PROJECT REPORT

Of

DAL/PULSE MILL

PURPOSE OF THE DOCUMENT

This particular pre-feasibility is regarding **Dal/Pulse Unit.**

The objective of the pre-feasibility report is primarily to facilitate potential entrepreneurs in project identification for investment and in order to serve his objective; the document covers various aspects of the project concept development, start-up, marketing, finance and management.

[We can modify the project capacity and project cost as per your requirement. We can also prepare project report on any subject as per your requirement.]

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DALL/PULSE MILL

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INTRODUCTION

The various pulses are part of the normal diet of all vegetarians and are also used frequently by non vengetarians too. They are the main sources of protein. The important dals in the country are Channa Moong, Urad, Moth, Turdal and Masoor, Matar etc. The pulses are used for preparing hot dishes, sweet dishes and other varieties. There are over 1000 units at present engaged in processing of various pulses in different parts of the country, but most o these mills are based on obsolute type technology resulting invariably in higher production losses. The pulse milling industry is predominantly a small scale industry and has been reserved for exclusive development in small scale sector.

The inter-dependence of agriculture and industry is related both to the management of inputs and the processing of the produce. The highest priority therefore, must be given to industrial investment which are agro-based so that growth in both the sectors can be aculerated on a mutually supportive basis.

Pulses being the most common diet part of Indian families, need to be given the due importance in the form of production of pulse grains in the farms is also likely to sea a break through. A pulse grain is made of two parts covered under a continuous encloser called husk or peels. Cleanly removing the peels and splitting the pulse grains in intact two pieces is the most desired form of dal to be cooked for the families. Pulse mills can satisfy the tastes of consumers by providing unbroken natural full parts of the pulse grains with no husk part left behind on the pulse being supplied to the consumer. Further, besan of very fine and clean type can be easily offered to the consumers by using the up to date technology of pulse mills. Losses can be minimized and pulse prices can be contained within the reach of general mass by technological improvements and largescale production in our dal mills without an extra expense on the part of pulses millers.

USES AND APPLICATIONS

Dal(pulses) is a dry cereal which is taken to fulfill the requirements of protein for a normal human being. The inner portion of the dal is rich in proteins vitamins and after cooking supplies the necessary nutrients. Due to the hig content of proteins pulses are mixed in other cereals food to increase the quality of protein to be ingected in the body. The Kernals and broken part the pulses is feed for animals known as chunni.

PROPERTIES

The advised safe moisture contents are 15% for haricot and horse blens and 14% for the peas and lentils.

BULK DENSITY

Bulk density of all pulses is uniform (haricot 900 kg/cm2, lentils 890 kg/cm2. Peas 880kg/2 and 810/cm2 for butter beans.

CHEMICALS

Pulses are the good source of protein, minerals carbohydrate and vitamines and having the high calorific value.

PROPERTIES

CHANNA DAL (GRAM)

MOONG WASH

URD WASH (BLACK GRAM)

TOOR DAL (PIGEON PEA)

YELLOW SPLIT PEA

URD Urd in a highely nutritive pulse. It is a very rich in phosphoric acid. It is used in the same way as `mung'. Urd in also used in manufacturing papad and barain and together with rice in preparing dosa and idli, popular south Indian dishes.

BENGAL GRAM (CHANNA)

Channa Dal is the most important pulse accounting for more than about 40 per cent of the production of pulses in this country. Germinated seeds are recommended to cure scurvey. Maleic acid and oxalic acid are prepared from green leaves.

MUNG (GREEN GRAM)

The mung grines are used as a pulse or made into flour and into straw and husk as fodder for cattle. It does not produce heavyness or flatulance. Mung grains are also eaten whole (Germinated), parched, salted, with sugar or boiled with condiments.

PEAS

It is a high yielding pulse crop, unripe pods are used as a green vegetable and the broken parts are used as a cattle feed. This pulse is similar to channa and lentil in its requirements.

TOOR (ARHAR/PIGEON PEA/RED GRAM)

It is extentensively used as dal. Its green pods may be used as a vegetable. The green leaves and tops of plants are fed to animals or are utilized as green manure. The husks of pods or seeds with parts of the kernels constitute a valuable cattle feed. Dry stalks obtained after threshing are used for basket making or as fuel.

B.I.S. SPECIFICATION

IS:2814-1978 Method for sampling of smaller size food grains (first revision)

IS:5315-1978 Methods of sampling for milled cereals and pulses products (first revision)

IS:10768-1984 Methods of test for quality characteristics of pulses.

MARKET SURVEY

The important part pulses play as a source of dietary protein, energy, minerals and vitamins for the predominantly vegetarian population of India, needs no reiteration and nutritionists regard pulses as an essential means to correct malnutrition. Even in the developed countries, the trend has been in favour of substituting animal protein by vegetable protein in view of the indications about the positive correlation of arterio-sclerosis with diets rich in saturated fatty acids, on the one hand, and decrease in blood cholesterol level with the inclusion of pulses, on the other. Pulses not only have nutritional value for human beings, but also contribute to soil fertility, besides providing nutritious green fodder and feed for livestock .

Viewed in this context, the production and per capita availabiity of pulses in India cannot be regarded as satisfactory. The requirements cannot be met fully from indigenous production and recourse to imports has had to be made With the rising trend in population, the sitution is bound to worsen if steps are not taken to bring about a revolution in pulses as in the case of wheat. The breakthrough in 1988-89 provides a ray of hope.

The area under pulses has been around 20 to 24 million hectares, the production around 10 to 13 million tonnes and the productivity around 475 to 544 kg per hectare. Over a dozen pulses crops are gron and gram (chickpea) and arhar (pigeonpea) account for 45 per cent of the total pulses output. The other importnt pulses crops are : moong, urad, cowpea, mothbean, lentil, horsegram and lathyrus (kesari dal). The major pulses - growing States are Madhya Pradesh, Rajasthan, Uttar Pradesh, Maharashtra, Orissa, Bihar, Andhra Pradesh, Haryana, Tamil Nadu, West Bengal, Punjab and Gujarat. The other State have only a limited area under pulses.

Recent trends indicate that the area under gram progressively declined from 10.3 million hectares in 1959-60 to 6.6 milion hectares in 1980-81. This is attributed to the introduction of irrigation networks in some of the predominantly gram growing regions and the impact of the green revolution which has made wheat more attractive than gram to the farmer. After 1980-81 there has been amarginal increase in the area under gram possibly owing to its introduction in the command areas. Despitethe shrinkage in area, gram production has remained constant mainly owing to the increase in productivity contributed by improved varieties and production technology.

Percentage Yield of Daby by Dehullking /Splitting)

Practically dall milling results are :-

Dall = 89%
Churi = 1%
Husk = 10%

Since the project intends to simply dehusk and split the full pieces, we can take just 10+1 =11% extra weight of grains for dall milling.

For project calculation we will take the yield as an average for all pulses i.e.

1) Channa

2) Moong Wash

3) Urad Wash

4) Toor (Arhar) Dal

5) Yellow split pea

Details of Plant & Machinery (Suitable to Fabricate at site).

A. Dall Plant :

1. Elevators in steel construction @ appx. 8" x 8" x 30 Ft with bucket 6" size (10 Nos) complete with ball bearings, bushes, brackets and shafts.

2. Emery rolls with wooden body, steel shaft, bearing and other accessories (2 Nos.)

3. Vertical grinder of steel body with energy stone, shaft, bearing etc. (4 Nos.) size 18".

4.
(a) Single Chalana (sieve) of wooden construction with reel drum of perferoated sheets, shafts, bearing (2 sets).

(b) Double chalana ----do ----

5. Fans with impellers in steels (6Nos) each construction with rotor shaft and bearings (6 Nos).

6. Worm, wooden make with shaft, steel pipe, worm blades, pulleys etc (3 Nos.)

Bought out Items:-

a. Electric motor 30 Hp, 960 RPM, slipping, 3-phase.
b. Electric motor 20 HP, 960 RPM, slipping, 3 -phase.
c. Electric motor 5 HP, 1440 RPM, TEFC, Sq. cage, 3-phase.
d. Oil circuit breaker 600 amps, 3-phase, with ammeter, volt meter, selector, switches, indicating light, neon lamp, busher and other accessories.
e. Transformer 200 KVA, oil immersed, sel cooled, double wound core type 11,000/433 volts with accs.
f. Laboratory equipment.
g. Water pump & boring wells.

MANUFACTURING PROCESS

All the pulse grains have to be milled to remove the outer husk and then to break them into two pieces for edible purposes. For all the grain pulses the same pulse mill can be used with some adjustment. However, the pretreatment is to be done before milling varies form pulse to pulse.

PULSE DEHUSKER

The dehusking is done by a paddy and pulses shelling machine called paddy dehusker. In this machine the grinder comprises of two circular stones which are placed horizontally over one another and where the lower store rotates and the upper store is fixed. The distance between the two grinding surfaces can be adjusted. There are thrust and ball beadings fitted to keep the system very light.

The paddy or whole pulse(dal) is fed through the hopper and as the handle is rotated it is displaced down in the grinding space where it is lightlyabrased by the stones and is deshelled.

BENGAL GRAM (CHANA)

After usual cleaningof gram it is moistured at 2 per cent then dried for 4 hours thereafter 10% milling is done to break the outer shell. The broken gram is again moistured and conditioned for four hours and then the final millining is done. Thereafter it is passed through sieves of different sizes and dal, Churi, and chilka (husk) are collected from different outlets.

GREEN GRAM (MOONG DAL)

After usual cleaning of moong, it is milled 10% thereafter 0.3 per cent edible oil is sprinkled on the broken moong, then drie for 3 sunny days. After that broken moong is moistured at 5 per cent and then dried for one day. Finally it is moistured at 2 per cent and milling is done to separate from Churi and Husk .

ARHAR DAL

After usual cleaning, moisturing is done and it is dried for 3 sunny days, then 75% milling is done to break the outer shell oil mixed with water issprinkled over Srhr and then dried in the sunfor one day and milling is done to separate the dal, Chrui and husk.

RED GRAM/MASORE DAL

The pricess is the same as in Arhar Dal.

The main operations involved in dal milling are:

(1) Cleaning

(2) Removal of upper skin

(3) Breaking on two piece

Some equipment can be used for all the dals with minor adjustment. The various dals are pretreated following different procedures described below for a few varieties. The process of converting gram to began involves steaming washing and drying then finally ground or moiled in two stages.

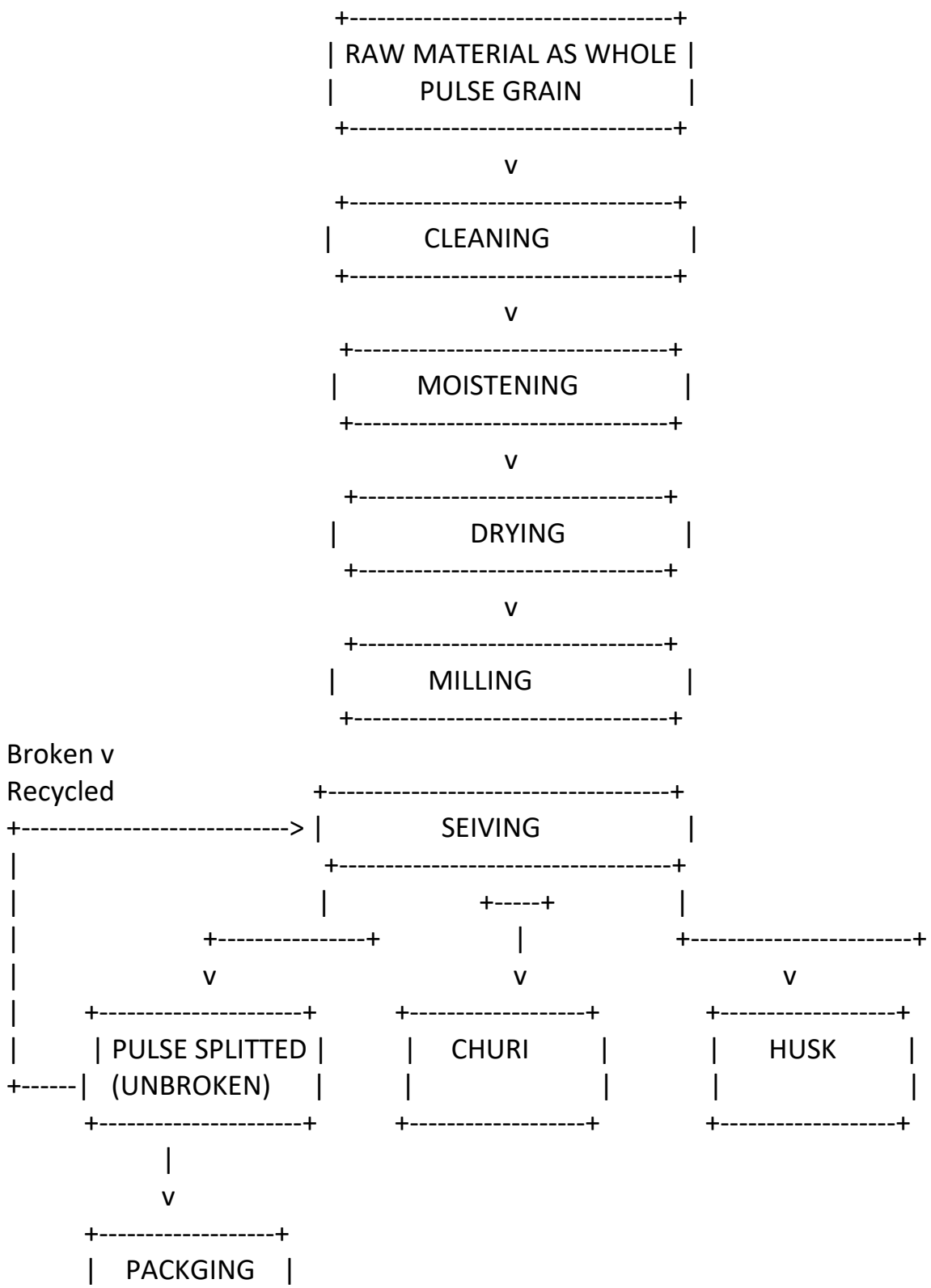
WASHING

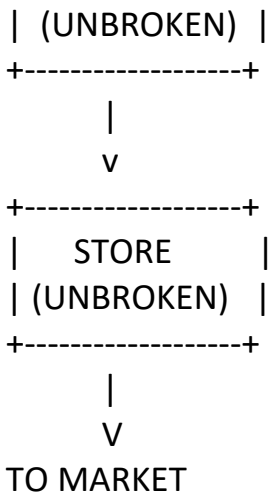
The grain is then washed in big tanks where the mechanical devices fitted into the tanks lift up the gram materials from the bottom and turn upside down to give it a through washing. It is then dried to two ways. It can be spread under the sun or can be dried mechanically.

MILLING

The powdered materials are prepared by reduction, in some form of the mill of grain size of material having an initial stage larger than that required in the final product. The process of reduction of the particles size of a granular material or sold circular materials etc is known as milling orgrinding. The two being interchangeable from the technical point of view. Generally for preparation of mills is frequently used. For grinding for the larger quantities of material however, since these the ball tube or rod mills are used exclusively since these are the only types of mills, which provide the capacity of required magnitude. The whole family carries a great importance in milling technology and is termed as tubeing mills famiily.

PROCESS FLOW DIAGRAM




| (UNBROKEN) |
STORE
| (UNBROKEN) |
TO MARKET

PLANT ECONOMICS

PROJECT NAME	=	DALL MILL
Basis		
No. of working days	=	25 days/month
	=	300 days/annum
No. of shifts	=	1 per day
One shift	=	8 hours

Currency - Rs.

LAND & BUILDING

1. Land 2000 sq.mt @ Rs. 600/-sq.mt	Rs. 12,00,000.00
2. Production shed 400 sq.mt @ Rs. 3000/-sq.mt	Rs. 12,00,000.00
3. Administrative Office Bldg. 100 Sq.mt @ Rs. 3500/-sq.mt	Rs. 3,50,000.00
4. Raw material storage godown 400 sq.mt @ Rs.3000/-sq.mt	Rs. 12,00,000.00
TOTAL	Rs. 39,50,000.00

PLANT & MACHINERY

1. Dall mill complete with automatic feed Hopper with accessories		Rs. 6,00,000.00
2. Belt conveyer system with drive		Rs. 2,20,000.00
3. Tray Driers, Handling Cap. 0.75 Mt/hr 2 Nos.		Rs. 1,80,000.00
4. Sheller with 10 HP motor 1 Nos.	1 No.	Rs. 40,000.00
5. Polisher, Husk seperator with sieve with two 5 HP motor		Rs. 50,000.00
6. Cleaning sieves (complete set of screens) with accessories		Rs. 20,000.00
7. Suction Fan with 5 HP motor		Rs. 20,000.00
8. Elavators with acceesories with 5 HP motor		Rs. 1,30,000.00
9. Self oil drum with piping & Instrumentation		Rs. 15,000.00
10. Maintenance Tools, Jigs, trolleys.		Rs. 45,000.00
11. Moistening Tanks 10 m3 Cap: 2 Nos.	2 No.	Rs. 46,000.00
12. Weighing machine upto 100 kg and up to 1000 kg 2 Nos. with pump & accessories		Rs. 20,000.00
13. 5 H.P. Motor with starter 2 Nos.	2 No.	Rs. 30,000.00
	TOTAL	Rs. 14,16,000.00

OTHER FIXED ASSETS

1.	Telephone, Water, power connections		Rs. 30,000.00
2.	Site fabrication work		Rs. 45,000.00
3.	Errection and Commissioning		Rs. 45,000.00
4.	Preliminary and preoperative expenses		Rs. 50,000.00

		TOTAL	Rs. 1,70,000.00

FIXED CAPITAL

1.	LAND & BUILDING		Rs. 39,50,000.00
2.	PLANT & MACHINERY		Rs. 14,16,000.00
3.	OTHER FIXED ASSETS		Rs. 1,70,000.00

		TOTAL	Rs. 55,36,000.00

WORKING CAPITAL REQUIREMENT/MONTH

RAW MATERIALS

1.	Channa 10 x 25 tons @ Rs. 18/- Kg.	Rs. 45,00,000.00
2.	Moong 10 x 25 tons @ Rs.32000/-tons	Rs. 80,00,000.00
3.	Urad 10x25 tons @ Rs.25000/-tons	Rs. 62,50,000.00
4.	Toor 10x25 tons @ Rs. 17000/tons	Rs. 42,50,000.00
5.	Yellow pea 10 x 25 tons @Rs.19000/ tons	Rs. 47,50,000.00
	TOTAL	Rs. 2,77,50,000.00

SALARY & WAGES / MONTH

1.	Works Manager	1 No.	Rs. 8,500.00
2.	Accountant	1 No.	Rs. 5,000.00
3.	Typist/Clerk	1 No.	Rs. 3,800.00
4.	Sales cum store keeper	1 No.	Rs. 4,000.00
5.	Production Engineer/Food technologi sts	2 No.	Rs. 10,400.00
6.	Foreman	4 No.	Rs. 18,000.00
7.	Skilled workers	6 No.	Rs. 22,800.00
8.	Semi-skilled workers	8 No.	Rs. 28,000.00
9.	Unskilled workers	10 No.	Rs. 32,000.00
10.	Peon/Chowkidars	4 No.	Rs. 12,800.00
	TOTAL		Rs. 1,45,300.00
	Plus perks @ 33% p.a.		Rs. 47,949.00
	TOTAL		Rs. 1,93,249.00

UTILITIES AND OVERHEADS

1.	Power Consumption of 10000 Kwatt hrs @ Rs. 4.50 per Kwatt hr.	Rs. 45,000.00
2.	Water Consumption of 100 KLs @ Rs. 3.00 per KL	Rs. 300.00
3.	Postage & Stationary	Rs. 10,000.00
4.	Telephone	Rs. 5,000.00
5.	Gunny bags 12,500 Nos @ Rs.10/-per bag	Rs. 1,25,000.00
6.	Conveyance & Transportation etc.	Rs. 25,000.00
7.	Publicity & Sales promotion	Rs. 25,000.00
8.	Repairs & maintenance	Rs. 20,000.00
	TOTAL	Rs. 2,55,300.00

Total load is 55 Kwatts

TOTAL WORKING CAPITAL/MONTH

1.	RAW MATERIAL		Rs. 2,77,50,000.00
2.	SALARY & WAGES		Rs. 1,93,249.00
3.	UTILITIES & OVERHEADS		Rs. 2,55,300.00
		TOTAL	Rs. 2,81,98,549.00

1.	WORKING CAPITAL FOR 1 MONTHS	Rs. 2,81,98,549.00
2.	MARGIN MONEY FOR W/C LOAN	Rs. 70,49,637.25

COST OF PROJECT

	TOTAL FIXED CAPITAL	Rs. 55,36,000.00
	MARGIN MONEY	Rs. 70,49,637.25
	TOTAL	Rs. 1,25,85,637.25

TOTAL CAPITAL INVESTMENT

TOTAL FIXED CAPITAL		Rs. 55,36,000.00
TOTAL WORKING CAPITAL FOR	1 MONTHS	Rs. 2,81,98,549.00

	TOTAL	Rs. 3,37,34,549.00

COST OF PRODUCTION/ANNUM

1.	Working Capital for 1 year		Rs.33,83,82,588.00
2.	Interest @ 13.50% on T.C.I		Rs. 45,54,164.12
3.	Depreciation @ 10.00% on buildings		Rs. 2,75,000.00
4.	Depreciation @ 20.00% on Plant and Machinery		Rs. 2,83,200.00

		TOTAL	Rs.34,34,94,952.12

TURN OVER/ANNUM

1.	By sale of Channa Dal 10x0.89x300 tons @ Rs.22000/-per ton	Rs. 5,87,40,000.00
2.	Moong wash 2670 tons @Rs.39000/- ton.	Rs.10,41,30,000.00
3.	Urad wash 2670 tons @ Rs.32000/-per ton.	Rs. 8,54,40,000.00
4.	Toor 2670 tons @ Rs.25500/- per to N	Rs. 6,80,85,000.00
5.	Yellow pea split 2670 tonnes @ Rs. 24000 per ton	Rs. 6,40,80,000.00
6.	Husk 1500 tons @ Rs. 2500/- per ton	Rs. 37,50,000.00
	TOTAL	Rs.38,42,25,000.00

PROFIT = RECEIPTS - COST OF PRODUCTION

= 38,42,25,000.00 - 34,34,94,952.12

= 4,07,30,047.88

PROFIT SALES RATIO = Profit / Sales x 100

$$= \frac{4,07,30,047.88}{38,42,25,000.00} \times 100$$

= 10.60 %

RATE OF RETURN = Operating profit / T.C.I x 100

4,07,30,047.88

$$= \frac{\text{---------- X 100}}{3,37,34,549.00}$$

= 120.74 %

BREAK EVEN POINT (B.E.P)

Fixed Costs of the plant are as under -

1.	Interests	Rs. 45,54,164.12
2.	Depreciation	Rs. 5,58,200.00
3.	40.00% of salaries	Rs. 9,27,595.20
4.	40.00% of overheads	Rs. 12,25,440.00
	TOTAL	Rs. 72,65,399.32

$$B.E.P. = \frac{\text{FIXED COSTS}}{\text{FIXED COSTS + PROFIT}} \text{ X 100}$$

$$= \frac{\text{` 72,65,399.32}}{72,65,399.32 + 4,07,30,047.88} \text{ X 100}$$

= 15.14 %

LAND MAN RATIO = Total land / Manpower

2000 : 38 :: 53 : 1

RESOURCES FOR FINANCE

1.	Term loans from Financial institutions (80.00 % of fixed capital) at @13.50% p.a rate of interest		Rs. 44,28,800.00
2.	Bank loans for 3 months (75.00 % of working capital) at @ 13.50% p.a rate of interest		Rs. 2,11,48,911.75
3.	Self raised capital from even funds & loans from close ones to meet the margin money needs at a @ 13.50% p.a rate of interest		Rs. 81,56,837.25
		TOTAL	Rs. 3,37,34,549.00

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