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RICE BIOPARK BUSINESS PLANS

FEASIBILITY STUDY



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Chennai**

RICE BIOPARK: BUSINESS PLANS

FEASIBILITY STUDY



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Preface

India is a land of paradox. There has been spectacular agricultural progress; yet, nearly 250 million children, women and men go to bed partially hungry every day. This is due to inadequate purchasing power and not due to physical shortage of food in the market. India's rich human resource will remain underutilized, unless every individual has economic access to balanced diet and clean drinking water.

Seventy percent of our population live in rural areas, where the principal sources of livelihoods are crops and animal husbandry, fisheries, agro-forestry and agro-processing. There is currently a mismatch between production and post-harvest technologies with the result that value-addition to primary products is poor. The United Nations designated 2004 as the *International Year of Rice* to focus attention on the intimate relationships between rice and life, particularly in Asia. There is a saying in several countries in Asia that "Paddy and Poverty go together." However, science has shown that paddy and prosperity can go together, if we convert every part of the rice biomass into value added products.

India produces over 250 million tones of rice biomass, in addition to over 125 million tonnes of paddy. In order to develop an institutional mechanism for adding value to every part of the rice plant-grain, straw, bran and husk – MSSRF developed the concept of *Rice Bio-Parks*, which can provide the necessary infrastructure for entrepreneurs to initiate rice biomass based enterprises. With the financial and technical supply of Technology Information Forecasting and Assessment (TIFAC) of the Government of India headed by Dr. R. Chidambaram, Principal Scientific Advisor to Govt. of India, a feasibility study was commissioned. Marg Associates under the leadership of Prof. Ramakrishnan was entrusted with the task of preparing the Business Plans for the wide range of rice human based enterprises-both micro and macro. We are indebted to Prof. Ramakrishnan and his associates for their dedicated and competent work. Our gratitude goes to Dr. V. Prakash, Director, CFTRI and to the many Scientific Institutions which provided the technical data. My special thanks go to Dr. Sudha Nair, who provided outstanding leadership to this exercise and ensured that the Rice Biopark is an idea whose time has come.


M S Swaminathan

Introduction

One of India's proud achievements is achieving self sufficiency in food production. Improvements in rice output - quality and quantity- is the major contributor in this regard. Yet, families dependant on rice farming are economically marginalized. Such a situation is a paradox. considering the phenomenal crop utilization potential of rice biomass...

Realising that value addition is the paramount need of the hour to save Indian agriculture in general, more so rice cultivation, a brain storming meeting on 'Possibilities Relating to Value Addition to Rice Biomass' was held at M S Swaminathan Research Foundation (MSSRF) on 20th March, 2004 under the auspices of TIFAL. As decided at the meeting, business plans forming the basis for setting up *Rice Bio Parks* in the states of Andhra Pradesh, Karnataka and Tamil Nadu was prepared by Marg Associates on behalf of MSSRF. The brochure presents 28 business plans for establishing economically viable business units in the proposed parks from which prospective entrepreneurs could make their choice.

The Parks are proposed to be developed and managed by autonomous bodies. Sheds/ land shall be made available on long lease basis. The Parks will have satellite Parks dedicated to husk based units. The Park infrastructure will include provision of utilities, effluent treatment and disposal, quality control laboratory, training support etc.

The summary gives the details of capacity and economics of each project. The 28 pages that follow depicts the business plans.

The contact addresses of the source of technical know-how is given at the end of the brochure. The know-how is available generally on the basis of one time payment. In exceptional cases royalty on turnover is charged. The Biotechnology Park for Women, Chennai, will also consider proposals from prospective entrepreneurs, provided they satisfy certain criteria notable being that the project should be based on value addition to rice biomass.

The units have been classified according to level of investment as Tiny upto Rs 5 lakhs, Small (Rs 5 lakhs to Rs 25 lakhs), Medium (Rs 25 lakhs to Rs 300 lakhs) and large (above Rs 300 lakhs).

BIOPARK BUSINESS PLANS

Summary

No	Business Plan	*Capacity MT		Investment (Rs. Lakhs)				PBP (yrs)
		Day	Year	Own	Subsidy	Loan	Total	
T1	Ready to Fry Snacks	0.06	18	0.30	0.40	1.34	2.04	3
T2	Ready to Eat Snacks	0.06	18	0.23	0.27	1.02	1.52	3
T3	Ready to Make Flour	0.20	60	0.21	0.25	0.94	1.40	2
T4	Papad Unit	0.06	18	0.19	0.31	0.75	1.25	2
T5	Stabilized Rice Bran HA	1.60	480	0.60	0.75	2.65	4.00	3
T6	Stabilized Rice Bran HCl	2	600	0.75	1.06	3.19	5.00	2
T7	Straw Hand Made Paper**	0.30	98	0.08	0.06	0.36	0.50	2
S1	Parboiled Rice DH	8	2400	2.19	2.94	9.47	14.60	2
S2	Parboiled Rice HS	4	1200	1.35	1.63	6.02	9.00	3
S3	Quick Cooking Rice	1	300	1.79	2.93	7.23	11.95	3
S4	Cereal Flakes	1.5	450	1.75	2.55	9.15	13.45	3
S5	Ready to Eat Low Fat Snacks	0.50	150	1.92	2.45	8.43	12.80	3
S6	Rice/Legume Snack	0.5	150	1.72	2.08	7.68	11.48	2
S7	Expanded Snacks	0.15	45	2.14	1.65	7.21	11.00	4
S8	Papad Plant	0.15	45	1.78	2.34	7.72	11.84	4
S9	Cattle and Poultry Feed	4	1200	3.75	2.50	8.25	14.50	2
M1	RTE Retort Rice	1	300	22.50	17.05	43.65	83.20	3
M2	Fabricated Chips	3.2	960	44.55	54.25	198.20	297.00	5
M3	Energy Foods	4	1200	16.00	30.00	60.00	106.00	2
M4	Modern Rice Mill	60	18000	11.25	11.25	52.50	75.00	2
M5	CHP Rice Mill	100	30000	31.80	40.62	139.58	212.00	3
M6	Vermicelli/Noodle	1	300	9.80	15.24	40.46	65.50	3
M7	Rice Bran Oil	0.60	180	6.00	8.00	24.00	38.00	3
Sp1	RHA Nodule	3	900	12.00	15.00	53.00	80.00	4
Sp2	RH Board	8	2400	27.00	37.50	114.50	179.00	4
Sp3	RH Power Plant	5MW		412.00	690.00	1648.00	2750.00	6
Sp4	RHA Cement Plant	200	60000	90.00	125.00	385.00	600.00	3
Sp5	Biofertilizer RHA Carrier	1.00	300	4.50	6.25	19.25	30.00	3

*Installed Capacity **Number of sheets

T1: READY TO FRY SNACKS 0.060 TPD

Know-how	KVIC
Products	Extruded products like karavadam of different shapes and sizes Flat products like vadam, appalam Fabricated flat products of different designs
Materials	Rice, bengal gram, black gram, green gram, chili, salt, condiments
Process Flow Chart	

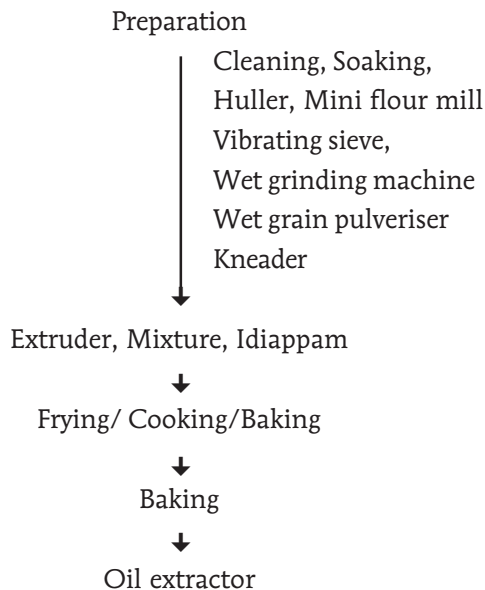


Annual Capacity	(MT) at 70% utilization, 1 shift - 12.6
Project Cost	(Rs) 2,04,410.00
Pay back period	3 years
Means of finance	(Rs) Own 30,660.00, Subsidy 39,850.00, Bank Finance 1,33,900.00

T2: READY TO EAT SNACKS 60 KPD

Know-how	KVIC
Products	Extruded snacks like Muruku, Ribbon Pakoda, Sev Some of these are offered as sweet products A wide range of dumplings, Pan cakes, Mixture and Idiappam
Materials	Rice, bengal gram, green gram, black gram, Chilli powder, salt, ajwan, asafetida, ajwan

Process Flow Chart



Annual Capacity	(MT) at 70% Utilization, 1 shift – 12.6
Project Cost	(Rs)1, 52,040
Pay back period	3 Years
Means of finance	(Rs) Own 22,810.00, Subsidy 26,765.00, Bank Finance 1,02,465.00



T3: READY TO MAKE (RTM) FLOUR MIXES 0.20 TPD

Know-how	KVIC
Product	Mixes for extruded products, convenience snacks, dumplings
Materials	Rice, cereals, legumes some of them fried, condiments, salt
Process Flow Chart	

Preparation

Cleaning
Drying
Frying where needed
Adding condiments

Flour milling



Weighing



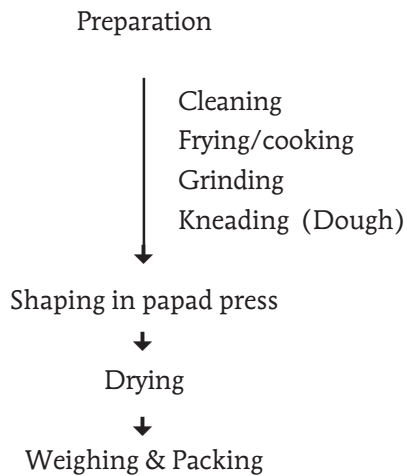
Packing

Annual Capacity	(MT) at 70% utilization, 1 shift - 42
Project Cost	(Rs) 1,40,000.00
Payback period	2 years
Means of finance	(Rs) Own 21,000.00, Subsidy 25,000.00, Bank Finance 94,000.00



T4 : PAPPAD UNIT 60 KPD

Know-how	KVIC
Product	Urad papad, Rice papad, Moong papad etc
Materials	Cereals, urad, moong, pepper, condiments etc
Process Flow Chart	



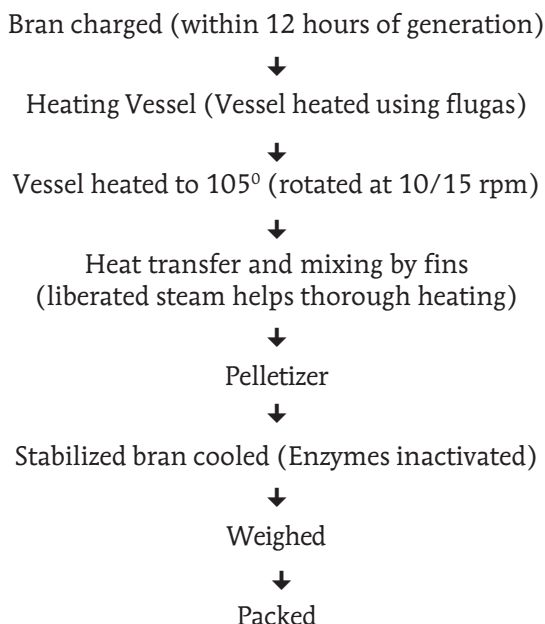
Annual Capacity	(MT) at 70% utilization, 1 shift – 12.6
Project Cost	(Rs) 1,25,306.00
Payback period	2 years
Means of Finance	(Rs) Own 18,790.00, Subsidy Rs 31,324, Bank Finance 75,192.00



T5: STABILIZED RICE BRAN (HOT AIR) 1.60 TPD

Know-how	PPRC
Product	Stablized rice bran as a health tonic-a nutrient supplement and antioxidant

Process Flow Chart



Plant and Machinery	Bran Stabilizer, Motor - Gear Box, Shaker with air blowing arrangement, Furnace (step grate) with blower and auto stop arrangement with reference to hot air temperature.
Annual Capacity	(MT) at 70% utilization, 1 shift – 336
Project Cost	(Rs) 4,00,000.00
Payback period	3 years
Means of Finance	(Rs) Own 60,000.00, Subsidy 75,000.00, Bank Finance 2,65,000.00

T6: STABILIZED RICE BRAN (HCl) 2 TPD

Know How	CFTRI
Product	Stabilized rice bran, a nutrient rich health product, input for extracting rice bran oil
Material	Freshly milled rice bran processed within 12 hours of milling

Process Flow Chart

Process involves adjusting the pH to 4 in Bran using HCl making the activity of enzyme in bran to near zero level



Spray hydrochloric acid on the bran in drum



Mix the lot for 4 minutes



Weighing



Packing

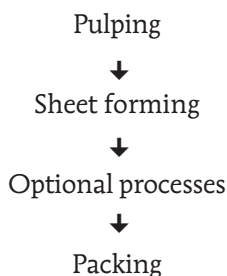
Plants and Machinery	Mixer with motor, Spraying device with compressor and Epoxy Coated tanks.
Annual Capacity	(MT) at 70% utilization, 1 shift - 420
Project Cost	(Rs) 5,00,000.00
Pay back period	2 years
Means of Finance	(Rs) Own 75,000.00, Subsidy 1,06,250.00, Bank Finance 3,18,750.00



T7 : HANDMADE RICE STRAW PAPER

Know-how	KVIC
Product	Handmade paper
Materials	Rice straw, Starch (gawgaw), rosin size (solid resin), alum (tawas), caustic soda, okra juice, water, sodium hypochlorite (bleach), dyes
Tools and Equipments	Sharp scissors or knife, Screen box, Stainless steel, cauldron, drum, measuring cups, weighing scale, Stove, wooden mortar and pestle, vat or basin, mold and deckle (a pair of movable rectangular wooden frames with detachable screen), cheesecloth, rolling pin, drying board (plain galvanized iron sheet).

Process Flow chart

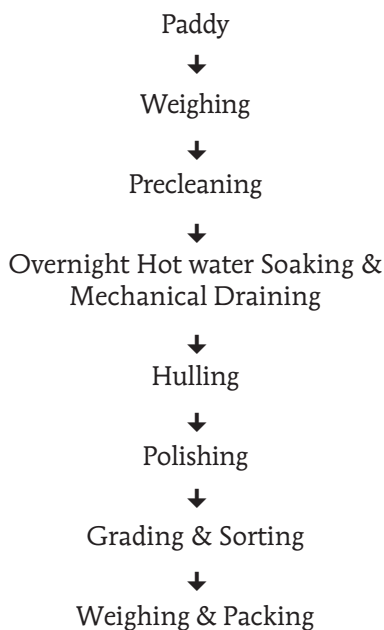


Annual Capacity	(Sheets) at 80% utilization, 1 shift – 72,000
Project Cost	(Rs) 50,000.00
Payback period	2 years
Means of Finance	(Rs) Own 7,500.00, Subsidy 6,250.00, Bank Finance 36,250.00

S1: PARBOILED RICE PLANT (HOT SOAK METHOD) 1 TPH

Know how	CFTRI
Products	Parboiled branded rice, Medicinal rice, Jeera rice
Parboiling of paddy	Increases head rice yield, enhances nutrients in rice and oil content in bran
Hot soak method	Helps elimination of unwanted odor and reduction of soaking period

Process Flow Chart

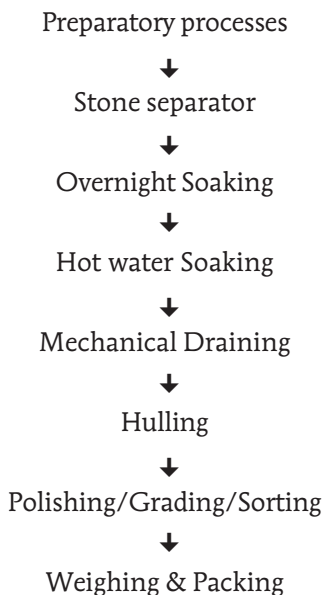


Plant and Machinery	Parboiling Plant TPH-Overhead paddy holding bin, parboiling tank, hot water tank, water pump, Steam Boiler KPH 200, Standard Rice Milling Plant TPH
Annual Capacity	(MT) at 70% utilization, 1 shift – 1880
Project Cost	(Rs Lakhs) 14.60
Payback period	2 years
Means of Finance	(Rs Lakhs) Own 2.19, Subsidy 2.94, Bank Finance 9.47

S2: PARBOILED RICE PLANT (DRY HEAT PROCESS) 0.50 TPH

Know how	PRDC, Tanjore
Products	Parboiled branded rice, medicinal rice, jeera rice
Parboiling of paddy	Increases head rice, enhanced nutrition in grain oil content in bran, improved cooking quality. Dry Heat Process of PPRC, Tanjore proposed in this project helps elimination of unwanted odour & reduction of soaking period

Process Flow Chart

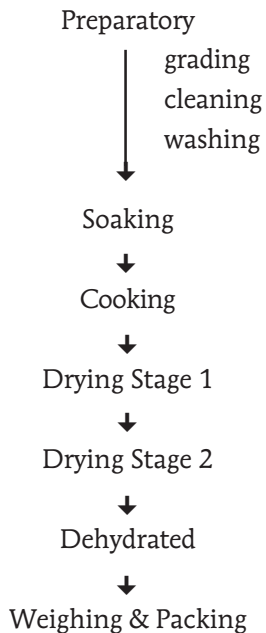


Plant and Machinery	Parboiling Plant-Roaster and soaking tank, Overhead paddy holding bin. Steam Boiler KPH 200, Standard Rice Milling Plant, Weighing scales, trolleys
Annual Capacity	(MT) at 70% utilization, 1 shift – 640
Project Cost	(Rs Lakhs) 9.00
Payback period	2 years
Means of Finance	(Rs Lakhs) Own 1.35, Subsidy 1.63, Bank Finance 6.02

S3: QUICK COOKING RICE 0.80 TPD

Know-how	DFRL/CFTRI
Products	Rice for ready to cook and ready to eat rice products

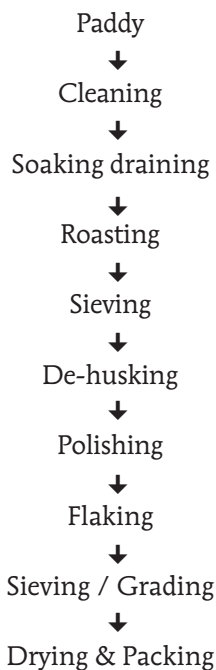
Process Flow Chart



Annual capacity	(MT) at 70% Utilization, 1 shift – 168
Project cost	(Rs Lakhs) 11.95
Payback period	2 years
Means of Finance	(Rs Lakhs) Own 1.79, Subsidy 2.93, Bank Finance 7.23

S4: CEREAL FLAKES 1.5 TPS

Know how	CFTRI
Raw material	Paddy
Products	Rice flakes plain and value added products.
By-products	Husk 22%, bran 5%, broken flakes 2%
Process flow chart	

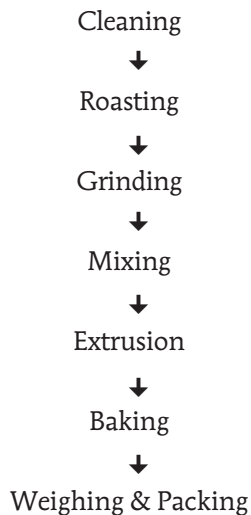


Plant and Machinery	<i>Principal equipments</i> :Hot Water Soaking Tanks (150 kg/hr-300 kg/hr), Edged Runner (60 kg/hr – 6 nos), Roster, Sheller and Polisher. <i>Auxiliary Equipments</i> : Weighing Scales, Trolleys, Fumigation Equipment.
Annual Capacity	(MT) at 70% utilization, 1 shift – 450
Project Cost	(Rs Lakhs)Rs 13.45
Payback period	3 years
Means of Finance	(Rs Lakhs) Own 1.75, Subsidy, 2.55, Bank Finance 9.15

S5: LOW FAT RTE SNACKS 0.50 TPD

Know how	CFTRI
Products	Low fat high fiber non fried crisp snacks 'Tengolal' and 'Chakli'
Raw materials	Rice and black gram

Process Flow Chart

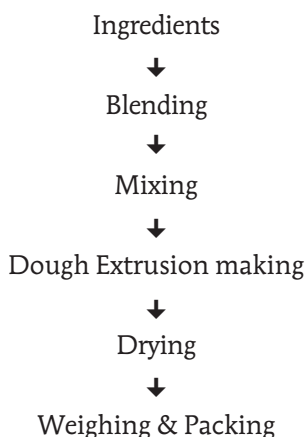


Plant and machinery	<i>Principal Equipments:</i> Plate Grinder, Sieve Shaker, Dryer, Roaster, Ribbon Blender, Sigma Mixer, Extruder/Bhujia Maker, Baking Oven, Sealing Equipment, Electric Stove, Electronic Balance <i>Auxiliary Equipment</i> Preparation Tables, Weighing Machine, Holding Vessels, Miscellaneous Items.
Annual Capacity	(MT) at 70% utilization, 1 shift – 150
Project Cost	(Rs lakhs) 12.80
Payback period	3 years
Means of Finance	(Rs lakhs) Own 1.92, Subsidy 2.45, Bank Finance 8.43

S6: RICE/LEGUME RTF SNACKS 0.50 TPD

Know-how	CFTRI
Products	Ready to fry low moisture snacks
Raw material	Rice/bengal gram , green gram, black gram flour, gelatinized starch, red chili, salt etc.

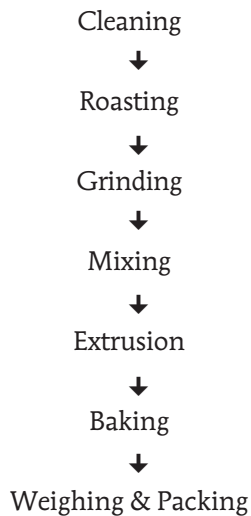
Process Flow Chart



Plant and machinery	<i>Principal Equipments</i> Ribbon-Blender, Planetary Mixer, extruder/ Bhujia maker, Tray Drier, Sealing machine, Electric Stove, Pan Balance etc. <i>Auxiliary Equipments</i> Preparation Tables, Trolleys, Weighing Machine, Holding vessels, Miscellaneous Items
Annual Capacity	(MT) at 70% Utilization, 1 shift – 105
Project Cost	(Rs Lakhs) 11.48
Pay back period	3 years
Means of Finance	(Rs Lakhs) Own 1.72, Subsidy 2.08, Bank Finance 7.68

S7: LOW-FAT EXPANDED SNACKS 0.15 TPD

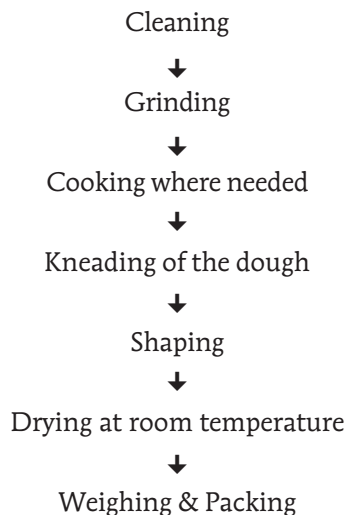
Know how	CFTRI
Product	Non fried snacks
Material	Cereals, green gram, condiments, Butter, seasoning
Process flow chart	



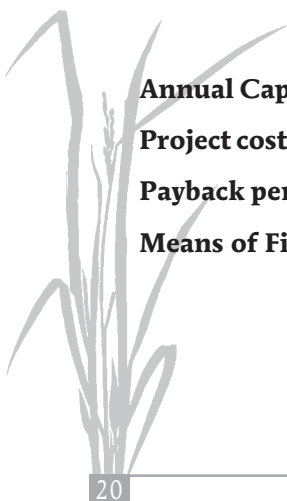
Annual Capacity	(MT) at 70% utilization, 1 shift – 31.5
Project Cost	(Rs Lakhs) 11.00
Payback period	4 years
Means of Finance	(Rs '000) Own 2.14, Subsidy 1.65, Bank Finance 7.20

S8: PAPAD PLANT 0.15 TPD

Know how	CFTRI
Product	Ready to bake or fry snack food adjunct
Material	Cereals, urad, moong, condiments, pepper, chilli, salt
Process Flow Chart	



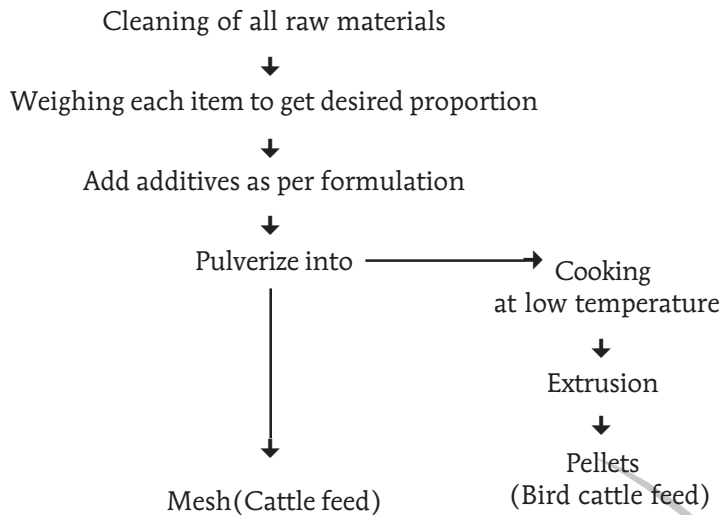
Plant and Machinery	<i>Principal equipments:</i> Plate Grinder, Sieve shaker, Low-pressure boiler, steam-jacketed kettle with stirrer, motorized mixing, forming and kneading machine, leg operated papad press and sealing equipment. <i>Auxiliary Equipments:</i> electric stove, general heating, and lighting, Electronic balance and working tables.
Annual Capacity	(MT) at 75% utilization, 1 shift – 33.75
Project cost	(Rs Lakhs) 11.84
Payback period	4 years
Means of Finance	(Rs Lakhs) Own 1.78, Subsidy 2.34, Bank Finance 7.72



S 9: CATTLE AND POULTRY FEED

Know how	CFTRI
Products	Poultry feed and Cattle feed
Raw materials	Formulations by CFTRI covers broken rice, rice germ; raw rice bran, oil extracted bran upto 30 to 35 % for cattle and upto 7 % for poultry; maize, jowar, ragi .broken wheat and soya meal, All edible oil cakes such as ground nut, sun flower, til etc Soya bean meal, fish meal, silk worm papae meal, cotton seed meal etc molasses, and rice straw for cattle feed, only; and nutrient, minerals, vitamin, binders, anti toxins etc.

Process

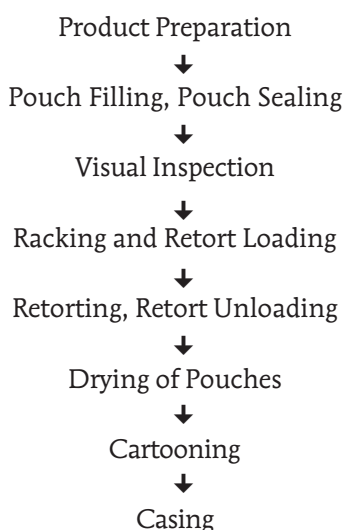


Annual capacity	(MT) at 70 % utilization, 1 shift – 840
Project cost	(Rs lakhs) 14.50
Pay back period	2 years
Means o f Finance	(Rs Lakhs) Own 3.75, Subsidy 2.50, Bank 8.25

M1: RTE RETORT RICE 1 TPD

Know how	CFTRI / DFRL
Products	Veg pulav, non veg pulav, bisibale bath, nembu rice, fried rice, tamarind Rice, tomato rice, ghee rice, veg biryani, non veg biryani
Materials	Rice, pulses, legumes, vegetables, meat, chicken, condiments and spices, cheese, fats/oils, saffron.

Process Flow Chart



Equipments	<i>Principal Equipment:</i> Heat sealer, Compressor for heat sealer, Retort, Compressor for retort operation. Boiler, Pulverize, Peeler, Slicer, Sterilizer, Grinder, Stem jacketed kettles, Racking system, Kettles with stirrer, Frying system, Centrifugal pump, LPG stove with gas connection, Pre-heater. Liquid filling machine etc. <i>Auxiliary Equipment:</i> Deep freezer, Walk in coolers, Balances (table top & digital), Hydraulic pallet truck, Generator, Material handling equipments, Working tables, Storage racks & Laboratory equipments etc.
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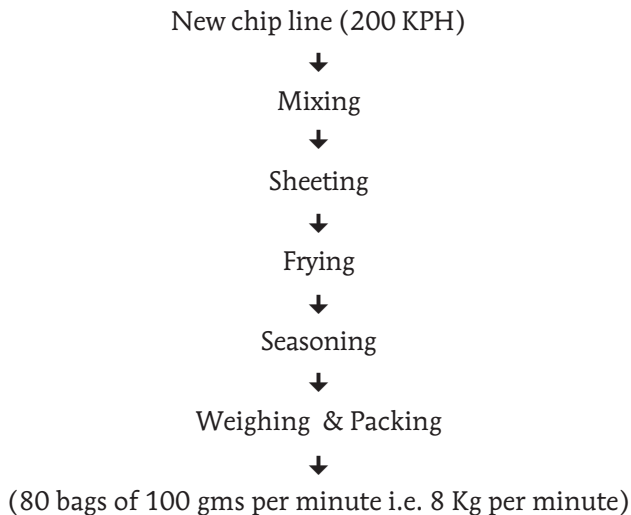
Annual Capacity	(MT) at 70% utilization, 1 shift – 210
Project Cost	(Rs Lakhs) 83.20
Pay back period	4 Years
Means of Finance	(Rs Lakhs) Own 22.50, Subsidy 17.05, Bank Finance 43.65

M2: FABRICATED RICE CHIPS 3.20 TPD

Product Totally export oriented cereal (rice and corn) based chip popular in Middle East, South American countries and the West having a preference over potato chips.

Materials Rice/corn, seasoning, salt etc

Process Flow Chart



Miscellaneous Equipments Storage bin, conveyors, cross conveyors, extractors etc., LPG Storage, Vegetable oil storage (stainless steel), Air Compressor, Nitrogen generators to do nitrogen packing, Electric fork lift, Pallet trucks and Workshop equipment/tools

Annual Capacity (MT) at 75% Utilization, 2 shifts – 720

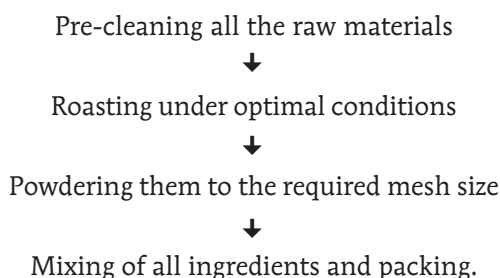
Project cost (Rs Lakhs) 297

Pay back period 5 years

Means of Finance (Rs Lakhs) Own 44.55, Subsidy 54.25, Bank Finance 198.20

M3: ENERGY FOOD ((NEW FORMULATION) 4 TPD

Know how	CFTRI
Product	Ready to eat Amylose rich energy food containing malted cereals providing 15 gm of protein and 360 kcal of energy per 200 gram per serving to be consumed in the form of gruel
Materials	Rice/wheat, Bengal gram dhal, defatted soya flour, sugar, vitamins, minerals and malted cereal.

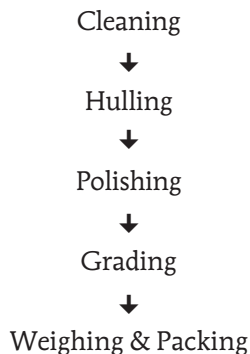
Process Flow Chart

Plant And Machinery	Single trunk elevator, grain grader cum seed cleaner, fluidized bed roaster, cooler, impact pulverizer, storage bins, gram toaster, ibbon mixture
Annual capacity	(MT) at 75% utilization, 1 shift – 900
Project Cost	(Rs Lakhs) 106
Pay back period	4 years
Means of Finance	(Rs Lakhs) Own 16, Subsidy 30, Bank Finance 60

M4: MODERN RICE MILL 2.5 TPH

Know how	Bhuler, Milltech, Millmore
Products	Quality of rice based value added products are as good as the quality of milling. branded rice, medicinal rice, brown rice, jeera rice.

Process Flow Chart



Plant and machinery	Cleaning, Hulling, Polishing and Grading
Rice recovery norms	69% Head Rice, Broken 6%, Tips 3%
Annual Capacity	(MT) at 80% Utilisation, 3 shifts – 14,400
Project Cost	(Rs Lakhs) 75
Pay back period	2 years
Means of Finance	(Rs Lakhs) Own 11.25, Subsidy 11.25, Bank Finance 52.50

M5: COMBINED HEAT & POWER (CHP) RICE MILL

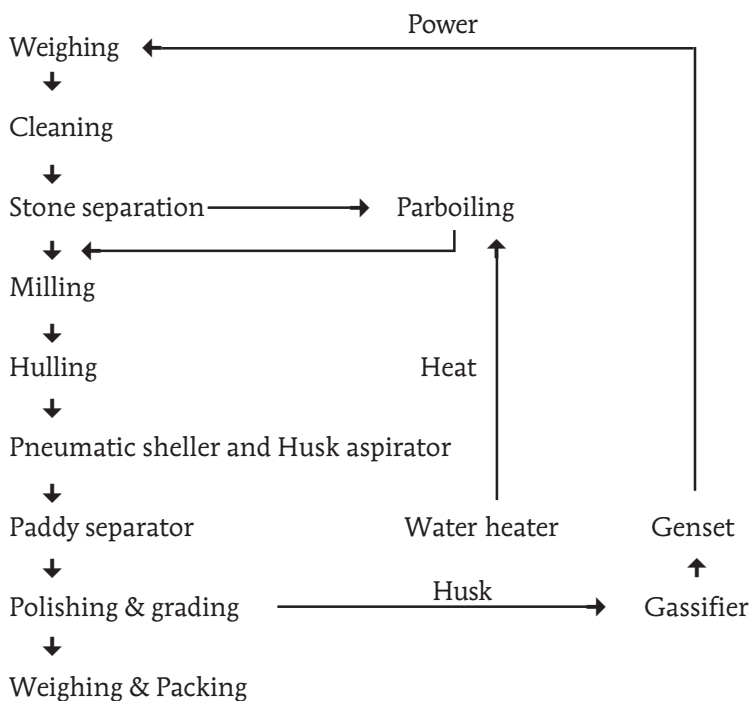
Know-how NIT Tiruchi

Products Rice, Bran, Husk, Rice broken and Utilities- steam and power

Process Flow Chart

CHP, combined heat and power is a cogeneration approach to meeting the total energy needs of a rice mill (Power + Heat) from primary fuel, husk a process waste.

PREPARATORY



Annual Capacity (MT) at 70% Utilisation, 3 shifts – 21,200

Project Cost (Rs Lakhs) 212.00

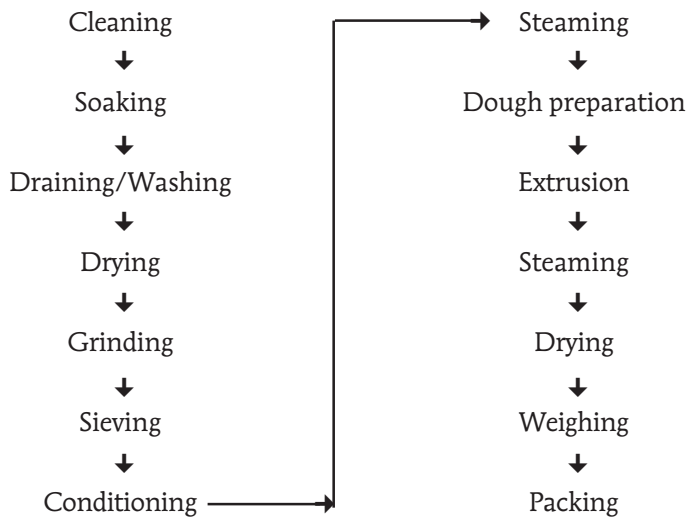
Payback Period 3 years

Means of Finance (Rs Lakhs) Own 31.80, Subsidy 40.62, Bank Finance 139.58

M6: RICE VERMICELLI / NOODLE 3 TPD

Know-how	CFTRI
Product	Vermicelli / Noodles
Materials	Whole milled rice or broken rice

Process Flow Chart



Plant and Machinery	Grader, grain conditioner, grain polisher, soaking tanks, drier, grinder, flour sifter, ribbon blender, dough maker, extruder, noodle cooker, noodle drier and packing unit.
Annual Capacity	(MT) at 75% - 1 shift, 300 days - 225
Project Cost	(Rs Lakhs) 65.50
Payback period	3 years
Means of Finance	(Rs 'Lakhs) Own 9.80, Subsidy 15.24, Bank Finance 40.46

M7: RICE BRAN OIL PLANT 5 TPD

Know-how	Malnad Industries, Shimoga
Products	Rice bran oil, de oiled rice bran, soap stock, gum, wax
Process Flow Chart	

Rice bran preparation



Solvent extraction



Refining



Degumming



Dewaxing



Deodourizing



Packing

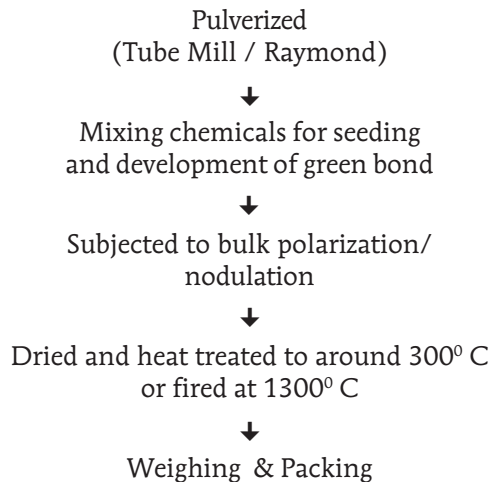
Plant and Machinery	Solvent Extraction Plant and Oil Refining Plant
Annual Capacity	(MT) at 70% Utilisation - 3 shifts Refined oil 126
Project Cost	(Rs Lakhs) 38
Pay back period	3 Years
Means of Finance	(Rs Lakhs) Own 6, Subsidy 8, Bank Finance 24



SP1: RICE HUSK ASH NODULE 1 TPD

Know-how	CGCRI
Product	Rice husk ash nodules as thermal insulator
Material	Rice husk

Process Flow Chart

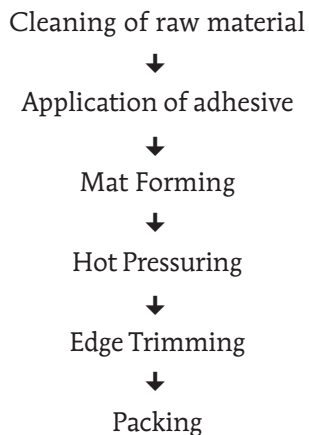


Plant and Machinery	Raymond or Tube Mill 2 Nos (Capacity 1.5 Ton/day), Pan Mixer (70 Kg. Capacity), Nodule maker 2 No. (capacity 220 kg/hr.), Channel Drier (350 D C) (Capacity 200 kg/hr), Miscellaneous equipment: Weighing Balance, Packing etc.
Annual Capacity	(MT) at 70% utilization, 1 shift – 630
Project Cost	(Rs Lakhs) 80.00
Payback period	4 years
Means of Finance	(Rs Lakhs) Own 12.00, Subsidy 15.00, Bank Finance 53.00

SP2: RICE HUSK PARTICLE BOARD 4 TPD

Know-how	NRDC
Product	RH Particle board (1 wood substitute)
Material	Rice husk, adhesives

Process Flow Chart



Plant and Machinery	Hydraulic hot press, Resin mfg, Kettle Resin blender, Dust Separator, Thermic fluid heating, Roller table, Caul sheets, Glue separator, Material Handling, Scissors, Lift, Silicos etc.
Material Usage	(Tonnes per Tonne of Board) 11 and Resin 0.11
Annual Capacity	(MT) at 75% utilization, 2 shifts – 1800
Project Cost	(Rs Lakhs) 179.00
Payback period	4 years
Means of Finance	(Rs Lakhs) Own 27.00, Subsidy 37.50, Bank Finance 114.50

SP3: 5 MW POWER PLANT RHA TECHNOLOGY

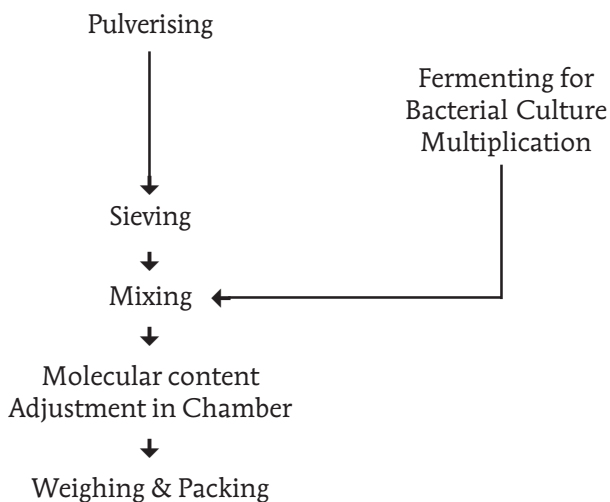
Know-how	INSWAB
Output	Electricity, Rice Husk Ash
Material	RHA technology will require about 50,000 Tonnes of Rice husk per annum. It is estimated that each one MW of power plant, based on husk would generate 10,415 tonnes of carbon dioxide credits annually, 6700 credit on account of using biomass, 1600 on account of avoiding open husk burning, 115 by abating nitrous oxide emission, and 2000 by substituting cement with RHA
Process	The process involves combusting the husk in controlled parameters resulting in an amorphous residue with super pozzolona (RHA). Targeting the amorphous state will facilitate a standard heat rate of 400 to 5000 K.Cal. In husk based generation, against 5000 to 6000 K.Cal.
Capacity	5 MW
Project Cost	(Rs Lakhs) 2750.00
Payback period	6 years
Means of Finance	(Rs Lakhs) Own 412.00, Subsidy 690.00, Bank Finance 1648.00

SP4: RHA CEMENT PLANT

Know-how	CBRI / INSWAB
Product	RHA Enriched Cement
Material	Clinker RHA, Gypsum
Process	The process involves pulverization of a mix of clinker from cement mills, gypsum and RHA in the right proportion to achieve the desirable particle size.
Annual Capacity	(MT) 60,000
Project Cost	(Rs. Lakhs) 600.00
Payback period	3 years
Means of Finance	(Rs Lakhs) Own 90.00, Subsidy 125.00, Bank Finance 385.00

SP5: BIOFERTILIZERS (BLACK ASH CARRIER) 1 TPD

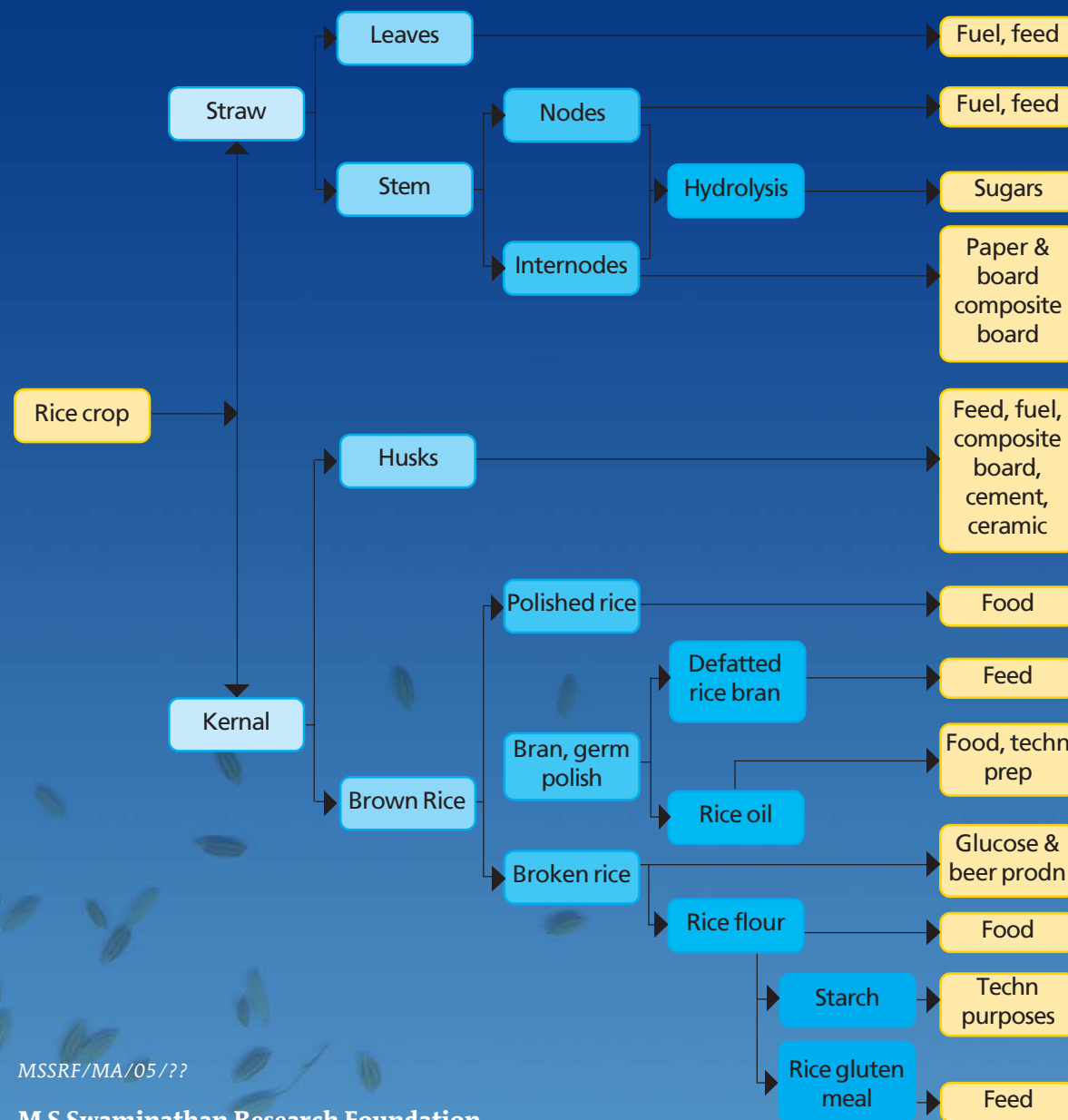
Know-how	PPRC
Product	Bio fertilizer Rice husk ash as a carrier
Materials	Rice Husk Ash (Black), Lignite/Charcoal, Bacterial culture
Process Flow Chart	



Annual Capacity	(MT) at 70 % utilization, – 1 shift – 210
Project Cost	(Rs Lakhs) 30.00
Pay back period	3 years
Means of funding	(Rs Lakhs) Own 4.50, Subsidy 6.25, Bank Finance 19.25



Rice - total crop utilization



MSSRF/MA/05/??

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