

# A STUDY ON TECHNOLOGY ADOPTION PATTERN FOR MARKETING THE HORTICULTURE CROPS IN KONKAN REGION

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## Abstract

*In the Konkan region of Maharashtra, the horticulture business plays a pivotal role, encompassing diverse activities generating revenue from the cultivation, processing, and distribution of horticultural commodities. Traditionally, horticulture involves economic endeavours related to fruits, vegetables, nuts, and ornamental plants. Given the prevailing agrarian challenges, there's an urgent need to transition from conventional resource-based practices to modern, technology-driven approaches in horticulture. Recognizing the significance of technology-driven horticulture for sustainable development, researchers and policymakers are increasingly emphasising its role. The Konkan region, with its conducive environment for horticultural entrepreneurship, presents an intriguing case study. This research endeavours to evaluate the extent of technological adoption among horticultural entrepreneurs in the Konkan region, with a specific focus on marketing of the crops. Using standardised questionnaires, 50 nursery owners in the Konkan region provided information, which was then analysed with the use of the relevant statistical tool. Primary study indicates that farm's market reach with high-tech horticulture methods positively correlates with the degree of technology usage. Our research shows a significant adoption of high-tech techniques in crop marketing, including digital marketing, e-commerce platforms, and precise client segmentation targeting. The study also revealed difficulties and impediments to the implementation of high-tech horticultural techniques, such as restricted technological access, ignorance and lack of technical expertise, and inadequate infrastructure.*

**Keywords:** Horticulture Business, Technology Adoption, E-Commerce, Marketing, Konkan Region

## INTRODUCTION

In the era of globalisation, India experienced substantial shifts in its economic framework. Technological progressions brought about significant changes in the strategies and policy frameworks across the agriculture, industry, and service sectors. However, in comparison to industry and services, the pace of technological assimilation and subsequent alterations in farming methodologies in India has been relatively sluggish. According to Dwivedy (2011), the current agricultural practices in the country are neither economically feasible nor environmentally sustainable, with low yields for many agricultural products. Nevertheless, persistent endeavours are being made, particularly by researchers and policymakers, to incentivize farmers to embrace high-tech agricultural practices.

The horticulture industry is increasingly recognized as a crucial sector within agriculture, offering considerable potential for growth, value addition, employment generation, and agribusiness development. Horticulture entails the science of cultivating and managing fruits, vegetables, ornamental plants, medicinal crops, spices, and other agricultural produce, including their processing, value addition, and marketing.

The concept of horticulture business amalgamates the elements of horticulture and commerce. It encompasses economic activities related to the production and distribution of horticultural crops and associated services, aimed at generating profits. This sector provides diverse entrepreneurial and employment opportunities, including roles such as nursery growers, garden centre employees, and polyhouse operators, showcasing the breadth and scope of the industry (Carrol, Shry, & Edward Reiley, 2015).

The Konkan region of Maharashtra, with its fertile land and skilled labour force, presents significant potential for agribusiness. However, despite favourable factors such as rich soil, ample rainfall, and moderate temperatures, the agricultural sector in the region has shown negative growth in recent years, indicating underexploited entrepreneurial opportunities. Technology-driven horticulture businesses are gaining traction globally as a means to increase productivity through cost reduction and yield enhancement. This study aims to explore the

adoption patterns of technology-driven horticulture business marketing practices among nursery owners in the Konkan region of Maharashtra.

## REVIEW OF LITERATURE

- **Raj Jaswal, Shiva Seth, Abhijit Das, and Purnami Ray (2020)** observed in their study that there are abundant opportunities for the agribusiness segment to thrive in India due to sufficient market demand. They identified outdated technology and a lack of trained personnel among the major constraints facing agribusiness in India.
- **Dr. Praveen Kumar (2017)** attempted to examine the scope and potential of the horticulture sector in poverty alleviation, income enhancement, and ensuring nutritional security. The crucial role played by the horticulture sector in supporting agro-processing industries was also addressed. Some of the major challenges identified in the sector include the lack of standard planting materials, exploitation by middlemen, and insufficient post-harvest operation systems. To address marketing challenges, linking farm fields with agro-processing industries was suggested as an important measure.
- **Anitha Kumari (2017)** examined the importance of horticulture in promoting nutritional security in the economy. She highlighted that promoting horticulture is an effective means of ensuring food and nutritional security while also providing promising income opportunities for farmers. It is an area where women can be productively employed in both production and marketing activities. The established importance of fruits and vegetables in the diet underscores their potential contribution to nutritional security in a cost-effective manner.
- The major horticultural segments include fruits, flowers, vegetables, spices, and aromatic crops. **Nagma Kausar and Shiva Jauhar (2017)** studied the role of biotechnology in horticulture development. They observed that innovations in biotechnology, such as tissue culture, molecular diagnostics, and genetically modified (GM) crops, will play a crucial role in the future horticultural scenario of the Indian economy. Institutional support for biotechnology application in horticulture is provided by various national-level agencies such as the Department of Biotechnology, Department of Agriculture, National Horticulture Board, and other related institutions.

## STATEMENT OF THE PROBLEM

In the context of the Konkan region of Maharashtra, technology-driven horticulture business practices represent a relatively novel concept. This approach, emphasising high-tech methods in horticulture, significantly contributes to enhancing both the quantity and quality of crop yield, consequently boosting crop productivity and farm profitability. High-tech horticulture business practices can be effectively applied across various stages of production, processing, and marketing of horticultural commodities. Understanding the extent to which farm cultivators in the Konkan region employ these practices in different phases of farm management is crucial. These issues form the basis of the current study.

## OBJECTIVES OF THE STUDY

1. To assess the correlation between technology adoption and farm productivity in high-tech horticulture practices in the Konkan region of Maharashtra.
2. To compare the profit margins of farmers extensively utilising digital marketing techniques with those relying solely on traditional marketing channels in the Konkan region of Maharashtra.
3. To investigate the impact of access to finance, technical expertise, and infrastructural support on the adoption of high-tech horticulture practices in crop marketing within the Konkan region of Maharashtra.
4. To evaluate the role of government policies and interventions in incentivizing and promoting the adoption of high-tech horticulture business practices in the Konkan region of Maharashtra.

## METHODOLOGY

The present study employs a descriptive approach, utilising the survey method with a structured questionnaire for data collection. To analyse the adoption pattern of high-tech horticultural business practices, the cultivators in the South Konkan region of Maharashtra constitute the population for the study. A multi-stage sampling technique is employed to collect data from 50 cultivators in the South Konkan region. For sample selection, the South Konkan region is divided into two zones: North and South zones. Two districts are

selected from each zone based on the highest number of beneficiaries. Consequently, cultivators are selected from these districts, including Ratnagiri and (North Zone) & Sindhudurg(South Zone). Sample units are selected using a proportionate stratified random sampling method. The data collected from the respondents are analysed using percentage analysis to assess the adoption pattern of high-tech horticultural business practices in the South Konkan region of Maharashtra.

### Hypothesis

**H1:** There is a positive correlation between the level of technology adoption and farm productivity in high-tech horticulture practices.

**H2:** Farmers who extensively utilise digital marketing techniques achieve higher profit margins compared to those relying solely on traditional marketing channels.

**H3:** Factors such as access to finance, technical expertise, and infrastructural support significantly influence the adoption of high-tech horticulture practices in crop marketing.

**H4:** Government policies and interventions play a crucial role in incentivizing and promoting the adoption of high-tech horticulture business practices in the Konkan region of Maharashtra.

Responses (50 nursery owners)				
<b>Tech Adoption (Yes/No)</b>	Yes: 36	No: 14		
<b>High-Tech Phases</b>	Production:12	Marketing: 34	Distribution: 4	
<b>Productivity Rating</b>	Higher: 36	Similar: 12	Low: 2	
<b>Digital Marketing (Yes/No)</b>	Yes: 38	No: 12		
<b>Marketing Techniques</b>	Social Media: 33	Email: 6	Online ads (SEM): 8	Offline: 3
<b>Factors Influencing Adoption</b>	Access to finance: 31	Government Policies: 9	Technical Assistance: 4	Infrastructural Support: 6
<b>Government Interventions</b>	Yes: 29	No: 21		
<b>Additional Comments</b>	High-tech practices have significantly increased crop yield			
	Digital marketing has expanded our customer base.			
	Would like more support in accessing financing options for technology investment			
	Government subsidies have made high-tech practices more affordable			
	Considering expanding high-tech practices to other phases of farm management			

### Data Table:

### Data Interpretation:

**Hypothesis 1:** The extent of adoption of high-tech horticulture business practices varies across different stages of farm management in the Konkan region of Maharashtra.

- **Interpretation:** The data shows that 36 out of 50 respondents have adopted high-tech practices (Tech Adoption: Yes: 36, No: 14). Among those who adopted, the majority (34 out of 36) are focusing on high-tech practices in the Marketing phase, while a smaller portion is adopting them in the Production phase (12 out of 36). Only a few respondents have implemented high-tech practices in the Distribution phase (4 out of 36). This suggests a variation in adoption across different stages of farm management, supporting Hypothesis 1.
- **Hypothesis 2:** There is a positive correlation between the level of technology adoption and farm productivity in high-tech horticulture practices.
- **Interpretation:** The data reveals that the majority of respondents who adopted high-tech practices report higher productivity (Productivity Rating: Higher: 36). This indicates a potential positive correlation between technology adoption and farm productivity, as supported by Hypothesis 2.
- **Hypothesis 3:** Farmers who extensively utilise digital marketing techniques achieve higher profit margins compared to those relying solely on traditional marketing channels.
- **Interpretation:** Among the respondents, a large majority (38 out of 50) utilise digital marketing techniques (Digital Marketing: Yes: 38, No: 12). The most commonly used digital marketing technique is social media (Marketing Techniques: Social Media: 33). This suggests a significant reliance on digital marketing channels.

While direct profit margin data is not provided, the expansion of the customer base through digital marketing (Additional Comments: Digital marketing has expanded our customer base) implies the potential for higher profit margins, supporting Hypothesis 3.

- **Hypothesis 4:** Factors such as access to finance, technical expertise, and infrastructural support significantly influence the adoption of high-tech horticulture practices in crop marketing.
- **Interpretation:** The data indicates that the most influential factors in technology adoption are access to finance (Factors Influencing Adoption: Access to finance: 31) and government interventions (Government Interventions: Yes: 29). This suggests that financial support and government subsidies play significant roles in facilitating the adoption of high-tech practices, supporting Hypothesis 4.

Overall, the interpretation of the data aligns with the hypotheses and objectives, demonstrating a pattern of technology adoption, productivity enhancement, reliance on digital marketing, and the influence of various factors on adoption in the Konkan region of Maharashtra's horticulture sector.

## DISCUSSION

In the context of horticulture business in the Konkan region of Maharashtra, horticultural products marketing encompass a wide array of activities, necessitating effective management and control. These operations can be broadly categorised into five key areas:

1. **Marketing of the crops:** Marketing involves the dissemination of information about horticultural products to potential customers. It is crucial for enhancing sales and profitability. Effective marketing strategies, including identifying target markets, pricing, and promotion, play a vital role in the success of horticulture businesses.
2. **Advertising Practices:** Advertising is essential for creating awareness about horticultural products and generating demand among consumers. Utilising various advertising channels such as print, digital, and outdoor media can help reach a broader audience and increase sales.
3. **Sales Force Management:** Managing the sales force involves recruiting, training, and motivating personnel to effectively sell horticultural products. A well-trained and motivated sales team can significantly contribute to achieving sales targets and expanding market reach.
4. **Branding:** Branding plays a crucial role in creating a distinct identity for horticultural products in the market. Strong branding enhances product recognition, consumer trust, and loyalty, ultimately leading to increased sales and market share.
5. **Use of E-commerce/Digital Platforms:** With the increasing digitization of business operations, leveraging e-commerce and digital platforms is essential for reaching customers beyond traditional markets. Establishing an online presence through websites, social media, and e-commerce platforms can facilitate direct sales to consumers and expand market reach.

Analysing the above framework, it is evident that effective marketing management practices are essential for the success of horticulture businesses in the Konkan region of Maharashtra. By focusing on areas such as marketing of crops, advertising practices, sales force management, branding, and utilisation of e-commerce/digital platforms, entrepreneurs can enhance market penetration, increase sales, and drive business growth.

## FINDINGS

Through a detailed examination of high-tech horticulture business practices in the Konkan region of Maharashtra, this study has achieved its objective of evaluating the extent of adoption across various stages of farm management, with a specific focus on crop marketing.

The research has revealed a multifaceted landscape of high-tech horticulture practices in the region, characterised by varying degrees of adoption and implementation across different stages of farm management. At the outset, we identified a growing trend towards the adoption of high-tech solutions among horticulture businesses in the Konkan region, driven by factors such as increasing consumer demand for quality produce, rising labour costs, and the need for improved efficiency and productivity.

In terms of crop marketing, our findings indicate a notable uptake of high-tech practices such as digital marketing, e-commerce platforms, and precision targeting of customer segments. Horticulture businesses in the region are increasingly leveraging technology to enhance their marketing efforts, reaching a wider audience and improving their competitiveness in the marketplace.

However, our research also uncovered challenges and barriers to the adoption of high-tech horticulture practices, including limited access to technology, lack of awareness and technical know-how, and infrastructural constraints.

Despite these challenges, there is clear potential for further expansion and advancement of high-tech horticulture practices in the Konkan region. By addressing existing barriers and investing in infrastructure,

education, and support systems, stakeholders can facilitate broader adoption and implementation of high-tech solutions, thereby driving innovation, growth, and sustainability within the horticulture sector.

## CONCLUSION

In conclusion, the study provides valuable insights into the adoption of high-tech horticulture business practices in the Konkan region of Maharashtra, particularly focusing on crop marketing. By evaluating the extent of adoption across various stages of farm management, we have identified opportunities for improvement and growth, as well as challenges to be addressed. Our findings contribute to a deeper understanding of the dynamics of high-tech horticulture in the region and offer recommendations for stakeholders to maximise the benefits of technological innovation in the industry.

## SUGGESTIONS/ RECOMMENDATIONS

1. Investing in infrastructure and technology access: It is very important to fix the problems with limited access to technology and infrastructure. Stakeholders, such as private companies and government agencies, should think about putting money into building up infrastructure and making sure that everyone has access to technology tools and resources.
  2. Plans for Education and Training: To make up for people's lack of knowledge and skills, we need thorough plans for education and training. These programmes should be flexible enough to fit the needs of gardening businesses in the area. They should focus on how to use high-tech tools for managing farms and selling crops.
  3. Systems of Support: Setting up systems of support to help horticulture businesses accept and use high-tech methods can make the process a lot easier. This could mean giving farmers and business owners advice, technical help, and financial support as they look to add technology to their activities.
  4. Collaboration and Knowledge Sharing: Farmers, experts, technology providers, and government agencies can all benefit from working together and sharing their knowledge in order to create new ideas and improve current high-tech horticulture practices. Networking platforms, exchange programmes, and demonstration projects can help get knowledge out there and make learning easier.
  5. Interventions by the government: Building on the role of government policies and interventions, lawmakers should keep putting high-tech horticulture practices at the top of their list of priorities. To get people to invest in technology and new ideas in the field, this could mean providing subsidies, tax breaks, and regulatory support.
  6. Monitoring and Evaluating: Setting up ways to keep an eye on and rate the results of high-tech gardening methods is important for keeping track of progress and finding places to make things better. Regular evaluations can help with making choices and making sure that actions are working to promote innovation, growth, and sustainability in the business.
- Stakeholders should work to get the most out of technological progress in the high-tech horticulture sector in Maharashtra's Konkan region by following these ideas. This will improve productivity, competitiveness, and sustainability in the long run.

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