Industrial Hygiene: A Study in Coir Spinning Units in Tamil Nadu

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Abstract

Coir yarn spinning as a micro entrepreneurial venture is promoted extensively in rural areas particularly in regions where coconut as a crop is prominent, with the twin objectives of employment generation particularly among women and meeting the global demand for coir and coir related products. Of late, both the State and Central governments have launched several schemes and programmes for extending liberal supports for the promotion of coir based entrepreneurial activities. The study conducted among a few coir yarn spinning units in the sample geographical area in Tamil Nadu discloses the state-of-affair on the health and safety hazards in coir yarn spinning units. Coir yarn spinning entrepreneurs have taken up adequate precautionary measures against 'safety hazards in the workplace' while the measures relating to caring the health and hygiene of the workers employed in the production process are inadequate. The workers are reported to be affected by ailments such as headache, back pain, respiratory problems, skin diseases, and ailments in eyes more frequently. These call for very immediate appropriate solutions. The feasibility of extending the welfare measures as applicable to workers in the formal / organised sectors may be gauged and worked out without hampering the initiatives of the coir yarn entrepreneurs at the grass roots.

Keywords: Industrial Hygiene, Entrepreneurial Performance, Safety and Health measures, Coir Spinning Units

Introduction

Industrial hygiene is an art of anticipating, recognising, evaluating, and controlling workplace conditions that may potentially result in workers' injury or illness(AIHA, 2010).It is duty of the administration to use environmental monitoring and methods to detect the extent of worker exposure and employ engineering, work practice controls, and other methods to control potential health hazards. Industrial hygiene ensures practices that will safeguard health of the factory workers (UNICEF, 2007). Ensuring industrial hygiene both in quantity and in quality is very essential for workers in industries and communities to lead socially and environmentally productive lives (Tiwari, Sharma, Zodpey, & Patel, 2015). There is a move to manage systems to safety and health stressing continuous improvement or at least common standards for performance across the world (Swaminathan, 2014). Recognising the workplace safety and health as a decisive factor in an organisational effectiveness, several management frameworks have been proposed to implement cost-effective occupational health and safety (OHS) in preventing workplace ailments and promoting health and welfare of workers (ICMR Bulletin, 2003).

Government of India has made certain mandatory provisions in the Factories Act, 1948 which highlights certain health and safety measures. The health factors are cleanliness, disposal of wastes & effluents, ventilation, control of dust & fume, artificial humidification and overcrowding, lighting/illumination, provision of drinking water, latrines &urinals, and spittoons. Precautions against explosive or inflammable dust, gas, incase of fire, etc., are the few safety measures that ensure hygiene of the industrial workers in the workplace.

Coir sector in our country which is concentrated in Kerala, Tamil Nadu, Andhra Pradesh, and Orissa has been providing employment to many people, especially to women folk in rural areas. The raw material for coir industry is prepared through the process of retting by immersing the husk in water for 8-9months.

Retting of husk presents unique and extremely serious problems. Thomas, Harikrishnan, and Nair (2006) studied the molecular analysis of bacterial population inhabiting coconut husk in retting area. Environmental pollution due to retting of coconut husk has been studied by Abbassi and Remani (1982). The retting of coconut husks has liberated

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large quantities of organic substances including pectin, pentose, fat and tannin into the ambient water. Effects of retting on water quality and ecosystem of the estuaries of Kerala has been studied in detail by various scientists. The impact of retting on the fishery wealth was studied by Abdul Azizand Balakrishnan Nair (1978). Besides the ecological degradation caused by the liberation of organic wastes, the unhygienic conditions prevailing around the area results to health hazards. Uragoda (1975) reported that respiratory diseases such as asthma bronchitis, byssinosis, and pulmonary tuberculosis are most common among workers who involve in retting process. Nirmala, Jalaja, and Remani (2002) reported that aquatic pollution is caused due to organic wastes like lignin, tannin and polyphenolsin the retting sites. Air pollution is also caused in the areas due to the release of hydrogen sulphide, methane and carbon dioxide. It is reported that common diseases likely to occur among the people are filariasis, eye diseases, skin diseases, oedema of lungs and headache due to the inhalation of poisonous gases. Gnanasaranya (2013) in her study highlighted that the workers in coir spinning units are exposed to hazards/accidents that are reported to happen among workers while operating the machines for turboing, sleeving, and spinning.

Perusal of literatures indicates that the health hazards are caused by coir sector not only by polluting the environment, but also by affecting the health and safety of workers engaged in the process of production of coir yarn. However literature highlighting the hygiene and safety hazards faced by workers in the coir spinning units is very scarce and inadequate in addressing a few basic issues such as: whether the micro entrepreneurs know about the potentials of health and safety hazards in their coir spinning units or not? Have they taken any initiative for controlling the health and safety hazards that happen to workers involved in the process of coir spinning? Do they follow safety and hygiene practices in their spinning units? and the like. Therefore an attempt is made through empirical analysis at micro level to address above and a few other such issues relating to hygiene and safety practices in coir spinning unitswith a few specific objectives.

Objectives of the Study

1. To assess the knowledge of coir spinning entrepreneurs in anticipating and recognising the health and safety hazards to workers in their coir spinning units.
2. To study the health and safety measures practiced in the coir spinning units, and
3. To identify problems in implementing health and safety measures,if any, and suggest remedial measures.

Research Methodology

The study is an empirical analysis and field survey method is employed. Personal interview technique is followed by administering structured interview schedule among the respondents viz., coir spinning entrepreneurs and workers employed in the coir spinning units. The geographical area for the study viz., Periyakulam Coir Cluster in Tamil Nadu encompassing Theni, Dindigul districts and a few areas of Madurai district. It is noticed that there were 129 coir spinning units functioning in the geographical area under study and about 800 workers were employed for coir spinning during the year 2014 (DIC, 2014).On stratified proportionate to fixed number random sampling basis, 25 coir spinning units including five workers from each sample unit (125) were selected forthe study.

A few statements to be responded in binary answers meant to know about the knowledge of the coir yarn entrepreneurs on industrial hygiene and knowledge in locating and recognising the work spots where the safety hazards happen to workers, and a few statements to the responded in 3 point rated scales meant to know about the industrial safety measures adopted were prepared and administered among coir yarn entrepreneurs. Similarly a few statements to be responded in 3 point rated scales meant to know about the frequency of occurrence of ailments presumed to be caused out of poor lighting, poor ventilation, increased dusts and toxic gases, noise pollution, and work drudgery prevailing in the work place etc., were prepared and administered among workers. Thus the responses obtained from both the entrepreneurs and workers were analysed and a summary of major inferences drawn from the analyses are presented in the paper.

Knowledge about Safety Hazarded Work Spots

Whatever be the nature and type of enterprises, where machines are involved in bringing out the output, there are

chances of safety hazards while operating the machines, and/ or during the work processes. The coir yarn spinning units are not exempted from such safety hazards though they are micro-enterprises. The production of coir yarn through spinning is carried out through the production processes which involve willowing and sleeving of fibre, coir yarn spinning, and the final process of quality control and bundling. All these production operations are carried out with the help of machines operated by electric power.While carryingout these production processes, the workers are very much prone to be affected by safety hazards. For instance, workers are exposed to bear with toxic gases emitting from husk fibre including will owing process and chances of minor injuries to hands and fingers during sleeving process and sometimes the chances of major injury or life challenging accidents during spinning of coir yarn are prevalent. The workers are very much prone to be affected by safety hazards.

Moreover the production work spots will be reigned with noise pollution which may aggravate work drudgery among workers. These and such other problems are compounded when the space of the work spot is narrow or inadequate with poor ventilation. The entrepreneur is expected to know about all such safety hazards and should communicate or educate the workers so that safety hazards can be avoided. The workers are to be well-informed about the work spots where the probability of safety hazards are very frequent and the work spots where the probabilities of occurrence of life challenging hazards are high. Unless the entrepreneurs have thorough knowledge about these and such other issues pertaining safety hazards in the coir spinning units, the preventive measures cannot be carved out and employed.

The study finds that majority of the entrepreneurs know about unsafe and hazarded work spots in the coir yarn spinning units. They also know more about the work spots where the probability of occurrence of mild injuries, major injuries and life challenging hazards to workers are very high.

Safety measures in Coir Spinning Units

Since the entrepreneurs know about the work spots where the probability of occurrence of safety hazards are high, they do take up certain prevention/precautionary measures with the objective of ensuring safety to workers for the reason to avoid unnecessary expenditures, litigations including reduction in production/ productivity in their spinning units.

The study finds that the entrepreneurs of coir spinning units seem to have taken up more than one safety measures so as to avoid safety hazards among workers (Table 2).

Health and Hygiene practices in Coir Spinning Units

Besides measures against safety hazards, coir yarn spinning entrepreneurs need to take up measures to ensure health and hygiene of the workers. During field visits, it is noticed that most of the work sheds of coir spinning units had inadequate working space; the machines were not installed systematically in line to 'production routes' involved in the production processes; ventilation was inadequate; drinking water provided to workers was not free from harmful minerals/ salts; urinals, toilets including lunchrooms were seldom available; measures to protect the workers from dusts/minute particles emanating from coir yarnduring production process were absent. The production wastages such as fibre wastages and rejected coir yarn were dumped nearby the spinning units exposing to safety hazards. However the coir spinning units that are located in urban/semi-urban areas and also in residential areas seem to have taken up certain health and hygiene measures. Space for urinals/

Table 1: Knowledge of Entrepreneurs about Safety Hazards in the Coir Yarn Spinning Units

S.No	Nature of Injury / Work Spots	Number of Entrepreneurs with 'YES' response (N=25)		
		Mild injury	Major injury	Life challenging
1	Willowing process	25 (100)	10 (40)	2 (8)
2	Sleeving process	25 (100)	3 (12)	4 (16)
3	Spinning process	25 (100)	25 (100)	--
4	While changing the bobbin from the spinning machines	25 (100)	--	6 (24)

(Figures in brackets are percentages to N = 25)

Table 2: Safety Measures in Coir Spinning Units

S.No	*Extent of Safety measures Particulars*	*Number of Entrepreneurs with 'YES' response (N=25)*		
		Always	*Often*	*Rarely*
1	Maintenance of first aid kid	10 (40)	10 (40)	5 (20)
2	Machine operation by trained workers	5 (20)	15 (60)	5 (20)
3	Maintenance / repair of electrical circuits	5 (20)	15 (60)	5 (20)
4	Precautionary measures against fire accidents	20 (80)	5 (20)	--
5	Cleanliness of the work shed	10 (40)	15 (60)	--
6	Disposal of dusts and fibre wastages	10 (40)	15 (60)	--
7	Provision of adequate lightings in the work sheds	10 (40)	15 (60)	--
8	Maintenance / repair to drainage, seepage and leakage during rainy days	10 (40)	5 (20)	10 (40)
Average		**10(40)**	**12(48)**	**03(12)**

(Figures in brackets are percentages to N = 25)

toilets was found; the production wastages were disposed properly. Majority of the workers brought drinking water on their own from their homes along with their lunch. So as far as provision of space for taking lunch is considered, it was observed that the workers take their lunch mostly in the space provided for rewinding of yarn/bundling of coir yarn. No exclusive space was provided in all the coir spinning units located either in urban areas/residential areas or rural areas under the study.

Perceived Ailments of Coir Workers

During field visits and inquiry among coir workers, it is noticed that the workers seem to suffer from a few ailments which are perceived to be occurred due to lack of safety hazards and hygiene practices in the coir spinning units. The responses obtained to a few statements in three point scales relating to ailments that are perceived to be caused by inadequate safety hazards and hygiene practices in the working place of coir spinning units are presented here.

From Table 3, Rheumatism, headache, back pain, eye, and skin diseases were reported to be the most frequent ailments suffered by workers. It is reported that skin disease was due to sedimentation of minute organic materials flowing out from coir fibre containing toxic substances, on the skin of the workers and also cause the respiratory problems. Ailments in eyes and acute head

Table 3: Frequency of Occurrence of Ailments to Coir Workers

S.No	*Ailments perceived*	*Frequency of occurrence* *Distribution of respondentswith 'YES' answers (N=125)*		
		Frequently	*Sometimes*	*Rarely*
1	Head ache	80 (64)	20 (16)	25 (20)
2	Back Pain	60 (48)	40 (32)	25 (20)
3	Skin diseases	60 (48)	40 (32)	25 (20)
4	Ailment in eyes	80 (64)	20 (16)	25 (20)
5	Rheumatism	60 (48)	40 (32)	25 (20)
6	Respiratory diseases	60 (48)	40 (32)	25 (20)
7	Major injury	--	25 (20)	100 (80)
8	Minor injury	25 (20)	40 (32)	10 (8)
9	Mental monotony	20 (16)	25 (20)	80 (64)

(Figures in brackets are percentages to N = 125)

ache were due to the inhalation of dust particles and the poisonous gases like methane and hydrogen sulphide emanating from wet fibres, whereas the back pain was reported to be caused by unhealthy posture of the body kept for a long time while working with the machines in the coir spinning units.

Conclusion

Coir yarn spinning as a micro entrepreneurial venture is promoted extensively in rural areas particularly in regions where coconut as a crop is prominent, with the twin objectives of employment generation particularly among women and meeting the global demand for coir and coir related products. Of late, both the State and Central governments have launched several schemes and programmes for extending liberal supports for the promotion of coir based entrepreneurial activities. The study conducted among a few coir yarn spinning units in the sample geographical area in Tamil Nadu discloses the state-of-affair on the health and safety hazards in coir yarn spinning units. Coir yarn spinning entrepreneurs have taken up adequate precautionary measures against 'safety hazards in the workplace' while the measures relating to caring the health and hygiene of the workers employed in the production process are inadequate. The workers are reported to be affected by ailments such as headache, back pain, respiratory problems, skin diseases, and ailments in eyes more frequently. These call for very immediate appropriate solutions. The feasibility of extending the welfare measures as applicable to workers in the formal/ organised sectors may be gauged and worked out without hampering the initiatives of the coir yarn entrepreneurs at the grass roots.

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