



The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.



Socio-Economic Status of Coir Co-operative Societies Worker: A Case of East and West -Godavari Districts of Andhra Pradesh

G. Nagaraja^{1*}

¹*Department of Economics, Andhra University, Visakhapatnam, India.*

Author's contribution

The sole author designed, analyzed and interpreted and prepared the manuscript.

Article Information

DOI: 10.9734/AJAEES/2016/22916

Editor(s):

(1) Rana Ozen Kutanas, Sakarya University, Esentepe Campus, Health Management Department, Turkey.

Reviewers:

(1) Bergaoui Ridha, National Institute of Agronomy, Tunisia.

(2) Diana Bilkova, University of Economics, Prague, Czech Republic.

Complete Peer review History: <http://sciencedomain.org/review-history/12757>

Case Study

Received 4th November 2015
Accepted 7th December 2015
Published 22nd December 2015

ABSTRACT

Aims: The paper examines socio economic status of coir industry workers. The Coir Industry is one of the most important traditional small enterprises in India which provides employment to about 7 lakhs persons of whom a majority is from rural areas belonging to the economically weaker sections of society. Nearly 80% of the coir workers in the fibre extraction and spinning sectors are women. The Coir industry earns foreign exchange to the tune of Rs. 1425.77 crores in 2013-14 (Coir Board, Annual Report, 2013-14). The Development of Coir Industry has taken place in areas where there is concentration of coconut cultivation and availability of coconut husks. The major coconut growing states and union territories include Kerala, Tamil Nadu, Andhra Pradesh, Karnataka, Maharashtra, Goa, Orissa, Assam, Andaman and Nicobar, Lakshadweep, Pondicherry etc. The study highlighted the socio economic status of coir industry workers in two selected district of Andhra Pradesh namely East and West Godavari District.

Study Design: Random sample method.

Place and Duration of Study: Two Districts of Andhra Pradesh state i.e., East and West Godavari District.

*Corresponding author: E-mail: nagarajag918@gmail.com;

Methodology: The study used primary data collected from 1000 coir industries workers,
Objectives: The important objectives of the study are to study the working conditions of workers in coir industries, to analyze the income and expenditure pattern of workers in coir industries, to analyze the problems of workers of coir industries, to identify the living conditions of workers of coir industries in two Districts.
Results: The study area coir industries workers socio-economic status pathetic conditions. Central and state government should take necessary policy measures to improve the status of this industry workers.
Conclusion: It was recommended that government should fix the minimum wage system in order to cater the needs of the workers, government should provide bonus to the workers regularly provide necessary working facilities to the workers in the working hours.

Keywords: Coir fibre; agro-based; socio-economic status; coir co-operative societies.

1. INTRODUCTION

Coir industry is one of the traditional agro- based cottage industries concentrated in the coconut producing states in the country. Coir, the golden clean fibre extracted from the fibrous husk covering the inner shell of the coconut, is the raw material for coir industry. The industry is important for the country, as it provides direct employment to more than half a million people and indirect sustenance to an equal or more number. India is the largest coir producer in the world accounting for more than 80 per cent of the total world production of coir fibre. The coir sector in India is very diverse and involves households, co-operatives, NGOs, manufacturers and exporters. This is the best example of producing beautiful artefacts, handicrafts and utility products from coconut husks which is otherwise a waste.

During the early days of Indian independence Indian coir industry met with crisis which led to unemployment and consequent wage loss to the coir workers. In the post independence period it passed through significant changes as the government took many policy prescriptions to protect the coir workers which have been a socio-political issue in Andhra Pradesh during 50's. The introduction of the Coir Development Scheme by the government of Andhra Pradesh during 1950-51 the coir industry was reorganized under cooperative lines with the major objective of providing more days of employment and adequate wages to workers as it had turned out to be the social responsibility of the government at that time. Since then, the government has been spending considerable amount of its resources to support the coir co-operatives to ensure employment and wage to workers to achieve its prime objectives. In spite of these governmental interventions, the productivity

performance of coir co-operatives revealed a dismal performance. Then the question is whether these governmental interventions have made any impact on the well being of the coir worker households and to answer this, an attempt is made to discuss the socio-economic profile of the coir workers households using deprivation indices.

2. REVIEW OF LITERATURE

Alexander [1], unveiled the economic and social importance of coir industry in India. According to him no cottage industry in Kerala engages so many people in manufacture and trade as in coir industry. Shamanarayan in his study [2] highlighted the role of Coir Board in the development of the industry particularly in export trade, restrictions in foreign trade, its impact, role of agencies in the foreign trade and their problems are analysed with due emphasis on developing a strong export market for the product. V.O.Varkey's [3] Doctoral thesis was a detailed study of the Coir Co-operatives with special reference to Primary Coir Vyavasaya Co-operatives. The study made an attempt to analyse the organization and development of Coir Co-operatives, the working of coir co-operatives operating at different stages, the role played by different developmental agencies, besides studying in particular the problems and working of primary Coir Vyavasaya Co-operatives. The socio-economic profile of the coir workers in both co-operative and private sector were also analysed in his study. Robin [4] in his article narrates the historical background of coir industry, features of labour movement in this sector of Kerala state etc. The article throws light on the caste system that prevails in the Kerala society and how it decays the society and the coir workers. The role and influence of 'moopan' among coir workers is also touched in the article.

He also tries to link the labour movement (their militancy and stamina) in coir industry with Punnapra- Vayalar Revolt in 1946 in Kerala. N. MenonMadhava [5] conducted a study on Coir Mat Weaving Industry in Kerala. The study has examined the growth of the development system its child the new putting out system of production and the organization chains in Domestic Small Scale Coir Mat Weaving Sector, the study attempted to analyse the rationales of such a system, the factors encouraged it and its consequences. It had also examined the emergence the structure, the working and the failure of the small scale producers coir mats societies. The study found out that the organization of production in the coir mats weaving sector changed through the policy out system of production due to the emergence of depot owners which was unfavorable to the weakers and small scale producers in the sector. Ajith Kumar [6], in his work states that coir yarn is the chief item of consumption within the country which is marketed by private traders. According to him domestic market for coir goods has not fully been exploited, particularly for door mats and mattings. Therefore along with the intensification effort for expanding export market for coir goods, efforts should also be made to strengthen the domestic market for withstanding the stress and strain of a fluctuating export market. Pillai [7], in his article, while explaining various measures taken by the central and state governments for the development of coir industry and coir societies, reminds that 85 percent of the coir products are marketed in the internal market and finds it very difficult to catch the external market. He also suggests to implement mechanisation in the husk beating sector and to try to reduce the workers of this sector. Gopalan Nair [8], while explaining the relevance of coir industry and coir co-operatives in Kerala finds out that the traditional decentralised nature of the coir industry was the major factor that retarded effective quality control. He also has given a brief picture of the technology improvement attempted by the Coir Board and observes that it was essential for reducing human drudgery to a great extent. He identifies that co-operatives are the best agency for effective transformation of results of research to the industry. Malik [9] examined the historical background of Coir Co-operatives in Kerala. According to him until the starting of coir development scheme during 1950-51 [10], there were no organised attempts made to stabilise and strengthen the industry. The industry was depending on the initiative, enterprise and financial resources of the private

industrialists. He found out that the weaknesses of central coir societies (not existing now) were due to the shortage of working capital and concluded with a suggestion that coir co-operatives should be strengthened in order to protect foreign exchange earnings and to prevent the throwing of workers out of employment.

2.1 Objectives of the Study

- To study the socio economic conditions of workers in Coir industries.
- To analyze the income and expenditure pattern of women workers in coir industries.
- To identify the living conditions of workers of Coir industries in East and West Godavari District.

3. METHODOLOGY

The study, a survey design, was carried out in East and West Godavari Districts of Andhra Pradesh. This study based on both primary and secondary data. Data for the study were primary data collected through a Random sampling method. For collecting relevant data from the respondents, an interview schedule was prepared considering the objectives in view. Personal Interview was conducted with all the 1000 respondents using interview schedule. For the purpose of collecting primary data with regard to the socioeconomic conditions of workers in coir industries. The prevailing data is termed as the secondary data. Secondary data were collected from books, journals, magazines, newspapers and published articles from leading journals.

4. SAMPLE DESIGN

Since the objective of the study is to find out the socioeconomic conditions of workers in Coir Industry in East and West Godavari District. The researcher has taken 1000 samples for the present study.

5. RESULTS AND DISCUSSION

The Socio-economic conditions of industry, In term of gender structure, female respondents were more than the male respondents with 55.6% of the respondents are female and 44.4% are males. The majority of respondents were between (Table 1) 30 to 45 years (41.9%). Large numbers of respondents were Malay ethnicity

(64%). Years of experiences vary among respondents and majority of them (77%) had more than 3 years of experiences before starting their own business.

The interesting to point that even now about 18% of the workers in the coir co-operatives are in the unproductive age group of above 60 years (Table 1). Of the total workers in the age group of above 60 years about 5.3% is women workers. This may be the result of unhealthy practices existing in the records maintenance of the coir co-operative societies like retaining the names of the workers who have already left the society. On enquiry, it was found that in certain societies women workers are allowed even now to continue on humanitarian grounds. At the same time, it is also true that in the manufacturing sector for weaving certain special variety products they engage experienced workers irrespective of their age since they have no new entrants to do such tedious job. It is also seen that among the workers younger age group below-30 years are found to be only 13.2% [11]. It may be inferred that the new generation in the coir worker households do not prefer coir work as their source of income. This may be due to its unattractive performance of the industry in giving regular employment and reasonable wages to its workers. Even then, women workers continued to be in the coir co-operative societies and do work for the society as they have certain other preferences which are discussed here under.

Education is the important social factor. The distribution coir industries' women workers on their educational qualification are presented in Table 1. It is clear from Table 1 that, 515 workers (51.5%) are qualified with middle school education, 275 workers (27.5%) are qualified with primary school education, 95 workers (9.5%) are qualified with high school education and 105 workers (10.5%) are illiterate. It is clear that majority of coir industry workers are qualified with middle school education [12].

Coir Industries workers daily wages refers to the wage obtained for the daily work in the industry (Table No 1). It shows that 125 workers (12.5%) have the daily wages below Rs. 150, 520 workers (52.0%) have the daily wages between Rs. 150 to Rs. 200, 175 workers (17.5%) have the daily wages between Rs. 200 to 300. 150 (15.%) have the daily wages between Rs. 300 to 400 and only 30 workers (10%) have the daily wages of above Rs. 500. It is clear that majority

of the coir industries workers have the daily wages between Rs. 150 to Rs.200. 77% of the households have annual income of Rs.20000/- and below. Income of 78% households is Rs.50000/- and below. The households earn income above Rs.50000/- is only 10% [13]. A detailed examination of the income level of households revealed that the households having high income is not accrued from the coir work alone but from other sources too. Households with income more than Rs.50000/- include even from foreign remittances of family members from abroad [14]. The analysis of annual income from coir work as a percentage to their total household income explored that 22% households alone is depended on coir work all others have earned income from other sources also (Table 1).

The coir industry workers were given reasons to continue in societies, stated that even though the coir work is not attractive in terms of employment and wages they prefer coir work on the following reasons; 31.7 % workers responded that they get job near to their dwelling 16.5% remarked that they have no other alternative employment in their area, 16.3% explained that the only skill they have is to make coir so they could not seek any other job, 15.4% told they that to support their family they need income, 11% aged workers told that they have no other option, and 5% responded that they can do coir work along with their engagements in home, 15.1% responded that they can do work leisure during work [15].

The various type of work performed by the coir industry workers are presented in the Table 3. It is clear from Table 3 that, 128 workers (12.8%) are directly engaging in retting of coir, 178 workers (17.8%) are engaging in spinning activities of coir, 8 workers (0.8%) are engaging in husk beating and 204 workers (20.4%) are engaging in coir fibre cleaning and 482 workers (48.2%) engaging other activities like loading transportation and other activities [16].

Experience makes a perception of work. It is clear from Table 4 that, 505 workers (50.5%) have been working in coir industries for the period of one to 3 years, 225 workers (22.5%) have been working in the industries for the period of three to five years, 165 workers (16.5%) have been working in industries for the period of five to seven years and only 105 workers (10.5%) have been working in the industries for above seven years [17].

Table 1. Classifications of coir workers (age, educational level, wages, income level)

		Frequency	Percentage
Gender	Male	556	55.6
	Female	444	44.4
Age Groups	Below- 30	132	13.2
	30-45	419	41.9
	45-60	269	26.9
	Above 60	180	18.0
Education Level	Illiterate	105	10.5
	Primary Level	275	27.5
	Middle School Level	515	51.5
	High school Level	95	9.5
	Degree and above	10	1.0
Wages	Below 150	125	12.5
	150-200	520	52.0
	200-300	175	17.5
	300-400	150	15.0
	500 and Above	30	3.0
Income Level of the Family	Below 10000	190	19.0
	10001-20000	580	58.0
	20001-30000	185	18.5
	30001-50000	38	3.8
	50001-100000	4	0.3
	Above 100000	3	0.4

Source: Survey data

Table 2. Reasons for continuing in coir co-operatives responses and percentages

Sl. no	Reasons	Districts		Total %
		East Godavari	West Godavari	
1	A	152 (47.94)	165 (52.05)	317 (31.7)
2	B	75 (45.45)	90 (54.54)	165 16.5
3	C	91 (55.82)	72 (44.17)	163 (16.3)
4	D	85 (55.19)	69 (44.80)	154 (15.4)
5	E	30 (60)	20 (40)	50 (5)
6	F	67 (44.37)	84 (55.62)	151 (15.1)
		500 (50)	500 (50)	1000 (100)

Source: Survey data, Notes: 1. In brackets percentages are given. 2. Reasons are coded as; A. Nearness to home, B. No other alternative job, C. No other job skill, D. Need some income, E. Age does not permit to go other job, F. Leisure during work

The coir industry workers face many problems. It is analyzed with the help of Garrett Ranking Technique (Table 5), majority of coir industry workers (Avg. Score 74.23) faced the problem of very low wages it attained first rank, second rank (Avg. Score 68.92) has been attained by long working hours, third rank (Avg. Score 61.25) has been attained by poor working conditions, fourth

rank (Avg. Score 55.12) has been attained by no Government support. It is clear that majority of the industry workers faced the problem of very low wages [18].

The Coir industry worker satisfaction depends on a working conditions and wages. The overall level of satisfaction of coir industry workers are

presented in the table 6. It shows that, 321 respondents (32.1%) level of satisfaction is moderate, 231 respondents (23.1%) level of satisfaction is very low, 287 respondents (28.7%) level of satisfaction is low and only 45 respondents (4.5%) level of satisfaction is high. It is clear that majority of coir industry workers are not satisfied with their work [19].

Table 3. Occupation wise workers

Sl. no	Occupation	No. of workers	Percent
1	Ratter	128	12.8
2	Spinner	178	17.8
3	Husk Beater	8	0.8
4	Fibre Cleaner	204	20.4
5	Others	482	48.2
Total		1000	100.0

Source: Survey data

Table 4. Experience of the workers

Sl. no	Experience	No. of workers	Percentage
1	Less than one year	190	19.0
2	One to Three years	315	31.5
3	Three to Five	225	22.5
4	Five to Seven	165	16.5
5	Above Seven	105	10.5
	Total	1000	100

Source: Survey data

Table 5. Problems faced by coir industry workers

Sl. no	Problems	Average (Garrett mean score)	Rank
1	Very Low Wages	74.23	I
2	Long Working Hours	68.92	II
3	No Government Support	55.12	IV
4	Poor Working Conditions	61.25	III

Source: Survey data

In the East Godavari district 380 respondents (76%) have awareness on health insurance scheme and only 120 respondents (24%) not have awareness on the schemes (Table 7). Likewise, in the West Godavari district 362 respondents (72.4%) have aware on the insurance scheme and 138 respondents (27.6 %) are not aware of health insurance scheme. It could be concluded that majority of the respondents are aware of health insurance

scheme and it is very interesting to note that equal number of respondents (258) in both the district are unaware of the health insurance schemes [20].

Table 6. Level of satisfaction

Sl. no	Level of satisfaction	No of respondents	Percentage
1	High Level Satisfied	45	4.5
2	Satisfied	116	11.6
3	Moderate	321	32.1
4	Low Level	231	23.1
5	Very Low Level	287	28.7
	Total	1000	100

Source: Survey data

Table 7. Awareness of health insurance scheme

Health insurance scheme	East Godavari	West Godavari	Total
Yes	380 (76)	362 (72.4)	742 (100)
No	120 (24)	138 (27.6)	258 (100)
Total	500 (100)	500 (100)	1000 (100)

Source: Survey data

The sources of energy especially electricity for lighting being one of the important indicators of human development presented in the Table 8. It is remarkable that in coir worker households 85% use electricity as a source of energy for lighting houses [21]. The remaining 15% is still use energy other than electricity. The coir worker households in East Godavari district some mandels are more backward and deprived in respect of sources of energy for lighting houses.

A study on the expenditure pattern of coir industry workers will throw light on their living conditions. The pattern of consumption expenditure determines the economic status of the people. The monthly expenditure pattern of the sample coir industry workers are given in the table. It is clear from Table 9, that, the monthly expenditure pattern of industry workers [22]. A large portion (73.08%) of the income is spent for food, 7.82% of the income spent for cloths, 6.21% of the income spent for education, 2.44% of the income spent for medicine and only 4.2% of the income spent for electrical and 6.25% of the income spent for other purpose. It is clear a large portion of income spent for food.

Table 8. Sources of energy for lighting of coir workers

Sl. no	Facility of lighting	Districts		Total
		East Godavari District	West Godavari District	
1	Electricity	420 (84)	430 (86)	850(85)
2	Kerosene	60 (12)	50(10)	110(11)
3	Solar	14(2.8)	12(2.4)	26(2.6)
4	Oil	0	0	0
5	Others	6(1.2)	8(1.6)	14(1.4)
6	All	500 (100)	500 (100)	1000(100)

*Source: Survey data***Table 9. Monthly expenditure pattern**

Sl. no	Item of expenditure		Average (1)	Percentage
1	Food	4800000	4800	73.08
2	Cloth	400000	400	7.82
3	Medicine	130000	130	2.44
4	Education	350000	350	6.21
5	Electrical	140000	140	4.2
6	Others	350000	350	6.25
	Total	6710000	6170	100

*Source: Survey data***Table 10. Housing status of coir worker households in percentage**

Sl. no	Level of housing	Districts		Total
		East Godavari District	West Godavari District	
1	Multi storied	10	6	8
2	Concrete	29	17	22
3	Tile	34	37	35
4	Sheeted	17	30	25
5	Thatched	10	10	10
6	All	100	100	100

Source: Survey data

The Table 10(above) shows that the coir worker households have multi-storied buildings though it is found to be only 8% and another 22% have concrete buildings [23]. On a detailed examination it was observed that people with better housing have their income shared from other sources also. Workers living in sheeted and thatched houses constitute 35% and these houses, according to the workers, were constructed with the assistance of local bodies and not from the income earned from coir work [24].

- 77% of the households have annual income of Rs. 20000/- and below.
- 50.5% workers have been working in coir industries for the period of one to 3 years.
- 128 workers (12.8%) are directly engaging in retting of coir, 178 workers (17.8%) are engaging in spinning activities of coir.
- In the East Godavari district 380 respondents (76%) have awareness on health insurance scheme and only 120 respondents (24%) not have awareness on the schemes.

6. SUMMARY AND FINDINGS

- Majority of coir worker daily wages between Rs. 150 and Rs. 200, 520 workers (52.0%).
- Majority of coir industry workers (Avg. Score 74.23) faced the problem of very low wages.

7. SUGGESTIONS

- The present study reveals about the socioeconomic condition of coir industry workers in East and West Godavari Districts. The researcher grasped up various problems of the workers and summed up-them.

- The government should fix the minimum wage system in order to cater the needs of the workers.
- The government should arrange education of workers so that, the workers get necessary information from these education. The government should give necessary training to the women workers to increase the efficiency of the workers.
- The Government should necessary take steps to ensure regular supply of electricity.
- The Coir industry may provide bonus to the workers regularly.
- Employee State Insurance Scheme can also be introduced for the welfare of the workers in the Coir industry.
- The Coir industry may provide necessary working facilities to the workers in the working hours.
- The industry should modify the wages system in order to meet the present condition of expense.
- The Coir industry may introduce Employee Provident Fund (EPF) facility to the women workers. The Coir industry may reduce the working hours because majority of workers feels that long working hour.

8. CONCLUSION

The study on socio-economic conditions of women workers in coir industries of East and West Godavari Districts brings out standard of living of workers, working condition and problems faced by the workers. During the early days of Indian independence Indian coir industry met with crisis which led to unemployment and consequent wage loss to the coir workers. In the post- independence period it passed through significant changes as the government took many policy prescriptions to protect the coir workers which have been a socio-political issue in Andhra Pradesh during 50's. The introduction of the Coir Development Scheme by the Government of Andhra Pradesh state in 1950-51 the coir industry was reorganized under cooperative lines with the major objective of providing more days of employment and adequate wages to workers as it had turned out to be the social responsibility of the government at that time. Since then, the government has been spending considerable amount of its resources to support the coir co-operatives to ensure employment and wage to workers to achieve its prime objectives. In spite of these

governmental interventions, the productivity performance of coir co-operatives revealed a dismal performance. Then the question is whether these governmental interventions have made any impact on the well being of the coir worker households. Unfortunately workers are facing a lot of problems in their working environment. Their socio-economic status will be improved only if adequate measures are taken to overcome their problems. The state and central government can formulate many policies to increase the welfare of the workers. This study helps to suggest increasing the socio-economic conditions of workers of Coir industries.

COMPETING INTERESTS

Author has declared that no competing interests exist.

REFERENCES

1. Ajith Kumar P. Home market of coir. Coir, Coir Boad. 1987;XXXI(Book No. 1):9-11.
2. Alexandar J. Coir industry of India and export markets. Journal of Industry and Trade. 1976;15-18.
3. Annual Report (Coir Board 2014-15), Kochi.
4. Bhardwaj DS. A periscope on co-operation and its basic values. Indian Co-operative Review. 1989;XXVI(5):1-11.
5. Devasia Leelamma. Co-operatives as a strategy for rural social development: A study. Kurukshetra. 1988;XXXVI(9):38-41.
6. Dhanya G. Problems of women workers in Coir Industry. Project Report, School of Gandhian Thought and Development Studies, M. G. University, Kottayam; 1999.
7. Gopalan Nair N. Role of co-operatives in improvement of technology and quality in coir industry. Kerala Industry. 1987;XXXIV(VIII):31-33.
8. Gopalakrishnan Ansari V. Profile of a village coir co-operative. Kurukshetra; 1985.
9. Gopakumar S. Coir as a building product. International Seminar, Kochi; 2001.
10. Gopalan Suseela. Kaya rVyavasayam Pariharamargamghalum (Mal.), Golden Jubilee Muhamma Coir Factory Workers Union; 1988.
11. Jeffrey Robin. Destroy capitalism! growing solidarity of Allepey'scoir workers 1930-40, Economic and Political Weekly. 1984;XIX:1159-1164.

12. Khanna SS, Singh SK. Co-operatives need revamping. Yojana. 1988;XXXII:18-20.
13. Kilikar LD. Rubberised coir products. Coir Quarterly Journal, Coir Board; 1965.
14. Kothari Industrial Directory of India. Coir Industry, 1994 and 1995, Madras, 36th and 37th Edition.
15. Kalra MS, et al. Pre-fabricated building components from coir fibre and cement. International Seminar, Kochi; 2001.
16. Kutappan M. Recent trends in the coir industry. Southern Economist; 1987.
17. Lee Myung Hoon. Soil bio-engineering- the korean experience. International Seminar, Kochi; 2001.
18. Malik IR. Strengthening co-operatives in coir industry. Glimpses of Co-operatives Through Press. 1988;3:605-608.
19. Mathew Tommy. COIR- nature's bounty for sustainable development. International Seminar, Kochi; 2001.
20. Mary Philip Neena. Women in unorganised sector-A study of coir workers in Thanneermukkom Village. M Phil Dissertation, School of Gandhian Thought and Development Studies, M. G. University, Kottayam; 1999.
21. Menon Madava N. Changes in the organisation of production in the coir mats weaving industry in Kerala. M. phil., Thesis Submitted in the University of Kerala, Thiruvantapuram; 1994.
22. Shamanaryan B. Marketing of coir and coir products in India and Abroad, with special reference to coir Board. University of Mysore; 1977.
23. Thampan PK. The coconut profile of india- glimpses of coconut industry in India. Coconut Development Board, Kochi. 1988;1.
24. Varkey's VO. Development and working coir co-operatives in Kerala. Ph.D., Thesis Submitted to the University of Poona; 1981.

© 2016 Nagaraja; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:
The peer review history for this paper can be accessed here:
<http://sciencedomain.org/review-history/12757>