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INNOVATIONS & SUSTAINABILITY IN THE COIR INDUSTRY

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INNOVATIONS AND SUSTAINABILITY IN THE COIR INDUSTRY

EXECUTIVE SUMMARY

This white paper explores the coir industry, emphasizing India's strategic advantage in coir production due to its favorable geographic and climatic conditions for coconut cultivation. It begins by detailing the global landscape of coconut cultivation, highlighting the major coconut-producing states in India, which are key contributors to the coir industry.

The chemical and physical properties of coir are discussed, showcasing its numerous advantages as a natural fiber, including durability, water resistance, and biodegradability. The paper also outlines the coir value chain, illustrating the process from raw material to finished products. It identifies existing coir products and introduces novel applications, while also discussing the product life cycle of coir.

Production and export trends are analyzed, highlighting the top export destinations for coir products. Additionally, the paper delves into the technology requirements of the coir industry, offering recommendations to address industry challenges and meet evolving market needs. This comprehensive analysis underscores the importance of innovation and strategic investment in sustaining and growing the coir sector.

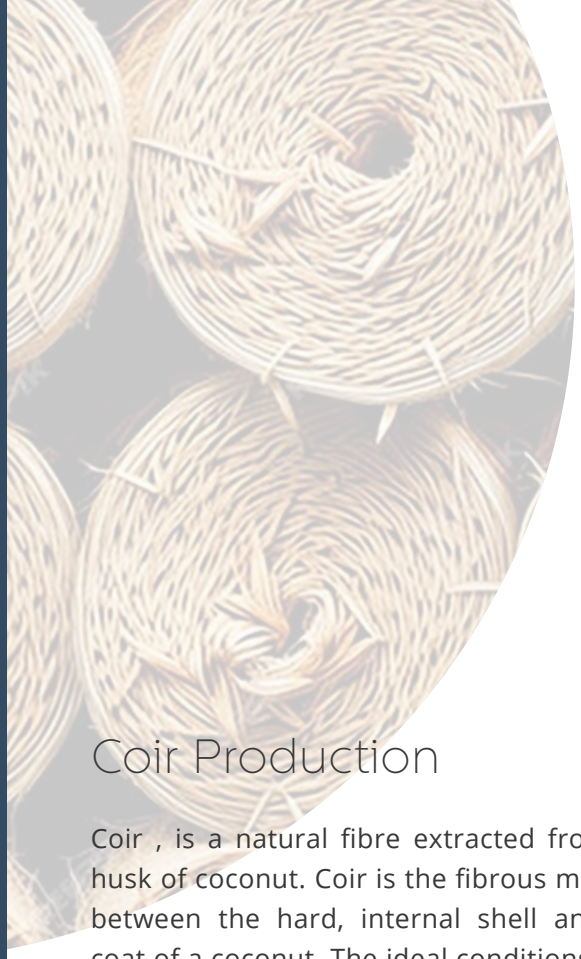
ABOUT COIR

COIR, known as "The Golden Fibre," is a versatile natural fiber extracted from the coconut husk. Coir is one of the oldest industries in India. Historically, its extraction method has been documented by explorers like Marco Polo. Originating in India, coir weaving began in Alleppey in 1859 and spread across the nation, becoming one of the hardest natural fibers, preferred for soil erosion control and stabilization. Coir, termed "kalpa vriksha" in Sanskrit, symbolizes a tree providing life's necessities. It's eco-friendly, recycled from coconut husks, and offers numerous applications, including rope, floor coverings, Geo-textiles, and wood furniture substitutes, contributing to waste reduction and wealth creation. India, the largest coconut India, the largest coconut producer globally, cultivates coconut husks in 18 states, meeting nationwide demand. Kerala leads in coconut production and coir products, contributing significantly to India's economy alongside other major coconut-producing states. India, with Sri Lanka, dominates global coir fibre production, producing around 280,000 metric tonnes annually. Coir products, traditionally limited to floor coverings, now include Geo-textiles, organic manure, and garden articles, reflecting the industry's adaptability and commitment to sustainability. Overall, the coir industry is pivotal in India's rural economy, providing employment and promoting eco-friendly practices.

PURPOSE OF THE WHITE PAPER

The insights in the white paper aims to:

- To inform and educate by providing a comprehensive overview of the coir industry, its products, applications, and potential.
- To identify the current research and stimulate research and development by focusing the needs of the industry, the scope of coir, and its importance for sustainability and innovation. Encouraging further research and innovation within the coir industry to enhance product quality, develop new applications, and improve manufacturing processes.
- To focus policymakers' attention on the challenges faced by the coir industry throughout its value chain, as well as the market scope and potential of coir, so they can incentivize and implement policy regulations to achieve significant growth in the coir sector.

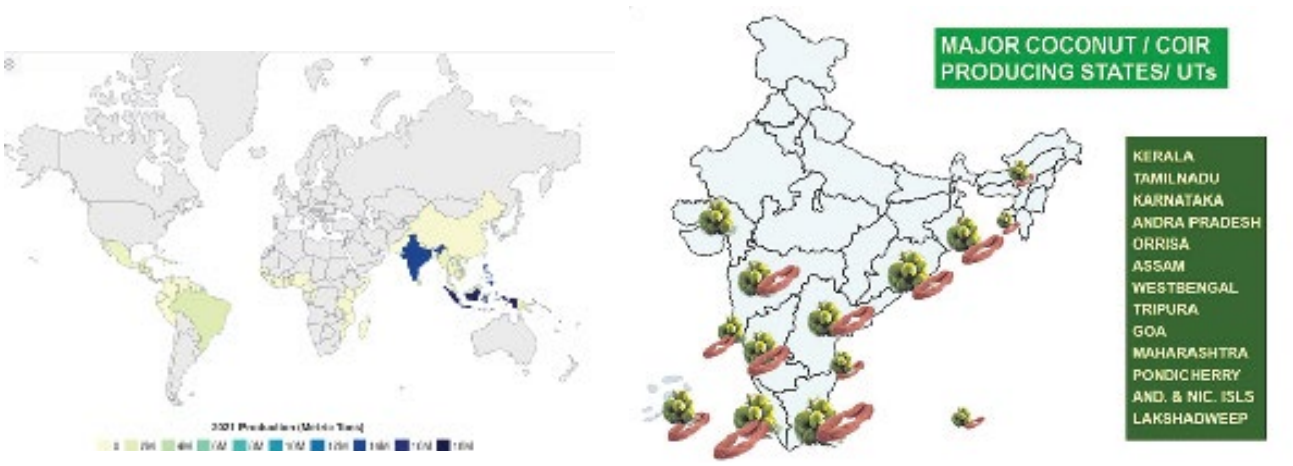


Coir Production

Coir , is a natural fibre extracted from the outer husk of coconut. Coir is the fibrous material found between the hard, internal shell and the outer coat of a coconut. The ideal conditions for coconut cultivation are

- Latitude: Between 20°N and 23°N (or 20°S and 23°S) for optimal commercial yield.
- Altitude: Up to 600 meters above sea level (MSL), although some success up to 900 MSL has been reported.
- Temperature: Mean annual temperature: 27°C and Range: 20°C to 32
- Rainfall Minimum: 1000 mm annually, ideally well-distributed throughout the year.
- Rainfall Maximum: Up to 3000 mm is suitable, but good drainage is crucial.
- Humidity: 80-85% relative humidity
- Wind: Moderate winds are beneficial for pollination and nutrient uptake.
- Sunshine: Abundant sunlight is essential. Coconut palms don't thrive in shade or cloudy conditions.
- Soil: Adaptable to various soil types including laterite, coastal sandy, alluvial, and reclaimed marshlands.
- Salinity: Tolerates slightly saline soils found in coastal areas.
- Soil pH: Wide tolerance range (from 5.0 to 8.0).

India boasts several favourable factors that grant it a strategic advantage in coconut cultivation. A large portion of the country falls within the ideal latitude and altitude range for coconut growth, enabling large-scale production. Furthermore, India's diverse landscape offers a variety of soil types suitable for coconut palms, from laterite to coastal sandy soils. This adaptability allows for efficient land utilization compared to countries with limited soil options. Additionally, India's climate, with its moderate temperatures, well-distributed rainfall patterns, and ample sunshine hours, provides a naturally nurturing environment for coconut trees. Even the presence of slightly saline soils in coastal areas and a wide soil pH tolerance range add to India's advantage, allowing for coconut cultivation in diverse regions. These factors combined create a cost-effective and large-scale coconut cultivation potential, making India a major player in the global coir market.



Global Coconut Production Heat Map

PHYSICAL & CHEMICAL PROPERTIES OF COIR

Coir is the fibrous husk of the coconut shell. It is tough and naturally resistant to seawater, the coir protects the fruit enough to survive months floating on ocean currents to be washed up on a sandy shore where it may sprout and grow into a tree, if it has enough fresh water, because all the other nutrients it needs have been carried along with the seed. The physical and chemical properties are as show below

Chemical Properties of Coir	Physical Properties of Coir
Lignin 45.84%	Length in inches 6-8
Cellulose 43.44%	Density (g/cc) 1.40
Hemi-Cellulose 00.25	Tenacity (g/Tex) 10.0
Pectin's and related Compound 3.0%	Breaking elongation% 30%
Water soluble 5.25%	Diameter in mm 0.1 – 1.5
Ash 2.22%	Rigidity of Modulus 1.8924 dyne/cm2
	Swelling in Water (diameter) 5%
	Moisture at 65% RH 10.50%

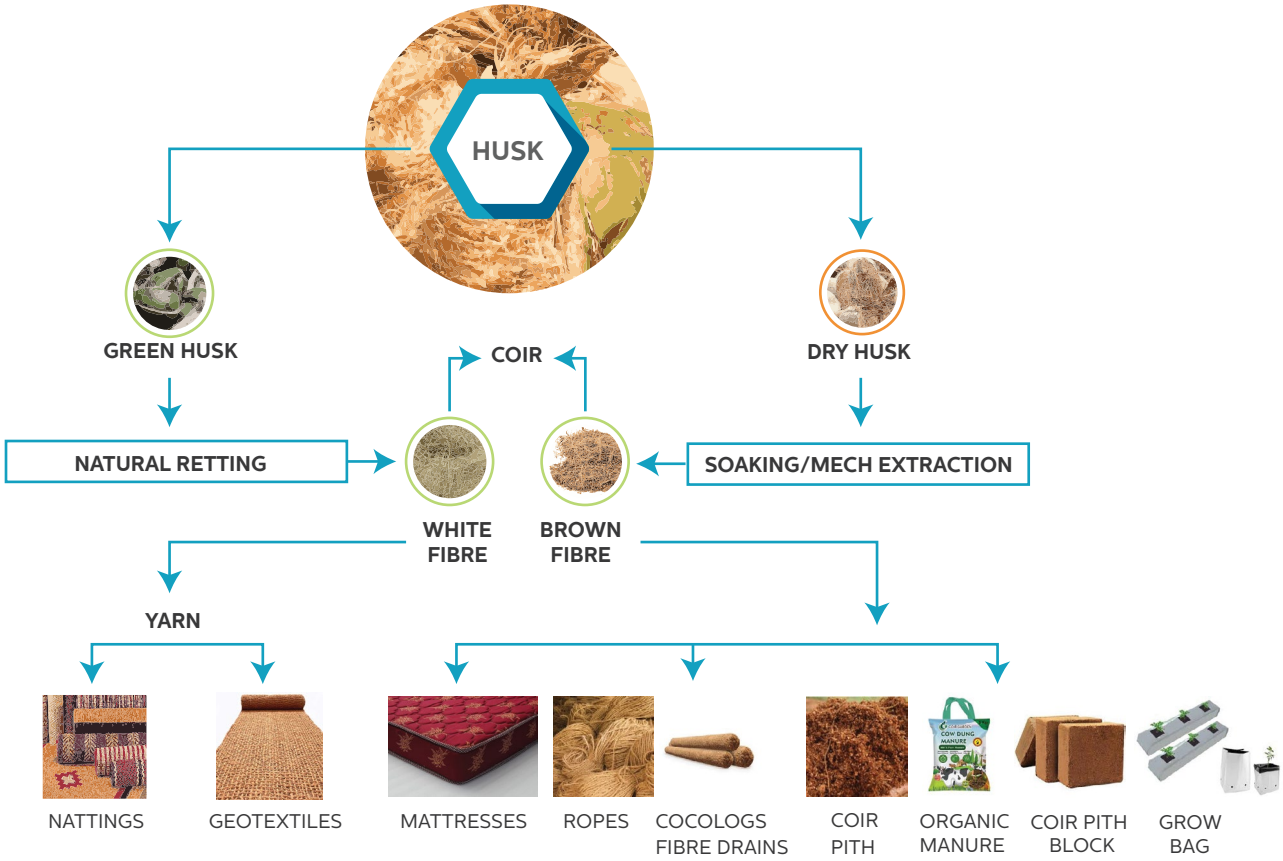
The high content of lignin (45.84%) contributes to coir's strength and resistance to wear and tear. Lignin also plays a role in coir's resistance to rot and mold growth. This extends the lifespan of coir products and makes them suitable for use in humid environments. The high cellulose content (43.44%) makes it biodegradable. The cellulose also contributes to coir's ability to absorb water. Beyond being eco-friendly, coir offers a remarkable range of advantages listed as follows.

Moth-proof; resistant to fungi and rot.
Provides excellent insulation against temperature and sound.
Not easily combustible.
Flame-retardant.
Unaffected by moisture and dampness.
Tough and durable.
Resilient; springs back to shape even after constant use.
Totally static free.
Easy to clean.

COIR VALUE CHAIN

The various advantages of coir makes it a highly functional and versatile material creating a huge demand for coir and the coir value chain takes coconut husks, a byproduct of harvesting, and transforms them into a diverse range of useful products. The process starts with either green or dry husks, which undergo natural retting (soaking) or a combination of soaking and mechanical extraction to separate the valuable coir fibres. These fibres are then categorized as brown, ideal for brushes and matting, or white, used for higher-value applications due to their strength. The diagram showcases some of the final coir products, including yarn for ropes and mats, geotextiles for erosion control, mattresses for their natural support, and even coir pith, a valuable organic fertilizer. This transformation from a byproduct to useful and eco-friendly products highlights the efficiency and sustainability of the coir value chain.

COIR VALUE CHAIN



Leveraging its ideal location for coconut cultivation and the inherent versatility of coir, India has emerged as a leading global supplier of coir fiber. Coir fiber exports are steadily increasing in volume, yet the export value in 2022-23 (Rs. 52,851.99 crore) is lower compared to 2018-19 (Rs. 60,164.11 crore). This is despite a significant rise in export volume during the later year (4,46,340 MT) compared to the former (2,99,279 MT). Potential reasons for this discrepancy could be increased global coir supply or lower demand for coir products. Interestingly, the United States is the top export destination by value (29.7%), while the Republic of China leads in terms of import quantity (44.69%), though their value contribution remains lower (20.42%). However, recent export data reveals a gap between increasing volume and decreasing value. To address this concern and fully harness coir's potential, building an innovation ecosystem, developing value-added coir products, and fostering a supportive infrastructure are crucial priorities.

RESEARCH TRENDS IN COIR

Research and development (R&D) play a critical role in the growth, progress, and sustainability of the coir industry. Innovative solutions are essential for enhancing production processes, creating new applications, and promoting the eco-friendly potential of coir. In this section, we will explore the broad areas of ongoing research

and highlight some leading articles in the field of coir. R&D in this sector requires significant funding, along with active involvement from stakeholders. A list of top funding agencies supporting coir-related research is also provided.

	2018-19		2019-20		2020-21		2021-22		2022-23	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
COIR FIBRE	299279	60164.11	308457	49842.6	354123	62890.57	399428	63655.79	446340	52851.99
COIR YARN	3408	2642.23	11290	2681.57	3849	2919.30	4285	3330.73	4150	2908.75
HANDLOOM MATS	19367	21911.04	16910	19630.1	20527	24662.10	21079	26172.99	26287	31071.63
TUFTED MATS	54131	52225.03	58300	56344.1	81799	80690.82	92810	100114.57	96389	104788.31
POWERLOOM MATS	8	15.89	26	49.65	65	106.51	408	753.80	419	887.82
HANDLOOM MATTING	1071	1436.08	1177	1366.41	1418	1712.00	1110	1423.21	1224	1831.62
POWERLOOM MATTING	7	17.22	5	8.53	11	19.24	4	9.62	0	0.00
COIR GEO- TEXTILES	7674	5972.56	8068	6389.45	8583	7059.05	6978	6165.74	10096	9067.32
COIR RUGS & CARPET	195	243.96	367	483.82	327	427.90	580	861.79	711	1011.32
COIR ROPE	486	439.79	512	466.03	505	491.76	716	649.84	754	663.42
CURLED COIR	10768	3137.02	3028	2301.22	9381	2422.22	9943	2622.89	14753	3784.89
RUBBERISED COIR	807	1029.58	578	786.82	982	1321.41	644	1096.88	410	739.20
COIR PITH	566661	123208.48	579980	134963	680898	191974.07	696175	225917.69	661629	186859.95
COIR OTHER SORTS	183	361.58	298	476.93	744	1200.96	696	1229.56	1622	2751.75
TOTAL	**964046.4**	**272804.57**	**988996**	**275790**	**1163213**	**377897.91**	**1234855**	**434005.10**	**1264784**	**399217.97**

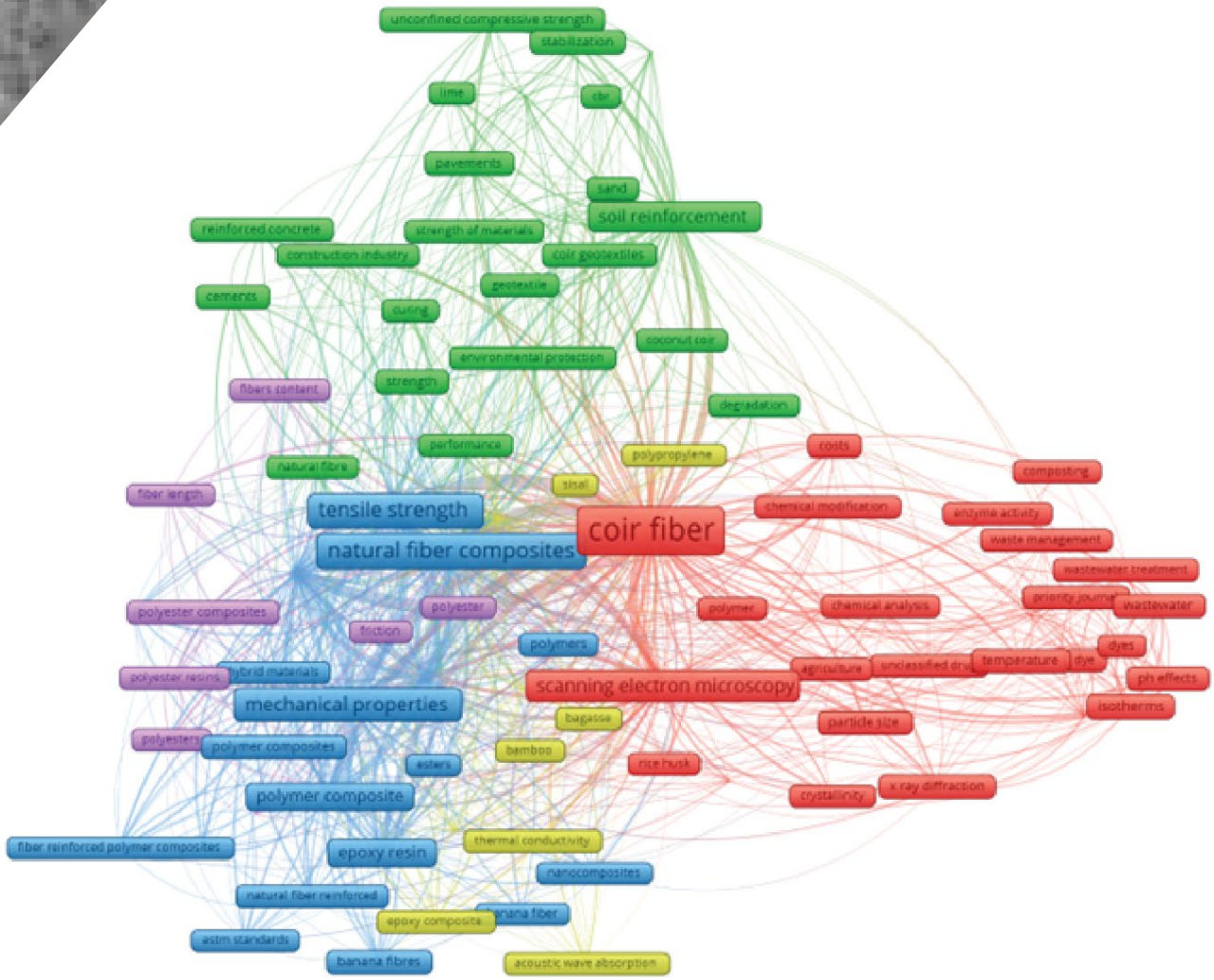
Source: Coir Board

Country wise Export of Coir & Coir Products - 2022-23

Quantity in MT — Value in Rs.Lakhs

Sl.No.	Country	Quantity	Value	QTY%	VAL%
1	USA	161307	117646.75	12.75	29.47
2	REPUBLIC OF CHINA	565250	81520.21	44.69	20.42
3	NETHERLANDS	74324	24352.37	5.88	6.1
4	SOUTH KOREA	91613	19528.04	7.24	4.89
5	UK	39459	18426.91	3.12	4.62
6	SPAIN	52497	16363.70	4.15	4.1
7	AUSTRALIA	28210	14105.84	2.23	3.53
8	GERMANY	20794	11602.16	1.64	2.91
9	ITALY	20057	9925.68	1.59	2.49
10	FRANCE	12590	8600.80	1	2.15

Market acceptance, competition from synthetic alternatives, pricing pressures. Source: Coir Board



Area of research focused by Institutions
n the area of coir

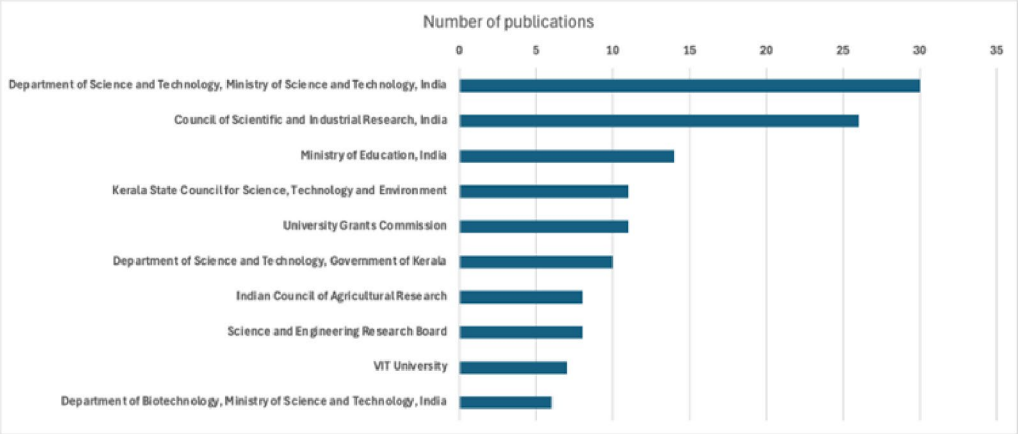
The table below presents recent research conducted by researchers on coir, showcasing their findings and comprehensive recommendations based on their exhaustive research.

Authors	Title	Finding	Source Title
Raj B.; Sathyan D.; Madhavan M.K.; Raj A.	Mechanical and durability properties of hybrid fiber reinforced foam concrete	Coir fiber reinforced foam concrete shows superior functional and durability characteristics compared to PVA fiber reinforced foam concrete	Construction and Building Materials
Chokshi S.; Parmar V.; Gohil P.; Chaudhary V.	Chemical Composition and Mechanical Properties of Natural Fibers	Potential for diverse applications in industries like textiles, automotive, and construction	Journal of Natural Fibers
Singh Y.; Singh J.; Sharma S.; Lam T.-D.; Nguyen D.-N.	Fabrication and characterization of coir/carbon-fiber reinforced epoxy based hybrid composite for helmet shells and sports-good applications: influence of fiber surface modifications on the mechanical, thermal and morphological properties	Coir fiber/carbon fiber/ epoxy resin hybrid composites exhibit better mechanical properties (tensile, compressive, flexural, and impact strength) and improved thermal stability compared to single fiber-reinforced composites.	Journal of Materials Research and Technology
Biruntha M.; Karmegam N.; Archana J.; Karunai Selvi B.; John Paul J.A.; Balamuralikrishnan B.; Chang S.W.; Ravindran B.	Vermiconversion of biowastes with low-to-high C/N ratio into value added vermicompost	Investigated vermicomposting of seaweed, sugarcane trash, coir pith, and vegetable waste mixed with cow dung using Eudrilus eugeniae over 50 days.	Bioresource Technology

Authors	Title	Finding	Source Title
Sreenivas H.T.; Krishnamurthy N.; Arpitha G.R.	A comprehensive review on light weight kenaf fiber for automobiles	The research highlights that natural fibers like coir, when used in hybrid composites, can contribute to the development of sustainable materials with enhanced mechanical properties for various industrial applications.	International Journal of Lightweight Materials and Manufacture
Nayak S.Y.; Sultan M.T.H.; Shenoy S.B.; Kini C.R.; Samant R.; Shah A.U.M.; Amuthakkannan P	Potential of Natural Fibers in Composites for Ballistic Applications–A Review	Further research and development to fully integrate coir and other natural fibers into ballistic applications, highlighting their potential in replacing synthetic fibers.	Journal of Natural Fibers
Tiwari N.; Satyam N.; Puppala A.J.	Strength and durability assessment of expansive soil stabilized with recycled ash and natural fibers	Coir fiber when combined with bottom ash (BA), coir fibers help stabilize the soil, improving its mechanical properties like unconfined compressive strength and split tensile strength	Transportation Geotechnics
Naik V.; Kumar M.; Kaup V.	A Review on Natural Fiber Composite Materials in Automotive Applications	Emphasizes the role of these materials in reducing vehicle weight and improving fuel efficiency, while also providing sustainable alternatives to synthetic fibers.	Engineered Science
Tiwari N.; Satyam N.	An experimental study on the behavior of lime and silica fume treated coir geotextile reinforced expansive soil subgrade	Combined with lime and silica fume, coir geotextiles help reduce swelling and increase the load-bearing capacity of the soil, making it a sustainable solution for reinforcing road subgrades and infrastructure.	Engineering Science and Technology, an International Journal

Authors	Title	Finding	Source Title
Karmegam N.; Jayakumar M.; Govarthanan M.; Kumar P.; Ravindran B.; Biruntha M.	Precomposting and green manure amendment for effective vermitrans formation of hazardous coir industrial waste into enriched vermicompost	Coir waste, when properly treated, can be sustainably managed and repurposed into a valuable organic fertilizer, reducing environmental hazards and supporting agricultural productivity.	Bioresource Technology
Sathish T.; Palani K.; Natrayan L.; Merneedi A.; de Poures M.V.; Singaravelu D.K	Synthesis and characterization of polypropylene/ramie fiber with hemp fiber and coir fiber natural biopolymer composite for biomedical application	The study demonstrates the potential of coir fiber in sustainable, natural biopolymer composites for medical purposes.	International Journal of Polymer Science
Sathish T.; Jagadeesh P.; Rangappa S.M.; Siengchin S.	Mechanical and thermal analysis of coir fiber reinforced jute/ bamboo hybrid epoxy composites	Highlights coir's role in improving the overall performance of natural fiber-reinforced composites, positioning it as a viable eco-friendly alternative to synthetic fibers.	Polymer Composites
Maroušek J.; Marouškova A.; Periakaruppan R.; Gokul G.M.; Anbukumaran A.; Bohatá A.; Kříž P.; Bárta J.; Černý P.; Olšan P.	Silica Nanoparticles from Coir Pith Synthesized by Acidic Sol-Gel Method Improve Germination Economics	Silica nanoparticles synthesized from coir pith using the acidic sol-gel method enhance seed germination and improve overall agricultural economics	Polymers
Sathish T.; Jagadeesh P.; Rangappa S.M.; Siengchin S.	Studies on mechanical and thermal properties of cellulosic fiber fillers reinforced epoxy composites	Coir, as a cellulosic fiber filler in epoxy composites, contributes to enhanced mechanical and thermal properties.	Polymer Composites

Authors	Title	Finding	Source Title
Hariharan A.; Prabunathan P.; Kumaravel A.; Manoj M.; Alagar M.	Bio-based polybenzoxazine composites for oil-water separation, sound absorption and corrosion resistance applications	2020	Polymer Testing



List of the top sponsoring agencies in India for the research in the field of coir.

- Department of Science and Technology, Ministry of Science and Technology, India
- Council of Scientific and Industrial Research, India
- Ministry of Education, India
- Kerala State Council for Science, Technology and Environment
- University Grants Commission
- Department of Science and Technology, Government of Kerala
- Indian Council of Agricultural Research
- Science and Engineering Research Board
- VIT University
- Department of Biotechnology, Ministry of Science and Technology, India

INDUSTRY CHALLENGES

Coir, a versatile and eco-friendly fiber derived from coconut husks, boasts numerous benefits, including durability, biodegradability, and suitability for various applications for the emerging global needs. However, the coir industry is not without its hurdles. It faces production challenges, such as fluctuating raw material quality and seasonal variations, as well as market pressures from synthetic competitors and price volatility. Additionally, the industry must navigate strict regulatory landscapes and adopt sustainable practices to ensure its long-term viability. Addressing these issues is key to unlocking coir's full potential in the global market. The various industries and the stakeholder visited to understand the challenges and needs includes the following

- Par Coco Products, Udumalai Road, Palani
- Srivari Coirs, Coimbatore Bypass, Pollachi
- Bio Gardener, Pollachi
- AV Coirs, Pollachi
- AP Industry, Marthandam, Kanyakumari District
- Ethmozhi Coirs, Ethamozhi, Nagercoil
- NKP Coirs, Nagercoil
- Felix Exports, Ethamozhi, Nagercoil
- Vaigai Coirs, Vadipatti, Madurai
- Unitek Hydraulics, Chinnavedampatti, Coimbatore.
- Essar Engineers, Coimbatore
- Kerala State Coir Machinery Manufacturing Company,Alappuzha
- Central Coir Research Institute, Alappuzha.

PRODUCTION CHALLENGES

The coir industry faces several production challenges that impact its efficiency, product quality, and overall growth. These challenges arises from the nature of the raw materials, the processes involved in fibre extraction, and the key challenges in the production includes

COST OF PRODUCTION AND PRICE INSTABILITY

Small businesses exporting coir and coco pith face challenges due to high production costs and fluctuating prices. Expenses related to labor, the availability of raw materials, and market demand can all impact the overall cost and pricing of these products.

LACK OF TECHNOLOGY

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 medium-sized 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.

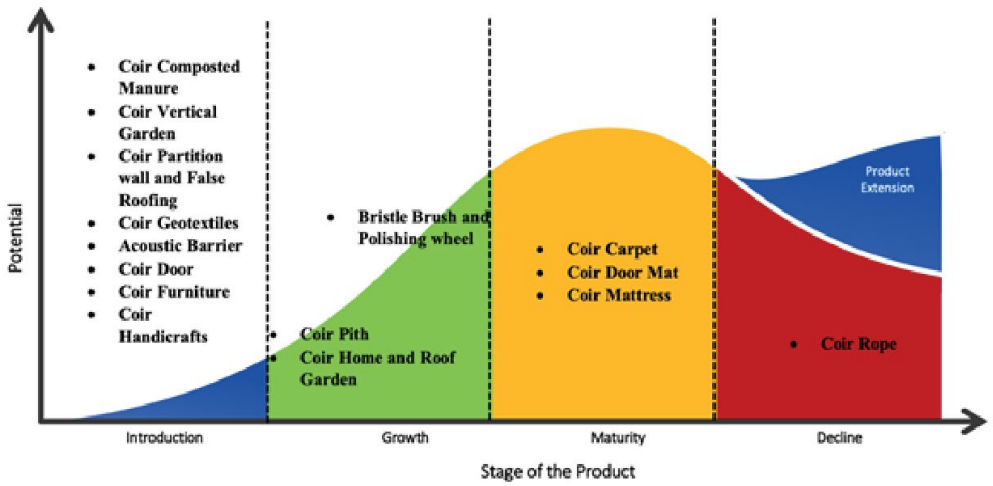
LIMITED ACCESS TO FINANCIAL RESOURCES AND CREDIT

Small scale manufacturers and exporters of coir are hindered by a lack of financial resources and difficulty in obtaining credit. This increases the cost of production due to the higher interest rates, inability to have continuous production and difficulty in business expansion.

ERRATIC CLIMATE

Erratic climate conditions have adversely affected the production process, particularly as unseasonal rain disrupts the drying of coir fibers. This inconsistency in weather patterns can lead to delays in production, lower fiber quality, and increased costs for coir manufacturers.

MARKET CHALLENGES

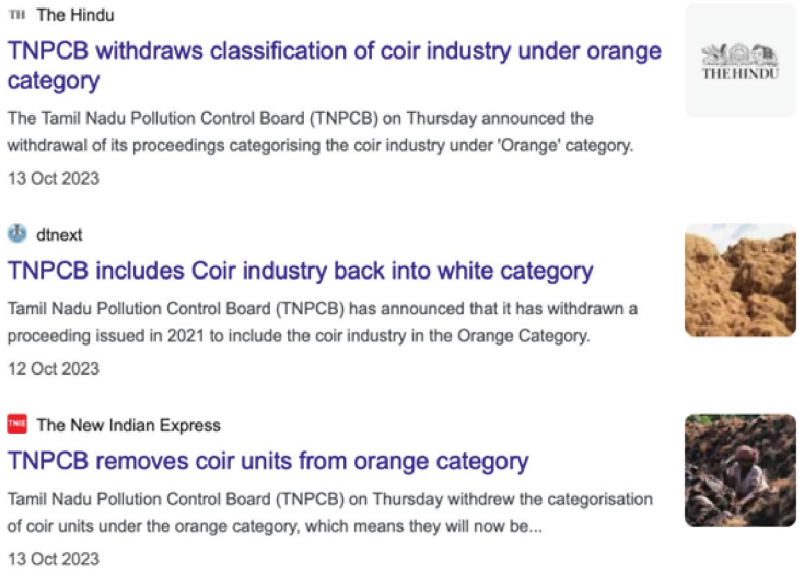


The above figure illustrates the product life cycle of various coir products. Traditional coir products, such as coir rope, coir carpets, coir door mats, and coir mattresses, benefit from well-established technologies, support from common facility centers, and private investments. However, emerging coir products like coir vertical gardens, coir geotextiles, acoustic barriers, wcompetition from synthetic alternatives, and pricing pressures.

MARKET ACCEPTANCE

The traditional coir products have achieved market acceptance however the competition is high and the profit margin is narrow in these product line up. The newer applications like coir vertical gardens and coir geotextiles are still gaining recognition, For instance, coir geotextiles, which offer a sustainable solution for soil erosion control and soil conditioning, are eco-friendly and biodegradable. Despite their benefits, the adoption of these products is limited due to a lack of awareness and slower acceptance by industries and consumers. The traditional coir products have established presence in the market, and the industry faces significant challenges in promoting newer, more sustainable coir applications.

REGULATORY CHALLENGES



The coir industry, like many others, faces several environmental regulatory challenges that can impact its operations, production processes, and overall sustainability. These challenges stem from the need to comply with environmental laws and regulations designed to protect natural resources, reduce pollution, and ensure sustainable practices. Key environmental regulatory challenges related to the coir industry include:

DISPOSAL OF BABY FIBER

The coir production process generates significant amounts of waste, such as coir fibre of shorter length. Proper disposal and management of these byproducts are required to avoid environmental harm. There is a very little R&D for value addition of these fibers and end up disposed as land fills. Baby fibre of coir is considered as waste as it does not have enough length to make other products. This is piled up in the mills causing pollution issues

Sreeji Sreenivas with board made of baby fibre

MANAGEMENT OF RETTING WASTE

The traditional retting process used to extract coir fibers involves soaking coconut husks in water, which can produce large quantities of organic waste and result in water pollution. Environmental regulations require the treatment of retting effluents before they are discharged into water bodies. The industry lacks a necessary cost effective technology for disposal of the same.

LACK OF REGULATORY STANDARDS / CERTIFICATIONS

The new innovative products such as coir geotextiles and coir wood currently lack guidance on quality standards, manufacturing processes, quality parameters, certification, and usage. Establishing well-defined standards and codes is essential to ensure consistent product quality, enhance market acceptance, and support the widespread adoption of these sustainable alternatives

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.

RESEARCH & DEVELOPMENT

Research and development (R&D) is the key to ensure the long term sustainability of the industry. Key issues that need to be addressed by the R&D for sustainability include innovative processing technologies to improve fiber quality and consistency, enhance product durability, and develop new applications for coir to expand market reach. Accelerated R&D efforts focused on novel coir products, sustainable production methods, life cycle assessments, and establishing standards and certifications for new coir applications are the need of the hour. These advancements are crucial for the industry to remain sustainable and competitive in the global market. Lack of investment in R&D for sustainable practices makes it difficult to reduce environmental impact while maintaining cost-effectiveness. The collaboration between research institutions and the industry is often limited, hindering the advancement of technology and product development in this sector.

RESOURCE MANAGEMENT

Several factors limit the full potential of the coir industry. The inadequate collection mechanisms lead to underutilization, with less than 42% (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%, however a cost effective mechanism for the husk collection model is to be developed for 85% husk utilisation. It cannot be underestimated as it will become a problem causing price fluctuation as the world starts adopting coir for various applications.

ENVIRONMENT

Disposal is a challenge as coconut husks pile up across Indian cities amid high summer demand

Tender coconut husk is biodegradable and has extensive uses. But it takes a long time to degrade due to its high moisture content and size.

Ravleen Kaur
May 08, 2024 · 07:30 pm

READ IN APP

where coir production is widespread. Coir exports include a variety of products, such as mats, ropes, geotextiles, and brushes, which are valued for their durability, eco-friendliness, and versatility. Exporters focus on meeting international quality standards to cater to diverse markets worldwide. 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.

LEADING COIR INDUSTRIES AND COIR STARTUPS

The coir industry, rooted in the sustainable use of coconut husks, has grown significantly, thanks to visionary leaders, innovative exporters, and dynamic startups. 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 standout 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,

PROMOTING SUSTAINABLE GROWTH: EXPANDING COIR INDUSTRY ACROSS INDIA

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 addressed. Efforts to establish industry by value to coir has to be focused across the other coconut harvesting states.

Exporters of Coir & Coir Products - 2022-23
Exporter's Performance during the period from April, 2022 to March, 2023.

Quantity in MT — Value in Rs.Lakhs

Sl.No.	Exporter	Quantity	Value	QTY%	VAL%
1	KERAFIBRETEX INTERNATIONAL PVT.LTD.	19786.80	21317.19	1.56	5.34
2	REMMY SUBSTRATES INDIA PRIVATE LTD.	59564.07	14768.56	4.71	3.7
3	HARISH COCONUT PRODUCTS PVT. LTD.	96049.66	12905.74	7.59	3.23
4	DUTCH PALNTIN COIR INDIA PVT.LTD	33825.98	12186.50	2.67	3.05
5	FIBRE WORLD	8563.45	10066.98	0.68	2.52
6	N C JOHN & SONS LIMITED	7996.99	9817.58	0.63	2.46
7	PALM FIBRE (INDIA) PRIVATE LTD.	6762.71	9570.60	0.53	2.4
8	TRAVANCORE COCOTUFT PVT.LTD.	6965.49	8437.12	0.55	2.11
9	WILLIAM GOODACRE & SONS INDIA LTD	6538.13	7483.80	0.52	1.87
10	FLOOR GARDENS	5969.73	5636.17	0.47	1.41
11	VAIGHAI AGRO PRODUCTS LIMITED	23825.29	5472.34	1.88	1.37
12	ELITE CARBON CREATIONS PVT. LTD.	41115.26	5105.85	3.25	1.28
13	R.L.KHANNA & COMPANY (OVERSEAS)	4070.27	4996.30	0.32	1.25
14	SIVANTHI JOE COIRS	6913.96	4901.34	0.55	1.23
15	PELEMIX INDIA (P) LTD	13061.52	4713.56	1.03	1.18

The leaders in the coir industry are dedicated to advancing both innovation and sustainability while enhancing quality and meeting client needs. They excel in various areas, from production and quality management to market expansion, and are committed to utilizing renewable resources. These professionals focus on improving rural livelihoods, driving integration within their firms, and promoting India's coir sector globally through high-quality products such as doormats. Their combined efforts are steering the industry towards greater growth and development, particularly in regions like Tamilnadu & Kerala. The leadership factor that enabled the Visionary leader to standout in the global market is listed in the below table.

Visionary Leader	Description
Anandharaju Muthusamy Founder, Anandh International Peat Industries, Maramangalathupatti	An industry expert, highly committed to enhancing the lives of people in rural areas, aligning with the broader goal of contributing to the country's development.
Deepak Mahesh, Vice President, CoirPlus, Pollachi	With a commitment to innovation, sustainability, and quality, he has established himself as a prominent player in India's coir sector utilizing renewable resources.
Deepika Muthusamy, Co-Founder, Saamy Coir Product, Dindigul.	A pioneer industry expert helps the firm meet specific requirements of individual clients in order to provide them high-quality and best-of-its-class products.
Jitesh Nambiar, Director, Geco Coir Products, Cherthala.	With his unmatched industry expertise, he looks after the production, sampling, quality, and day-to-day communication.
Dr. Pratheesh G Panicker, Managing Director, Coir Craft, Alappuzha	With his unmatched skill and industry expertise, he is steering the coir industry of Kerala to a new level.
Suga Kumaravel, Founder, Sugacoco, Coimbatore.	A highly accomplished professional steering the firm towards upward integration with his extensive industry expertise.
Vinodkumar, Ram Coir Mills, Alleppey	He is highly engaged in exporting top-quality doormats, especially PVC Doormats and Latex Tufted mats, Jute Poly Propylene Door Mats, and many more through the firm.

Source: Industry Outlook

ANANDH INTERNATIONAL PEAT INDUSTRIES

Anandh International Peat Industries Private Limited is one of the prominent manufacturers of Coco Peat products in India. We are specialised in the manufacturing eco-friendly Coco Peat products for sustainable agriculture, Horticulture, Floriculture and substrates industry usage. We are unique in procuring, producing and marketing Cocopeat products. Our products are guaranteed certain qualities to customers are Eco-Friendly, Bio degradable, Durability, Water retention, Air Porosity, Low maintenance, Long lasting performance.

Our infrastructure is completely equipped with advanced machineries, Software tools, Manufacturing unit, packaging unit and storage facility. we use state of art (or best-in-class) process techniques to maintain standard quality control metrics for all the stages of washing, drying, screening and compressing. We are driven by highly passionate and dedicated workforce. Our ultimate aim is to provide utmost satisfaction to the clients by meeting their expectations.

COCO GREEN SUBSTRATES

Cocogreen Substrates is a leading manufacturer and exporter of high quality Coir pith or Coco peat products from India. We have 25 years of experience in supplying to the Horticulture/Floriculture and Farming/Landscaping applications globally. We are one of the Pioneers of the Coir pith / Coco peat industry with wide presence in USA, Europe, Japan, South Africa, Chile, Korea and Mexico. Our company 'Ravi Bala Exports' is 100% family-owned business and has come a long way since inception in 1994 through our commitment to excellence and innovation.

Images of novel coir product currently made by leading industry

From 1994 to 2014, we have been exporting with the label of 'Ravi Bala Exports' which is a sister concern of Cocogreen Substrates. From the year 2014, we restructured to operate under Cocogreen Substrates with the diversification to meet varied requirements. Main factory is situated in Sivagangai, a municipal area famous for its elegant beauty and green coconut trees. It is in the south of Tamil Nadu, India. We are 45 Kms away from Madurai Airport. Our team have achieved a broad perspective and in-depth technical knowledge in quality management and manufacturing. Enhancement of technology and human capital makes sure that we stay ahead. Our in-house quality control and well-managed export department assures the buyers prompt delivery with competitive prices. We are focused to meet the challenges of globalization by improving quality, achieving cost reduction and enhancing efficiency. Our core strength lies in understanding the customer needs and providing them the solution for their Coir requirements. We manufacture 100 % organic Coconut Coir products from our own manufacturing facility located in India. Being the manufacturer helps us to offer our customers competitive price all through the year.

GECO COIR PRODUCTS PRIVATE LIMITED, KERALA.

The word "Traditional" is deeply connected to nature. Before the industrial revolution, traditions guided how people lived, including their clothing, materials, and customs. In Kerala, the coconut tree, or "Keram," has been central for centuries. People utilized every part of it—coconut leaves for roofs, trunks for construction, and the golden coir fiber for doormats, which became world-renowned. GECO Coir Products, established in 2007, continues this heritage by producing eco-friendly products from natural fibers like jute, hemp, and coir, offering sustainable and green solutions globally.

KERAFIBRETEX INTERNATIONAL PVT.LTD, KERALA

Established in the year 2000, we are engaged in manufacturing and exporting a wide array of Coir, Jute and Rubber Products. The products offered by us are available in various designs, sizes, shapes and colors. These are designed keeping in mind the aesthetic value of our clients and are widely used in houses, offices and any fashionable place. The products offered by us are also available as per the specification of our clients.

TRAVANCORE COCOTUFT PVT LTD, KERALA.

Travancore Cocotuft is a leading player in the coir industry, founded as an Indo-German joint venture. Specializing in the manufacturing of Tufted Coir Mats, Woven Jute Rugs, and Moulded Rubber/ Polypropylene Mats, the company has grown to become India's largest exporter of doormats, shipping over 2,500 container loads to 85+ countries. Originating from a coir exporting business founded in 1917 by Mr. Velayudhan in Alleppey, the company now stands as a 50-million-dollar group, spanning five generations of family leadership.

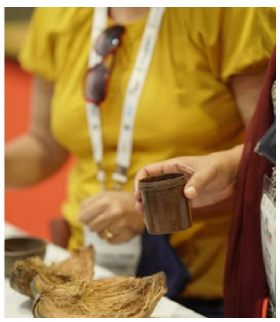
SAAMY COIR PRODUCTS, TAMILNADU.

Saamy Coir Products is a leading manufacturer, exporter, and supplier of cocopeat from Tamilnadu, India, with over 20 years of experience in coconut and coir products. As a second-generation family business established in 2000, we are committed to guaranteeing high quality and best-of-its-class products by strictly controlling the production process in our factories. We are a registered member of The Coir Board of India, the Federation of Indian Export Organisations (FIEO), approved by the Government of India, and an ISO 9001:2015 Certified Company. Our offices are located in India and the USA, and we utilize the latest machinery and technologies along with high-quality raw materials to produce various blends of coir products. Additionally, we have a 3.5 lakh square feet concrete yard for drying to prevent foreign material contamination.

STARTUP: GREENAMOR, KOCHI.

At Greenamor, we believe that the future of packaging lies in sustainability. As stewards of the environment, it's our responsibility to innovate and provide eco-friendly packaging solutions that not only preserve our planet but also meet the stringent demands of the cosmetic, food, and pharmaceutical industries. Our goal is to create eco-friendly packaging that will definitely meet your industrial standards and also helps to preserve our planet. Through extensive research and development, we've crafted environmentally friendly options of compostable containers from waste fibre. Join our mission and let's lead the way to sustainability.

Greenamor is taking its initial strides towards sustainability through the development of eco-friendly cosmetic containers. However, our dedicated R&D team is actively seeking opportunities to revolutionize in the field of pharmaceuticals, toys, hospitality, and jewelry packaging in the near future.



STARTUP: GO DO GOOD, PUNE.

Go Do Good provides custom sustainable packaging solutions to quality & price-conscious individuals and businesses. Acting as a direct replacement for bubble wrap, The Good Bubble Wrap is made from agricultural waste materials like coconut coir and wool waste which offer excellent cushioning properties for fragile products. To source this material, we work with various farmer communities at a grassroots level for ethical sourcing. The Good Bubble Wrap is 100% biodegradable and home-compostable, hence acting as a perfect eco-friendly solution for breakages in logistics.

- 6x higher impact protection
- Reduces manual labour
- Enhances unboxing experience

COIR INDUSTRY NEEDS

TECHNOLOGY NEEDS OF THE INDUSTRY:

The technology needed for the coir industry focuses on developing advanced machinery and control systems to produce high-quality coir yarn with consistent thickness and minimal hairiness. To achieve this, there is a need for innovation in spinning technologies and automated control systems that enhance yarn uniformity and quality. Such advancements will help improve production efficiency, product consistency, and market competitiveness, ultimately supporting the industry's growth and sustainability.

There is a significant need in the coir industry for advanced drying solutions that utilize renewable energy. Traditional open-air drying methods are heavily dependent on weather conditions, which can lead to inconsistent drying times and variability in product quality. By implementing dryers that operate on renewable energy sources, the industry can create a more controlled and stable drying environment, ensuring uniform moisture levels in coir and coir pith products. This would not only enhance the consistency and quality of the products but also reduce production delays caused by unfavorable weather. Moreover, adopting quick, reliable, and sustainable drying technologies would lower energy consumption, reduce carbon footprints, and contribute to the overall sustainability of coir production, aligning with global environmental goals and improving the industry's competitiveness.

MARKET DEVELOPMENT NEED OF THE INDUSTRY

STRATEGIES FOR MARKET EXPANSION, BRANDING, AND MARKETING

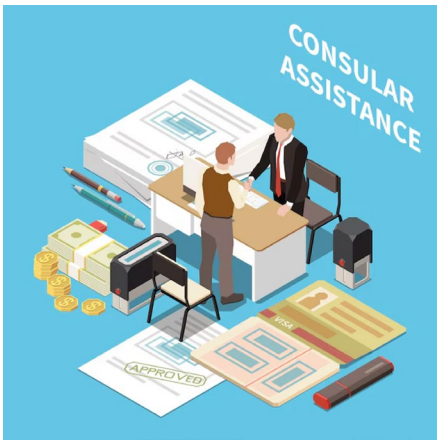
To successfully expand into new markets, the company needs to develop robust strategies that focus on identifying and targeting potential market segments. This includes creating strong branding initiatives to position coir products as sustainable, eco-friendly alternatives to synthetic materials. Effective marketing campaigns should be tailored to highlight the unique benefits of coir, such as its biodegradability, durability, and versatility, appealing to both environmental and quality-conscious consumers. The emerging and aspiring entrepreneur requires training, mentoring and support for their marketing and branding exercise.

ACCESS TO INTERNATIONAL MARKETS

The coir industry must work towards improving access to international markets by meeting global quality standards and obtaining necessary certifications, such as ISO and eco-labels. Building strategic trade partnerships and participating in international trade fairs and exhibitions can help establish a global presence. Additionally, navigating export regulations and reducing tariffs can make coir products more competitive in the international market.

CONSUMER AWARENESS:

Raising consumer awareness about the benefits of coir products is crucial for driving demand. This can be achieved through educational campaigns, workshops, and demonstrations that showcase the environmental benefits and multiple uses of coir products. Collaborating with influencers, environmental organizations, and industry stakeholders can also help amplify the message and reach a broader audience.



POLICY SUPPORT

The industry needs to advocate for favorable policies and government support to enhance competitiveness. This includes seeking subsidies for sustainable practices, tax incentives for eco-friendly production, and grants for research and development. Engaging with policymakers to create supportive frameworks can encourage the adoption of coir products both domestically and internationally.

TRADEMARK PROTECTION

Establishing and protecting trademarks is essential for securing brand identity and ensuring the authenticity of coir products in the market. This involves registering trademarks in key markets and actively monitoring for infringement to prevent counterfeit products from undermining the brand's reputation. Protecting intellectual property rights is also crucial for fostering innovation and maintaining a competitive edge in the market.

RESEARCH AND DEVELOPMENT NEEDS

The R&D in the coir industry should prioritize developing applications that can be quickly brought to market, such as sustainable building materials, automotive components, and agricultural products like biodegradable grow bags and mulches. Efforts should also focus on enhancing coir-based consumer goods and packaging solutions, replacing synthetic materials with coir to reduce environmental impact. By optimizing production processes and improving product quality, the industry can meet the immediate demand for eco-friendly alternatives while boosting economic returns.

However, for long-term success, R&D should explore more advanced and innovative uses of coir, such as in energy storage technologies like supercapacitors, which leverage the carbon-rich properties of coir fibers. There should also be a focus on biomedical applications, where coir's natural antimicrobial and biodegradable characteristics can be utilized for medical implants and wound dressings. Additionally, the development of high-performance textiles and composites, through advanced processing and blending techniques, can open new markets and applications.

Long-term research should aim to create new, high-value coir products that push the boundaries of current technology, ensuring the industry's sustainability and global competitiveness in the future.

SUCCESS OF SCHEME OF FUND FOR REGENERATION OF TRADITIONAL INDUSTRIES (SFURTI)

The coir industry faces a complex challenge. Outdated technology and a lack of skilled workers create a vicious cycle. Traditional methods, while valuable, lead to an aging workforce less interested in innovation. Furthermore, outdated technology and fragmented supply chains, characterized by decentralized processing and weak connections between stakeholders, lead to inconsistent prices. This inefficiency prevents economies of scale, further discouraging investment in modern technology and skill development. The lack of a skilled and innovative workforce, coupled with a fragmented and inefficient supply chain, ultimately hinders the overall effectiveness and competitiveness of the coir industry.

- Outdated technology
- Aging workforce
- Lack of skilled workers
- Fragmented supply chains
- Inconsistent prices
- Lack of innovation

To address these challenges, Scheme Of Fund For Regeneration Of Traditional Industries (SFURTI) was launched in 2005 by the Ministry of MSME. It aims to revitalize traditional industries like coir. It envisions a multi-pronged approach to enhance competitiveness through market focus, productivity improvements, and profitability.

The scheme, managed by the Coir Board, establishes Common Facility Centers within clusters to provide modern technology and infrastructure. To encourage innovation, Product Development and Design Intervention Centers foster the creation of new and improved coir products. Market promotion efforts and dedicated outlets within clusters aim to increase consumer awareness and improve access to coir products. Overall, the SFURTI scheme seeks to develop clusters, strengthen local governance with stakeholder participation, and bridge the gap between traditional skills and modern advancements, ultimately leading to the regeneration of the coir industry and creation of sustainable employment opportunities.

The SFURTI scheme directly addresses several challenges of the coir industry by establishing Common Facility Centers (CFCs) within clusters. The CFCs are equipped with modern technology, potentially attracting a younger workforce and reducing reliance on outdated methods. Cluster development fosters collaboration, improving supply chain efficiency and reducing price inconsistencies. Product Development and Design Intervention Centers directly address the innovation gap by encouraging creation of new, high-value coir products. This multi-pronged approach, encompassing infrastructure development, skill development, innovation, and market promotion, contributes to an overall improvement in the industry's effectiveness and competitiveness. The economies of scale achieved through cluster development has supported lower production costs and more competitive pricing The SFURTI has successfully developed 40 clusters across the country. Tamil Nadu and Karnataka attracted the majority of the cluster. Although successful in solving multiple problems of the industry such, the implementation of only 40 CFCs in 18+years is quite slow. It is ripe time to identify potential states for further implementation of more CFCs.

STATE	NAME OF THE CLUSTER	No of Clusters
Karnataka	Tumkur, Kumta, Haralakatta, Javagal, Cheluru, Kadaluru, Korategere, Sri Gavi Ranganatha Swamy	8
Kerala	Neyattinkara, Balusseri, Haripad, Ambalapuzha	4
Gujarat	Samvedana, Tarapur	2
Maharashtra	Pendur, Sawantavadi	2
Tamil Nadu	Dindigul, Kangayam (Thirupur), Palladam, Thirunelveli Salem Consortium (Mettur), Dharmapuri Coir Cluster, Madurai Coir Cluster, Pollachi Coir Cluster, Ethamozhy, Krishnagiri, Pakkam, Kongu, Mannargudi, Salem (Omalur)	14
Andhra Pradesh	Vizianagaram, Kadiyapulanka, Amalapuram	3
Odisha	Bhograi, Konark, Rajkanika, Raghunath, Radharani	5
West Bengal	PurbaBardhaman	1
UT of Andaman	Andaman	1
	TOTAL NUMBER OF CLUSTER	**40**

STRATEGIC RECOMMENDATIONS FOR THE COIR INDUSTRY

INFRASTRUCTURE DEVELOPMENT

Establish dedicated husk collection centers across coconut-producing regions to increase the utilization of raw materials and enhance the overall supply chain efficiency for coir production.

INCENTIVE AND SUBSIDY SCHEMES

Introduce incentive schemes to boost the export of coir products, along with subsidies specifically targeted at promoting the novel coir products. This can encourage more investments and innovation in coir-based products, making them more competitive globally.

GOVERNMENT PROCUREMENT POLICY

A clear procurement policy that encourages government and public sectors to use coir products is to be mandated. This could involve setting targets for coir usage in various applications, thereby ensuring steady demand and supporting local producers

ESTABLISHMENT OF STANDARDS

Develop and enforce standardized codes for products like Coir Geotextiles, Coir Wood, and other coir-based materials. This will help build trust among consumers and facilitate broader adoption of these products in various industries.

ENHANCED MARKETING AND AWARENESS

Increase publicity for new-generation coir products such as horticultural items, geotextiles, and coir wood. Greater awareness can be achieved through participation in international exhibitions, targeted marketing campaigns, and leveraging foreign embassies to promote coir in new markets.

TRAINING AND DEVELOPMENT PROGRAMS

Organize more training programs for new coir entrepreneurs across different regions to build capacity and innovation in the industry. This will help in nurturing new talent and spreading knowledge about advanced coir production techniques

WORKFORCE WELFARE SCHEMES

Introduce special welfare schemes for coir workers to retain and attract new talent to the industry. This could include health benefits, educational programs, and financial incentives to ensure a stable and motivated workforce.

FINANCIAL SUPPORT AND CREDIT FACILITIES

Implement an interest subsidy scheme for bank loans to large-scale coir producers and exporters, along with a structured credit plan to support the establishment of new coir units. Aimed at encouraging industry growth, these financial aids should be accompanied by annual export targets to stimulate continuous improvement and expansion.

STAKEHOLDER ENGAGEMENT AND INNOVATION

Foster a sense of commitment and responsibility among industry stakeholders to maintain high-quality production standards and to continuously innovate. Regular consultations with importing countries, industry experts, and consumers can help understand evolving market demands and align product development accordingly.

CONCLUSION AND WAY FORWARD

The coir industry is a vital segment of India's MSME sector, playing a significant role in employment generation and socio-economic development. With its eco-friendly products and wide-ranging applications, coir offers sustainable solutions to pressing global environmental issues. To fully realize the potential of coir, there is a need for focused policy support that accelerates R&D, ensures quick and adequate funding, and empowers rural communities through improved infrastructure and training. By investing in these areas, the coir industry can enhance exports, contribute significantly to GDP growth, and promote sustainable development on a global scale.

Moving forward, the industry should prioritize innovation in coir applications, expand into new markets, and strengthen its domestic presence. By leveraging government schemes and enhancing awareness of coir's benefits, the sector can tap into new opportunities, ensuring its growth and sustainability. A concerted effort to enhance product quality, increase consumer awareness, and promote the environmental benefits of coir will be key to transforming the coir industry into a major economic contributor while fostering a greener planet.

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