

COIR BOARD

REPORT
of the
AD HOC COMMITTEE FOR
RESEARCH AND STATISTICS

Published by
THE COIR BOARD, ERNAKULAM
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REPORT OF THE AD HOC COMMITTEE ON RESEARCH AND STATISTICS OF THE COIR BOARD

I. Introduction

1. *Composition of the Committee.* The Research and Statistics Committee was one of the six *Ad Hoc* Committees set up by the Coir Board at its first meeting held on 28th August, 1954 to advise the Coir Board as to the manner in which it should exercise its functions effectively under the various sections of the Coir Industry Act. This Committee which consisted of 7 members of the Board had powers to co-opt 4 more members either from among the members of the Board or from outside subject to the approval of the Board. The final composition of the Committee after the co-option of the members was as follows:-

Members of the Board

1. Shri A. Karunakara Menon
2. „ K. P. Amrithanatha Iyer
3. „ R. Krishna Aiyar
4. „ C. M. John
5. „ B. Beerappa, I. A. S.
6. „ S. R. Sen
7. Dr. P. V. Nair .. Convener.

Co-opted Members

1. Shri T. Gopalan, Badagara.
2. „ T. Madhava Menon, Professor of Chemistry, Maharaja's College, Ernakulam.
3. „ K. Karunakara Panicker, Coir Special Officer, Trivandrum.
4. „ K. B. Unnithan, Lecturer, M. G. College, Trivandrum.

2. *Terms of reference of the Committee:* The terms of reference of the Committee were, broadly speaking, to advise the Coir Board as to the manner in which the Board shall exercise its

functions effectively under Sections 10 (2) (c) and 10 (2) (d) of the Coir Industry Act. These sections are as follows:-

- (a) "Undertaking, assisting and encouraging scientific, technological and economic research and maintaining and assisting in the maintenance of one or more research Institutes" (Section 10(2) c) of the Act).
- (b) "Collecting statistics from manufacturers of, and dealers in, coir products and from such other persons as may be prescribed, on any matter relating to the coir industry; the publication of the statistics so collected or portions thereof or extracts therefrom" (Section 10 (2) (d) of the Act).

3. *Meetings of the Committee:* The Committee held three meetings in all, the first one on Tuesday, the 7th September, 1954, the second on Saturday, the 22nd July, 1954, and the 3rd on Tuesday, the 22nd March, 1955. The draft report of the Committee was finalised at the last meeting of the Committee.

4. Memoranda giving specific views about the items of research that will have to be taken up by the Coir Board were presented to the Committee by Shri A. Karunakara Menon, Shri K. P. Amrithanatha Iyer, Shri S. R. Sen and Professor T. Madhava Menon. These were considered in detail during the meetings of the Committee.

II Scope of scientific investigation, research and survey in the coir industry.

5. The Committee reviewed the present position with regard to scientific research in the coir industry and felt that very little has been done so far to further the interests of the industry either in the technological sphere or even in the economic sphere. In this connection, the Committee noted that the Panel on Coir, Rope, Cordage and other Fibre industries of the Government of India which submitted its report to the Government in 1946 had come to the same conclusion. The Panel have observed *inter alia* as follows:-

"The possibilities of coir are so great and experiments so far made so few that there is an urgent need for the establishment

of a Coir Textile Institute for the study of coir in all its aspects. From the agricultural point of view the cultivation of the coconut has received a great deal of attention, but when compared to other animal, vegetable and synthetic fibres, the fibrous product of the coconut palm has received very scanty attention at the hands of research scientists”.

6. It needs no particular emphasis, therefore, to state that intensive research in the technological and economic fields is indicated if steady progress were to be achieved on the industrial front so far as the coir industry is concerned.

7. The Committee felt that in order to fully implement the obligations of the Coir Board as laid down in sections 10(2)(c) and 10(2)(d) of the Coir Industry Act, it would be necessary for the Coir Board to adopt a three-pointed programme of research activities consisting of investigations into the technological, statistical and economic aspects of the industry.

(a) Technological Research

8. The Committee considered some of the more salient problems which are awaiting solution and felt that the following, among others, should be given priority of consideration:—

- (1) To make the coir yarn more versatile so as to make it possible for the coir industry to compete with other fibre industries;
- (2) To soften the fibre by chemical, physical or mechanical methods so as, on the one hand, to increase its tensile strength and, on the other, to lessen its rigidity. This, in the opinion of the Committee, would result in the production of better types of yarn and assure a closer kind of weave than is now possible;
- (3) To devise suitable methods to pre-treat yarn so as to make it easier for the yarn to absorb and retain fast colours;
- (4) To reduce the period of retting by physical, chemical, biological or mechanical means. The Committee considered the various aspects of retting by different known processes and held the view that the most economical and effective means

of reducing the retting period would presumably be to disintegrate or pre-treat the husk mechanically in such a manner that the retting process which is now in vogue would be quickened;

- (5) To utilise the by-product, namely, coconut pith in the most economic manner. Pith could be used in the manufacture of boards, building materials, insulating materials, etc. and by treating with hydrochloric acid, it could be made to yield a very important chemical called furfural which is in great demand in plastic industry;
- (6) To instal a pilot plant for the Research Institute of the Coir Board to study and pass on to the industry the results of experiments in mechanisation.

9. The Committee also incidentally considered the question of grading of coir fibre and coir yarn. Since, however, the question of fixing standards for coir fibre and coir yarn is engaging the attention of an Expert Committee of the Indian Standards Institution, called the Coir Sectional Committee, of which Dr. P. V. Nair himself was the Chairman, the Committee felt that it would be advisable for the Coir Board to accept the standards which are prescribed by a statutory body like the Indian Standards Institution rather than proceed to draw up its own standards.

(b) Statistical Research

10. As statistical surveys calculated to collect detailed information regarding production and export of coir and coir products and various other cognate details, should be given top priority in any scheme of statistical research, the Committee decided that the Coir Board should endeavour to collect data regarding the following through a well-organised statistical section:—

- (1) Various varieties of yarn and fibre which are produced and which are exported, classified according to the notional distinctions which now prevail in the trade;
- (2) The categories of labour engaged in the production of each variety of yarn along with the number of labourers engaged in each category;

- (3) The average daily income of a labourer in the industry as linked up with the quantum of work;
- (4) Family income of a labourer;
- (5) Number of green husk dealers and the number of labourers engaged in the green husk business;
- (6) Number of godowns for coir fibre, yarn and coir products;
- (7) Rates of godown rent realised per candy of coir and coir fibre and per cubic content in the case of coir mats and mattings;
- (8) Number of factories and establishments engaged in the manufacture of mats and mattings and the number of labourers engaged in such establishments under various categories;
- (9) Number of coir spindles, the number of looms for making mats and mattings (to be collected separately) and the number of roperies;
- (10) Information relating to production and export of other hard fibres with a view to ascertaining their force of competition to coir. Collection of information should relate to the quantity of hard fibres produced and which enter the world markets and of other materials such as paper twine which are produced and which are used in the manufacture of floor coverings. Information relating to the production and availability in the world markets of other floor coverings, with which coir mats and mattings have to compete, should also be collected.

(c) Economic Research

11. In the opinion of the Committee the statistical survey contemplated in the previous section cannot be properly orientated without the help of an Economist. Economic research on the various aspects of the industry must proceed *puri passu* with the statistical survey. The following are the lines on which economic research on the coir industry should be envisaged:—

- (1) An economic survey of the coir industry based either on a statistical sample survey or a complete

enumeration which takes into account the size and budget of the families of workers, the number of people engaged in the industry, the scope of employment, production, marketing, etc.;

- (2) *Production economics.* The main ingredients proposed to be determined under this are:—
 - (a) number of workers employed in various industrial units including co-operative societies;
 - (b) the rates of wages paid;
 - (c) the mechanical aids used by the units and the turn-over in any given period;
 - (d) the availability of raw materials indicating the prevailing prices, transport facilities, etc.
- (3) *Marketing Studies:* Information regarding prevailing market prices should be collected and collated by the economic research section. The incidence of competition from other natural fibres in the world markets should be closely followed by comparative market studies.
- (4) *General:* At the present moment there are a number of economic problems facing the industry such as the extent and availability of raw materials, the proportion of raw materials available in the coastal regions, the relative cost of transport from interior regions, the proportion of husk that goes for retting out of the total quantity of husk available, the quantity of husk required for making one candy of yarn for different varieties of yarn and in various regions, the weight structure and its effects on the economics of the industry, the employment position, the possibility of rationalisation of standards, both in the spinning and factory sides, the economics of the retting processes and the economics of by-product utilisation, the cause of large fluctuations in prices and the effect of tax and duties, and lastly the mechanism

of finance in the industry and the place of the co-operative movement in the industry.

- (5) *Publication:* It is expected that the economic research section will guide the statistical section in collecting general factual data relating to the various aspects of the industry. In good time the section will also publish periodical bulletins dealing with problems facing the industry and embodying the results of research already carried out. These publications will also set forth general trade information, such as prevailing market prices of different varieties of coir yarn and manufactured goods, production, price trends, consumption, marketing, export, etc.

12. The economic research section would devote special attention to the periodical assessment of the achievements made in the sphere of coir industry by the co-operative movement.

III. Detailed Recommendations

13. (a) *Long-term Proposals*

(i) *Establishment of a Coir Research Institute.* A Coir Research Institute consisting of the following sections should be established under the auspices of the Coir Board as early as possible:

- (i) Coir Technological Research,
- (ii) Statistical Research, and
- (iii) Economic Research.

The Committee would suggest that the scheme for the establishment of a Coir Research Institute be included in the Second Five Year Plan of the Coir Board and appropriate financial provision be made therefor in the Five Year Plan Budget.

14. *Location of the Research Institute:* Although in the initial stages the Committee felt that it would be desirable to have the Coir Research Institute located at or near about Ernakulam, on second thoughts they felt that Kalamassery which is barely 6 miles away from Ernakulam on the Ernakulam-Alwaye road would be more suitable for the location of the Institute in view

of the excellent facilities which are available there. It may be noted that Kalamassery is now the seat of the Government Polytechnic and is contiguous to the great industrial area Udyogamandal, where some of the largest of our industrial undertakings are situated. Kalamassery has at the moment a railway halt; but it is likely that a station will be provided there in due course by the Southern Railway. So far as the Committee are aware, there should be sufficient Government land available near the Polytechnic for the purpose of locating the Coir Research Institute. It is estimated that the requirement of land for the Coir Research Institute will not exceed about 10 acres. The Coir Board may move the Travancore-Cochin Government to let the land on long lease to the Coir Board. Although the main Institute will be situated at Kalamassery, it would be necessary for the Institute to maintain retting tanks and small field stations in the chief coir industrial centres throughout the State. These, however, can be leased out either from the Government or from private owners for short duration.

15. *Staff requirements:* The Institute shall consist of the following sections as mentioned previously and the overall staff positions will be as follows:-

Director - Coir Research Institute - Rs. 600-50-1150.

Technology Section

1. Chief Research Officer	Rs. 350-850
2. Senior Research Assistants (2) (One in Coir Technology and the other in Applied Chemistry specialised in Biochemistry)	Rs. 250-350
3. Junior Research Assistants (3)	Rs. 80-220
4. Mechanic	Rs. 80-220
5. Media Maker	Rs. 55-130
6. Laboratory Attender	Rs. 55-130
7. Store-keeper	Rs. 80-220

Statistical Section

1. Chief Research Officer	Rs. 350-850
2. Senior Research Assistant (1)	Rs. 250-350

3. Computers and Analysts (3)	Rs. 80—220
4. do. Lower Division (2)	Rs. 55—130
5. Investigators (15)	Rs. 80—220
6. Mechanic	Rs. 55—130

Economic Section

1. Chief Research Officer	Rs. 350—850
2. Senior Research Assistant (1)	Rs. 250—350
3. Junior Research Assistants (2)	Rs. 80—220

Administration

1. Administrative Assistant	Rs. 250—350
2. Head Clerk (1)	Rs. 160—330
3. Accountants and Clerks (3)	Rs. 80—220
4. do. Lower Division (3)	Rs. 55—130
5. Stenographer (1)	Rs. 80—220
6. Typists (4)	Rs. 55—130
7. Peons (10)	Rs. 30+D. A.

Library

1. Librarian	Rs. 80—220
2. Library Assistant	Rs. 55—130
3. Typist	Rs. 55—130

16. *Qualifications of the Technical Staff*

Director—Post Graduate or Research Degree in any branch of Fibre Technology or Chemical Technology or Applied Chemistry with at least 5 years' experience of research in Fibre Technology.

Chief Research Officer (Technology)—Degree in Textile Technology with at least 5 years' experience in any branch of Fibre Technology.

Chief Research Officer (Statistics) — M. Sc. First or Second Class in Statistics with at least 5 years' experience in Statistical Surveys. Preference will be given to those who hold the Ph.D. Degree by Research in Statistics.

Chief Research Officer (Economics)—B. A. (Hons.) or M. A. in Economics First or Second Class with at least 3 years

experience in Economic Research. Preference will be given to those who hold the Ph.D. Degree in Economics.

Senior Research Assistant (Technology) — A Degree in Textile Technology.

Senior Research Assistant (Applied Chemistry) — B. Sc.(Hons.) or M. Sc. in Applied Chemistry. Preference will be given to those who have specialised in Bio-chemistry.

Senior Research Assistant (Statistics)—B. Sc. (Hons.) or M. Sc. Degree in Statistics First or Second Class with 2 years' experience in statistical survey.

Senior Research Assistant (Economics)—B. A. (Hons.) or M. A. Degree in Economics first or second class with 2 years' experience in Economic Research.

Junior Research Assistant (Technology) — B. Sc. Degree in Textile Technology or Chemical Technology or B. Sc. (Hons.) or M. Sc. in Chemistry or Applied Chemistry or Applied Physics.

Junior Research Assistant (Economics)—B. A. (Hons.) or M. A. in Economics.

Administrative Assistant — Graduation with at least 5 years' experience in office management.

Computers, Analysts and Investigators: (Statistical Section)

Computers and Analysts (Upper Division) and Investigators (scale Rs. 80 –220)—B. Sc. or M. Sc. in Statistics, preferably with experience in statistical surveys.

Computers and Analysts (Lower Division) (Statistics) (Scale Rs. 55 –130)—B. Sc. Degree in Mathematics or Statistics.

Mechanic (Technology Section) (Scale Rs. 80–220) – Diploma in Mechanical Engineering with at least 2 years' experience in a mechanical workshop.

Mechanic (Statistical Section) (Scale Rs. 55–130) – Diploma or Certificate in Mechanical Engineering with experience in the maintenance and repair of Comptometers, calculating machines, etc.

Media Maker (Scale Rs. 55-130) - Passed E. S. L. C. with at least 5 years' experience in media making in a biological laboratory.

17. The qualifications of the rest of the staff may conform to those already prescribed for members of the ministerial staff of the Coir Board Office.

18. *Financial Estimates.* The broad financial estimates of the scheme for the establishment of the Coir Research Institute spread over a five year period are shown in Table I (Appendix).

Establishment of Branch Institutes

19. Shri S. R. Sen, Deputy Director of Industries, West Bengal has submitted a scheme for the establishment of a Research Institute in West Bengal to deal specifically with problems facing the coir industry in that State. The Committee considered Shri S. R. Sen's scheme and would recommend that a small branch Research Institute be set up in Calcutta in the first instance to be followed up later by similar small units in Mysore, Andhra and Madras when found necessary.

20. Shri Sen has pointed out that the West Bengal Government have already taken up a scheme for the utilisation of green husks of tender coconuts that are available in large quantities in Calcutta markets and that it is urgently necessary to follow up the scheme for a few years more. Shri Sen's scheme envisages the setting up of not only a branch Institute but also a model factory attached to it in order to study the process of manufacture of hard bristle fibre from the locally available mature husks. The aims and objectives of the scheme are defined by him as follows:

- (1) To investigate different types of husks, tender and mature, available in different regions in the country;
- (2) To find out suitable means of production of coir fibres and products thereof to suit various purposes;
- (3) To carry on investigations as to the constitution and physical properties of raw materials and finished products;
- (4) To study the economics of the coir industry in West Bengal.

21. Shri Sen has proposed that the branch Research Institute should be located somewhere near Calcutta along with a model factory.

22. Financial Implications

I. Research Institute

(1) Non-recurring—		
(i) Furniture and fittings	Rs. 2,000	
(ii) Accessories and equipments	Rs. 5,000	
(2) Recurring-		
(A) Pay of Establishment-		
(i) One Research Officer at Rs. 250-450 p. m. plus allowances admissible	Rs. 250x12	= Rs. 3,000
(ii) One Laboratory Assistant at Rs. 70-110 p. m. plus allowances.	Rs. 120x12	= Rs. 1,440
(iii) One Boy	Rs. 40x12	= Rs. 480
(iv) One Peon	Rs. 50x12	= Rs. 600
(B) Travelling allowances	Rs. 300	
(C) Contingencies - including house-rent	Rs. 1,180	
(D) Raw Materials-Chemicals etc.	Rs. 3,000	
		<u>Rs. 10,000</u>
Total Expenditure:		
Non-recurring	Rs. 7,000	
Recurring	Rs. 10,000	
	<u>Rs. 17,000</u>	

23. II. Model Factory

- (1) Basis of work—5000 cocconut husks to be dealt with daily.
- (2) Expected Daily out-turn—600 lbs. bristle fibre, 600 lbs. coarse fibre,

600 lbs. dust or pith, 1000 brushes, 5 dozen door mats (average 2 sq. ft. each) and 100 Board Sheets (2' x 4' each) from pith

- (3) Employment expected (about 100 persons)
- 1 Manager at Rs. 250 p. m. (consolidated)
 - 3 Purchasing agents on commission basis
 - 8 Labourers for crushing and ginning work etc. at Rs. 1/12 each per day
 - 10 Women for combing at Re. 1/- each per day
 - 25 Men for door mats and brushes at Rs. 2/- per day
 - 20 Boys to assist them at Rs. 1/4 each per day
 - 6 Men for Board making at Rs. 2/- each per day
 - 12 Women to assist them at Re. 1/- each per day
 - 1 Engine Driver at Rs. 120/- p. m. (consolidated)
 - 2 Machine men at Rs. 100 p. m. (consolidated)
 - 1 Typist Clerk at Rs. 100 p. m. (consolidated)
 - 1 Asst. Manager-cum-storekeeper at Rs. 150/- p. m. (consolidated)
 - 1 Cashier at Rs. 125/- p. m. (consolidated)
 - 1 Supervisor-cum-Accountant at Rs. 125/- p. m. (consolidated)
 - 2 Asst. Supervisors at Rs. 100/- each p. m.
 - 1 Peon at Rs. 50/- p. m.
 - 1 Darwan at Rs. 50/- p. m.
 - 5 Contingent labourers at Rs. 1/12/- each per day.

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24. Financial implications

- (1) Non-recurring expenditure
- (i) Land - 1 acre. Rs. 2,000

(ii)	Buildings - workshed	Rs. 10,000
(iii)	15 cisterns - capacity for 5000 husks at Rs. 300/-'each	„ 4,500
(iv)	One Diesel Engine 12 G. H. P. with fittings	„ 8,000
(v)	1 Husk Crushing machine	„ 3,000
(vi)	1 Small Shearing machine	„ 1,500
(vii)	1 Fibre Ginning machine	„ 2,500
(viii)	1 Combing implement	„ 200
(ix)	Brush making implements	„ 1,000
(x)	Board making implements	„ 4,500
(xi)	One softener machine	„ 1,000
(xii)	One breaker machine (small)	„ 1,500
(xiii)	One belting machine	„ 1,200
(xiv)	One string spinning machine	„ 800
		<u>Rs. 41,700</u>
	or roughly	<u>Rs. 42,000</u>

(Rates are approximate and collected from Marshall Sons Ltd.)

(2)	Working capital for purchase of raw materials and for meeting labour charges etc.	<u>Rs. 10,000</u>
(3)	Recurring expenditure:	
A	(i) One Manager at Rs. 250/- p. m. (consolidated)	„ 3,000
	(ii) One Asst. Manager-cum-storekeeper at Rs. 150/- p. m.	„ 1,800
	(iii) One Cashier at Rs. 125/- p. m.	„ 1,500
	(iv) One Supervisor-cum-Accountant at Rs. 125/- p. m.	„ 1,500
	(v) Two Asst. Supervisors at Rs. 100/- p. m. each.	„ 2,400
	(vi) One Typist Clerk at Rs. 100/- p. m.	„ 1,200
	(vii) One Engine Driver at Rs. 120/- p. m.	„ 1,440
	(viii) Two machine men at Rs. 100 p. m. each	„ 2,400
	(ix) 1 Peon and 1 Darwan at Rs. 50/- p. m. each	„ 1,200

B. Travelling allowances		Rs. 300
C. Contingencies		Rs. 1,260
		<u>Rs. 18,000</u>
Total Non-recurring	Rs. 42,000	
Working Capital	„ 10,000	
Recurring	„ 18,000	
	<u>Rs. 70,000</u>	

25. The Committee approve the above proposals and recommend that they may be accepted in their entirety.

B. Short-term Proposals

26. (1) *Technological Section*—The Committee recommend that as the establishment of the Coir Research Institute would take a few years, the Coir Board should immediately proceed to appoint a qualified Technologist and depute him to work in the Central Cotton Research Institute, Matunga, or at some suitable laboratory on the various technological problems connected with the coir industry the more important of which are detailed in the Section II. The Technologist so chosen should be a Graduate in Chemistry who has taken the B. Sc. (Tech.) Degree in Textile Technology of a recognised University. The salary of the post may be provisionally fixed at Rs. 250—350.

27. (2) *Statistical Research*: As the statistical surveys detailed in the previous section have to be initiated almost immediately, the Committee would recommend that the Coir Board may proceed to make the following appointments during the next financial year:

- (i) 1 Statistician on Rs. 250—350
Qualifications: M. Sc. Degree in Statistics with at least 5 years' experience in statistical surveys.
- (ii) 3 Statistical Investigators on Rs. 80-220 to be posted at the 3 principal ports in Alleppey, Cochin and Calicut.
- (iii) 1 Analyst on Rs. 80-220 for the office of the Board.

28. The Investigators and Analyst shall hold the B. Sc. Degree in Statistics and preference should be given to those who

have at least 2 years' experience in statistical surveys or statistical analysis.

29. (3) *Economic Research*: A skeleton economic research section should be started in the office of the Coir Board during the next financial year and the following provisional appointments be made therefor.

One Economist on Rs. 250-350.

(Qualification: B. A. (Hons.) or M. A. or M. Sc. in Economics with at least 2 years' experience of research in the economics of the coir industry)

One Research Assistant on Rs. 80-220.

(Qualification: B. A. (Hons.) or M.A. in Economics)

Sd/- P. V. S. Sarma (Chairman)

Sd/- A. Karunakara Menon

Sd/- R. Krishna Aiyar

Sd/- K. B. Unnithan

Sd/- K. Karunakara Panicker

Sd/- T. Madhava Menon

Sd/- Dr. P. V. Nair (Convener)

Sd/- K. P. Amrithanatha Iyer

Sd/- S. R. Sen

Sd/- B. Beerappa

Sd/- C. M. John

APPENDIX

(Ref. Paragraph 18 of the report of the Ad Hoc Committee for Research & Statistics)

TABLE I

	Total cost in 5 years Rs in lakhs	1st year Rs. in lakhs	2nd year Rs. in lakhs	3rd year Rs. in lakhs	4th year Rs. in lakhs	5th year Rs. in lakhs
1. Buildings	3.5	1.5	2	—	—	—
2. Equipments including library	3.5	—	.75	1.0	1.0	.75
3. Recurring expenditure staff	5.79	1.06	1.10	1.16	1.21	1.26
4. Other recurring items	.5	.1	.1	.1	.1	.1
Total	13.29	2.66	3.95	2.26	2.31	2.11

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