

## Employment generation and economics of cane-based furniture enterprises of Chittagong, Bangladesh

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**Abstract**—An exploratory survey was carried out to assess employment generation and economics of cane-based furniture enterprises of Chittagong, Bangladesh. Multi-stage random sampling was adopted to carry out the study. Based on the total investment the enterprises were divided into large, medium and small. For the study, five enterprises from each category were selected at random. Most of the labour engaged in cane furniture making is skilled (67.21%). The main source of both skilled and unskilled labours is in rural areas, which is about 77%. The wage rate of unskilled workers varied from US\$ 15 to 30 per month, whereas for skilled workers it varied from US\$ 45 to more than 75 per month. Man-days required producing an article varied from 6.5 to 31.5 (dolna and dinning, respectively). Net average profit per article was the highest in Sofa (45 cm × 45 cm; US\$ 20) and lowest in Dolna (US\$ 2). Seven articles of 16 different sizes were identified made from cane, which are sofa (45 cm × 45 cm, 50 cm × 50 cm and 55 cm × 55 cm), dinning (4 chairs and 1 table, and 6 chairs and 1 table), Bed (1 m × 2 m, 1.3 m × 2.3 m and 1.5 m × 2.3 m), chair (45 cm × 45 cm and 50 cm × 50 cm), rocking chair (large, medium and small), dolna (hanging and running) and partition. The total net annual income from cane furniture is US\$ 1381.

*Key words:* Bangladesh; cane furniture; economics; employment generation.

### INTRODUCTION

Rattan or cane is one of the important natural resources of Bangladesh forests and homesteads. In Bangladesh, only two rattan genera are reportedly present, *Daemonorops* and *Calamus*, of which the latter has 10 species [1]. In Bangladesh all species, except *Calamus tenuis*, are forest-dwelling rattans. Generally, in the forests of Bangladesh rattans are found in the northeastern hill forests of Chittagong, Cox's Bazar, Chittagong Hill Tracts and Sylhet. In hill forests rattans are found to grow well in well-drained, moist, sandy-loam soils on the slopes. The most important

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and much esteemed for furniture is *D. jenkinsianus* (gola or golak bet). Other large diameter cane species suitable for furniture, particularly as frames, include *C. latifolius* (korak bet), *C. viminalis* (bara bet) and *C. longisetus* (udom bet). For handicrafts and for tying material in house construction and in furniture making *C. guruba* (jali bet or sundi bet) and *C. tenuis* (bet, jayo) are commonly used. Due to the clear-felling system rattan plants are also eradicated and destroyed in the hill forest [2].

Rattan products chiefly serve the rural economy, the bulk of the national population. Cane is important since they provide basic and useful materials to the rural housing, particularly the poor sections of the population. Cane also provides inexpensive furniture, utensils and agricultural implements, and is important in the handicraft and small cottage industry sector. The demand for well-processed, good-quality canes is going up in the world market and it is presumed that the demand is three times the supply. Indonesia exports 90% of the world's requirement of rattans. In the total world export of primary forest products, rattan occupies the second position, next to timber [3]. The climatic condition of Bangladesh is very suitable for cane growing and it grows well in some cases without any special attention in its propagation, harvesting, extraction, processing and manufacture. Cane furniture is very popular because of its cheapness and the natural looks [3]. At the present moment, there are several cane furniture making enterprises in the city of Dhaka, Chittagong, Sylhet, Comilla, Khulna and some other towns of Bangladesh [4] in which a large mass of rural people are working as a skilled and unskilled labour. Non-wood forest products (NWFP) are important raw materials of forest-based industry. Among the NWFP the use of bamboo and cane are well known in the rural areas [5]. Various authors [5–9] studied various aspects of the bamboo-based industry in Bangladesh. Hardly any research has been undertaken aimed at improving the quality of local cane [3]. Very few researches have also been conducted on different aspects of cane-based industry; therefore, the present study was conducted to explore the employment generation and economics of the cane-based industry in Bangladesh.

## MATERIALS AND METHODS

The study was conducted in Chittagong Metropolitan City of Bangladesh. It lies in the extreme southeast of the country between 22°35' and 22°59' N latitude and between 91°27' and 91°22' E longitude. The area of Chittagong Metropolitan City is 137.30 km<sup>2</sup>. The target area of Chittagong Metropolitan area, according to the Chittagong Development Authority (CDA) master plan, is 986.304 km<sup>2</sup> [10]. Chittagong Metropolitan City had a population of 2.096 million in 2001 [4]. The average annual relative humidity is 80.53% with a monthly average range from 70.50% in February to 85.55% in July. The mean monthly temperature ranges from 21.20°C in November to 28.44°C in April with a mean annual temperature of 26.44°C. Average annual rainfall was recorded as 2790 mm [4].

The study was conducted following a multi stage random sampling. A preliminary survey was carried out to classify the enterprises on their total investment and to determine the category of skilled and unskilled labour in the enterprises. Three categories of enterprises were made based on the preliminary survey, which are large (>US\$ 1500), medium (US\$ 750–1500) and small (<US\$ 750). The labourers, who have more than 5 years experience in cane processing to produce furniture and/or training, are considered as skilled. In all other cases they are classified as unskilled labour. The demand of the article was determined according to the view of the owner of the enterprise. All enterprises manufacture more or less similar products. Out of 60 cane enterprises of Chittagong Metropolitan City 15 enterprises (5 from each category) were selected randomly and data were collected through a semi-structured questionnaire. A semi-structured questionnaire was used so the respondents were free to express their own view at each step of the interview. The production cost of each article was calculated as: production cost of each article = raw material cost + transportation cost + processing cost (labour wage + supplementary materials). Selling price is the price at which the articles are sold. A variation in the selling price was found in different enterprises for the same article, so an average for each article was recorded. Net average profit is the difference between selling price and production cost of each article. The net profit from a single article was multiplied by the total number of articles sold annually to get the total net profit of category.

Seven articles of 16 different sizes were identified made from cane, which are sofa (45 cm × 45 cm, 50 cm × 50 cm and 55 cm × 55 cm, Fig. 1), dinning (4 chairs and 1 table, and 6 chairs and 1 table), bed (1 m × 2 m, 1.3 m × 2.3 m and 1.5 m × 2.3 m, Fig. 2), chair (45 cm × 45 cm and 50 cm × 50 cm, Fig. 3), rocking



**Figure 1.** Sofa of 50 cm × 50 cm size ready for sale in a cane enterprise of Chittagong City Corporation area.



**Figure 2.** Bed of 1.5 m × 2.3 m size ready for sale in a cane enterprise of Chittagong City Corporation area.



**Figure 3.** Chair of 45 cm × 45 cm size ready for sale in a cane enterprise of Chittagong City Corporation area.

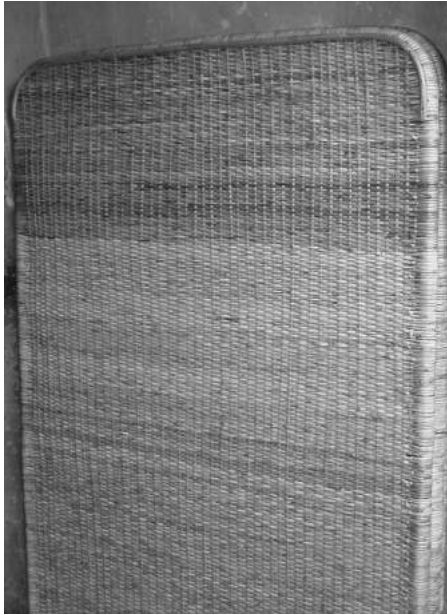
chair (large, medium and small, Fig. 4), dolna (hanging and running, Fig. 5) and partition (Fig. 6). The total net annual income from cane furniture is US\$ 1381.



**Figure 4.** Large and medium size rocking chair ready for sale in a cane enterprise of Chittagong City Corporation area.



**Figure 5.** Dolna (running) ready for sale in a cane enterprise of Chittagong City Corporation area.



**Figure 6.** Partition ready for sale in a cane enterprise of Chittagong City Corporation area.

## RESULTS AND DISCUSSION

### *Employment generation and sources of labour in the industry*

Most of the labour engaged in cane furniture making is skilled (67.21%) and only 32.79% is unskilled. Most labourers are in the age class 30–40 years (34%) and the lowest number (15%) was found in the highest age class (>40 years; Table 1). In both the skilled and unskilled category the illiterate labour is the highest, 54 and 55%, respectively. As the educational level increases the proportion of both skilled and unskilled labour decreases and in the higher secondary category there is only one person (3%; Table 2). This miserable literacy situation agrees with the findings of Chowdhury and Nahar [11], who found that about 73% of the informants engaged in the bamboo and cane works in Comilla region of Bangladesh were illiterate. According to the FAO [12] the educational level of persons employed in informal wood working shops is usually low. The case is also true for the cane based furniture industry of Bangladesh.

The main source of both skilled and unskilled labour is the rural area (30 and 17 labourers, respectively) followed by the city area (7 and 3, respectively). Out of 61 only 4 workers engaged in cane furniture are family members and all of them are skilled. In the whole 77% of the workers are rural people and a negligible percentage from the local and family members (16 and 7%, respectively). The wage rate of unskilled workers varies from US\$ 15 to 45 per month (Table 3). Out of 20 unskilled workers 16 earn US\$ 15–30 per month and the remaining 4 earn US\$ 30–45 per month. The wage rate of skilled workers varies from US\$ 15

**Table 1.**

Skilled and unskilled labour engaged in cane furniture making enterprises

Type of labour	Labour category (age)				Total
	<20	20–30	30–40	>40	
Skilled	3	12	17	9	41 (67.21)
Unskilled	12	5	3	—	20 (32.79)
Total	13 (21.31)	18 (29.51)	21 (34.43)	9 (14.75)	61 (100)

Values in parentheses show percentage.

**Table 2.**

Educational status of labour engaged in cane furniture enterprises

Level of education	Skilled		Unskilled	
	Number	Percentage	Number	Percentage
Illiterate	22	53.7	11	55
Primary	13	31.7	8	40
Secondary	5	12.2	1	5
Higher secondary	1	2.44	—	—
Total	41	100	20	100

**Table 3.**

Sources of labour with their wage rate

Labour	Source			Wage/month (US\$)				
	Family member	City corporation area	Rural area	15–30	30–45	45–60	60–75	>75
Skilled	4	7	30	—	—	8	23	10
Unskilled	—	3	17	16	4	—	—	—
Total	4 (6.6)	10 (16.4)	47 (77.1)	16 (26.2)	4 (6.6)	8 (13.0)	23 (37.7)	10 (16.4)

Values in parentheses show percentage.

to 45 to more than 75 per month. Out of 41 skilled labours the wage rate of 23 (highest number) skilled labours is US\$ 60–75 per month, followed by >US\$ 75 per month ( $n = 10$ ) and US\$ 45–60 per month ( $n = 8$ ) (Table 3). Cane furniture making is a very technical job and the study has revealed that a skilled person is a most important element in these enterprises. Most of the labours in the cane furniture making industry are illiterate and village dwellers (Tables 2 and 3). A huge portion (40%) of the people of Bangladesh is illiterate and about 70% of the total population are village dwellers [4]. Illiteracy is the main cause of unemployment of village people. From this study it is found that cane furniture is a good sector for providing employment to the illiterate people of the country particularly village people. This finding also connotes with the findings of Mather [13] that small scale forest industries provide the principle employment for 20–30% of the rural labour in many developing countries. As most of the people of the country live in villages, the rural economy is the major part of the national economy. Cane furniture making



**Figure 7.** Labor working in a cane industry to prepare a sofa of Chittagong City Corporation area.



**Figure 8.** Labor working in a cane industry to process raw cane of Chittagong City Corporation area.

plays a significant role in the rural economy, which is very much important for national economy of Bangladesh. Figures 7–9 show labourers at work.





**Figure 9.** Labor working in a cane industry of Chittagong City Corporation area.

### *Availability of cane*

Dried cane is used for making various articles. The entrepreneurs purchase cane from three different sources, local market, harvesting site and from importer directly. The local traders purchase cane from a nearby district, and store and sell them in the local markets. The cost of cane from this source is very high, on average 1 cane costs US\$ 1 in the local market. The entrepreneurs also purchase cane directly from the harvesting site. The harvesting site mainly includes the forest area of Chittagong Hill Tracts, Chittagong and Cox's Bazar. The entrepreneurs go there and purchase the cane. Though these canes are cheaper than those of the local market (on an average a cane costs US\$ 0.75), it takes time to go there and involves high transportation cost. From harvesting site the entrepreneurs purchase all the cane and store to use off season. The cane industries have high preference for the imported cane. The main imported cane is mostly golak bet (*D. jenkensian*) which is now scarce in Bangladesh [14]. The cost of cane from this source is very high; on an average a cane cost US\$ 1.5. Of the requirements of cane 50% comes from the harvesting site, 30% from the local market and the remaining 20% from imported cane; due to unavailability of local cane and better quality of imported cane the entrepreneurs seek the imported cane. The quality of imported cane is better because some irregularities and cracks are formed in the local cane during harvesting and drying (entrepreneurs view). The present study also connotes the BSCIC study [14] that local production of cane could easily meet the demand.

**Table 4.**

Requirements of cane, man days in making of each article, average selling price per article and net average profit per article

Article	Cane requirements per article (No.)	Man days require to produce (h)	Total production cost (US\$)	Average selling price per article (US\$)	Net average profit per article (US\$)
Sofa (45 cm × 45 cm)	27	24	88	108	20
Sofa (50 cm × 50 cm)	30	24	103	122	19
Sofa (55 cm × 55 cm)	32	24	118	135	17
Dinning (4 chairs, 1 table)	36.5	27.5	85	97	12
Dinning (6 chairs, 1 table)	46	31.5	124	140	16
Bed (1 m × 2 m)	22.5	16	39	47	8
Bed (1.3 m × 2.3 m)	27	16.5	50	58	9
Bed (1.5 m × 2.3 m)	29.5	17.5	63	73	10
Chair (45 cm × 45 cm)	6	8	9	12	3
Chair (50 cm × 50 cm)	7.5	8	10	13	3
Rocking chair (large)	9.5	8.5	15	20	4
Rocking chair (medium)	8	8.5	14	18	4
Rocking chair (small)	7	8.5	12	15	3
Dolna (running)	3.75	6.5	12	14	3
Dolna (hanging)	3.25	6.5	11	13	2
Partition	3.25	10	10	14	4

### *Economics of the industry*

Table 4 shows the requirements of cane, man-days in making of each article, average production cost (total), average selling price per article and net average profit per article. Sixteen articles were identified made from cane. The highest amount of raw materials (cane) is required to produce dinning (4 chairs, 1 table) (36.5 pieces) and lowest to produce dolna (hanging) and partition (3.25 pieces each). Man-days required to produce an article vary from 6.5 to 31.5 (dolna and dinning, respectively). Production cost is the highest for the dinning (US\$ 124) and lowest for the partition (US\$ 10); on the other hand, the highest average selling price is for the dinning (US\$ 140) and the lowest for the chair (US\$ 13). Net average profit per article varies from US\$ 20 to 2 (sofa and dolna, respectively). Annual number of articles produced, sold, demand and annual expected net income from each type of article are shown in Table 5. Among the cane furniture chair (45 cm×45 cm) and chair (50 cm × 50 cm) are the highest number produced and sold (production 118 and 67, sold 115 and 65, respectively). Highest net incomes are expected from chair (45 cm × 45 cm) and chair (50 cm × 50 cm), US\$ 288 and 190, respectively. The total net annual income from cane furniture is US\$ 1381. Among the cane furniture the demand for chair (45 cm × 45 cm) is the highest (100–125) followed by chair (50 cm × 50 cm) (60–70), dolna (hanging) (46–50) and dolna (running) (35–37). Figure 10 shows a cane enterprise.

**Table 5.**

Average annual number of articles produced, sold, demands and net income of the enterprise

Article	No. of articles produced	No. of articles sold	Demand (No.)	Annual net income (US\$)
Sofa (45 cm×45 cm)	10	10	10–15	200
Sofa (50 cm×50 cm)	18	18	18–25	35
Sofa (55 cm×55 cm)	8	8	8–10	150
Dinning (4 chairs, 1 table)	5	5	3–5	58
Dinning (6 chairs, 1 table)	3	3	3–4	48
Bed (1 m × 2 m)	2	2	2–3	16
Bed (1.3 m×2.3 m)	3	3	2–4	48
Bed (1.5 m×2.3 m)	2	2	2–4	21
Chair (45 cm×45 cm)	118	115	100–125	288
Chair (50 cm×50 cm)	67	65	60–70	190
Rocking chair (large)	15	15	15–20	58
Rocking chair (medium)	17	17	15–16	60
Rocking chair (small)	8	8	8–10	25
Dolna (running)	36	36	35–37	90
Dolna (hanging)	49	49	46–50	98
Partition	7	7	8–10	26
Total				1381

**Figure 10.** A cane enterprise at Chittagong City Corporation area.

Cane furniture making is a labour-intensive work, which requires a considerable amount of raw materials to produce each article. In Bangladesh the per capita income is only US\$ 444 [4], but net profit from an article of cane is about US\$

20 (sofa). Cane furniture making is a very profitable business in Bangladesh and it could be a potential sector of employment generation for the illiterate people. Several research works [15–18] also conclude that canes are used extensively across their range by local communities and play an important role in subsistence strategies for many rural populations. Bangladesh is a Third World country and the economic condition of the country is now severely facing very low GDP growth, unemployment problems, low development of small scale enterprises like the bamboo- and cane-based ones, etc. No exact data are available on the number of people employed in the collection, transportation and processing of cane. Generally statistical reports lump the cane industry with the bamboo industry. The 1992–1993 records of the Bangladesh Small and Cottage Industry Corporation (BSCIC) show that there were 45 386 small industries engaging 138 556 persons in the cane industry [14]. Thus, cane furniture making enterprises are continuously sustaining the national economy through providing employment opportunities to the poor people in each step, like raw material collection, processing and marketing, without any incentives from the government and non-government sector. Most of the cane furniture demands are higher than the production. This is due to the limited supply of raw materials and also the very high price during limited supply. The other reason for less production is that if they produce more there is always a risk of stocking and they are not willing to take a risk because they have limited investment. In Bangladesh the processing and transport of raw materials for cane furniture are poorly handled. The canes are cut, roughly trimmed and then cut into suitable lengths for transportation in shoulder-load bundles. In the river bank, the canes are usually transported over bamboo rafts up to the end of the river communication. Thereafter, these are transported to the marketing centres by trucks or boats. No special treatment is done except for drying the canes in the sun throughout the process of harvesting, transportation and also in the selling centres. In the manufacturing process these canes are cut into suitable lengths, the knots are trimmed and the surface smoothed. In some cases the outer rind of the cane is made into cane strings, the surface smoothed and used for the seats of chairs and other such purposes. Seldom is any processing carried out except for drying, rubbing and finishing at the manufacturing end. As a result, canes are often attacked by stain fungus, which does not allow a good finish. Canes are also attacked by borers, particularly dry immature canes. In the manufacturing process, bending is done by blow torches which scorch the bent portion, thus affecting the good finish. Fixing and joining is done with nails and by tying with split canes, which spoils the look and most of the time these come loose, thus damaging the furniture [3]. So there is considerable scope for improving the processing of the cane from harvesting time up to the manufacturing stage. Cane furniture is very popular to the foreigners also because of its cheapness and the natural looks. If the quality and the design can be improved by proper research and training, the demand for cane furniture, particularly from the foreigners and the richer section of Bangladeshis, will go up. The economics of the industry could be increased

through training of the worker in harvesting and processing because it will increase the quality of cane furniture. There is a need to provide an attention of Government or non-Government organization to the cane-based furniture industry to facilitate some incentives so that they will fulfil the demand of the country and also export to the foreign country.

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