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**RESEARCH ARTICLE**

## **Socio-economic and Health Status of Women Involved in Coir Retting in Rathgama Division, Galle District**

A.G.L.A. Sumith Kumara.<sup>1\*</sup>, N.Y. Hirimuthugoda.<sup>2</sup> and Edirisinghe U.<sup>3</sup>

<sup>1</sup> *Department of Fisheries and Aquatic Resource, District Fisheries Office, Tangalle.*

<sup>2</sup> *Department of Animal Science, University of Ruhuna, Mapalana.*

<sup>3</sup> *Department of Animal Science, Faculty of Agriculture, University of Peradeniya*

**Abstract:** Coir retting yards are concentrated along the southern coastal line and specially women folk, find this work as the source of their principle income for the fisher's family in off season of fishing. However, traditional conventional method of retting has adverse impacts on the ecosystem and human beings. The study was conducted to determine the impact of coir retting on the Socio-Economic Status (SES) and health status of women involved in coir retting in Rathgama are of Galle district. A total of 35 coir retting families were randomly selected and interviewed using a pre-tested structured questionnaire. Data obtained was statistically analyzed by using SPSS Soft-ware. Water quality parameters, such as pH, Temperature, BOD, COD, NO<sub>3</sub>-N and conductivity were analyzed in coir retting yards. All the water quality parameters were not in permissible ranges. Literacy level in the study population was relatively low; 77 % showed primary education; < 18% and 5 % showed secondary and tertiary education respectively. The average household size and daily net income of the coir retting family involved in the industry were 4.8 and Rs. 275.00 respectively. They earn low income due to lack of proper marketing facilities. Field survey results indicated that 90 % suffer from job oriented diseases like skin disease, blindness, headache, backbone pains and respiratory disease. Retted husk release more organic pollutants and they highly affect the water quality parameters. Therefore, it is a difficult task to protect these women from these occupational hazards. Finally the majority of the families fall within the low SES with deepening poverty background depicted by low educational achievement and occupational status. The results of this study will help to design new techniques as well as providing a good market for these products to improve the income level of the target group.

**Keywords:** Coir retting, Fisher's family, Income, Job oriented disease, Socio-economic status

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### **Introduction**

The coir (coconut fibre) business is essentially a cottage industry that mostly employs women in southern coastal area. This income assist fisher families during the monsoon season when the sea is too rough for fishing and coir spinning forms the only source of income for their families. Coir retting yards are mostly located along the southern coastal line. An estimated 10 percent of fibre comes from traditional coir retting in the southern coastal region (Oxfam, 2006). However, this industry provides a significant quantity of organic matter to the environment.

Specially cellulose and lignin get flushed out of the enclosures and pollute adjacent water bodies (Immanuel et. al., 2006). The retting process used in coir fibre production generates significant water pollution. Among the major organic pollutants are pectin, pectosan, tannin, toxic polyphenols and several types of bacteria including salmonella (Woolly et. al., 1997). Environmental pollution due to retting of coconut husk and preliminary studies on closed system retting has been studied by Abbassi and Remani (1982).

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\* *Corresponding author: [gunawardan@gmail.com](mailto:gunawardan@gmail.com)*

Effluents of coir retting yards have more pollutants and highly affect ground water, estuaries, human and coastal ecosystems. Air pollution also prevails in these areas due to the release of hydrogen sulphide, methane and carbon dioxide. Reported work on the effect of coir retting on socio-economic and health status of coir retting involved families in Sri Lanka is scarce. The purpose of this study was to determine the socioeconomic status and health status coir retting families.

## **Materials and Methods**

### **Study design:**

The study was conducted in Rathgama area of Galle district located on the southern part of Sri Lanka from September 2009. The necessary data from the location were collected by questionnaires, interviews and discussion. A structured questionnaire was developed for the purpose of this study and after pre-testing, the questionnaire was modified according to cultural sensitivity. It sought information about the socioeconomic and health status of coir retting families.

### **Water quality analysis:**

## **Results and discussion**

### **Water quality**

All the water quality parameters were significantly different ( $p < 0.05$ ) between retting yard and non retting area (Table 01). Water temperature in the retting yard ranged from 25 °C to 28 °C. Mean water temperature in retting yards was significantly higher ( $p < 0.05$ ) than the non retting area. The Dissolved Oxygen level (DO) varied from 3.8 - 5.8 mg/l with significantly lower ( $p < 0.05$ ) DO level recorded from retting yard

Water quality parameters such as temperature (OC) and Dissolved Oxygen (DO) (mg/l) were measured by using an electronic probe (Digital DO/ Temperature Meter, Model UC-12, Central Kagaku, Co., Ltd., Japan). pH was measured by using an electrocode probe (Digital pH Meter, Model UC-23, Central Kagaku, Co., Ltd., Japan). The estimation of Biological Oxygen Demand (BOD<sub>5</sub>) (mg/l-1) was analyzed after incubation of water samples for 5 days, titrimetrically by Winkler's method (Golterman et al., 1978). Nitrate (mg/l-) contents were measured by using Hatch Portable Data logging Spectrophotometer (Model DR/2010).

### **Data Analysis**

Collected data was edited, coded and analyzed using Statistical Package for Social Science (SPSS, 1999). Descriptive summery statistics such as proportions, means and percentages were used to describe Socioeconomic and health status of the study group. The differences in water quality parameters (pH value, Temperature, BOD, COD and NO<sub>3</sub>-N) between the retting and non-retting water bodies were determined using Student's t-test (SAS, 1988).

(Table 01). BOD level and COD level were significantly higher ( $p < 0.05$ ) than non-retting area. This may be due to occurrence of higher biological activity in coir retting yards. Coir retting released more organic pollutants to the environment. According to Flaig (1984), mean constitutes of organic compounds are liberated by microbial activity during the formation and dynamics of soil organic matter. The process of retting is found to cause pollution problems at the river mouth and in backwaters. Air pollution also prevails in these areas due to the release of hydrogen sulphide, methane and carbondioxide (Remani *et al.*, 1989)

**Table 01. Comparison of water quality parameters of retting yards and non-retting area**

| Parameter          | Topic     | Retting yard            | Non retting area         |
|--------------------|-----------|-------------------------|--------------------------|
| Temperature (°C)   | Mean ± SD | 29 <sup>a</sup> ± 0.04  | 22 <sup>b</sup> ± 0.01   |
| pH                 | Range     | (28 °C - 29 °C)         | (20 °C - 24 °C)          |
| DO (mg/l)          | Mean ± SD | 7.2 <sup>a</sup> ± 0.02 | 7.5 <sup>b</sup> ± 0.01  |
| BOD (mg/l)         | Range     | (6.0 - 6.9)             | (7.0 - 8.1)              |
| COD (mg/l)         | Mean ± SD | 3.8 <sup>a</sup> ± 0.05 | 4.5 <sup>b</sup> ± 0.05  |
| NO <sub>3</sub> -N | Range     | (3.0 -4.2)              | (4.2 -5.8)               |
|                    | Mean ± SD | 28 <sup>a</sup> ± 0.2   | 28 <sup>b</sup> ± 0.5    |
|                    | Range     | (22 - 29)               | (26 - 29)                |
|                    | Mean ± SD | 42 <sup>a</sup> ± 0.5   | 4 <sup>b</sup> ± 0.5     |
|                    | Range     | (38 - 44)               | (7 - 3.8)                |
|                    | Mean ± SD | 0.19 <sup>a</sup> ± 0.2 | 0.08 <sup>b</sup> ± 0.08 |
|                    | Range     | (0.17- 0.19)            | (0.07- 0.0 9)            |

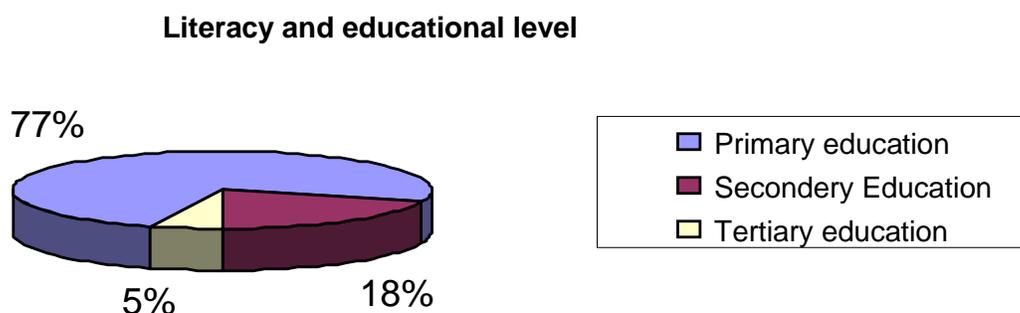
Note: <sup>1</sup> DO – Dissolved Oxygen, BOD – Biological Oxygen Demand, NO<sub>3</sub>-N – Nitrogen Nitrate, COD- Chemical Oxygen Demand

<sup>2</sup> Within rows, mean sharing a common superscript are significantly different (p<0.05).

**Literacy and educational levels**

Fig. 01 shows the distribution of household members by educational level. It is clearly evident from the results that a large proportion of the study population (95 %) had at least some formal education.

Those with primary education constituted 77 %. Nevertheless despite the large proposition who attained primary education, the percentage that proceeded to secondary and tertiary level education were 18 % and 5 % respectively.



**Figure 01. Distribution of literacy level of the coir retting involved families**

**Occupational status**

Fishing is the major economic activity in the study area. Fishing and fishing related activities constituted 38 %, while significantly higher females (72 %) were involved in coir retting industry and rope making industry (Table 02). However, when fishermen cannot involve in this fishing activity from May to September due to the effects of monsoonal rain, coir retting is the

major income of these families. This study revealed that most of the family women engaged in this employment were those who had low level of education. Low level of education attainment has lead to unskilled labour, which could explain this situation. On the other hand, this results in increase in household income; which is one of the key determinations of nutrition and health of the family members (Crawford *et al.*, 1995).

**Table 02. Occupational status of the coir retting involved family**

| <b>Occupational status</b> | <b>Male</b> | <b>Female</b> |
|----------------------------|-------------|---------------|
| Fishing                    | 53          | -             |
| Fishing related activity   | 08          | 03            |
| Coir making                | 10          | 47            |
| Rope making                | -           | 15            |
| Unemployed                 | 15          | 21            |

**Socioeconomic and health status**

A large proportion of the total household members (33 %) were children under 15 years old, followed by the age range between 15 – 25. More than half of the total household members (n = 89) were female (53 %), while males contributed 79 %. The average household size was 4.8. Ninety five percent of the households were Buddhists, while Catholics were 5% of the total.

Among the 35 families majority of them belong to Rs. 4000.00 - 6000.00 monthly income group and 14 % belong to very low income group, and

only 9 % gained above Rs. 6000.00 per month (Table 03). This low income level recorded due to poor marketing facilities for their coir production. In addition, they were not saving money for future use, which may be a result of low education level.

The daily net income of the coir retting involved family was Rs. 275.00. However, they engaged in this process only for 12 - 15 days per month due to lack of raw materials, marketing problems and bad weather conditions. Coconut husks are obtained from outside areas and buy at Rs. 150.00 per 100 husk rate. An average of two hundred rotten husks were beaten by women per day and earn Rs. 600.00 per day.

**Table 03. Distribution of monthly income level of the coir retting involved family**

| <b>Monthly Income (Rs)</b> | <b>No of families</b> | <b>Percentage (%)</b> |
|----------------------------|-----------------------|-----------------------|
| 0 - 2000                   | 5                     | 14                    |
| 2000 - 4000                | 12                    | 34                    |
| 4000 - 6000                | 15                    | 43                    |
| 6000 - 8000                | 2                     | 6                     |
| 8000 above                 | 1                     | 3                     |

A list of 10 items was developed, namely house type, electricity supply, saving machine, television, bicycle and motor bike (Table 4). Material style of life, a method of measuring wealth based on the presence or absence of household possessions, can be an indicator of relative wealth or social status in a community

(Pollnac and Crawford, 2000). Results reveal that 100 % of these families had their own house but 51 % of houses were incomplete. When their assessts were compared a higher percentage of families (57 %) had televisions for their houses. In addition, most of the houses (89%) had electricity.

**Table. 04 Condition of house and assets of coir retting involved family**

| <b>Item</b>        | <b>No of Families</b> | <b>Percentages</b> |
|--------------------|-----------------------|--------------------|
| Roofed             | 29                    | 83                 |
| Incomplete houses  | 18                    | 51                 |
| Thatched           | 0                     | 0                  |
| Asbestos           | 6                     | 17                 |
| No house           | 0                     | 0                  |
| Electricity supply | 31                    | 89                 |
| Saving Machine     | 8                     | 23                 |
| Television         | 25                    | 71                 |
| Bicycle            | 8                     | 23                 |
| Motorbike          | 3                     | 8                  |

According to the analysis of health aspects, it was clearly seen that the majority of the coir retting involved family (90%) members suffered from eye disease, skin disease, back pain, headache, respiratory disease and many other diseases (Table 05). Back pain and headache was observed as the major diseases in the target group. Women often stand knee-deep in the pits containing polluted water for more hours in removing the rotten husks. The exposure of the women to polluted waters and their long hours standing have affected their health very acutely.

Several studies and scientific literature have identified socioeconomic status (SES) as powerful determinant of health status (Adler and Ostrove, (1999). Infact, today health disparities as a result of SES have become important issues of public health concern worldwide (Kim *et al.*, 2004). In addition, water pollution of the retting yards may be adversely effected for their health status (Remani and Nirmala, 1989).

**Table. 05 Distribution of household health status of coir retting involved family**

| <b>Name of the disease</b> | <b>No. of persons</b> | <b>Percentage (%)</b> |
|----------------------------|-----------------------|-----------------------|
| Eye disease                | 4                     | 7                     |
| Skin disease               | 6                     | 10.5                  |
| Back pain                  | 14                    | 24.5                  |
| Headache                   | 15                    | 26                    |
| Respiratory disease        | 5                     | 8.8                   |
| Other                      | 7                     | 12.2                  |
| <b>Total</b>               | <b>51</b>             | <b>90</b>             |

**Conclusion**

Results of this study show that majority of the households fall within the low SES with deepening

poverty background depicted by low educational status and occupational status. It is therefore recommended that introduce a new technique as well as providing a good marketing for these products to improve income level of the target group.

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