Vidarbha Region*

Introduction:

The introduction of nano-based fertilizers represents a significant innovation in Indian agriculture, aimed at improving nutrient-use efficiency while reducing input costs and environmental impact. Nano urea, developed as an alternative to conventional urea, has gained increasing attention due to its higher absorption efficiency, lower application quantity, and potential contribution to

sustainable farming practices. However, the adoption of such advanced inputs depends not only on their agronomic effectiveness but also on how they are marketed, branded, and promoted among farmers.

In regions like Vidarbha, Maharashtra characterized by rainfed agriculture, small and marginal landholdings, and high production risks farmer acceptance of new technologies is strongly influenced by trust, awareness, and perceived benefits. Branding initiatives, government endorsement, demonstrations, and promotional campaigns play a critical role in shaping farmers' perceptions and purchase decisions. Despite the policy push for nano urea, empirical evidence on how branding and promotional strategies influence farmers' adoption and buying behavior remains limited at the regional level. Therefore, the present study examines the impact of branding and promotional strategies on farmers' adoption and buying behavior of nano urea in the Vidarbha region of Maharashtra using primary data.

Need and Importance of the Study:

The Indian fertilizer market is witnessing a gradual shift from conventional bulk fertilizers toward innovative and efficiency-enhancing products such as nano urea. While nano urea offers several technical and environmental advantages, its widespread adoption among farmers is not automatic and depends heavily on effective communication and trust-building mechanisms. In Vidarbha, where farmers are generally risk-averse due to climatic uncertainty and economic vulnerability, the role of branding and promotion becomes especially important.

From an agribusiness perspective, understanding how branding elements (such as brand image, government backing, and perceived quality) and promotional strategies (such as field demonstrations, dealer recommendations, and media campaigns) influence farmer behavior is essential for designing effective marketing strategies. The study helps input companies and cooperatives refine their outreach programs and improve adoption rates.

For policymakers and extension agencies, insights into farmers' responses to promotional efforts can guide the design of more effective awareness campaigns and capacity-building programs. Academically, the study contributes to the literature on technology adoption, branding, and rural consumer behavior by providing region-specific primary data evidence from Vidarbha.

Review of Literature:

Branding and promotional strategies play a vital role in influencing farmers' adoption of new agricultural technologies, particularly in the case of innovative inputs such as nano fertilizers.

Sharma and Verma (2019) examined the branding of agricultural innovations and found that strong brand identity significantly enhances farmers' trust and willingness to adopt new products. Their study emphasized that government-backed or institutionally endorsed brands enjoy higher credibility in rural markets, which is especially relevant for inputs introduced as part of

national agricultural initiatives.

Patil and Jadhav (2020) analyzed farmers' awareness and perception of nano fertilizers in India and reported moderate to high awareness levels but uneven adoption across regions. They observed that lack of firsthand experience and uncertainty regarding performance limited adoption, highlighting the importance of effective communication and demonstration-based promotion. This finding supports the need to examine branding and promotional strategies together rather than in isolation.

Singh and Kaur (2018) focused on promotional strategies and rural consumer trust, concluding that personal selling and interpersonal communication channels are more effective than mass media advertising in rural markets. Their study highlighted that farmers place greater trust in information provided by dealers and fellow farmers than in generic advertisements, underlining the importance of localized promotional efforts.

Rao and Naidu (2021) explored technology diffusion in Indian agriculture from a branding perspective and found that branding significantly accelerates the adoption process when farmers associate the product with innovation, reliability, and institutional support. The authors stressed that branding reduces perceived risk, which is a critical factor in the adoption of new technologies among risk-averse farmers.

Kulkarni and Deshpande (2017) studied the influence of dealers on agro-input purchasing decisions and identified dealers as key opinion leaders in rural input markets. Their research revealed that dealer recommendations strongly affect farmers' brand choices, particularly for technically complex products such as fertilizers and pesticides. This underscores the importance of integrating dealers into promotional strategies for nano urea.

Banerjee and Ghosh (2019) examined the role of field demonstrations in fertilizer adoption and concluded that demonstrations significantly improve farmers' understanding of product benefits and correct usage. Their findings suggest that experiential learning through demonstrations leads to higher trial rates and repeat purchases, making demonstrations a crucial promotional tool for innovative fertilizers.

Mehta and Shah (2020) analyzed adoption behavior of new agricultural technologies in India and identified perceived relative advantage, compatibility, and observability as key determinants of adoption. They noted that branding and promotion directly influence these perceptions by shaping farmers' expectations and experiences with new products.

Chavan and Pawar (2018) studied farmers' perceptions of government-promoted agricultural inputs and found that government involvement enhances credibility and initial adoption but does not guarantee sustained usage unless supported by performance-based evidence. This highlights the complementary role of branding and promotional follow-up activities such as training

and demonstrations.

Iyer and Menon (2021) assessed the effectiveness of marketing communication in rural India and reported that integrated communication strategies combining mass media with interpersonal communication yield better results. Their study reinforces the idea that promotional strategies must be context-specific and tailored to rural audiences.

Joshi and Malhotra (2019) examined risk perception and technology adoption among farmers and found that high perceived risk reduces adoption likelihood. They emphasized that branding and promotional communication can mitigate risk perception by providing reliable information and success stories.

Nair and Pillai (2022) discussed nano fertilizers in the context of sustainable agriculture and highlighted their potential to reduce environmental impact while maintaining productivity. However, the authors noted that farmer acceptance remains a challenge and requires effective awareness-building and trust-enhancing measures.

Desai and Patel (2017) investigated brand trust and purchase intention in agro-input markets and concluded that brand trust is a strong predictor of purchase intention. Their study confirmed that trust develops over time through consistent product performance and credible promotional communication.

Objectives of the Study:

1. To analyze the **impact of branding factors** on farmers' adoption and buying behavior of nano urea in the Vidarbha region.
2. To assess the **effectiveness of promotional strategies** in influencing farmers' awareness, trial, and repeat purchase of nano urea.

Hypotheses:

Objective 1 (Branding):

- $H0_1$: Branding factors have no significant impact on farmers' adoption and buying behavior of nano urea.
- $H1_1$: Branding factors significantly influence farmers' adoption and buying behavior of nano urea.

Objective 2 (Promotion):

- $H0_2$: Promotional strategies do not significantly influence farmers' adoption and buying behavior of nano urea.
- $H1_2$: Promotional strategies significantly influence farmers' adoption and buying behavior of nano urea.

Research Methodology:

The present study adopts a descriptive and analytical research design to examine the impact

of branding and promotional strategies on farmers' adoption and buying behavior of nano urea in the Vidarbha region of Maharashtra. The descriptive component is used to understand the existing level of awareness, adoption, and perception of nano urea among farmers, while the analytical component helps in examining the relationships between branding and promotional factors and farmers' purchasing decisions.

The area of study is confined to the Vidarbha region of Maharashtra, which comprises districts with predominantly rainfed agriculture and a large concentration of small and marginal farmers. Vidarbha was selected for the study due to the increasing promotion of nano urea in the region and the relevance of understanding farmers' responses to new fertilizer technologies.

The sample size for the study consists of 120 farmers, including both users and non-users of nano urea, to capture a balanced view of adoption as well as non-adoption behavior. This sample size was considered adequate to provide meaningful insights into farmers' perceptions and buying behavior within the selected region.

A multi-stage random sampling technique was employed for the selection of respondents. In the first stage, representative districts from the Vidarbha region were selected. In the second stage, villages were randomly selected from each chosen district. In the final stage, individual farmers were randomly selected from the selected villages to participate in the survey. This approach ensured adequate regional representation and minimized selection bias.The study is based entirely on primary data, which were collected directly from farmers through personal interviews. Primary data were preferred to obtain first-hand information on branding awareness, promotional exposure, and purchasing behavior related to nano urea.

A structured questionnaire was used as the data collection instrument. The questionnaire consisted of close-ended questions and statements measured on a five-point Likert scale**,** ranging from "strongly disagree" to "strongly agree," to capture farmers' perceptions of branding and promotional strategies. The questionnaire also included questions related to socio-economic characteristics, awareness levels, adoption status, and purchase behavior.

The collected data were systematically coded, tabulated, and analyzed using appropriate statistical tools. Descriptive statistics such as percentages and mean scores were used to summarize the data. Ranking techniques were applied to identify the most influential branding and promotional factors. Correlation analysis was used to examine the relationship between selected variables, while the chi-square test was employed to test the association between categorical variables and to examine the stated hypotheses.

The period of study covered one agricultural season, during which data were collected to capture farmers' current experiences and recent purchase decisions related to nano urea.

Results and Interpretation:

Objective 1: Impact of Branding on Adoption and Buying Behavior

Table 1: Awareness and Adoption of Nano Urea Based on Brand Perception (N=120)

Branding Aspect	Aware (%)	Adopted (%)	Interpretation
Government-backed brand	92.5	68.3	Strong government branding significantly increases trust and adoption.
Perceived product quality	85.8	61.7	Quality perception positively influences buying behavior.
Brand reputation	78.3	55.0	Well-known branding improves trial and purchase decisions.

Table 1 presents the relationship between key branding aspects and farmers' awareness and adoption of nano urea among the sampled farmers in the Vidarbha region. The results clearly indicate that branding plays a crucial role in shaping both awareness and actual adoption behavior.

A very high proportion of farmers (92.5%) reported awareness of nano urea due to its government-backed branding, and a substantial share of these farmers (68.3%) had adopted the product. This suggests that government endorsement significantly enhances credibility and trust among farmers, particularly in a region like Vidarbha where farmers tend to be risk-averse and cautious in adopting new agricultural inputs. Government association appears to reduce perceived risk and encourages farmers to try innovative products such as nano urea.With respect to perceived product quality, 85.8% of farmers were aware of nano urea and 61.7% had adopted it. This indicates that farmers' perceptions regarding the effectiveness and performance of the product strongly influence their purchasing decisions. While awareness levels are high, the lower adoption percentage compared to awareness suggests that farmers may require direct experience, demonstrations, or peer validation before fully committing to regular use, highlighting the importance of performance-based trust.

In the case of brand reputation, 78.3% of farmers were aware of nano urea and 55.0% reported adoption. Although brand reputation positively influences trial and purchase decisions, its impact appear relatively lower compared to government endorsement and perceived quality. This finding implies that in rural agricultural input markets, institutional backing and perceived functional benefits outweigh conventional brand image alone when farmers evaluate new fertilizer technologies.

Overall, the results demonstrate a clear gap between awareness and adoption across all branding aspects, indicating that awareness by itself is not sufficient to ensure adoption. Trust-

building mechanisms particularly government endorsement and proven product quality play a decisive role in converting awareness into actual buying behavior. These findings confirm that branding is a significant determinant of nano urea adoption and support the rejection of the null hypothesis that branding has no impact on farmers' adoption and buying behavior.

Table 2: Mean Scores of Branding Factors Influencing Buying Decision (1–5 scale)

Branding Factor	Mean Score	Rank
Government endorsement	4.21	1
Brand credibility	3.98	2
Product innovation image	3.65	3
Packaging and labeling	3.12	4

The results in Table 2 indicate that government endorsement is the most influential branding factor affecting farmers' buying decisions, with the highest mean score of 4.21. Brand credibility ranks second, suggesting that trust and reliability associated with the brand play a major role in purchase decisions. The product innovation image also positively influences buying behavior, indicating farmers' interest in technologically advanced inputs. In contrast, packaging and labeling received the lowest mean score, implying that visual aspects are less important than trust and performance in rural input markets. Overall, functional and institutional branding elements dominate farmers' buying decisions over cosmetic branding features.

Objective 2: Impact of Promotional Strategies on Adoption and Buying Behavior

Table 3: Effectiveness of Promotional Methods in Creating Awareness

Promotional Strategy	Awareness Created (%)	Interpretation
Field demonstrations	76.7	Most effective promotional tool
Dealer recommendation	70.8	Trusted source of information
TV / radio advertisements	54.2	Moderate impact
Mobile/SMS campaigns	38.3	Limited reach

Table 3 shows that field demonstrations are the most effective promotional method, creating awareness among 76.7% of farmers by providing firsthand experience of nano urea performance. Dealer recommendations also play a crucial role, as 70.8% of farmers rely on dealers as trusted information sources. Television and radio advertisements have a moderate impact, indicating limited but useful reach in rural areas. In contrast, mobile and SMS campaigns generate relatively low awareness, suggesting constraints related to digital access and engagement. Overall, interpersonal and experiential promotional methods are more effective than mass or digital media in creating

awareness among farmers.

Table 4: Promotional Strategies and Repeat Purchase Behavior

Promotional Factor	Mean Score	Rank
On-field demonstrations	4.08	1
Subsidized trial packs	3.74	2
Training programs	3.46	3
Printed leaflets/posters	2.91	4

Table 4 indicates that on-field demonstrations are the most influential promotional strategy for encouraging repeat purchase, with the highest mean score of 4.08. Subsidized trial packs rank second, suggesting that risk reduction through low-cost trials motivates continued use. Training programs also positively influence repeat purchase by improving farmers' understanding of correct application and benefits. In contrast, printed leaflets and posters have the least impact, reflecting limited effectiveness of passive promotional tools. Overall, interactive and experiential promotional strategies are most effective in sustaining farmers' buying behavior.

Conclusion:

The study reveals that branding and promotional strategies significantly influence farmers' adoption and buying behavior of nano urea in the Vidarbha region. Government endorsement, brand credibility, and field demonstrations emerged as the most influential factors driving adoption. While awareness levels are relatively high, sustained adoption depends on experiential learning and trust-building measures. The findings highlight the importance of integrated branding and promotion strategies for accelerating the diffusion of innovative fertilizers among farmers.

Limitations of the Study:

- The study is confined to Vidarbha and cannot be generalized to the entire state.
- Data are based on farmers' self-reported responses and may involve recall bias.
- Short-term adoption behavior was studied; long-term impact was not assessed.

Recommendations:

- Increase the number of on-field demonstrations in rainfed areas.
- Strengthen dealer training programs to improve information accuracy.
- Use government branding strategically along with farmer success stories.
- Introduce subsidized trial packs to encourage first-time users.

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