



VALUE CHAIN DIVERSIFICATION AND ITS IMPACT ON FARMERS IN ARECA INDUSTRY.

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Abstracts

The arecanut industry is an important plantation sector supporting the livelihood of millions of farmers, especially in Karnataka and Kerala. However, farmers often face low price realization, dependency on intermediaries, and limited access to value-added markets. Value chain diversification offers opportunities to improve income through processing, branding, cooperative marketing, and alternative product development. Existing literature shows that diversification strengthens farmers' market participation, improves price share, and enhances income stability. Nevertheless, gaps remain in areas such as export-oriented value addition and digital market integration. This review analyzes the impact of value chain diversification on farmers in the arecanut sector and identifies future research directions.

Keywords: *Arecanut Industry, Value Chain Diversification, Farmer Income, Marketing Efficiency, Value Addition.*

Introduction

India is the largest producer and consumer of arecanut, with major production concentrated in Karnataka, Kerala, Assam, and Meghalaya. The crop supports millions of farm households and contributes significantly to rural employment. Even though being largest producer and consumers the farmers involved in areca cultivation are finding difficulties to improve their income as they are facing the different challenges such as price volatility, labour shortage, disease outbreak and health related controversies.

Value chain diversification refers to the expansion of economic activities beyond primary production into processing, grading, branding, packaging, marketing, and development of value-added products.

In the arecanut sector, diversification has emerged as an important strategy to improve farmers' income, reduce market risks, and enhance sustainability by identifying multiple usages of areca products over its traditional uses that is mastication and religious purpose.

Review of literature

Sl. No	Field of Research	Focus	Outcomes	References
1	Competitive through Value chain diversification.	Study focuses on value chain diversification through linked activities.	Not specific to agriculture or arecanut but study focuses on value chain diversification through linked activities.	Michael Porter (1985)



2	Value Chain Research.	Explains value chain analysis method.	Limited focus on plantation crops but study stresses on up gradation of value chain system in order to improve competitiveness.	Raphael Kaplinsky & Mike Morris (2001)
3	Agricultural Value Chain Development.	The objective of the study is to improve farmers participation in value chain development.	The study gives general recommendations to increase agricultural returns with farmers participation in value chain development.	Food and Agriculture Organization (2014)
4	Cooperative Society and Arecanut Marketing in Kerala.	Assess cooperative role to control fluctuation in price level.	Study conducted in Kerala. Study states that Cooperative society strengthens the bargaining power of the areca farmer. Thereby helps to get better prices for their products.	Karunakaran (2014)
5	Areca Nut Value Chain Analysis in Nepal.	Evaluate value chain efficiency in areca nut farming	Study conducted in Nepal. Study states that the farmers are not able to get better price for their products due to intermediaries.	Bhattarai et al. (2019)
6	Threats and Prospects of Arecanut Cultivation.	Examines production challenges	As per study Price volatility affects farmer's income. But study has not focused on diversification of products and its impact on income level of farmers	Vazhacharikal & Kumar (2020)
7	Economics of Arecanut Processing Plant	Analyses value addition economics	Study states that the processing significantly increases returns. But study has not covered farmers level impact fully.	Mula et al. (2018)
8	Sustainable Practices Through Arecanut Diversification	Study explores diversification opportunities	As per study diversification improves sustainability. But study requires empirical study.	Dhimal & Sharma (2024)
9	Marketing Efficiency of Arecanut	Assess marketing channels	Study states that the intermediaries get major share in final consumer value. Limited focus is given to diversification in the study.	Raghavendra et al. (2017)
10	Price Spread in Arecanut Marketing	Analyses farmer share	Study states that farmers receive lower final value share. Study has not made	Naik, B. K., & Ramachandran



			any value added product analysis.	a Bhatta (1994)
11	Farmer Participation in Arecanut Cooperatives	Study examines the benefit received by the farmers for participating in cooperative marketing	The study reveals that farmer members receive better returns by participating in cooperative marketing	Nair et al. (2015)
12	Arecanut Supply Chain Management	Study evaluates supply chain performance.	Study states that Efficient management of logistic improves profitability. But study has not explored diversification opportunities.	Kumar & Pai (2021)
13	Quality Grading in Arecanut Marketing	Study focuses on assessment of grading system in arecanut marketing.	As per the study the gradind of areca nut fetches higher prices for the product. But stydy has not focused on small land holders.	Sharma et al. (2022)
14	Arecanut Processing and Employment	Study measures employment generation through areca nut processing.	As per the study the jobs can be created by undertaking arecanut processing by the farmers. But long term sustainability of the farmers is not studied.	Rao et al. (2018)
15	Export Potential of Indian Arecanut	Study assesses international market opportunities for arecanut.	Study states that export market opportunities expand market coverage of arecanut.	Prakash et al. (2021)
16	Value Addition Opportunities in Arecanut Sector.	Study focuses on different pathways of diversification.	Study identifies different pathways of diversification and states that value addition and new products increases revenue streams. But staudy has not focused on adation constraints.	Bhat et al. (2019)
17	Areca Leaf Plate Enterprises	Study focuses on by product of arecanut.	Study states that value addition to by products creates additional souce of income to the farmers. But study has not focused on challenges of expanding the enterprise.	Hegde & Rao (2020)
18	Branding and Market Diversification in Areca Industry.	The study evaluates branding benefits.	Study states that branding generates premium prices. But in the study farmers level evidence is limited.	Shetty et al. (2023)



19	Integrated Farming in Arecanut Gardens	The study assesses the profitability of `integrated farming.	The study states that multiple enterprises help to mitigate the risk of depending on single enterprise. But study has not measured value chain effect.	Krishnamurt hy et al. (2017)
20	Farmer Producer Organizations in Plantation Crops.	The study examines collective marketing.	The study explains that FPOs improve market access to the farmers. But study has given general recommendations not specifically for arecanut.	Ramesh et al. (2021)
21	Agro-processing and Farmer Income	The study focuses on processing effects	Study states that processing increases farm income. But study has given general recommendations and no crop specific recommendations.	Singh et al. (2022)
22	Rural Employment Through Agro-Industries	The study focuses on assessment of employment generation in rural area.	The study states that Agro-industries create non-farm jobs. But in this study Plantation crop focus is lacking.	Patel et al. (2018)
23	Plantation Crop Value Chains	The study compares plantation sectors	As per study diversification improves resilience. But in the study coverage of arecanut is limited.	George et al. (2019)
24	Upgrading in Global Value Chains	The study focuses on value chain upgrading.	As per study functional value chain upgradation increases income. But study has not focused on value chain upgradation of plantation crops.	John Humphrey & Hubert Schmitz (2002)
25	Value Chain Development for Small holders	The study evaluates inclusion of small holders.	Study states that value addition benefits farmers interms market expansion, better price and enhancement of income level.	Donovan et al. (2015)
26	Agricultural Value Chains in Developing Countries	The study examines market integration.	The study states that the value chain efficiency improves competitiveness. But study has not covered commodity specific insights.	Trienekens (2011)



27	Farmer Organizations and Market Access	The study focuses on assessment collective action of the farmers in marketing their products.	As per the study cooperatives strengthen bargaining power among the farmers in the market. There is only limited evidence in the study of the arecanut.	Hellin & Meijer (2006)
28	Building Competitiveness in Agricultural Value Chains	The study focuses on development of competitiveness framework	The study states that availability of infrastructure is the critical factor which influence value chain diversification. But study is not crop specific.	Webber & Labaste (2010)
29	Crop Diversification in India	The study examines diversification impacts.	As per study Diversification improves income stability of the farmers. But study has limited focus on plantation crops.	Birthal et al. (2015)
30	Agricultural Diversification and Rural Growth	The study focuses on analyzes diversification trends.	As per the study when farmers conduct market oriented farming then income is increased. Study has not made on the basis of value chain perspective.	Joshi et al. (2004)
31	Agricultural Commercialization	The study focuses on commercialization effects.	The study states that commercial crops raise profitability. The study doesnot address value addition.	Pingali & Rosegrant (1995)
32	Smallholder Inclusion in Modern Markets	The study examines market participation	As per study market access is the critical factor growth. Geographical perspective of South India is missing in the study.	Reardon et al. (2009)
33	Agricultural Growth and Poverty Reduction	The study links growth to livelihood.	As per the study Agricultural diversification reduces poverty by creating employment opportunities. But in the study commodity wise evidence is missing.	Hazell et al. (2010)
34	Market Diversification Strategies in Plantation Crops	The study assesses the diversification methods.	The study reveals that multiple markets reduce risk. That is multiple market system helps mitigate the risk of dependence on single market system. But emperical test is needed.	Rao & Hegde (2023)



35	Contract Farming and Market Access	The study focuses on institutional arrangements for selling farm products.	The study explains that contracts improve market security and fixed price for farm products but it is rare in arecanut sector.	Das et al. (2021)
36	A-Study-On-Present-Status-Of-Betel-Nut-Growers-Of-Assam	The study examined the present status of betel nut growers in Nagaon district of Assam, focusing on landholding, production, cultivation cost, income, profitability, productivity, and mixed cropping practices.	The study found that most growers were marginal and small farmers earning satisfactory profits due to low cultivation costs and good returns. Mixed cropping enhanced income, and larger garden sizes showed higher productivity and profitability. The study is limited to assessing the socio-economic status of growers and does not examine the arecanut value chain, marketing efficiency, stakeholder linkages, value addition, supply chain governance, or strategies for value chain diversification to improve farmers' income.	Durlove Borah (2020)
37	Arecanut Cultivation under Micro Irrigation	The study focused on the adoption of micro-irrigation (drip irrigation) in arecanut cultivation and evaluated its impact on water use efficiency, labour requirements, crop growth, yield, and farm profitability through farmer case studies.	The study reported that drip irrigation reduced water consumption and labour requirements, enabled faster irrigation, lowered maintenance costs by nearly 50%, improved crop growth, and increased arecanut yield and farmers' income. It also promoted efficient resource utilization and sustainable cultivation practices. The study primarily emphasizes production technology and irrigation efficiency but does not examine the role of value chain diversification in improving farmers' income and market competitiveness.	Jain Irrigation Systems Ltd.



38	Cultivating arecanut in india challanges opportunities and sustainable practices	The study reviewed the major challenges and opportunities in arecanut cultivation in India, with emphasis on climate variability, diversified farming, integrated farming systems, sustainable cultivation practices, and farmers' adoption of scientific technologies to improve productivity and resilience.	The study concluded that diversified farming, intercropping, integrated farming systems, and modern scientific practices improve resource use efficiency, soil health, biodiversity, climate resilience, farm productivity, and farmers' income. It also emphasized the need for extension services, technological adoption, and better market access to ensure sustainable and profitable arecanut cultivation. The study is primarily a review of sustainable cultivation practices and diversified farming. It does not empirically examine the arecanut value chain, governance mechanisms, marketing efficiency, stakeholder integration, value addition, or the impact of value chain diversification on farmers' income and competitiveness. These areas require further empirical investigation.	Premalatha K, Soundarya H.L., Keerti Sharma, Meghana Suresh Nayak. (2024)
39	Diversified Multitier Cropping Systems for West Coast of India	The study examines diversified multi-tier cropping systems as a sustainable farming approach to maximize land use efficiency, improve resource utilization, increase crop diversity, and enhance farmers' income through the cultivation of multiple crops at different canopy levels.	The study found that multi-tier cropping systems significantly improve overall productivity, profitability, resource-use efficiency, and environmental sustainability while reducing production risks through crop diversification.	Parveen Kumar,V. Arunachalam ,V. Paramesha and S. R. Maneesha (2021).



40	Forming System and Income Security A case study of areca nut	The study examines the role of arecanut-based farming systems in enhancing farm income and income security by integrating intercrops and allied enterprises, while assessing their contribution to the livelihoods of farming households.	The study found that diversified arecanut farming systems generate higher and more stable income, improve resource utilization, and reduce farmers' dependence on a single crop, thereby strengthening livelihood security. The study primarily focuses on farm-level income security and farming systems, with limited analysis of value chain diversification, market linkages, processing, branding, and the role of digital marketing in improving farmers' income.	Tigari, H., & Rajamma, S. (2019).
41	Innovations and Limitations in Areca Nut Research: A Narrative Review	The study examines technological, cultivation, processing, and marketing innovations in the arecanut sector while identifying the major constraints that limit productivity, value addition, and farmers' profitability.	The study found that innovations such as improved cultivation practices, mechanization, and value-added processing can enhance productivity and income. However, challenges including price fluctuations, labour shortages, pest and disease incidence, and limited market access continue to restrict the sector's growth.	Jasper Hoi Chun Luong, Zisis Kozlakidis , Io Hong Cheong, Hui Wang (2023)
42	Processing and Value Addition of Arecanut	The study examines various arecanut processing methods and value-addition techniques to improve product quality, diversify arecanut-based products, enhance market value, and increase farmers' income.	The study found that scientific processing, improved packaging, and the development of value-added products significantly increase the marketability, shelf life, and profitability of arecanut while creating additional employment opportunities in rural areas. The study mainly emphasizes processing technologies and product development, with limited focus on value chain integration, consumer	S.Keshav Bhat, R. Pandiselvam and D. Jaganathan (2017).



			demand analysis, export competitiveness, digital marketing, and the impact of value addition on farmers' long-term income and livelihood sustainability.	
43		The study examines recommended methods of arecanut cultivation, including site selection, nursery management, planting techniques, nutrient and water management, intercropping, and pest and disease control to improve productivity and sustainability.	The study found that adopting scientific cultivation practices, balanced nutrient management, efficient irrigation, and integrated pest management significantly enhances arecanut yield, quality, and resource-use efficiency while reducing production risks. The study primarily focuses on production technologies and agronomic practices, with limited attention to value chain diversification, post-harvest management, market integration, climate resilience, and the impact of improved cultivation practices on farmers' income and profitability.	Dr. K. S. Sheshagiri, Dr. H. Narayanaswamy and Dr. B. K. Shivanna
44	Growth and Diversification of Horticulture Crops in Karnataka: An Inter-District Analysis	The study analyzes the growth and diversification of horticultural crops across districts of Karnataka by examining changes in cropping patterns, area, production, productivity, and the extent of regional diversification.	The study found considerable inter-district variation in horticultural growth and diversification. Districts with better irrigation, infrastructure, and market access recorded higher productivity and greater diversification, leading to improved farm income. The study focuses on district-level production and diversification trends but gives limited attention to crop-specific value chains, post-harvest management, market integration, value	Komol Singha, Rohi Choudhary and Kedar Vishnu (2014)



			addition, and the direct impact of diversification on farmers' income, particularly for plantation crops such as arecanut.	
45	Betel Leaf and Betel Nut in India: History and Uses	The study examines the historical evolution, cultural significance, traditional uses, and medicinal importance of betel leaf and arecanut (betel nut) in India, tracing their role from the Vedic period to modern times.	The study found that betel leaf and arecanut have been deeply embedded in Indian culture, religion, Ayurveda, and social customs for centuries. They also possess medicinal properties and have contributed significantly to traditional practices and regional trade. The study primarily emphasizes historical, cultural, and medicinal aspects, with limited focus on the modern arecanut value chain, value addition, marketing, export potential, consumer behavior, and the impact of diversification on farmers' income and livelihood sustainability.	Subhash Chander Ahuja (S. C. Ahuja), Uma Ahuja (U. Ahuja) (2011).
46	Agri-business Potentiality in Arecanut Processing: A Study in the North Bengal Districts of West Bengal	The study evaluates the agribusiness potential of arecanut processing by examining opportunities for value addition, entrepreneurship, employment generation, and income enhancement through processing and marketing activities.	The study found that arecanut processing has significant potential to increase farmers' income by producing value-added products, improving product quality, and creating rural employment. However, inadequate processing infrastructure, limited investment, and weak market linkages constrain the sector's growth. The study mainly focuses on processing and agribusiness opportunities, with limited analysis of integrated value chain diversification, branding, digital marketing,	Gobinda Mula, S. C. Sarker and A. Sarkar



			export competitiveness, consumer preferences, and the long-term impact of value-added enterprises on farmers' livelihoods.	
47	An Analysis of Marketing and Processing of Areca-Nut in Shivamogga District of Karnataka State	The study analyzes the production pattern, marketing channels, processing practices, price spread, marketing efficiency, marketed surplus, and price fluctuations of arecanut in Shivamogga district, Karnataka.	The study found that the producer's share in the consumer's rupee was highest (80.80%) and marketing efficiency was greatest in the Producer → Trader → Retailer channel. It also reported positive growth in arecanut area, production, and productivity, while identifying total production as the major determinant of marketed surplus. The study primarily focuses on marketing efficiency and processing economics, with limited emphasis on value chain diversification, value-added product development, branding, digital marketing, export opportunities, and the long-term impact of these strategies on farmers' income and livelihood sustainability.	A. T. S. Shambhavi (2016):



48	Areca nut in the National Economy	The study examines the contribution of the areca nut sector to India's national economy by analyzing trends in area, production, productivity, marketing, processing, consumption, trade, exports, employment, and the overall economic significance of areca nut.	The study highlights that areca nut is an important commercial plantation crop, contributing substantially to rural employment, farmers' livelihoods, agro-based industries, and foreign exchange earnings. It also notes that India has achieved self-sufficiency in areca nut production through expansion of cultivation and technological improvements. The study primarily presents macro-level economic statistics and sectoral analysis, with limited attention to value chain diversification, value-added products, digital marketing, consumer preferences, sustainability, and the impact of value chain interventions on farmers' income and livelihood security.	Prakash Kammardi T N
49	Areca nut – History, Constituents, Cancer and Beyond	The study examines the historical evolution, cultural significance, chemical constituents, processing methods, and health aspects of areca nut. It critically reviews scientific evidence on the alleged carcinogenic effects of areca nut while discussing its economic importance, value addition, and future research opportunities.	The study concludes that areca nut has significant historical, cultural, and economic value and contains several bioactive compounds with antioxidant properties. It emphasizes that existing evidence on health effects is complex and should be interpreted based on rigorous scientific research, while highlighting opportunities for value addition, improved cultivation, and market expansion. The book identifies the need for more systematic, multidisciplinary research on the health effects of areca nut, standardized processing methods, and	Dr. Prasanna Belur (2026)



			scientific validation of its beneficial compounds. It also gives limited attention to value chain diversification, farmers' income, market governance, consumer behavior, and the socioeconomic impact of value-added arecanut products.	
50	Cropping Systems Approach for Improving Resource Use in Arecanut (Areca catechu) Plantation.	The study evaluates arecanut-based cropping systems by integrating compatible intercrops to improve resource-use efficiency, enhance productivity, increase farm profitability, and promote sustainable utilization of land, water, and nutrients in arecanut plantations.	The study found that diversified arecanut-based cropping systems significantly improved land-use efficiency, resource utilization, total farm productivity, and economic returns compared to sole arecanut cultivation. Intercropping also enhanced soil health and reduced production risks. The study primarily focuses on agronomic performance and resource-use efficiency, with limited emphasis on value chain diversification, post-harvest management, market integration, value addition, and the long-term impact of diversified cropping systems on farmers' income and livelihood sustainability.	S. Sujatha, Ravi Bhat and P. Chowdappa

Key Themes Emerging from the Literature:

1. Value Chain Diversification

- Processing, grading, packaging, branding, and export marketing increase value realization.
- Farmers participating in diversified chains earn higher returns than those selling raw produce.

2. Farmer Income and Welfare

- Cooperative marketing and value addition consistently improve farm-gate prices.
- Diversification reduces dependence on volatile arecanut markets.

3. Employment Generation

- Processing industries and areca leaf product enterprises create rural employment opportunities.

4. Sustainability



- Intercropping and integrated farming systems improve resource use efficiency and income stability.

Research Gap

The existing studies focus on value chain diversification in the form of Product Diversification, Functional Diversification and Channel Diversification. Very few studies comprehensively examine the impact of value chain diversification on farmer income, livelihood security, market resilience, employment generation, and sustainability within the areca industry. Furthermore, limited empirical evidence exists regarding emerging diversified products such as areca leaf products, biodegradable packaging materials, industrial applications, and innovative value-added products.

Therefore, the present study seeks to examine the relationship between value chain diversification and farmer welfare in the areca industry, with special emphasis on income enhancement, market access, employment generation, and livelihood sustainability.

Conclusion

Value chain diversification in areca industry helps to expand market coverage, eradicate price volatility, yield more return generates rural employability. Thereby enhances income level of the farmers and sustainable economic development.

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