MINISTRY OF FOOD PROCESSING INDUSTRIES
GOVERNMENT OF INDIA

PMFME
सूक्ष्म उद्यमों का संबल

NIFTEM
THANJAVUR

PM Formalisation of
Micro Food Processing Enterprises Scheme

DETAILED PROJECT REPORT FOR PROCESSING OF GINGER POWDER

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CHAPTER 1: THE PROJECT AT A GLANCE

1.	Name of the proposed project	:	Ginger powder Processing Unit
2.	Name of the entrepreneur/ FPO/ SHG/ Cooperative	:	
3.	Nature of proposed project :	:	Proprietorship/Company/Partnership
4.	Registered office	:	
5.	Project site/location	:	
6.	Names of Partners (if partnership)	:	
7.	No. of share holders (if company/FPC)	:	
8.	Technical advisor	:	
9.	Marketing advisor/partners	:	
10.	Proposed project capacity	:	120 MT/ annum (60%, 70%, 80% & 90% capacity utilization in the 2nd, 3rd , 4th & 5th years respectively)
11.	Raw materials	:	Ginger
12.	Major product outputs	:	Ginger powder
13.	Total Project Cost	:	Rs. 36.10 Lakhs
	• Land development, building & civil construction(only for expansion of existing built-up area)	:	*Rs 2.00 Lakhs*
	• Machinery and equipments	:	*Rs 20.00 Lakhs*
	• Utilities (Power & water facilities)	:	*Rs 2.00 Lakhs*
	• Miscellaneous fixed assets	:	*Rs 2.00 Lakhs*
	• Pre-operative expenses	:	*Rs 0.25 Lakhs*
	• Contingencies	:	*Rs 2.00 Lakhs*
	• Working capital margin	:	*Rs 7.81 Lakhs*
14.	Working capital requirement		
	• 2 nd year	:	*Rs 31.22 Lakhs*
	• 3 rd year	:	*Rs 38.43 Lakhs*
	• 4 th year	:	*Rs 43.89 Lakhs*
15.	Means of Finance		
	• Subsidy grant by MoFPI (max 10 lakhs)	:	*Rs 10.00 Lakhs*
	• Promoter's contribution (min 20%)	:	*Rs 8.10 Lakhs*
	• Term loan (42%)	:	*Rs 18.00 Lakhs*
16.	Debt-equity ratio	:	2.22:1
17.	Profit after Depreciation, Interest & Tax		
	• 2 nd year	:	*Rs 3.42 Lakhs*
	• 3 rd year	:	*Rs 21.04 Lakhs*
	• 4 th year	:	*Rs 26.14 Lakhs*
18.	Average DSCR	:	8.89
19.	Benefit-Cost Ratio	:	1.16
20.	Term loan repayment	:	7 years with 1year grace period
21.	Payback period for investment	:	4 years

CHAPTER 2

General Overview of Production, Post Harvest Management and Value Addition of Ginger in India

2.1 Introduction

India is rightly called as “spice bowl of the world” for its production of variety and superior quality spices. Ginger (Zingiber officinale) is a member of the family of plants that includes cardamom and ginger. The ginger family is a tropical group, especially abundant in Indo-Malaysian region, consisting of more than 1200 plant species in 53 genera.

Today, ginger is used around the world as a dietary supplement and food ingredient. In addition to its culinary function, it has been used since ancient times for a variety of conditions, including colds, fevers, and digestive problems, and as an appetite stimulant. Ginger has been used for centuries to treat a variety of maladies, particularly in non-Western cultures. The strong aroma of ginger is the result of pungent ketones including gingerol, the extract that primarily has been used in research studies. The consumed portion of the ginger plant is the rhizome, often called “ginger root,” although it is not actually a root. The rhizome is the horizontal stem of the plant that sends out the roots.

Ginger is cultivated by all tropical and subtropical countries in the world; much of it is produced in India. India is the largest producer and consumer of ginger contributing about 31% of total global production followed by China, Nepal, Indonesia, Nigeria, and Thailand. The total production of ginger in the world is 1683.00 thousand tons with the total acreage of 310.43 thousand hectares. India and Indonesia have the largest area under cultivation.

In India, states like Kerala, Arunachal Pradesh, Orissa, Meghalaya, and West Bengal cultivate ginger widely and states of Tamil Nadu, Andhra Pradesh and Karnataka cultivate it in lesser area. In Tamil Nadu high rain fall districts like Kanyakumari and lower Palani hills are the ginger cultivation belts. The area under cultivation in India is 107.54 thousand ha and the total production of the country is 385.33 thousand tons.

The potential for value added products provides an extremely viable opportunity for sustainable promotion of rural as well as urban livelihoods. Processing of Ginger into value added products at small scale/ village level and selling to the markets directly/ tying up with big aggregators will help both the farmers and the consumers.

Therefore, processing of Ginger into value added products such as Ginger powder can ensure

nutritional and food security, improved profitability and also offers huge scope for entrepreneurship development at micro, small or medium scale levels using effective government schemes such as PM-Formalization of Micro Food Processing Enterprises Scheme of MoFPI, Government of India.

2.2 Origin and distribution of Ginger

Ginger is native to South-eastern Asia. It is mentioned in ancient Chinese, Indian, and Middle Eastern periodicals and has long been valued for its aromatic, culinary, and medicinal properties. The medicinal properties of ginger were known in ninth century in Germany and France and in tenth century in England. History shows that ancient Romans imported ginger from China almost two thousand years ago. By the middle Ages it was a very popular spice in the Mediterranean region and had spread throughout other countries. Medieval writing from many European countries indicates that ginger was a standard ingredient in recipes for the kitchen and the apothecary. In an attempt to make it more available, Spanish explorers introduced ginger to the West Indies, Mexico, and South America in the 16th century and these areas began exporting this precious herb back to Europe.

Ginger is an integral part of Ayurveda, the traditional medicine of India, and is known as sunthi in Ayurveda. It was used to block excessive clotting of blood in arteries and veins, to reduce cholesterol, and to fight against arthritis.

In Traditional Chinese Medicine ginger is considered a pungent, dry, warming herb to be used for ailments triggered by cold and damp weather. It was also used as a digestive aid and anti-nausea remedy and to treat bleeding disorders, rheumatism, baldness, toothache, snakebite, and respiratory conditions.

Ginger is consumed worldwide as spice, flavoring agent, garnish, medicine, and food preservative and is used either fresh, in a fresh paste, or dry, in a dry powder. Fresh ginger can be substituted for dried ground ginger, although the flavors of fresh and dried ginger are somewhat different. Powdered dry ginger is typically used as a flavoring for recipes such as gingerbread, cookies, crackers and cakes, ginger ale, and beer. In India and Pakistan, fresh as well as dried ginger is used to spice tea and coffee, especially in winter.

2.3 Production of Ginger in India

India is the largest producer and consumer of ginger contributing about more than 35% of total global production followed by China, Nepal, Indonesia, Nigeria, and Thailand. India produces

10,76,000 tons of ginger per annum that is almost 1/3rd of world's total production. 30 per cent of total production of ginger in India is transferred to dry ginger, 50 per cent is taken as fresh or green ginger and the rest part is used as seed materials.

Table 1: Area, production and productivity of Ginger in India

Years	Area (In ' 000 Hectare)	Production (In ' 000 MT)	Productivity (In MT/Hectare)
1997-98	75.60	252.10	3.3
1998-99	77.80	265.30	3.4
2006-07	106.10	393.40	3.7
2007-08	104.10	382.60	3.7
2008-09	143.90	610.40	4.2
2009-10	142.10	679.30	4.8
2010-11	167.40	702.00	4.2
2011-12	155.10	755.60	4.9
2012-13	136.30	682.60	5.0
2013-14	132.60	655.10	4.9
2014-15	141.70	760.30	5.4
2015-16	164.00	1109.00	6.8
2016-17	168.00	1076.00	6.4

Source: Spices Board, India & Ministry of Agriculture and Farmers Welfare, GoI

2.3.1 Production and yield of Ginger in major states in India

Assam, West Bengal, Karnataka, Gujarat and the North-eastern states are the major ginger producing states in India.

Table 2: State-wise share in area and production in 2017-18

State	Area	Percent share	Production	Percent share
Assam	18733	11.36	166536	15.40
Gujarat	6500	3.94	100500	9.29
Karnataka	29285	17.76	109340	10.11
Madhya Pradesh	7650	4.64	56575	5.23
Meghalaya	9936	6.03	66366	6.14

Sikkim	12300	7.46	55900	5.17
Orissa	14200	8.61	34230	3.17
Mizoram	8207	4.98	59994	5.55
West Bengal	13000	7.89	138000	12.76
Uttaranchal	2055	1.25	19599	1.81
Kerala	4500	2.73	20000	1.85
Andhra Pradesh	509	0.31	1770	0.16
Telangana	2500	1.52	12340	1.14
Others	35475	21.52	240280	22.22
Total	164850		1081430	

2.4 Composition and Nutritional value of Ginger

Table 3: Composition of Ginger (per 100 g edible portion), fresh weight basis

Nutrients	Quantity per 100g
Energy	**69(Kcal)**
Moisture	**80.9(g)**
Protein	**2.3 (g)**
Fat	**0.9 (g)**
Ash	**1.2(g)**
Crude fibre	**2.4(g)**
Carbohydrate	**12.3 (g)**
Calcium	**20 (mg)**
Phosporous	**60 (mg)**
Iron	**3.5(mg)**

Source: National Institute of Nutrition, 2019

Table 4: Nutritive value of Ginger (per 100 gm)

Nutrient	Amount	DV
Choline	28.8 mg	
Folate	11.00 mcg	
Niacin	0.750 mg	5 %
Pantothenic acid	0.203 mg	4 %
Riboflavin	0.034 mg	3 %
Thiamin	0.025 mg	2 %

Vitamin B6	0.160 mg	12 %
Vitamin C	5.0 mg	6 %
Vitamin E (alpha-tocopherol)	0.26 mg	1 %
Vitamin K	0.1 mcg	0 %
Minerals		
Calcium, Ca	16.00 mg	1 %
Copper, Cu	0.226 mg	25 %
Iron, Fe	0.60 mg	3 %
Magnesium, Mg	43.00 mg	11 %
Manganese, Mn	0.229 mg	10 %
Phosphorus, P	34.00 mg	5 %
Potassium, K	415.00 mg	9 %
Selenium, Se	0.7 mcg	1 %
Sodium, Na	13.00 mg	1 %
Zinc, Zn	0.34 mg	3 %
Protein	**1.82 g**	**4 %**

Source: USDA National Nutrient Database

2.5 Health benefits of Ginger

Ginger reduces cold and flu. It is good for heart as it reduces cholesterol and lowers risk of having heart diseases and blood clots. Most importantly, it regulates blood sugar levels. Ginger consists of anti-inflammatory components and antioxidants that can cure inflammation. Ginger was very effective in blocking prostate cancer cells and their growth. The anti-inflammatory properties available in ginger helps in good brain functionality. Ginger root can improve cognitive function. Ginger helps in preventing indigestion. It protects the liver from harmful chemicals and also reduces the risks of liver from ageing, damaging and scarring. Ginger prevents the bone damage, severe joint pain and stiffness in the joints associated with osteoarthritis.

2.6 Ginger Varieties in India

Several cultivars of ginger are grown in different ginger growing areas in India and they are generally named after the localities where they are grown. Some of the prominent indigenous cultivars are Maran, Kuruppampadi, Ernad, Wayanad, Himachal and Nadia. The exotic cultivar 'Rio - de - Janeiro' has also become very popular among cultivators. The improved varieties of ginger and their salient features are given below. The variety IISR Varada is suited for fresh

ginger, dry ginger and making candy while, IISR Rejatha is rich in essential oil.

Table 5: Important varieties cultivated in India

Variety	Fresh mean yield (t/ha)	Maturity (days)	Dry recovery (%)	Crude fibre (%)	Oleoresin (%)	Essential oil (%)
Indian Institute of Spices Research, Kozhikode – 673 012, Kerala						
IISR Varada	22.6	200	20.7	4.5	6.7	1.8
IISR Mahima	23.2	200	23.0	3.3	4.5	1.7
IISR Rejatha	22.4	200	19.0	4.0	6.3	2.4
High Altitude Research Station, Orissa University of Agriculture and Technology, Pottangi – 764 039, Orissa						
Suprabha	16.6	229	20.5	4.4	8.9	1.9
Suruchi	11.6	218	23.5	3.8	10.0	2.0
Suravi	17.5	23.5	23.5	4.0	10.2	2.1
Subhada	18.0	210	22.4	3.4	10.4	2.0
Y.S. Parmar University of Horticulture and Forestry, Nauni, Solan, Himachal Pradesh – 173 230						
Himagiri	13.5	230	20.6	6.4	4.3	1.6
Kerala Agricultural University, Thrissur – 680 656, Kerala						
Athira	21.0	220 - 240	22.6	3.4	6.8	3.1
Karthika	19.0	220 - 240	21.6	3.7	7.2	3.2
Aswathy	23.0	220 - 240	19.7	3.5	7.5	3.3

2.7 Cultivation and Harvesting of Ginger

2.7.1 Climatic and soil requirements

Ginger grows well in medium temperature regions and moisture in the air. Ginger cultivated 1500 meters above sea level. But it grows well in 300 meters to 900 meters above the sea level. At regular intervals throughout the year from 1500 to 3000 mm of rain per year available rainfall areas should be chosen. Land preparation and harvesting periods of dry weather are needed. If cultivated in areas where rainfall is less, watering should be done at regular intervals. Ginger grows well in drained soils like sandy loams, clay loams, and red loams. It grows best in soil rich in humus. Soil pH should be 6 to 6.5. Drained lands should be avoided.

2.7.2. Land preparation

Ginger can be planted under well irrigated conditions; hence it can be planted during the months of February or early March. This planting gives more yield and also showed resistance towards diseases. The other type of planting used in West coast India is during the first fortnight of May with the receipt of pre-monsoon showers.

The land has to be ploughed thoroughly and deeply nearly 4 to 5 times with receipt of showers to bring the fine tilth to soil. Beds of 1 m width, 30 cm height with minimum length are prepared and an interspacing of 60 cm in between the beds; this has to be maintained for plantation during May, whereas for the irrigated land 50cm ridges are formed.

2.7.3. Propagation and planting

Ginger is propagated by seed tubers that are 2.5 to 5.0 cm in length and weigh between 20 to 25 grams with one or two viable nodes. 1500 to 1800 kg/ha seed tubers need for plains and hilly areas 2000 to 2500 kg/ha are recommended.

After harvest, the prospective seed tubers should be separated according to the quality. Ginger yields better if the seed rhizomes are treated with 0.3% mancozeb for 30 min and dried in shade for 4hrs. Then seed can be sown at a spacing of 20-25 cm.

2.7.4. Manuring & mulching

Before sowing the seeds, 25 -30/ha FYM and 4 kg/ha Pseudomonas mixture is spread on top of the beds. Neem cake powder (2 tonnes/ ha) protects from root rot disease or nematode and also increases the yield.

When planting to harvest good yields by the above basal levels of manure and neem cake powder to be applied. Recommended dose of NPK is 75:50:50 kg/ha. On this 50% of the phosphorous should be applied as basal. Nitrogen and potassium should be applied 50% (37.5 and 25kg) after 40 days of planting and remaining dose should be applied after 90 days of planting. Boron (3 kg / ha) and zinc (5 kg / ha) provide better results in crop yield.

Laying mulch increases seed germination. Mulching will be set during the first planting. 10-12 tons/ha green leaf or 5-6 ton/ha dried leafs are used for mulching. Similarly, 45 and 90 days after planting, mulching is to be set.

2.7.5. Weeding & irrigation

Weed management is carried out twice during the cultivation of ginger. First weeding during set up of mulching and the second weeding at intervals of 45-60 days, depending on the amount

of weed. While weeding, the plant needs to be taken care of without affecting stem and root. After completing the weeding, the earthing up should be done.

To obtain good yields in ginger 1320 to 1520 mm rainfall is required. If planted in April-May, depending on the moisture of the soil, watering 2-4 times a week is required. In the absence of rain, watering should be done at intervals of 15 days. Seed tuber germination time and tubers forming time essentially require proper watering.

2.7.6. Crop Rotation

Ginger absorbs the large amount of nutrients in the soil. So it should not be cultivated in the same land continuously. So it should be cultivated with rotation of tapioca, beans, chow-chow and other vegetables. Ginger can be cultivated as a single crop or intercrop with coffee, orange, banana etc.

2.7.7. Harvesting

Ginger takes 210-240 days to mature completely (dry ginger) after planting. For making dry ginger, the rhizomes are harvested after full maturity that is when the leaves turn yellow and start drying. Irrigation has to be stopped before 1 month of harvesting. In wide space cultivation, tractor or power tiller harvesters are used.

A well maintained crop has an average yield ranging between 15 to 20 tons/ha of ginger rhizomes.

2.8 Post Harvest Operations, Processing and Storage of Ginger

2.8.1 Post harvest operations for Ginger

a. Washing & drying

Freshly harvested ginger rhizomes are thoroughly washed in water twice or thrice and shade dried for a day. Ginger should be scrubbed by hand or with a soft-bristled brush in clean water sanitized with 150 ppm hypochlorous acid. Care is required during cleaning to prevent bulb breakage, which increases decay and shrinkage.

The ginger intended for long term storage should be washed immediately after harvest and then cured. Curing is done by drying the rhizomes in air at ambient temperature (22°C to 26°C or 71°F to 79°F) and 70% to 75% RH for several days to allow the skin to thicken and the cut

surfaces to suberize.

b. Sorting and Grading

Ginger is then pre-graded in the field for any unmarketable, damaged or diseased rhizome. Damaged and injured bulbs should be removed. The remaining marketable bulbs should be sorted according to size and overall appearance. The ginger surface should be clean, bright yellow-brown and appear fresh. It should not be wilted or have any evidence of sprouting. Export quality ginger should be smooth and firm, with uniform shape and size, be free from insect damage and decay, and have a uniform peel colour typical of the variety. The internal flesh should be firm and uniformly cream or pale-yellow coloured, without any indication of darkening.

c. Pre-cooling & Storage

Forced-air or room cooling to 12 to 14 °C (54 to 57 °F) should be used for pre-cooling. Mature ginger rhizomes can be stored at 12 to 14 °C (54 to 57 °F) with 85 to 90% RH for 60 to 90 days.

2.8.2 Processing of Ginger Powder

The cleaned and sorted ginger must be cured and dried for storing for a long period, about 6 months. This dried ginger can be powdered, sieved and packed for marketing as Ginger powder. The following steps are the unit operations involved in the production of ginger powder.

a. Cleaning and Washing

The fingers and mothers are separated and ginger washers are used to clean the ginger. Cleaning of harvested rhizomes should be necessary to remove debris, shoots and roots. Thorough cleaning of rhizome required immediately after harvest if ginger intended for export or for long-term storage. Killing of rhizome was being followed in traditional method, in which rhizomes were dipped in boiling water for 10 min. This method is useful in inactivation of enzymatic processes. In ginger washer water is sprayed from the top of the washer to remove the impurities.

b. Sorting

In this process all the damaged and injured rhizomes are separated and the rhizomes are separated based on size and shape. Clean, brown-yellow and bright colored ginger should be

preferred. Ruptured or blot skin with bacterial or fungal infected rhizome are not recommended

c. Peeling

Peeling serves to remove the scaly epidermis and facilitate drying. Peeling of fully matured rhizomes is done by scrapping the outer skin with bamboo splits having pointed ends and this accelerates the drying process.

Deep scraping with knifes should be avoided to prevent the damage of oil bearing cells which are present just below the outer skin. Excessive peeling will result in the reduction of essential oil content of the dried produce.

The peeled rhizomes are washed before drying. Indian dried gingers are usually rough peeled. The rhizomes are peeled only on the flat sides and much of the skin in between the fingers remains intact. The dry ginger so produced is known as the rough peeled or unbleached ginger.

d. Slicing

The rhizomes may be sliced before drying to reduce the drying time and improve the quality of the final product (it is easier to achieve a lower final moisture content in small pieces of rhizome without spoiling the appearance of the product). The rhizomes are traditionally sliced by hand, but there are small machines available to carry out this process.

e. Bleaching

The scrapped fresh ginger is dipped in a slurry of slaked lime (1 kg of slaked lime/120 kg of water) followed by sun drying. As the water adhering to the rhizomes dry, the ginger is again dipped in the slurry. This process is repeated until the rhizomes become uniformly white in colour. Dry ginger can also be bleached by the similar process. Liming gives ginger a better appearance and less susceptibility to the attack of insect pests during storage and shipping.

f. Drying

The moisture content of fresh ginger at harvest is about 80-82 per cent which is brought down up to 10 per cent for its safe storage. The yield of dry ginger is about 19-25 per cent of fresh ginger depending on the variety and climatic zone.

Generally ginger is sun dried in a single layer in open yard or clean bamboo mats or on a

concrete floor which takes about 8 to 10 days for complete drying (final moisture content of 10 %). The sun dried ginger is brown in colour with irregular wrinkled surface.

Using a mechanical drier will result in a better colour and a higher quality product. Tray drier, cross flow air tunnels, solar driers and cabinet driers can be used.

The optimum drying temperature is 60°C temperature higher than this result in a darker coloured product. Sliced ginger pieces take only 5-6 hours to dry when a hot air drier is used. Whole peeled ginger rhizomes take about 16-18 hours to dry in a mechanical drier. It is important to monitor the air flow and temperature during drying.

g. Milling/ grinding

Grinding is one of the most common operations used to prepare Ginger powder for consumption and resale. The main aim of particular spice grinding is to obtain smaller particle sizes, with good product quality in terms of flavour and color. There are different ambient grinding mills and methods available for this process; such as hammer mill, attrition mill and pin mill. In India, traditionally, plate mills and hammer mills are used for Ginger grinding.

h. Sieving & Packing

The powdered dry ginger should be sieved through a mesh size of 50 to 60.

The ginger powder is packed in packaging materials that deal with the common deteriorating factors of Ginger powder such as hygroscopicity, loss of aroma/ flavour, discoloration, insect infestation and microbial contamination.

For bulk packaging, Flexible Intermediate Bulk Containers (FIBCs) commonly known as Jumbo bags with capacity up to 1 Tonne are prevalent. For institutional packages, materials such as Laminated flexible pouches and plastic woven sacks are used. In case of retail packs, Printed flexible pouches (pillow type, gusseted type, and stand-up pouches) and lined cartons are the most common forms, with materials such as Polyester/ metalized polyester/ LDPE, BOPP/ LDPE, BOPP/ metalized polyester/ LDPE, Polyester/ Al foil/ LDPE.

CHAPTER 3

MODEL GINGER POWDER PROCESSING UNIT UNDER PM-FME SCHEME

3.1 Introduction

The Central Sector scheme for Formalization of Micro Enterprises in Food Processing sector under Ministry of Food Processing Industries, Government of India is an important scheme that offers for formalization and mainstreaming the unorganized home based or micro food processing units. The scheme is useful for expansion of the existing units in terms of capacity and technology through installation of new machineries and additional civil infrastructures. Further, the scheme promotes establishment of new micro units on the principle of ODOP (One District One Product).

Establishment or expansion of Ginger powder Processing Unit is an attractive option in potential ginger growing states in India as ginger is a major cash crop cultivated across India. A model generalized DPR is therefore, prepared for expansion of existing unformalized Ginger powder Processing Unit. A detailed account of the model DPR prepared on the basis of certain generalized assumptions is discussed in the sequent sections. An entrepreneur can use this model DPR template and modify according to his/her need in terms of capacity, location, raw materials availability etc.

3.2 Form of the Business Enterprise

The entrepreneur concerned must specify about the form of his/her business organization i.e. whether Sole Proprietorship, Cooperative, FPO/FPC, SHG Federation, Partnership Firm or Company and accordingly attach all the required documents. The documents may be registration certificate, share holding pattern, loan approval certificate etc as specified in the FME scheme guidelines.

3.3 Background of the Promoters/ Owners and Required Documents

The detailed bio-data of promoter/promoters inter-alia name, fathers name, age, qualification, business experience, training obtained, contact number, email, office address, permanent address, share holding pattern, definite sources of meeting the commitment of promoters contribution, details of others business along with certified balance sheet and profit loss account for the last 3- 4 years, tax registration, PAN Number, income tax return etc for 3-4 years and other requirements as specified in the FME guidelines must be provided with the DPR.

3.4 Background of the Proposed Project

The entrepreneur must specify whether it is a new project or expansion of the existing project. If new project is proposed then the reason to go in to the project and if expansion of the existing project, the must specify what kind of expansion is proposed in terms of capacity, product, machines, civil infrastructure etc.

3.5 Location of the Proposed Project and Land

The entrepreneur must provide description of the proposed location, site of the project, distance from the targeted local and distant markets; and the reasons/advantages thereof i.e. in terms of raw materials availability, market accessibility, logistics support, basic infrastructure availability etc. The entrepreneur must mention whether project is proposed in self owned land or rented/allotted land in any industrial park or private location. Accordingly, he/she must provide ownership document, allotment letter/ lease deed.

Land clearance certificate must be from village authority/ municipality or any other concerned authority. The ideal locations for establishment of exclusive Ginger powder Processing Units are in the production clusters of the major Ginger growing states such as Orissa, Kerala, Karnataka, Arunachal Pradesh, West Bengal, Sikkim and Madhya Pradesh where adequate quantities of surplus Ginger will be available for processing.

3.6 Installed Capacity

The maximum installed capacity of the Ginger powder Processing Unit in the present model project is proposed as 120 tonnes/ annum. The unit is assumed to operate 300 days/annum @ 8-10 hrs/day. The 1st year is assumed to be construction/expansion period of the project; and in the 2nd year 60 percent capacity, 3rd year 70 percent capacity and 4th year 80 percent capacity and 5th year onwards 90 percent capacity utilization is assumed in this model project.

3.7 Raw Material Requirements for the Unit

A sustainable food processing unit must ensure maximum capacity utilization and thus requires an operation of minimum 280-300 days per year to get reasonable profit. Therefore, ensuring uninterrupted raw materials supply requires maintenance of adequate raw material inventory. The processor must have linkage with producer organizations preferably FPCs through legal contract to get adequate quantity and quality of raw materials which otherwise get deteriorated. In the current model Ginger powder processing project, the unit requires 1.2 Tonnes/ day, 1.4

Tonnes/ day, 1.6 Tonnes/ day and 1.8 Tonnes/ day of Ginger at 60, 70, 80 and 90 percent capacity utilization, respectively.

3.8 Product Profile of the Unit

In the present model Ginger powder processing unit, the targeted product output is taken as Ginger powder. Ginger powder forms an important component in curry powder. It also finds direct application in a variety of food products.

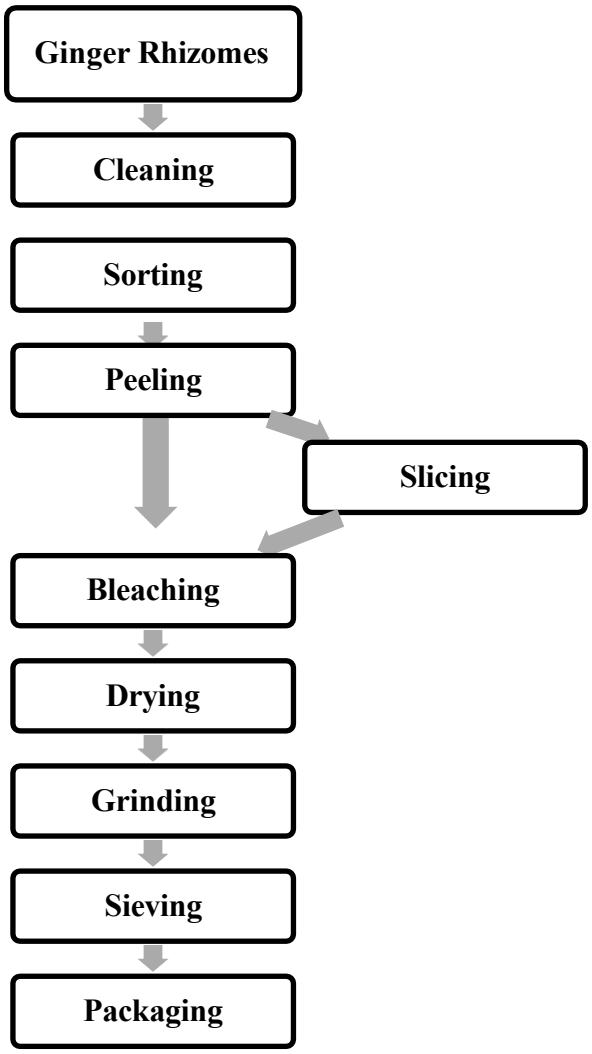
Ginger is valued because of its aroma and pungency and has been used through ages in almost all systems of medicine against many maladies due to its medicinal properties. Despite of its use as flavoring agent, ginger is also appreciated in ayurvedic, allopathic aromapethy and household medicines. Using it in the form of dried powder provide all the health benefits along with enhanced shelf life. The preference of traditional Indian cuisine across the country as well as around the globe drives the demand for this spice powder, which is a component of several important spice mixes of the cuisine.

Availability of a huge 70- 80 per cent of the total production as marketable surplus from the producing regions and the perishable nature of the commodity emphasize the importance of value adding ginger into such a long shelf life product, that can be alternatively used.

More recently, organic products are gaining prominence because of their harmful chemical-free nature. When ginger powder can be made organic, it will attract huge demand. This implies that not only cultivation, but also the processing methods should also be based on mechanized, physical and biological processes to maintain the vital quality of organic ingredient throughout each step of its processing.

Therefore, value addition of ginger has great potential in terms of maintaining the nutritive quality of the product, ginger powder, and minimizing post-harvest loses and enhancing the non seasonal availability.

3.9 Manufacturing Process of Ginger powder



3.10 Technology Accessibility

IIFPT and its liaison offices at Guwahati and Bhatinda have all the technical knowhow on Ginger powder processing. These technologies are available through training, incubation and consultancy. The entrepreneur can first avail training or consultancy and then undergo business incubation before venturing into the business. Other than IIFPT, NIFTEM, CFTRI and other institutes also have the technical knowledge and training facilities.

3.11 Market Demand and Supply

Owing to the distinct taste and health benefits of ginger powder, it is extensively used in the food & beverage industry to manufacture products such as tomato ketchup, pickles, meat

sausages, and salad dressings. Furthermore, it offers antioxidant properties, and is thus used in several digestive drinks, such as ginger tea. These health benefits offered by ginger powder fuel its demand among health-consciousness consumers, which acts as a key driver of the ginger powder market. Furthermore, there is increased consumer preference for natural flavoring and additives in processed foods and bakery products. This has boosted the need for natural flavorings such as ginger powder, thereby positively impacting the market growth. However, availability of low-quality raw materials and counterfeit products could cause health issues, which hamper the growth of the market.

With its significant applications, the demand for good quality and hygienically processed ginger powder is very huge and vast. Thus, the demand for ginger powder in this region is on a rise, and is opportunistic for the manufacturers to expand their consumer base. Given this trend and the current inclination of people for traditional spice products, Ginger powder processing has immense growth potential market both in national & international market.

3.12 Marketing Strategy

The increasing urbanization offers huge market for readily available ginger powder packaged attractively and merchandised in organized urban platforms such as departmental stores, malls, super markets.

The producer may also enter into agreements for supplying to big players or retailers in their brand name or as private labels.

The producer may also enter into agreements with other food processors, food additives manufacturers, nutraceutical companies, ayurvedic pharmaceutical companies as well as cosmetic companies for supplying them with ginger powder.

Export market is a major avenue for ginger powder, provided good hygienic production and compliant attractive packaging are done. Further there are several e-commerce companies that sell good quality produce, which can be utilized. Demand for organic products are on an increase and if the product is a result of organic cultivation and processing.

3.13 Detailed Project Assumptions

This model DPR for Ginger powder Processing Unit is basically prepared as a template based on certain assumptions that may vary with capacity, location, raw materials availability etc. An entrepreneur can use this model DPR format and modify as per requirement and suitability. The assumptions made in preparation of this particular DPR are given in Table 6.

This DPR assumes expansion of existing unit by adding new Ginger powder line. Therefore, land and civil infrastructures are assumed as already available with the entrepreneur.

Table 6: Detailed Project Assumptions		
Parameter	Value	
Assumed Capacity of the Ginger powder processing unit :	120 MT/ annum	
Utilization of capacity :	Year 1	Implementation
	Year 2	60%
	Year 3	70%
	Year 4	80%
	Year 5 onwards	90%
Working days per year:	300 days	
Working hours per day:	8-10 hours	
Interest on term loan Interest on working capital loan	12.00% 12.00%	
Repayment period	Seven years with one year grace period is considered.	
Average price of raw material:	Rs. 40/ kg	
Average sale price of product	Rs. 270/ kg	

3.14 Fixed Capital Investment

3.14. A. Land & Building

This DPR is for FME scheme to upgrade/ formalize existing micro enterprises which already has land & built-up area. However, they can invest to expand the built-up area (Table 7) as required.

Table 7: Land and Civil Infrastructures	
i. Land 1000 Sq ft	Assumed land already developed and has 6000 sq ft built in area. So additional 1000 sq ft can be built in @ Rs. 200/sq ft Rs. 2,00,000
ii. Built-up processing area 6000 sq ft	
iii. Storage area 1000 sq ft	
Total	Rs. 2,00,000

3.14. B. Machinery & Equipment: Rs. 20.00 Lakhs

Table 8: Machineries & Equipments						
S.No	**Description**	**Power required**	**Area reqd (Sq.ft)**	**Unit Price, (Rs.)**	**Qty**	**Amount (Rs. In Lakhs)**
1.	Weighing scale	2 HP	100	100000	1	1.00
2.	Washer cum Peeler	2 HP	50	250000	1	2.50
3.	Slicer	5 HP	100	150000	1	1.50
4.	Dryer	5 HP	200	600000	1	6.00
5.	Polisher	5 HP	300	100000	1	1.00
6.	Grinder	10 HP	100	400000	1	4.00
7.	Siever	5 HP	50	150000	1	1.50
8.	Packing machine	2 HP	100	250000	1	2.50
	Total					**20.00**

3.14. C. Utilities and Fittings

Table 9: Utilities and Fittings	
Power	Rs. 1.20 Lakhs
Water	Rs. 0.80 Lakhs
Total	Rs. 2.00 Lakhs

3.14. D. Other Fixed Assets

Table 10: Other Fixed Assets	
Furniture and fixtures	Rs. 2.00 lakhs
Utensils, trays, thermometer, refractometer, etc	
Total	Rs. 2.00 Lakhs

3.14. E. Pre-operative Expenses

Table 11: Pre-operative Expenses	
Legal expenses, start-up expenses, establishment cost, consultancy fee, trial runs, & others	Rs. 25,000.00
Total Pre-operative Expenses	Rs. 25,000.00

3.14. F. Total Fixed Capital Investment

Total Fixed Capital Investment = (Land & Building + Machinery & Equipment+ Utilities and Fittings + Other Fixed Assets + Pre-operative Expenses)

= Rs. (2.00+20.00+2.00+2.00+0.25) = **Rs. 26.25 Lakhs**

3.15. Working Capital Requirement

Table 12: Working Capital Requirement (Rs. In lakhs)				
Particulars	**Period**	**year 2 (60% - 72 MT)**	**year 3 (70% - 84 MT)**	**year 4 (80% - 96 MT)**
Raw material stock	7 days	3.00	3.50	4.00
Packing material	15 days	0.30	0.35	0.40
Work in progress	15 days	6.67	7.98	9.08
Finished goods' stock	15 days	6.40	7.92	9.03
Receivables	30 days	14.85	18.68	21.38
Total current assets		31.22	38.43	43.89
Trade creditors		0.00	0.00	0.00
Working capital gap		31.22	38.43	43.89
Margin money (25%)		7.81	9.61	10.97
Bank finance		23.41	28.82	32.92

3.16. Total Project Cost and Means of Finance

Table 13: Total Project Cost and Means of Finance (Rs. In lakhs)	
Particulars	**Amount**
i. Land and building	2.00
ii. Machinery and equipments	20.00
iii. Utilities & Fittings	2.00
iv. Miscellaneous Fixed assets	2.00
v. Pre-operative expenses	0.25
vi. Contingencies	2.00
vii. Working capital margin	7.81
Total project cost (i to vii) (Rounded off)	**36.10**
Means of finance	
i. Subsidy	10.00
ii. Promoter's contribution	8.10
iii. Term loan	18.00

3.17. Manpower Requirement

Table 14: Manpower Requirement			
Particulars	**No. of persons**	**Monthly Wage (Rs.)**	**Total Monthly Salary (Rs.)**
i. Manager (can be the owner)	1	20000	20000
ii. Skilled worker	2	10000	20000
iii. Semi skilled	3	7500	22500
iv. Helper	3	5000	15000
v. Salesman	1	7500	7500
Total	10		85000

Note: Only the manager and two skilled workers are permanent staffs (Salary Rs. 40000/ month). Others are causal staffs.

3.18. Expenditure, Revenue and Profitability Analysis

Table 15: Expenditure, Revenue and Profitability Analysis									
	Particulars	**1st year**	**2nd year**	**3rd year**	**4th year**	**5th year**	**6th year**	**7th year**	**8th year**
A	**Total Installed Capacity**	120 MT/Year Ginger powder							
	Capacity utilization (%)	Under const. (0%)	72 MT (60%)	84 MT (70%)	96 MT (80%)	108 MT (90%)	108 MT (90%)	108 MT (90%)	108 MT (90%)
B	**Expenditure (Rs. in Lakh)**								
	Ginger (Av. Price @ Rs. 40/ Kg)	0.00	144.00	168.00	192.00	216.00	216.00	216.00	216.00
	Packaging materials @ Rs. 10/ Unit	0.00	7.20	8.40	9.60	10.80	10.80	10.80	10.80
	Utilities (Electricity, Fuel)	0.00	4.62	5.12	5.62	6.11	6.11	6.11	6.11
	Salaries (1st yr only manager's salary)	2.40	7.14	7.91	8.67	9.44	9.44	9.44	9.44
	Repair & maintenance	0.00	0.69	0.69	0.69	0.69	0.69	0.69	0.69
	Insurance	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	Miscellaneous expenses	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	Total Expenditure	3.20	164.45	190.92	217.38	243.84	243.84	243.84	243.84
C	**Total Sales Revenue (Rs. in Lakh)**								
	Sale of Ginger powder @ Rs. 270/ kg	0.00	178.20	224.10	256.50	288.90	291.60	291.60	291.60
D	**PBDIT** (Total Sales Revenue-Total Expenditure) (Rs. in Lakh)	-3.20	13.75	33.18	39.12	45.06	47.76	47.76	47.76
	Depreciation on civil works @ 5% per annum	0.10	0.10	0.09	0.09	0.08	0.08	0.07	0.07

	Depreciation on machinery @ 10% p.a	2.02	1.82	1.64	1.47	1.32	1.19	1.07	0.97
	Depreciation on other fixed assets@ 15% p.a	0.91	0.77	0.65	0.56	0.47	0.40	0.34	0.29
	Interest on term loan @ 12% p.a	2.15	2.15	1.91	1.56	1.18	0.82	0.46	0.11
	Interest on working capital @ 10% p.a	0.00	2.81	3.46	3.95	4.44	4.47	4.47	4.47
E	**Profit after Depreciation and Interest** (Rs. in Lakh)	-8.38	6.10	25.43	31.49	37.57	40.80	41.35	41.85
F	Tax (assumed 15%) (Rs. in Lakh)	0.00	2.68	4.39	5.35	6.46	6.73	6.85	6.98
G	**Profit after depreciation, Interest & Tax** (Rs. in Lakh)	-8.38	3.42	21.04	26.14	31.11	34.07	34.50	34.87
H	Surplus available for repayment (PBDIT-Interest on Working Capital -Tax) (Rs. in Lakh)	-3.20	8.26	25.33	29.82	34.16	36.56	36.44	36.31
I	Coverage available (Rs. in Lakh)	-3.20	8.26	25.33	29.82	34.16	36.56	36.44	36.31
J	Total Debt Outgo (Rs. in Lakh)	2.15	4.15	3.91	3.56	3.18	2.82	2.46	2.11
K	**Debt Service Coverage Ratio (DSCR)**	-1.49	1.99	6.48	8.38	10.74	12.96	14.81	17.21
	Average DSCR	8.89							
L	**Cash accruals (PBDIT- Interest-Tax)** (Rs. in Lakh)	-5.35	8.92	26.88	32.21	37.42	40.21	40.45	40.67
M	**Payback Period** (on Rs. 36.10 Lakhs initial investment)	4 years							

3.19. Repayment Schedule

Table 16: Repayment Schedule (Rs. in Lakh)									
Year	**Outstanding loan at start of yr.**	**Disbursement**	**Total outstanding Loan**	**Surplus for repayment**	**Interest payment**	**Repayment of principal**	**Total outgo**	**o/s Loan at the end of the yr.**	**Balance left**
1	0	14	14	-3.20	2.15	0	2.15	14	-5.35
2	14		14	8.26	2.15	2	4.15	12	4.11
3	12		12	25.33	1.91	2	3.91	10	21.42
4	10		10	29.82	1.56	2	3.56	8	26.26
5	8		8	34.16	1.18	2	3.18	6	30.98
6	6		6	36.56	0.82	2	2.82	4	33.74
7	4		4	36.44	0.46	2	2.46	2	33.98
8	2		2	36.31	0.11	2	2.11	0	34.20

3.20. Assets' Depreciation

Table 17: Assets' Depreciation (Written Down Value Method) (Rs. in Lakh)								
Particulars	**1st Year**	**2nd Year**	**3rd Year**	**4th Year**	**5th Year**	**6th Year**	**7th Year**	**8th Year**
Civil works	2.02	1.92	1.82	1.73	1.64	1.56	1.48	1.41
Depreciation	0.10	0.10	0.09	0.09	0.08	0.08	0.07	0.07
Depreciated value	1.92	1.82	1.73	1.64	1.56	1.48	1.41	1.34
Plant & Machinery	20.19	18.17	16.35	14.71	13.24	11.92	10.73	9.66
Depreciation	2.02	1.82	1.64	1.47	1.32	1.19	1.07	0.97
Depreciated value	18.17	16.35	14.71	13.24	11.92	10.73	9.66	8.69
Other Fixed Assets	6.04	5.13	4.36	3.71	3.15	2.68	2.28	1.94
Depreciation	0.91	0.77	0.65	0.56	0.47	0.40	0.34	0.29
Depreciated value	5.13	4.36	3.71	3.15	2.68	2.28	1.94	1.65
All Assets	28.25	25.22	22.53	20.15	18.03	16.16	14.49	13.01
Depreciation	3.03	2.69	2.38	2.12	1.87	1.67	1.48	1.33
Depreciated value	25.22	22.53	20.15	18.03	16.16	14.49	13.01	11.68

3.21. Financial Assessment of the Project

Table 18: Benefit Cost Ratio (BCR) and Net Present Worth (NPW)										
S. No	**Particulars**	**1st year**	**2nd year**	**3rd year**	**4th year**	**5th year**	**6th year**	**7th year**	**8th year**	
i	Capital cost (Rs. in Lakh)	28.25	0	0	0	0	0	0	0	
ii	Recurring cost (Rs. in Lakh)	3.20	164.45	190.92	217.38	243.84	243.84	243.84	243.84	
iii	Total cost (Rs. in Lakh)	31.45	164.45	190.92	217.38	243.84	243.84	243.84	243.84	1579.56
iv	Benefit (Rs. in Lakh)	0.00	178.20	224.10	256.50	288.90	291.60	291.60	291.60	
v	Total Depreciated value of all assets (Rs. in Lakh)								11.68	
vi	Total benefits (Rs. in Lakh)	0.00	178.20	224.10	256.50	288.90	291.60	291.60	303.28	1834.18
	Benefit-Cost Ratio (BCR): 1.16 (Profitable Project) **Net Present Worth (NPW): 254.62**									

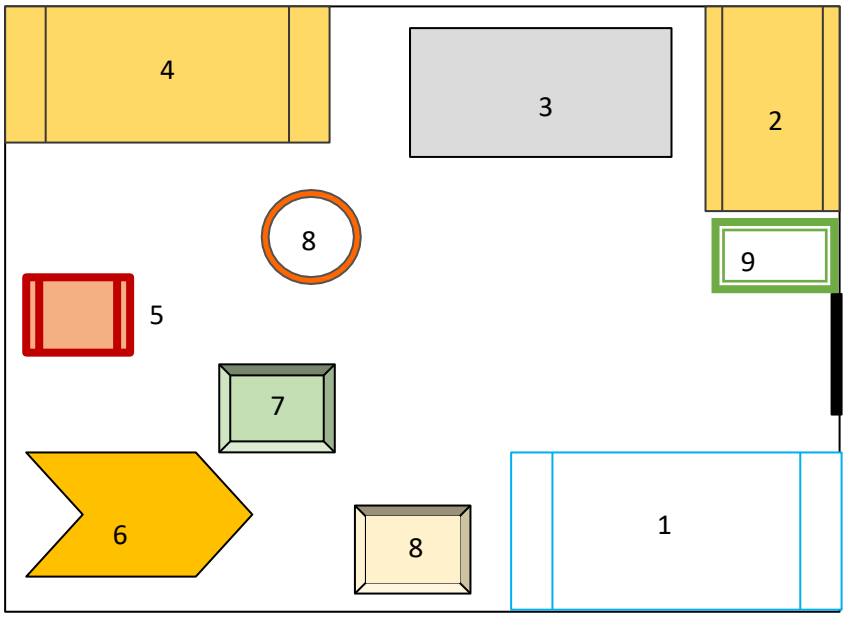
3.22. Break Even Analysis of the Project

Break Even analysis indicates costs-volume-profit relations in the short run. This is the level at which the firm is in no loss no profit situation.

Table 19: Break-Even Analysis									
S.No	**Particulars**	**1st year**	**2nd year**	**3rd year**	**4th year**	**5th year**	**6th year**	**7th year**	**8th year**
	Capacity utilization	Under const. (0%)	72 MT (60%)	84 MT (70%)	96 MT (80%)	108 MT (90%)	108 MT (90%)	108 MT (90%)	108 MT (90%)
A	**Fixed Cost (Rs. in Lakh)**								
	Permanent staff salaries	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55
	Depreciation on building @ 5% p.a	0.10	0.10	0.09	0.09	0.08	0.08	0.07	0.07
	Depreciation on machinery @ 10% p.a	2.02	1.82	1.64	1.47	1.32	1.19	1.07	0.97
	Depreciation on other fixed assets @ 15% p.a	0.91	0.77	0.65	0.56	0.47	0.40	0.34	0.29
	Interest on term loan 12% p.a	2.15	2.15	1.91	1.56	1.18	0.82	0.46	0.11
	Insurance	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	Total Fixed Cost (Rs. in Lakh)	8.03	7.69	7.14	6.53	5.9	5.34	4.79	4.29
B	**Sales Revenue (Rs. in Lakh)**	0.00	178.20	224.10	256.50	288.90	291.60	291.60	291.60
C	**Variable Cost (Rs. in Lakh)**								
	Ginger (Average Price @ Rs.50/ kg)	0.00	144.00	168.00	192.00	216.00	216.00	216.00	216.00
	Packaging materials @ Rs.10/ Unit	0.00	7.20	8.40	9.60	10.80	10.80	10.80	10.80
	Casual staff salaries	0.00	4.59	4.59	4.59	4.59	4.59	4.59	4.59
	Utilities (Electricity, Fuel)	0.00	4.62	5.12	5.62	6.11	6.11	6.11	6.11

	Repair & maintenance	0.00	0.69	0.69	0.69	0.69	0.69	0.69	0.69
	Miscellaneous expenses	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
	Interest on working capital	0.00	2.81	3.46	3.95	4.44	4.47	4.47	4.47
	Total Variable Cost (Rs. in Lakh)	0.50	164.41	190.76	216.95	243.13	243.16	243.16	243.16
D	**Break Even Point (BEP) as % of sale**	0.00	55.77%	21.42%	16.51%	12.89%	11.02%	9.89%	8.86%
	Break Even Point (BEP) in terms of sales value (Rs. in Lakhs)		99.37	47.99	42.35	37.24	32.15	28.83	25.83

3.23 Plant Layout



1	Storage	6	Grinder
2	Washer cum Peeler	7	Sieving
3	Slicer	8	Packing
4	Dryer	9	Weighing scale
5	Polisher		

3.24. Machinery Suppliers

The entrepreneur must provide tentative supplier list and quotations with respect to his project. However, there are many machinery suppliers available within India for Ginger powder processing machineries and equipments. Some of the suppliers are:

1. MMM Buxabhoy & Co, 140 Sarang Street 1st Floor, Near Crawford Market Mumbai India
   Tel: +91 22 2344 2902; Fax: +91 22 2345 2532
2. Acufil Machines S. F. No. 120/2, Kalapatty Post Office Coimbatore - 641 035 Tamil Nadu India Tel: +91 422 2666108/2669909 Fax: +91 422 2666255
   Email : acufilmachines@yahoo.co.in
3. Bombay Engineering Works, 1 Navyug Industrial Estate, 185 Tokersey Jivraj Road Opposite Swan Mill, Sewree (W) Mumbai 400015

Tel: +91 22 24137094/24135959 Fax: +91 22 24135828

4. Planters Energy network (PEN) No 5, Power House 3rd Street N R T Nagar Theni 625531 Tamil Nadu India
   Tel: +91 4546 255272 Fax: +91 4546 25527
5. Premium Engineers Pvt Ltd Plot No 2009, Phase IV, GIDC Vatva, Ahmedabad 382445 India
   Tel: +91 79 25830836 Fax: +91 79 25830965
6. Central Institute of Agricultural Engineering Nabi Bagh Berasia Road Bhopal 462 038 Madhya Pradesh India
   Tel: +91 755 2737191 Fax: +91 755 2734016
7. Eastend Engineering Company 173/1 Gopal Lal Thakur Road
   Calcutta 700 035 India
   Tel: +91 33 25536937 Fax: +91 33 23355667
8. Gardners Corporation 158 Golf Links New Delhi 110003 India
   Tel: +91 11 3344287/3363640 Fax: +91 11 3717179
9. Rajan Universal Exports Post Bag no 250 162 Linghi Chetty Street
   Chennai 600 001 India
   Tel: +91 44 25341711/25340731/25340751 Fax: +91 44 25342323
10. Gurdeep Packaging Machines, Harichand Mill compound LBS Marg,
    Vikhroli, Mumbai 400 079 India
    Tel: +91 22 2578 3521/577 5846/579 5982 Fax: +91 22 2577 2846
11. Global Kitchen Equipments Company,
    No. 252, Sivasakthi Colony, 1st Street, Ganapathy
    Coimbatore - 641006, Tamil Nadu,
    Tel: 08048602289; https://www.kitchenequipment.in

CHAPTER 4

LIMITATIONS OF THE MODEL DPR AND GUIDELINES FOR ENTREPRENEURS

4.1. Limitations of the Model DPR

i. This model DPR has provided only the basic standard components and methodology to be adopted by an entrepreneur while submitting a proposal under the Formalization of Micro Food Processing Enterprises Scheme of MoFPI.

ii. This is a model DPR made to provide general methodological structure not for specific entrepreneur/crops/location. Therefore, information on the entrepreneur, forms and structure (proprietorship/partnership/cooperative/ FPC/joint stock company) of business, background of proposed project, location, raw material base/contract sourcing, entrepreneur's own SWOT analysis, market research, rationale of the project for specific location, community advantage/benefit, employment generation etc are not given in detail.

iii. The present DPR is based on certain assumptions on cost, prices, interest, capacity utilization, output recovery rate and so on. However, these assumptions in reality may vary across places, markets and situations; thus the resultant calculations will also change accordingly.

iv. This particular DPR is made on three components of means of finance i.e. grant, owner's contribution and loan/debt as followed in many central sector schemes.

4.2. Guidelines for the Entrepreneurs

i. The success of any prospective food processing project depends on how closer the assumptions made in the initial stage are with the reality of the targeted market/place/situation. Therefore, the entrepreneurs must do its homework as realistic as possible on the assumed parameters.

ii. This model DPR must be made more comprehensive by the entrepreneur by including information on the entrepreneur, forms and structure (proprietorship/partnership/cooperative/ FPC/joint stock company) of entrepreneur's business, project location, raw material base/contract sourcing, entrepreneurs own SWOT analysis, detailed market research, comprehensive product mix based on demand, rationale of the project for specific location, community advantage/benefit from the project, employment generation,

production/availability of the raw materials/crops in the targeted area/clusters and many more relevant aspects for acceptance and approval of the competent authority.

iii. The entrepreneur must be efficient in managing the strategic, financial, operational, material and marketing aspects of a business. In spite of the assumed parameter being closely realistic, a project may become unsustainable if the entrepreneur does not possess the required efficiency in managing different aspects of the business and respond effectively in changing situations.

iv. The machineries should be purchased after thorough market research and satisfactory demonstration.

v. The entrepreneur must ensure uninterrupted quality raw materials' supply and maintain optimum inventory levels for smooth operations management.

vi. The entrepreneur must possess a strategic look to steer the business in upward trajectory.

vii. The entrepreneur must maintain optimum (not more or less) inventory, current assets. Selecting optimum source of finance, not too high debt-equity ratio, proper capital budgeting and judicious utilization of surplus profit for expansion is must.

viii. The entrepreneur must explore prospective markets through extensive research, find innovative marketing strategy, and maintain quality, adjust product mix to demand.

ix. The entrepreneur must provide required documents on land, financial transaction, balance sheet, further project analysis as required by the competent authority for approval.

x. The entrepreneur must be hopeful and remain positive in attitude.

Contact Us

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