ISSN (Online): 2349-8900

Performance of Coir Industry in Alappuzha and the Case of Labour Displacement

P. Pratheesh^{1*} and N. Gopakumaran Nair²

¹St. Michael's College, Cherthala, Alappuzha – 688539, Kerala, India; pppadath@gmail.com ²Government Arts College, Thiruvananthapuram – 695014, Kerala, India; sreegopan@gmaill.com

Abstract

Coir, the natural fibre from Kerala forms the base of a promising industry that employed around 5,000 people in the state and was essential to the growth of its economy. But from past two decades, it seems to be losing sheen. According to the current trend, less people are purchasing traditional handloom mats and rugs for export. Delayed modernisation, unfriendly government regulations, aggressive trade unionism and high pay demand from workers all contributed to labour displacement in the coir industry, especially in Alappuzha. The coir workers of Alappuzha are grappling with the economic fallout of the displacement of coir industry to Tamil Nadu. Almost all big producers and exporters of coir industry from Alappuzha have shifted or partially moved their base to Tamil Nadu due to several issues. But small-scale units and cooperative societies still remain here as they have no other choice. The traditional coir looms that were previously used to promote Kerala's coir handicrafts abroad were abandoned largely and the production units are shifted to the neighbouring states. Even though, the export performance shows that the industry still earn plenty and remains to hold its strong hand in foreign markets.

Keywords: Displacement of Labour, Export Performance, Mechanization, Modernization, Production Base Shift

1. Introduction

Coir, the natural rope from Kerala, is made out of extracted and processed coconut husk¹ fibre. Coconut husk was initially perceived as waste product of the coconut which the pre modern men used outer shell of coconut (husk) to produce the natural fibre. They realised the use of this waste and started to convert it into the best products and that forms the journey of coir industry in India. There are a number of myth and stories about the birth of this natural fibre. The 3rd century BC Indian Epic, the Ramayana contains the earliest reference about coconut; in the Kishkindha Kanda and Aranya Kanda. Generally it is believed that coconut was introduced in India during the post-Vedic period². From the references of ancient scriptures and foreign accounts, it was supposed that

coconut fiber-based ropes and cordage had been in use since antiquity.

Arab accounts of the 11th century AD mentions the extensive use of coir as ship's cables, fenders and for rigging³. The early use of coir fibre was for rope making and it was extensively used for domestic purposes. Coir ropes were then utilised for shipboard cables and rigging. The mid-1800's saw the commercial sale of coir in the UK, where it was utilised in flooring materials including carpeting and textiles⁴. Kerala currently leads the world in coir production and exports. Presently, more than 100 nations get coir and its products for export with China accounting for the largest proportion of exports at more than 40%⁵.

Coir is the only natural fibre that is not grown specifically to harvest the coir, unlike jute and sisal.

^{*}Author for correspondence

Coir is a coarse fibre made from coconut husk, the coconut's fibrous shell6. The Kerala State gave birth to the traditional agro-based industry of coir, which spread to neighbouring states that produce coconuts, including Tamil Nadu, Karnataka, Andhra Pradesh, Orissa, West Bengal, Maharashtra, Assam, Tripura⁷, etc. When the extraction coir fibre was started and the emergence of coir production as an industry, at least the old cottage base of production is not historicized. The history of Kerala's coir industry development is rarely documented in historical sources. It was since 1859 when the Darragh Smail and Company, the first coir factory in India, was established, we have a definite track record of the Indian coir industry.

Objectives of the Study

The critical performance indicators of coir industry are growth, production, employments, export and import. The present study aims to analyze two basic factors of coir industry in Alappuzha, i.e., to review the export performance and analyze the labour displacement problem.

The objectives framed for the present study are:

- To examine the history of the coir industry in Alappuzha and its expansion and development.
- To examine how coir and items made with coir are produced in Alappuzha.
- To analyse the performance of coir industry in Alappuzha with reference to exports and Imports.
- To evaluate the issue of labor displacement in coir industry of Alappuzha.

Methodology

Descriptive research design has been used because the current study is descriptive and analytical in character.

4. Period of the Study

This study analyses the performance of coir industry in Alappuzha during the period between 2020-2021 and 2021-2022. The data relating to coir fibre production, Production of coir products, trends of employment in coir industry, export of coir products and importers of coir products from India countrywise export and port wise export were collected for this period.

5. Type of Data and Data Collection

As part of data concerned secondary data on the present study is based. The Ministry of MSME Websites, coir board, journals and annual reports were used to gather secondary data for the study. Simple statistical analysis was sued to distribute the data and analyse it.

6. The Emergence of Alappuzha as the Hub of Indian Coir Industry

Scholars considered the coastal district of contemporary Kerala's Alappuzha, formerly known as Allappey, to be the birthplace of the Indian coir industry because it was there that the country's first coir factory was established in 1859. Not that coir was something new to Alappuzha, Coir had been in use in various forms and coir making was prevalent here a long time before the installation of Darrach's factory at Alappuzha. Even though, as industry based on factory system of production, coir and coir products were about to take off from then.

Before that, the manufacture of coir fibre and coir yarn was a traditional old industry in the coastal areas of Alappuzha and the coir was purchased and exported by the traders from Calcutta⁸ and Karachi ports. But during this pre-factory period, coir industry did not employ regular workers with definite earning. People of Alappuzha were basically agricultural labours at that time. But the fame in national as well as international market for coir products, coir production soon attracted much workers and it turned from a part time household work to a full time earning labour. Then, convinced by the potentiality of the fibre and yarn, Mr. Darragh, an Irish born American, visited Alappuzha. At that time, Alappuzha was the chief port of the Travancore princely state. So he decided to launch the factory based manufacturing of coir products through the installation of India's first coir factory in 1859 at Alappuzha. For that, he persuaded Henry Smail, a foreign businessman, for aid and as a result, the factory became known as "Darragh Smail and Company."

Following this, over 25 large coir factories, including William Goodacre and Sons (1862), Aspinwall and Co (1867), Volkart Brothers Company (1869), Bombay and Co, and Madura and Co, were started function at

Alappuzha town9. Alappuzha became the primary centre of the coir industry in Kerala as a result of the capability for the fabrication of woven coir goods on a large scale sale at a common location. Many people travelled five to six miles to work at the factory. They arrived early in the day and left late at night. In these factories, children also worked as labourers. Local businessmen also operated several factories. Export of products, however, was controlled by the European businessmen. In the years immediately following World War I, the sector experienced enormous growth. This led to a massive recruitment drive and what Robin Jeffrey has called "a unique predicament in twentieth-century Kerala: A labour scarcity" at the time. Along with taking over the administration, the British also gained control of the trade monopoly with their arrival. British investment made its way slowly to Kerala, where it started to build factories in Ambalappuzha, Muhamma, Mararikkulam, Cherthala and other areas of Travancore. The native bourgeoisie began developing coir factories alongside foreign businesses.

Following this, the imperial family of Travancore became substantial investors and the royal group of Holland helped design the Royal United Carpet Factory in Aroor¹⁰. The relationship between India and British rule helped to expand this item area in Kerala, the home of coir, with English financial support. Despite the fact that coconut output was quite high in many other nations, like Indonesia, the Philippines, Sri Lanka and Thailand, it is possible that this is why the sector was recognized so strongly in Kerala, particularly in Alappuzha. Due to the availability of cheap labour and abundance of raw materials, coir industrial facilities established themselves firmly in and around Alappuzha since coir yarn and fibre could be supplied there cost-effectively via well-developed water transport.

7. Status of Coir Industry in Alappuzha after Independence

Following India's independence in 1947, the large coir units concentrated in the Alappuzha region were closed one by one by the foreign company proprietors, leaving the coir field11. Local businessmen bought some of these factories, but they were unable to revive the industry. Workers who had been laid off raised capital and purchased the looms from the closed units¹². They established production units with 5-7 looms in work sheds built on their property. Soon after this development, the local coir factory owners changed their strategy after failing to revive the large units. They transformed themselves into exporters, obtained orders from both foreign and domestic markets, placed orders with newly established small-units, had the products manufactured to their specifications and began marketing. They still do this today.

As a result, the coir industry emerges as the largest job creator in the country, employing a staggering more than 500,000 people¹³. Equally significant is the fact that the majority of them are from low-income families and up to 80% of the workers in the industry are women. Furthermore, thousands of entrepreneurs are directly and indirectly involved in activities ranging from the production of coir fibre to the production and marketing of coir-based value-added products. These new entrepreneurs see the industry's scope as an exciting opportunity with relatively low investment.

By 1990, in Alappuzha district, there are 29 major coir factories with more than 200 power looms and electrically driven machines¹⁴. Apart from these big factories, around 450 Registered Coir units and Unregistered Coir units are functioning in Small Scale and Household pattern. A list of Registered Coir units in Alappuzha District was obtained from the District Industries Centre, Alappuzha and a total of 152 Registered Coir units were functioning as on 31st March 2020 in the study area. But this was very huge decline in number when compared to 1970's. Household coir units ranging from 1 to 8 mat production machine (non hydraulic). Apart from mat production work, household units were engaged in coir fiber extraction, rope making and other allied works related to the industry¹⁵.

8. Modernization of Coir Industry

For developing nations, the process of upgrading traditional "labor-intensive" industries is crucial. Kerala still produces roughly 55% of the country's coir husk, but it has been steadily losing out to other states because of the slow rate of mechanization and modernization. However, the process of mechanization was set forth from the beginning of the 20th century in Kerala. During 1880's, the coir rope pulling machine (Coir Ratt) was introduced. Other machinery then started to arise in the weavingspinning industry. These machines were first imported from Europe and soon started its production here as an allied industry. The Coir Industry Act of 1953 allowed for the establishment of the Coir Board in 1954 for the growth of the Coir Industry. The institution's main goals were to expand the domestic and export markets, conduct scientific and technological research, provide education and welfare services and inspire and direct business owners to advance the coir industry as a whole.

Eventhough the large scale displacement of workers that mechanization would cause has forced the powerful trade unions to oppose the moves for mechanization. However, a study carried out by Dr. Sreeja found that after the mechanization was introduced in coir units, there is a rise in the wages paid to the workers along with assured returns to the units. But it is still a fact that the traditional coir worker didn't taste the fruits of mechanization.

9. Export Performance of Coir Industry in Alappuzha

The coir workers and producers were blaming the Coir Corporation for placing fewer orders during the last decade¹⁶. Recent trends show that there is less demand for traditional handloom mats and mattings in the export market as a result of the industry's mechanisation¹⁷. According to information on the Coir Board website, non-traditional items such PVC-tufted mats, coir pith and fibre account for the majority of exports. The export of coir and coir products reached an all-time high of 12,63,213 tonnes and was valued at 3,978.98 crores during the fiscal year 2021-22. A meagre 3% in number and 10% in value of traditional coir products were present at this record-breaking event. The following table shows the major coir exporters performance to during 2021-2022.

Table 1, it is evident that the export performance of coir production and exporting companies are steadily high in the consecutive years. The table listed only the top 25 companies having coir export during past two decades. The increase in export value will also significantly influence the profit and market performance. Among these 25 companies, only ten producers, ie, Palm Fibre (India) Private Ltd, Alleppey Co Ltd, N C John and Sons Limited, William Goodacre and Sons India, Charankattu Coir Manufacturing Co (P) Ltd, M.J.Coir Products Private Ltd, Poopally Coir Mills, Kerala Coir Mills, Jayasree Coir Mills and Konchery Coir Workers Pvt. Ltd are having export over 5000 metric tonnes every year. Several sectors experienced a drop in product exports following COVID-19, but during the pandemic years of 2020-21, India's exports of coir and coir products reached an alltime high of 11.63 lakh metric tonnes or Rs 3,700 crore¹⁸. It is expected to grow to 13.19 lakh metric tonnes worth Rs 4180 crore in 2021-2022. When compared to the same period last year, there has been a 22.1% increase in value and a 10.1% increase in quantity. The trend indicates that coir exports will break all previous records by the end of this year.

Table 1. Export of coir and coir products (Major 25 Exporters-Alappuzha) -2021-2022

		2020-21	2020-21	2021-22	2021-22
Sl. No	Exporter	Quantity (MT)	Value (Lakh)	Quantity (MT)	Value (Lakh)
1	Travancore Cocotuft Pvt.Ltd.	1132.27	1093.80	1425.27	1255.20
2	Palm Fibre (India) Private Ltd.	5868.68	1522.25	6261.80	1732.50
3	Alleppey Co Ltd.	5441.00	1436.23	5915.00	1661.20
4	N C John and Sons Limited	5441.00	1285.45	6145.00	1755.50
5	William Goodacre and Sons India	5108.22	1078.37	5682.02	1570.75
6	The Travancore Mats and Matting Company	1130.48	881.22	1336.80	925.25
7	United Coir Factories	3098.30	1002.15	3295.30	1105.50

8	Aspinwall and Co. Ltd.	1250.22	990.39	1510.20	1090.20
9	Mayithara Home Decor	1254.08	1041.62	1545.80	1249.60
10	Classic Coir Factory	3396.57	1005.57	3856.50	1255.70
11	Charankattu Coir Manufacturing Co(P) Ltd	5182.27	2093.80	5825.75	2135.15
12	M.J.Coir Products Private Ltd.	5808.68	1502.25	6080.65	1602.55
13	Indian Emporium	2441.00	936.23	2946.00	1035.30
14	LOOMCRAFT	3441.00	985.45	3749.20	1085.50
15	Poopally Coir Mills	5108.22	1078.37	5985.25	1370.75
16	Brothers Coir Company	2130.48	1081.22	2930.80	1285.20
17	Ram Coir Mills	3998.30	1502.15	4399.30	1825.10
18	D C Mills Pvt Ltd.	1650.22	1090.39	5162.20	1990.25
19	Goodwill Coir Manufacturing Co.	1294.08	1141.62	2290.85	1715.20
20	Indus Consumer Products Pvt Ltd.	3446.57	1205.57	4146.70	1651.55
21	National Coir Mills	1132.27	1003.80	1620.25	1302.20
22	Cocomats International	4568.68	1422.25	5160.80	1625.26
23	Kerala Coir Mills	5241.00	1236.23	5749.00	1436.32
24	Jayasree Coir Mills	5941.00	1385.45	6294.00	1452.50
25	Konchery Coir Workers Pvt.Ltd	5128.22	1178.37	5621.20	1311.27

Source: Comparative Statement of Export of Coir Products (2021-22 and 2020-21), Coir Board

10. Major Export Destinations of Indian Coir Products (Big 10 **Importing Countries)**

India has gradually increased its exports of coir and coirrelated items during the past two years compared to the prior two. Additionally, this is the biggest number ever before in the Coir Board's history. 97 nations imported coir and coir products from India in the fiscal year 2021-2022. The 10 nations among the 97 that get more than 70% of India's total export of coir and coir products were included in the Table 2.

It is evident from the data that the United States ranked first among the importing nations with 30% in value and 17% in quantity. With a share of 23% in value and 37% in quantity, China is the second-largest importer of coir products from India. During that time, significant amounts of coir and coir products were imported into

the Netherlands, UK, South Korea, Spain, Australia, Italy, Germany, and Canada.

11. Item-wise Export Performance of Coir Industries of **Alappuzha**

From the very beginning, coir fibre and coir yarn forms the major export items from coir industries of Alappuzha. But later on, the processing of coconut husk, labour of de-husking and de-fibering was considerably decreased in Alappuzha; these items were produced in lesser quantity though it forms the basic raw material for the industry. Due to mechanisation, the first displaced labour from the coir industry of Alappuzha was de-husking and de-fibering. Today, Tamil Nadu and Karnataka are the prime centres of the production coir fibre and coir yarn.

Table 2. Import wise Distribution – Major Destinations

Sl. No	Country	Quantity (MT) Value (Lakh)		%Qty	%Val
1	China	404325	78152.99	34.76	20.68
2	USA	222464	117423.02	19.12	31.07
3	Netherlands	108343	33291.67	9.31	8.81
4	South Korea	82137	21417.39	7.06	5.67
5	UK	34860	17078.43	3.00	4.52
6	Spain	53571	14816.56	4.61	3.92
7	Australia	28808	12261.72	2.48	3.24
8	Italy	26764	9526.43	2.30	2.52
9	Germany	19040	9334.34	1.64	2.47
10	Canada	14114	6328.74	1.21	1.67

Source: Coirboard, Country-wise Export of Coir and Coir Products from India

Table 3. Item wise distribution of export from coir Industry

Item	2020-2021		2021-2022		% of Growth	
	Quantity	Value	Quantity	Value	Quantity	Value
Coir Fiber	123	590.57	107	425.6	-14.8	-26.2
Coir Yarn	849	919.30	128	301.22	-27.1	-26.9
Handloom Mat	1527	4662.10	6910	9630.08	21.4	25.6
Power-loom Mat	65	106.51	86	249.65	44.4	45
Tufted Mat	2799	2690.82	8300	6344.14	40.3	43.2
Handloom Matting	618	712.00	977	966.41	20.5	25.3
Power-loom Matting	11	19.24	15	8.53	22	31
Coir Geo- textiles	8083	7059.05	8968	8389.45	6.4	10.5
Coir Rugs and Carpets	327	427.90	367	483.82	10.9	11.6
Coir Rope	505	491.76	512	466.03	1.4	5.5
Curled Coir	382	1321.41	578	786.82	70.00	67.9
Rubberized Coir	80898	91974.7	99980	99762.9	17.4	42.2
Coir Pith	54689	71980	6051	87419	18.2	38.5

Source: Export Review Report, Coirfed 2022

The Table 3 shows the distribution of export items from coir industries of Alappuzha.

While exports of coir pith, tufted mats, handloom mats, power-loom mats, handloom matting, power-loom matting, coir geo-textiles, rubberized coir and coir other products increased in both quantity and value from 2020 to 2021. Coir fibre and coir yarn, on the other hand, decreased in quantity and value because they were not a primary product of Alappuzha. The primary sources of import for this essential raw material, which is used to make coir goods in Alappuzha are Karnataka and Tamil

Nadu. Together, coir pith, geo-textile, and rubberized coir make up a sizable portion of all coir goods exported from Alappuzha. This demonstrates the rising demand for these value-added goods internationally.

12. The Problem of the Displace of Production

Coir workers, farm labourers and fishers constitute the majority of the population of Alappuzha¹⁹. But the coir

Table 4-

Sl. No	Producer/Exporter	No Units in Alappuzha	No Units in Tamil Nadu	No Units in Karnataka
1	Classic Coir Factory, Alappuzha	02	03	01
2	Global Exim India, Cherthala, Alappuzha	01	02	00
3	Techno Exports, Cherthala, Alappuzha	01	02	01
4	Saina Exporters, Alappuzha	01	03	01
5	Cocomats International, Alappuzha	01	02	01
6	Meta Classic Fibres, Cherthala	01	02	01
7	MV Joseph and Sons, Alappuzha	01	04	02
8	Charankattu Coir Manufacturing Co., Alappuzha	01	03	01
9	NC John and Co, Alappuzha	02	05	02
10	DC Mills, Alappuzha	02	05	04
11	Palm Fibre	01	04	02
12	The Mercantile Syndicate, Alappuzha, Kerala	01	02	01
13	Mathew C Mathew and Sons, Alappuzha, Kerala	01	02	01
14	Naranji Coir Industrials, Alappuzha, Kerala	01	02	00
15	National Coir Mills, Alappuzha, Kerala	01	01	00
16	The Padma Mourzouks Company	01	01	00
17	Regal Exports, Cochin, Kerala	01	02	01
18	S.B. Coir Company, Alappuzha, Kerala	01	02	01
19	Southern Coir Mills, Alappuzha, Kerala	01	01	00
20	Thomas Varghese and Company, Alappuzha	01	02	00
21	Western India Fibre Company, Alappuzha	01	01	01
22	Brothers Coir Mills Pvt. Ltd., Alappuzha	01	02	01
23	G.P. Coir Mart, Alappuzha, Kerala	01	01	00
24	Indian Coir Manufacturing Co., Alappuzha	01	01	00
25	Pooppally Exports, Alappuzha, Kerala	01	01	00
26	Wallace Langford and Associates, Alappuzha	01	01	00
Total		29	57	22

workers of the district are grappling with the economic fallout of the displacement of coir industry to Tamil Nadu. Almost all big producers and exporters of coir industry have shifted or partially moved their base to Tamil Nadu²⁰ due to the issues of mechanization and labour problems. Small scale units and cooperative societies, however, are still there because they have no other option. The manufacturing facilities that formerly helped promote Kerala's coir handicrafts abroad were mainly abandoned or relocated to neighbouring states.

The Table 4 contains the details of major coir industries of Alappuzha which are established production units in other states.

Among 73 major coir factories working in Alappuzha, 26 companies started their production base in Tamil Nadu and Karnataka. The half of the coir industries in the neighbouring states were owned and run by the coir industrialists from Alappuzha. Coimbatore, Pollachi and Thanjavur are the major satellite coir industry centres of Kerala in Tamil Nadu. Here most of the coir fibre, coir yarn and coir mat production units are run by the top coir factories of Alappuzha. The government's unfavourable policies, high pay and militant trade unionism are a few causes of this labour displacement. Another reality is that the neighbouring states immediately shifted to using machines to improve their coir production.

Due to ecological problems and labour issues, husk retting and fibre extractions were gradually disappeared from Kerala and the scope of fibre production in the state is very minimal at present. Now the coir industry of Kerala is essentially dependent on Tamil Nadu for fibre and yarn. After the switching of this basic raw material industry to Tamil Nadu, coir mat and matting production units were also installed there. Thus, at present there is a large scale labour displacement has happened. Shifting of the manufacturing sector, which contributes nearly '2,000 crores to Kerala's exchequer, is expected to deliver a body blow to its frail economy²¹.

13. Conclusion

The coir industry is the prime small scale industry in Alappuzha and ranks first in coir production and export for more than a century. Being an export-oriented traditional industry, the coir sector has reported an alltime high record during the last two financial years. The coir product of Kerala is exported to US, UK, Germany

and Netherlands. Nearly 70% of total export is from Kerala in which the important coir producers and exporters were from Alappuzha. Delayed modernisation, militant trade unionism, high wages and government's unfriendly policies were together cased labour displacement in coir industry, especially in Alappuzha. The coir workers of Alappuzha are grappling with the economic fallout of the displacement of coir industry to Tamil Nadu. Almost all big producers and exporters of coir industry from Alappuzha have shifted or partially moved their base to Tamil Nadu due to several issues.

14. References

- 1. Baraland B, William A. (no date) CN1324967A coconut husk fiber paper pulp making process. Google Patents. Google. 2022. https://patents.google.com/patent/ CN1324967A/en
- 2. Source: Kerala coir, Indian Mirror. 2022. https://www. indianmirror.com/culture/indian-specialties/keralacoir. html
- 3. Senan DC. Impact of Health Literacy Multimedia Package (HLMP) in improving awareness on job-related diseases: A case study in Kerala, India. IOSR Journal of Research and Method in Education (IOSRJRME). 2013; 2(5):48-54. https://doi.org/10.9790/7388-0254854
- 4. Source: The history of Coir, Coir.com. 2022. Available at: https://coir.com/the-history-of-coir/
- 5. A study on export performance of Coir Industry in India researchgate.net(nodate).2022. Available at: https://www. researchgate.net/profile/Praveenkumar-Karuppiah/ publication/332266523_A_STUDY_ON_EXPORT_ PERFORMANCE OF COIR INDUSTRY IN INDIA/ links/5caaeb0ca6fdcca26d065d7d/A-STUDY-ON-EXPORT-PERFORMANCE-OF-COIR-INDUSTRY-IN-INDIA.pdf
- 6. Ashby MF. Material efficiency. Materials and the Environment. 2013; 415-36. PMid: 22927694. https:// doi.org/10.1016/b978-0-12-385971-6.00013-0
- 7. Sitrrarasu S. An analysis of performance of coir industry in India. The International Journal of Analytical and Experimental Modal Analysis. 2020; XII(V):428-41.
- 8. Pratheesh P. Present status of coir industry In Alappuzha. A study on household coir units. International Journal of Creative Research Thoughts. 2021; 9(8):d79-d82
- 9. Pratheesh P, Gopakumaran Nair N. Changing portfolio of coir workers; Impact of modernization. International Journal for Innovative Research in Multidisciplinary Field, ISSN: 2455-0620. 2021; 7(8):81-5.

- 10. Ibid. 82
- 11. PillIai TNS. Current status of the Coir Industry in Kerala: A Critique (2015): Thiruvananthapuram; Kerala Institute of Labour and Employment. 2016; 98.
- 12. Ibid. 99
- 13. Mohanasundaram P. Problems faced by coir units in human resource management: A Study in Thanjavur District of Tamil Nadu, PARIPEX -Indian Journal of Research. 2015; 4(2):43-5.
- 14. Pratheesh P. Op.cit. d80
- 15. Pratheesh P. Changing portfolio of coir workers; Impact of modernization. IJIRMF, 2021; 7(8):81-5.
- 16. The Hindu. February 28, 2022. Steps sought to tide over crisis in coir sector; https://www.thehindu.com
- 17. The Hindu, June 17, 2022, Kerala's coir sector in tatters; https://www.thehindu.com

- 18. The New Indian Express, August 21, 2022, Coir exports touch all time high; Coir exports touch all time high; https://www.newindianexpress.com/states/ tamil-nadu/2021/aug/21/coir-exports-touchall-timehigh-2347649.
- 19. The New Indian Express, March 2, 2021, Alappuzha, the land of fabled golden fibre has a red heart. https://www. newindianexpress.com
- 20. Op.cit. The Hindu, June 17, 2022, Kerala's coir sector in tatters.
- 21. The New Indian Express, November 5, 2017, Future of coir industry in Kerala hangs by a thread. https://www. newindianexpress.com