A STUDY ON SUPERMARKET SUPPLY CHAIN FOR FRESH FRUITS AND VEGETABLES IN LUCKNOW DISTRICT OF UTTAR PRADESH

PROJECT REPORT

Submitted to the

Acharya Narendra Deva University of Agriculture & Technology

Kumarganj, Ayodhya– 224229, Uttar Pradesh, India

By

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I.D. No A-14804/23

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

Master of Business Administration

in

(Agribusiness Management)

Department of Agribusiness Management

July, 2025

CERTIFICATE – I

This is to certify that the thesis entitled "**A Study on Supermarket Supply Chain for Fresh Fruits and Vegetables in Lucknow District of Uttar Pradesh**" submitted in the partial fulfilment of the requirement for the degree of Master of Business Administration with major in Agri-Business Management of the College of Agriculture Post Graduate Studies, Acharya Narendra University of Agriculture & Technology, Kumarganj, Ayodhya is a record of *Bonafide* research carried out by **Mr. Siddharth Raj Singh** Id No. **A-14804/23** under my supervision and no part of thesis has been submitted for any other degree or diploma.

The assistance and help received during the course of this investigation has been acknowledged.

Kumarganj, Ayodhya

25 July, 2025

25/07/2025

(Supriya)
Chairman Advisory Committee

CERTIFICATE – II

This to certify that the thesis entitled **"A Study on Supermarket Supply Chain for Fresh Fruits and Vegetables in Lucknow District of Uttar Pradesh"** submitted by **Mr. Siddharth Raj Singh** Id No. A-**14804/23** to the Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya in partial fulfilment of the requirement for the degree of **Master of Business Administration** in the subject of **Agribusiness Management** has been evaluated satisfactory and approved by **Student's Advisory Committee** after an oral examination on same in collaboration with an external examiner.

11/09/2025

(Supriya)

Chairman Advisory Committee

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CERTIFICATE-III

DECLARATION FOR ANTI-PLAGIARISM

I, **Siddharth Raj Singh,** Id. No. **A-14804/23** certify that the thesis entitled **"A Study on Supermarket Supply Chain for Fresh Fruits and Vegetables In Lucknow District of Uttar Pradesh"** submitted in partial fulfillment of the requirements for the degree of Master of Business Administration in Agri-Business Management to the College of Agriculture, **Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya (U.P.)** is original work and has similarities with published work not more than minor similarities as per the UGC (Promotion of Academic Integrity and Prevention of Plagiarism in Higher Educational Institutions) Regulations, 2018, adopted by the university.

I declare that I have faithfully acknowledged, given credit to and referred to the research workers wherever their works have been cited in the text and body of the thesis. I further certify that I have not willfully lifted up some others' work, para, text, data, results etc. reported in the journals, books, magazines, reports, dissertations, thesis et., or available at web-sites and included them in this thesis and cited as my own work.

Place: Kumarganj, Ayodhya

Date: 25./.07./2025

Siddharth Raj Singh

(Signature of the candidate)

CERTIFICATE FROM THE MAJOR ADVISOR

This is to certify that the above statement made by the candidate is correct to the best of my knowledge.

25/07/2025

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Siddharth Raj Singh.

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LIST OF ABBREVIATIONS

Abb.	Full Form
CBR	: Cost-Benefit Ratio
FAO	: Food and Agriculture Organization
FPO	: Farmer Producer Organization
GDP	: Gross Domestic Product
GoI	: Government of India
ha	: Hectare
Kg	: Kilogram
MSP	: Minimum Support Price
NABARD	: National Bank for Agriculture and Rural Development
NBFC	: Non-Banking Financial Company
NGO	: Non-Governmental Organization
NSSO	: National Sample Survey Office
RBI	: Reserve Bank of India
SC	: Supply Chain
SCM	: Supply Chain Management
UP	: Uttar Pradesh
₹	: Indian Rupee
ICT	: Information and Communication Technology
APMC	: Agricultural Produce Market Committee
et al	: And others
%	: Percentage
FVV	: Fruit and Vegetables Value chain

INTRODUCTION

India occupies a pivotal position in the global horticulture landscape as one of the top producers of fruits and vegetables. As per the National Horticulture Board (NHB, 2023), the country produced 204.61 million metric tonnes (MMT) of vegetables and 107.10 MMT of fruits during the year 2022–23. The area under cultivation stood at 11.27 million hectares for vegetables and 9.16 million hectares for fruits (Bhattacharyya *et al.,* 2021). Major vegetables include potato, onion, tomato, brinjal, and cabbage, while leading fruit crops include mango, banana, citrus, papaya, and guava. The horticulture sector not only contributes significantly to agricultural GDP but also plays a critical role in employment generation, food and nutritional security, and export earnings (Anand & Barua, 2022).

Within India, Uttar Pradesh is a leading contributor to horticultural output. The state is the largest producer of potatoes and mangoes and among the top producers of guava, tomato, and peas. According to the NHB and the Horticulture and Food Processing Department of Uttar Pradesh, in 2022–23, the state produced over 30 million tonnes of vegetables and around 12 million tonnes of fruits (Seckin, 2013). The agro-climatic conditions of Uttar Pradesh, combined with its extensive irrigation network and fertile soil, have made it one of the most agriculturally productive regions in the country (Shende & Meshram, 2013).

The horticulture sector, particularly the fresh fruits and vegetables (FFV) segment, faces significant supply chain challenges due to the perishable nature of the produce, high post-harvest losses (estimated at 20–30% for fruits and vegetables by ICAR-CIPHET), and a fragmented marketing system (Saadat & Gupta, 2018)

Traditionally, farmers have depended on local mandis (wholesale markets) and middlemen for marketing their produce. These traditional supply chains are often marked by inefficiencies, price asymmetries, quality inconsistencies, and inadequate infrastructure for storage, transport, and packaging (Nikmal, 2019 & Pradhan *et al.,* 2024).

In recent years, organized retail or supermarkets have emerged as an alternative and increasingly influential channel in India's FFV marketing landscape. With the rise in urbanization, increasing disposable incomes, and evolving consumer preferences for hygiene, convenience, and quality, supermarkets have become prominent players in food retailing. According to a report by ASSOCHAM (2023), the Indian food retail market is

projected to grow at a CAGR of 10–12%, with modern retail formats accounting for a growing share of this market (Singh *et al.,* 2013).

Supermarkets are attempting to transform the FFV supply chain by investing in cold storage, direct procurement from farmers, contract farming, centralized distribution centres, and digital inventory systems (Verhaegen *et al.,* 2001). These modern supply chains are characterized by shorter intermediaries, better traceability, standardized quality grades, and reduced wastage. However, the implementation of such systems is not uniform across regions and faces logistical, institutional, and socio-economic hurdles, especially in states like Uttar Pradesh where agriculture is still largely traditional (Sai *et al.,* 2022).

Lucknow, the capital city of Uttar Pradesh, represents a rapidly expanding urban hub where both traditional and modern retail formats coexist. The city is witnessing a retail boom with the presence of organized chains such as Reliance Fresh, Big Bazaar, Easy Day, Vishal Mega Mart, and local supermarket outlets. These retailers are increasingly sourcing fresh produce through dedicated supply chains, yet they face challenges in terms of consistent supply, price volatility, lack of producer linkages, inadequate cold chain infrastructure, and poor post-harvest handling practices (Thulasiram and Alagumani, 2018).

The transformation of the FFV supply chain in Lucknow is thus at a crucial juncture. While supermarkets offer potential for efficiency gains and better returns to producers, they also risk marginalizing smallholders if adequate support structures are not in place (Kumar *et al.,* 2023). It is important to critically assess how these supermarket supply chains function, how they differ from traditional marketing channels, and what implications they hold for farmers, consumers, and intermediaries (Dabbene, *et al.,* 2014).

Problem Statement

Despite India's position as one of the world's leading producers of fruits and vegetables, the supply chain system for these perishable commodities remains riddled with inefficiencies, particularly in urban centres such as Lucknow. High post-harvest losses, inadequate cold storage, multiple intermediaries, poor transportation infrastructure, and lack of direct market access severely impact both producer profitability and consumer satisfaction (Ali, 2024). While the emergence of organized retail and supermarkets promises improved procurement, quality assurance, and market connectivity, traditional marketing channels still

dominate, and smallholder farmers face numerous socio-economic barriers to integration with modern supply chains.

In the context of Lucknow, where demand for fresh and hygienic produce is rapidly rising due to urbanization and changing consumer behaviour, the performance of the supply chain is under pressure. The contrasting realities of modern supermarket supply chains and traditional distribution systems necessitate a critical evaluation of their structure, efficiency, and inclusiveness (Saikia *et al.,* 2024). Additionally, the economic viability of key drivers such as logistics, cold chain infrastructure, packaging, and handling practices remains insufficiently analyzed. There is also limited empirical evidence on the socio-economic status of different stakeholders and the specific constraints they encounter within the supply chain ecosystem.

Therefore, there exists a pressing need to systematically assess the supermarket supply chain for fresh fruits and vegetables in the Lucknow district. This involves understanding stakeholder profiles, evaluating cost-benefit dimensions, comparing modern and traditional practices, and identifying operational bottlenecks to propose effective and sustainable interventions. Addressing these issues is vital for improving supply chain responsiveness, reducing wastage, enhancing farmer incomes, and delivering quality produce to consumers at fair prices.

Description of study area

Lucknow, the capital city of Uttar Pradesh, serves as the administrative and commercial centre of the state. Geographically located between 26.8467° N latitude and 80.9462° E longitude, Lucknow is part of the Gangetic plain and enjoys fertile soil and a favourable climate for agricultural production. The district encompasses a mix of urban, semi-urban, and rural areas and is characterized by diverse agricultural activities, including the cultivation of fruits and vegetables such as mango, guava, brinjal, tomato, and leafy greens. With a population exceeding 3 million (Census 2011), the city has witnessed rapid urban expansion and increasing demand for fresh, high-quality food products. The growing presence of organized retail outlets and supermarket chains makes Lucknow an ideal location to study the evolving dynamics of the fruit and vegetable supply chain. Its mix of traditional agricultural practices and modern consumer demand provides a representative case for

examining the challenges and opportunities in streamlining fresh produce distribution through supermarket channels.

As such with the above pretext it is proposed to undertake a study "**A Study on Supermarket Supply Chain for Fresh Fruits and Vegetables in Lucknow District of Uttar Pradesh**" with the following objectives.

1. To study the socio-economic profile of different stakeholders involved in the supply chain of fresh fruits and vegetables;
2. to evaluate the economic viability of the supply chain drivers for fresh fruits and vegetables;
3. to compare the traditional and modern practices in the supply chain for fresh fruits and vegetable; and
4. to identify constraints in the supply chain management of fresh fruits and vegetables in the Lucknow district and to suggest major suitable measures there off.

Plan of Project Report

This project report is structured into five comprehensive chapters to facilitate a clear understanding and systematic presentation of the study on the supply chain management of fresh fruits and vegetables in Lucknow district of Uttar Pradesh.

- **Chapter 1** provided an introduction to the importance of efficient supply chain management in the context of perishable commodities like fresh fruits and vegetables. It outlines the background of the study, defines the research problem.
- **Chapter 2** offers a review of existing literature and previous research related to supply chain systems in agriculture, especially for horticultural produce.
- **Chapter 3** details the research methodology adopted in the study. It covers the sampling design, data collection procedures, the study area, stakeholder classification, and the statistical tools and techniques used for analysis such as cost-benefit analysis, Garrett ranking.
- **Chapter 4** presents a thorough analysis of the primary and secondary data collected. It discusses the structure and functioning of various supply chain channels, evaluates costs, margins, and price spread at each stage, and compares traditional and modern

supply chain mechanisms. The findings are interpreted to highlight key challenges and opportunities.

- **Chapter 5** concludes the study by summarizing the major findings and drawing significant conclusions. It provides actionable recommendations for different stakeholders including farmers, traders, retailers, policymakers, and government agencies to improve the efficiency and effectiveness of the fruit and vegetable supply chain in the region.

REVIEW OF LITERATURE

In this chapter, an attempt is made to conduct a critical survey of the available literature relevant to the present study. The review provides a theoretical and empirical foundation and helps in identifying the research gaps for further investigation. The studies and writings reviewed herein are classified under the following four heads, corresponding to the specific objectives of the study:

- To study the socio-economic profile of different stakeholders involved in the supply chain of fresh fruits and vegetables
- To evaluate the economic viability of the supply chain drivers for fresh fruits and vegetables.
- To compare the traditional and modern practices in the supply chain for fresh fruits and vegetables.
- To identify constraints in the supply chain management of fresh fruits and vegetables in the Lucknow district and to suggest major suitable measures thereof.

2.1 To Study the Socio-Economic Profile of Different Stakeholders Involved in the Supply Chain of Fresh Fruits and Vegetables

Akpinar *et al.* (2012) analyzed consumer purchasing habits are affected by various demographic, socio-economic and socio-cultural factors along with the product, price, distribution channel, and advertisement. Diversified and alternative supply chains offer so many advantages to consumers in agricultural product markets. Consumers prefer different outlets for agricultural products because of their personal differences that are formed by the effects of demographic, socio-economic and socio-cultural factors. The impacts of consumer demographic variables on their preference for fresh fruit and vegetables have been insufficiently studied in local literature. Therefore, it has been determined in this research for a deep evaluation. Target population was the consumer's residing in the city central of Antalya. The effects of demographic characteristics on preferences of outlets in fresh fruit and vegetables supply chains were tested by using the chi-square test. The results indicated that consumer age and marital status had no significant correlation with the preferences. On the other hand, the test results showed that gender, education, income and female employment status did have a significant correlation with the preference for outlets in fresh fruit and vegetables supply chains.

Anand & Barua (2022) The study analyzed the significant issue of post-harvest loss and waste (PHLW) in the agri-fresh produce supply chains (AFPSCs) of fruits and vegetables in developing countries, with a focus on India. It identified and examined key factors under five major operational issues: demand forecasting, production planning, transportation, inventory, and inefficient harvesting. Using the fuzzy DEMATEL technique, the researchers evaluated sixteen factors to understand their cause-effect relationships. They found eight critical causal factors contributing substantially to PHLW, including lack of coordination, poor demand forecasting, and limited cold chain facilities. The study emphasized the high influence of these factors on supply chain inefficiencies.

Assinou & Kpotchou (2024) conducted various vegetable supply chain development projects in Accra and Greater Lomé focus scarcely on the knowledge, attitudes and practices (KAP) of vegetable producers, traders and processors. Thus, the research aims to assess the level of sanitary, socio-economic and environmental sustainability of vegetable production, trade and processing in these cities, based on the knowledge, attitudes and practices of stakeholders. A quantitative multi-criteria evaluation approach was adopted, with reference to Global Reporting Initiative (GRI) standard 13 and Codex Alimentarius (CXC 1-1969 then CXC 53-2003). A sample of 303 people (156 in Accra and 147 in Greater Lomé) was formed using purposive sampling based on the assertion of E.R. Babbie (2016) and L. Kish (1965) combined with the comparison of S. Sudman (1976). Kobocollect and MS Excel respectively served to collect data and calculate KAP scores and percentages. Arcgis and Google Earth facilitated geographic representation of the data. The results reveal low rates of ecological (27.2%), health (26.9%), socio-economic (39.9%), technological and innovative (18.6%) KAP, evaluated at 28.6%. These results are unfavorable to the achievement of the SDGs. Hence the importance of an integrated, ongoing eco-nutritional education program for all stakeholder.

Javanmardan *et al.* (2024) focused on developing an optimal sustainable fruit Closed-Loop Supply Chain (CLSC). A novel multi-objective Mixed-Integer Linear Programming (MILP) model is suggested to formulate a multi-product, multi-market, multi-period, multi-level, multi-mode selling problem which aims to minimize cost and emissions and maximize the whole social segments' responsiveness to fruit, vinegar, and compost. The model is solved by the LP-metric method and implemented in a real case in Iran. The findings indicate that achieving the highest level of responsiveness comes with a substantial cost for the

network. However, this does not apply to environmental considerations. For decision-makers prioritizing sustainability, the proposed decision support system strongly advises against buying fruit from fruit cars. Due to the absence of positive impacts on the level of responsiveness, buying from fruit cars results in increased costs and emissions. For a cost- and environmentally-sensitive decision-maker, it is recommended to provide higher-quality fruits. Because the lower the quality of the fruit, leads to increased waste rates and emissions. Meeting increased vinegar demand, with its elevated costs and emissions, becomes justifiable only when the policymaker is actively seeking to achieve maximum responsiveness.

Omar *et al.* (2025) analyzed the growth trends of coconut, areca-nut, and cashew-nut, which are major plantation crops in India contributing to employment, foreign exchange earnings, and the agrarian economy. Descriptive statistics such as mean values and percentage compound annual growth rates (CAGR) were utilized to estimate the growth patterns in area, production, and yield of these crops from 1965 to 2022. The results showed that coconut experienced moderate growth in production at 5.31% CAGR, while its area and yield increased at lower rates of 2.71% and 1.00% respectively. Areca-nut demonstrated high growth in area (10.08%) and production (18.11%), but its yield growth remained slow. Cashew-nut exhibited slow yield growth (1.29%), moderate area growth (6.82%), and high production growth (11.24%). The findings emphasized the need for enhancing yield and implementing supportive policy measures to sustain the plantation crop sector.

Gupta *et al.* (2025) aimed to evaluate the growth, performance, and constraints of the Kisan Credit Card (KCC) scheme adopted by farmers in Sultanpur district of Uttar Pradesh. Both primary and secondary data were used, with survey schedules employed for data collection. Compound Annual Growth Rate (CAGR) was applied to analyze the performance of KCC beneficiaries, while Garrett ranking technique was used to assess the constraints faced by farmers. The study found that, at the national level, the KCC scheme showed a CAGR of 20.46% for cards granted by Regional Rural Banks (RRBs). Cooperative banks and commercial banks recorded CAGR rates of 13.63% and 13.96% respectively, indicating government efforts to support farmers through funding. The study inferred that tedious paperwork and high interest rates were significant barriers preventing farmers from fully availing the benefits of the KCC scheme.

2.2 To Evaluate the Economic Viability of the Supply Chain Drivers for Fresh Fruits and Vegetables

Manchester, A. C. (1962) estimated marketing margins and rural-urban price differences for fresh fruits and vegetables across five cities in July 2010. Data were collected through interviews with 200 retailers, 100 producers, 30 commission agents, and 10 transporters. Results showed that retail prices were consistently higher in rural markets than urban ones, with greater disparities observed in vegetables than fruits. Rural-urban price differences for fruits ranged from 2.3% to 50%, while for vegetables, the differences varied between 4% and 89%, depending on the city. Producers received about 25% of the consumer price for most commodities. The total marketing margin was highest for sweet lemon (389.8%) and banana (371.7%) and lowest for potatoes (84.2%). Intermediaries captured substantial net margins, for example, 43% for potatoes and varying shares for other commodities. The findings highlight significant inefficiencies and price variations in fresh produce marketing between rural and urban areas.

Verhaegen & Huylenbroeck (2001) analyzed the additional benefits and costs for farmers involved in six innovative marketing channels for quality products in Belgium. A theoretical model was used to structure qualitative comparisons with traditional channels and direct sales. The analysis focused on qualitative aspects, as many benefits and costs were not easily quantifiable. Transaction costs were considered significant, particularly when shifting from conventional to innovative channels. It was found that increased costs were offset by higher prices, greater turnover, and reduced market uncertainty. Cooperation among farmers helped lower transaction costs. Collective initiatives enabled participation in quality food markets with minimal investment in labor and capital.

Fundira (2004) examined the agro-food sector's shift towards a globally interconnected system characterized by complex relationships and year-round supply. It analyzed two fruit supply chains table grape and citrus in South Africa using a transaction cost approach. The research identified key governance structures and sources of competitiveness through literature review and discussions with industry experts. Findings showed that role-players tended to overcompensate to minimize risk, favoring vertical integration over outsourcing. The study emphasized the importance of bilateral contracting and strategic alliances to improve communication, commitment, and joint decision-making. The application of transaction cost economics demonstrated how exporters adapted to global

environmental changes. Overall, the study highlighted that improved supply chain coordination is crucial for long-term sustainability and competitiveness of the industry.

Shende & Meshram (2015) examined the economics and resource use efficiency of tomato production in Yavatmal district during 2016-17. It assessed input use across small, medium, and large farmer groups, finding excess use of human labor, bullock labor, and phosphorus among small farmers; nitrogen and machine hours among medium farmers; and seed, manure, and potash among large farmers. The per hectare cost of cultivation was calculated under different costing methods, with cost 'C2' showing an input-output ratio of 1:1.94. Regression analysis revealed machine hours and seed as significant factors influencing yield, explaining 81% of the variation. Marginal value product to factor cost ratios were positive for all major inputs, indicating potential for increased input use. The findings suggest that there is room to expand tomato cultivation area and improve input efficiency. This study provides valuable insights for enhancing productivity and profitability in tomato farming in the region.

Alam (2018) evaluated the traditional mango fruit supply chain to identify opportunities and challenges in existing practices. It analyzed the mango value chain from farm to market and estimated the Benefit-Cost Ratio (BCR) for mango farmers. The research examined the distribution of added value among farmers, traders, and retailers. A value chain model was developed and validated through responses from over two hundred stakeholders, including farmers, traders, retailers, and consumers. Both primary and secondary data were collected and analyzed using simple statistical techniques. The findings revealed significant potential for mango farmers, but also highlighted high post-harvest losses and the presence of many intermediaries. The value chain analysis showed that farmers received the lowest share of added value, whereas retailers captured the highest share. These results underscore the need for policy interventions and strategic actions to improve farmers' benefits. The study provided valuable insights for policymakers, researchers, and practitioners aimed at enhancing the mango supply chain. Ultimately, it emphasized improving equity and efficiency for the betterment of farmers and consumers.

Ali (2024) examined the role of vegetables in addressing dietary micronutrient deficiencies and promoting economic development in Asia. It found that both abiotic and biotic constraints significantly limit vegetable production and consumption, leading to intake levels below recommended standards. The analysis highlighted how increased vegetable

production could enhance nutrition, cognitive development, income, and job creation across farm and non-farm sectors. Urbanization, income growth, and consumer awareness have driven up vegetable demand. To meet this rising demand, the study proposed trade-oriented and production-enhancing strategies. It emphasized the need for environmentally sustainable technologies and supportive government policies. Increased investment in research and policy stability was deemed essential for overcoming production constraints and reducing risks in vegetable farming.

2.3 To Compare the Traditional and Modern Practices in the Supply Chain for Fresh Fruits and Vegetables

Yiridoe *et al.* (2005) reviewed empirical research comparing organic and conventional foods, focusing on consumer demand and marketing issues. It examined economic definitions, consumer awareness, attitudes, preferences, and willingness-to-pay for organic products. The findings revealed that while consumers had general awareness of organic food, they often misunderstood specific farming practices and quality attributes. Skepticism about labels and inconsistent standards contributed to consumer hesitation. Health concerns emerged as a primary motivator for organic purchases. Willingness-to-pay declined with higher premiums but increased with preferred product attributes. Demand was more responsive to price differentials than to actual prices. Income elasticity of demand was found to be generally low. Organic fruits and vegetables dominated the organic food basket, though perceptions of other products like meat remained unclear.

Cadilhon *et al.* (2006) analyzed the evolution of vegetable marketing in Ho Chi Minh City, Vietnam, amid growing competition between modern and traditional distribution channels. Using interview data and a wholesaler survey, the research compared the performance of both supply chains. Findings indicated that modern channels were more efficient and focused primarily on quality, while traditional channels catered to broader consumer needs. Despite their efficiency, modern channels accounted for only 2% of total vegetable distribution. The study found the supply chains to be segmented by product focus. It concluded that overemphasizing modernization risks marginalizing traditional systems that fulfil vital market functions. The article emphasized the need for balanced policy approaches that support both modern and traditional marketing channels.

Seckin (2013) explored the impact of supermarket-driven restructuring of the agri-food supply chain on smallholder farmers during the retail transition period of the 1990s. It analysed how supermarket expansion, private standards, and centralized procurement affected the traditional wholesale systems, especially in the fresh fruits and vegetables sector. Drawing on cases from Istanbul, the study examined the evolving strategies of different supply chains and the organizational changes in procurement systems. It investigated the relational geography from farm to consumer and the interactions between supermarkets and other supply chain actors. The research revealed that while supermarkets have increased the volume of agri-food commodities, smallholder farmers have faced exclusion due to rising entry barriers and the displacement of traditional markets. Three sub-goals guided the study: to assess supply chain strategies, map relational networks, and evaluate the effects on small farmers. Findings highlighted the need for inclusive procurement models. The paper also identified conditions necessary for integrating smallholders into modernized food supply chains.

Dabbene *et al.* (2014) reviewed how traceability has become a crucial component of ensuring food safety and quality in modern supply chains. It examined the significant impact that implementing traceability systems has on reorganizing supply chain structures. The paper analyzed how traceability concepts, requirements, and technologies are integrated into supply chain management and optimization. Through an extensive review of existing literature, the authors identified key influences on supply chain efficiency. The study emphasized that traceability should be embedded within, rather than separated from, chain operations. It also explored the implications of traceability for operational and strategic decision-making. Finally, the paper outlined potential future trends and research directions in the field.

Bisen *et al.* (2018) assessed and compared the marketing efficiency of modern and traditional supply chains for fruits and vegetables in Hisar and Karnal districts of Haryana. A sample of 200 respondents and two supply chains was purposively selected. Findings revealed that the modern supply chain (MSC) was significantly more efficient than the traditional supply chain (TSC). Physical losses were 20.6% in TSC compared to only 6.66% in MSC. The marketing efficiency index for vegetables was 1.06 in MSC and 0.77 in TSC; for fruits, it was 2.49 in MSC and 1.99 in TSC. Producers received a higher share in the consumer's rupee in MSC 52% for vegetables and 70% for fruits compared to 43% and 66%

in TSC, respectively. Shorter supply chain length, better packaging, and reduced losses contributed to MSC's efficiency. The study highlighted the growing impact of modern retail on agricultural marketing systems. It emphasized the need for adopting efficient models for better producer returns and reduced wastage.

Kumar *et al.* (2023) investigated the impact of modern retail stores on the marketing efficiency of fruit and vegetable supply chains in Hisar and Karnal districts of Haryana. A purposive sample of 200 respondents was used to compare the modern supply chain (MSC) with the traditional supply chain (TSC). Findings revealed that MSC was significantly more efficient than TSC for both fruits and vegetables. Physical losses were notably lower in MSC (6.66%) compared to TSC (20.6%). The marketing efficiency index for vegetables was 1.06 in MSC versus 0.77 in TSC, and for fruits, 2.49 in MSC versus 1.99 in TSC. Producer's share in consumer's rupee was higher in MSC (52% for vegetables and 70% for fruits) than in TSC (43% and 66% respectively). The superior efficiency of MSC was attributed to shorter supply chain length, better packaging, and reduced physical losses. The study emphasized the growing significance of modern retail in enhancing supply chain outcomes for fresh produce.

2.4 To Identify Constraints in the Supply Chain Management of Fresh Fruits and Vegetables in the Lucknow District

Saadat and Gupta (2018) analyzed the marketing efficiency, price spread, spatial price difference, and marketing constraints of fresh mango in Malda district, West Bengal. The study was based on primary data collected from 120 samples, including 60 farmers and 60 intermediaries. Farmers were selected using a three-stage stratified random sampling method, while intermediaries were chosen randomly from two purposively selected markets. They identified seven predominant marketing channels, focusing on four major ones that accounted for 80% of procurement. Marketing efficiency was calculated using Acharya's Modified Marketing Efficiency method. They found that the producer's share in consumer's rupees was highest in Channel-I (80%) compared to Channel-III (57%). Garrett ranking revealed major constraints as the large number of intermediaries, faulty sales methods, and lack of infrastructure. The study suggested promoting cooperative marketing models to improve efficiency through direct selling to consumers.

Thulasiram and Alagumani (2018) examined the constraints hindering India's export potential in the fruits and vegetables sector. Despite being a major producer, India's share in global trade remained low at 1.7% for fruits and 0.5% for vegetables. From the producers' side, key challenges included failure to meet international quality standards, poor infrastructure, and excessive chemical use. Exporters faced issues like inadequate export facilities, lack of post-harvest standardization, and complex documentation. The study emphasized the need for improved infrastructure and institutional support. It also highlighted the importance of better coordination between production and export processes. These improvements were deemed essential to enhance India's global competitiveness in the sector.

Nikmal (2019) examined the evolving dynamics of the pomegranate supply chain, highlighting significant changes in global fresh produce markets due to economic growth, consumer preferences, and technological advancements. It discusses efficient management practices from seed to market that address post-harvest losses and the overall profitability for stakeholders. Additionally, the pomegranate's health benefits and production statistics in India, particularly in states like Maharashtra and Karnataka, are analyzed, emphasizing the fruit's economic value and export potential.

Battacharyya *et al.* (2021) conducted a study at ICAR-Central Citrus Research Institute (ICAR-CCRI), Nagpur, to analyze constraints faced by citrus cultivators in the Vidharbha and Marathwada regions of Maharashtra and Chhindwara region of Madhya Pradesh during the COVID-19 lockdown in India. The study covered the major citrus belt of Central India, which produces most of the Nagpur mandarin. Through telephonic interviews and WhatsApp group surveys involving 100 farmers, they identified and ranked ten major constraints using Garrett Ranking Technique. The problem of logistics and marketing (Garrett score 64.25) emerged as the most severe constraint during the lockdown. They also identified future strategies to improve marketing and logistics to support farmers during pandemic situations.

Ge *et al*. (2022) studied the facility location problem within the U.S. fresh produce supply chain, emphasizing its importance for supply chain efficiency in aggregating and distributing products. The research highlighted the multi-disciplinary nature of the problem, requiring multiple complementary approaches at various aggregation levels to capture key location determinants. They developed a model integrating an empirical scenario into the

facility location problem to provide comprehensive information for optimal location decisions. Their results suggested that facility location efficiency could be enhanced without substantially increasing operating costs. The study demonstrated how applying complementary modeling techniques improves the effectiveness of facility location solutions.

Sai *et al.* (2022) onducted a study in Siddipet district of Telangana to identify major constraints affecting vegetable production and marketing that reduce growers' profitability. Primary data were collected from 150 vegetable growers and various market stakeholders including wholesalers, commission agents, processors, and retailers (both organized and unorganized). The study found that price fluctuations and postharvest losses were the key constraints faced by most stakeholders. They suggested developing efficient strategies such as strengthening cold chain infrastructure to improve production and marketing practices and thereby enhance profitability in vegetable cultivation.

Singh *et al.* (2023) conducted a study in Patna district, Bihar, analyzing the supply chain of Arize 6444 seed with data from 100 respondents. Using Henry Garrett's test, they identified key marketing constraints ranked from 1 to 7 as price, availability, certification issues, transportation, quality problems, competitors, and communication gaps. Price emerged as the most critical concern. The study suggested that regular promotional activities, including demonstrations, farmer meetings, and joint field visits with company officials, should be conducted to address these constraints effectively.

Saikia *et al.* (2024) studied the constraints faced by small and marginal vegetable growers in Golaghat and Udalguri districts of Assam during 2021-2022. The study was based on primary data collected from 240 respondents through structured interviews. Using Garrett's ranking technique, they found that lack of suitable varieties in every season was the major technical constraint. They also identified non-availability of labour during harvesting as a key labour issue. High cost of quality seeds was recognized as a significant economic constraint. The perishable nature of the produce was a major marketing challenge. Additionally, they found insects and pests attack to be an important environmental constraint. The study highlighted the need for cold storage facilities, more agro-processing units, and advanced research on gene mutations. These measures were suggested to improve productivity and make Indian vegetables globally competitive.

Pradhan *et al.* (2024) studied grape production in Nashik District, Maharashtra, focusing on 200 grape growers. The research highlighted that farmers faced significant constraints, with limited exposure to export markets identified as the most critical challenge. This lack of exposure hindered their understanding of international market dynamics and regulations. The second major constraint was inadequate storage facilities, which are essential for maintaining grape quality and prolonging shelf life. The study emphasized the need for improved market access and better storage infrastructure to enhance the competitiveness of grape growers in export markets.

MATERIALS AND METHODS

This chapter outlines the methodological framework employed to assess socio-economic status, cost benefit ratio and constraints analysis in the supply chain of fresh fruits and vegetables in Lucknow district of Uttar Pradesh. The study was based on primary data collected from 2023 to 2024 and secondary data was collected from sourced government and statistical agencies. All methods utilized are listed below:

3.1 Collection of data:

Primary data was collected to survey schedule and personal interview of the respondents in the study area.

3.2 Period of the study:

This Study was based on the agriculture year 2023-2024.

3.3 Sampling Technique:

A multi-stage purposive-cum-random sampling technique was employed for the collection of primary data. This sampling approach was deemed suitable to achieve unbiased representation and reliability of data from urban and peri-urban settings.

3.3.1 Selection of State: Uttar Pradesh was selected purposively as it is a major producer and consumer of fresh fruits and vegetables in India.

3.3.2 Selection of District: Lucknow district was purposively chosen due to its high concentration of supply chain activities involving fresh fruits and vegetables.

3.3.3 Selection of Blocks: Gosaiganj block within Lucknow district was purposively selected as it represents a significant urban and peri-urban area with diverse stakeholders involved in the supply chain.

3.3.4 Selection of respondents: A total of 120 stakeholders were selected randomly from among farmers, retailers, traders, wholesalers, and supermarket managers involved in the supply chain. The sample was stratified to ensure representation of all key supply chain actors.

3.4 Descriptive Statistics:

It is used to display the enormous quantitative data in systematic and logical manner for analysis. There are 3 main descriptive statistics are measure of central tendency, measure of dispersion and measure of association-ship. Average, Standard Deviation, s

\tandard error, skewness and kurtosis. Among these Mean and Percentage were used for the explaining the patterns of the data.

3.4.1 Mean:

Arithmetic mean or simple mean is a measure of central tendency. It helps in the summarization of data and identification of overall average. The formula for calculation of the arithmetic mean is:

$$X = \frac{1}{n}\sum_{i=1}^{n} x_i$$

where, X = mean

N = total number of years

x_i = individual observations

3.4.2 Percentage:

Percentage method was utilized for finding the proportional contribution of different stakeholders in the respondent (Omar *et al.,* 2025). The formula used:

$$\text{Percentage} = \left(\frac{\text{Component Value}}{\text{Total Value}}\right) \text{X } 100$$

3.5 Cost Benefit Ratio:

The Cost Benefit Ratio (CBR) is a critical financial metric used to evaluate the economic viability and profitability of the supply chain operations in fresh fruits and vegetables. It measures the relationship between the net benefits (profits) gained and the total costs incurred in the process. The primary purpose of using CBR is to assess whether the supply chain activities provide a satisfactory return on investment for the stakeholders involved.

The Cost Benefit Ratio was employed to evaluate the economic feasibility and profitability of the supply chain operations. The interpretation is as follows:

- If CBR > 1, the operation is economically feasible.
- If CBR = 1, the operation is at break-even point (no profit, no loss).
- If CBR < 1, the operation is not feasible and should be reconsidered.

The calculations were made using the following formulas:

Net Benefit (Profit) = Total Revenue – Total Cost

$$\text{Cost-Benefit Ratio (CBR)} = \frac{\text{Net Benefit}}{\text{Total Cost}}$$

3.6 Garrett Ranking:

Garrett ranking technique was used to analyse and prioritize the major constraints experienced by stakeholders in the fresh fruits and vegetables supply chain. This technique converts ranks given by respondents into scores to allow quantitative analysis of qualitative data (Gupta *et al.*, 2025). Respondents were asked to rank constraints on a severity scale from 1 to 10, with 1 indicating the most severe constraint and 10 the least severe. The ranks were converted into percent positions using the formula:

$$\text{Percent Position} = \left(\frac{R_{ij} - 0.5}{N_j}\right) X\ 100$$

Where,

R_{ij} = rank of the i^{th} constraint by the j^{th} respondent

N_j = total number of constraints ranked by the j^{th} respondent

RESULTS AND DISCUSSION

The primary data collected from personal schedule was analysed for the concerned objectives. The study's finding and discussion were conferred in the following section.

1. Socio-economic profile of Different Stakeholders involved in the supply chain of fresh fruits and vegetables

1.1 Stakeholder composition of total respondents

Table 1.1 presented the classification of respondents based on their stakeholder category in the fresh fruits and vegetables supply chain. Out of a total of 120 respondents, the largest proportion comprised traders (30%), followed by retailers (22.5%) and farmers (19.16%). Supermarket managers and wholesalers constituted 16.66% and 11.66% of the respondents respectively.

Table 1.1: Stakeholder composition of total respondents

Stakeholder Category	Total number
Farmer	23 (19.16)
Retailer	27 (22.5)
Supermarket Manager	20 (16.66)
Trader	36 (30)
Wholesaler	14 (11.66)
Grand Total	**120 (100)**

Note: values in parentheses are in percentage. *Source: Survey conducted in Lucknow District (2023-24)*

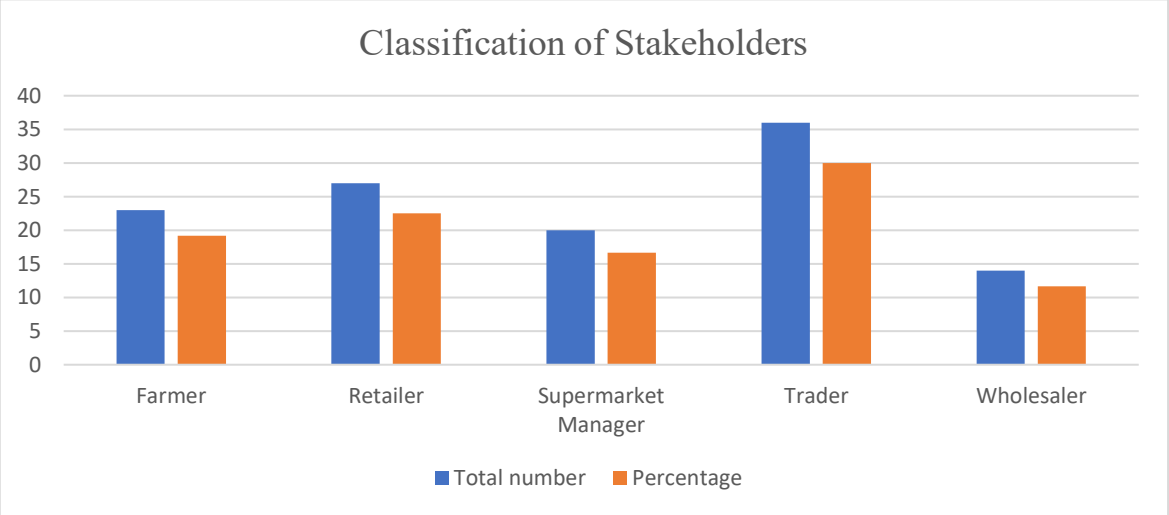


Figure 1.1: Stakeholder composition of the respondents

1.2 Gender composition of stakeholders

Table 1.2 outlined the gender composition of respondents across different stakeholder categories in the fresh fruits and vegetables supply chain. Out of the total 120 respondents, 94 (78%) were male and 26 (22%) were female, indicating a male-dominated stakeholder base. Male respondents were most prominent among traders (23%) and retailers (17%), followed by supermarket managers (13%), farmers (15%), and wholesalers (11%). Female participation, though comparatively lower, was observed across all categories, with the highest representation among traders (8%) and retailers (6%).

Table 1.2: Gender composition of stakeholders

Stakeholder Category	Female	Male	Grand Total
Farmer	5 (4)	18 (15)	23 (19)
Retailer	7 (6)	20 (17)	27 (23)
Supermarket Manager	4 (3)	16 (13)	20 (17)
Trader	9 (8)	27 (23)	36 (30)
Wholesaler	1 (1)	13 (11)	14 (12)
Grand Total	**26 (22)**	**94 (78)**	**120 (100)**

Source: Survey conducted in Lucknow District (2023-24)

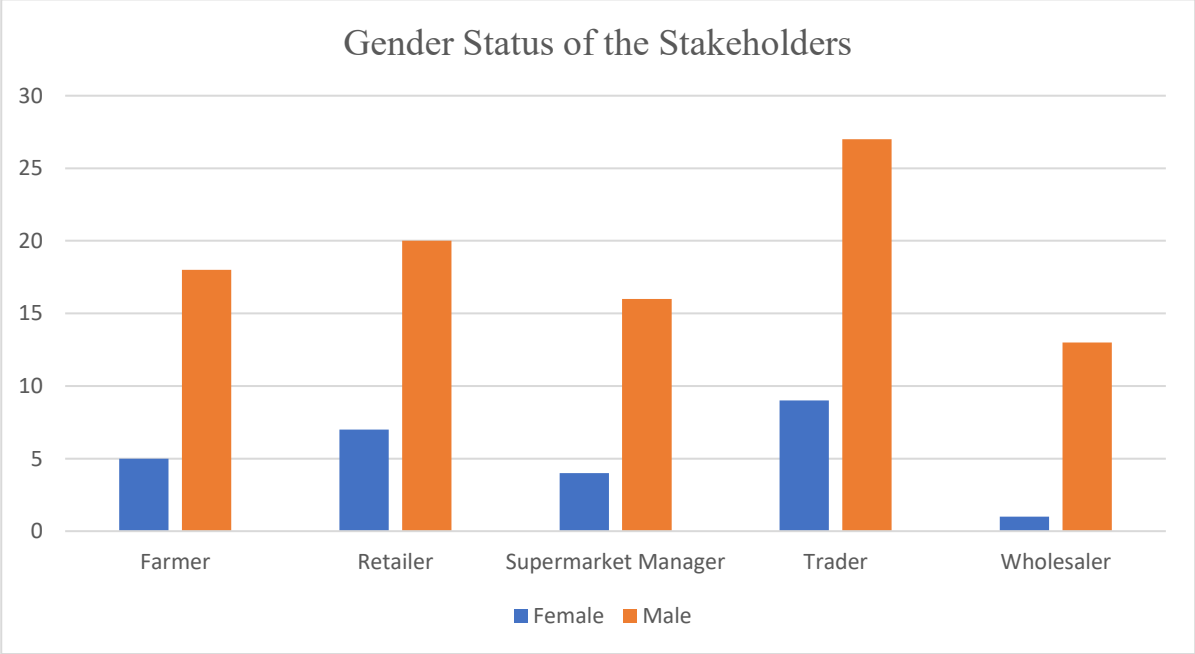


Figure 1.2: Gender Composition of the stakeholders

1.3 Age composition of stakeholders

Table 1.3 presented the age-wise distribution of stakeholders across various categories in the fresh fruits and vegetables supply chain. Out of 120 respondents, the largest group (45%) falls within the 40–49 age category, indicating that middle-aged individuals form the core workforce of the sector. This is followed by 29.16% in the 30–39 age group and 22.5% in the 50–60 age group, while only 3.33% belong to the youngest group of 20–29 years. Traders and supermarket managers show particularly high representation in the 40–49 age bracket.

Table 1.3: Age composition of stakeholders

Age category	Farmer	Retailer	Supermarket Manager	Trader	Wholesaler	Grand Total
20-29	1 (0.83)	1 (0.83)	-	1 (0.83)	1(0.83)	4 (3.33)
30-39	7 (5.83)	10 (8.34)	5 (4.16)	9 (7.5)	4 (3.3)	35 (29.16)
40-49	6 (5)	13 (10.83)	9 (7.5)	19 (15.83)	7 (5.83)	54 (45)
50-60	9 (7.5)	3 (2.5)	6 (5)	7 (5.83)	2 (1.6)	27 (22.5)
Grand Total	**23 (19.16)**	**27 (22.5)**	**20 (16.6)**	**36 (30)**	**14 (11.6)**	**120 (100)**

Source: Survey conducted in Lucknow District (2023-24)

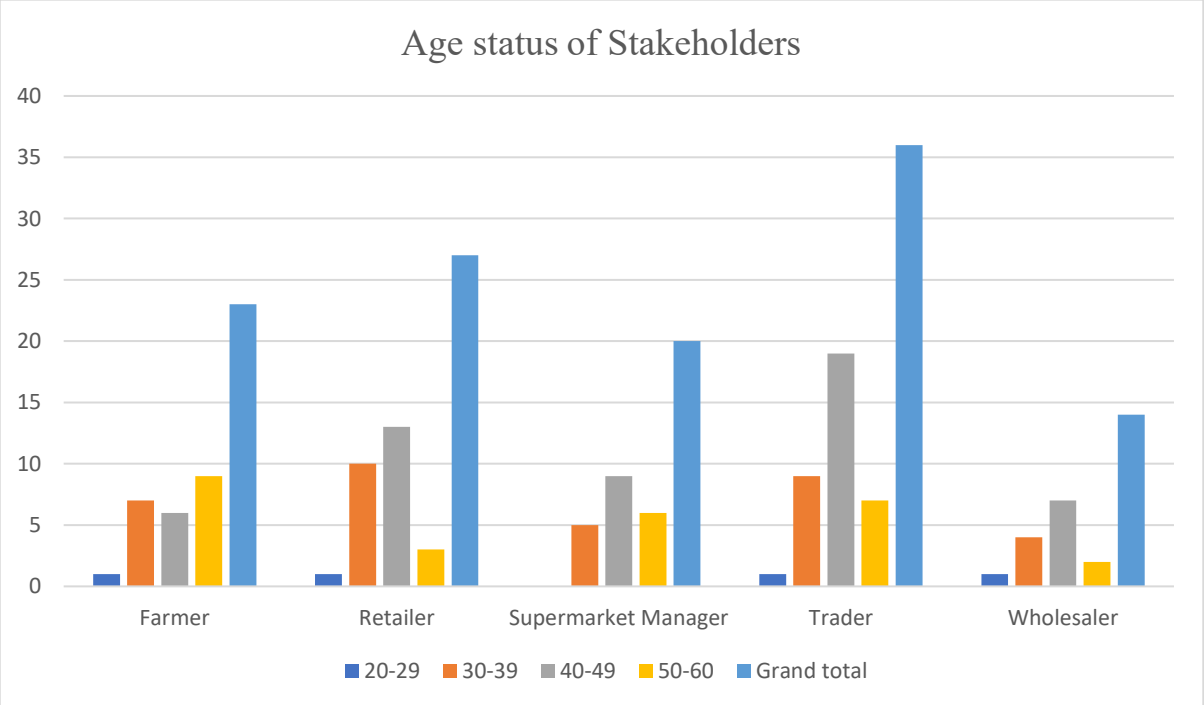


Figure1.3: Age composition of stakeholders

1.4 Education composition of stakeholders

Table 1.4 illustrated the educational qualifications of stakeholders involved in the fresh fruits and vegetables supply chain. Among the 120 respondents, the largest proportion (20.83%) held postgraduate degrees, followed closely by illiterate individuals (20%) and graduates (17.5%). Primary and technical education levels accounted for 15.83% and 15%, respectively, while 10.83% had secondary education. Postgraduates were most common among traders, while illiteracy was notably present among farmers and traders.

Table 1.4: Education composition of stakeholders

Education of Qualification	Farmer	Retailer	Supermarket Manager	Trader	Wholesaler	Grand Total
Graduate	3	5	3	6	4	21 (17.5)
Illiterate	7	5	3	6	3	24 (20)
Postgraduate	7	2	4	10	2	25 (20.83)
Primary	2	6	4	5	2	19 (15.83)
Secondary	2	3	1	5	2	13 (10.83)
Technical	2	6	5	4	1	18 (15)
Grand Total	**23**	**27**	**20**	**36**	**14**	**120 (100)**

Source: Survey conducted in Lucknow District (2023-24)

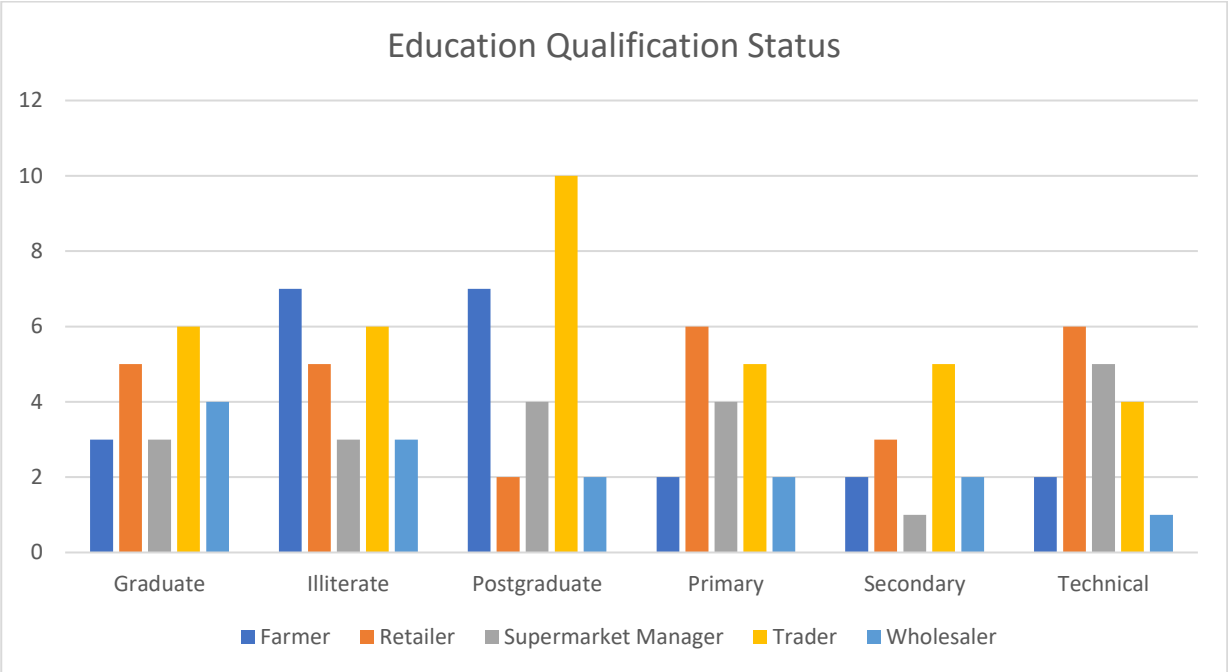


Figure 1.4: Education composition of stakeholders

1.5 Land holding composition of Stakeholders

Table 1.5 provided an overview of the landholding status of different stakeholders in the fresh fruits and vegetables supply chain. A significant majority of respondents (79.16%) were marginal landholders, followed by 6% each in the small and medium categories, and 9% in the large landholding category. Marginal landholding was predominant across all stakeholder groups, particularly among farmers, retailers, and supermarket managers. Traders and wholesalers showed some presence in the large landholding category, though still relatively limited.

Table 1.5: Land holding composition of Stakeholders

Stakeholder Category	**Marginal**	**Small**	**Medium**	**Large**	**Grand Total**
Farmer	20 (17)	1 (1)	2 (2)	-	23 (19)
Retailer	23 (19)	-	2 (2)	2 (2)	27 (23)
Supermarket Manager	17 (14.16)	-	1 (1)	2 (2)	20 (17)
Trader	22 (18.33)	6 (5)	2 (2)	6 (5)	36 (30)
Wholesaler	13 (10.83)	-	-	1 (1)	14 (12)
Grand Total	**95** (79.16)	**7** (6)	**7 (6)**	**11** (9)	**120** (100)

Source: Survey conducted in Lucknow District (2023-24)

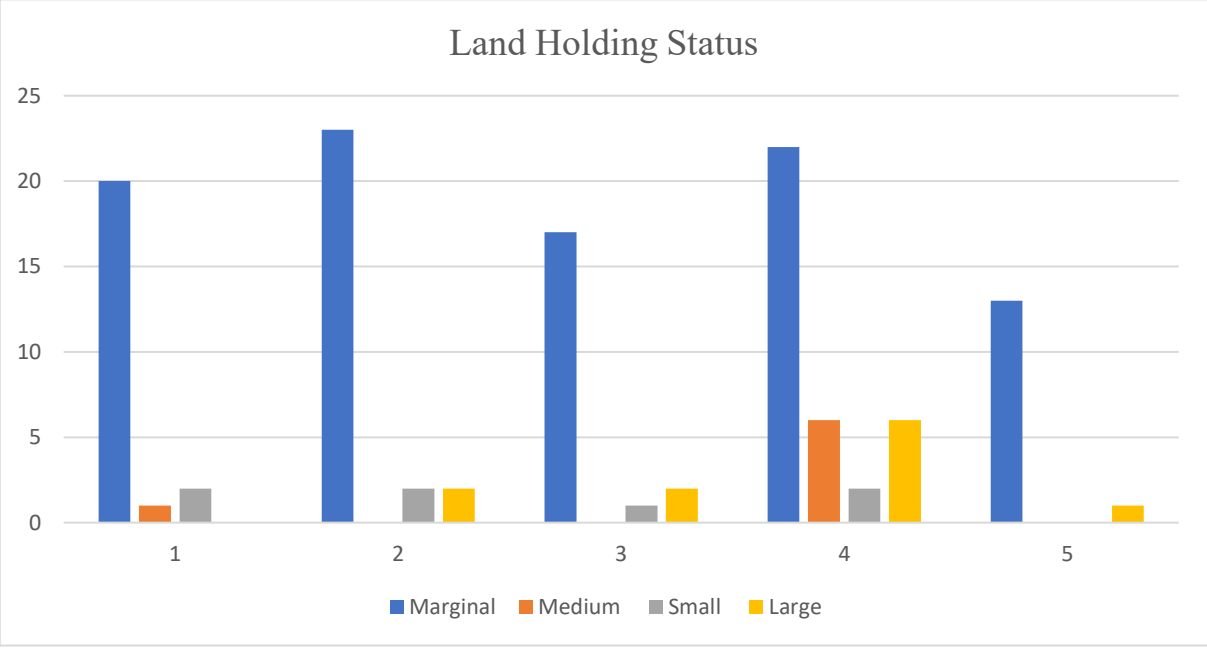


Figure 1.5: Land holding composition of Stakeholders

1.6 Monthly Income composition of Stakeholders

Table 1.6 displayed the monthly income distribution of various stakeholders in the fresh fruits and vegetables supply chain. Among the 120 respondents, the majority (51.67%) reported a monthly income between ₹40,000–₹60,000, followed by 26.67% earning more than ₹60,000, and 20% earning between ₹20,000–₹40,000. Only a small fraction (1.67%) earned less than ₹20,000 per month. Across all stakeholder categories, the ₹40,000–₹60,000 income bracket was the most common, particularly among traders, farmers, and supermarket managers.

Table 1.6: Monthly Income composition of Stakeholders

Stakeholders Category	**10-20000 rupees**	**20-40000 rupees**	**40-60000 rupees**	**>60000 rupees**	**Grand Total**
Farmer	-	4 (3.33)	12 (10)	7 (5.83)	23 (19.17)
Retailer	1 (0.83)	6 (5)	13 (10.83)	7 (5.83)	27 (22.5)
Supermarket Manager	-	3 (2.5)	10 (8.33)	7 (5.83)	20 (16.67)
Trader	-	8 (6.67)	21 (17.4)	7 (5.83)	36 (30)
Wholesaler	1 (0.83)	3 (2.50)	6 (5)	4 (3.33)	14 (11.67)
Grand Total	2 (1.67)	24 (20)	62 (51.67)	32 (26.67)	120 (100)

Source: Survey conducted in Lucknow District (2023-24)

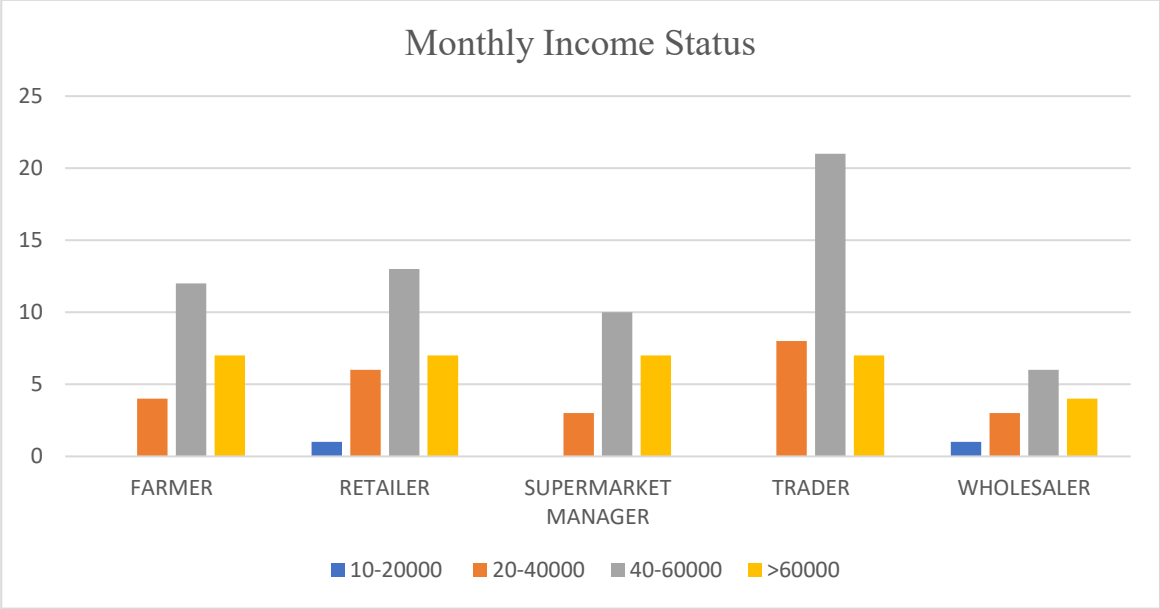


Figure 1.6: Monthly Income composition of Stakeholders

1.7 Additional Source of income composition stakeholders

Table 1.7 highlighted the distribution of additional sources of income among stakeholders in the fresh fruits and vegetables supply chain. Out of 120 respondents, the most common supplementary income source was retailing (24.16%), followed by transport-related activities (22.5%), farming (20%), agri-trading (17.5%), and other sources (15.83%). All stakeholder categories reported involvement in multiple income-generating activities, with traders and retailers showing notable participation in retailing and transport. Farmers also engaged significantly in retailing and agri-trading.

Table 1.7: Additional Source of income composition stakeholders

Source of Income	Agri-Trading	Farming	Other	Retailing	Transport	Grand Total
Farmer	5	3	4	7	4	23
Retailer	5	6	4	6	6	27
Supermarket Manager	4	7	6	2	1	20
Trader	4	6	5	9	12	36
Wholesaler	3	2		5	4	14
Total	**21 (17.5)**	**24 (20)**	**19 (15.83)**	**29 (24.16)**	**27 (22.5)**	**120 (100)**

Source: Survey conducted in Lucknow District (2023-24)

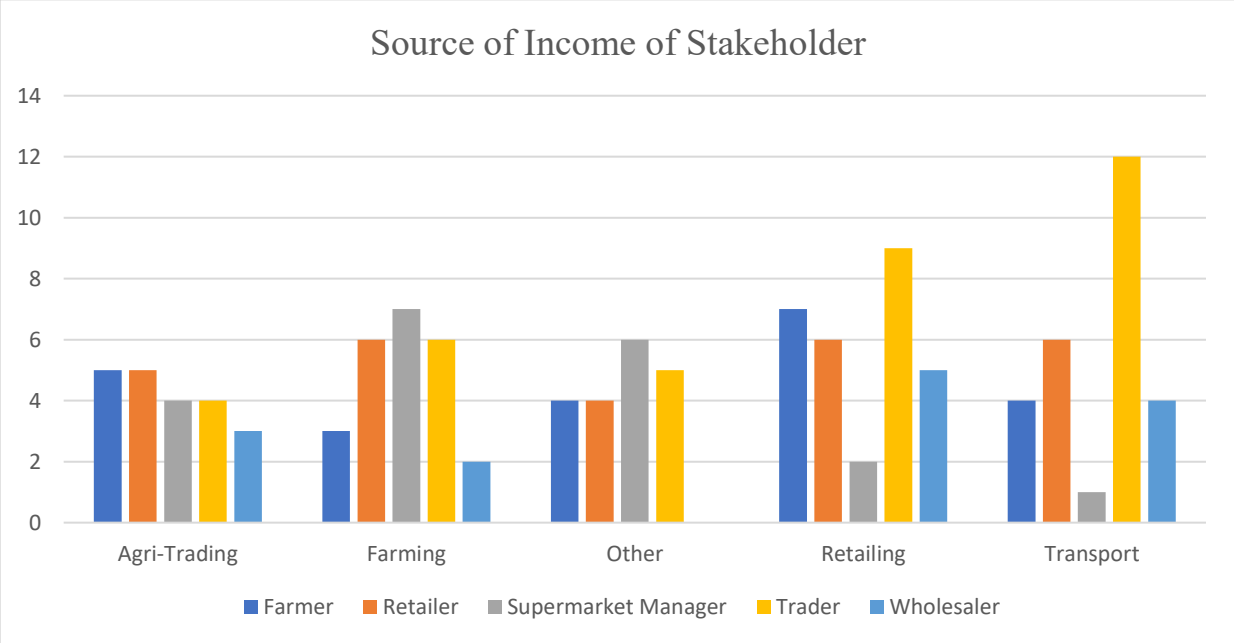


Table 1.7: Additional Source of income composition stakeholders

1.8 Type of Business Ownership composition of Stakeholders

Table 1.8 presented the types of business ownership among stakeholders in the fresh fruits and vegetables supply chain. Of the 120 respondents, 35.83% operated on leased property, followed by 25.83% who owned their business, 24.16% in partnerships, and 20.83% working on rented premises. Traders had the highest number of leased businesses, while retailers showed a relatively higher tendency toward partnerships. Farmers and supermarket managers displayed a balanced mix of owned, leased, and rented business types.

Table 1.8: Type of Business Ownership composition of Stakeholders

Type Of Business Ownership	**Leased**	**Owned**	**Partnership**	**Rented**	**Grand Total**
Farmer	7	8	5	3	23
Retailer	6	6	9	6	27
Supermarket Manager	5	5	4	6	20
Trader	11	10	8	7	36
Wholesaler	6	2	3	3	14
Grand Total	**35 (35.83)**	**31 (25.83)**	**29 (24.16)**	**25 (20.83)**	**120 (100)**

Source: Survey conducted in Lucknow District (2023-24)

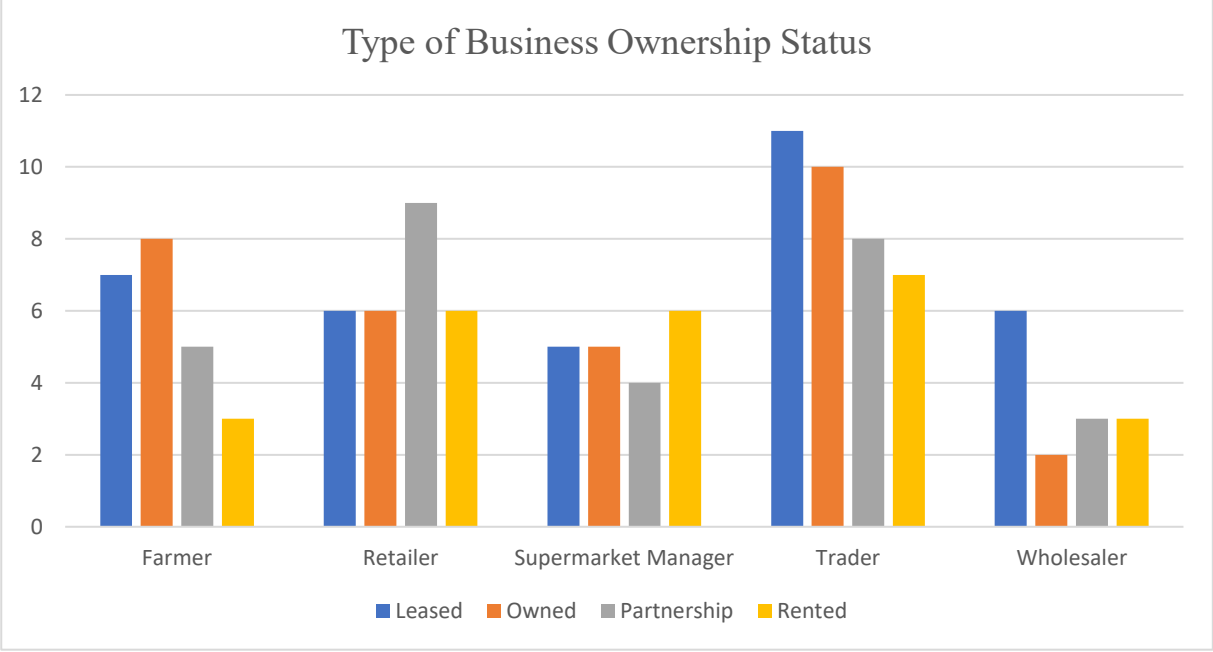


Figure 1.8: Type Of Business Ownership composition of Stakeholder

1.9 Year of experience composition of stakeholders

Table 1.9 depicted the distribution of years of experience among stakeholders in the fresh fruits and vegetables supply chain. Among the 120 respondents, the largest group (33.33%) had 11–15 years of experience, followed by 28.33% with 6–10 years, and 21.66% with 16–20 years. A smaller proportion of stakeholders had less than 5 years of experience (6.66%) or over 20 years (10%). Traders and farmers predominantly fell within the 11–15 years of experience category, reflecting a moderately experienced workforce.

Table 1.9: Year of experience composition of stakeholders

Year of experience	Farmer	Retailer	Supermarket Manager	Trader	Wholesaler	Grand Total
1-5	2	1	1	4	8	8 (6.66)
6-10	6	9	5	10	4	34 (28.33)
11-15	11	6	7	12	4	40 (33.33)
16-20	3	8	3	7	5	26 (21.66)
21-25	1	3	4	3	1	12 (10)
Total	**23 (19.16)**	**27 (22.5)**	**20 (16.66)**	**36 (30)**	**14 (11.66)**	**120 (100)**

Source: Survey conducted in Lucknow District (2023-24)

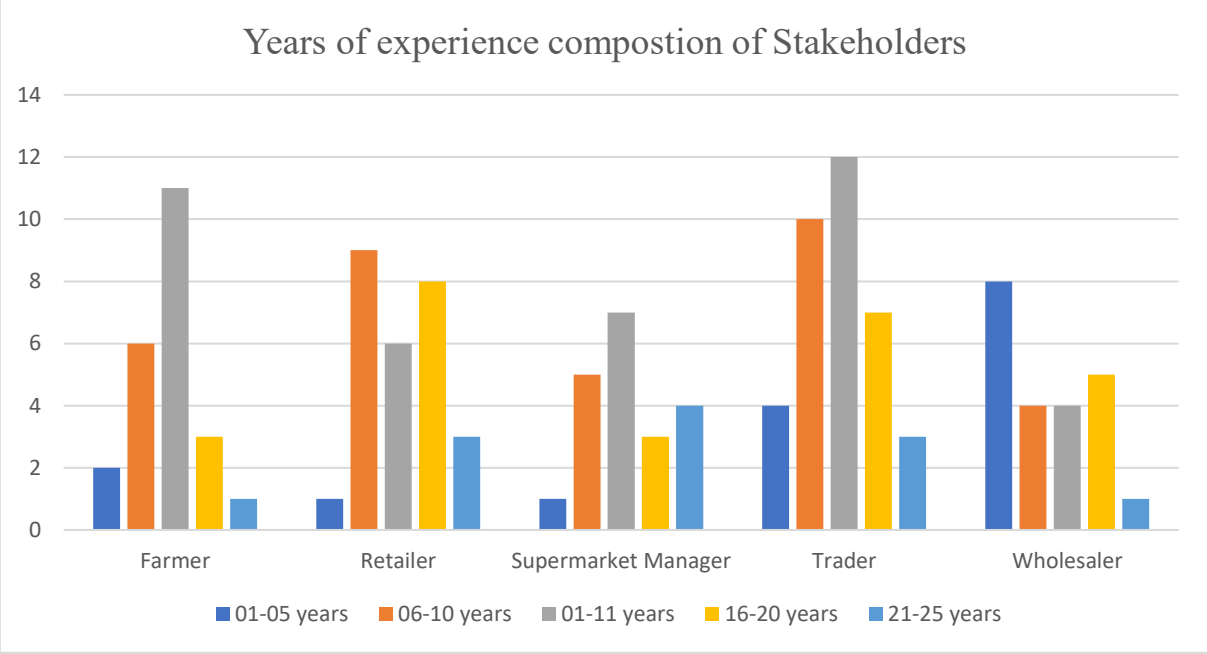


Figure 1.9: Year of experience composition of stakeholders

1.10 Type of Commodity handled composition stakeholders

Table 1.10 illustrated the distribution of stakeholders based on the type of commodities they handle—fruits, vegetables, or both. Out of 120 respondents, 35.83% dealt exclusively with vegetables, 35% with fruits, and 29.16% handled both. Traders primarily focused on vegetables, while retailers and supermarket managers were more involved in fruit handling. Farmers showed a relatively balanced distribution across all three categories.

Table 1.10: Type of Commodity handled composition stakeholders

Stakeholder Category	Both	Fruits	Vegetables	Grand Total
Farmer	10	5	8	23
Retailer	8	13	6	27
Supermarket Manager	5	9	6	20
Trader	9	8	19	36
Wholesaler	3	7	4	14
Grand Total	**35 (29.16)**	**42 (35)**	**43 (35.83)**	**120 (100)**

Source: Survey conducted in Lucknow District (2023-24)

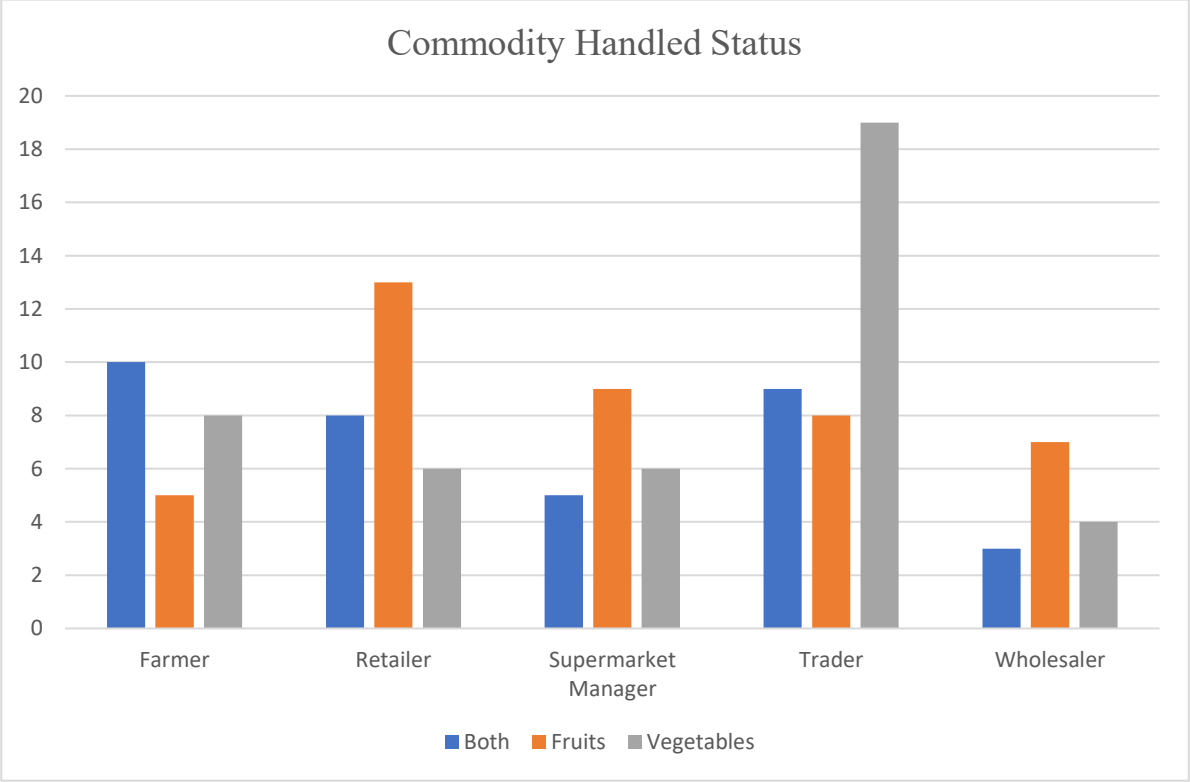


Figure 1.10: Type of Commodity handled composition stakeholders

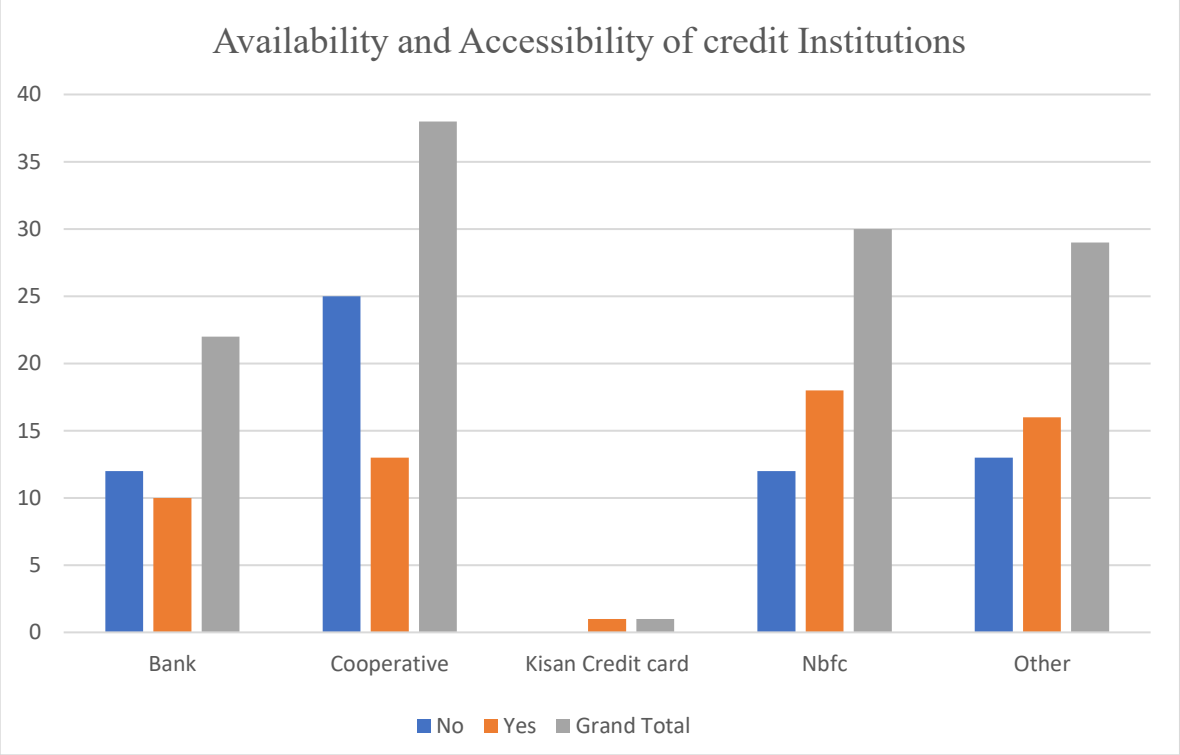
1.11 Availability and Accessibility of Credit Composition Different Institutions

Table 1.11 presented data on stakeholders' access to credit from various financial institutions. Out of 120 respondents, 48.33% reported receiving credit, while 51.66% did not. Among those with access, Non-Banking Financial Companies (NBFCs) were the most common source (25%), followed by cooperatives (31.66%), banks (18.33%), and other institutions (24.16%). Only one respondent (0.83%) accessed credit through the Kisan Credit Card. Cooperative institutions had the highest number of respondents without credit access.

Table 1.11: availability and accessibility of credit composition different institutions

Institutional Credit	No	Yes	Grand Total
Bank	12	10	22 (18.33)
Cooperative	25	13	38 (31.66)
Kisan Creditcard	-	1	1 (0.83)
Nbfc	12	18	30 (25)
Other	13	16	29 (24.16)
Grand Total	**62 (51.66)**	**58 (48.33)**	**120 (100)**

Source: Survey conducted in Lucknow District (2023-24)



. **Figure 1.11: availability and accessibility of credit composition different institutions**

1.12 Availability and Accessibility Composition of Different Institutional Training

Table 1.12 showed the availability and accessibility of training programs offered by different institutions to stakeholders in the fresh fruits and vegetables supply chain. Out of 120 respondents, 60% reported receiving training, while 40% did not. Among those who received training, the highest number benefited from "Other" institutions (30%), followed by private companies (23.33%), government agencies (25.83%), and NGOs (20.83%). Notably, all types of providers had both trained and untrained respondents, indicating varied outreach and coverage.

Table 1.12: Availability and Accessibility Composition of Different Institutional Training

Training providers	No	yes		Grand Total
Government	15	16		31 (25.83)
NGO	11	14		25 (20.83)
Other	11	25		36 30)
Private Company	11	17		28 (23.33)
Grand Total	**48 (40)**	**72 (60)**		**120 (100)**

Source: Survey conducted in Lucknow District (2023-24)

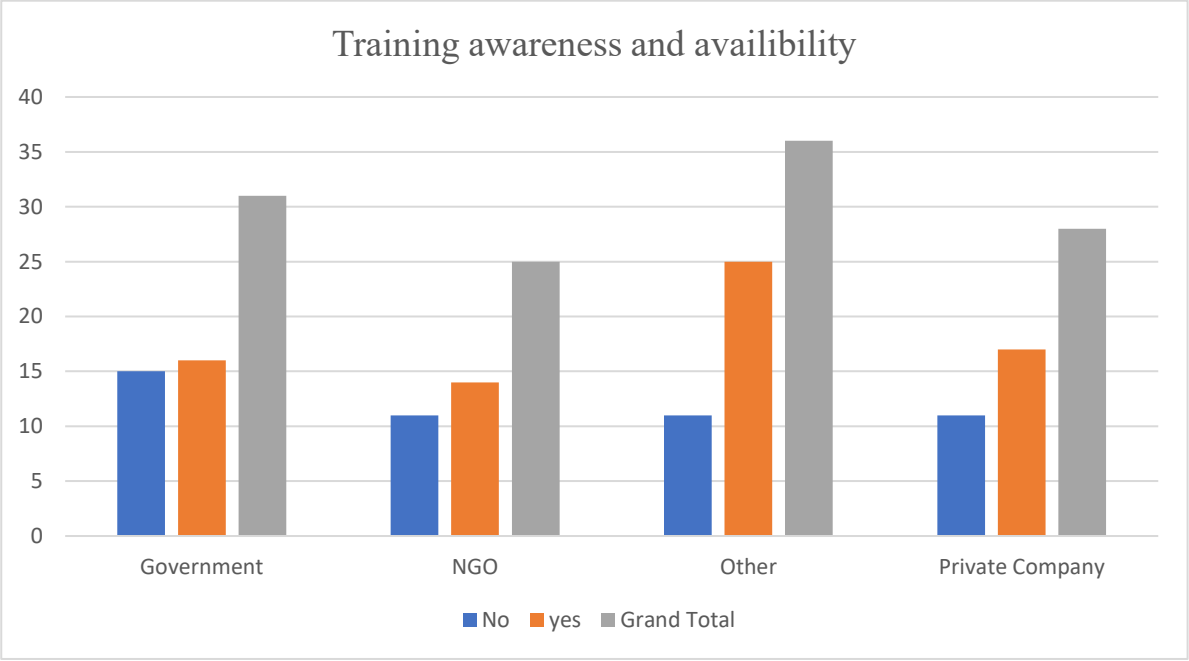


Figure 1.12: availability and accessibility composition of different institutional training

1.13 Supply chain model composition of stakeholders

Table 1.13 illustrated the distribution of stakeholders according to their engagement in either modern or traditional supply chain models within the fresh fruits and vegetables sector. Out of 120 respondents, 66 (55) operated within a modern supply chain framework, while 54 (45) followed traditional models. Retailers and supermarket managers showed a higher inclination toward modern supply chains, whereas farmers and traders were evenly split between the two models. Wholesalers were also equally represented in both. This distribution reflects a gradual shift toward modernization in supply chain practices, while traditional systems still hold significant relevance.

Table 1.13: Supply chain model composition of stakeholders

Primary Supply Chain Model	Modern	Traditional
Farmer	11	12
Retailer	18	9
Supermarket Manager	12	8
Trader	18	18
Wholesaler	7	7
Grand Total	**66 (55)**	**54 (45)**

Source: Survey conducted in Lucknow District (2023-24)

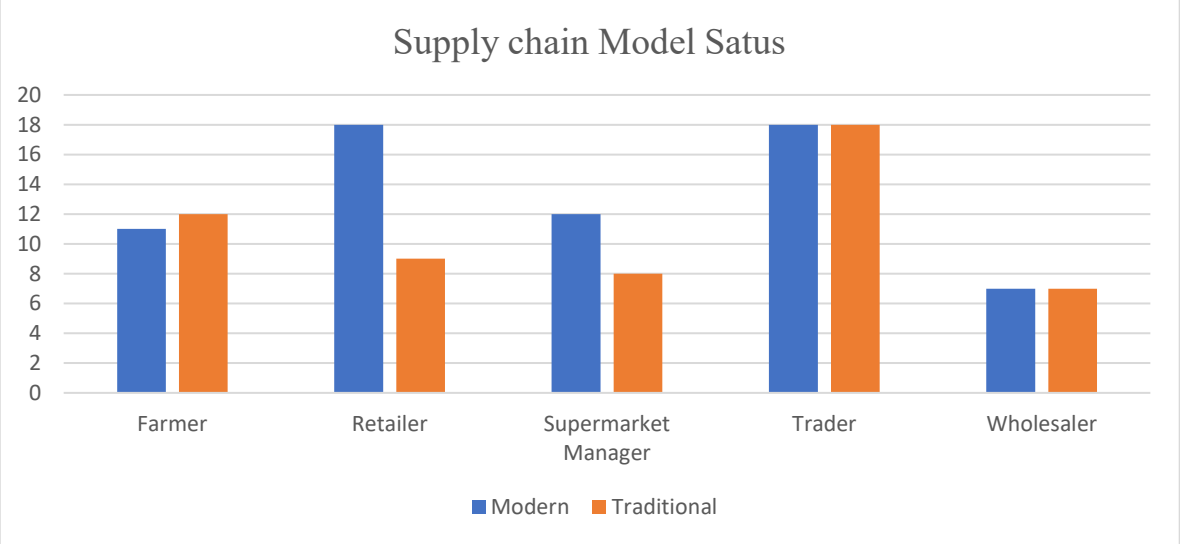


Figure 1.13: Supply chain model composition of stakeholders

1.14 Utilization of cold storage by the respondents

Table 1.14 presented the extent of cold storage utilization among different stakeholders in the fresh fruits and vegetables supply chain. Out of 120 respondents, 55 (45.83) reported using cold storage facilities, while the majority—65 respondents (54.16)—did not. Farmers had the highest rate of cold storage usage, with 15 out of 23 utilizing it, whereas traders and supermarket managers showed lower adoption despite handling large volumes. Retailers and wholesalers displayed a mixed pattern.

Table 1.14: Utilization of cold storage by the respondents

Use of Cold Storage	NO	YES	Grand Total
Farmer	8	15	23
Retailer	14	13	27
Supermarket Manager	13	7	20
Trader	21	15	36
Wholesaler	9	5	14
Grand Total	**65 (54.16)**	**55 (45.83)**	**120 (100)**

Source: Survey conducted in Lucknow District (2023-24)

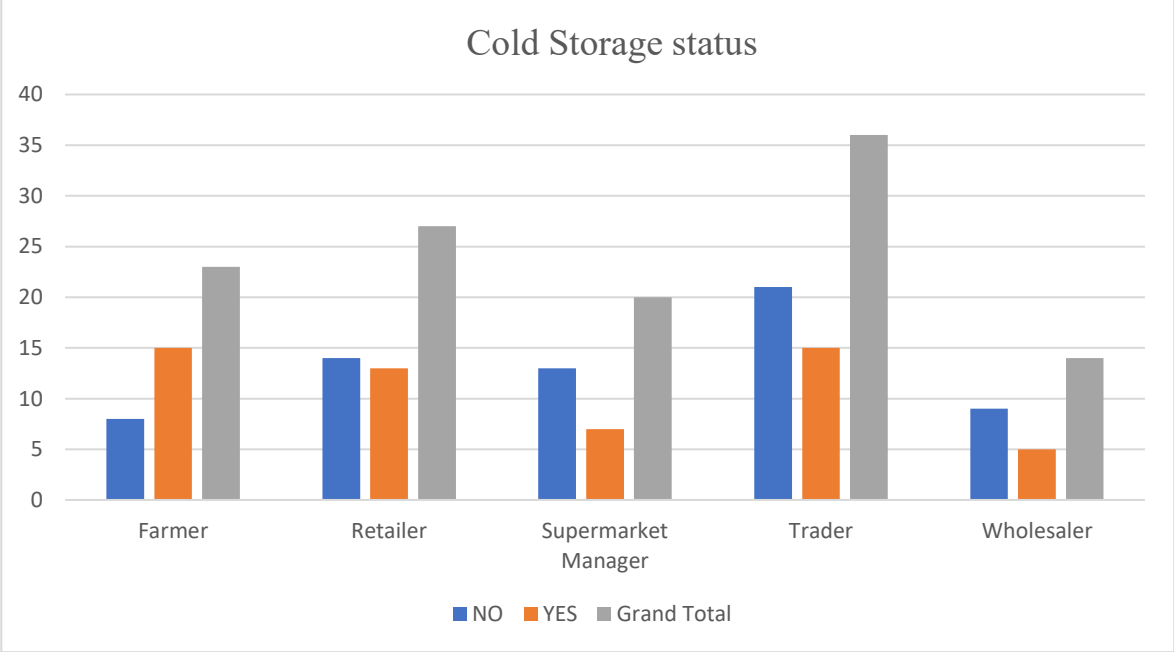


Figure 1.14: Utilization of cold storage by the respondents

1.15 cold storage facility the rental cost

Table 1.15 presented information on the rental cost of cold storage facilities charged by different types of institutions, measured in ₹ per kilogram per day. Among the three categories, cooperative cold storages charged the highest rental cost at ₹49.28/kg/day. Government-run cold storages followed closely with a rental rate of ₹48.25/kg/day. Private cold storages offered the most economical option, with a rental cost of ₹42.67/kg/day. The combined total rental cost across all institutional types amounted to ₹140.21/kg/day. This highlighted variations in storage pricing structures depending on the managing institution.

Table 1.15: cold storage facility the rental cost (₹/kg/day)

Institution	Cold Storage Rental Cost (₹/kg/day)
Cooperative	49.28
Government	48.25
Private	42.67
Grand Total	**140.21**

Source: Survey conducted in Lucknow District (2023-24)

2. Cost benefit analysis of stakeholder in supply chain of fresh fruits and vegetables in Lucknow district

Table 2 presented the cost-benefit analysis of various stakeholders involved in the fruits and vegetables supply chain in Lucknow district. The overall cost-benefit ratio (CBR) across all stakeholders is 1:1.57, indicating that for every ₹1 invested, the return is ₹1.57. Wholesalers achieved the highest CBR of 1:2.87, reflecting the most efficient profit margin, contributing 10.32% to total costs and earning 16.16% of total revenue. Supermarket managers also demonstrated a favourable CBR of 1:1.52, followed by traders (1:1.34), farmers (1:1.29), and retailers (1:1.14). In terms of revenue generation, traders and retailers contributed significantly, while farmers and supermarket managers also maintained notable returns. It highlighted the varying profitability levels across stakeholder categories, with wholesalers and supermarket managers emerging as the most economically efficient links in the supply chain.

Table 2: Cost benefit analysis of different stakeholders

Stakeholder category	Total Monthly Cost	Total Monthly Revenue	Net Benefit	Cost-Benefit Ratio
Farmer	4563583 (19.77)	10437442 18.28	5873859 (17.27)	1:1.29
Retailer	5374466 (23.28)	11526739 20.19	6152273 (18.09)	1:1.14
Supermarket Manager	4049099 (17.54)	10212684 (17.89)	6163585 (18.13)	1:1.52
Trader	6715697 (29.09)	15688869 (27.48)	8973172 (26.39)	1:1.34
Wholesaler	2383144 (10.32)	9224139 (16.16)	6840995 (20.12)	1:2.87
Grand Total	23085989 (100)	57089873 (100)	34003884 (100)	**1:1.57**

Source: Survey conducted in Lucknow District (2023-24)

3. Comparison between modern and tradition practices in supply chain of fresh fruits and vegetables in Lucknow district

Table 3 provided a comparative analysis of modern and traditional supply chain models adopted by various stakeholders in the fruits and vegetables sector in Lucknow district. The overall cost-benefit ratio (CBR) is higher in the modern supply chain (1:1.57) compared to 1:1.16 in the traditional system, indicating that stakeholders in modern channels achieve greater profitability.

In the modern model, retailers exhibit the highest CBR of 1:1.59, followed closely by wholesalers (1:1.51) and traders (1:1.47). Farmers and supermarket managers also demonstrate efficient performance with CBRs of 1:1.23 and 1:1.35, respectively. Conversely, in the traditional model, the highest CBR is observed among wholesalers (1:1.31), followed by traders and retailers, though all values remain lower than their modern counterparts. Traditional farmers show the lowest efficiency with a CBR of 1:1.05, suggesting limited returns on investment. These findings clearly highlight the economic superiority of the modern supply chain in terms of cost efficiency and profitability across all stakeholder categories.

Table 3: Comparison between modern and tradition supply chain management practices.

	Stakeholder category	Total Monthly Cost	Total Monthly Revenue	Net Benefit	Cost Benefit Ratio
Modern	**Farmer**	2271620 (17.57)	5515227 (18.42)	3243607 (19.06)	1:1.23
	Retailer	3375985 (26.11)	7390290 (24.68)	4014305 (23.58)	1:1.59
	Supermarket Manager	2436371 (18.85)	5721124 (19.10)	3284753 (19.30)	1:1.35
	Trader	3453080 (26.71)	8394173 (28.03)	4941093 (29.03)	1:1.47
	Wholesaler	1390688 (10.76)	2927714 (9.78)	1537026 (9.03)	1:1.51
	Grand Total	12927744 (100)	29948528 (100)	17020784 (100)	**1:1.57**
Traditional	**Stakeholder category**	**Total Monthly Cost**	**Total Monthly Revenue**	**Net Benefit**	**Cost Benefit ratio**
	Farmer	2291963 (22.56)	4922215 (22.44)	2630252 (22.34)	1:1.05
	Retailer	1998481 (19.67)	4136449 (18.86)	2137968 (18.16)	1:1.17
	Supermarket Manager	1612728 (15.88)	3281560 (14.96)	1668832 (14.17)	1:1.13
	Trader	3262617 (32.12)	7294696 (33.26)	4032079 (34.25)	1:1.24
	Wholesaler	4992456 (33.26)	2296425 (10.47)	1303969 (11.08)	1:1.31
	Grand Total	10158245 (100)	21931345 (100)	11773100 (100)	**1:1.16**

Source: Survey conducted in Lucknow District (2023-24)

4. Constraint Analysis in the supply chain of fresh fruits and vegetables in Lucknow district

The table 4 ranked various constraints faced by stakeholders in the agricultural supply chain based on Garrett's mean scores. The highest-ranked constraint is the involvement of middlemen with a score of 58.82, indicating it as the most significant challenge. This is followed by lack of direct market access (55.85) and unpredictable market demand (51.81) as the second and third most critical issues. Other notable constraints include the high cost of packaging (51.34) and lack of training/awareness (49.19). Lesser-ranked challenges include inadequate government support (49.04), lack of cold storage (48.84), transport delay (44.91), spoilage during transit (42.15), and poor price realization (40.42). This ranking highlighted the key barriers to efficiency and profitability in the supply chain, emphasizing the need for interventions to reduce middlemen involvement and improve market access.

Table 4: Constraint analysis of supply chain management of fruit and vegetable in Lucknow district of Uttar Pradesh

Sr No.	Constraints	Garrett's mean Score	Rank
1	Lack of cold storage	48.84	VII
2	Transport delay	44.91	VIII
3	Poor price realization	40.42	X
4	Involvement of middlemen	58.82	I
5	Lack of direct market access	55.85	II
6	High cost of packaging	51.34	IV
7	Inadequate government support	49.04	VI
8	Spoilage during transit	42.15	IX
9	Unpredictable market demand	51.81	III
10	Lack of training/awareness	49.19	V

SUMMARY AND CONCLUSIONS

The supply chain of fresh fruits and vegetables (F&V) in Lucknow district of Uttar Pradesh is a complex network involving multiple stakeholders from production to final consumption. This study was designed to assess the efficiency, profitability, and constraints of both traditional and modern supply chains by analysing stakeholder profiles, economic returns, and systemic bottlenecks. The findings are based on primary data collected from the Gosaiganj block during 2023–2024.

Stakeholders were classified into five major categories namely farmers, traders, wholesalers, retailers, and supermarket managers. The socio-economic profiling of stakeholders in the fresh fruits and vegetables supply chain revealed significant variations across different actors involved. The majority of farmers were middle-aged with moderate education levels, primarily relying on agriculture as their main source of livelihood. Landholding patterns indicated that most were marginal to small farmers, limiting their bargaining power and capacity to invest in advanced practices. Retailers and commission agents were found to have higher levels of market experience but operated in highly competitive environments with limited formal training. Supermarket managers, part of the modern chain, had better access to infrastructure, market information, and technology, reflecting a more organized and commercially oriented approach. Overall, the socio-economic data highlighted a distinct gap between traditional and modern stakeholders in terms of education, access to credit, market awareness, and technological adoption, underlining the need for targeted capacity-building programs to bridge these disparities and enhance inclusive participation in the evolving supply chain.

The Cost-Benefit Ratio (CBR) analysis across both supply chains revealed that modern channels were more profitable and economically efficient than traditional ones. Farmers in the modern supply chain achieved a CBR of 1.57, indicating a significant return over cost, followed by retailers (1.59) and wholesalers (1.51). In comparison, the traditional supply chain yielded a CBR of 1.05 for farmers, while other stakeholders such as supermarket manager (1.13) and retailers (1.17) had relatively lower profitability due to higher transaction costs and longer value chains.

The comparative analysis highlighted that the modern supply chain not only ensures better price realization for producers but also reduces post-harvest losses and transaction

inefficiencies. It is characterized by fewer intermediaries, better infrastructure (cold storage, packaging, quality grading), and improved logistics. However, it demands adherence to quality standards, consistent supply, and better market knowledge, which may be challenging for small and marginal farmers.

To capture the constraints within supply chain, Garrett Ranking Technique was applied. In the traditional supply chain, top-ranked constraints included lack of cold storage facilities, inadequate transportation, exploitation by middlemen, high price fluctuations, and delayed payments. In the modern supply chain, although more structured, challenges like high packaging and grading costs, quality compliance, and supply chain consistency emerged as significant hurdles, especially for smallholders aiming to participate.

Conclusions:

This study underscores the evolving dynamics of the fresh fruits and vegetables supply chain in Uttar Pradesh, revealing both the economic superiority and emerging complexities of modern marketing channels. The traditional supply chain, while deeply rooted and accessible, suffers from inefficiencies, exploitation, and inadequate infrastructure. In contrast, the modern supply chain, despite its efficiency and higher profitability, is less inclusive and demands greater organization and investment from stakeholders, particularly producers.

The Cost-Benefit Analysis clearly indicates that modern supply chains deliver higher net returns, especially to farmers, due to reduced intermediation and better market access. However, adoption remains limited due to lack of awareness, infrastructure gaps, and smallholder constraints. The Garrett Ranking identified critical supply-side and marketing constraints that need to be urgently addressed to improve efficiency, reduce wastage, and ensure fair price transmission.

In light of these findings, the following strategies are recommended for policy formulation and development planning:

I. Infrastructure Development: Establish decentralized cold storage units, rural pack houses, and grading centres to reduce post-harvest losses and enhance value realization.

II. Farmer Empowerment: Promote Farmer Producer Organizations (FPOs) and cooperative marketing models to aggregate produce, strengthen negotiation power, and ease access to modern retail networks.

III. Financial and Technical Support: Provide subsidies, low-interest credit, and capacity-building programs to enable farmers to meet modern chain requirements such as packaging, quality standards, and consistent supply.

IV. Technology Adoption: Encourage use of mobile-based market information systems, e-NAM integration, precision farming tools, and ICT-based logistics to streamline the value chain.

V. Market Linkages and Digital Platforms: Develop government-supported digital platforms that connect producers directly with retailers, institutional buyers, and consumers to reduce intermediation and transaction costs.

VI. Inclusive Modernization: Design inclusive policies that integrate small and marginal farmers into modern chains by reducing entry barriers and providing risk mitigation tools such as crop insurance and price stabilization mechanisms.

The findings of this study have broader implications for rural development, income security, and nutritional accessibility. A well-structured, efficient, and inclusive supply chain for fresh fruits and vegetables can significantly enhance farmer income, reduce urban-rural price spread, and ensure availability of quality produce to consumers. By linking economic analysis with policy suggestions, this study contributes to the evidence base required for designing robust agricultural marketing reforms in Uttar Pradesh and similar regions. It emphasizes that transitioning from traditional to modern supply chains must be facilitated through targeted investment, institutional support, and participatory governance to ensure sustainability, profitability, and equity for all stakeholders involved in the F&V ecosystem.

LITERATURE CITED

A. Journal Paper

Akpinar, M. G. 2012. Analysing the effects of consumers' demographic characteristics on the references of fresh fruit and vegetables supply chains. *African Journal of Agricultural Research*, 7(9): 1442-1449.

Alam, M. M. 2018. Mango supply chain and value chain analysis from farm to market. *Int. J. Supply Chain Manag*, 7(4): 7-12.

Ali, M. 2024. Nutritional and economic benefits of enhanced vegetable production and consumption. In *Food Systems for Improved Human Nutrition*, 145-176.

Anand, S. & Barua, M. K. 2022. Modeling the key factors leading to post-harvest loss and waste of fruits and vegetables in the agri-fresh produce supply chain. *Computers and Electronics in Agriculture*, 198(1): 106936.

Assinou, K. E. & Kpotchou, K. 2024. Socio-Economic, Health and Ecological Sustainability of Vegetable Supplies in West African Cities: Assessment of Stakeholders' Knowledge, Attitudes and Practices in Accra and Greater Lomé. *Journal of Ecohumanism*, 3(4): 3274-3302.

Bisen, J.; Patel, R. K. & Kundu, K. K. 2018. Marketing efficiency between traditional and modern supply chains of fruits and vegetables. *Economic Affairs*, 63(2): 441-447.

Bhattacharyya, S.; Huchche, A. D.; Ladaniya, M. S. & Pakhmode, P. 2021. Analysis of constraints faced by citrus growers of central India Amidst Covid-19 lockdown and delineation of post-pandemic marketing strategies. *Food Systems for Improved Human Nutrition*, 185-196.

Cadilhon, J. J.; Moustier, P.; Poole, N. D.; Tam, P. T. G. & Fearne, A. P. 2006. Traditional vs. modern food systems? Insights from vegetable supply chains to Ho Chi Minh City (Vietnam). *Development Policy Review*, 24(1): 31-49.

Dabbene, F.; Gay, P. & Tortia, C. 2014. Traceability issues in food supply chain management: A review. *Biosystems engineering*, 120: 65-80.

Fundira, T. 2004. A transaction cost analysis of the fruit supply chain in South Africa: A case study approach *American International Journal of Research in Formal, Applied & Natural Sciences*, 14(1): 28-34.

Ge, H.; Goetz, S. J.; Cleary, R.; Yi, J. & Gómez, M. I. 2022. Facility locations in the fresh produce supply chain: An integration of optimization and empirical methods. *International Journal of Production Economics*, 249:108534.

Gupta, S.; Omar, I.; Yadav, D. N. & Yadav, U. 2025. Growth and Performance of Kisan Credit Card Scheme in Sultanpur District of Uttar Pradesh, India. *Journal of Experimental Agriculture International*, 47(6): 420-431.

Javanmardan, A.; Golpîra, H. & Baradaran, V. 2024. A socio-economic and quality-oriented optimal fruit supply chain network design in a multi-market and multi-product environment: A real case study. *Socio-Economic Planning Sciences*, 94: 101910.

Kumar, V.; Mandal, M. R.; Prakash, S. & Singh, B. 2023. Supply and price pattern of traditional channel for fruits and vegetables in India. *Progressive Agriculture*, 23(1): 67-75.

Manchester, A. C. 1962. Prices, costs and marketing margins for fresh fruits and vegetables. *Journal of Farm Economics*, 44(3): 888-894.

Nikmal, G. R. 2019. Supply Chain Analysis of Pomegranates in Kandahar, Afghanistan. *Progressive Agriculture*, 25(4): 87-95.

Omar I.; Supriya; Kumar P.; Gupta S.; T S. Yadav U. 2025. Growth prospects of India's plantation crops: Insights from simple growth rate analysis. Int J Agric Extension Social Dev 2025, 8(5): 563-567.

Pradhan, A. S.; Barker, D. N.; Stephen, D. A. J. & Mishra, R. 2024. Constraints in marketing and export of grapes in Nashik district, Maharashtra: a comprehensive analysis. *International Journal of Research in Agronomy*, 7(2S): 01-04.

Thulasiram, R. and T. Alagumani. 2018. Status and constraints in fruits and vegetables export: a Garrett ranking approach. *International Journal of Farm Sciences* 8(3):13-16.

Saadat, N., & Gupta, K. 2018. Marketing efficiency and constraints analysis of fresh mango in Malda district, West Bengal. *Indian Journal of Agricultural Marketing*, 32(1): 21-36.

Sai, K. S.; AliBaba, M. & Kumari, R. V. 2022. Production and marketing constraints of vegetables. *The Pharma Innovation Journal*, 11(1): 629-631.

Saikia, P.; Das, P.; Deka, P. & Barman, S. 2024. Constraints experienced in commercial vegetable production by growers of Assam. *Vegetable Science*, 51(02): 301-305.

Seckin, E. 2013. The comparison in terms of trust of modern and traditional supply chains in fresh fruit and vegetable. *Food Systems for Improved Human Nutrition*, 175-186.

Shende, N. V. & Meshram, R. R. 2015. Cost benefit analysis and marketing of tomato. *American International Journal of Research in Formal, Applied & Natural Sciences*, 11(1): 46-54.

Singh, A. K.; Zechariah, J. & Barker, N. 2023. Constraints and Suggestions towards Supply Chain Management of Arize 6444 in Patna District of Bihar, India. *Asian J. Agric. Ext. Econ. Soc*, 41(7): 236-240.

Verhaegen, I. & Van Huylenbroeck, G. 2001. Costs and benefits for farmers participating in innovative marketing channels for quality food products. *Journal of Rural Studies*, 17(4): 443-456.

Yiridoe, E. K.; Bonti-Ankomah, S. & Martin, R. C. 2005. Comparison of consumer perceptions and preference toward organic versus conventionally produced foods: A review and update of the literature. *Renewable agriculture and food systems*, 20(4):193-205.

APPENDICES

1. What is your stakeholder category?

Farmer	
Retailer	
Supermarket Manager	
Trader	
Wholesaler	

2. What is your gender?

Male	
Female	

3. What is your age group?

20–29	
30–39	
40–49	
50–60	

4. What is your highest level of education?

Illiterate	
Primary	
Secondary	
Graduate	
Postgraduate	
Technical	

5. What is your landholding size?

Marginal	
Small	
Medium	
Large	

6. What is your average monthly income?

Less than ₹20,000	
₹20,000–₹40,000	
₹40,000–₹60,000	
More than ₹60,000	

7. Do you have any additional sources of income? If yes, please specify.

Agri-trading	
Farming	
Retailing	
Transport	
Other	

8. What type of business ownership do you operate under?

Owned	
Leased	
Rented	
Partnership	

9. How many years of experience do you have in this business?

1-5	
6-10	
11-15	
16-20	
More than 20	

10. Which commodities do you handle?

Fruits	
Vegetables	
Both	

11. Do you have access to credit facilities? If yes, from which source?

Bank	
Cooperative	
NBFC	
Kisan Credit Card	
Other	

12. Have you received any formal training from institutions? If yes, by whom?

Government	
NGO	
Private company	
Other	

13. Which supply chain model do you follow?

Modern	
Traditional	

14. Do you use cold storage facilities?

Yes	
No	

15. If yes, what is the average rental cost you pay (₹/kg/day)?

Government	
Cooperative	
Private	

16. What is your approximate monthly cost of operation (₹)? ……

17. What is your approximate monthly revenue generated (₹)? ……..

18. What is your net benefit (Revenue – Cost)? ……..

19. Do you consider your business profitable?

Yes	
No	

20. How do you evaluate your cost-benefit ratio (CBR)?

Very favourable	
Favourable	
Neutral	
Unfavourable	

21. Which supply chain do you primarily participate in?

Modern	
Traditional	

22. What are the main benefits you observe in your supply chain model?

Higher returns	
Less risk	
Better infrastructure	
More market access	

23. What are the main challenges you face in your supply chain model?

Low profit margin	
Lack of infrastructure	
Price fluctuation	
Middlemen dependency	

24. Rate the following constraints based on how severely they affect your business
(1 = Not a problem, 10 = Very severe):

Lack of cold storage	
Transport delay	
Poor price realization	
Involvement of middlemen	
Lack of direct market access	
High cost of packaging	
Inadequate government support	
Spoilage during transit	
Unpredictable market demand	
Lack of training/awareness	

24. Which constraint do you consider as the biggest challenge for your business?

……..

……..

……..

……..

……

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Title : A Study on Supermarket Supply Chain for Fresh Fruits and Vegetables in Lucknow District of Uttar Pradesh

Advisor : Dr. Supriya

Abstract

The present study examined the socio-economic profile, cost-benefit dynamics, and key constraints in the supply chain of fresh fruits and vegetables in Lucknow district, Uttar Pradesh. Using a multi-stage purposive-cum-random sampling technique, data were collected from 120 stakeholders including farmers, traders, retailers, wholesalers, and supermarket managers through structured interviews and schedules during the agricultural year 2023–2024. Analytical tools such as descriptive statistics, cost-benefit ratio (CBR), and Garrett ranking method were employed to derive insights. Findings revealed that traders formed the largest stakeholder group (30%), with males constituting a significant majority (78%). Most stakeholders were middle-aged, with considerable experience and diverse educational backgrounds. The cost-benefit analysis showed that wholesalers achieved the highest CBR (1:2.87), indicating superior profitability, followed by supermarket managers (1:1.52) and traders (1:1.34). Modern supply chains outperformed traditional ones with an overall CBR of 1:1.57 compared to 1:1.16, showcasing greater economic efficiency. Constraint analysis highlighted the involvement of middlemen, lack of direct market access, and unpredictable demand as the most pressing challenges. The study underscores the need for policy interventions aimed at promoting modernized supply chains, improving market linkages, and providing institutional support to optimize economic returns for all actors in the supply chain.

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मेजर : एग्रीबिजनेस

समर्थन: कृषि व्यवसाय

शीर्षक: उत्तर प्रदेश के लखनऊ जिले में ताजे फल और सब्जियों के लिए सुपरमार्केट आपूर्ति श्रृंखला पर एक अध्ययन

सलाहकार: डॉ. सुप्रिया

सारांश

वर्तमान अध्ययन ने उत्तर प्रदेश के लखनऊ जिले में ताजे फलों और सब्जियों की आपूर्ति श्रृंखला में सामाजिक-आर्थिक प्रोफ़ाइल, लागत-लाभ की गतिशीलता और प्रमुख बाधाओं की जांच की। एक बहु-चरण उद्देश्य-सह-यादृच्छिक नमूनाकरण तकनीक का उपयोग करते हुए, कृषि वर्ष 120-2023 के दौरान संरचित साक्षात्कार और कार्यक्रम के माध्यम से किसानों, व्यापारियों, खुदरा विक्रेताओं, थोक विक्रेताओं और सुपरमार्केट प्रबंधकों सहित 2024 हितधारकों से डेटा एकत्र किया गया था। विश्लेषणात्मक उपकरण जैसे वर्णनात्मक आँकड़े, लागत-लाभ अनुपात (सीबीआर), और गैरेट रैंकिंग पद्धति को अंतर्दृष्टि प्राप्त करने के लिए नियोजित किया गया था। निष्कर्षों से पता चला कि व्यापारियों ने सबसे बड़ा हितधारक समूह (30%) बनाया, जिसमें पुरुषों का एक महत्वपूर्ण बहुमत (78%) था। अधिकांश हितधारक मध्यम आयु वर्ग के थे, जिनके पास काफी अनुभव और विविध शैक्षिक पृष्ठभूमि थी। लागत-लाभ विश्लेषण से पता चला है कि थोक विक्रेताओं ने उच्चतम सीबीआर (1: 2.87) हासिल किया, जो बेहतर लाभप्रदता का संकेत देता है, इसके बाद सुपरमार्केट प्रबंधक (1: 1.52) और व्यापारी (1: 1.34) हैं। आधुनिक आपूर्ति श्रृंखलाओं ने 1:1.57 की तुलना में 1:1.16 के समग्र सीबीआर के साथ पारंपरिक लोगों से बेहतर प्रदर्शन किया, जो अधिक आर्थिक दक्षता प्रदर्शित करता है। बाधा विश्लेषण ने बिचौलियों की भागीदारी, प्रत्यक्ष बाजार पहुंच की कमी और अप्रत्याशित मांग को सबसे अधिक दबाव वाली चुनौतियों के रूप में उजागर किया। यह अध्ययन आधुनिक आपूत श्रृंखलाओं को बढ़ावा देने, बाजार संपर्कों में सुधार लाने और आपूत श्रृंखला में सभी अभिकर्ताओं के लिए इष्टतम आथक लाभ प्रदान करने के उद्देश्य से नीतिगत हस्तक्षेपों की आवश्यकता को रेखांकित करता है।

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