বি আই ডি এস ওয়াকিং পেপার
BIDS WORKING PAPER

বাংলাদেশ উন্নয়ন গবেষণা প্রতিষ্ঠান

চাকা, বাংলাদেশ

BANGLADESH INSTITUTE OF DEVELOPMENT STUDIES
DHAKA, BANGLADESH

Working Paper No. 5

ECONOMICS OF COIR INDUSTRY IN
BANGLADESH: A CASE STUDY*

MUHAMMAD ABDUL LATIF**
MUSHFIQUR RAHMAN**

November 1988

Price : Tk. 30.00

CONTENTS

LIST OF TABLES

1. INTRODUCTION

1.1 Relevance of the Study

A recent study on small-scale and cottage industries in Bangladesh (BISP, 1979) reveals that the coir industry has income and employment generating potentials. It is an important industry among the rural industrial activities in some of the major coconut growing areas of the country. The study reveals that there are, in all, 4,329 such industrial establishments in Swarupkati thana[1] alone, which employ more than 14,000 people. Furthermore, according to an estimate made by EPSIC[2] (EPSIC, 1964), the total number of small-scale and cottage level coir establishments, as of the end of 1962, was about 10,000 in this country employing about 39,000 people.

Unfortunately, the industry has not been properly investigated in any of the studies done so far. Lack of proper information poses a serious problem to the formulation of policies for the development of the industry. It has, therefore, been felt very essential that an in-depth study of the industry should be carried out.

1.2 The Approach

The study has attempted to generate information on various aspects of the industry with a view to improving the knowledge base for planning purposes. Identification of the problems and constraints facing the industry and examination of its potentials relating to employment and income generation are the main aspects among the broad objectives.

With these objectives in mind, the broad issues which are to be analysed in this report have been presented in eight sections. The second section dealth with the background information on coir production. The treatment in this section is mainly descriptive. It deals with the meaning of the products, the location of the industry with the distribution of source of raw materials, the manufacturing processes, and the use of the products.

Survey results on employment and capital structure have been dealt with in section three. Employment pattern and workers profiles have been presented and analysed in the first part of this section, and structure and composition of capital have been analysed in the second part.

The fourth section deals with the characteristics of the entrepreneurs and the enterprises. Entrepreneurship is by far the most important factor concerning the growth of the industry and its successful operations. The factors that determine the supply of entrepreneurship has been attempted to analyse in this section. Moreover, some relavant information on the survey enterprises have been put forward in this section.

Finance and marketing have been analysed in section five and six respectively. Coir is not an organized industry in the modern sense of the term. The proper institutional set up for financing the industry has not yet been developed in this country. The approach to the study of finance in this report is mainly descriptive in nature. The approach followed in the study of marketing is mainly functional which studies marketing from the standpoint of activities or functions such as buying, selling, and transportation of both raw materials and finished products. Prices of the products, their market positions, and price trends have also been analysed. Finally, the export trends and the problems associated with the products have been analysed towards the end of section six.

Productivity and profitability of coir industry have been dealth with in section seven. Value of output, costs, output per unit of capital, output per worker etc., are the main thrusts of this section.

The summary of major findings and policy implications have been presented in section eight.

1.3 Survey Methodology and Data

The information collected for the study falls into two categories as follows:

(i) <u>Sample Survey</u>: A pre-designed one shot questionnaire containing entrepreneurship and economic characteristics of the industry was administered on each of a number of selected enterprises. The details of sampling will be discussed later.

(ii) <u>Non-survey Information</u>: Information on the industry was also collected from various other sources; these include published and unpublished materials available in various organisations (such as Bangladesh Small and Cottage Industries Corporation, Export Promotion Bureau, and other related organisations), on-the-spot enquiries in the coir producing centres, and personal discussions with leading coir manufacturers, dealers, and officials.

This is a case study of the coir industry within the framework of the Rural Industries Study Project (RISP). A census of all industrial enterprises in Swarupkati thana was taken in Phase I survey of the Rural Industries Study Project. One of the primary justification for including Swarupkati in the study is the heavy concentration of coir industry there (RISP, 1979) However, on the basis of available information, other areas which also have the concentration of this industry have been included in this study in order to have a broader based sample. The other areas included are five adjacent unions[3/] under five thanas, namely, Fultola and Dumuria in Khulna district, and Avoynagar, Keshabpur and Monirampur in Jessore district. The latter area is in the south-western part of Bangladesh. For simplicity we call this area "Khulna-Jessore zone" and former area "Swarupkati".

The 4,329 coir enterprises recorded in Swarupkati in the RISP Phase I survey provides the sampling frame in Swarupkati for the purpose of this study. A total of 100 enterprises have been randomly selected.

Listing of enterprises was not previously done in Khulna-Jessore zone and normal procedure for sampling could not be followed. It was, however, decided that the questionnaires would be administered to 50 enterprises on the basis of availability of the entrepreneurs, taking 10 from each of five unions in the zone.

Six investigators collected information from the selected 150 enterprises, using pre-designed questionnaires. They took about a month (July 1979) to complete the job. They had been involved in the RISP Phase I survey and it was made sure that they properly understood the coir questionnaire. The entrepreneurs were cooperative. The author himself and the RISP field supervisor at Swarupkati supervised data collection. After the questionnaires were filled in, internal consistency of the information collected was throughly checked.

2. BACKGROUND INFORMATION ON COIR PRODUCTION

2.1 The Coir Fibre

Coir or coconut fibre is obtained from the fibrous husk (mesocarp) which lies between the outer shell of the coconut and its inner kernel, and is thus a by-product of coconut production. Coir is relatively shorter compared with other hard fibres. Its individual fibre cells measure from 0.4 to 1.0 mm. in length and its staple length varies from 15 to 35 cm. It has unique resistance to the action of bacteria and salt water and it is much less impaired by immersion in water. It has been estimated that even after it has been immerzed in water for about 4 months, coir loses only 35-40 per cent of its strength while its main rival sisal fibre loses 52-59 per cent (FAO, 1969).

There are three main types of coir fibre: yarn fibre, bristle fibre, and mattress fibre. Of these, only the finest and longest variety, known as mat or yarn fibre, is suitable for spinning. It is obtained from the husks of unripe nuts, which present a low degree of lignification, but yield an inferior quality of copra. Bristle fibre and mattress fibre are extracted from the husks of ripe nuts. Bristle fibre is coarser and thicker and mattress fibre is finer but shorter.

The colour of the coir fibre ranges from light brown to dark brown approaching black depending on the species of coconut, maturity

of the nuts, time lapse between husking and retting, mineral content of the soil, water of retting place and the period of retting. Sometimes, the fibre, extracted from the husks of unripe nuts, may be to some extent golden in colour.

2.2 The Producing Areas

Coconut is the only source of coir, and the industry therefore, tends to be localised in the coconut growing areas. The total area under coconut in the world has been estimated at about 6 million hectares and the annual world production at nearly 30,000 million coconuts in 1969. The coconut plant is grown widely throughout the tropics, particularly in Southern Asia, Oceania, and East Africa. The Philippines, India, Indonesia, Malaysia, and Sri Lanka are the most important coconut growing countries of the world. Coconut palm is cultivated throughout the producing countries mainly for producing copra for oil extraction and preparation of various food items. Latest available data for coconut production of major producing countries are shown in Table 1.

Not all the countries which produce coconut have developed the coir industry. India and Sri Lanka are the major producers of coir. It was estimated that world production of coir for the period 1964–66 amounted to some 285–290 thousand ton annually. Of this total, more than 91 per cent came from India and Sri Lanka, and a further 5 per cent from Tanzania and Bangladesh.

Table 2 shows the estimated distribution of coir output in 1964–66. The Philippines, which is the world's biggest producer of coconut, has only a small coir industry supplying mainly domestic requirements, while Indonesia, the second largest producer of coconut, no longer extracts coir fibre. Bangladesh produced an average of 5.8 thousand ton per annum during 1964–66. Recently established coir industries with a raising output exist in Thailand and Malaysia, but none of the other major coconut gorwing countries produce more than 500 ton of coir annually. Of the minor coconut producers Kenya, the Seychelles, and Mozambique have annual output of fibre ranging

TABLE 1

INFORMATION ON COCONUT PRODUCTION IN SOME OF THE MAJOR PRODUCING COUNTRIES AND BANGLADESH - 1969

Country	Production (million nuts)	Percentage of world output
1. The Philippines	8,000	26.9
2. Indonesia	5,805	19.5
3. India	5,440	18.3
4. Sri Lanka	2,700	9.1
5. Thailand	1,000	3.4
6. Mexico	791	2.7
7. Malaysia	742	2.5
8. Brazil	656	2.2
9. New Guinea	634	2.1
10. Mozambique	403	1.4
11. Tanzania	300	1.0
12. Nigeria	200	0.7
13. Bangladesh	140	0.5

Source: FAO Production Yearbook, 1970, Vol. 24.

TABLE 2

ESTIMATED OUTPUT OF COIR IN PRINCIPAL PRODUCING COUNTRIES, 1964-66

(Thousand metric ton)

Country	Production	Country	Production
India	160.0	Philippines	2.5
Sri Lanka	100.0	Kenya	2.0
Tanzania	8.5	Malayasia	1.5
Bangladesh	5.8	Seychelles	1.5
Thailand	3.0	Mozambique	1.0

Source: FAO Commodity Bulletin Series 44, Rome 1969

mployed for collecting timber from the <u>Sundarbans</u> used coir rope and cardage mainly imported from Calcutta.

After the partition of India in 1947, rope, string, and fibre could not be imported from Calcutta easily. As a result, the local people found it an attractive proposition to produce coir locally, and soon it began to spread. Gradually, a large number of landless and unemployed and underemployed people of Swarupkati engaged themselves in this industry, using locally evolved process of manufacturing.

In 1963, EPSIC (BSCIC) established an industrial estate at Swarupkati to promote small-scale and cottage industries in the area. In that estate, one coir enterprise was also set up. The aim of the plant was not only to process coir but also to train up the local people in this line. This helped promote coir manufacturing in the area. By that time, coir processing also spread to other coconut producing areas such as Khulna-Jessore zone.

Economic:

Source of supply of raw materials, and markets for the finished products are the two important economic factors which influence the location of industries (Balakrisna, 1948). The location of coir industry in Bangladesh can be analysed in terms of Weberian theory (Weber, 1929). Weber has classified the factors which determine industrial location on the basis of cost of production: cost of raw materials, cost of labour, and the cost of transportation are basic factors in determining location. The orientation and location of the industry therefore depend largely on the type of materials used and the nature of their transformation in the process of production.

The raw material, coconut husk, has great bulk and weight compared to its value. Processing of coir fibre needs retting of the husks for a few months; the retted husks are heavier than green husks and the cost of their transportation to distant places is therefore prohibitive. Again, retting of husks needs backwaters. As such the

processing of husks into fibre tends to be located near such soaking pits, which exist in the coastal districts of Barisal, Khulna, and Jessore. In these districts, there are facilities for easy transportation of the materials by river at costs. Besides, labour is also available abundant in rural Bangladesh. The availability of coconut from the plain lands, accessible good roads, canals and rivers, the presence of backwaters and above all, the availability of cheap labour have all contributed to the location of the industry in the coastal districts of Bangladesh.

The factors responsible for the existence of the industry in the urban centres like Dhaka, Chittagong and Narayanganj are not all similar to those discussed above. These urban centres are not located in the major coconut growing areas. Coconut (but not coconut husk) is brought to these places by wholesale traders for various purposes (such as extraction of oil, sale for consumption purposes etc.). These wholesale traders are the only suppliers of raw materials to the coir producers in these urban centres.

2.4 Processing of Coir

The methods of extracting coir fibre from coconut husk can be divided into three categories: traditional manual methods, improved or semimechanical methods, and modern mechanical methods (Grimwood, 1975). Traditional methods with little mechanization are still used to prepare yarn fibre, while bristle and mattress fibres are now generally prepared by semimechanical or mechanical methods in most of the producing countries.

Virtually all of these three methods are now being, more or less, used to extract coir fibre in Bangladesh. But traditional manual methods are in wider use; semimechanical and modern mechanical methods are used only by a few enterprises.

The natural bacteriological process of retting is followed to extract coir fibre from coconut husk in almost all the producing countries including Bangladesh, although this is a more laborious process.

Husks of ripe or unripe coconuts are usually retted for one to two months in backwaters which are quiet and undisturbed but have an ebb and flow, ensuring a constant change of water. Its saline properties are necessary to produce the best quality and bright coloured fibre. These backwaters are often connected with the canals and rivers. When and where backwaters are not available, husks are also soaked in stagnant water in ponds, ditches etc., in which case the time required for retting is much shorter, but the fibre obtained is inferior and dull looking. Sometimes it is deliberately done to get fibres early so that entrepreneur's invested money may be realised within a short period of time by selling the product. In such cases, sulpher smoke is used to colour the fibre. Sometimes husks are crushed by a machine called crushing machine or by dhenki before soaking, because this process considerably shortens the retting period.

When the husks become sufficiently soft, they are removed, washed in water and, squeezed to remove the mud and bad smell. After removing the tough exocarp, the remaining fibre is placed on hard wood, preferably tamarind heartwood, until all the pith is removed. After it is well beathen and softened, it is shaken, washed again, and spread out by hand to dry in order to remove any clogging pithy material that still adheres to it. The dry fibres are then beaten again to some extent and combed by fingers or spikes to remove all small particles of pith. Extraction of fibre is also done by a modern machine called "fibre machine".

Now the fibres are ready to be spun into yarn which may be used to manufacture various coir products. In Swarupkati, tufted door mats (local name is paposh) are manufactured directly from the fibre. For manufacturing strings, rope and other mats, the fibres are first spun into yarn. The task of spinning the fibre into yarn is performed in Swarupkati both by hand and by locally made manually operated wheel or charka, in a form of soft twist. Spinning on a wheel gives better quality yarn with a hard twist that is suitable for the manufacture of matting, good quality rope, and other such materials. The charka consists of two parts: one is for spinning the fibre into yarn and

the other is for twisting the yarn into string. A triangular block of wood, grooved on the sides, is introduced between the strands; this helps to regulate the counter twist, prevents tangling, and binds the strands closely as the spindle on the movable whell is turned.

Two artisans are required to work at a time to operate the charka -- one is for moving the wheel and the other is for introducing the fibre in the spindle of charka for spinning. Two workers with this charka can produce 12 to 15 pounds of hard twist string and 20 to 25 pounds of soft twist string in a day. This type of charka which is used in Swarupkati is manufactured by local carpenters and one charka costs Tk. 80.00 to 100.00 only.

A variety of products such as door mat, cricket mat, floor mat, and rope are manufactured in Swarupkati. Rope is made both by hand and by machine. Only a few enterprises have such rope machines. To make fancy mattings the fibres are dyed as desired.

In Khulna-Jessore zone, only the hard twist and comparatively thinner strings are manufactured. The spinning set used to manufacture the yarn and string consists of three-piece charka here: one is operated by foot to spin a single ply yarn and the other two are for twisting the yarn into string. A bundle of fibre is fixed to the spindle of one charka. The wheel of the charka is moved by a foot-operated lever and the fibre from the spindle is delivered at the required thickness of yarn. To make two ply string, all the three pieces of charka of the spinning set are to be worked in unison. In this process three workers are also required to work in unison with the charka -- two are for moving the wheel and one is to regulate the counter twist, with a piece of wood, grooved on the sides and introduced between the strands.

The coir processing in the areas other than Swarupkati and Khulna--Jessore zone is confined only to the extraction of fibre from coco-nut husk. The fibres extracted in those places are of inferior qua-lity containing at least 50 per cent pith in them. This type of fibre is used only by the local mattress manufacturers.

The coir processing in Bangladesh is, by and large, a cottage type operation using traditional tools and equipment. The products of the industry are mainly coir fibre, coir string and rope, and several types of mats like door mat, floor mat, and cricket mat. However, there are five factories in the country which use modern machines and tools and have relatively large investment of capital. Three of them are by definition small enterprises (less than 50 workers) located in BSCIC industrial estate at Swarupkati. Of the other two larger enterprises, one is at Barisal producing not only coir products but also other coconut products, and one is in Chittagong producing sophisticated coir products like rubberized coir.

2.5 Grades and End-uses of Coir

The grade of the coir fibre is determined by its strength, cleanliness, colour, texture, and length. These qualities depend on the species of the coconut, maturity of the nut at harvest time, and the methods of defibering. For instance, the tensile strength of the fibre varies with locality, the colour depends upon the maturity of the nut and retting process, and finally the texture and length are affected by the variety of the nuts and the cleaning method used in the defibring process.

Coir has a veriety of end-uses. Bristle and mattress fibres are used in the manufacture of wide variety of products. Bristle fibre is used for producing rubberized coir which is used by the furniture and automobile industries for the interior of seats. It is also used in carpet making, brooms, brushes, and bags for the transport of salt. Mattress fibre is used for upholstery stuffing, inner-spring mattresses, door mats, protective packaging, and insulating materials. New usage for it has recently been developed in airconditioning and sound proofing plants. Yarn fibre is extensively used in ropes and twines, including marine cardage, ropes for the timber industry, and horticulture twines. It is also widely used in making string for use in housebuilding, matting manufacture, fishing net making, ship's fenders, and deep-sea telegraph cables.

In most of the end-uses, coir does not compete directly with any of the hard fibres. In twines for stringing hops, in lobster pots, and in bags for the collection of seaweed. Its coarse handle, moisture absorbancy, and resistance to sea-water have up to now precluded any competition from other fibres, natural or synthetic (FAO, 1969). But with technological advancement, however, coir cordage is gradually being displaced in marine uses by synthetic ropes, lines and nets.

3. EMPLOYMENT AND CAPITAL STRUCTURE

3.1 Employment Size

The average number of workers per enterprise has been found to be 3.9 including the entrepreneur; the average number of workers including the entrepreneur in all rural industrial activities surveyed in the Phase I of the Rural Industries Study Project is 3.8 (RISP, 1979). Size distribution (by employment) of the sample enterprises is given in Table 3. The table shows that, out of 150 establishments surveyed, the majority (68 per cent) employ 3-5 workers.

TABLE 3

DISTRIBUTION OF THE SAMPLE ENTERPRISES BY EMPLOYMENT SIZE: 1979

Size groups (no. of employees)	Number of enterprises	Percentage distribution
1 - 2	34	22.7
3 - 5	102	68.0
6 - 9	9	6.0
10 +	5	3.3
TOTAL	150	100.0

Next comes the smallest size group (less than 3 workers per establishment) accounting for 22.7 per cent of the total establishments surveyed; in this category, many are single-worker enterprises and it has been found that generally the entrepreneur's spouse is the worker of the enterprise, i.e. in most of the enterprises with two workers the workers are generally the husband and the wife. The proportion of establishments with 10 and more workers is the smallest (3.3 per cent). The maximum number of workers in a single enterprise was found to be 19, all of them being hired workers, and the entrepreneur himself was the manager.

It is interesting to note that none of the enterprises of Khulna-Jessore zone falls either in the size group 1-2 or in the size group 10+; among the 50 enterprises surveyed in this zone, 46 were in 3-5 group and the remaining four were in the 6-9 group. The reason may be that the entrepreneurs of the area use <u>charka</u> to produce coir string, which requires three workers to run a single set at a time. The number of <u>charkas</u> in an enterprise was found to vary from one set to three sets, requiring 3 to 9 workers. But in Swarupkati, the situation was quite different which led to different size pattern.

3.2 The Profile of Workers

Types of Workers and Their Age-sex Distribution:

Table 4 gives a breakdown of he labour force employed in the enterprises surveyed according to the nature of their relationship with the units, such as owners, members of the owners' family, and hired labour. One of the well-known characteristics of the labour force employed in small-scale and cottage industries is that substantial part consists of entrepreneurs (or owners) and members of their families (Dhar, 1958; RISP, 1979). Since they are either self-employed or have a special relationship with the employer. They cannot, strictly speaking, be called wage-earners.

TABLE 4

TYPES OF WORKERS AND THEIR AGE-SEX DISTRIBUTION: 1979

Type of Worker	WORKERS							
	Male		Female		Children		Total	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Owner	62 (87.3)	43.3	9 (12.7)	2.8	–	–	71 (100.0)	14.1
Family worker	57 (16.3)	39.9	252 (72.2)	79.8	40 (11.5)	88.9	349 (100.0)	69.3
Hired worker	24 (28.6)	16.8	55 (65.5)	17.4	5 (5.9)	11.1	84 (100.0)	16.6
TOTAL	143 (28.4)	100.0	316 (62.7)	100.0	45 (8.9)	100.0	504 (100.0)	100.0

Notes: 1. Figures in parentheses indicate row percentages.

2. Only those owners who contribute direct labour have been included in this table.

It will be seen from the table that 71 owners (47 per cent) in the sample contribute direct labour to the production process; they constitute 14.1 per cent of the total employment in all the sample enterprises. The incidence of owner workers and family workers tends to be lower as the size (number of employees) of the establishment becomes larger. In the largest size group (10+) no owner has been found to participate in the production activity and the family members constitute only 10.3 per cent of the total labour force employed in the size group. More than 69 per cent of the workforce in the sample enterprises is family labour excluding entrepreneurs, and hired workers contribute less than 17 per cent only. It is also interesting to note that the owner does not contribute labour in 19 of the single-worker enterprises, and there is no hired worker in this group, so that the work is done totally by family members.

It will also be seen from the table that the female accounts for the majority (62.7 per cent) of the workforce. The male-female ratio is 5:11. Children constitute about 9 per cent. It should be noted that the proportion of female workers in coir industry is nearly double of the average of 33.6 per cent in all rural industries recorded in the Phase I survey of the rural industries study project (RISP, 1979). Higher incidence of female workers in this industry compared to other small-scale and cottage industries may be explained by the fact that the nature of work involved in this activity allows the female to be employed in this industry more easily than that in other industrial activities.

Nature of Employment:

Nature of employment refers to part-time or full-time involvement of the workers in the industry. Table 5 shows the distribution of workers by nature of employment. A significant finding is that the incidence of part-time workers in the industry is much larger (74.6 per cent) compared to the average situation (18 per cent of the total labour force) obtained in rural industries in the eleven survey thanas, as revealed by the Phase I survey (RISP, 1979). The order of magnitude is roughly the same for males, females, and children separately. The main explanation seems to be that most of those who work in coir industry have other employment as the main source of income, and coir industry is only an additional source.

Hired Workers and their Wages:

As already mentioned, a considerable proportion of labour is provided by the owners and their families. Very often the owner provides labour, particularly in the establishment where he is a master craftsman. Table 6 represents the distribution of hired workers and their wage rates.

The table shows that almost all the hired male workers are working on a full-time basis, while about half the female workers are

TABLE 5

DISTRIBUTION OF WORKERS BY NATURE OF EMPLOYMENT: 1979

Classification of workers	NATURE OF EMPLOYMENT				Total	
	Full-time		Part-time			
	Number	Percentage	Number	Percentage	Number	Percentage
Male	36 (25.2)	28.1	107 (74.8)	28.5	143 (100.0)	28.4
Female	82 (26.0)	64.1	234 (74.0)	62.2	316 (100.0)	62.7
Children	10 (22.2)	7.8	35 (77.8)	9.3	45 (100.0)	8.9
TOTAL	128 (254)	100.0	376 (74.6)	100.0	504 (100.0)	100.0

Note: Figures in parentheses indicate row percentages.

TABLE 6

DISTRIBUTION OF HIRED WORKERS BY NATURE OF EMPLOYMENT AND THEIR WAGES: 1979

Classification of workers	Number of workers	Average monthly wage per worker (Taka)
1. A. Male : Full-time	23	214.00
B. Male : Part-time	1	100.00
2. A. Female : Full-time	27	96.00
B. Female : Part-time	28	60.00
3. A. Children : Full-time	3	60.00
B. Children : Part-time	2	45.00

part-time. There are child workers who also work on both part-time and full-time basis. Many of the female workers are the housewives from neighbouring places who tend to work on a part-time basis.

As can be seen from the table that the average wage rates for the workers seem to be very low. But the minimum wage rate for agricultural labourer prevailing in the survey areas has been found to be the same as that in coir industry (Bureau of Statistics, 1979). Seasonal variation of employment opportunity, and unemployment and underemployment in agriculture sector tend to push the rural labour force in coir industry in the areas concerned.

There are significant variations of the wages between the male and female workers. Information suggests that this wage differential is due to the fact that females have much more limited employment opportunities compared to males.

3.3 Capital Structure

Initial Capital[5/]:

Data on initial or start-up capital employed by the enterprses under study are discussed in this sub-section. First of all, measurement of initial capital poses some problems. The enterpirses under study have been set up in different points of time over a range of more than 30 years (see Section 4) and the money value of assets of the enterprises vary significantly over time due to heavy inflationary trend persisting in the country. In such a situation, the system of indexing of prices could be followed. But to aviod complicacy in calculation, data on size of initial or start-up capital of recently established enterprises have been taken into consideration.

The average initial capital invested per enterprise (average of 31 enterprises) set up during the last five years prior to 1979 has been found to be Tk. 356 only. The data show that there are wide variations in the size of initial capital among the enterprises.

The range of such variation has been found to be from the minimum of Tk. 20 to the maximum of Tk. 6,000 in two extreme cases among the above mentioned 31 enterprises. The wide range of variation of capital is due to the variation in scale of operation, differences in the nature of technology used, degree of mechanisation, product mix etc., the details of which are discussed below.

Current Capital Structure:

Data on current fixed and working capital employed by the sample enterprises are discussed as follows. Fixed capital in value terms is the sum total of the values of machinery, equipment, and tools. Values of other fixed assets like land and buildings have not been considered here. The main reason behind this is that the entrepreneurs in the industry do not necessarily require land and structure especially meant for their coir work. The production process used in manufacturing coir products such as fibre, string, door mats etc. is such that their production can be carried out at home without having to have a specific space or workshop earmarked for the purpose; no such machinery is used in this country as should be parmanently installed in a particular place. In most of the cases production as carried on is open space in front of the dwelling house or nearby places in the dry season, and in _verandas_ (parlour of a cottage) in the rainy season. In the case of products like floor mats, ropes etc., there are some instances where special workshops with some machinery exist; but such cases are a few in the sample, and have therefore been actually ignored in the measurement of capital for the sample as a whole.

Fixed assets have been valued in terms of the replacement cost only. The estimation of true replacement is very difficult as it is supposed to represent the true wear and tear of the asset in question, taking into account price changes. As an approximation, we have taken the present market values of the existing machinery, equipment, and tools as the replacement cost. This is arbitrary but is probably a good approximation. To give some details, let us cite

those machines, equipment, and tools which are currently in use in the production process. They include: (1) hammer; (2) dhenki; (3) pieces of wood; (4) cutta or ashra; (5) punja; (6) scissors; (7) batoi; (8) frame; (9) charka; (10) rope machine [6/] etc. The average value of a rope machine, used by 4 of the sample enterprises (all in Swarup-kati) has been found to be only Tk. 3000, and these are all made in this country. Most of the simple tools have been made by the entre-preneurs themselves and cost nothing to the entrepreneurs except their manual labour and home-grown wood. during the survey, an arbitrary value has been taken for each of them on the basis of opportunity cost of labour and value of the material used in making these tools. Usually tools and equipment are not very costly except a few cases like dhenki and charka.

TABLE 7

COMPOSITION OF CAPITAL IN THE SAMPLE ENTERPRISES

Size groups (no. of employees)	Fixed capital (Taka)	Working capital (Taka)	Total capital (2)+(3)	Average total capital per enterprise	(2) as % of (4)	(3) as % of 4
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1 - 2	900	672	1,572	46	57.3	42.7
3 - 5	6,322	12,504	18,826	185	33.6	66.4
6 - 9	1,178	2,949	4,127	459	28.5	71.5
10 +	4,390	31,530	35,920	7,184	12.2	87.8
ALL	12,790	47,655	60,445	403	21.2	78.8

Table 7 summarises the composition of capital employed by the sample enterprises. Working capital has been taken as the current values of inventories (the exact definition used for working capital will be given subsequently. The table shows that the average size of capital varies significantly between the various size of the enterprises. The more meaningful analysis is not the average capital employed per enterprise, but the average capital employed per worker which will be discussed in Section 7 of this study. At the moment, it can be said that the capital content of the industry is low as compared to other major rural industrial activity (RISP, Phase II Interim Report, 1980).

The percentage share of fixed capital and working capital to the total capital vary according to the sizes. Columns 6 and 7 of the table show that in the smallest size group (number of employment 1-2) 57.3 per cent of the total capital is fixed capital and 42.7 per cent is working capital; share of working capital increases as the size increases with the consequent decrease in share of fixed capital. The figures in the table also indicate the relative importance of working capital to the fixed capital. It is clear, then, that operating expenses are more important than initial outlays in the setting up of this small-scale and cottage industres. In the words of P.N. Dhar, who commenting on the Indian cottage industries, wrote "... it is easier to start these cottage industries that to operate them" (Dhar, 1958).

Composition of Working Capital:

The working capital has been broken into the following categories: stock of raw materials, stock of finished and semifinished products, and outstanding credit. Several items like cash with banks, cash in hand, investment in securities, loans and advances etc. of liquid assets which should come into the calculation of working capital, have been totally omitted. The justification for ommission of these items are as follows: (1) other activity like agriculture, day labour, other business etc. rather than coir processing being the primary

occupation of majority of the entrepreneurs (the occupational distribution has been shown in the section of entrepreneurship and the enterprises), the items like cash with banks, cash in hand, investment in securities, and loans and advances will not reflect the current liquidity position of the entrepreneurs relating to the enterprises only, but will reflect those relating to the whole lot of things; (2) there are only four entrepreneurs out of the sample of 150, who have bank accounts and it is suspected that how far correct information they have provided with; and (3) no information was available regarding investment in securities, and loans and advances. So, the omission of the above mentioned items will not affect the study significantly.

Table 8 shows the breakdown of working capital. In the size group of 1-2 employees, no enterprise has outstanding credit, which

TABLE 8
COMPOSITION OF WORKING CAPITAL IN THE SAMPLE ENTERPRISES: 1979

Size groups (no. of employees)	Stock of raw materials (Taka)	Stock of finished & semi-finished products (Taka)	Out-standing credit (Taka)	Total working capital (2)+(3)+(4)	Average of (5) per enterprise	(2) as % of (5)	(3) as % of (5)	(4) as % of (5)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1 - 2	219	453	-	672	20	32.6	67.4	
3 - 5	1,753	8,286	2,465	12,504	123	14.0	66.3	19.7
6 - 9	639	810	1,500	2,946	328	21.7	27.5	50.8
10 +	6,070	11,060	14,400	31,530	6,306	19.3	35.1	45.6
ALL	8,681	20,609	18,365	47,655	318	18.2	43.3	38.5

means that the entrepreneurs of that group do not usually sell on credit. The small units apparently cannot afford to sell on credit as they need the income for their immediate livelihood. The average amount of working capital required for different sizes, given in column 6 of the table, shows how it varies with size from a low figure of Tk. 20 in the smallest size group (1-2 employment size) to Tk. 6,306 in the case of the largest size group (10+ employment size), registering a steep jump for the largest size group. The variation of working capital arises not only on account of the variation in sizes of the establishments, but also on account of the variation in purchase and stocking policies, and in the cost prices due to processed and non-processed raw materials used by different size groups of enterprises. Variation in marketing practices, resulting in the differential sizes of the inventories of finished products, also affect the size of working capital.

Columns 7-9 of the table show the percentage share of different components of total working capital. Stock of raw materials accounts for relatively small share in almost all the cases. Share of outstanding credit is larger for larger size enterprises. Larger enterprise can both afford to, and also for disposing of stocks need to, sell on credit.

Available data also reveal that the enterprises possess very small financial reserves. Invariably, interruption of business is related to financial vulnerability arising out of loss of working capital which may result from short term emergency like illness, difficulty in marketing of the products etc.

4. ENTREPRENEURS AND THE ENTERPRISES

Characteristics of the Entrepreneurs

The term "entrepreneurship" has been defined in the Phase I report of the Rural Industries Study Project as follows: an entrepreneur is a person who is responsible for the establishment, and orga-

nization or management of industrial enterprises (RISP, 1979). This definition is employed in this study as well. Defined as such, an entrepreneur is not only the owner of an enterprise but also the person who performs other entrepreneurial functions such as investment planning, decision making, and supervision of overall activities of an establishment.

There are several entreprenurial characteristics which may have important influence on the peroformance of their firms. These are: age, level of education, level of income, land holding, and the main source of income of the entrepreneurs. Detailed analysis of entrepreneurship is not undertaken here. The main thrust of analysis here is to see who are the entrepreneurs (in true sense of the term they are the proprietors or owners of the enterprises, but we shall treat them as entrepreneurs in our analysis) in the industry, and how have they come into this industry.

Age of the Entrepreneurs:

Age is one of the important personal characteristics of an individual which may be a determinant of his ability as an entrepreneur. It is suggested that generally in the age range of 20's and 30's such capability of an individual flourishes (Watanabee, 1970). Table 9 shows the distribution of the sample enterprises by the major age groups of the entrepreneurs. The figures in the table show that a majority of the entrepreneurs (57.3 per cent) are in the age range 30-49, and 24 per cent are in the age range 20-29. As it will be seen in Sub-section 4.7 that 36 per cent of the enterprises are aged between 10-19. This result together with the distribution of the entrepreneur's age range found here correspond with the suggestion that majority of the entrepreneurs are in the right side of age for good performance. Only seven entrepreneurs (4.7 per cent) are aged below 20; most of them have inherited their enterprises from their parents. Only eight of the entrepreneurs are female and all of them are incidentally widows.

TABLE 9

DISTRIBUTION OF ENTREPRENEURS BY AGE (IN YEARS): 1979

Age groups (years)	Number of entrepreneurs	Percentage distribution
Below 20	7	4.7
20 - 29	36	24.0
30 - 49	86	57.3
50 +	21	14.0
TOTAL	150	100.0

Level of Education:

The level of formal education may have important bearing on entrepreneurial performance. It may be assumed that formal education can contribute to entrepreneurial ability by improving their organizational, managerial, and technical skills. Entrepreneurs of some developing countries such as the Philippines and Kenya have in general much higher level of education compared to other sections of population (Carroll, 1965). In the case of Bangladesh, the large majority of the entrepreneurs of rural small-scale and cottage industries in general have been found to have no education at all (RISP, 1979). The level of educational attainment of the entrepreneurs of coir industry has been shown in Table 10. A majority (56 per cent) of the entrepreneurs have no formal education, 36 per cent have less than six years of schooling. The corresponding figures for Bangladesh rural male population are 65.4 per cent, 12.9 per cent, and 14.2 per cent (Bureau of Statistics, 1974). These suggest that those who have higher education seldom come to this occupation.

There are only three entrepreneurs among the sample total of 150 who have apprenticeship training, and none of the entrepreneurs has any formal institutional training in any field of activity. But

TABLE 10

DISTRIBUTION OF ENTREPRENEURS BY LEVEL OF EDUCATION: 1979

Level of education (Yrs. of schooling)	Number of entrepreneurs	Percentage distribution
No education	84	56.0
1 – 5	54	36.0
6 – 9	10	6.7
10 +	2	1.3
TOTAL	150	100.0

it has been gathered that many of the entrepreneurs have learnt the necessary skills by way of doing the work as family labour.

Size of Land Holding:

In an agro-based economy like Bangladesh, landownership may be used to measure general economic status of the rural people. Since land is the economic base and principal source of income for the rural masses, it may be hypothesised that a section of people who have land may extend their economic activities into industrial activities by using funds initially out of surplus generated from agriculture. Alternatively, it may also be hypothesised that landowners may not be enthusiastic about industrial activities as their livelihood is more or less secured, so that it may be those who have no land or do not have enough land for their economic needs may tend to search for alternative sources of income in industrial fields. It will be seen from Table 11 that 15 per cent of the households involved in the coir industry are completely landless, 94 per cent of the entrepreneurs are landless or near landless holding up to one acre of land. In this case the second hypothesis seems to be valid.

TABLE 11

DISTRIBUTION OF ENTREPRENEURS BY SIZE OF LAND HOLDING: 1979

Size group of land holding (acres)	Number of entrepreneurs	Percentage distribution
No land	15	15.0
0.01 – 0.15	42	42.0
0.16 – 1.00	37	37.0
above 1.00	6	6.0
TOTAL	100	100.0

Note: 1. Land holding means the permanent holding of total land including both homestead and agricultural land.

2. The maximum total holding of an entreprneur has been found to be only 1.83 acres.

3. The land holding data for the sample units have been taken from the RISP Phase I Survey of Rural Industries Study Project (RISP, 1979) from which the sample has been drawn. Since it was carried on in Swarupkati, the data refers to that area only. Land holding data for Khulna-Jessore zone have not been collected.

Sources of Income:

A comparative study of the sources of income of the entrepreneurs will indicate the magnitude of importance of the industry as a source of income. Table 12 shows that coir processing is the main source of income of 38.7 per cent of the entrepreneurs; this means that this activity is the means of livelihood of 38.7 per cent of the landless or near landless people in Swarupkati. The main source of income of 38 per cent of coir enterprise owners is day-labouring, indicating an equal importance of this industry with day-labouring. This implies that all these people undertake coir processing of some sort to enhance their income earned through day-labouring. It should be men-

TABLE 12

DISTRIBUTION OF ENTREPRENEURS BY MAIN SOURCE OF INCOME: 1979

Main source of income	Number of entrepreneurs	Percentage distribution
1. Agriculture	18	12.0
2. Industry (Coir)	58	38.7
3. Trade	11	7.3
4. Day labour	57	38.0
5 Others	6	4.0
TOTAL	150	100.0

tioned that 62 per cent of the owners of the establishments of size up to 2 have day-labouring as their main source of income. Another interesting feature is that, those whose main source of income is day-labouring have industrial activities usually limited to extracting of coir fibre and are not involved in further processing of the fibre. The reason is that further processing needs some equipment and tools which they cannot afford to have due to lack of money. Moreover, this poorer section of people have to sell their products after immediate processing for consumption needs. Agriculture is the main source of livelihood of only 12 per cent of the entrepreneurs.

Level of Income:

Level of income is the main determinant of the economic welbeing of the people. Table 13 represents the data on yearly income of the entrepreneurs of the sample enterprses. All possible efforts were made to get as good estimates as possible of household income from all sources. Figures in column 4 of the table show that the average per capita income of the entrepreneurs of coir industry is Tk. 891 only, while the national average is Tk. 1500. This suggests that

TAB_E 13

DISTRIBUTION OF ENTREPRENEURS BY LEVEL OF YEARLY INCOME: 1979

Income groups (Taka)	Number of entrepreneurs	Percentage distribution	Income per capita (Taka)
Upto 3,000	24	16.0	411
3,001 – 5,000	65	43.3	765
5,001 – 10,000	50	33.4	1,030
10,000 +	11	7.3	1,602
ALL	150	100.0	891

Note: 1. Income refers to income from all sources in which the entrepreneur and his other household members are involved.

2. Since the rural people do not habitually keep accounts of their incomes, some arbitrariness are involved in these income data; estimates relate to the year preceding the time of survey.

income from coir processing is n t attractive. But the people are involved in this industry only for subsistence purposes.

4.2 Ownership Pattern

Generally they ownership of the enterprises are confined to the craftsmen themselves. The capital requirement for the industry is comparatively low which allows the craftsmen to be able to own an unit individually or keep the unit within the family ownership. The ownership pattern of the sample units are given in Table 14. There are only two types of ownership -- individual and family. Roughly three-fourths (74 per cent) of the units are owned by single owners and the rest are under family ownership. Apart from the low capital requirement, there seems to be a tendency to keep the ownership of the establishments within the family limits irrespective of the enterprise size.

TABLE 14

OWNERSHIP PATTERN OF THE SAMPLE ENTERPRISES: 1979

Size groups (no. of employees)	OWNERSHIP PATTERN				Total
	Individual		Family		
	Number	Percentage	Number	Percentage	
1 - 2	31	27.9 (91.2)	3	7.7 (8.8)	34 (100.0)
3 - 5	71	64.0 (69.6)	31	79.5 (30.4)	102 (100.0)
6 - 9	6	5.4 (66.7)	3	7.7 (33.3)	9 (100.0)
10 +	3	2.7 (60.0)	2	5.1 (40.0)	5 (100.0)
TOTAL	111	100.0 (74.0)	39	100.0 (26.0)	150 (100.0)

Note: Figures in parentheses indicate row percentages.

One important point to be mentioned here is that all the enterprises have not been founded by the entrepreneurs themselves. Among the 150 enterprises, 109 (or 72.7 per cent) have been founded by the entrepreneurs themselves, 35 (or 23.3 per cent) have been founded by their father and the present owners have inherited them, while the remaining 6 (or 4 per cent) have been founded by others and the present owners have acquired them by purchase or through gift.

4.3 Occupational Origin

Occupational origin may be one of the determinants of entrepreneurs' efficiency in running the enterprises. Entrepreneurs can acquire skills in the process of work as well as what may be called the feel and natural process of internalisation from family environ-

ment. But these are not the main thrust of analysis in this sub-section. This sub-section will mainly analyse the changes of occupational structure that have taken place through generations.

Table 15 shows the main occupation of the entrepreneurs, their fathers and grandfathers.. The table shows that 68 per cent of the grandfathers were mainly engaged in agriculture; the proportion

TABLE 15

DISTRIBUTION OF ENTERPRISES BY THE MAIN OCCUPATION OF THE ENTREPRENEURS, THEIR FATHERS, AND GRANDFATHERS: 1979

Main occupation	Entrepreneur		Father		Grandfather	
	Number	Percentage	Number	Percentage	Number	Percentage
Agriculture	18	12.0	70	46.7	102	68.0
Industry (Coir)	58	38.7	6	4.0	-	-
Trade	11	7.3	38	25.3	22	14.7
Day labour	57	38.0	30	20.0	8	5.3
Others	6	4.0	6	4.0	18	12.0
TOTAL	150	100.0	150	100.0	150	100.0

declined to 46.7 per cent in the case of the fathers; and it is down to 12 per cent in the case of entrepreneurs themselves. On the other hand, the role of coir industry as the main source of employment has increased through generations. The bar diagram in Figure 1 represents more clearly the intergenerational mobility between occupations. There is a gradual decline in the proportion of population engaged in agriculture with a corresponding increase in the proporion of population employed in coir industry (or alternatively we call 'manufacturing'), and day-labouring. A recent survey on rural occupational structure conducted in 11 villages of Bangladesh, under Rural Indus-

tries Study Project also supports this fact. The phenomenon can be explained by the fact that agriculture is reaching its saturation point with respect to employment, and it can no longer provide employment to the expanding population. Surplus people from agriculture are, therefore, being forced to search for alternative employment opportunity for their subsistence. In the survey areas, people find raw materials and markets for coir products, so some of the people have moved into coir industry, and others into day-labouring and other activities as their main profession.

4.4 Factors Behind Establishing the Enterprises

In order to assertain the main factors behind establishment of coir enterprises, the entrepreneurs were asked to tell what factors motivated them to set up coir processing units. The replies have been summarized in Table 16. The entrepreneurs were asked to rank the answers by 'primary' and 'secondary' factors. Profits made by other in similar concerns have been considered by 36 per cent of the entrepreneurs as the primary factor to influence them to take to coir manufacturing. Low capital requirement by the industry has been so considered by 21.1 per cent of the entrepreneurs. More than 18 per cent of the entrepreneurs found no alternative employment opportunity at that moment, other than coir manufacturing for earning their livelihood. Demand for the product in the market has been indicated by 11 per cent of the entrepreneurs as the primary factor. There are other answers such as ready availability of raw materials for the industry, low technical skill requirement, low business risk etc. which have been indicated by more than 16 per cent of the entrepreneurs as the primary factors. Among the secondary factors, low capital requirement topped the list followed by non availability of alternative employment opportunity.

From the above findings, it appears that it is an effort of the surplus people from agriculture to engage themselves in a sector which requires less capital, less technical skill, and the product has market so that some profits may be earned for their subsistence.

TABLE 16

DISTRIBUTION OF ENTERPRISES BY THE RELATIVE WEIGHTS OF THE FACTOR BEHIND THE ESTABLISHMENT OF COIR MANUFACTURING ENTERPRISE AS REPORTED BY THE ENTREPRENEURS

| Factors | Distribution of Enterprises Reporting Primary and Secondary Factors | | | |
| | Primary | | Secondary | |
	Number	Percentage	Number	Percentage
Demand for the product in the market	12	11.0	3	2.8
Profit made by others in similar concerns	36	33.0	16	14.7
No other employment opportunity for subsistence	20	18.3	18	16.5
Requires less capital	23	21.1	42	38.5
Others	18	16.6	30	27.5
TOTAL	109	100.0	109	100.0

Note: The table shows the distribution of those enterprises which are founded by the entrepreneurs themselves. The number of such enterprises is 109.

4.5 Entrepreneurs' Choice of Stage of Production

As already described in Section 2 that coir manufacturing involves different stages of production for different products. For example, extraction of fibre from coconut husks involves single stage, while making of coir string involves double stage, such as first to extract fibres from coconut husk, and then to make string out of those fibres. Some of the products like coir rope and coir mat involve several stages in their production process. Figure 2 represents the stages of production of the products produced in the sample areas of the study. The basic raw material is coconut husk.
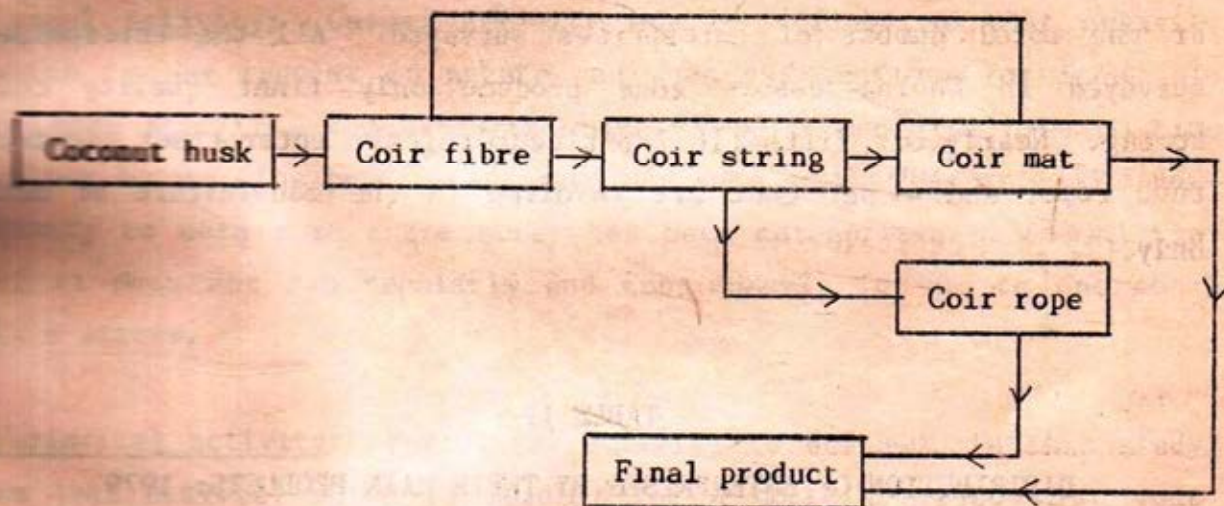
Figure 2

There are establishments which specialize at one or the other of the successive stages of production from extracting fibre from coconut husk to the production of string to the manufacture of ropes, cordage etc. There are also establishments which are mainly engaged in production of mats, fibre, and string.

Some of the establishments produce only a single product which requires either a single stage or several stages depending on the nature of the product they produce, while others produce more than

one product with different processes. The multiple product enterprises are few in number as compared to single product enterprises. In all, 137 out of 150 enterprises (91.3 per cent) produce a signle product, 6 enterprises (4 per cent) produce two products, and the remaining 7 enterprises (4.7 per cent) produce three or more products. Product diversification is found mainly in larger enterprises. For example, 4 out of 5 enterprises in size group 10+, and 2 enterprises out of 9 in size group 6-9 have at least three product lines.

It has been found that, even when an enterprise produces several products it usually has one single main line of production. The distribution of the enterprises by their main products has been shown in Table 17. The table shows that the number of establishments producing mainly coir string is the largest, accounting for nearly one half of the total number of enterprises surveyed. All the enterprises surveyed in Khulna-Jessore zone produce only finer quality coir string. Nearly one fifth (18.7 per cent) of the enterprises manufacture rope, and 4 per cent are involved in the manufavture of mats only.

TABLE 17

DISTRIBUTION OF ENTERPRISES BY THEIR MAIN PRODUCTS: 1979

Main product	Number of enterprises	Percentage distribution
1. Coir fibre	46	30.7
2. Coir string	70	46.6
3. Coir rope	28	18.7
4. Coir mat	6	4.0
TOTAL	150	100.0

It is also worth mentioning here that 92 per cent of the enterprises begin their activity from the extraction of fibre from coconut husk, and 30.6 per cent are involved in the extraction of fibre only and proceeds no further with processing. About 97 per cent of the enterprises in size group 1-2 extract fibre only; this is mainly because it requires less labour.

4.6 Duration of Activity

The activity or duration of running the enterprise in a year has been classified into the following three categories: (1) casual; (2) periodical; and (3) year round.

Casual activity: Casual activity may be defined as that activity which is not regular in nature and does not continue for long. To be more specific, the activity which is performed from time to time either because the person concerned has some spare time or good opportunity to earn some extra money has been categorised as casual type if it does not run regularly and continuously for up to one month at a stress.

Periodical activity: Periodical activity is defined, in this study, as that activity which is regular for a certain period in a year, the period being at least one month but less than a year at a stress. There are some establishments which are not run throughout the whole year but one or more continuous periods in a year, these establishments fall in this category.

Year round activity: Enterprises which are run throughout the year regularly fall in this category.

Table 18 presents the distribution of the enterprises surveyed in the study by duration of activity.

It is clear from the table that 114 establishments (76 per cent) are operated on year round basis. Among the remaining 36 enterprises (24 per cent), 18 are casual in nature and the rest are periodically

TABLE 18

DISTRIBUTION OF ENTERPRISES ACCORDING TO WORKING PERIOD (DURING THE YEAR): 1979

Size groups (No. of employees)	Working Period						Total
	Casual		Periodic		Year Round		
	Number	Percentage	Number	Percentage	Number	Percentage	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1 - 2	8	44.4 (23.5)	6	33.3 (17.7)	20	17.5 (58.8)	34 (100.0)
3 - 5	10	55.6 (9.8)	12	66.7 (11.8)	80	70.2 (78.4)	102 (100.0)
6 - 9	-	-	-	-	9	7.9	9
10 +					5	4.4 (100.0)	5 (100.0)
TOTAL	18	100.0 (12.0)	18	100.0 (12.0)	114	100.0 (76.0)	150 (100.0)

Note: Fitures in parentheses indicate row percentages.

run enterprises. The number of employment of the establishments, which are run casually or periodically, varies from one to five. All the enterprises which are run all the year round have the employment size of 6 and above. Again, we can see when we look into the figures in column 7 of the table that the proportion of the enterprises running throughout the year is larger in size group 3-5 (78.4 per cent) than that in size group 1-2 (58.8 per cent). All these indicate several things: (i) many of the entrepreneurs of smaller size groups belong to the poorer section of people so that they cannot collect sufficient fund for working capital to run their enterprises regularly throughout the year (it was reported by some of the entrepreneurs of this group that they could not run their business regularly due to lack of finance); (ii) it has been observed that the quality of the products of these casual and periodic enterprises is relatively

poor, perhaps due to lack of seriousness about the occupation of the entrepreneurs of these groups, which results into low return and low profit margin and hence lower capital accumulation for further investment; (iii) some people may not always be interested in this professions, and whenever they are totally or partially free from other professions they accept it for the time being; and finally (iv) seasonal flactuation of raw material and product prices render some products less profitable in a particular season, so that some entrepreneurs become disinterested in producing the products in that season.

The variatios are not only in the case of period of operation but also in the case of hours of work per day between the enterprises. Data on working hours are presented in Table 19. The conventional 8 hours in one shift or 16 hours in two shifts are generally absent

TABLE 19

AVERAGE HOURS AND MAN–HOURS WORKED PER DAY PER ENTERPRISE: 1979

Size groups (No. of employees)	Number of enterprises	Average hours worked per day per enterprise	Average man-hours worked per day per enterprise
(1)	(2)	(3)	(4)
1 – 2	34	4.9	6.0
3 – 5	102	6.6	13.3
6 – 9	9	8.9	40.7
10 +	5	9.5	97.0
All Groups	150	6.7	16.8

in the case of small-scale and cottage industries of Bangladesh. The table shows that the average hours an enterprise is run per working day varies from a minimum of 4.9 hours (for 1-2 size group) to a maximum of 9.5 hours (for 10+ size group). The average working hours have increased steadily as the size of the enterprise increases.

This together with the figures of duration of activity in Table 18 suggests that this occupation is not only irregular in nature but also, to some extent, part-time, particularly in the case of smaller size groups. Indeed, there are several enterprises in size group 1-2 which are run just for an hour per working day; column 4 of Table 19 shows that the average man-hours worked per working day varies from 6.0 for size group 1-2 to 97.0 for size group 10+.

4.7 Age of the Enterprises

In Section 2 of this report, it has been already mentioned that diffusion of coir technology in this country is very recent --- it began to spread in early 1930's. In this section, the distribution of enterprises by their age since initial establishment has been presented. Although, in most of the cases, the exact dates of their establishment are not available since records were not generally kept, the rough idea about the age of an enterprise has been obtained from the entrepreneurs and the results have been presented in Table 20.

TABLE 20

DISTRIBUTION OF ENTERPRISES BY AGE (IN YEARS): 1979

Age groups of enterprises (in years)	Number of enterprises	Percentage distribution
(1)	(2)	(3)
Less than 3	6	4.0
3 - 5	25	16.7
6 - 9	11	7.3
10 - 19	54	36.0
20 - 29	46	30.7
30 +	8	5.3
TOTAL	150	100.0

It will be seen from the table that 36 per cent of the enterprises are in the age group 10-19 years, and another 30.7 per cent are in the age group 20-29 years. This indicates that coir business flourished in this country during the 1950's and 1960's. The proportion of establishments in the age groups 3-5 years is much larger (16.7 per cent) than that in the age group 6-9 years (7.3 per cent), which indicates that there was a slow growth of the industry immediately after the liberation of Bangladesh (or even the growth might be below replacement level if mortality of the previously established firms were taken into account), and again the growth rate increased during the famine of 1974 (partly due to unemployment and underemployment arising out of famine in 1974, and partly for the scope of earning to subsidise the high rice price in that year). The table also indicates that, although processing of coir began in early 1930's in this country, it spread widely after partition in 1947, and the indusry got a philip as a result of the 1965 Indo-Pak war which led to increase in demand for the products from the then West Pakistan.

5. FINANCE

5.1 Sources of Finance

Given the small amount of capital requirement by coir industry, financing of such enterprises at the initial stage is mainly done out of funds generated through personal savings of the entrepreneurs accumulated from their previous occupations (Ahmed 1976, Liedholm and Chuta 1976). It was also observed that, in some cases, a part or all of the finance is met out of credit mainly from informal sources (friends, relatives and moneylenders).

The sources of finance for intial capital employed by the sample enterprises along with the percentage share of each source have been shown in Table 21. It can be seen from the table that the main source for the initial capital is the personal savings of the entrepreneurs from agriculture, trade, day-labouring, and other occupations, which have contributed over 70 per cent of the total initial capital. The

TABLE 21

THE AMOUNT OF INITIAL INVESTMENT IN THE ENTERPRISES
BY THE MAIN SOURCES OF FUNDING

Sources of fund	Number of enterprises involved	Total amount (Taka)	Percentage share	Average amount (3)/(2)
(1)	(2)	(3)	(4)	(5)
Personal savings	108	13,332	70.4	123.44
Parents	10	2,834	15.0	283.40
Loans	10	2,570	13.6	257.00
Gifts	5	207	1.0	41.40
TOTAL	133	18,943	100.00	132.47

Note: The number of enterprises founded by the entrepreneurs them-
selves is 109. But there are enterprises with more than one
source of finance so that we have 133 enterprises.

number of enterprises involved in such financing has been found to
be 108 (or 81.2 per cent). The other sources of finance are contri-
bution of parents, loans from private sources and gifts, and their
shares to the total initial capital have been found to be 15 per cent,
13.6 per cent, and 1 per cent respectively. Private sources consist
of friends and relatives, and the village moneylenders. Friends and
relatives sometimes provide loans without any interest but for a very
short period of time. On the other hand, village moneylenders charge
a high rate of interest; in one extreme case in Swarupkati, it has
been found that the interest rate charged was 400 per cent which was
to be paid in kind (paddy).

None of the enterprises reported taking loan from commercial
banks or other institutional sources. It appears that generally the
commercial banks do not advance loans to this type of cottage industry
where the proprietors usually have neither enough fixed nor suffici-
ently large stocks of semifinished goods to offer as collateral.

5.2 Expansion of Capital

The expansion of fixed capital since the establishment of the units and the sources of such expansion capital have been analysed in this sub-section. Out of 150, only 34 (or 23 per cent) enterprises undertook expansion on their fixed assets since establishment, and in none of the cases the amount of expansion capital did exceed the amount of initial investment. Those who have expanded their fixed capital from time to time were primarily dependent on their own internal resources for expansion. It has been found that more than 95 per cent of these resources consisted of plough back of profits, and the remaining part came from personal savings from agriculture and other sources. Since the absolute size of profits was small, the plough back was consequently very small. Again, it was only a few enterprises which were originally relatively big in size and could earn profits and, hence, could reinvest out of profits. In most of the other cases, profits from this business are mainly used for personal consumption.

5.3 The Problem of Financing

The problem of financing the small-scale and cottage industries is currently a widely discused issue. Lack of adequate finance is believed to be one of the major hindrance to the growth and expansion of this sector. In most of the cases, the entrepreneurs have offered, lack of capital or credit has been a ready-to-hand explanation for a number of difficulties. Introduction of even a minor technical innovation is said to have often rendered difficult by the scarcity of capital (Dhar, 1958).

The case of coir industry is perhaps more acute in respect of financing. In most of the cases, this industry is a poor man's business; and as such the entrepreneurs are not able to provide adequate investment funds in their enterprises. The entrepreneurs face problems of financing both at the initial stage and also in running the enterprises. Sometimes the entrepreneurs even consume their working capital, particularly at the time of unforeseen circumstances like

illness. Again, since there is no institutional set up to finance the industry and since loans from private sources involve heavy security and very high rate of interest the entrepreneurs are in very difficult position for running the enterprises.

The situation can better be understood from the entrepreneurs' own perception about the financial constraint. To assertain whether finance posed a major difficulty to the sample entrepreneurs they were asked to state the problems faced by them in starting their business. The respondents mentioned a number of problems among which finance has been found to top the list. Nearly 37 per cent of the respondents cited finance as the number one problem at the initial stage. Again, while indicating the need for various types of assistance from the Government, an overwhelming majority of the entrepreneurs (69 per cent) mentioned that they needed credit for working capital. And finally, in seeking the suggestions on how to improve the condition of coir industry, 52 per cent of the respondents mentioned the need for credit for expansion capital. It thus clearly emerges that finance is one of the main constraints for the growth of the industry, and it relates to both investment and working capital needs, more acute in the latter case.

6. PROCUREMENT AND MARKETING

6.1 Procurement of Raw Materials

Since both the study areas are located in coconut producing areas, abundant raw materials are locally available to feed the industry. The source media of new materials are producers, middlemen, wholesellers, and retailers. There are coconut oil producing firms in the areas which sell coconut husks direct to the coir producing units, while some coir enterprises which produce only coir fibre supply their final product to other enterprises where it is further processed. Middlemen here is the supplier who collects raw materials from elsewhere and supplies them to the enterprises concerned for some commission. Middlemen generally supply the raw materials at

the doors of the enterprises. Wholesellers generally sell raw materials in the market places at wholesale rates. On the other hand, retailers sell raw materials both in market places and at the doors of the enterprises. The practice of selling the raw materials to enterprise premises is common in Swarupkati perhaps because of good water communication facilities.

Tables 22 and 23 present the shource and the place of procurement of raw materials. The most important suppliers of raw materials are retailers, and the dominant place of procurement of the same is the market place within the thana. The proportion of entrepreneurs who purchase raw materials mainly from retailers has been found to be 44.7 per cent (Table 22); and 48.7 per cent (Table 23) of the entrepreneurs purchase raw materials from markets within the thana.[7] Whether the market place is within the thana or in neighbouring thana, its maximum distance from the enterprise has been found to be 10 miles. The main market places in Swarupkati are Miarhat (Indirhat) within the thana and Nazirpur in the neighbouring thana. Fultola, Noapara, and Keshabpur are the main marketing centres in Khulna-Jessore zone.

TABLE 22

DISTRIBUTION OF ENTERPRISES BY THE MAIN SOURCE OF RAW MATERIALS: 1979

Sources of raw materials	Number of enterprises	Percentage distribution
(1)	(2)	(3)
1. Producer	18	12.0
2. Middleman	35	23.5
3. Wholeseller	30	20.0
4. Retailer	67	44.7
ALL	150	100.0

TABLE 23

DISTRIBUTION OF ENTERPRISES BY THE MAIN PLACE OF PROCUREMENT OF RAW MATEIALS: 1979

Place of procurement	Number of enterprises	Percentage distribution
(1)	(2)	(3)
1. Enterprise premise	37	24.7
2. Market within the thana	73	48.7
3. Market in neighbouring thana	40	26.6
ALL	150	100.0

Prices of raw materials are not the same in the two areas. Also, prices fluctuate rather widely from season to season. Table 24 presents the range of variation of raw material prices in three consecutive years. The table shows that the magnitude of intra-year variation of raw material prices was much larger in Swarupkati than in Khulna-Jessore zone.[8/] Price differences between seasons (difference

TABLE 24

RANGE OF INTRA-YEAR AND INTER-YEAR VARIATION OF RAW MATERIAL (COCONUT HUSK) PRICES IN TWO MAIN COIR PRODUCING AREAS, 1977-1979

(Price in Tk./100 raw husk)

Year	Swarupkati			Khulna-Jessore Zone		
	Minimum price	Maximum price	(3)-(2) as % of (2)	Minimum price	Maximum price	(6)-(5) as % of (5)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1977	70	250	257	60	150	100
1978	90	360	300	60	140	133
1979	90	340	278	60	120	150

Note: Price of medium quality coconut husk.

of maximum price from the minimum price) have been found to be 257 per cent in the year 1977, 300 per cent in 1978, and 278 per cent in 1979 in Swarupkati. The corresponding figures for Khulna-Jessore zone are 100 per cent, 133 per cent, and 150 per cent. Again, raw material is much more expensive in Swarupkati than in Khulna-Jessore zone. The reasons behind these may be the localized scarcity of raw materials.

The seasonal variation of prices are mainly due to variation in the supply of coconut husks. In the period of April-June, supply of coconut husks increases as a result of increased harvesting of ripe nuts in the period compared to other periods in the year. The larger variation of prices in Swarupkati than in Khulna-Jessore zone may be due to other reasons also. It was reported that a proportion of coconut husks used in Swarupkati has to be imported from the neighbouring places usually by water transport. But at times, particularly when the inland canals become non-navigable due to insufficient water flow in the dry season, there is difficulty in transportation of the bulky materials. In Khulna-Jessore zone, unlike in Swarupkati, there is good road communication as a substitute for water transportation.

Even though prices fluctuate widely between seasons, entrepreneurs do not seen to respond to it by storing raw materials when prices tend to be low. Only 16 per cent of the sample entrepreneurs, irrespective of the size of their enterprises, has been found to store 16 per cent of the total requirements of raw materials at the cheapest period in the year 1979. The remaining 84 per cent of the entrepreneurs did not store. Entrepreneurs were asked as to the reasons why they do not store raw materials, about 75 per cent of them mentioned that they could not store due to lack of finance, and the remaining 9 per cent did not bother about storing as they might change their profession.

6.2 Marketing of Finished Products

Marketing of finished products involves a chain of middlemen. The entrepreneurs carry their finished products to the markets in

hat day (once or twice in a week) and the business of buying and selling takes place there. The sellers sell their products not necessarily to a particular dealer every time. Sometimes a number of entrepreneurs in the same locality select one from among themselves to go to the hat to sell their products on a particular day to minimise marketing costs. The person who undertakes the task gets some extra remuneration; he is a middleman. It can be seen from Table 25 that this type of cost sharing is done by 22 per cent of the entrepreneurs. The table also shows that a small number of enterprises (4.7 per cent) sell their products direct to other coir manufacturing firms. About 43 per cent of the enterprises sell their products to retailers.

TABLE 25

DISTRIBUTION OF ENTERPRISES BY THE MAIN CUSTOMER OF THEIR PRODUCTS: 1979

Customers	Number of enterprises	Percentage distribution
1. Manufacturing firm	7	4.7
2. Middleman	33	22.0
3. Wholeseller	45	30.0
4. Retailer	65	43.3
ALL	150	100.0

Table 26 shows the distribution of market places where the entrepreneurs sell their products. Most of the sample entrepreneurs (96.7 per cent) sell their products in local markets within or in neighbouring thanas. Five of the entrepreneurs have reported that they sell their products in the largest city centres of the country; four from Swarupkati sell their products in Dhaka and Chittagong, and one from Khulna-Jessore zone sell his products at Khulna. All of the five enterprises are larger in size and are run throughout the year. They

TABLE 26

DISTRIBUTION OF ENTERPRISES BY THE MAIN SALES CENTRES OF THE PRODUCTS: 1979

Sales centres	Number of enterprises	Percentage distribution
1. Market within the thana	116	77.4
2. Market in neighbouring thana	29	19.3
3. Other sales centres	5	3.3
ALL	150	100.0

Note: Other sales centres refer to Dhaka, Chittagong and Khulna, three important cities of Bangladesh.

can afford to take their products to cities as the quantities of products and hence profits earned are fairly large.

Generally, the local traders or traders coming from elsewhere buy the products in lots and sell them to different trade centres in various parts of the country. As already noted Miarhat, Fultola, and Noapara are the main local centres for coir business in producing areas. The main trade centres are Dhaka, Khulna, and Chittagong.

The basis of sale is usually cash. However, there are some entrepreneurs (14 per cent) who also, sometimes, sell on credit; only 19 per cent of the sales of these enterprises has been on credit, and the average length of payment time has been found to be 9 days, varying from a minimum of 3 days to a maximum of one month. Those who sell on credit to some extent are the entrepreneurs who (i) are engaged in this activity on year-round basis, (ii) have larger size enterprises, (iii) have this activity as their main source of income, and (iv) have comparatively large working capital.

Prices naturally vary according to quality of the products. Also, like the prices of raw materials, the prices of the products fluctuate

widely in different periods of the year. Tables 27 and 28 present the relevant price data. It can be seen from Table 27 that the price of coir string produced in Khulna-Jessore zone is much higher than that in Swarupkati. This price difference may not be due to different market situations, but perhaps mainly due to difference in quality of the products; the quality of coir string produced in Khulna-Jessore zone is superior compared to the product of Swarupkati, which is essentially due to (i) technological differences, (ii) differences in qualities of coconut husks used, and (iii) differences in skills of the workers between the two areas.

TABLE 27

INFORMATION ON PRESENT MARKET PRICE PER UNIT OF CERTAIN COIR PRODUCT IN TWO MAIN COIR PRODUCING AREAS: JULY 1979

Area and products	Unit	Quality-wise price per unit (Taka)		
		Inferior quality	Medium quality	Superior quality
Swarupkati				
Coir fibre	Seer	2.00	2.75	3.50
Coir string	Seer	3.00	5.00	7.50
Coir rope	Seer	1.50	4.25	10.00
Door mat	Piece	5.00	8.00	12.00
Khulna-Jessore Zone:				
Coir string	Seer	7.00	10.00	14.00

Note: 1. 1 Seer = 2.2. lbs.

2. 1 piece of standard door mat measures 16" in length and 10" in breadth.

TABLE 28

RANGE OF INTRA-YEAR AND INTER-YEAR VARIATION OF PRODUCT PRICES IN TWO COIR PRODUCING AREAS, 1977-79

(Price in Tk.)

Area and product	Unit	1977			1978			1979		
		Minimum price	Maximum price	(4)-(3) as % of (3)	Minimum price	Maximum price	(7)-(6) as % of (6)	Minimum price	Maximum price	(10)-(9) as % of (9)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Swarupkati										
Coir fibre	Seer	2.32	4.50	94	2.50	4.70	88	2.77	5.25	89
Coir string	Seer	2.76	5.41	96	3.21	6.14	91	3.09	6.28	103
Coir rope	Seer	1.50	3.53	135	1.80	4.19	133	2.00	3.97	99
Door mat	Piece	5.00	8.93	79	5.21	9.85	89	5.92	9.13	57
Other mats	Sq. yrd.	8.25	10.13	23	8.25	10.00	21	9.00	10.67	19
Khulna-Jessore zone										
Coir string	Seer	7.31	10.32	41	7.11	10.39	46	7.20	9.83	37

Note: Prices of medium quality products have been taken.
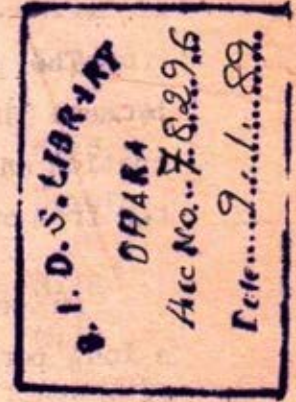
Information on marketing suggests that the producers get only 60-70 per cent of the actual price. The middleman, wholeseller, and retailer get the rest of the share in the sales proceeds.

Prices of the products have been found to fluctuate widely in both Swarupkati and Khulna-Jessore zone, but more so in Swarupkati. Such seasonal fluctuation of product prices was observed to be due mainly to (i) fluctuation of demand for the products, and (ii) fluctuation of raw material (coconut husk) prices.[9]

The price fluctuation is more acute in the case of coir rope, because the price of this product is also affected by the price fluctuation and availability of its close substitute, synthetic rope imported from other countries.

In general, the entrepreneurs do not store or do not wait for a long period for the purpose of getting better prices. Some traders in Swarupkati store products at the time of low prices --- but only for short periods.

Coir is now facing competition from its close substitutes in the product market. The nature and extent of competition vary from product to product and this variation is mainly due to comparative durability and advantage in using the products. The survey results regarding competition have been presented in Table 29. It can be seen from the table that severe competition is faced by string and ropes from imported synthetic products (the products are both imported and produced domestically using imported raw materials). In other cases, the competition is not severe.

6.3 Export of Coir Products

During Pakistan period, export of coir products was completely in the hands of Pakistani (earstwhile West Pakistan) traders. They had purchasing centres in Dhaka, Khulna, and Chittagong. Goods were usually shipped from Swarupkati. An estimated 10 to 12 thousand mounds (1 mound = 88 lb)of various kinds of coir fibre and rope used to be exported to Karachi per month. A major portion was usually

TABLE 29

TYPES OF COIR PRODUCTS IN RELATION TO THEIR COMPETING PRODUCTS, THEIR NATURE, AND ORIGIN

Name of the coir products	Competing products	Origin of the products	Nature of competition
Coir string	1. Jute string	Domestic	Mild
	2. Steel wire	Domestic	Mild
...	3. Nylon string	Imported	Severe
Coir rope	1. Jute rope	Domestic	Mild
	2. Synthetic rope	Imported	Severe
Door mat	1. Rubber mat	Domestic	Mild
	2. Jute mat	Domestic	Mild

consumed in Pakistan (West Pakistan) while the rest used to be reexported to other countries through Karachi port. Bangladeshi (earstwhile East Pakistan) traders had no hand in exporting the products; they supplied the products to the traders from Pakistan.

But after liberation, the local traders became interested in exporting the products. In some cases, they have succeeded to some extent in exporting coir products. The export trade is in the hands of private traders. Limited shipping space is one of the problems for exporting the products. Major exportable items get priority in ships. As there is scarcity in shipping space and coir products are not among the major exportables, the exports of the products find it difficult to get shipping space. This discourages export of coir products.

According to Export Promotion Bureau of Bangladesh, coir products face severe competition in international markets. It is difficult four our products to compete with the products of other countries in international quotations, as the production costs of the items

TABLE 30

EXPORT OF COIR PRODUCTS FROM BANGLADESH

A. Period: 1960-1966

Export	Year-wise Distribution (Year: January-December)						
	1960	1961	1962	1963	1964	1965	1966
Quality (Metric ton)	56	30	10	5	8	9	15
Value (000 US $)	10	7	3	1	3	3	3

Source: FAO commodity Bulletin Series 44, Coir: Economic Character-istics, Trends and Problems, Rome 1969

B. Period: 1974/75-1978/79

Export	Year-wise Distribution (Year: July-June)				
	1974/75	1975/76	1976/77	1977/78	1978/79
Value (000 Tk.)	8	48	–	46	1,109

Source: Government of Bangladesh, Export Promotion Bureau.

are higher in this country than those of other producing countries, and the quality of the products are not up to international standards. But the export trade is improving overtime. Table 30 presents the available data on export for both pre- and post-liberation periods. During pre-liberation period the main export items were coir rope and cordage. The quantity exported was diminishing after 1960; it was perhaps due partly to increasing home consumption and partly to growing inroads of synthetic fibre in international markets. After 1963 it began to increase in volume but the value remaining the same; the main cause being the competition of synthetic fibre.

The information on items exported and their volumes is not available during post-liberation period. Figures in Table 30(B) tell that the export market for coir products is expanding rapidly.

7. PRODUCTIVITY AND PROFITABILITY

7.1 Capital Employment Per Worker

Capital employed per worker or capital-labour ratio gives the capital intensity of the industry. The ratio has been defined as:

$$r_c = \frac{F_s + W_s}{L_n}$$

Where r_c = Capital-labour ratio;

F_s = Fixed capital. It has been taken as the replacement cost of fixed assets (excluding the value of land and structure);

W_s = Technologically necessary working capital. The technologically necessary working capital includes all the items of working capital (see Section 3, Sub-section 3.3) minus stock of finished products and outstanding credit (these items have no determine relation, in any strict sense, with the technical process of manufacture);

L_n = Entire working force, including hired workers plus the family members and others who contribute labour.

Table 31 presents the results. Column 2 of the table shows that the current per capita capital requirement of the industry is rather low; and that should be so as existing technology is traditional and backward. The average capital employed per worker has been found to be Tk. 43 only. It will also be seen from the table that the average capital requirement per worker vary slightly between the enterprises of size groups 1-2, 3-5, and 6-9 only Tk. 23-29 per worker; but the capital requirement by the enterprises of size group 10+ is about 5-7 times of that in other size groups. This variation in capital intensity may be explained by the simple fact that the enterprises of the largest size group employ relatively capital intensive semi-

TABLE 31

CAPITAL EMPLOYED PER WORKER IN THE SAMPLE ENTERPRISES

Size groups (no. of employees)	Capital/worker (r_c in Taka)
(1)	(2)
1- 2	23
3 - 5	25
6 - 9	29
10 +	154
ALL	43

mechanised methods of poduction while the others follow traditional manual methods of production.

7.2 Gross Value of Output and Its Elements

Gross value of output gives the magnitude of the total output produced by the industry in a particular period of time. It has been calculated, in this study, as follows:

$$V_g = v_i d_i$$

V_g = Gross value of output;

v_i = Value of the product produced by ith enterprise on average per day of operation of the enterprise;

d_i = Number of days of operation of the ith enterprise in a year.

Table 32 presents the gross value of output of the sample enterprises classified by size of employment. The average gross value of output per enterprise has been found to be Tk. 8,542 only. The effect of the size of enterprise on output is significant. For comparative purpose, average gross output per man-day has been calculated for different sized enterprises. Column 4 of Table 32 shows that the average gross output per man-day for size 10+ is more than fourfold (Tk. 28.54) of that of size 1-2 (Tk. 6.07). Also, it increases with the size of enterprises. This may not only be due solely to the effect of size (scale economies) of the enterprises, but also differences in stages and technique of production used by different size of enterprises. As already discussed in Section 4, most of the enterprises of smaller size groups (particularly enterprises of size group 1-2) are involved in earlier stages of production, and their final products are used by the larger size enterprises for further processing. Naturally, the value of the products of larger size enter-

TABLE 32

GROSS VALUE OF OUTPUT OF THE SAMPLE ENTERPRISES: 1979

Size groups (no. of employees)	Gross value of output (Vg) (Taka)	Average (Vg) per enterprise (Taka)	Average (Vg) per man-day (Taka)
(1)	(2)	(3)	(4)
1 - 2	37,056	1,090	6.07
3 - 5	529,881	5,195	11.63
6 - 9	195,300	21,700	14.23
10 +	519,000	103,800	28.54
ALL	1,281,237	8,542	15.33

Note: One man-day is equal to 8 hours of working by a single worker in an enterprise.

prises is higher than those of the smaller size enterprises. This will be clear from the analysis of the elements of gross value of output by size of enterprises.

The Elements

The gross value of output has been broken down into raw materials, hired labour charges, depreciation of machines, equipment and tools, other costs, and the residual. Table 33 presents the breakdown of gross value of output.

The 'residual' includes several items such as return on entrepreneur's capital, his profit, his own wage, and wages of the unpaid family labour. Profit should ideally be treated as a separate item, and not included in the residual. But the important thing here is not the profit as such but the returns to entrepreneur's family. Moreover, there are problems, in this case, in calculating profit also. One of the major problems is to compute the wages of family labour.

The table shows that the residual is the most important element (44.6 per cent) in gross value of output. The next important element is raw material (42.9 per cent). Residual and raw material together accounts for 87.5 per cent of the gross value of output. It is interesting to note that with the exception of size group 1-2 employment, the proportion of residual to gross value of output decreases, and the proportion of raw material increases as the size of the enterprise increases. This can be explained as follows: (i) a majority of the larger size enterprises use semi-processed raw materials (as mentioned earlier), the value of which will naturally pull the share up as compared to others; and (ii) larger size enterprises use relatively more hired labour. Although the relative share of residual in gross value of output is much lower in 10+ size group compared to others, residual per enterprise is much higher in this group. Again, if we compare the relative shares of raw materials and residual of the enterprises of size groups 1-2 and 3-5 employees, we can see that the share of raw material is higher and the share of residual is lower in the size

TABLE 33

ELEMENTS OF GROSS VALUE OF OUTPUT IN THE SAMPLE ENTERPRISES: 1979

Size groups (no. of employees)	No. of enterprises	Elements of Gross Value of Output (Taka)					Gross value of output (Total)	Residual per enterprise (7)/(2)
		Raw material	Hired labour charges	Depreciation	Others	Residual		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1 - 2	34	14,596 (39.4)	-	467 (1.3)	708 (1.9)	21,285 (57.4)	37,056 (100.0)	626
3 - 5	102	119,700 (22.6)	12,450 (2.3)	2,226 (0.4)	17,857 (3.4)	377,648 (81.3)	529,881 (100.0)	3,702
6 - 9	9	81,300 (41.6)	16,980 (8.7)	505 (0.3)	4,989 (2.5)	91,526 (46.9)	195,300 (100.0)	10,170
10 +	5	334,500 (64.4)	81,1800 (15.6)	3,364 (0.7)	18,985 (3.7)	80,891 (15.6)	519,000 (100.0)	16,196
ALL	150	550,096 (42.9)	110,610 (8.6)	6,562 (0.5)	42,539 (3.3)	571,430 (44.6)	1281,237 (100.0)	3,810

Note: Figures in parentheses indicate row percentages.

group 1-2 than those in the size group 3-5 respectively. This is simply because majority of the enterprises of size group 1-2 are involved in simple processing of raw materials rather than manufacturing (see Section 4), while the majority of the enterprises of other size groups are involved in both processing and manufacturing activities.

Depreciation is usually an important factor in manufacturing. But in this small-scale and cottage industry, where there is not in use sophisticated machinery, it is naturally not a significant factor. Depreciation constitutes only 0.5 per cent of the gross value of output.

The element 'others' in the table includes cost of transportation, interest payments, taxes (only _hat_ tax: a kind of sales tax), and miscellaneous costs. Interest payments are very low because of the limited use of external capital.

It can be deduced from the data that the major costs involved in coir processing are raw material and labour charges.

7.3 Output-capital Ratios

Output capital ratio is a statistical relationship that relates the flow of income in a given period to the stock of capital; or it measures the average productivity of capital employed by the industry. The meaningfulness of these ratios depends upon the definitions of the key concepts of capital and output.

The ratio has been defined in this study as:

$$r_o = \frac{Q}{F_s + W_s}$$

where, r_o = Output-capital ratio;

Q = Output; it is defined as the net value added by manufacture. The 'value added' has been calculated as gross value of output minus value of raw materials and depreciation charges;

F_s = Fixed capital as defined earlier in Sub-section 7.1;

W_s = Technically necessary working capital as defined earlier, also in Sub-section 7.1.

According to the definitions used for capital and output, the ratio here measures the amount of income per unit of capital employed in the industry. Table 34 presents the results. It is clear from the table that income generated per unit of capital employed in the industry is quite high. This indicates a high capital productivity of the industry. It has been observed that productivity of capital differs, even for producing similar products, between enterprises. This is perhaps attributable partly to technological variations in production process between enterprises. It can be seen from the table that the ratios vary from a low figure of 17.3 in the case of the enterprise of size group 10+ to a high figure of 62.5 in the case of the enterprises of size group 6-9.

TABLE 34

OUTPUT-CAPITAL RATIOS OF THE SAMPLE ENTERPRISES: 1979

Size groups (no. of employees)	Output/Capital (R_o)
1 - 2	19.7
3- 5	50.5
6 - 9	62.5
10 +	17.3
ALL	33.8

The table also shows that the average productivity of capital first increases as the employment size increases up to a certain limit (employment size 6-9), and then decreases as the employment size in-

creases beyond that limit. Again, it has been observed that the capital intensity of the industry is positively related to employment size (Table 31). The best way to analyse these phenomena is to fit production function and then to split the sample units into various size groups in order to see if there are additional scale economies in the output range studied. However, it has not been done in this study. But, at the moment in explaining capital productivity, it may be argued that there is a certain range of capital requirements by the industry at which productivity of capital is maximum. More capital investment does not necessarily mean more return on capital.

7.4 Output-labour Ratios

Output-labour ratio measures the relationship of the flow of income in a particular period of time to the labour force employed in the industry. The exact nature of relationship depends upon the definitions of the key concepts of output and labour. For analytical purposes, two sets of ratios have been calculated.

$$(1) \ r_1 = \frac{Q}{L_n}; \qquad (2) \ r_2 = \frac{Q}{L_m}$$

where, r_1, r_2 =   Output-labour ratios;

Q =   Output as defined earlier;

L_n =   Entire work force as defined earlier; and

L_m =   Total man-day worked by the workers in a year.

According to the definitions used to measure the relationship of output to labour, r_1 will indicate the average output per worker per year, and r_2 will refer to the average output per man-day worked by the labour force employed in the industry. Since a larger proportion (74.6 per cent; see Section 3) of the work-force in the industry is employed on a part-time basis, the number of workers in the denominator of the ratio (r_1) will not reflect the actual picture of the industry. In order to get more useful results, the r_2 has been calculated.

Table 35 presents the corresponding figures of r_1 and r_2. The figures in the table indicate that the values of both r_1 and r_2 for the enterprises of size group 1-2 are the lowest of all size groups. It may be recalled that the majority of the enterprises (56 per cent) of this size group use the most traditional manual methods to extract coir fibre only, the returns to which may be necessarily lower. Again,

TABLE 35

OUTPUT-LABOUR RATIOS OF THE SAMPLE ENTERPRISES: 1979

(Size groups (no. of employees)	Output/labour	
	r_1 (Taka)	r_2 (Taka)
1 - 2	449	3.61
3 - 5	1,259	8.95
6 - 9	1,802	8.27
10 +	2,664	9.96
ALL	1,438	8.67

Note: r_1 is output per worker and r_2 is output per man-day worked.

most of the entrepreneurs of this size group are involved in this activity on a part-time basis and also their occupation is not year round. These may be the main causes of very low return of the enterprises of this size group.

The overall picture shows that the activity is not highly attractive in terms of private profitability at the existing state of technology. But the essential social and economic reason for the existence of the industry is that a large number of people are employed somehow to subsidise their income.

8. SUMMARY, POLICY IMPLICATIONS AND CONCLUSIONS

8.1 Summary

General

Coir or coconut fibre is obtained from the fibrous husk which lies between the outer shell of the coconut and its inner kernel, and is thus a by-product of coconut production. There are three types of coir fibre: yarn fibre, bristle fibre, and mattress fibre. Of these, only the yarn fibre is suitable for spinning. It is obtained from the husks of unripe nuts. Bristle and mattress fibres are extracted from the husks of ripe nuts.

There are three methods of producing coir fibre from coconut husks. They are traditional manual methods, improved or semi-mechanical methods, and modern mechanical methods. Virtually all of these three methods are now being more or less used to extract coir fibre in Bangladesh. But traditional manual methods are in wider use.

Coir has a variety of end-uses. Bristle fibre is used in the manufacture of rubberized coir which is used by the furniture and automobile industries for the interior of seats. It is also used in carpet making, brooms, brushes, and salt bags. Mattress fibre is used for upholstery, staffing spring mattresses, door mats, protective packaging, and insulating materials. And yarn fibre is exclusively used in ropes and twines, including marine cordage, ropes for the timber industry and horticulture twines. It is also widely used in making string for use in house building, mat manufacture, and fishing net making.

A variety of products such as string, rope, door mat, floor mat, and cricket mat are produced in Swarpukati. An improved quality of coir string is produced in Khulna-Jessore zone.

Perhaps the most traditional coir product in this country is mattress fibre for use in spring mattresses. All other types of coir manufacturing in this country is a relatively recent phenomenon.

According to local people in coir producing areas, the activity began around 1930 in Swarupkati. Then it spread into other coconut producing areas such as Khulna-Jessore zone.

Survey Findings

The sample units have been classified into four size groups according to the number of employment; they are 1-2, 3-5, 6-9 and 10+. A large majority of the units surveyed (68 per cent) fall in the size group 3-5. Only 3.3 per cent of the enterprises employ 10 or more workers. The average size of employment has been found to be 3.4 including those entrepreneurs who contribute direct labour to the enterprises. The average size becomes 3.9 including all entrepreneurs.

Nearly 47 per cent of the owners contribute direct labour to the production process and their number constitutes about 14 per cent of the total workforce in the coir industry. More than 69 per cent of the workers are the members of the owners' family and the remaining 16.6 per cent are hired workers.

The proportion of female workers is 62.7 per cent. Slightly less than 9 per cent of the workforce is children. Nearly threefourths (74.6 per cent) of the entire workforce are employed on parttime basis.

The average monthly wage of a hired full-time male worker has been found to be Tk. 214 and that of a female Tk. 96 only. These are about the same as minimum agricultural wages prevailing in the areas.

There are only five enterprises in the sample which have land and structure exclusively used for coir manufacturing purposes. In other cases, work is performed sometimes in open spaces and sometmes in veranda (parlour) of dwelling houses. Only four of the enterprises have hand-driven machines (rope machine), the average value of which is found to be Tk. 3,000 only. The other 146 of the sample enterprises are using tools and equipment for coir processing.

The average initial capital invested per enterprise set up during the last five years prior to 197? (average of 31 such enterprises) has been found to be Tk. 356 only; the amount of such initial investment ranges from a minimum of Tk. 20 to the maximum of Tk. 6,000 in two extreme cases.

The capital structure shows that nearly 79 per cent of the total capital is working capital and about 21 per cent fixed capital (excluding the values of land and structure). It also shows that the capital required by the industry vary according to the size of employment and the variation in technology.

The entrepreneurs in coir industry generally belong to the landless and near landless groups. Survey results show that 94 per cent of the entrepreneurs have only up to one acre of land. Study of occupational origion of the entrepreneurs indicate that 68 per cent of the grandfathers were mainly engaged in agriculture; the proportion was reduced to 46.7 per cent in the case of the fathers; and it is down to only 12 per cent in the case of the present entrepreneurs themselves. As the people became landless after generations to come, they have shiften their occupation to other directions. It has been found that day-labouring and coir industry have become nearly equally important as the main source of income of the poor in coir processing areas. It appears that lack of employment opportunities in agriculture and availability of raw materials and markets for coir products encourage people to set up coir manufacturing enterprises.

Of the total of 150 sample enterprises, 114 (76 per cent) are operated on year round basis, and the rest (24 per cent) are casual and periodically run enterprises. Again, more than 90 per cent of the enterprises are run less than 8 hours on an average per working day. These suggest that coir processing is mainly a part-time occupation of the rural poor to subsidise their livelihood.

The sources of finance for initial investment in the sample enterprises were personal savings (70.4 per cent), parents (15 per cent), non-institutional loans (13.6 per cent) and gifts (1 per cent). None

of the enterprises took loan from commercial banks or from other institutional sources for the purpose of either initial investment or expansion capital. It appears that finance is one of the main constraints for the growth of the industry; and it relates to capital requirements, more importantly to working capital.

Raw materials for the industry are procured locally. The main suppliers of raw materials are producers, middlemen, wholesalers, and retailers. Season to season variation of raw material prices is very significant. Yet the entrepreneurs do not tend to buy raw materials for storing purposes when they are cheaper. The main reason is lack of finance; only 16 per cent of the entrepreneurs were found to store an average of 62 per cent of the total requirements of raw materials when they are cheaper. The large majority (84 per cent) of the entrepreneurs do not store.

Raw materials are cheaper in Khulna-Jessore zone compared to Swarupkati. This indicates that the supply of raw materials is relatively better in Khulna-Jessore zone than in Swarupkati.

Marketing of finished products also involves a chain of middlemanship as in the case of procurement of raw materials. About 97 per cent of the entrepreneurs sell their products in local markets within or in neighbouring thanas; the others sometimes carry their products to important city centres like Dhaka, Chittagong, and Khulna in the hope of better prices. Seasonal fluctuation of product prices is also acute like raw material prices.

Prices of coir string, the only product produced in Khulna-Jessore zone is much higher (almost double) in that zone than in Swarupkati. The reason has been found to be the better quality of the product in the Khulna-Jessore area --- the entrepreneurs of the area use better technology and the right type of coconut husks. As there is abundant supply of coconut husks in Khulna-Jessore zone, the entrepreneurs always have a greater degree of freedom to choose the right type of coconut husks.

Some of the coir products, particularly string and rope are now facing severe competition from synthetic fibre imported from abroad or produced locally using imported raw materials. As a result, the producers of coir very often face problem in marketing of the products, and it becomes difficult on their part to sustain in such situations.

Export of coir is not very important in terms of volume. Export trade of coir is in the hands of private traders. They face various problems in exporting the products. Limited shipping space, higher production cost, and inferior quality of the products are considered to be the main problems in export trade. In spite of that, export market of the products is expanding rapidly. Export earnings from these products was Tk. 0.46 million in 1977-78 which rose to Tk. 1.109 million in 1978-79. Pakistan is the chief customer of our coir products.

The major cost involved in the production process is raw material. The share of raw materials in the gross output have been found to be 42.9 per cent; hired labour charges 8.6 per cent, and residual (see Section 7) accounts for 44.6 per cent of the gross output. The average gross value of annual output per enterprise has been estimated at Tk. 8,542. The gross value of output and value added per man-day have come out to be Tk. 15.33 and Tk. 8.67 respectively. Labour productivity increases with the increase in capital employed per worker. Productivity of capital seems to be very high in this industry. The most inefficient enterprises appear to be those which are involved in coir extraction only, while those which are involved in manufacturing activity appear to be far more efficient in terms of labour and capital productivity.

8.2 Policy Implicatons and Conclusions

Some concrete policy proposals relating to promotion of the coir industry emerge from the evidence generated by the study. While suggesting the policies, relevant points which have not been mentioned in the main body of literature of this study need to be discussed.

Raw Materials

Coconut grows all over Bangladesh; but the coastal areas such as Barisal, Khulna, Jessore, Noakhali, and Faridpur districts together produce about 76 per cent of the total nuts of the country. The concentration of coconut palms and a good river transportation system in this southern region of the country facilitate easy collection of coconut husks. This together with natural retting facilities provides the basis for the expansion of the industry in this region. Our field observations suggest that the available official statistics on coconut production (source: Bureau of Statistics, 1979) in this country seem to be gross underestimates. We have tried to assemble a reasonable figure for the coconut production in the country, but without success. It is clear that a comprehensive survey is necessary to assertain it. And obviously a correct assessment of coconut production in the country is essential for planning purposes.

Immature coconuts (green coconut) are often plucked as there is a heavy demand for its water content in this tropical country. Sometimes, the price of such inmature nuts becomes almost as high as the price of ripe nuts. The farmers do not, therefore, wait for the nuts to ripen. There is a strong feeling among coir producers that plucking of green coconuts should be banned by legislation, so that more husks of ripe nuts are available for coir extraction. It has an additional advantage also --- the production of coconut oil can be increased, which can save some foreign exchange as coconut oil is an important import item. In these regards, cultivation of coconut palms also should be encouraged.

Labour Supply

Labour will not be a problem if the industry expands. There are large numbers of landless labourers and marginal farmers with very limited employment opportunities. This industry also has a tradition of employing large numbers of women. Hence, there is almost unlimited supply of labour available for employment. Indeed, one

major justification for promoting this industry may be promotion of female employment.

Supply of Entrepreneurship

The availability of people to undertake or expand coir manufacturing is also not a constraint. Landless or near landless rural people will find self-employment opportunities in the industry, and with facilities for training and finance availabale to them there is no reason why they should not do well.

Credit

The poor people who generally own coir enterprises have acute financial problems. They need funds for both initial and working capital. Funding is the immediate need both for existing enterprises for their survival and growth, and for establishing new enterprises. These people also generally do not have any collateral to offer as to secure loans. Arrangements should be made for them to get loan without having to offer security. People are of the opinion that initial assistance should be provided in the form of machinery, equipment, and tools.

Marketing

Appropriate measures are necessary to improve the marketing system prevailing in the country. In the present structure, a substantial margin is appropriated by a chain of intermediaries from the raw material stage to the disposal of final products. In this respect, attempt may be made to encourage development of producers' cooperatives so that their bargaining capacity increases which may enable them to improve their self-reliance and reduce their dependence on intermediaries.

The internal market appears to be potentially large, but no systematic attempt has so far been made to develop it. The measures that will be helpful in this context include (i) diversification and

upgrading of the products, and (ii) sales promotion activities. Coir fibre is used to produce a number of products in this country, but it can be used to manufacture many more products already developed in countries like India and Sri Lanka (FAO, 1969; Unnithan, 1970). Upgrading of the products also can increase the use of coir fibre in this country. For example, if the quality of the rope and cordage produced is sufficiently improved, it can substitute synthetic rope in marine and other uses (local people's view).

Sales promotion activities should include a network of sales depots and accredited dealers, and show-room-cum-sales depots in every potential marketing centre. Arrangements for publicity is strongly recommended for sales promotion. We have observed that people in many parts of the country do not know the use of the coir fibre or its products.

An import restriction on certain products such as synthetic rope and cordage will be needed to protect coir industry from severe competition from outside.

In order to protect the coir producers from the adverse effects of price fluctuation in the home market, appropriate price stabilisation measures seem called for. As a first step in price stabilisation, floor prices may be officially set for the products. But, in order to do that, the first necessary thing is the introduction of grading and standardisation of coir products. Grading and standardisation are also necessary for export purposes, as uncontrolled export of substandard coir goods had adversely affected the foreign trade in coir in India (Unnithan, 1970).

Export of coir products from Bangladesh is insignificant compared to India and Sri Lanka. The competitive strength of coir products of different countries in the international market depends also on their relative price advantages. Hence, side by side with measures for improving quality, necessary steps should also be taken to reduce cost of sales. In this regard, arrangement may be made with national shipping lines so that they charge lower freights for coir, the low

value product compared to other exportables. Further, exporters may also be encouraged by giving priority in shipping space; this will help to reduce the cost of storage at the port (see Section 6) and ehhance price competitiveness of the product.

Technology and Training

As we have seen, the overall productivity in coir industry is very low; in many cases, it is not sufficient even to ensure a subsistance income to the entrepreneurs. Increase in productivity of the industry depends to a large extent on the improvement of techniques of production, and the efficiency of the workers. Suggestion has been made by an expert from Sri Lanka that the existing techniques can be improved by the use of contrivances (a simple mechanical device used to produce coir yarn and rope) as in Sri Lanka, which can be produced locally and the design may be supplied on request (Wickramasingha, 1977).

The efficiency of the workers depends to a large extent on their skills. Training is necessary for skill formation. It also provides the workers with technical information on various products. Hence, training facilities should be created to train the entrepreneurs as well as the workers. Training programmes may be arranged as joint venture between Bangladesh and neighbouring countries of India and Sri Lanka, where coir industry has made strong headway. One way of doing this is to send some craftsmen to India and/or Sri Lanka for receiving training in this field. The other way may be to bring some craftsmen here from those countries to train up our craftsmen. History of diffusion of coir industry in this country (see Section 2) suggests that the former will be more fruitful. In this case, one must be very careful in selecting the persons to be sent, they must be real craftsment.

FOOTNOTES

1. Thana is an administrative unit with an average area of 120 sq. miles. Swarupkati thana is in the district of Barisal, which is located in the southern part of Bangladesh.

2. EPSIC – East Pakistan Small Industries Corporation. Now it is named as BSCIC, Bangladesh Small and Cottage Industries Corporation.

3. Union is a local administrative unit with an average area of roughly 12–15 sq. miles; 10–15 such unions comprise a thana.

4. A deep forest in Bangladesh.

5. Initial capital refers here to both fixed (other than land and structure) and working capital initially invested.

6. In true sense of the term, only "rope machine" may be called machine, and others fall into the category of tools/equipment.

7. Data on volume of purchase are not available.

8. In general, price of coconut husk goes up in November–January, and goes down in April–June.

9. It was observed that the prices of some products always follow the raw material prices. But of course, seasonal pattern of demand of some other products Affect the price variation; for example, price of finer quality coir string (produced in Khulna-Jessore zone) increase in April–June due to increase in demand (coconut husk is at the time cheaper) as it has larger demand for net making them.

REFERENCES

1. Ahmed, M.U., Role of Modern Small-Scale Enterprises in the Development Process: A Case Study of the Irish Plastics Industry, Unpublished Ph.D. Thesis, Lancaster University, U.K., 1976.

2. Balakrishna, R., Regional Planning in India, 1948.

3. Bureau of Statistics, Government of Bangladesh, Population Census Report, National Volume, 1974.

4. Bureau of Statistics, Government of Bangladesh, Statistical Year Book, 1979.

5. Carroll, J., The Philippine Manufacturing Entrepreneur: Agent and Product of Change, Cornell University Press, New York, 1965.

6. Dhar, P.N., Small-Scale Industries in Delhi, July 1958.

7. East Pakistan (Bangladesh) Small Industries Corporation (EPSIC), Survey of Cottage Industries in East Pakistan, Dhaka, 1966.

8. Food and Agriculture Organisation (FAO) of the United Nations, Coir: Economic Characteristics, Trends and Problems, Commodity Bulletin Series No. 44, Rome, 1969.

9. Food and Agriculture Organisation (FAO) of the United Nations, Production Year Book, Volume 24, Rome, 1970.

10. Grimwood, Brian E., Coconut palm Products, Their processing in Developing Countries, Food and Agriculture Organisation (FAO) of the United Nations, Rome, 1975.

11. Liedholm, C. and Chuta E., The Economics of Rural and Urban Small-Scale Industries in Sierra Loene, African Rural Economy Paper No. 14, Michigan State University, U.S.A., 1976.

12. Rural Industries Study Project (RISP), Phase I Report, Bangladesh Institute of Development Studies (mimeo.), May 1979.

13. Rural Industries Study Project (RISP) phase II Interim Report, (Mimeo.), Bangladesh Institute of Development Studies, 1980.

14. Unnithan, K.E., Coir Industry in India with Special Reference to Marketing and Trade, Coir Board, Cochin, 1970.

15. Watanabee, S., Entrepreneurship in Small Enterprises in Japanese Manufacturing, International Labour Review, Volume 202, No. 6, 1970.

16. Weber, A., _Theory of Location of the Industry_, 1929.

17. Wickramasingha, A.P., Report Pertaining to a Short Term Consultancy assignment with Bangladesh Small and Cottage Industries Corporation (mimeo.), Dhaka, October 1977.