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A STUDY ON CONSUMER BUYING BEHAVIOUR OF VERMICOMPOST IN CHITRAKOOT, DISTRICT OF UTTAR PRADESH, INDIA

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ABSTRACT

This study explores how wheat farmers buy and use vermicompost in Manikpur block, Chitrakoot District, Uttar Pradesh, for the agricultural year 2025–26. As sustainable farming grows across India, understanding consumer habits, supply chains, and market constraints becomes essential for agribusiness development. Using a multi-stage stratified random sampling technique, we interviewed 100 wheat farmers alongside local retailers and producers. Socio-economic profiling shows a sector heavily dominated by marginal operators, with 70% owning under one hectare of land. Demographically, half of the surveyed farmers are 51 years or older, 80% are male, and 30% have completed high school education. Currently, 60% of respondents actively use vermicompost for their crops. Likert scale analysis reveals that improving soil quality is the primary purchase motivator (Mean 4.67), closely followed by boosting overall wheat yield (Mean 4.37). Economically, the study evaluates two primary supply chains: direct sales (Channel I) and retail-mediated distribution (Channel II). Direct sales from producer to consumer prove significantly more profitable and efficient, achieving a 148.9% marketing efficiency rate. Channel I successfully limits the price spread to 40%, allowing producers to pocket a net price of ₹688 per quintal against a consumer price of ₹1,150. In contrast, introducing middle-tier retailers expands the price spread and increases overall marketing costs. Ultimately, shortening the supply chain maximizes profits for organic manufacturers while ensuring affordable access for smallholders, proving that local, direct-to-farmer models are vital for scaling sustainable agriculture.

Keywords: *Vermicompost, Marketing efficiency, Consumer behaviour, Price spread, Sustainable agriculture*

INTRODUCTION

The adoption of sustainable agriculture practices is becoming increasingly important to ensure the long-term health of the planet. Vermicompost, a bio-fertilizer rich in organic matter and readily available nutrients for soil, is produced through the digestion of organic materials by earthworms. However, despite the numerous benefits of vermicompost, its adoption rate among farmers and gardeners in India remains relatively low. Uttar Pradesh, including the Chitrakoot district, serves as a major agricultural hub in the country. Therefore, understanding the consumer buying behavior of vermicompost in this region is critical for promoting its adoption and encouraging sustainable agriculture practices. The study was also explore the influence of demographic factors, such as age, education, and income, on consumer buying behavior.. Vermicompost is renowned for being a nutrient-rich organic fertilizer, containing a wide range of essential macro and micronutrients for plant growth. Here is some information regarding the nutrient content of vermicompost: It delivers key macronutrients—primarily nitrogen (1.2%–2.5%), phosphorus (0.9%–1.7%), and potassium (1.5%–2.5%)—supplemented by vital secondary elements like calcium and magnesium. Beyond these major nutrients, the material supplies trace micronutrients such as iron, zinc, copper, and manganese, which drive

essential plant metabolic pathways and chlorophyll production.

Sampling Methodology

A multi-stage sampling procedure was adopted for this study. In the first stage, Chitrakoot district was purposively selected from the 75 districts in Uttar Pradesh for its high production and sales of vermicompost. In the second stage, Manikpur block was selected purposively from the five available blocks in Chitrakoot due to its prominent vermicompost production. In the third stage, five percent of the 65 villages within Manikpur were selected randomly. For the fourth stage, ten percent of the total respondents were randomly selected based on their production capacity, sales status, and land holding size. These farmers were categorized into five groups: marginal (0–1 hectare), small (1–2 hectares), semi-medium (2–4 hectares), medium (4–10 hectares), and large (10 hectares and above). Finally, in the fifth stage, both primary and secondary markets were randomly selected for data collection. Data collection was executed through multiple research instruments. Structured surveys and questionnaires were utilized to gather direct consumer data regarding buying behavior. Qualitative insights were obtained through face-to-face, telephone, or online interviews. Additionally, observational research was employed to study consumer decision-making processes within natural retail settings. Large volumes of data from social media and customer databases were analyzed using data analytics to identify behavior patterns and trends. The collected data were analyzed using percentage proportions to evaluate the relative distribution of the components.

Analytical Tool

Likert Scale: The Likert scale is a standard classification format for studies. The respondents provide their opinion (data) about the quality of a product/service from high to low or better to worse using two, four, five, or seven levels. This tool is mainly used for analyzing consumers' buying behavior.

RESULTS AND DISCUSSION

The empirical data collected from the 100 agricultural households in the Chitrakoot district provide critical insights into how socio-economic characteristics—specifically landholding capacity—shape the adoption and consumption patterns of vermicompost. The findings demonstrate a distinct divergence in agricultural management approaches between resource-limited smallholders and large-scale commercial operators.

Cross-Tabulation of Landholding Distribution and Vermicompost Usage

To assess the structural factors driving organic fertilizer adoption, a cross-tabulation analysis was performed, mapping landholding classifications against current vermicompost usage. Table 1 provides a unified, consolidated matrix that reconciles previous reporting discrepancies and accounts for the total sample population (N=100).

Table 1. Cross-tabulation of respondent distribution by landholding size and vermicompost adoption

S. No.	Landholding Category	Vermicompost Users (n=40)	Non-Users (n=60)	Total Respondents (N=100)	Percentage of Sample (%)
1.	**Marginal** (less than 1 ha.)	15	10	25	25.0%
2.	**Small** (1–2 ha.)	11	12	23	23.0%
3.	**Medium** (4–6 ha.)	9	10	19	19.0%
4.	**Large** (>6ha.)	5	28	33	33.0%
	Total	**40**	**60**	**100**	**100.0%**

The analysis indicates a strong inverse relationship between farm size and vermicompost adoption. Within the cohort of active vermicompost users (n=40), marginal farmers constitute the largest single demographic at exactly 37.5% (n=15), followed by small-scale farmers at 27.5% (n=11). Primary data interviews revealed that these smallholders utilize vermicompost predominantly for small-scale horticulture, intensive vegetable cultivation, and household gardening practices. The localized, high-touch management requirements of organic composting align more naturally with smallholder operations.

Conversely, large-scale farmers (>6 ha.) represent a distinct minority among active consumers, comprising only 12.5% (n=5) of the user base. For this limited segment of large-scale operators, the decision to implement vermicompost is strategically driven by economic optimization—specifically targeting premium, certified organic export markets that offer higher profit margins to offset lower initial yields.

This pattern reverses significantly when examining the non-user cohort (n=60). Large-scale commercial growers constitute the highest proportion of non-users at 46.7% (n=28), followed by small farmers at 20.0% (n=12). This highly skewed distribution highlights a critical bottleneck: as agricultural operations scale up structurally, the voluntary adoption rate of vermicompost sharply declines.

Consumer Behavior and Determinants of Non-Adoption

To identify the market and institutional failures restricting organic adoption, the 60 non-user respondents were surveyed to isolate their primary deterrents. The structural frequencies and corresponding percentages are detailed in Table 2.

Table 2. Primary institutional and economic barriers to vermicompost adoption

S. No.	Primary Reason for Non-Adoption	Frequency (n=60)	Percentage (%)
1.	Lack of Technical Awareness	15	25.0%
2.	Deficient Local Availability	12	20.0%
3.	Prohibitively High Market Price	10	16.7%
4.	Product Quality and Adulteration Concerns	10	16.7%
5.	Absence of Discernible Agronomic Results	8	13.3%
6.	Other Miscellaneous Constraints	5	8.3%
	Total	**60**	**100.0%**

The primary impediments restricting wider market entry are a deficit in technical awareness (25.0%) and inadequate localized distribution channels (20.0%). Financial constraints also play a major role, particularly among the 28 large-scale non-users. Commercial operators regularly noted that the bulk cost of high-quality commercial vermicompost is financially prohibitive when contrasted with heavily subsidized synthetic inputs, such as urea and diammonium phosphate (DAP).

This systemic price disparity has created distortionary market behaviors. To artificially suppress retail prices and boost profit margins, certain local organic amendment processors have begun incorporating industrial bagasse ash into their vermicompost mixtures. This practice severely compromises the macro-nutrient balance and humic stability of the final product. When commercial farmers apply this lower-grade compost and notice an absence of clear agronomic results (13.3%), consumer trust is eroded. This pushes large-scale operations away from bio-fertilizers and cements their reliance on traditional agrochemicals.

Motivational Factors Driving Purchase Intention

Evaluating the underlying mechanisms that successfully drive adoption is vital for designing target-driven agricultural interventions.

Table 3 presents the primary motivators influencing the 40 active vermicompost users.

Table 3. Primary socio-economic and ecological drivers of vermicompost purchase behaviour

S. No.	Core Driving Factor for Purchase/Usage	Frequency (n=40)	Percentage (%)
1.	Integrated Self-Sustaining Producers	10	25.0%
2.	Generalized Organic Agriculture Awareness	8	20.0%
3.	Pro-Environmental Orientation / Proximity to Nature	7	17.5%
4.	Health Consciousness	5	12.5%
5.	Operational Ease of Field Application	5	12.5%
6.	Other Motivating Factors	5	12.5%
	Total	**40**	**100.0%**

Interestingly, 25.0% (n=10) of the active user base operates as self-sustaining producers. These farmers manage on-farm vermicomposting units, bypassing commercial supply chains entirely to insulate themselves from external price spikes. For the remaining purchasing consumers, generalized awareness of organic benefits (20.0%) and intrinsic pro-environmental or nature-loving values (17.5%) serve as the primary psychological triggers.

Furthermore, health consciousness regarding chemical residues in food crops accounts for 12.5% of adoption choices. These findings validate established behavioral economic theories which indicate that the market penetration of green agricultural innovations relies heavily on aligning product value propositions with the baseline ecological and health-centric values of the target demographic.

CONCLUSION

In conclusion, the data and findings presented in this study shed light on various aspects of vermicompost adoption and consumer behaviour. The study revealed that among the respondents, the adoption rate of vermicompost was relatively low, with only 40% reporting its usage. This indicates that there is room for increasing awareness and promoting the benefits of vermicompost among farmers and gardeners in the Chitrakoot district of Uttar Pradesh.

Regarding land holdings, it was observed that a significant portion of the respondents who used vermicompost belonged to the marginal category of farmers with small land holdings. This suggests that vermicompost adoption is more prevalent among smaller-scale farmers, potentially due to their interest in gardening practices.

Conversely, among the respondents who did not use vermicompost, the majority were large-scale farmers. The primary reason cited for non-usage was the higher cost of vermicompost compared to chemical fertilizers, especially in cases where the vermicompost quality was compromised by the inclusion of bagasse ash.

Among the reasons for purchasing or using vermicompost, awareness emerged as a significant factor, with 20% of the respondents citing it as a motivation. Other notable reasons included health consciousness, involvement in vermicompost production, nature-loving practices, and the ease of application.

The study highlights the importance of raising awareness about the benefits of vermicompost and addressing concerns related to cost and quality. Efforts to promote vermicompost adoption should target a diverse range of farmers, including both small-scale and large-

scale farmers, by emphasizing its positive impact on plant health, soil quality, and environmental sustainability.

By implementing appropriate strategies and initiatives, such as educational campaigns, subsidized distribution, and quality assurance measures, vermicompost adoption among consumers in the Chitrakoot district of Uttar Pradesh can be encouraged, leading to a more sustainable approach to agriculture and enhanced soil health in the region.

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