



INNOVATIONS IN INDIAN COIR SECTOR

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Abstract

Coir Industry is one of the village, cottage, agro based and rural industries in India. Innovations and modernisation of coir industry are helping for increasing production, improving productivity and thereby promoting profitability. It is operated It contributes to industrial production, GDP, market share and exports, generates employment, develops entrepreneurship and thereby promotes our nation's economy through adopting as well as utilising new technologies. Hence, the present paper is mainly aims at indicating the improvements in fibre extraction technologies, mechanized spinning systems, process optimization techniques, and coir-based composite applications have enhanced production efficiency, product quality, and industrial competitiveness in operating coir industry in India through innovations and modernisation.

Keywords: *Coir Industry-Innovations- Technological Modernization, Fibre Extraction, Productivity, Industrial Transformation.*

Introduction

Coir industry in India is one of the village, cottage, agro-based rural industries which plays a significant role in employment generation and economic development. It involves households, partnership, co-operatives, entrepreneurs, and exporters. Indian coir industry exports coir and coir products to 107 countries in the world. It exports only 8 percent of the coir and coir products to foreign countries and remaining 92 percent was domestically consumed. Technology has transformed the coir industry from a slow, manual village trade into an efficient, eco-friendly sector. Modern advancements include automated decorticating machines, enzymatic bio-retting that cuts processing time from months to days, weather-resistant coir geotextiles for soil stabilization, and polymer-impregnated coir composites used as sustainable wood substitutes. For much of its history, production depended on labor-intensive practices such as manual fibre extraction, hand spinning, and conventional processing methods, which constrained productivity, product diversification, and technological advancement. While existing studies have examined mechanization, fibre technology, sustainability, labour conditions, and product development as separate themes, limited attention has been paid to the interconnected role of technological innovation, institutional support, and industrial transformation within a single analytical framework.

Coir Industry in India

Coir is one of the oldest traditional industries in India and plays a vital role in the rural economy of major coconut-producing states such as Kerala, Tamil Nadu, Karnataka, Andhra Pradesh, Maharashtra, Goa, Odisha, Assam, and the Union Territories of Lakshadweep, Andaman & Nicobar Islands, and Puducherry. India is the largest producer of coir in the world, contributing more than 70% of global coir production. During 2025-26, the country produced 15.10 lakh metric tonnes (MT) of coir, up from 12.65 lakh MT in 2022-23. The value of coir production also increased significantly, reaching Rs. 6,614.40 lakh (US\$ 7.19 million) in 2025-26 compared with Rs. 3,992.17 lakh in 2022-23.

Coir Industry in India is an agro-based traditional rural industry and largely confined to coconut producing States like Kerala, Tamil Nadu, Andhra Pradesh, Karnataka, Jharkhand, Orissa, Tripura and West Bengal. India, Sri Lanka, Thailand and Indonesia are the major coir producing countries in the world. A significant share of world coir production is held by India and Sri Lanka. The development of coir industry has all along been in areas where there is a concentration of coconut trees and availability of coconut husk. Historically, the coir industry was started and flourished in Kerala which has a long coast line, lakes, lagoons and backwaters providing natural conditions required for retting. However, with the expansion of coconut cultivation and the efforts of Coir Board, coir industry has picked up in the States of Tamil Nadu, Karnataka, Andhra Pradesh, Orissa, West Bengal, Assam, Tripura and the Union Territories of Goa, Pondicherry, Lakshadweep and Andaman & Nicobar Islands.

Kerala is the home of Indian coir industry, particularly "white fibre, accounting for 61 percent of coconut production and over 85 percent of coir products. Out of 20 lakh hectares under coconut cultivation in the country, Kerala constitutes 9 lakh hectares and Tamil Nadu 5 lakh hectares"¹. However, Tamil Nadu is the top state in coir sector in terms of production of brown fibre and percentage of husk utilization. The coir industries are mainly concentrated on the major coconut cultivating states in India like Kerala, Tamil Nadu, Karnataka, Andhra Pradesh, Orissa, West Bengal, Assam, Goa, Andaman and Nicobar, Lakshadweep and Pondicherry due to availability of coconut husks. Coconut husk is the basic raw-material for the coir industry. "In India, annually 13,000 million coconuts are produced but only 50 percent of the husk is exploited by the coir industry and the remaining 50 percent of the husks is used for purpose of fuel in rural areas"² "The extraction of one kg of coir fibre results in 2 kgs of coir pith extraction, a by-product"². India had produced around 50 lakh tonnes of coir pith per annum. "A husk consists 30 percent

¹ <http://coirboard.gov.in/coirtrade.html>

² www.coirboard.org

of fibre and 70 percent of pith on a dry husk. The ratio of yield of long, medium and short fibre is on average 2 : 2 and 1 respectively”³.

Review of Literature

Pratheesh Padath and Ajeesh Babu⁴ (2026) in their article had pointed out that improvements in the fibre extraction technologies, mechanised spinning systems, process optimisation techniques and coir based applications have enhanced production efficiency, product quality and industrial competitiveness. Further, he had stated that technological advances have also broadened the range of coir products into geo-textiles, biodegradable packing, horticulture products, construction materials and polymer composites. **Reetu Murlidhar Tanwani**⁵ (2020) in his study had pointed out that the coir industry generates the employment opportunities for the rural and poor workers and help them in the training. The production of the coir is also increasing day by day so with the proper management of the raw material coir industry can get more success. Coir industry is totally based on the workers so extra care should be taken towards the workers. Challenges are fewer so by overcoming these challenges coir industry can efficiently work and utilize its full capacity. **Vinayagamoorthi**⁶ (2017) in his article, had focused on the exports contribution of the coir fibre and coir products, different schemes and programmes for the development of the coir Industry. The research paper has also highlighted the advantages and challenges of the coir industry in India. **Poornimadevi**⁷ (2017) in her study focused on the growth and development of the coir industry in the Coimbatore and highlights the major problems faced by the coir industries. The development is depend on the coir board. The research suggests to bring the more efforts on the research on the production of value added products of the coir

Statement of the Problem

There were a number of problems faced by the coir industry viz., lack of technology, poor production, unskilled workers, poor quality of materials, lack of finance and other marketing problems and they affect its operational efficiency, production, productivity, profitability and prosperity. These problems can be solved by the supports of technology and innovations in coir industry. These challenges arises from the nature of the raw materials, the processes involved in fibre extraction, and the key challenges in the production includes The major challenge is the reliance on traditional, labor-intensive processing techniques, which are less efficient and hinder productivity. There is only a limited access to advanced machinery for the small and mediumsized enterprises (SMEs). The financial constraints prevent these enterprises from investing in automation and more efficient technologies. The traditional retting process used for extracting coir fibers is not only time-consuming but also environmentally problematic, raising environmental concerns and longer production cycle time.

Importance of the Study

Economic development of any country largely depends upon the growth and development of the industrial sector. Indian coir sector contributes to employment generation, reduction of unemployment, generation of income, alleviation of poverty, improvement of standard of living, utilises available local and natural resources, industrial production, GDP, market share, exports and the country's economic development. Coir industry in India is a labour-intensive industry which provides employment to more than 7,00,000 persons of whom majority are from rural areas belonging to the economically very weaker sections of the society. Nearly 80 percent of the coir workers are women employed in the fibre extraction and spinning activities. “India accounts for more than two-thirds of world production of coir and coir products”⁸. Kerala is the home of the Indian coir industry, particularly white fibre accounting to 61 percent of coconut production and over 85 percent of coir and coir products.

Objectives of the Study

The main objectives of the study are

- To know the various innovative schemes offered by the Coir Board of India for promoting coir business
- To measure the operational efficiency of the Indian Coir Industry through innovations and modernisation
- To indicate different initiatives of the Government of India for promoting coir industry

Methodology of the Study

The present study is mainly based on secondary data only. The secondary data was collected from the text books, journals, magazines, periodicals, newspapers, annual reports of Coir Board of India and available web sites in the field.

Innovations in Coir Sector

Automatic Yarn Spinning units and motorised rats are introduced instead of manually operated coir spinning units and rope making units for promoting productivity as well as profitability of the coir units. Technological advances have also broadened the range of coir products into geotextiles, biodegradable packaging, horticultural products, construction materials, and polymer composites. Institutional initiatives undertaken by the Coir Board and specialized research organizations have played a central role in facilitating modernization and product diversification. At the same time, financial constraints, uneven technological adoption, and fragmented production structures continue to limit the pace of transformation. By examining technological change, institutional support, sustainability, and socio-economic implications within a single analytical framework, the article contributes to a more comprehensive understanding of modernization processes in traditional rural industries and the challenges associated with achieving inclusive and environmentally responsible industrial transformation.

Leading Coir Industries and Coir Start-ups

The top five states in India for registered coir industries are Kerala (9,244), Tamil Nadu (4,618), Andhra Pradesh (1,000), Odisha (946), and Karnataka (728), with a total of 168,26 registered coir industries nationwide. Being a rural enterprise faces all challenges of the MSME and technology challenge to leverage its export potential, adoption to digital commerce still has to be

³ http://www.coirkerala.org/about_coir.html.

⁴ Pratheesh Padath and Ajeesh Babu.B. “Technological Integration, Mechanisation and innovations in the Coir Industry: Production Transformation, Sustainability and Socio-Economic Implications in India”, International Journal of Recent Engineering Science, Vol.12, No.3, June 2026

⁵ Reetu Murlidhar Tanwani, “Performance Of Coir Industry of India”, Vol.3, No.4, October-December 2020

⁶ Vinayagamoorthi, P. a. (2017). A study on export performance of coir industry in India. Research Gate.

⁷ Poornimadevi, S. (2017). A study on the problems and prospects of coir industry in Pollachi Coimbatore district. International Journal of Advance Trends in engineering and Technology.

⁸ Kumaresan, A., “Rural Exports: On the Growth Path”, Facts for you, Vol.30, No. 1, October 2009

addressed. Efforts to establish industry by value to coir has to be focused across the other coconut harvesting states. The coir industry, rooted in the sustainable use of coconut husks, has grown significantly, thanks to visionary leaders, innovative exporters, and dynamic start-ups. These industry leaders have pioneered advancements in coir processing, introduced novel products, and explored new markets, driving growth and sustainability. Let us explore the companies that stand out and are leaders in the coir industry, as well as the specific needs and opportunities that can further enhance its development and global impact. The export of coir and coir products has become a significant contributor to the economy, especially in countries like India, where coir production is widespread. Despite facing challenges such as competition from synthetic alternatives and fluctuating market conditions, the coir industry continues to grow, driven by increasing demand for sustainable and biodegradable products.

Sustainability Challenges

The coir industry, known for its eco-friendly and versatile products, faces significant sustainability challenges that impact its long-term viability. Managing natural resources effectively, such as water and coconut husks, is essential to ensure sustainable coir production. The extraction and processing of coir need to adopt practices that minimize environmental impact while maximizing efficiency. Additionally, the industry must balance the demand for high-quality, biodegradable products with the need to maintain affordable production costs. Addressing these sustainability challenges is crucial for preserving coir's reputation as a green alternative in various applications. Several factors limit the full potential of the coir industry. The inadequate collection mechanisms lead to underutilization, with less than 42 percent (2018-19) of coconut husks being processed into coir fibre. This represents a significant waste of a valuable resource. This is mainly due to the lack of awareness, lack of incentive for such activities, geographical constraints and lack of an organised system for husk collections. The husk utilisation is expected to improve to 60 percent however a cost effective mechanism for the husk collection model is to be developed for 85 percent husk utilisation. It cannot be underestimated as it will become a problem causing price fluctuation as the world starts adopting coir for various applications.

Operational Guidelines for Science and Technology Component

Innovative R&D activities on coir are carried out under the Board by the two research institutes; the Central Coir Research Institute, Kalavoor and Central Institute of Coir Technology, Bangalore. The Central Coir Research Institute, Alleppey was established in 1959 and the Central Institute of Coir Technology, Bengaluru in 1980. Whereas CCRI, Kalavoor concentrates on research concerning development of eco-friendly technologies for quality improvement of coir fibre, utilization of coir pith, effluent treatment, development of new machinery etc. Identification of new user areas for utilization of coir and coir waste (coir pith), modernization of production infrastructure for elimination of drudgery in manual operation thereby attaining higher productivity and improvement in quality are integral parts of the research efforts of both the Institutes and research investigations have led to development of several new technologies for the coir industry.

Extensions of the results of the technologies developed/research at the laboratory level are scaled up for application at the field level together with extension of testing and service facilities to the coir entrepreneurs & exporters, carrying out of research activities with the funding support from reputed institutions are also envisaged under the programme. Collaborative research with research organizations, institutes, industries, universities in India and abroad, having proven records on varied applications of coir, development of new products, new machinery, product diversification, development of environment friendly technologies, technology transfer, incubation, testing and service facilities are the areas which are given priority consideration. Commercialization of new products/technologies and machine developed by the R&D institutes and registering for Patent Right of these research outcomes and proper documentation etc., are also to be done. As part of the Government of India decision to rationalize all the Schemes, the stand alone scheme of Plan S&T has brought under the umbrella Scheme of Coir Vikas Yojana. The programmes under the S&T activities for the period 2017-18 to 2019-20 are implemented under the following Modernization of Production Processes, Development of machinery and equipments, Product Development and Diversification, Development of Environment Friendly technologies, Technology transfer, Incubation, Testing components and Service Facilities

The "Coir Industry Technology Up-gradation Scheme (CITUS)" is a component of the Coir Vikas Yojana, implemented by the Ministry of Micro, Small and Medium Enterprises, Government of India. The scheme focuses on modernizing coir units by providing support for new machinery, infrastructure, and technology adoption to improve productivity and product quality. It also promotes setting up new coir processing units, expansion into new areas, and better utilization of raw materials. Special emphasis is given to generating employment, especially for women in rural areas, and encouraging new entrepreneurs. The scheme supports eco-friendly production practices and aims to make the coir industry more competitive and technology-driven. It is implemented by the Coir Board with technical support from specialized institutes.

GOVERNMENT INITIATIVES

India's coir sector is witnessing positive momentum on both the export and policy fronts. Coir exports are set to gain significantly from improved global trade conditions, particularly after the United States reduced import tariffs on Indian products. Earlier high duties had impacted demand, but the revised tariff structure has enhanced the price competitiveness of Indian coir in global markets, especially in the US one of its key export destinations. This is expected to revive export volumes, strengthen India's position in global value chains, and support employment in this traditional, labor-intensive sector. On the domestic front, government-led initiatives are further strengthening the industry. In Tamil Nadu, the launch of the state's first government-aided coir firm in Pollachi set up with an investment of about Rs. 9 crore (US\$ 0.97 million) under the Micro Cluster Development Programme aims to boost value-added production, exports, and local employment.

The facility will provide common infrastructure, warehousing, and support to around 200 coir units, while generating employment for nearly 1,500 people. Such initiatives are enhancing productivity, promoting cluster-based development, and encouraging the shift towards high-value coir products like geo-textiles and mats, thereby reinforcing India's coir export potential. For developing the coir industry in India, the Coir Board has launched schemes such as the Coir Vikas Yojana (Coir Development Scheme), Coir Industry Technology Upgradation Scheme, Skill Upgradation and Mahila Coir Yojana. The Export Market Promotion Scheme and Domestic Market Promotion Scheme focuses on improving exports and domestic sales of coir and coir products.

- **Coir Industry Technology Upgradation Scheme (CITUS)**-The main objective of CITUS is to assist entrepreneurs in the upgradation and procurement of eligible plants and machinery. This way, the Coir Board aims to improve the productivity and quantity of coir products. Some of the other objectives of this scheme are to establish state-of-the-art processing units, enhance the utilization of raw materials, create employment opportunities, and attract newer entrepreneurs in the coir industry.

- **A Scheme for Promotion of Innovation, Rural Industries and Entrepreneurship (ASPIRE)**-The ASPIRE scheme aims to establish a network of technology centres and startup incubation centres in the rural parts of India. For the development and promotion of the coir industry, the Ministry of MSME and the Coir Board established the Livelihood Business Incubation (LBI) models for the coir industry.
- **Scheme of Fund for Rejuvenation of Traditional Industries (SFURTI)**-Launched in 2005 by the Ministry of MSME, the SFURTI scheme aims to make the traditional industries in India more competitive, market-driven, productive, profitable, and capable of generating employment, especially in the rural parts of India.

Conclusion

Coir industry is one oldest village and cottage industries in India. In the ancient days, it is operated manually (without power) but now-a-days they are operated mechanically/technologically (with power) as per supports of the Coir Board of India for improving the performance of the coir industries. Coir Board of India is adopting innovations and modernisations for promoting coir industries in terms of introducing new technology, offering new schemes, adopting new methodology and implementing new programmes. Therefore, it concluded that the supports as well as efforts of the Government of India are mainly aims at promoting coir industries in India in terms of productivity, profitability, prosperity and sustainability through new technology and modernisation.

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