

# A Review on Value Chain Analysis of Millets

## Abstract

Millets, a group of small-seeded grasses, are essential crops cultivated for their resilience and ability to thrive in arid regions where other crops often fail. Globally, millets are predominantly grown in Asia and Africa, with India being the largest producer, contributing over 40% of the world's millet production. This review article employs a comprehensive and systematic approach to analyze the economic aspects of millet production and marketing, focusing on value chain analysis. The methodology involves a thorough examination of existing literature, including peer-reviewed journal articles, research reports, and relevant books published over the last two decades. The review process is guided by a conceptual framework that outlines key components such as production, productivity, market dynamics, marketing strategies, marketing channels, and price spread. The literature search and selection involve systematic searches of academic databases using relevant keywords, with a focus on studies published within the last 20 years and those addressing the specified value chain components. Relevant data is extracted and categorized according to the framework, allowing for the identification of patterns, trends, and gaps in the existing literature. This analysis provides insights into the current state of the millet value chain, highlights challenges and opportunities, and suggests strategies for improving its efficiency and sustainability. The findings aim to inform policymakers, researchers, and practitioners about the economic viability of millet production and marketing, promoting millets as a sustainable and nutritious food source globally.

**Keywords:** *Value chain analysis; Millets; Production; Marketing; Consumer preferences.*

## 1. Introduction

Millets are a group of small-seeded grasses that are widely cultivated for food and fodder. They are particularly valued for their resilience and ability to thrive in arid and semi-arid regions where other crops may fail. Globally, millets are predominantly grown in Asia and Africa, with India being the largest producer (Meena et al., 2021). India contributes to over 40% of the world's millet production, followed by Niger, China, and Mali (Iqbal et al., 2023). These grains have been a staple food in many cultures for thousands of years due to their nutritional benefits and adaptability to harsh climatic conditions. The millet yield in India has more than doubled since 1966. In 2021-22, the average yield was 1208 kg per hectare (Nayak et al., 2024). Despite a 7% increase in millet production from 1966 to 2022, the area used for

millet cultivation has consistently declined since 1971-72, with a significant drop between 2006 and 2016 (Fuglie et al., 2024).

In terms of consumption, millets are integral to the diets of millions of people in developing countries, particularly in regions prone to food insecurity. They are known for their high nutritional value, providing essential nutrients such as proteins, vitamins, and minerals. In India, millets are consumed in various forms, including traditional dishes like rotis, porridges, and snacks. The rising awareness of the health benefits of millets, such as their low glycemic index and high fiber content, has led to a resurgence in their popularity, not only in rural areas but also in urban markets globally (Devi et al., 2024).

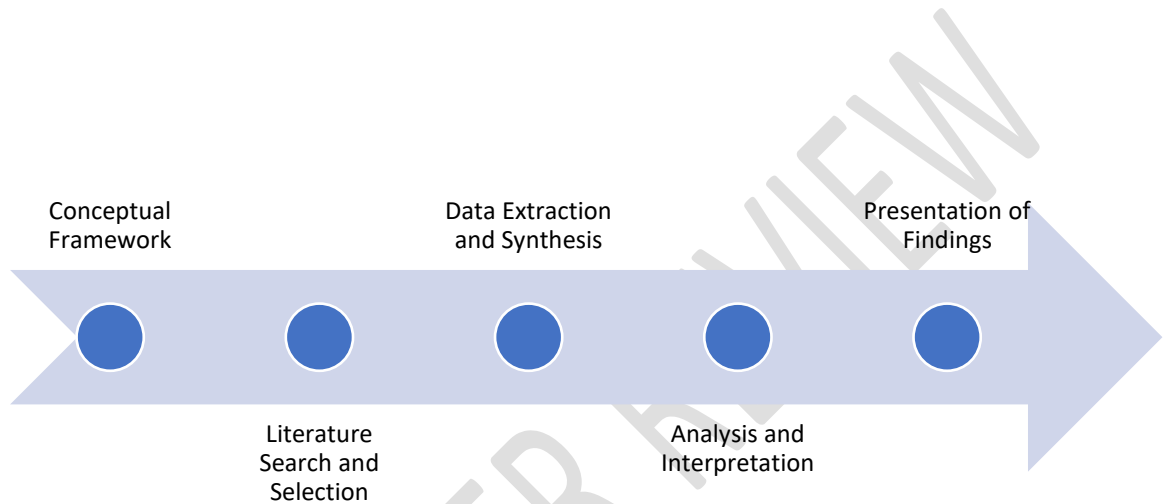
The importance of millets extends beyond nutrition. They are environmentally sustainable crops requiring less water and more resistant to pests and diseases than other cereals like wheat and rice. This makes them a crucial component in the fight against climate change and in efforts to achieve food security. Additionally, millets play a vital role in maintaining soil health through their short growing season and ability to grow in poor soils without significant chemical inputs.

The value chain of millets encompasses a series of processes and activities that add value from production to consumption (Pandey and Bolia, 2023). It starts with input supply, followed by cultivation, harvesting, processing, marketing, and distribution. Each stage involves various stakeholders, including farmers, traders, processors, and retailers (Rafi, et al., 2023). Understanding the value chain is essential for identifying opportunities to improve efficiency, reduce losses, and enhance the overall profitability and sustainability of millet production.

This review article aims to analyze the economic aspects of the millet value chain, focusing on production, productivity, market dynamics, marketing strategies, marketing channels, and price spread. By systematically reviewing the existing literature, the article will provide insights into the current state of the millet value chain, highlight the challenges and opportunities, and suggest strategies for enhancing its performance. This comprehensive analysis is crucial for policymakers, researchers, and practitioners aiming to promote millets as a sustainable and nutritious food source globally.

## 2. Methodology

This review article employs a comprehensive and systematic approach to analyze the value chain of millets, focusing on economic aspects of production and marketing. The methodology is designed to ensure a thorough examination of existing literature, including peer-reviewed journal articles, research reports, and relevant books published over the last two decades and the systematic approach of the review article has been shown in Figure 1.



**Figure 1. Systematic approach**

### 2.1. Conceptual Framework

The review process is guided by a conceptual framework (Table 1) that outlines the key components of millet value chain analysis. These components include production, productivity, market dynamics, marketing strategies, marketing channels, and price spread. This framework serves as an organizational tool for synthesizing diverse literature on millet value chains, facilitating a structured and comprehensive review.

**Table 1. Conceptual framework**

<b>Review of Concepts</b>	<b>Review of Past Studies</b>
Farmer Producer Organization	Value Chain Value Chain Analysis

Farmers Organization Supply chain Value Chain Value Chain Map Value Chain Analysis Value Addition Market intermediaries Commission agent Wholesaler Retailing Retailer Consumer Marketing Marketing cost Marketing margin Marketing Efficiency Price Spread Garrett's ranking technique	Producer Companies Farmer Producer Organization Value Chain Actors Consumer preference Value Addition
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## 2.2. Literature Search and Selection

The literature search involves a systematic and exhaustive review of academic databases, such as Scopus, Web of Science, and Google Scholar. Keywords and phrases such as "millet value chain," "millet production," "millet marketing," "economic aspects of millets," and "millet market dynamics" are used to identify relevant studies. The selection criteria include:

- Peer-reviewed journal articles, research reports, and books published within the last 20 years.
- Studies that specifically address the value chain components outlined in the conceptual framework.
- Research conducted in diverse geographical contexts to ensure a comprehensive understanding of the global millet value chain.

### **2.3. Data Extraction and Synthesis**

Relevant information from the selected literature is extracted and categorized according to the components of the conceptual framework. This includes detailed data on:

- Production and Productivity
- Marketing Strategies
- Marketing Channels
- Price Spread

### **2.4. Analysis and Interpretation**

The extracted data is analyzed to identify patterns, trends, and gaps in the existing literature. This involves:

- Comparing findings across different studies to highlight commonalities and divergences.
- Identifying key success factors and challenges in the millet value chain.
- Evaluating the impact of various marketing strategies and channels on the economic viability of millet production.

### **2.5. Presentation of Findings**

The findings are organized and presented in a manner that aligns with the conceptual framework. Each component of the millet value chain is discussed in detail, supported by evidence from the reviewed literature. The chapter also presents related concepts and how they have been applied in previous studies, providing a deeper understanding of the research problem at an appropriate scale.

By employing this systematic and comprehensive methodology, the review aims to develop a positive and deeper understanding of the economic aspects of the millet value chain, ultimately contributing to enhanced knowledge and informed decision-making in this field.

## **3. Review of Concepts**

### **3.1. Farmer Producer Organization**

Joshi and Choudhary (2018) emphasized that Farmer Producer Organizations (FPOs) can protect small farmers from the adverse effects of liberalization and encourage their participation in modern markets. FPOs connect unorganized farmers to organized sectors,

providing services such as farm inputs, custom hiring centers, and output market linkages, including value addition, processing, handling, and branding of products. Karthik et al. (2017) described FPOs as collectives of small and marginal farmers that form viable alliances to tackle agricultural challenges like access to investment, innovation, inputs, and markets. Stockbridge et al. (2003) highlighted that FPOs support small farmers' effective market participation, enhancing agricultural production, productivity, and profitability.

### **3.2. Farmers Organization**

Tolno et al. (2015) highlighted the crucial role of Farmers Organizations in empowering smallholder farmers, boosting their production and incomes. These organizations are vital for promoting pro-poor economic growth. Markelova and Mwangi (2010) described Farmers Organizations as collective activities undertaken by groups investing time and money to achieve shared goals, thus addressing common agricultural challenges.

### **3.3. Supply Chain**

Jensen et al. (2010) described a supply chain network as encompassing activities related to the transformation, processing, and movement of goods from raw materials to finished products. Kanaka (2008) defined the supply chain as a complex network of producers, traders, agents, wholesalers, processors, exporters, retailers, and consumers intricately linked in product creation, distribution, and utilization, though their roles in improving the value chain require more exposure and training. Hertz (2001) characterized the supply chain as the organizational chain supplying products from raw materials to final customers, aiming for productivity and efficiency.

### **3.4. Value Chain**

Miller and Jones (2010) defined the value chain as encompassing all activities and actors involved in product development from raw material suppliers to end-consumers. Janssen and Feenstra (2010) viewed it as interconnected, value-creating activities undertaken by enterprises or groups to produce, deliver, and service products. Joshi and Gurung (2009) described it as a sequence of related business functions from input provision to production, processing, and distribution to the final customer. Schmitz (2005) summarized the value chain as the sequence of activities needed to produce a product or provide a service.

### **3.5. Value Chain Map**

Reddy Amarender (2013) defined a value chain map as depicting the interlinkages between successive stages in the value chain. Subramanian (2007) described it as a tool to illustrate all activities, actors, and relationships within the chain, highlighting connections between producers and intermediaries.

### **3.6. Value Chain Analysis**

Sahoo and Sarangi (2018) emphasized value chain analysis as a strategic tool for analyzing internal firm activities, transforming products from their initial state to more significant states. Joshi and Gurung (2009) described it as a strategy for accounting and presenting the value created in products or services from raw inputs to final consumption. Richard and Besigye (2005) used it to establish a joint vision, identify essential requirements, and analyze supply limits and market barriers to develop intervention strategies. Donaldson et al. (2004) focused on the full range of activities needed to bring a product or service from conception to end use, involving various actors in a vertical chain.

### **3.7. Value Addition**

Shukla and Raj (2016) defined value addition as enhancing under-utilized foods' nutritive worth, variety, and utilization through better processes. Rao et al. (2010) described it as activities adding value through grading, cleaning, processing, and reviewing for distribution. Goyal and Sharma (2009) viewed value addition as transforming fruits and vegetables into more useful and convenient products. Joshi and Gurung (2009) included simple tasks like bulking, cleaning, grading, packaging, transporting, processing, and marketing additions that improve product appeal to buyers.

### **3.8. Market Intermediaries**

Ocholi et al. (2020) defined market intermediaries as individuals or organizations specializing in marketing operations like assembling, sorting, cleaning, packaging, transportation, and holding products until purchase. They buy farm products at lower costs and sell them at higher prices.

### **3.9. Commission Agent**

Haq et al. (2013) referred to "Arthi" as local intermediaries facilitating crop transactions between farmers and buyers in grain markets, charging a commission based on the sale price.

In this study, commission agents are viewed as middlemen who trade millets for fees without taking ownership of the crops.

### **3.10. Wholesaler**

Kotler (2012) defined a wholesaler as one who performs all activities involving goods or services for resale or business use. Dhanapal (2007) described a wholesaler as someone who buys produce from farmers or village merchants and sells it to retailers at the best price.

### **3.11. Retailing**

Stichter (2015) defined retailing as selling goods to end clients for use and consumption rather than resale. Pradhan (2009) viewed retailing as all activities involved in marketing goods and services directly to consumers for personal or household use.

### **3.12. Retailer**

Kotler and Lee (2008) defined a retailer as a business primarily involved in selling goods or services directly to final consumers for non-business use. Skytte and Bove (2004) described retailers as intermediaries or cooperatives buying from wholesalers or producers and selling to end consumers.

### **3.13. Consumer**

Levy et al. (2004) defined a consumer as an individual who consumes goods and services manufacturers or retailers provide.

### **3.14. Marketing**

Nair (1988) described marketing as activities, organizations, and processes that value providers, clients, partners, and society develop, connect, distribute, and exchange offerings.

### **3.15. Marketing Cost**

Naphade and Tingre (2008) defined marketing cost as including sorting, grading, packing, and transporting. Acharya (2004) described it as the cost of moving products from producers to consumers, encompassing various marketing functions at different stages.

### **3.16. Marketing Margin**

Giribabu (2016) explained marketing margin as the profit earned by middlemen in moving products from producers to consumers. Vilas and Chinnappa (2012) defined it as the difference between sale and purchase prices at different marketing stages.

### **3.17. Marketing Efficiency**

Zinyoro (2018) defined marketing efficiency as the adequacy with which a marketing system operates. Palanisami (2007) referred to it as the market's effectiveness in performing various functions.

### **3.18. Price Spread**

Baba et al. (2010) noted an inverse relationship between the producer's share of farm product prices and the price spread. Acharya (2004) defined price spread as the difference between the price paid by consumers and the price received by producers for a comparable amount of produce.

### **3.19. Garrett's Ranking Technique**

Senthilkumar et al. (2018) used Garrett's ranking technique to identify challenges faced by capsicum growers in Tamil Nadu, finding high establishment costs, lack of technical knowledge, and skilled labor shortages as major constraints. Singh (2018) applied the technique to assess production and marketing issues of pulses in Uttar Pradesh, identifying input availability, agro-climatic problems, post-harvest pest infestations, price fluctuations, government policies, viral attacks, demand assessment, and technical knowledge gaps as significant issues.

## **4. Review of Past Studies**

### **4.1. Value Chain**

Odongo and Etany (2018) mapped the cassava value chain and assessed marketing margins, revealing that cassava is primarily sold as value-added products like flour, chips, and fresh tubers. Fresh tubers were the most marketed due to a lack of market data on other products. Reddy et al. (2018) found that producer companies in India excel in consolidating pearl millet for breweries. Golban and Doga (2016) provided extensive information on Moldova's tomato value chain, covering end markets, production advances, post-harvest practices, investment needs, and relevant policies. Kirimi et al. (2011) emphasized that

improving Kenya's maize value chain requires coordinated efforts from diverse actors due to its complex market structure. Trienekens (2011) proposed a framework for analyzing developing country value chains, focusing on network structure, value addition, and governance. Rieple and Singh (2010) analyzed the cotton value chain, detailing the stages of value addition in organic cotton garment production.

#### **4.2. Value Chain Analysis**

Sahoo and Sarangi (2018) developed a theoretical model for the organic turmeric value chain, stressing the importance of collective producer action for accessing international markets and eliminating intermediaries. Naik and Hosamani (2017) studied the financial aspects and marketing channels of turmeric in Northern Karnataka. Kleih et al. (2013) detailed the cassava value chain in Ghana, highlighting its end-use in high-quality flour, industrial-grade flour, and animal feed. Trienekens (2011) identified constraints in value chain upgrading, focusing on value addition, network structure, and governance. Umagowri and Chandrasekaran (2011) found that the Producer-Commission Agent-Wholesaler-Retailer-Consumer channel was most effective for Nendran bananas in Tamil Nadu.

#### **4.3. Producer Companies**

Franz et al. (2014) showed that producer companies can improve farmers' livelihoods by building relationships with supermarket chains, balancing welfare and business orientations through a consortium of NGOs, input suppliers, and potential buyers. Trebbin and Hassler (2012) argued that producer companies, though profit-oriented, benefit the public and originated from the farming community.

#### **4.4. Farmer Producer Organization**

Salokhe (2016) highlighted the role of Farmer Producer Organizations (FPOs) in bringing small and marginal farmers together for better market participation and profitability. Sawairam (2015) emphasized that FPOs help small farmers transition to market-oriented institutions, facilitating participation in modern retail and export markets. Shiferaw and Muricho (2011) noted that producer organizations improve market access, reduce production and marketing costs, and incentivize active participation from farmers.

#### 4.5. Value Chain Actors

Okech et al. (2016) revealed that pearl millet actors had limited access to credit due to weak affiliations, resulting in poor coordination between producers and other value chain actors. Mmasa and Msuya (2012) mapped the sweet potato value chain in Tanzania, identifying two significant value-added products and direct market sales by 44% of producers.

#### 4.6. Consumer Preference

Harshitha and Jayaram (2019) observed that finger millet is popular for its health benefits and versatility in products like flour, pudding, porridge, and roti. Alekhya and Shrivanthi (2019) emphasized the need to understand consumer acceptance and buying behavior towards millet products for better nutritional consumption. Kalaiselvi et al. (2016) stressed the importance of awareness programs to promote millet consumption. Nath et al. (2015) highlighted the value addition in products like sugar, gur, and khandsari to meet consumer needs. Amadou et al. (2013) reviewed the nutritional benefits of millets, noting their high energy content and potential to address amino acid deficiencies when combined with other proteins.

#### 4.7. Value Addition

Nath et al. (2015) concluded that value addition in products like sugar, gur, and khandsari is crucial for sustaining profitability. Hoq et al. (2012) emphasized improving vegetable quality through activities like upgrading, packaging, and processing. Babu and Verma (2010) compared the value chains of milk products in private and cooperative dairies, identifying high-value products like ice-cream, frozen yogurt, ghee, and Mysore pak in private dairies.

### 5. Conclusion

In conclusion, the value chain of millets is a complex and multifaceted system involving numerous stakeholders and processes from production to consumption. The continuous improvement in yield suggests better farming practices have been adopted in recent decades. Although India remains the largest millet producer, significant progress has been lacking in the past twenty years. Since 1966, millet production has shown an erratic trend, and per capita availability has fluctuated, reaching its lowest point since a peak in 2019 (Dalwai, 2024). In 2021, the per capita availability of millet was approximately 12.3 kg. The analysis reveals that while millets hold significant potential due to their nutritional benefits, environmental

sustainability, and adaptability to harsh climates, several challenges hinder their optimal utilization and market penetration. Key issues include low productivity due to traditional farming practices, inadequate access to modern agricultural inputs and technologies, limited market access, and inefficient marketing channels. The economic viability of millet production can be significantly enhanced through targeted interventions aimed at improving production techniques, facilitating better access to inputs and technologies, and strengthening market linkages. Developing robust marketing strategies and efficient channels can help in reducing the price spread and ensuring fair returns to farmers. Additionally, promoting value addition through processing and branding can increase the market appeal of millet products and cater to the growing health-conscious consumer segment. Policy support is crucial in addressing these challenges, with emphasis on research and development, extension services, and infrastructure development. Strengthening Farmer Producer Organizations (FPOs) can empower small and marginal farmers, enabling them to participate more effectively in the market and benefit from economies of scale. Furthermore, creating awareness about the health benefits of millets can drive demand, both domestically and internationally, contributing to better nutritional outcomes and enhanced food security. The review underscores the need for a holistic approach that integrates production, marketing, and policy interventions to unlock the full potential of the millet value chain. By doing so, millets can play a pivotal role in sustainable agriculture, rural development, and global food security, ensuring that this ancient grain continues to nourish and sustain populations worldwide.

### **Disclaimer (Artificial intelligence)**

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

### **6. References**

- Acharya, SS. 2004. *Agricultural Marketing In India, 4/E: Oxford and IBH publishing. agricoop.nic.in, w. (2010-11). [www. agricoop.nic.in](http://www.agricoop.nic.in)*
- Agribusiness: An International Journal* 20 (3):323-345.
- Alekhyia, P, and AR Shravanthi. 2019. "Buying Behaviour of Consumers towards Millet Based Food Products in Hyderabad District of Telangana, India." *Int. J. Curr. Microbiol. App. Sci* 8 (10):223-236.
- Amadou, I, ME Gounga, and G-W Le. 2013. "Millets: Nutritional composition, some health benefits and processing-A review." *Emirates Journal of Food and Agriculture*:501- 508.

- Baba, S, M Wani, S Wani, and S Yousuf. 2010. "Marketed surplus and price spread of vegetables in Kashmir valley." *Agricultural Economics Research Review* 23 (347- 2016-17025):115-128.
- Babu, D, and N Verma. 2010. "Value Chains of Milk and Milk Products in Organized Sector of Tamil Nadu—A Comparative Analysis." *Agricultural Economics Research Review* 23 (347-2016-16948):479-486.  
Chand Publications), p.94."
- Dalwai, A. (2024). *An Ecosystem Approach to Promoting Pearl Millet: Balancing Demand and Supply*. In *Pearl Millet in the 21st Century: Food-Nutrition-Climate resilience-Improved livelihoods* (pp. 589-613). Singapore: Springer Nature Singapore.
- Devi, O. A., Saikia, A. R., Ghorband, A. S., Saikanth, D. R. K., Badekhan, A., Aresh, J., ... & Gireesha, D. (2024). *Shree Anna (Millets): A Nutritional and Agrarian Solution to Food Production*. *Journal of Scientific Research and Reports*, 30(5), 316-327.
- Dhanapal, S. 2007. "To Study the Supply Chain of Major fruits and Vegetables from Oddanchatram to Spencers Retail Outlet."
- Donaldson, KM, K Ishii, and SD Sheppard. 2004. "Customer value chain analysis." *International Design Engineering Technical Conferences and Computers and Information in Engineering Conference*.
- Franz, M, M Felix, and A Trebbin. 2014. "Framing smallholder inclusion in global value chains—case studies from India and West Africa." *Geographica Helvetica* 69 (4):239-247.
- Fuglie, K. O., Morgan, S., & Jelliffe, J. (2024). *World Agricultural Production, Resource Use, and Productivity, 1961–2020*.
- Goyal, M, and S Sharma. 2009. "Traditional wisdom and value addition prospects of arid foods of desert region of North West India."
- Harshitha, H, and M Jayaram. 2019. "Consumers' preference for value-added products of finger millet (*Eleusine coracana*)." *Indian Journal of Economics and Development* 7 (9).
- Hertz, S. 2001. "Dynamics of alliances in highly integrated supply chain networks." *International Journal of Logistics* 4 (2):237-256.
- Iqbal, S., Bhat, M. A., Sheikh, T. A., & Baba, Z. A. (2023). *Deciphering the Importance of Underutilized Millet Crop towards Sustainable Feed and Food Sources*. *Current Journal of Applied Science and Technology*, 42(48), 165-175.

- Janssen, M, and R Feenstra. 2010. "Service portfolios for supply chain composition: Creating business network interoperability and agility." *International Journal of Computer Integrated Manufacturing* 23 (8-9):747-757.
- Jensen, TK, J Nielsen, EP Larsen, and J Clausen. 2010. "The fish industry—toward supply chain modeling." *Journal of Aquatic Food Product Technology* 19 (3-4):214-226.
- Joshi, SK, and VK Choudhary. 2018. "Performance of Farmer Producer Organizations (FPOs) in Different Regions of Chhattisgarh State: A Case Study." *Indian Journal of Agricultural Economics* 73 (3):399-406.
- Joshi, SR, and BR Gurung. 2009. "Citrus in Bhutan: value chain analysis." Department of Agricultural Marketing and Cooperatives. Ministry of Agriculture and Forests.
- Kalaiselvi, A, F Razia, and M Paramewari. 2016. "Awareness and consumption of millets by women—A study on Coimbatore city." *Indian Journal of Applied Research* 6 (2):96- 98.
- Kanaka, B. 2008. "Optimization in supply chain: zero inventory approach, Icfai University Journal of Supply Chain Management." V (3) 33:42.
- Karthik, D, A Sailaja, T Archana, and G Palve. 2017. "Hindrances in Functioning of Farmer Groups in Telangana State, India." *Int. J. Curr. Microbiol. App. Sci* 6 (6):2120-2124.
- Kirimi, L, NJ Sitko, TS Jayne, F Karin, M Muyanga, M Sheahan, J Flock, and G Bor. 2011.
- Kleih, U, D Phillips, MT Wordey, and G Komlaga. 2013. *Cassava market and value chain analysis: Ghana case study.*
- Kotler, P, and N Lee. 2008. *Corporate social responsibility: Doing the most good for your company and your cause: John Wiley & Sons.*
- Kotler, P. 2012. *Kotler on marketing: Simon and Schuster.*
- Levy, M, D Grewal, PK Kopalle, and JD Hess. 2004. *Emerging trends in retail pricing practice: implications for research. Elsevier.*
- Markelova, H, and E Mwangi. 2010. "Collective action for smallholder market access: evidence and implications for Africa." *Review of policy research* 27 (5):621-640.
- Meena, R. P., Joshi, D., Bisht, J. K., & Kant, L. (2021). *Global scenario of millets cultivation. Millets and millet technology, 33-50.*
- Miller, C, and L Jones. 2010. *Agricultural value chain finance: Tools and lessons: Practical Action Publishing Rugby, Reino Unido.*
- Mmasa, J, and EE Msuya. 2012. "Mapping of the sweet potato value chain linkages between actors, processes and activities in the value chain: A case of "Michembe" and "Matobolwa" products—A case study of Shinyanga and Mwanza regions."

- Naik, V, and S Hosamani. 2017. "Value Chain Analysis of Turmeric in Northern Karnataka, India." *Asian Journal of Agricultural Extension, Economics & Sociology*:1-8.
- Nair, R. 1988. "American Marketing Association, Marketing, (New Delhi: Sultan and Naphade, S, and A Tingre. 2008. "Economics of production and marketing of guava in Buldhana district of Maharashtra." *Indian Journal of Agricultural Marketing* 22 (2):32-41.
- Nath, A, D Dutta, P Kumar, and J Singh. 2015. "Review on recent advances in value addition of jaggery based products." *Journal of Food Processing & Technology* 6 (4):1.
- Nayak, M. D., Sahoo, B. P., Rath, D., Pradhan, N. C., Priyadarshini, A., Pal, D., ... & Sahoo, J. P. (2024). *Biotica Research Today*.
- Ocholi, A, Z Nyiatagher, and V Ayila. 2020. "Effect of marketing intermediaries on pricing of agricultural perishable products: A case study of onions and tomatoes in Benue State, Nigeria." *Journal of Agricultural and Crop Research* 8 (7):132-139.
- Odongo, W, and S Etany. 2018. "Value chain and marketing margins of cassava: An assessment of cassava marketing in northern Uganda." *African Journal of Food, Agriculture, Nutrition and Development* 18 (1).
- Pandey, A., & Bolia, N. B. (2023). *Millet value chain revolution for sustainability: A proposal for India. Socio-Economic Planning Sciences, 87, 101592.*
- Pradhan, S. 2009. "Retailing Management: Text and Cases. Tata McGraw-Hill." New Delhi.
- Rafi, D., Laxmi, B., Charishma, E., & Babu, K. S. (2023). *Strengthening millet value chain through farmer producer organizations. Indian Journal of Extension Education, 59(3), 26-31.*
- Rao, BD, J Patil, M Rajendraprasad, KN Reddy, K Devi, B Sriharsha, and N Kachui. 2010. Reddy Amarender, A. 2013. "Training Manual on Value Chain Analysis of Dryland Agricultural Commodities. Patancheru 502 324, Andhra Pradesh, India: International Crops Research Institute for the Semi-Arid Tropics (ICRISAT). 88 pp." *Training Manual on Value Chain Analysis of Dryland Agricultural Commodities (Prepared under the HOPE project):3.*
- Richard, J, and A Besigye. 2005. "Value chain analysis-Mapping maize, sunflower and cotton chains." *The United States Agency for International Development.*
- Rieple, A, and R Singh. 2010. "A value chain analysis of the organic cotton industry: The case of UK retailers and Indian suppliers." *Ecological Economics* 69 (11):2292-2302.
- Sahoo, PP, and K Sarangi. 2018. "Value chain analysis of organic turmeric in Kandhamal district of Odisha." *Journal of Pharmacognosy and Phytochemistry* 7 (4):1130-1137.

- Salokhe, S. 2016. "Farmers producer organization for effective linkage of small producers with market." *International Journal of Applied Research* 2 (10):142-146.
- Sawairam, P. 2015. "Case study of farmer producer organization in Maharashtra in the era of globalization." *IBMRD's Journal of Management & Research* 4 (2):55-63.
- Senthilkumar, S, K Ashok, M Chinnadurai, and S Ramanathan. 2018. "An economic analysis of capsicum production under protected cultivation in North West Region of Tamil Nadu, India." *Int J Curr Microbiol Appl Sci* 7 (6):2276-2283.
- Shiferaw, B, and G Muricho. 2011. "Farmer organizations and collective action institutions for improving market access and technology adoption in Sub-Saharan Africa: review of experiences and implications for Policy." *Towards priority actions for market development for African farmers.*
- Shukla, N, and A Raj. 2016. "Effectiveness of distance education package on value added products from fruits and vegetables." *Indian Research Journal of Extension Education* 10 (2):55-57.
- Singh, N. 2018. "Profitability of Capsicum Cultivation under Protected Condition."
- Skytte, H, and K Bove. 2004. "The concept of retailer value: A means-end chain analysis."
- Stichter, S. 2015. "Accounting topics in the retail industry."
- Stockbridge, M, A Dorward, J Kydd, J Morrison, and N Poole. 2003. "Farmer organisations for market access: an international review." *Briefing paper.*
- Subramanian, U. 2007. "Moving toward competitiveness: A value chain approach."
- Tolno, E, H Kobayashi, M Ichizen, M Esham, and BS Balde. 2015. "Economic analysis of the role of farmer organizations in enhancing smallholder potato farmers' income in middle Guinea." *Journal of Agricultural Science* 7 (3):123.
- Trebbin, A, and M Hassler. 2012. "Farmers' producer companies in India: a new concept for collective action?" *Environment and Planning A* 44 (2):411-427.
- Trienekens, JH. 2011. "Agricultural value chains in developing countries a framework for analysis." *International food and agribusiness management review* 14:51-82.
- Umagowri, M, and M Chandrasekaran. 2011. "An Economic Analysis of Value Chain of Banana in Western Tamil Nadu." *IUP Journal of Supply Chain Management* 8 (3).
- Vilas, J, and B Chinnappa. 2012. "An analysis of costs, margins and producer's share in marketing of raisins." *International Research Journal of Agricultural Economics and Statistics* 3 (1):133-137.
- Zinyoro, E. 2018. "An Analysis of the Efficiency of Indigenous Chicken Marketing Channels. A Case Study of Bindura District." *BUSE.*

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