

Challenges and Innovations in Fruits and Vegetable Operations in Indian Organized Retail Industry

Shilpa Sarvani Ravi, M. V. Ram Prasad

Abstract: *The retail sector in India is emerging as one of the largest sectors in the economy. The organized retail market in India is growing at a CAGR of 20-25 per cent per year. India was ranked second in the Global Retail Development Index 2019 after China, backed by rising middle class and rapidly growing consumer spending. As the country's population is witnessing a steep hike, the demand for various Fruits and Vegetables (F&V) products is also increasing at the same pace providing sustainable income and employment in this segment. Unfortunately this segment in the organized retail industry is facing challenges hindering the growth due to high wastage issues and demand uncertainty. This is a novel study focused on clearing the roadblocks in F&V segment for retail entities. This is a qualitative study which included data collection through structured interviews with the Operation Managers of retail stores and Warehouse Managers of Organized Retailers in Bengaluru city. Critical challenges like Low shelf life, Uncertainty in Quality, Price Fluctuations, Seasonality, Fill-Rate issues and respective innovative strategies to overcome such challenges were rightly identified. The study developed a conceptual framework aligning the critical challenges and innovations in F&V handling to attain the sustainable growth. This research also identified the emerging trends in F&V retailing. This information can be considered as treasure to the retailers and entrepreneurs to defeat the F&V challenges and enjoy the perks of sustainability in the market.*

Keywords: Retail Industry, Fruits and Vegetables (F&V), Retail Challenges, Strategic Innovations, Sustainable Growth.

I. INTRODUCTION

"Money lost is Money gain"

This is one of the famous quotes, but do not hold good in particular to F&V segment in retail chains. Here every penny saved is penny gained, in the operational process that will give a sustainable growth to the retailer.

Developing countries witnessed three successive waves in the Modern Retailing take off in the time frame between early 90's and 2000s [1]. The countries like China and India observed this modern retailing wave at the third [2]. The phenomenon of 'Supermarket Revolution' was popularly evidenced in this phase in these large Asian developing economies which had been metamorphosing the food retail markets, logistics and supply chain operations in both developing countries and also poor income nations [3].

The credibility of F&V segment has enhanced dramatically as it is improving the sustainability and nutritional security for the country. This is also leading to the raise in the employment opportunity nationally both in urban and rural areas. India is the fastest growing retail industry globally.

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USD 1,824 billion is the consumption expenditure nationally in 2017 and USD 3,600 billion is the expected consumption expenditure of the country by 2020. US\$ 672 billion in 2017 is the retail industry market size. It is expected to reach US\$ 1,200 billion by 2021 and 1,750 billion by 2026 [4]. India stands as the second largest producer in the globe with respect to F&V segment and at par with the biggest consumer nation. Global trade of F&V sector is blossoming with rising international demand due to rise in nutritional and dietary consciousness of the consumers.

F&V internationally is also encountering a steep growth. The highest dietary share of F&V is boosted by Indians in global statistics. High health consciousness nature has also reinforcing the demand with increase in the fresh produce preferences and opting organic products wherever possible. The vegetables contribute up to 65% of the F&V segment and rest by the fruits. The highest share in the fruit segment is held by Banana followed by Mango and Citrus. India leads the production of fruits like Banana, Papaya and Mango worldwide. Major share in vegetable market is Potato followed by Onions, Tomato and Brinjal [5].

The Hindu Agri Business Line [6] report also specified that 284.74 Million tons in 2018-19 out of which 187.36 million tons of vegetables and 97.38 million tons of fruits was the production of F&V in India and running through a persistent rise in per capita, demand and consumption aspects. This steady growth accelerated the investments in this segment and domain inclination. Enormous opportunities for export have emerged due to the immense production base in the country. Fruits and Vegetables valuing of USD 1,459.93 million were exported from the country India during 2017-18. This includes USD 655.90 million fruits and USD 5181.78 million vegetables. This is creating the trend of urbanization and rapid growth of consumerism in the country. This is promoting eminent raise in the upper middle class and higher income households across the nation. This development is not only persistent to India but spreading throughout developing nations.

A study conducted by ICRIER (2008) uncovered that those unorganized retailers which are in the vicinity of the organized retailers are experiencing decline in the volume of sales and profits. The impact of corporate business houses led organized retailers is huge on the unorganized segment of respective areas. The wallop is expected to be increased intensively in the long run [7, 8].

However, with respect to the F&V segment- organized retail entities are extending relatively higher benefits to the farmers connected with them [9]. There is a paradigm shift from traditional supply chains to the hub and spoke models and value chain models in the organized sector which were advantageous for the farmers [10].

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An illustration to interpret that the organized retailers benefit farmers than the unorganized is the contract farming [11]. The contract farmers receive higher monetary benefit than the regular farmers [12]. Mangala and Chengappa [13] emphasized that the contract farmers also savor better net profits. They incur lesser transaction costs when compared to the regular farmers [14]. The quality consciousness among the farmers and the grading of the production in the primary process is inculcated in the farmers due to the retail chains interventions. This has enhanced cost cutting and improved the yield [15].

Negi and Anand [16] in their 'Handbook of research on strategic supply chain management in the retail industry' clearly emphasized that the segment of F&V will be the large opportunity to all the retail corporates in India. Win in this segment will be a cutting edge to the retail entities across the nation. They also expressed that the F&V segment is facing critical challenges that is hindering the economical and viable units. They identified the challenges like Cold chain issues, numerous intermediaries, poor infrastructure, losses and wastage is high, many products are seasonal in nature etc. These are deliberately precipitating the growth of F&V. As Indian economy is highly based on agriculture, F&V of retail industry should take the opportunity to overcome the challenges and reach demand conditions of the market by crossing the roadblocks.

II. THEORETICAL PROBLEM

After the literature review, it was found that enormous work has been conducted in the supply chain of F&V particularly in the unorganized sector. It is also understood that the criticality of sustainable growth of corporate retail chain lies in the F&V efficiencies. There is minimal work in the field of organized retail industry. It is clear from the above literature that many authors identified the issues and challenges of F&V operations but the solutions and strategies to administer were very less focused. With the change in times, the culture of every business is emerging and altering. There is prominent need to understand the emerging trends in F&V for the retailers and all parties of supply chain to run and withstand in the dynamic business phenomena.

III. METHODOLOGY

The main objective of this study is to analyze the current challenges faced but the F&V segment which is hindering the retail growth. This study also evaluates the challenges and identifies the innovative strategies crossing those roadblocks. This research was conducted during September-December 2019. Qualitative study is conducted by employing structured personal interviews with 16 store managers and F&V buyers, 23 floor managers and 7 warehouse managers from almost 41 various corporate retail outlets across Bangalore city considering both super and hypermarket formats through convenience sampling method. Fourteen structured questions were posted to the respondents regarding the challenges, wins, best practices, strategies, reasons for losses and innovations in the F&V segment. This study disclosed seven major challenges and strategic innovations to overcome them by developing a conceptual framework. This information is treasure to the corporate retailers to defeat the F&V challenges and enjoy the perks of sustainability in the market.

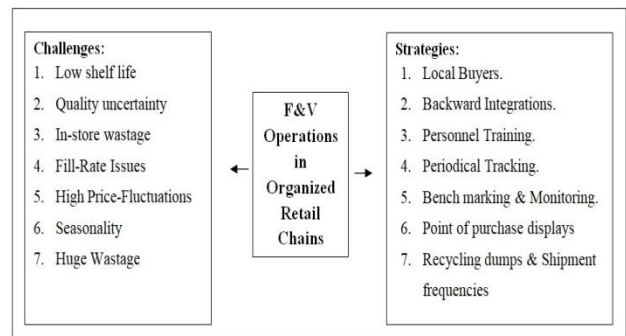


Figure 1: Conceptual Framework

IV. DISCUSSION AND ANALYSIS:

The perspectives of various challenges and strategies were analyzed to ensure sustainable growth in F&V. The conceptual framework as in Figure 1 is discussed below.

A. Low Shelf Life → Local Buyers

Rais and Sheoran [17] confirms that the perishable nature is the major aspect that makes F&V segment more sensitive and dynamic when compared to the other segments of retail. Lack of cold storage infrastructure is the inefficiency needed to be dealt with all the retail corporate chains across the country [18]. This low shelf life of F&V segment is the cause for the highest manpower employment in this segment compared to any segment in a retail hyper store. The criticality is to understand that the shelf life ranges from 12 hours to 12 day based on the nature of the products. Leafy vegetables range the lowest shelf time whereas coconut and few hard vegetables take the highest self life. This is the prominent challenge faced by the F&V segment to support the growth of retail chain as contended by a majority of store manager.

Adopting local buyers is the strategy of decentralization. The retail corporate chains have a centralized phenomenon. The buying and the TOT agreements happen centrally for all the stores in all the chain including segments like FMCG, non food, food, apparel, home care etc. Leading retail chains like More retail Ltd, Big bazaar, Reliance etc are already using this strategy of appointing a local buyer for each locality with respect to F&V. These stores are engaging the local farmers and dealers for their regular supply of fruits and vegetables. Cold logistics are not available and also not a solution in near future. Procurement from the nearest point is a strategy to improve the shelf life of the products. A special team with buyers, front end merchandisers, managers and lining staff are appointed to lead these decentralized operations. This decentralization in the system can give a cutting edge to retail chains. This assists to compete with local unorganized vendors both in quality and pricing was the pattern of opinion shared by the major group of store managers and Buyers.

B. Quality Uncertainty → Backward Integration.

The major source of Dietary fiber, minerals, antioxidants and essential vitamins are the fruits and vegetables. The quality of the fruits and vegetables determine the relative contribution of the health and wellness to the consumers.

The per capita consumption is highly influenced by the consumer choices and the quality of products availability. Rather the sale of F&V is directly proportional to the quality of the F&V [19]. The nature of F&V demands great care in harvesting, handling and logistics before they decay and turn unfit for consumption. Mowat and Collins [20] strongly argue that the quality of F&V is directly related to the consumer behavior. Top retail stores have the specified quality standards and F&V products not reaching the measures will directly reach their garbage dump. The quality supply from the vendors is dynamic and to attain certainty in both quality and quantity is huge hindrance as expressed by the retail warehouse managers.

The defending strategy to control quality in the retail chains is suggested as Backward Integration. This is an emerging trend in operations piloting by Reliance Fresh in couple of warehouses to study the consequences. This is an innovative strategy which can yield certainty in the procurement of F&V. New term coined in research as "Relationship Farming" is taking existence. Majority of the top retail entities already entered in the contract farming including the e-commerce entities like Bigbasket etc. for procurement of F&V [21, 22]. It is believed that the growers necessarily make investments in growing, cutting and packaging. The agreement between the farmers and the buyers (retailer) to produce and supply F&V as per the agreed quality, quantity, grading, variety and packaging in the time frame [23]. To go one step ahead is backwards integration. To ensure the quality, the retailers supply the high grade seeds and also invest in the agricultural affairs for the assured produce. Few illustrations of backward integration include supply of high standard vegetable seeds, advice of the F&V production, financial assistance for operations etc. By this the retailers can vertically integrate in the channel by controlling procurement and grading in the right time and right quality. However by vertical integration, retailers support farmers with technology knowhow and also vouch to purchase the produce at a relatively good rate. This will be a win-win strategy to farmers and retailers. The retailers will not buy what farmers supply rather purchase as per their requirement both in count and quality as discussed with F&V Buyers.

C. In-Store Wastages → Personnel Training

Mr. Arun Mehta [24] the National Head Quality E Com at Reliance Retail mentions that the wastage of F&V in the complete supply chain occurs as 08-10 percent at farm, 05-06 percent in transport, 02-03 percent at the distribution centers, 12-15 percent in the store and 1 percent at the consumer end. When observed, the maximum loss occurs at the store. Eriksson, Strid and Hansson [25] in their study classified these losses into pre-store losses and in-store losses. The major reason of in-store loss is caused by store handling.

The strategy to reduce wastage can only be personnel training. F&V segment to be given trained permanent manpower to handle the stock inside the stores. Good in-house conditions maintained by the store will ensure low wastage. In-house conditions include specious F&V category, proper care for avoidance of rates or rodents and majorly temperature control inside the store. The solution is simple but the execution is intemperate shares a Floor Manager. He elaborated that cold water to be sprayed every hourly on green leafy vegetables only on the leaves of the

bunch but not on the bottom portion. Bananas when held leave black marks on the fruit and ripe faster, they need to be handled with the stem portion, Tomatoes always to be kept as the top crate while transit were few illustrations shares by the respondents during the research. Timely grading and sorting is an expertise to be trained to the staff. Vegetables can be classified as hard and soft veggies and handling should be accordingly. Shrinkage in F&V (shoplifting) will be very high especially for fruits like grapes. Staff training is a low hanging fruit to control in-store wastage efficiently.

D. Fill Rate Issues → Periodical Tracking

Fill-Rate refers to the percentage of the products supplied by the vendors (farmers/dealers) to the percentage of the products raised in the purchase order [26]. The higher fill-rates cite the best performance of stock maintenance levels in the store whereas lower the fill-rates mention the uncertain supply from the vendor leading to the out of stock situations. Successful retail entities try to keep the Fill-Rate number as high as possible for better assortment in the store. As the suppliers are unorganized, less skilled it remains as a irrepressible challenge as explained by the respondents.

To tackle the availability crunch of products like F&V from an unorganized vendor is toilsome. The only manner to dilute the challenge is continuous tracking of shipments vendor wise and product wise and also sporadically. The capability of the vendors needs to be analyzed by considering 'Fill-Rate' as a tool and raise purchase order accordingly. Vendors with ideal fill-rates can be motivated by awards in regular intervals to build the competitive spirit among the vendors and encourage higher Fill-rates as suggested by an e-commerce buyer of F&V.

E. Price Fluctuations → Benchmarking Price Strategies

Fruits and vegetables prices are highly unpredictable and the prices majorly incline [27]. This is a national issue and retail supermarkets are not exceptional to this. Vegetable like Tomato, Potato and Onion witness the highest spike in prices and other green vegetables and contribute to some extent [28, 29].

This is an unavoidable scenario as it is a macro economic issue but the way out is only to deal in a better fashion. Benchmarking refers to comparison and adjusting the prices in line with the competitor's price [30]. Continuous benchmarking and monitoring the price situations per SKU (Stock Keeping Unit) will put the retailer in par with market conditions and create trust in the minds of the consumer as elaborated by the majority of the store managers. This is also supported by the literature as price is the major factor to create brand image and brand loyalty [31].

F. Seasonality → Point Of Purchase Displays

The seasonality of fruits and vegetables refer to the trend of production of specific produce in a year and also the geographic specialization of produce [32]. Seasonal products were available in only particular seasons and this study when elaborated by the research respondents has two dimensions.

Dimension one expresses concern of procurement as the trend unsure thus estimation of requirement or sale becomes unmanageable. Dimension two highlights the unseasonal or pre-post seasonal availability of the produce off sales concerns. An example quotes by the buyer F&V explains that the Guava and grapes majorly are seasonal to February, so the procurement from the vendors based on previous months sales or average store sales cannot be determined. Since the sale is uncertain the indenting and procurements hinders will most of the time result in out of stock situations. Dimension two is the raising concern for operational issues. Mentioned grapes as seasonal produce in the above example, it is also available throughout the year at hyper stores. Thanks to the trade and hybrid produce, majority of F&V were available across the year but remain unsold in the store resulting in losses. This is also supported by Fruitslogistica report [33]. Fruits like butter fruits, Dragon fruits, pears, kiwis are also gaining the market share lacking a particular trend in sale. This is a bothering the operations team in indenting the produce quantities and leading to high losses in F&V segment.

The strategic innovation shared by the Store managers which was tested and proved in their chain of stores that F&V segment is a display driven segment. Seasonality was outdated concept and does not hold good in this era of international trade and hybrid technology. Mangoes are available in the store from November to August and consumers will only purchase if they realize that the produce is available at the store. F&V profitability can be improved by the point of purchase displays available in the stores especially for season specific products. Regular F&V like potato, tamoto, Banana, apples were bought on demand but special F&Vs like strawberries, Dragon fruits, Avocados, kiwis, cut pumpkins were only sold when displayed prominently in the shelf or as special displays. Dimension one of unsure procurement trend can be managed by specific month to month average sales. Constant check on competitor availability of seasonal fruits can improve the consumer loyalty to the store.

G. High Wastage → Recycling Dumps And Twice A Day Shipment

High wastage is conventional in F&V. Due to the nature or specifications of standards maintained by the retailer, the waste is high as expressed by all the respondents in common and it is also unavoidable.

The only strategy is to reduce the waste by implementing all the various strategies mentioned in this study. Maintaining recycling dumps by selling them to manure makers, or bio gas manufactures can earn additional income to the stores. The retailers set high standards and little imperfections in F&V were also dumped in garbage. This can be avoided and can be taken as CSR (Corporate Social Responsibility) to distribute to the underprivileged. The other solution discussed by the warehouse managers is increase the shipment frequencies to the store to always sell fresh F&V and reduce waste. More Retail Ltd. pioneered this with twice a day shipment for green leafy vegetables which have the least shelf life. This will ensure fresh stock and reduction in wastage.

V. EMERGING TRENDS IN F&V

Kapoor and Kumar [34] in their study on Fruits and vegetables consumption in India elaborated the consumer purchasing patterns as majorly inclined to the family income and educational background. Credence features influence more than the search and experience during the purchase decisions. Present study conducted in 41 retail outlets in Bangalore city by conducting one to one personal interviews with officials investigated three major emerging trends in F&V which could be the key for the growth.

A. Organic Products:

Most consumers purchase organic products occasionally. But organic consumers were proved few in number but loyal to the store and repeat purchases. Even at higher prices with advantages like health, quality and environmental benefits these Organic Products will offer value for money [35]. Nandi, Bokelmann, Gowdru and Dias [36] confirmed that more than 90 percent of the consumers are willing to pay more from 5 percent up to 100 percent for better quality, health and safety based on their financial system. With the growing consumer income and life style, Double income nuclear family cultures, there is a steep hike in the demand of consumer towards organic products. The advantages of organic sale to retailers include low wastages, higher margins, higher self life and convenient procurement. With organic produce in the segment the value sale of F&V can ameliorate as they are priced at an average of 52 percent higher than the regular pricing. The price differences between organic and regular F&V of few fast moving products mentioned in the Table 1 below:

Table 1: Price Comparison of Organic and Regular produce in Indian rupees.

Product Description	Grams	Organic	Regular	Percentage Difference
Capcicum	250	20	12	60
carrot	250	50	18	36
ladies finger	250	25	11	44
French Beands	250	29	16	55
Onions	250	30	17	57
Tomato	250	14	6	43
Potato	250	15	11	73
Palak	250	33	15	45
Average percentage Difference				52

Note: Prices were collected in Jan, 2020 and are highly volatile in nature. Percentage consideration is ideal.

B. Pre Chopped F&V:

Nielsen [37] report emphasized that convenient meal solution are the way of life ahead as the life style is getting busier with the time. Pre chopped F&V can assist consumer to eat fresh and healthier food with less exertion. Washed, chopped, bagged fresh F&V serve as value addition to the products and trade at premium prices. This trend is picking up in the retail organized sector in India and also in e-commerce. Worldwide, this trend is growing at a CARG of 7.1% and expected to reach USD 346.05 billion by 2022 from USD 245.97 billion in 2017 [38]. The respondents of this study clearly notified that this segment has a huge potential in

Indian markets and majorly sold in Hyper formats and e-retails. The quality is ensured as per the store standards which gained consumers appreciations and increased the volume of high priced products to the consumer cart. It is observed that there is an average of 49 percent inclination in the price range with processed F&V. The price comparisons of few fast moving processed SKUs with regular is explained in the below Table 2.

Table 2: Price Comparison of Processed and Regular produce in Indian rupees.

Product Description	Grams	Regular	Processed	Percentage Difference
Drumsticks	250	15	44	34
carrot	250	18	30	60
Jack Fruit	250	21	44	48
Frech Beans	250	29	75	39
Capcicum(3 colours avg)	250	50	80	63
ladies Finger	250	11	30	37
Average percentage Difference				49

C. Instant mixes in F&V

This is the budding wave in the F&V which provides a meal kit for the preparation with combination of veggies required for the recipe. On the go life style of consumers resulted in no time for preparation of traditional meals. Instant mixed provides quick and easy solutions for various recipes. Respondents of this study contributed that consumer needs evolve regularly and the retailers have to ensure that the convenience is provided to consumers by standing in par with their expectation. This is improving the store image in the minds of the consumer. Instant mixes product prices were relatively as high as 50 percent to the separate purchase prices as illustrated by a Floor manager of a hyper format store. Stores are focusing on affordability as strategy with price clocking close to fifty rupees by adjusting the grams accordingly to influence the consumers. The prices of fast moving instant F&V mixes were elaborated Table 3 below.

Table 3: Examples of Instant produce and price in Indian rupees.

Product Description	Grams	Rupees
Sambar MIX	250	49
Pulav Mix	250	49
Green Chutney mix	250	49
Mutter Mushroom curry	200	54
Mix Vegetable Chinese	250	49
Fresh Vegetable soup mix	200	49

VI. CONCLUSION

In the organized retail format, F&V is identified as the low margin segment. This cannot be altered as this wing is dynamic and competition is huge both from organized and unorganized segments. Thus F&V sustainability can be achieved only by volume game. Quality, grading of the products are other keys to growth. The roadblocks in this segment are high due to the perishable like features of the F&V. This study analyzed the seven major challenges and

minted innovative strategies to subdue them respectively. These strategies aid the retailers to gain a competitive edge in Indian market scenario. This study also further identified the emerging trends as organic products, processed F&V and instant mixes which are capable to contribute higher value to this volume game. These SKUs provide higher margins and better profits to compete in the perfect market conditions.

VII. MANAGERIAL IMPLICATIONS

It has become a challenge to the operational staff of retail F&V departments to handle the segment my bridging the consumer needs and vendor crunches. We strongly believe that this study will give solutions to the retailers both in organized and unorganized sectors in improving the efficiencies of F&V handling. This is also helpful to the upcoming retail entrepreneurs to setup their supply chain for effective F&V operations. This study ensures the fresh stock availability in the retail store and also reduces the losses to the retailers thereby providing a cutting edge to the retailer to lead the F&V market.

VIII. LIMITATIONS AND FUTURE STUDY

This study focused on the antecedents of roadblocks and solutions in F&V segment with respect to organized retail sector. This is only a conceptual study which is not sufficient to estimate the degree of performance of the innovative strategies. This study is only conducted in organized sector in Bangalore city. The demographic factors of the respondents can be explored and studies like gender, age, ethnicity and relation with solutions suggested can be analyzed. The prices and the future trends suggested are dynamic with the time period as the F&V segment is highly price volatile in nature.

In Future research can be conducted and prove the conceptual framework in an empirical fashion. The emerging trends can be further explored with the consumer intensions on acceptance and operational efficiencies can be captured. The profitability of F&V with implementations of innovative strategies can also be statistically verified. In addition a comparative study between organized and unorganized operations in F&V segment can be evaluated.

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