

# “A Study on the Impact of Digitalization on Farmers’ Satisfaction in APMC Markets of Shajapur District.”

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## ABSTRACT

This study examines the impact of digitalization on farmers’ satisfaction in APMC Markets of Shajapur District. The research focuses on understanding how digital platforms influence farmers’ experiences and satisfaction in agricultural marketing. By evaluating the level of awareness, usage, and interaction with digital services, the study seeks to assess the effectiveness of digitalization initiatives in enhancing convenience, transparency, and efficiency in market processes. Understanding the impact of digital technologies is essential to identify the role of digitalization in improving farmers’ engagement and satisfaction. The study provides insights into how technology adoption shapes farmers’ experiences in APMC Markets and highlights areas where digital initiatives can positively influence agricultural marketing systems.

**Keywords:** Farmers’ Satisfaction, Digitalization, Agricultural Marketing, APMC Markets, Awareness, Usage.

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## INTRODUCTION

India's economy is based on agriculture, which supports millions of farmers’ and makes a substantial contribution to the country's food security. The efficiency of the agricultural sector and the income of farmers are significantly influenced by the sale of agricultural produce. These markets are governed by Agricultural Produce Market Committees (APMCs) to guarantee openness, reasonable prices, and organized commerce. Transactions in APMC Markets have always been carried out manually, which frequently results in delays, restricted access to market data, and inefficiencies. In an effort to overcome these obstacles and enhance market operations, APMC Markets has implemented digital technologies. Online transaction systems, digital payments, and electronic record-keeping are examples of digital platforms that are intended to improve market processes' efficiency, ease, and transparency. By enhancing the general market experience and facilitating improved access to information and services, these measures have the potential to have a substantial impact on farmers' happiness.

The impact of digitalization depends on how effectively farmers are able to utilize these technologies and how aware they are of the available services. Examining farmers’ experiences and satisfaction provides an understanding of the tangible effects of digitalization on agricultural marketing. Evaluating the impact of digital platforms in APMC Markets can inform policymakers and market authorities about the effectiveness of these initiatives and guide future strategies to enhance farmers’ engagement and satisfaction.

The degree to which digitalization affects farmers’ satisfaction depends on several factors, including the accessibility of technology, the ease of using digital platforms, and the level of support provided by market authorities. Farmers’ perceptions of these services are shaped not only by the availability of digital systems but also by their ability to effectively engage with them in daily market operations. Studying these aspects helps to understand the practical implications of digitalization on agricultural marketing and provides a foundation for exploring strategies that can maximize the positive effects of technology. A comprehensive assessment of the impact of digitalization on farmers’ satisfaction is therefore essential for enhancing the efficiency, transparency, and overall effectiveness of APMC Markets in Shajapur District.

## LITERATURE REVIEW

**1. KJ Raghvendra, Shiv Kumar, Amit Kar, Pramod Kumar, Rashmi Singh, Prawin Arya and TM Kiran Kumar (2023)** examined “Awareness and Determinants of Farmer’s

Participation in e-Marketing of Agricultural Commodities in India”. The study concludes that farmers’ participation in electronic marketing platforms like e-NAM is influenced by specific socio-economic factors, with market distance and farm size being significant determinants. Overall awareness of e-marketing processes among farmers was found to be relatively low in some regions, indicating a need for greater capacity building and educational efforts. Enhancing awareness and knowledge of digital market mechanisms is essential to promote wider farmer participation and create a more efficient agricultural marketing system.

**2. Siddesh Sadashiv Pawar, Dr. Shrikrishna Gulabrao Walke (2024)** discussed “Electronic National Agricultural Market (E-Nam) and Its Role in Transforming Agricultural Marketing: A literature Perspective”. The study concludes that the Electronic National Agriculture Market (eNAM) represents a major step toward modernizing India’s traditional agricultural marketing system by integrating APMC mandis into a unified digital marketplace. It highlights that eNAM improves market efficiency through transparent competitive bidding, reduces transaction costs, and supports inter-state trade by expanding market access for farmers. However, the review also notes that infrastructural gaps, regulatory inconsistencies across states, and low levels of digital literacy remain barriers to full adoption. The findings suggest that while eNAM has the potential to transform agricultural marketing, its success depends on stronger policy support, improved digital infrastructure, and capacity-building for stakeholders.

**3. CA Manoj Chaudhry, Dr. Samir Gopalan (2025)** discussed “Digital Mandis and Market Liberalization: Transforming Agriculture Trade through E-platforms in India” The paper highlights that digital mandis, such as e-NAM, are transforming India’s agricultural markets by increasing transparency, reducing middlemen, and enabling direct farmer-to-business and farmer-to-consumer transactions. They improve price discovery, expand market access, and boost competitiveness. However, their effectiveness depends on adequate infrastructure, supportive regulations, and farmers’ digital literacy. Overall, digital mandis are a significant step toward modern, inclusive, and efficient agricultural markets in India.

**4. Ankita A Mathur, Bhumit A Shah (2025)** examined “Digital Transformation in Agricultural Marketing: Advancing India’s Agri Trade Ecosystem”. The study addressed that the use of digital technologies is transforming India’s agricultural marketing system. Digital platforms and ICT-based tools provide farmers’ and traders with better market access, real-time price information, and increased transparency. The study analyzes the impact of various digital tools—such as e-commerce platforms, mobile apps, and data-driven decision support systems—and finds that they overall improve market efficiency, price discovery, and supply chain management. It also emphasizes the role of government initiatives like E-NAM in creating a stronger national market for agricultural commodities. The study concludes that with adequate support from the government and stakeholders, digital transformation can make agricultural marketing more inclusive, efficient, and resilient.

**5. Palak Sangwan, Asma Fayaz Lone and Munish Kundal (2025)** discussed “Impact of E-Marketing and Digital Mandis on Agricultural Supply Chain”. The study finds that e-marketing platforms and digital mandis like e-NAM and Kisan-Mandi are transforming India’s agricultural supply chain by enhancing transparency, increasing farmers’ incomes, and improving overall efficiency. These digital interventions reduce transaction costs, support financial inclusion, and help minimize post-harvest losses. The paper emphasizes the role of ICT in modernizing agricultural marketing and aligning India’s supply chains with global practices.

#### OBJECTIVES OF THE STUDY-

1. To examine the impact of digitalization on farmers’ satisfaction in APMC Markets of Shajapur District.
2. To assess farmers’ awareness and usage of digital platforms and their influence on satisfaction.
3. To study the relationship between awareness, usage, and overall satisfaction, and to identify key influencing factors.
4. To identify the factors that determine the impact of digital services on farmers’ satisfaction.
5. To provide recommendations for improving the effectiveness of digital services and enhancing farmers’ satisfaction.

#### HYPOTHESIS-

**1. H<sub>0</sub>:** There is no significant impact of digitalization in APMC Markets on farmers’ satisfaction.

**H<sub>1</sub>:** There is a significant positive impact of digitalization in APMC Markets on farmers’ satisfaction.

**2. H<sub>0</sub>:** There is no significant effect of farmers’ awareness and usage of digital platforms on their satisfaction in APMC Markets.

**H<sub>1</sub>:** There is a significant positive effect of farmers’ awareness and usage of digital platforms on their satisfaction in APMC Markets.

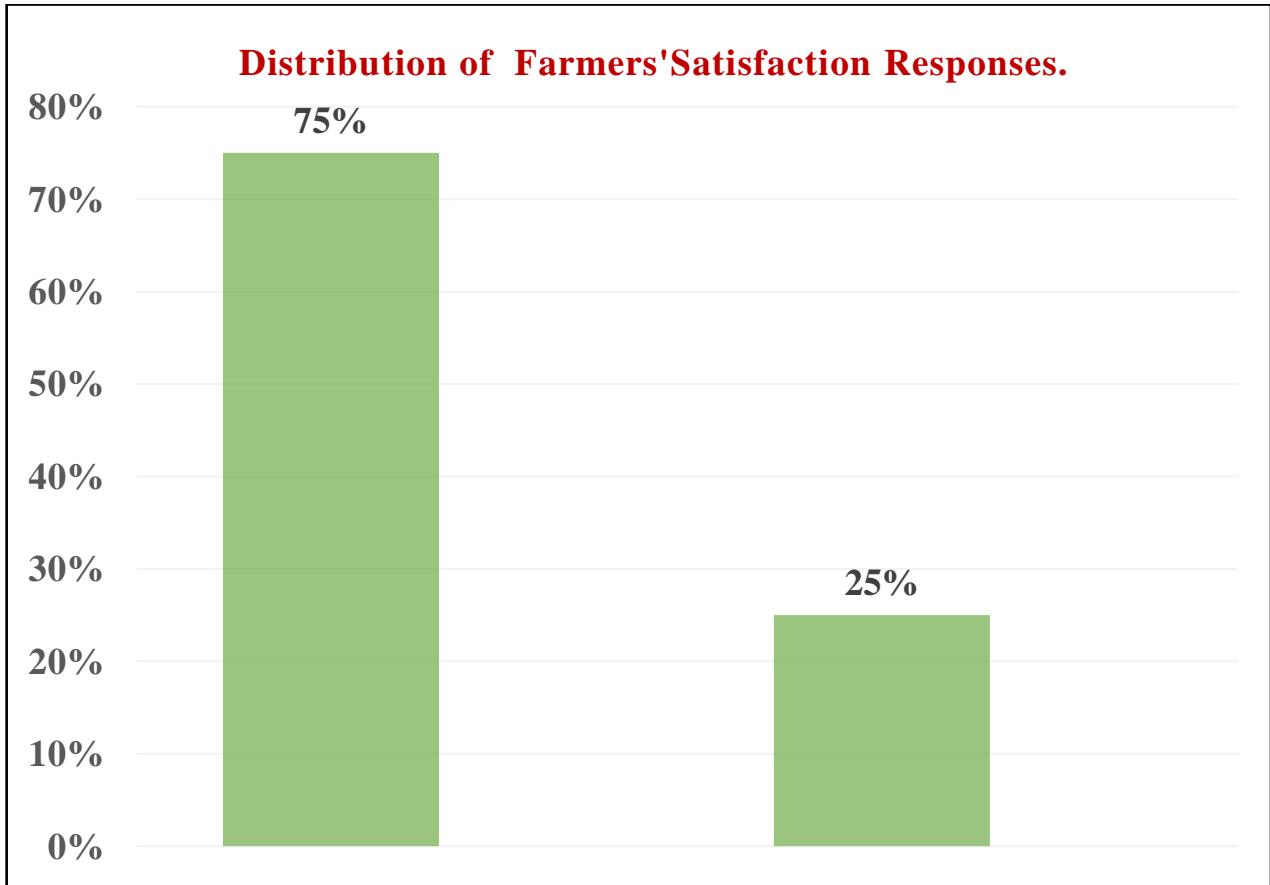
#### RESEARCH METHODOLOGY

The research methodology outlines the systematic procedures employed to investigate the study’s objectives, address key questions, and analyze relevant phenomena within the chosen field. This study utilizes primary data collected directly from farmers. A total of 100 farmers were selected through the random sampling method from various APMC mandis in Shajapur district, including Shujalpur, Shajapur, Kalapipal, Akodiya, Maksi, Bercha, and Mo. Badodiya.

**DATA ANALYSIS AND INTERPRETATION-**

**I. Farmers’ Satisfaction with Digitalization in APMC Markets.**

The satisfaction level of farmers regarding digitalization in APMC markets was measured using a structured questionnaire. Data was collected from 100 farmers in APMC markets of Shajapur District. Based on the responses, 75% of the farmers answered ‘Yes’, indicating that digitalization has increased their satisfaction, while 25% answered ‘No’. These findings have been visually represented through a bar graph, providing a clear overview of the distribution of responses.



**Figure 1: Bar Graph Showing the Distribution of ‘Yes’ and ‘No’ Responses on Farmers’ Satisfaction with Digitalization.**

A Z-test for proportions was performed to assess the statistical significance of the observed response rate regarding farmers’ satisfaction with digitalization in APMC markets. A One-Tailed Z-Test for Proportions was applied based on the collected sample data.

**Given Data:**

- Sample size (n) = 100 farmers
- Sample proportion ( $\hat{p}$ ) = 75/100 = 0.75 (75% answered ‘Yes’)
- Population proportion under null hypothesis ( $p_0$ ) = 0.5 (50%, representing neutral or no impact)
- Confidence level = 95%
- Z-Critical (One-Tailed) = 1.645

**The formula for Z-test for one proportion is:**

$$Z = \frac{\hat{p} - p_0}{\sqrt{\frac{p_0(1-p_0)}{n}}}$$

**Calculation:**  $Z = \frac{\hat{p} - p_0}{\sqrt{\frac{p_0(1-p_0)}{n}}} =$

$$Z = \frac{0.75 - 0.50}{\sqrt{[0.50(1 - 0.50) / 100]}}$$

$$Z = 0.25 / \sqrt{[0.50 \times 0.50 / 100]}$$

$$Z = 0.25 / \sqrt{[0.25 / 100]}$$

$$Z = 0.25 / \sqrt{0.0025}$$

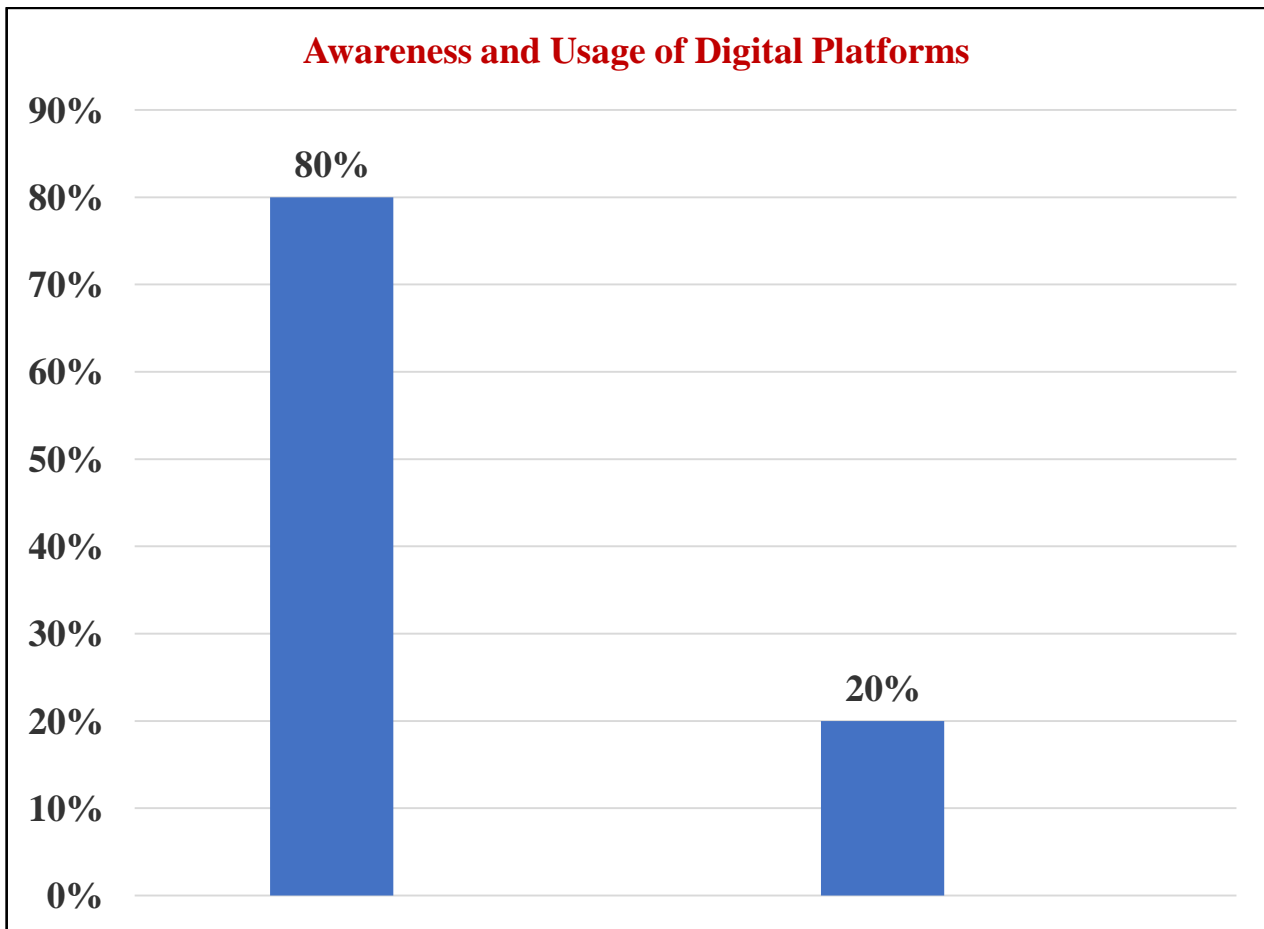
$Z = 0.25 / 0.05$   
 $Z = 5.0$

**INTERPRETATION-**

The calculated Z value is 5.0, which is greater than the critical value of 1.645 at the 5% significance level for a one-tailed test. Therefore, the null hypothesis is rejected. It is concluded that digitalization has a significant positive impact on farmers’ satisfaction in APMC markets of Shajapur District.

**II. Farmers’ Awareness and Usage of Digital Platforms and their Satisfaction in APMC Markets.**

The level of awareness and usage of digital platforms among farmers and its relation to their satisfaction in APMC markets was measured using a structured questionnaire. Out of 100 farmers surveyed, 80% responded ‘Yes’, indicating that their awareness and usage of digital platforms are associated with higher satisfaction, while 20% responded ‘No’. These findings have been illustrated through a bar graph to provide a clear representation of the distribution of responses.



**Figure 2: Bar Graph Showing Farmers’ Awareness and Usage of Digital Platforms and Their Satisfaction in APMC Markets.**

A Z-test for proportions was performed to assess the statistical significance of the observed response rate regarding farmers awareness and usage of digital platforms and their impact on satisfaction.

One-Tailed Z-Test for Proportions was applied based on the collected sample data to examine the impact of farmers’ awareness and usage of digital platforms on their satisfaction.

**Given Data:**

- Sample size (n) = 100 farmers
- Sample proportion ( $\hat{p}$ ) = 80/100 = 0.80 (80% answered ‘Yes’)
- Population proportion under null hypothesis ( $p_0$ ) = 0.5 (50%, representing neutral or no impact)
- Confidence Level = 95%
- Z-Critical (One-Tailed) = 1.645

**The formula for Z-test for one proportion is:**

$$Z = \frac{p^{\wedge} - p_0}{\sqrt{\frac{p_0(1-p_0)}{n}}}$$

**Calculation:**  $Z = \frac{p^{\wedge} - p_0}{\sqrt{\frac{p_0(1-p_0)}{n}}} =$   
 $Z = (0.80 - 0.50) / \sqrt{[0.50(1 - 0.50) / 100]}$   
 $Z = 0.30 / \sqrt{[0.50 \times 0.50 / 100]}$   
 $Z = 0.30 / \sqrt{0.25 / 100}$   
 $Z = 0.30 / \sqrt{0.0025}$   
 $Z = 0.30 / 0.05$   
 $Z = 6.0$

#### INTERPRETATION-

The calculated Z -value is 6.0, which is greater than the critical value of 1.645 at the 5% significance level for a one-tailed test. Therefore, the null hypothesis is rejected, and it is concluded that farmers' awareness and usage of digital platforms have a significant positive effect on their satisfaction in APMC markets of Shajapur District.

#### FINDINGS-

1. The study found that digitalization has a significant positive impact on farmers' satisfaction in APMC markets, as 75% of farmers reported improved satisfaction levels.
2. Statistical analysis (Z = 5.0) confirmed that digitalization significantly enhances efficiency, transparency, and convenience for farmers.
3. It was observed that 80% of farmers are aware of and use digital platforms, which positively influences their satisfaction levels.
4. The Z-test result (Z = 6.0) proved that awareness and usage of digital platforms have a strong and significant effect on farmers' satisfaction.
5. A positive relationship exists between awareness, usage, and satisfaction, indicating that higher awareness leads to increased usage and better satisfaction outcomes.
6. Key factors influencing farmers' satisfaction include:
  - Easy access to market information
  - Digital payment systems
  - Transparency in transactions
  - Time-saving processes
7. However, a small proportion of farmers' still face challenges due to lack of digital literacy, technical skills, and infrastructure issues.

#### SUGGESTIONS

1. Digital literacy among farmers should be improved through training and awareness programs.
2. Internet connectivity and digital infrastructure in rural areas should be strengthened.
3. Digital platforms should be made simple, user-friendly, and available in local languages.
4. Technical support and help desks should be provided in APMC markets.
5. Awareness about digital services like e-NAM should be increased.
6. Farmers' should be encouraged to adopt digital payments through incentives.
7. Regular feedback from farmers should be collected to improve digital services.

#### CONCLUSION

The study concludes that digitalization plays a crucial role in improving farmers' satisfaction in APMC markets of Shajapur District. The findings clearly indicate that both digitalization and farmers' awareness and usage of digital platforms have a significant positive impact on satisfaction levels. The relationship between awareness, usage, and satisfaction is strong, suggesting that increasing awareness leads to higher adoption and better outcomes for farmers. Digital services have improved transparency, efficiency, and accessibility in agricultural marketing. However, challenges such as lack of awareness, digital skills, and infrastructure still exist. Addressing these issues through proper training, improved facilities, and supportive policies can further enhance the effectiveness of digitalization.

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