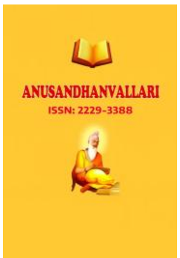

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A Comprehensive Analysis of the Farm-to-Fork Model and Its Impact on Retail Market Development in Vidarbha

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Abstract: This paper gives an in-depth examination of farm-to-fork model and its relevance in the development of retail market in Vidarbha region. Based on a descriptive research design and primary data gathered consisting of 150 respondents, the researchers found that farm-to-fork practices have a great positive impact on supply-chain efficiency, the reduction of intermediaries, and price transparency. Through the model, there has been a significant rise in the income of farmers and it has sustained the retail markets in the form of quality products, consistency and consumer confidence. Despite the obstacles of poor cold-chain infrastructure, average adoption of digital technologies, etc., the farm-to-fork system reveals a promising future to the establishment of sustainable and integrated agri-retail value chains. The research identifies the necessity of better infrastructure, enhancing the relationships between farmers and retailers, and increasing the range of the digital and organizational interventions in order to maximize the potential of the model in Vidarbha.

Keywords: Farm-to-Fork, Vidarbha, Supply Chain Efficiency, Retail Market Development, Farmer Income, FPOs, Digital Platforms, Agricultural Value Chain

INTRODUCTION

Farm-to-fork (F 2 F) model has become a revolutionary framework, to enhance value chains in agricultural, better the welfare of farmers and also to empower systems in retail markets, in agricultural economy of developing countries. Traditional supply chain inefficiencies in India, including multilayered intermediaries, price asymmetry, lack of information, and inadequate logistics, have restricted the economic potential of small and marginal farmers in India (Kumar and Yadav,2021). The Maharashtra state with its fractured landholdings, unstable crop prices, skyrocketing fields losses are shaped in the favor of farm-to-fork interventions joining production, aggregation, processing, distribution, and retail operations in the Vidarbha region (Dandekar and Sawant, 2022).

Farm-to-fork models are models that make the flow of produce simplified, as they bridge the gap between farmers and markets, lowering the business expenses and providing transparency. Newly developed evidence indicates that these models can help farmers to gain a bigger portion in the consumer rupee, gain better price realization, and have a better supply face to the contemporary retail outlets (Mehta and Singh, 2020). Strong market connections and insufficient infrastructure has long held agricultural anguish in areas such as Vidarbha, but the ongoing application of F2F systems, including farmer-producer organizations (FPOs), internet-based trading, and cold-chain integration, provides the avenues towards rural and urban market development (Patil and Shende, 2023).

Although more and more focus is placed upon F2F systems, limited research has been done so far regarding how they can influence the development of the retail markets in Vidarbha. Current research centers much on the productivity in agriculture or farmer wages and provides limited information on the effects of downstream retail,

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market efficiency, and market structure transformation. The current research paper tries to address this knowledge gap by giving a detailed discussion of farm-to-fork model, and estimating its impact on development of retail markets in Vidarbha. In this study, the researcher seeks to know how F2F systems can develop sustainable value chains and increase consumer access to quality produce as well as provide more general economic benefits to the region.

LITERATURE REVIEW

Studies of farm-to-fork models cut across the subject matters of supply chain effectiveness, inclusive marketing systems, price transmission, and retail transformation. Short food supply chains (SFSCs) have become a popular topic concerning the role of maintaining a more intensive interaction between producers and consumers by eliminating intermediate channels of contact. Sharma and Kulkarni (2020) note that SFSCs allow making transactions more transparent, lower transaction costs, and improve the product traceability, which modern retailers start to pay more and more attention to.

Research stresses that integrated supply chains enjoy the resilience aspect on price fluctuations and losses in the post-harvest period. Narayanan and Gulati (2021) in their study on the Indian fresh produce markets mention that coordinated farm-to-market routes know how to decrease spoilage rates by 20-30 percent primarily through investments in cold chains and better logistics. The findings are specifically applicable to the context of Vidarbha, where the poor storage and transportation remains a topic that prevents farmers to access remunerative markets (Bhosale and Jadhav, 2022).

Another theme that has been discussed widely is the role of farmer-producer organizations (FPOs) in facilitating transitions between farms and forks. Joshi and Agarwal (2023) also prove that FPOs increase the bargaining power of farmers and generate economies of scale and it is rather an essential mediator that can connect producers with retail chains. Likewise, direct procurement models that are frequently implemented by most contemporary retailers have demonstrated potential in enhancing price realization and stable quality of supply (Pandey & Sahu, 2021).

On-line media have also contributed to the increased usage of F2F. According to the study conducted by Deshmukh and Wankhede (2022), e-marketplaces enhance the price disclosure and remove information asymmetry, but their adoption can be uneven across regions because of the differences in infrastructures and digital literacy. The limitations are still eminent in Vidarbha that restricts the potential of the full adoption of technology (Thakare and Bansod, 2023).

Even though there has been a number of studies investigated to analyze discrete elements of the F2F model, there are limited studies to examine its aggregate effects of development of the retail market particularly in Vidarbha. The literature is either concerned with farmer performance, or with efficiencies on the supply side, creating a knowledge gap regarding downstream retail dynamics, consumer access and modernizing regional retail networks.

This review advises a definite gap in consolidated research to study the role of F2F systems in retail competitiveness, pricing systems, product supply and growth in agrarian areas like Vidarbha. The current study is filling this gap by considering the role of farm-to-fork processes in the process of developing the retail market, providing insights to fill gaps between agricultural supply-chain interventions and retail market change.

Objectives:

This research will analyze how the farm-to-fork model operates in Vidarbha and whether it leads to the development of the retail market based on the assessment of supply-chain efficiency, farmer-retailer interactions, pricing, infrastructure disjuncture, and how the model has helped in increasing the market transparency, consumer access, and economic growth in the region.

Methodology:

The current paper uses descriptive research design in order to have a systematic exploration of how the farm-to-fork model functions in Vidarbha. Under a structured questionnaire, primary data were gathered through the use of respondents who are directly concerned with agricultural marketing and retail business. 150 respondents which included farmers, FPO members, supply-chain intermediaries, and retail operators were chosen as the sample size. The selection of respondents was done using purposive sampling and in a way that involves the major stakeholders in the farm-to-fork operations. The methodology helped the research to obtain minute details on the supply-chain practices, priceGeneration processes, market connections and perceptions on the effectiveness of the model on the development of retail markets in the area.

Result and Discussion:

As a measure to determine the effectiveness of the farm-to-fork model in Vidarbha, the primary data collection was done; 150 respondents were chosen using a structured questionnaire. Quantification of the responses was done by the way of percentage distribution and analysis of results was done by averages and comparative tabulation. In the analysis, the four main areas are explored, including efficiency of the supply chain, changes in farmer income, impacts of retail markets, and implementation of farm-to-fork practices.

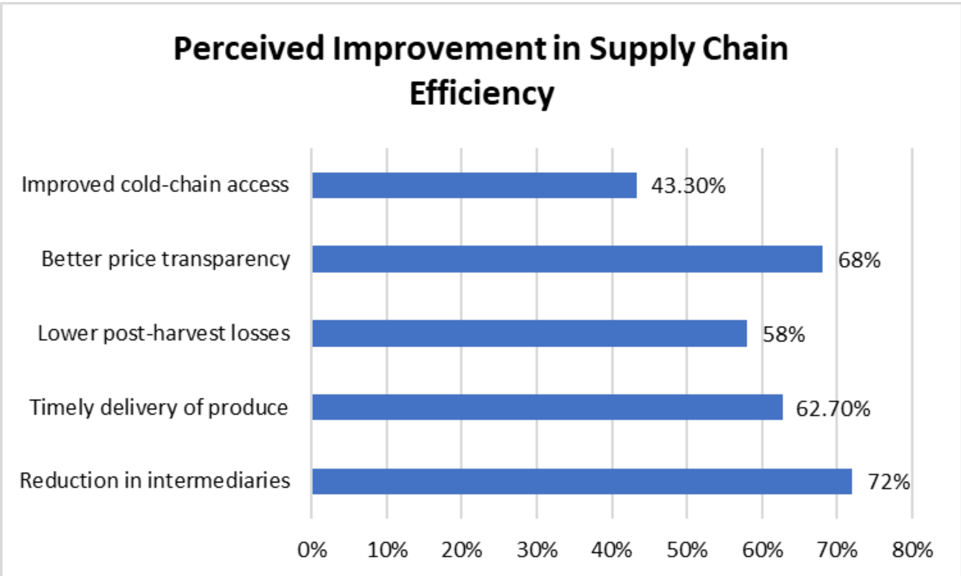

Fig. 1 Improvement in Supply Chain Efficiency

Most respondents (72%), claimed that they had decreased reliance on intermediaries according to the farm to fork model. Better coordination between retailers and farmers is also suggested by better price transparency (68%) and timely delivery (62.7). Nevertheless, cold-chain accessibility is low (43.3%), which indicates that infrastructure needs to be invested in.

Table 1 Change in Average Monthly Income After Farm-to-Fork Adoption

Income Category (₹/month)	Before	After	Percentage Increase (%)
Average Income (₹)	14,800	19,600	32.4%

Farmer income has risen on average by 32.4 percent being 14 800 to 19 600 per month, with the practice of F2F. Respondents recognized growth in income due to direct sales, lower marketing costs and improved realisation price.

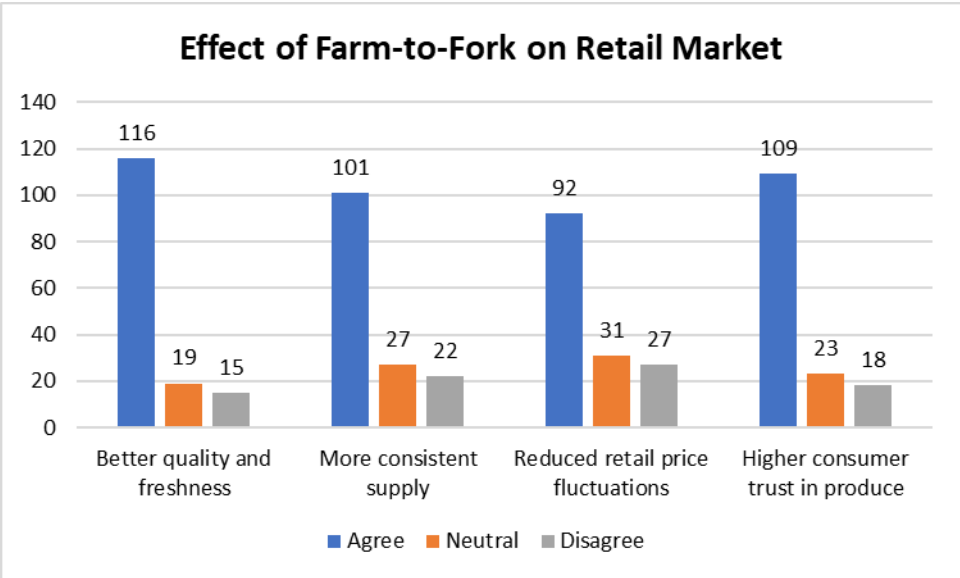

Fig. 2 Effect of F2F on Retail Market

A high majority (77.30) voted that farm-to-fork enhances the quality and freshness of goods in retail stores. Approximately 67.3 percent reported greater retail supply. The lower price variation (61.3%) implies the stability of the market behaviour, whereas a larger consumer trust (72.6%) implies transparent sourcing.

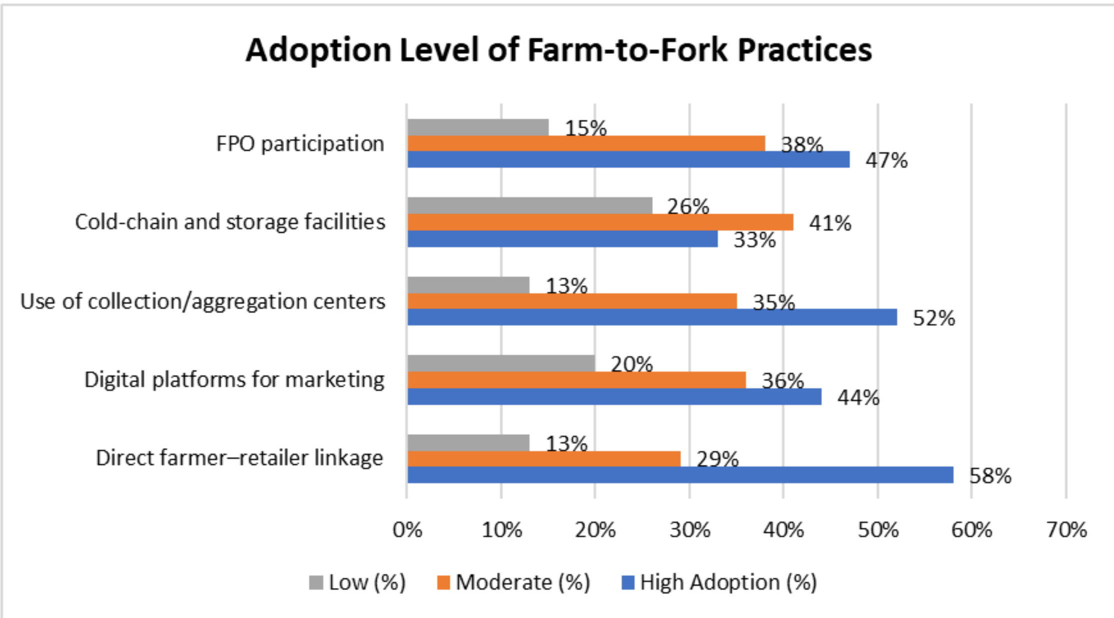

Fig. 3 Adoption of F2F practices

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There are fairly high adoption levels on direct linkages, aggregation centers and FPO participation. Digital platforms are moderately embraced whereas use of cold-chain is the least because of cost and infrastructure limitations. This shows that the F2F model is partially applied, and it can be extended.

The statistics identify that the farm-to-fork concept has greatly contributed to increasing efficiency of the supply-chain to over 32 percent increase in farmer income and reporting improved quality, consistency, and consumer trust in Vidarbha retail market. Although the implementation of digital tools and cold-chain infrastructure is minor, the stakeholders are mostly aware of the potential of the model to make agricultural and retail growth sustainable.

Overall Findings:

The general results of the study point out to the fact that the farm-to-fork model has benefited the agricultural supply chains as well as the time of development of retail markets in Vidarbha. This has resulted in reduced number of middlemen, increased price transparency, reduction in post-harvest losses and greater coordination between the farmers and retailers. Direct market connections and the low cost of marketing were also observed to increase the monthly revenue of farmers dramatically, and resulted in quality, freshness, and uniformity of the produce to retailers. Despite average levels of the adoption of digital platforms and cold-chain infrastructure, the increment in the number of FPOs and aggregation centers characterizes the rising interest in the model acceptance. On the whole, the farm-to-fork system is characterized by great prospects of enhancing efficiency, building stronger ties between the market, and targeting sustainable economic development in the area.

Conclusion

The paper arrives at the conclusion that the farm-to-fork model is essential to enhance the agriculture value chain and develop the retail market in Vidarbha. The results of the research show that direct affiliations between farmers and retailers have made supply-chain efficiency much more effective, decreased the reliance on mediators, made the supply chain more transparent, and raised the degree of farmer income. The advantages have been a steady supply, higher quality of the products and increased consumer confidence to the retailers, which demonstrates a positive shift in the dynamic perspective of the market. The paper, however, also points out a range of endemic issues like inadequate cold-chain facilities, disparities in digital access and supply-chain constraints. On the whole, the farm-to-fork model has a great promise to develop sustainable, inclusive, and efficient agri-retail ecosystems in the area, as long as the encouraging interventions keep on developing.

Recommendations

Various strategic interventions are suggestions on ways to boost the effectiveness of the farm-to-fork model in the Vidarbha. One, the investment in cold-chain infrastructure, such as pre cooling units, refrigeration transport, and storage systems need to be given priority so that post-harvest losses can be minimized. Second, it is possible to use training programs to develop the digital literacy level and encourage the use of online market applications, which will facilitate the smoother and more transparent marketing process. Enhancing Farmer Producer Organizations (FPOs) will enable collective bargain, access better markets as well as reduced cost of operation. Moreover, policymakers must encourage utilization of the private sector in supply-chain innovations and provide incentives to a retailer to embrace long-term procurement agreement with farmers when engaging in activities. Last but not least, the awareness among consumers can be created regarding the advantages of farm-to-fork products and this will further stimulate demand and lead to a more integrated and sustainable south agri-retail environment in Vidarbha.

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