TECHNO ECONOMIC FEASIBILITY REPORT

MOBILE FIBRE EXTRACTION MACHINE

Submitted to

COIR BOARD

Ministry of MSME

Govt. of India

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TECHNO ECONOMIC FEASIBILITY REPORT

MOBILE FIBRE EXTRACTION UNIT

SUMMARY

In North Eastern States of India, there is a huge unexploited stock of coconut husks scattered in the rural areas from where collection of husks is difficult as because of high transportation cost. The static Fibre Extraction Machine is economically not viable to set up in such rural scattered locations. Mobile Fibre Extraction Machine has the advantages like required no shed, only one machine mounted in a trolley, requires only 10HP, no pre-crushing of husks is required, can be obtained good quality fibre with minimum breakage, machine weight is much low (250 kg), smaller in dimensions (100cm × 1200cm), cheaper in cost, output (600 husk/hour) is comparable with the Static Machine (1000 husk/hour), it saves transportation charges of voluminous husks, the MFEM can either be run by Diesel Engine or Electric Motor which is economical.

The Mobile Fibre Extraction Machine under North East Indian conditions is very much technically feasible and economically viable as has been worked out in the feasibility report. It is calculated that 104 (98 in Assam & 6 in Tripura) numbers of Mobile Fibre Extraction Machine can be operated in this part of country for extraction of fibre from scattered coconut husks.

Plant Capacity :

The production basis for a single MFEM would be as follows :

Working hour per day	: 8 hours
Production capacity	: 336 kg fibre day
Working Days in a year	: 300 days
Capacity utilization	: 75%, 80%, 85% during first, second & third year & 90% from fourth year onwards.
Annual Production	: 100.80 tones

The major highlight of the feasibility report :

1. The Capital requirement : Rs.5.10 lakh
2. Promoter contribution : Rs.1.02 lakh
3. Annual Sales (Turnover) : Rs.22.176 lakh
4. Annual Operating expenses (fixed + variable) : Rs.16.911 lakh
5. Annual Gross profit (pre-tax) : Rs.5.265 lakh
6. Annual Gross profit Ratio : 23.74%
7. Break Even Point : 26.23%
8. Rate of return on investment : 23.92%
9. Number of person employed : 2 persons per day

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11. INTRODUCTION

11.1 General

The coconut palm indeed is a traditional plantation crop grown in India over the past 3000 years with longest mythological and historical record. In spite of the great antiquity attached to coconut crop in the country, organized efforts to develop the crop were made only about a century back and actual systematic efforts for development of coconut palm as a commercial crop begun in 1940s.

Coir is a unique natural fibre with diverse applications of great economic importance extracted from husks of Coconut. India is the largest coir producer in the world accounting for more than 80 per cent of the total world production of coir fibre. The coir sector in India is very diverse and involves households, co-operatives, NGOs, manufacturers and exporters.

The husk yields fibres, which is converted into coir and coir products *viz*., coil carpets, coir geo-textile, coir composite, coir safety belts, coir boards, coir asbestos and coir pith. Coir pith a secondary by product obtained during defibering process is used as soil conditioner and mending all types of soils. The spongy nature of pith helps in disintegration of clay soil and allows free drainage. Its sponginess helps to retain water and oxygen and also prevents loss of vital nutrients from soil.

Coir fibres measure up to 35 cm in length with a diameter of 12-25 microns. A coconut harvest occurs once in 45 days. From 1000 coconuts it would be possible to extract 10 kgs of coir. Among vegetable fibres, coir has one of the highest concentrations of lignin, making it stronger but less flexible than cotton and unsuitable for dyeing. The tensile strength of coir is low compared to abaca, but it has good resistance to microbial action and salt water damage and needs no chemical treatment.

There are two types of coir - the more commonly used brown fibre, which is obtained from mature coconuts, and finer white fibre, which is extracted from immature green coconuts after soaking for up to 10 months. Mature coir fibres contain more lignin, a complex woody chemical, and less cellulose than fibres such as flax or cotton.

Indian coir industry is an important cottage industry contributing significantly to the economy of the major coconut growing States and Union Territories, i.e., Kerala, Tamil Nadu, Andhra Pradesh, Karnataka, Maharashtra, Goa, Orissa, Assam, Andaman & Nicobar, Lakshadweep, Pondicherry, etc. Coconut husk is the basic raw material for coir products. Around 50 per cent of the available coir husk is used to produce coir products. Hence, there is scope for growth of coir industry in North East region of India.

There is a huge potential for using coconut husk to set up coir units to produce coir fibre, yarn and other value-added products including rubberised coir mattresses. Production of coir *bhoovastra* and coir pith in the North Eastern region could also help in the speedy development of the rural sector. It will be a great achievement for these States if they succeeded in capturing at least 5 per cent each of the Rs. 1,300-crore domestic market for rubberised coir mattresses.

11.2 Brief of the technologies

Central Coir Research Institute, Kalavoor the research center of Coir Board has successfully developed a Mobile Fibre Extraction Machine. It is fact that, there is an unexploited stock of coconut husks scattered in the rural areas from where collection of husks is difficult as because of high transportation cost. The existing Defibering Machine is not movable and also economically not viable to set up in such rural scattered locations. Unlike the Static Fibre Extraction Machine, Mobile Fibre Extraction Machine has the following competitive advantages like required no shed, only one machine mounted in a trolley, requires only 10HP, no pre-crushing of husks is required, can be obtained good quality fibre with minimum breakage, machine weight is much low (250 kg), smaller in dimensions (100cm × 1200cm), cheaper in cost, output (600 husk/hour) is comparable with the Static Machine (1000 husk/hour), it saves transportation charges of voluminous husks, the MFEM can either be run by Diesel Engine or Electric Motor which is economical.

11.3 About the North Eastern Region

North Eastern region of India comprising the eight states of Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura is endowed with vast natural resources and has enormous potential of development. The economic structure of north-east India is similar to the general economic structure of India as a whole. But because of its topography as well as social and political conditions it has a relatively backward economy.

The strategic importance of the region along with its sensitive geo political location extremely diverse nature of its population with different cultural, linguistic, religious and historical background make this region characteristically different from the rest of the country. In fact region is still backward as compared to other parts of the country and could not develop much industrially despite of having vast natural resources.

The climatic condition in the region varies from temperate to sub-tropical and tropical. The agro-climatic conditions of the region, varied soil types and abundant rainfall are favourable for cultivation of horticultural crops especially plantation crops. Coconut is one of the most popular crop grown for a long time especially in Assam state and in recent times in others N.E. states. The area and production which were 11,000 hectares and 60 million nuts, respectively, during 1985–86, have now increased to 40,000 hectares and about 178 million nuts, in the North Eastern Region. The cultivation which was confined to Assam, Tripura and to some extent in Manipur,

has now spread to states like Nagaland, Mizoram, Arunachal Pradesh and Meghalaya due to efforts made by Coconut Development Board.

The state of Assam is having 20710 ha area under Coconut & with a total production of 1756.13 lakhs of nuts every year. In the State, farmers of Nagaon, Nalbari, Kamrup (R), Morigaon districts and the Bajali sub-division in Barpeta district are the major producers of coconut. Farmers in some areas of Lakhimpur and Dhemaji districts also produce the crop. Lion's share of the coconut produced in the State is consumed by its own people, while a portion is exported to the neighbouring states of Manipur, Mizoram, Meghalaya and West Bengal. Some portions are also exported to Bihar and Jharkhand.

Taking advantage of the sufficient number of coconut production, there is great scope to set up Coir based industries in the states of Assam & Tripura in this North East Region of India. The prospect of the coir industry is very high as Assam produces a total of 176 million coconuts every year. The state produces 8 thousand 480 nuts per hectare per year against the national average of 8 thousand 303. According to experts, 80 tones of fiber could be extracted from 1 million coconuts. Hence, Assam can produce 17 thousand 561 metric tones of fiber per year. Traditional items like durable ropes and twines, brooms, door mats along with technology based products including Geo-textile for erosion control and ornaments are being produced, using coir.

11.4 Aim of the feasibility study

The development of coir industry has all along been in areas where there is a concentration of coconut trees and availability of coconut husk. Historically, the coir industry started and flourished in Kerala which has a long coast line, lakes, lagoons and backwaters providing natural conditions required for retting. However, with the expansion of coconut cultivation, coir industry has picked up in the States of Tamil Nadu, Karnataka, Andhra Pradesh, Orissa, West Bengal, Assam, Tripura, Pondicherry and the Union Territories of Lakshadweep and Andaman & Nicobar Islands through the efforts of Coir Board. The coir fibre industry is particularly located in Southern states of India, mainly the coastal region of Kerala State, produces 60% of the total world supply of white coir fibre. There is scope for development of coir industry in the coconut growing North Eastern States of India. Hence, the present study was undertaken to find out the feasibility of establishing Coir Industries in North Eastern States of India with respect to availability of raw materials (coconut husks), operational cost etc.

The main aims of the techno-economic feasibility study for a developed technology are –

- Technical evaluation of the know-how/technology developed by an R&D institution.
- To broadly specify the plant and machinery and other facilities required.
- Assessment of demand of the product to be produced.
- The likely investment required.

- Financial analysis of the proposed technology/venture to broadly determine whether the project is economically viable.
- Commercial analysis of the project to evolve sound marketing plan and organizational structure for the proposed venture.
- To make projected financial analysis for submission to the financial institutions and bank seeking long term and short term borrowings respectively.

12. DEMAND, PRODUCTION AND SUPPLY

12.1 Demand of the product

The coir industry has two main branches, namely, manufacturer of coir yarn from husk and the manufacture of coir goods such as mats, matting, carpets and rugs from coir yam. The Mobile Fibre Extraction Machine is developed to extract coir fibre from the husks available husks in scattered & rural areas where installation of Static Fibre Extraction Machine is either not economically viable or raw materials are not sufficient. In the North Eastern States where coconut cultivation is not an organized sector and cultivations are still in homestead garden in scattered area, the collection of husks is a major problem considering the high transportation cost. In the North Eastern States, the coconut husks were considered as waste materials. Common peoples, growers were not aware of the importance of coir fibre. Otherwise also, it is not possible or easy to extract fibre from husks without a fibre extraction machine. The major output from the Mobile Fibre Extraction Unit is Coir Fibre, which is the base of all coir based industries. Therefore, demand of coir fibre is immense.

12.2 Production & Supply

Assam produces 1756.13 lakh of coconut per year. It is estimated that 80 tones of fiber could be extracted from 1 million coconuts. Hence, Assam can produce 14 thousand 80 metric tones of fiber per year.

The coir fibre extracted through a Mobile Fibre Extraction Machine in different rural & scattered areas could be collected in a central location and can be sold as such to the existing coir industries. It is also possible to set up small cottage industry for ropes & twines production.

13. PLANT LOCATION AND INFRASTRUCTURAL FACILITIES

13.1 Plant Location

The source of coir fibre is the Coconut plant. It is observed from the survey, collection of data from various sources that Coconut is mostly grown in Assam (20710 ha) and Tripura (5900 ha) amongst the North Eastern States of India. Therefore, any entrepreneur wish to set up Coir Industry should be in Assam or in Tripura. Considering the area of plantation, The Mobile Fibre Extraction Machine requires no particular location. However, the district wise feasible requirement of Mobile Fibre Extraction Machine in Assam is as follows :

SL No	Districts	Area(Ha) 2011-12	Production (Lakh Nuts) 2011-12	Requirement of Mobile Fibre Extraction Machine (Nos.)
1	Barpeta	1941.00	314.88	15
2	Baska	1100.00	51.83	3
3	Bongaigaon	615.00	50.02	3
4	Cachar	1005.00	27.46	2
5	Chirang	451.00	37.48	2
6	Darang	599.00	43.89	2
7	Dhemaji	103.00	05.31	1
8	Dhubri	368.00	56.34	3
9	Dibrugarh	65.00	00.38	1
10	Goalpara	400.00	31.47	2
11	Golaghat	1030.00	177.37	8
12	Hailakandi	315.00	06.89	1
13	Jorhat	407.00	65.25	3
14	K. Anglong	474.00	24.72	2
15	Kamrup (M)	208.00	13.14	2
16	Kamrup (R)	1430.00	84.96	4
17	Karimganj	711.00	14.69	2
18	Kokrajhar	400.00	31.18	2
19	Lakhimpur	278.00	24.17	2
20	Morigaon	810.00	76.09	4
21	N. C. Hills	93.00	01.14	1
22	Nagaon	3323.00	235.47	11
23	Nalbari	1390.00	78.18	4
24	Sivasagar	532.00	27.78	2
25	Sonitpur	1928.00	252.96	12
26	Tinsukia	54.00	02.46	2
27	Udalguri	680.00	20.62	2
	Assam	**20710.00**	**1756.13**	**98**

The district wise feasible requirement of Mobile Fibre Extraction Machine in Tripura is as follows :

SL No	Districts	Area(Ha) 2011-12	Production (Lakh Nuts) 2011-12	Requirement of Mobile Fibre Extraction Machine (Nos.)
1	Dhalai District	427	19.91	1
2	North District	876	27.10	1
3	South District	2362	45.00	2
4	West District	2235	42.41	2
	Tripura	**5900**	**134.42**	**6**

Assam & Tripura together produces 1890.55 lakhs of nuts per year. If husks of 50% of the total coconut production are also available, there will be requirement of at least 104 numbers of Mobile Fibre Extraction Machine in the state of Tripura & Assam.

13.2 Infrastructural Facilities

Infrastructural facilities are only the Mobile Fibre Extraction Machine, one three wheeler Auto Van (Carrier) & a Platform Balance is required. Land & building for the machine is considered as owned by the entrepreneur.

13.3 Plant Layout

There will not be any specific plant for Mobile Fibre Extraction Machine. It is to be purchased from Coir Board authorized dealer. The machine will be attached with a three wheeler Auto ACE vehicle.

14. MANUFACTURING PROCESS

4.1. General :

Green coconuts, harvested after about six to 12 months on the palm, contain pliable white fibres. Brown fibre is obtained by harvesting fully mature coconuts when the nutritious layer surrounding the seed is ready to be processed into copra and desiccated coconut. The fibrous layer of the fruit is then separated from the hard shell (manually) by driving the fruit down onto a spike to split it (dehusking). A well-seasoned husker can manually separate 2,000 coconuts per day.

However, Machines (Static & Mobile) are now available which crush the whole fruit to give the loose fibres. These machines can process up to 2,000 coconuts per hour.

4.2. Manufacturing Process :

The technology of Mobile Fibre Extraction Machine has already been transferred to 17 parties and they are the authorized manufacturer of the Mobile Fibre Extraction Machine. Therefore, no manufacturing processes have been involved & interested

entrepreneurs have to purchase the Machine. However, the operating mechanism of MFEM for fibre extraction is to be trained to the operator.

4.3. Quality Control Analysis :

Mechanically extracted coir fibre, also known as "Brown fibre" is mechanically extracted from the dry husks of matured and ripe coconut after soaking these husks in water. The fibre shall be reasonably free from moisture and impurities.

The requirements of three commercial grades of fibre are also follows:-

1.Bristle Coir Fibre:- The two grades of Bristle Coir Fibre shall be comparatively long and stiff. The texture shall be firm and stiff and shall not be brittle. The colour shall be cinnamon brown.

2. Mattress Coir Fibre:- The Mattress Coir Fibre is comparatively short and resilient.

3.Decorticated Coir Fibre:- Decorticated coir fibre is mixed fibre. The Grade I fibre shall be strong and springy and the Grade II fibre shall be softer than Grade I but harder and more springy than matters fibre and both shall not be brittle.

Length of Fibre

Based on the lengths, the mechanically extracted coir fibre shll be grouped as follows:

Group	Length(mm)
Long fibre	Above 200
Medium fibre	Above 150 & up to 200
Short fibre	Above 50 & up to 150

The maximum permissible impurities, mainly pith, dust, bits of exocarp and fibre bits below 50 mm in two grades of Bristle Coir Fibre, in Mattress coir fibre and in two grades of Decorticated Coir Fibre should be within the permissible limits.

4.4. Pollution and abatement :

The proposed Mobile Fibre Extraction Unit does not produce harmful effluents. Therefore, no environmental pollution will arise from the proposed venture. This machine can significantly reduce the rate of pollution of water bodies in rural area. In the conventional method husks are soaked in river or lake water. More than 150000 liters of water is needed for soaking and other process.

15. ORGANIZATION AND MANAGEMENT

15.1 Functional areas envisaged

The operation and management of Mobile Fibre Extraction Machine is very easy and a simple organizational structure is recommended the following functional areas :

(i) Production
(ii) Administration, sales/purchase and accounts &
(iii) Quality Control.

5.2 Functional responsibilities

The recommended that only two persons are needed to execute the above functional areas with following responsibilities :

(i) **Production :** A person may be directly involved in the activities related to the operation & extraction of fibre using Mobile Fibre Extraction Machine. He will also be responsible for driving the vehicle along with the machine to various places where husks are available for extraction of fibre.

(ii) **Administration, Sales/Purchase and accounts** : Another second person may be made responsible for liaison with coconut growers, traders, purchase of husks, selling of fibre, calculating operational cost, fixing of prices for sales & purchase and maintaining accounts. Formulation of a workable & profitable program for purchase of raw materials & sales of fibre along with location-wise schedule of operation.

(iii) **Quality Control** : Both the person have to be well trained before starting the operation and should know about the operational functions of the machine with varied quality of raw materials for maintaining the quality of fibre.

16. PROJECT PHASING AND ACTIVITY SCHEDULE

16.1 Project phasing

A poorly designed traditional planning and control methods fail to cope up with the changing realities of modern business. Now the management have started using more effective planning and control techniques when a complex set of activities are involved. However, as the operation & function of Mobile Fibre Extraction Machine is very simple no such critical planning is required.

A time span of 15 weeks time is envisaged to complete the project implementation i.e. training, purchase of Mobile Fibre Extraction Machine, Purchase of three wheeler vehicles, raw materials & market survey.

16.2 Activity Schedule

The activity schedule for Mobile Fibre Extraction Machine will be varied with locations where raw materials (coconut husks) are available. It is location specific. The administrator (Manager) should make a schedule of weekly visit in one direction covering 5-6 locations having coconut husks for fibre extraction. As this will be regular & routine activity, the growers, owners, local collectors of husks should be well informed about the visit. Thus from Monday to Saturday the Mobile Fibre Extraction Machine could be utilized in every pockets having coconut husks in all directions.

17. CAPITAL REQUIREMENT AND COSTS

17.1 Fixed capital

For the purpose of techno-economic study fixed costs are taken as those which are required before the commencement of commercial production. This includes fixed assets towards land and buildings, plant & machinery, miscellaneous fixed assets, know-how and engineering/training fees, capitalized and pre-operative expenses etc. The fixed investment for purchase & operation of Mobile Fibre Extraction Machine is estimated as Rs.3.60 lakh. To cover the expenditure during project implementation period of 15 weeks, the establishment salaries, travelling expenses, postage and telephones, printing & stationeries expenses are considered under the pre-operative head. The Pre-operative cost in this case is calculated as Rs.0.05 lakh & Margin Money for Working Capital is estimated at 1.45 lakh (**Table-IV**). The detail cost break of individual components is presented in **Table I & Figure I**.

17.2 Working capital

Working Capital provided for the inventory of new materials & utilities, salaries and wages, stock of finished goods, bills receivable & other items. Considerable care is exercised in estimating the working capital since it is a non-depreciable capital on which a return must be earned. The details of working capital (Cost of production) have been calculated as Rs.16.91 lakh and shown in **Table-II, Table- III & Figure-II.**

17.3 Scheme of finance

The proposed Machinery *i.e.* Mobile Fibre Extraction Unit is to be managed by private entrepreneurs, requirement of funds are proposed to be drawn through a bankable project, capital subsidy from Coir Board, Govt. of India under suitable scheme. **Table-V** presents the Bank Loan along with loan repayment schedule for five years.

18. OPERATING REQUIREMENT AND COSTS

This is deals with the operating costs viz. fixed and variable costs after commencement of production. The breakdown of the production cost is given in **Table II**.

18.1 Variable costs

The variable costs which are directly related to the quantum of production, include raw materials, utilities, packing costs, maintenance cost etc. The total variable cost is presented in **Table-II**.

18.2 Fixed costs

The salary and wages of all the personnel to be employed is calculated as Rs.1.80 lakh per year and shown in **Table-III**.

19. FINANCIAL ANALYSIS

The primary objective of the financial analysis is to determine the suggested program and policies that form the very basis of the proposed venture would yield a reasonable return on investment. The assessment is presented in the following format.

(i) Fixation of price of Coir Geotextiles
(ii) Profitability Analysis
(iii) Cash Flow Analysis
(iv) Balance sheet presentation
(v) Appraisal of the proposed venture

19.1 Fixation of product price

Demand of coir fibre is well established in the country. From the available information the current price of coir fibre in NE states is varies from Rs.22-26/- per kg. However, for the purpose of feasibility study and financial analysis of the proposed project the minimum price of Rs.22/- per kg has been considered.

19.2 Profitability analysis

From the recommended selling price and generated cost data the profitability has been worked out. While estimating profitability, sales and administrative expenses, financial expenses i.e. interest payable to financial institutions and banks have been duly considered. Considering the geographical locations & Socio-economic conditions in NE states, it is calculated that only 75% of the capacity of MFEM is utilized in first year, 80% in second year, 85% in third year and 90% from fourth year onwards. The details of profitability analysis are presented in **Table-VI**. In short it can be seen that the proposed Mobile Fibre Extraction Machine of an entrepreneur can generate the Gross Operating Profit and Net Profits for ten production years as per the following table:

Years	Gross Operating Profit (Rs. in lakh)	Net Profit (Rs. in lakh)
I Year	3.481	3.476
II Year	3.481	3.476
III Year	3.481	3.476
IV Year	3.481	3.476
V Year	3.481	3.476
VI Year	3.481	3.476
VII Year	3.481	3.476
VII Year	3.481	3.476
IX Year	3.481	3.476
X Year	3.481	3.476

19.3 Cash flow analysis

The data presented in **Table VII** is very critical for the purpose of financial analysis. The data highlight the quantum of cash flow from the proposed Mobile Fibre Extraction Machine for the ten productive years. This would in turn bring the debt

paying power of the proposed entrepreneur. For the purpose of financial analysis, the repayment of loan (Rs.4.08 lakh), commences from the first year of production. It is expected to be cleared by the end of fifth year in 5 equal installments with interest. **Table-V** shows repayment schedule of loans and the interest payable to the financial institution at the rate of 12%. It is observed from the Cash Flow Analysis that an amount of Rs.42.889 lakh cash also has been accumulated for any expansion or diversification of business utilizing coir fibre during a period of ten years after clearing all the loans by fifth year.

19.4 Balance Sheet

The projected balance sheet for the ten productive years showing the assets and liabilities of the proposed venture (Mobile Fibre Extraction Machine) has been shown in **Table-VIII.**

19.5 Appraisal

Setting up of industries in NE states owing to its varied socio-cultural differences, geographical unevenness & other socio-economic condition is sometimes become complex. To overcome such risks it is very much essential to judge a project by various means after working out a detail techno-economic feasibility report. Most of the projects are financed from multiple sources, internal funds, loans, grants etc. The loan and associated interest and other charges will be repaid principally from the operating cash flow which the capital project is expected subsequently to generate. Thus the risk are shared by both the parties *i.e.* lender & financial institution. There are some reliable means of judging a project and they are duly considered here.

19.6 Break Even Point :

The Break Even Point analysis is primarily intended to indicate the proposed plant operating level at which accounting sales covers the accounting costs and the unit run at no loss basis. Any increase in production from break event level will definitely yield profit whereas it will run at loss if the production level is below the break even. The secondary objective is to examine the relationship between profit and quantum of production. **Table-IX** represented the detail Break Even Point Analysis and **Figure-III** represented the BEP graphically. In this particular Mobile Fibre Extraction Machine in NE States, the break even point occurs at **26.23%** production level.

20. CONCLUSION AND RECOMMENDATION

India accounts for more than two-thirds of the world production of coir and coir products. It is an important cottage industry contributing significantly to the economy of the major coconut growing States and Union Territories, *i.e.,* Kerala, Tamilnadu, Andhra Pradesh, Karnataka, Maharashtra, Goa, Orissa, Assam, Andaman & Nicobar, Lakshadweep, Pondicherry, etc.

However, despite the huge potential to grow up this industry in NE region, especially in Assam, due to lack of awareness, scattered nature of coconut plantations, the

growth of the coir industry is negligible or very poor. The state of Assam is having 20710 ha area under Coconut & with a total production of 1756.13 lakhs of nuts every year. Assam can produce 17 thousand 561 metric tonnes of fiber per year. Due to lack of infrastructure facility, lack of awareness & poor economic condition the full utilization of the coconut husk has not been achieved.

The Mobile Fibre Extraction Machine under North East Indian conditions is very much technically feasible and economically viable as has been worked out in the feasibility report. It is calculated that 104 (98 in Assam & 6 in Tripura) numbers of Mobile Fibre Extraction Machine can be operated in this part of country for extraction of fibre from scattered coconut husks.

Therefore, it is recommended that interested entrepreneurs may come forward to take up the technology for self employment and socio-economic development of this region. Cooperation is also required from different sectors to provide necessary facilities *i.e.* financial, technical etc. to help the interested entrepreneurs for speedy & successful implementation of the project.

TECHNO-ECONOMIC FEASIBILITY REPORT

Title of the Project : **Mobile Fibre Extraction Machine**

Basis of calculation :

Number of Working Days = 300 days

Debt Equity Ratio = 4 : 1

Plant Capacity

Raw Material (Coconut husk) processing = 4800 Kg per day

Yield of Coconut Fibre = 7.0 %

Product (Coconut Fibre) = 336 Kg per day

TABLE- I

PROJECT CAPITAL COST

Sl. NO.	PARTICULARS	CAPACITY	UNIT	QTY	COST(Rs)
A	**MACHINERY**				360000.00
1	Machinery 1 MFEM	600	Kg	1	
2	Three wheeler Auto van (Carrier)			1	
3	Platform Balance	500	Kg	1	
B	**PRE-OPERATIVE EXPENSES**				5000.00
C	**MARGIN MONEY FOR WORKING CAPITAL**				145000.00
	GRAND TOTAL				**510000.00**

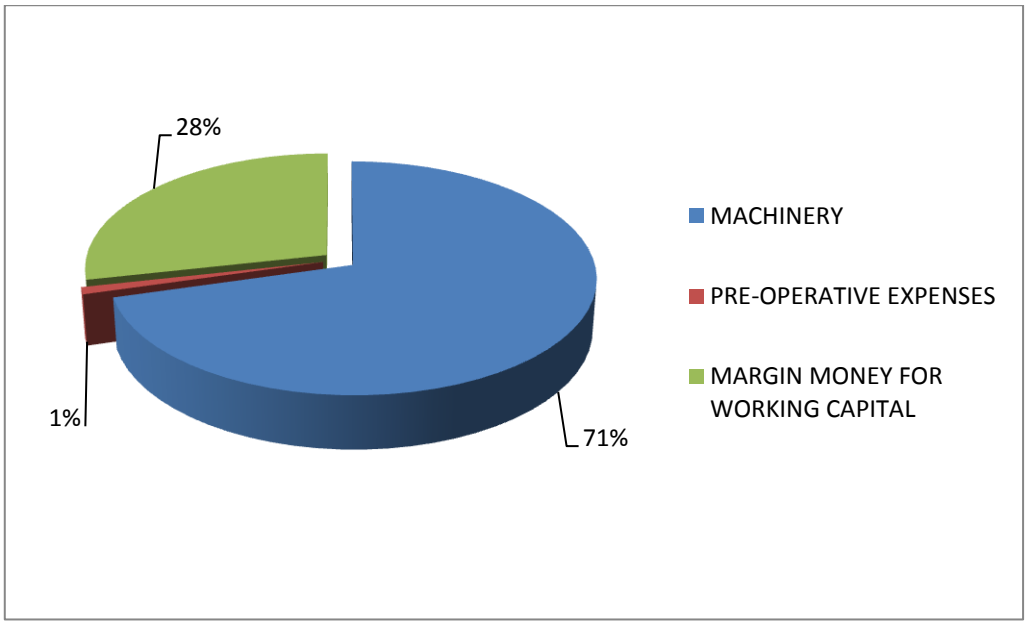

Figure-I : Diagrammatic Representation of Project Capital Cost

TABLE - II

COST OF PRODUCTION

Sl. No.	Item	Requirement per Day		Price (Rs)		Amount per Annum	
1	Raw Material Cost						
a)	Coconut husk	4800.0	Kg	0.80	per Kg	Rs.	1152000.00
b)	Bag	13.0	Nos.	12.00	per bag		46800.00
	Raw Material Cost					**Rs.**	**1198800.00**
2	Fuel						
	Diesel for Generator	8.0	Litre	58.80	per Litre	Rs.	141120.00
	Diesel for Van	3.0	Litre	58.80	per Litre	Rs.	52920.00
	Fuel Cost					**Rs.**	**194040.00**
3	Maintenance & Repair	5%	of Machinery			Rs.	18000.00
4	Manpower Cost					Rs.	180000.00
5	Depreciation Cost	10%	of Machinery			Rs.	36000.00
6	Interest on Bank Loan	12%	of Bank Loan			Rs.	49000.00
7	Miscellaneous Expenditure	3%	of Machinery			Rs.	15300.00
					TOTAL COST OF PRODUCTION	**Rs.**	**1691140.00**

SALES REALIZATION

Sl. No.	Item	Quantity		Selling Price (Rs)		Amount per Annum	
1	Coir Fibre	336	Kg	22.00	per Kg	Rs.	2217600.00
					TOTAL SALES REALIZATION	**Rs.**	**2217600.00**

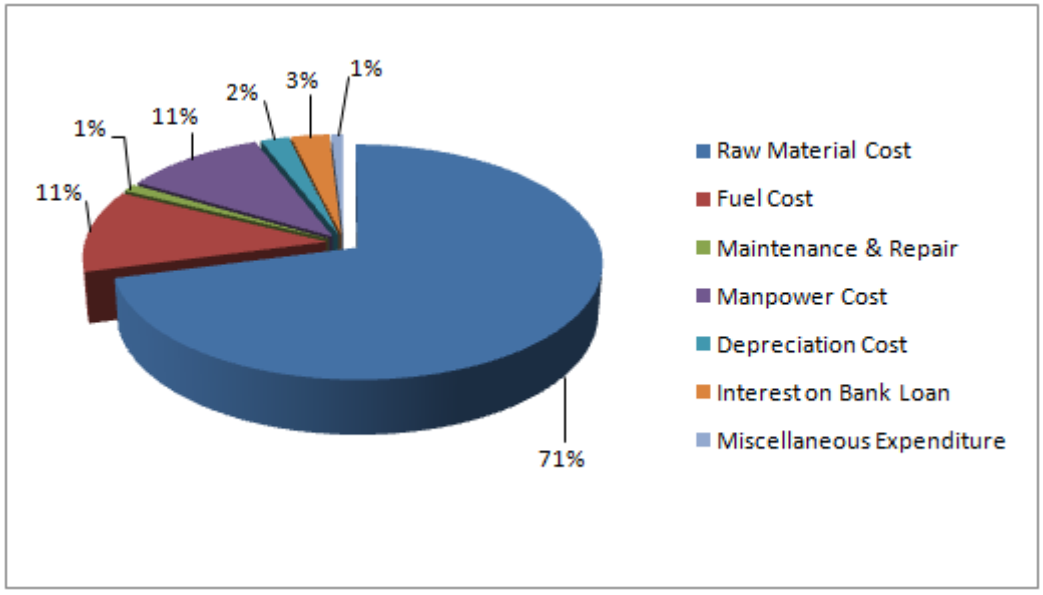

Figure-II : Diagrammatic Representation of Working Capital

TABLE - III

COST OF MANPOWER

Sl. No.	Type	Quantity	Wage/ Monthly Salary in Rs.	No. of Days or month		Amount in Rupees
1	Operator	2	300.00	300	days	180000.00
				TOTAL YEARLY COST		**180000.00**

TABLE - IV

MARGIN MONEY FOR WORKING CAPITAL

Sl. No.	Particulars	No. of Months		Amount in Rupees
1	Raw Materials	1	Month	99900.00
2	Fuel	1	Month	16170.00
3	Maintenance & Repair	1	Month	1500.00
4	Manpower	1	Month	15000.00
5	Depreciation	1	Month	3000.00
6	Interest on fixed capital	2	Month	8168.00
7	Miscellaneous	1	Month	1275.00
			TOTAL	**145013.00**
			SAY	**145000.00**

TABLE - V

BANK LOAN

Year	Loan Amount at the Beginning of the Year	Loan Repayment at the End of the Year	Outstanding Balance at the end of the Year	Interest (12%)
1st	408000.00	81600.00	326400.00	49000.00
2nd	326400.00	81600.00	244800.00	39200.00
3rd	244800.00	81600.00	163200.00	29400.00
4th	163200.00	81600.00	81600.00	19600.00
5th	81600.00	81600.00	0.00	9800.00

TABLE - VI

PROFITABITY ANALYSIS

(Rs. Lakhs)

Description	1st year	2nd year	3rd year	4th year	5th year	6th year	7th year	8th year	9th year	10th year
CAPACITY UTILIZATION	75%	80%	85%	90%	90%	90%	90%	90%	90%	90%
Total Turnover	16.632	17.741	18.850	19.958	19.958	19.958	19.958	19.958	19.958	19.958
Less: cost of production	13.151	13.903	14.655	15.407	15.407	15.407	15.407	15.407	15.407	15.407
Gross Operating Profit	**3.481**	**3.837**	**4.194**	**4.551**	**4.551**	**4.551**	**4.551**	**4.551**	**4.551**	**4.551**
Less: pre-operative expenses written off	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
Net Profit	**3.476**	**3.832**	**4.189**	**4.546**	**4.546**	**4.546**	**4.546**	**4.546**	**4.546**	**4.546**
Add back :-										
- depreciation	0.360	0.360	0.360	0.360	0.360	0.360	0.360	0.360	0.360	0.360
- expenses written off	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
TOTAL CASH ACCRUALS	**3.841**	**4.197**	**4.554**	**4.911**	**4.911**	**4.911**	**4.911**	**4.911**	**4.911**	**4.911**

TABLE - VII

CASH FLOW ANALYSIS

(Rs. Lakhs)

Description	Pre-operative stage	1st year	2nd year	3rd year	4th year	5th year	6th year	7th year	8th year	9th year	10th year
CAPACITY UTILIZATION		75%	80%	85%	90%	90%	90%	90%	90%	90%	90%
A. Source of Fund											
Owner's Equity	1.020										
Gross Operating Profit		3.481	3.837	4.194	4.551	4.551	4.551	4.551	4.551	4.551	4.551
Bank Interest		0.490	0.392	0.294	0.196	0.098					
Profit after Depreciation but before Interest		3.971	4.229	4.488	4.747	4.649	4.551	4.551	4.551	4.551	4.551
Depreciation		0.360	0.360	0.360	0.360	0.360	0.360	0.360	0.360	0.360	0.360
Bank Loan	4.080										
Total of A	**5.100**	**4.331**	**4.589**	**4.848**	**5.107**	**5.009**	**4.911**	**4.911**	**4.911**	**4.911**	**4.911**
B. Application of Fund											
Project Expenditure	5.100										
Repayment of Bank Loan		0.816	0.816	0.816	0.816	0.816					
Interest on Bank Loan			0.490	0.392	0.294	0.196	0.098				
Total of B	**5.100**	**0.816**	**1.306**	**1.208**	**1.110**	**1.012**	**0.098**				
Opening Balance of Cash			3.515	6.798	10.438	14.435	18.432	23.245	28.156	33.067	37.978
Surplus/Deficit during the year		3.515	3.283	3.640	3.997	3.997	4.813	4.911	4.911	4.911	4.911
Cumulative surplus		**3.515**	**6.798**	**10.438**	**14.435**	**18.432**	**23.245**	**28.156**	**33.067**	**37.978**	**42.889**

TABLE - VIII

PROJECTED BALANCE SHEET

(Rs. Lakhs)

Description	Procurement Stage	1st year	2nd year	3rd year	4th year	5th year	6th year	7th year	8th year	9th year	10th year
LIABILITIES											
Equity Capital	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020
Reserve or Surplus		3.481	7.318	11.512	16.063	20.614	25.165	29.716	34.267	38.818	43.369
Bank Loan	4.080	3.264	2.448	1.632	0.816						
Interest Payable		0.490	0.392	0.294	0.196	0.098					
Total	**5.100**	**8.255**	**11.178**	**14.458**	**18.095**	**21.732**	**26.185**	**30.736**	**35.287**	**39.838**	**44.389**
ASSETS											
Fixed Assets	3.600	3.240	2.880	2.520	2.160	1.800	1.440	1.080	0.720	0.360	0.000
Current Assets	1.500	1.500	1.500	1.500	1.500	1.500	1.500	1.500	1.500	1.500	1.500
Cash or Bank Balance		3.515	6.798	10.438	14.435	18.432	23.245	28.156	33.067	37.978	42.889
Total	**5.100**	**8.255**	**11.178**	**14.458**	**18.095**	**21.732**	**26.185**	**30.736**	**35.287**	**39.838**	**44.389**

TABLE - IX

BREAK-EVEN ANALYSIS

Sl. No.	Particulars	Amount in Rupees
A	**FIXED COST**	
1	Manpower Cost	90000.00
3	Interest on Bank Loan	49000.00
4	Depreciation Cost	36000.00
5	Maintenance & Repair	4500.00
6	Miscellaneous Expenditure	7650.00
	TOTAL OF (A)	**200650.00**
B	**VARIABLE COST**	
1	Raw Material Cost	1198800.00
2	Manpower Cost	90000.00
3	Fuel Cost	194040.00
4	Maintenance & Repair	13500.00
5	Miscellaneous Expenditure	7650.00
	TOTAL OF (B)	**1451070.00**
C	**TOTAL COST (A + B)**	1691140.00
D	**SALES REALIZATION (TURNOVER)**	2217600.00
E	**GROSS PROFIT**	526460.00
F	**BREAK - EVEN POINT**	**26.23%**

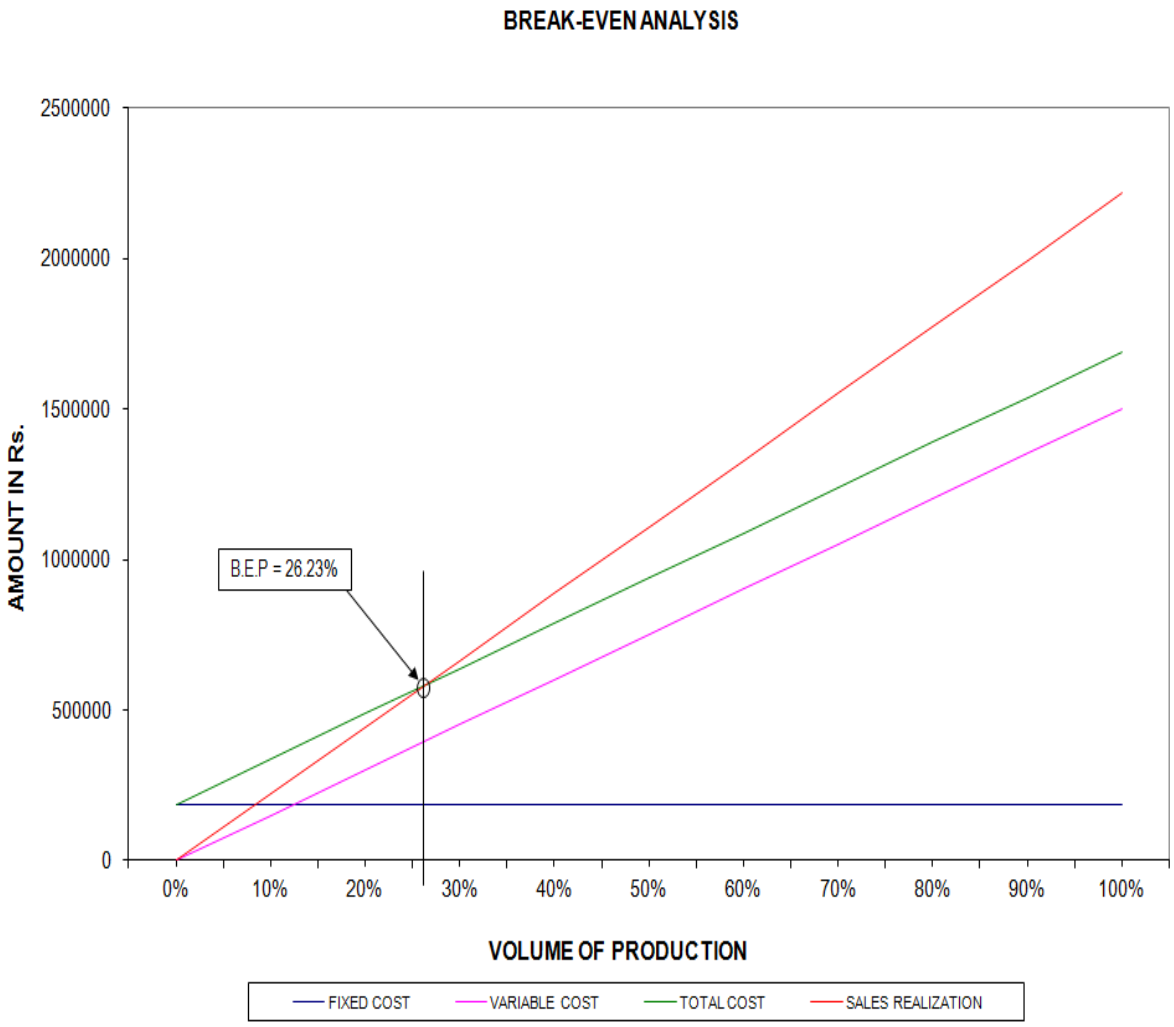

Figure-III : Graphical representation of Break Even Point Analysis