HERBAL EXTRACTION PLANT

1. INTRODUCTION:

There has been a shift in universal trend from synthetic to herbal medicine recently. It is ancient wisdom that plants have therapeutic value and are used to treat various diseases since Neanderthal age. All ancient civilizations in the world are known to use plants for medicinal purposes. Ayurveda and traditional Chinese medicines are well known to the world for their natural ingredients and multiple benefits. Nature has bestowed our country with an enormous wealth of medicinal plants; therefore India has often been referred to as the Medicinal Garden of the world. Today, people around the globe are giving preference to alternative medicines such as ayurveda, naturopathy, homeopathy and herbal medicine. Herbal medicine is cost effective and less expensive than the medicines bought from an allopathic pharmacy. Increasing realization of the side effects of allopathic medicines, coupled with the growing awareness about the medicinal benefits as well as therapeutic effect of herbal products is pushing up the demand for herbal extracts, dietary supplement sand herbal-based beauty aids worldwide. Herbal extraction and processing is very vast field. Some of the known projects are, rose plantation, cultivation & rose oil extraction plantation, cultivation of medicinal plant & herbs, Kali mahendi (henna), aloevera gel, aloevera gel & powder, aromatic plants cultivation & processing, asparagus cultivation & processing, ayurvedic churan & tablets, ayurvedic raw material from mercury a-singruph (hingula) or cinnabar (hgs), b-ras sindhoor, ayurvedic/herbal pharmacy, cough syrup, hair dyes (hinna based), herbal natural essential oil (steam distillation process), herbal shampoo & cream, herbal concentrate in the mfg. Of herbal drugs & concentrate, herbal extracts, herbal medicinal plant & processing, herbs cultivation & processing, herbs cultivation & processing, menthol crystal from menthol oil, patchouli oil, plantation, cultivation of medicinal plant & herbs, sindur roli bindi & gulal, tobacco based tooth powder, toilet & herbal soap, herbal capsules, herbal face paste, rajnigandha oil, amla cultivation, plantation, amla hair oil based on vegetable oil, aloe vera processing, artemisia vulgaris oil, aloevera gel, juice and powder,

ayurvedic hair oil for colouring of hair oil, herbal wine, mehandi cone, hibiscus cultivation, herbal beer, azadirachtin from neem, neem based pesticide, moringa -miracle tree, etc.

2. PRODUCT & ITS APPLICATION:

There are a number of Herbal extract producers all over India. Important producers include the following Cosmetics, Food Pharmaceuticals, Creams, Shampoos, Lotions, Talcum powder, Moisturisers, Food supplement, Sports drinks, Health drinks, Anti-inflammatory Detoxification, Treatment of several illness.

3. DESIRED QUALIFICATIONS FOR PROMOTER:

Anyone can start this project. Successful running of this project does not require any specific qualification. Promoter should have knowledge of ingredients, recipe, production process, packaging etc.

4. INDUSTRY LOOKOUT AND TRENDS

The Indian Medicinal Plant Extract Market is witnessing an astonishing growth, as there has been a shift in universal trend from synthetic to herbal medicine. India is a virtual treasure trove of plant species, and has one of the world's richest medicinal plant heritages. Medicinal Plants are highly esteemed all over the world as a rich source of therapeutic agents for the prevention of diseases and ailments. Owing to its wide range of medicinal uses, the Indian Medicinal Plant Extract market is expected to grow at a CAGR of around 22% during 2017-2022. As a result, of increased investments as well as significant demand of medicinal extract in internationals markets, there lies immense opportunity for new and existing players to tap the fast growing market which would garner huge revenue.

In the latest research study "Indian Medicinal Plant Extract Market Outlook 2022", RNCOS' analysts have conducted a segmented research on the Indian Medicinal Plant Extract industry, and have interpreted the key market trends & developments that clearly highlight the areas offering promising possibilities for industries to boost their growth. Indian

Medicinal Plant Extract market is rapidly growing over the years owing to factors like shift in consumers demand towards herbal and natural product, various schemes launched by government, key investment & expansions being made in the Indian medicinal plant extract industry, among others.

5. MARKET POTENTIAL AND MARKETING ISSUES, IF ANY:

The annual turnover of the Indian herbal medicinal industry is about Rs. 7,500 crore as against the pharmaceutical industry's turnover of Rs. 14,500 crores with a growth rate of more than 15 percent. As per study commissioned by the Associated Chamber of Commerce and Industry (ASSOCHAM), the Indian herbal industry is projected to double to Rs.18,000 crore by 2018, from the current 7,500 core business. India has a vast and rich resource of herbal raw materials and it can create a niche for itself in the global herbal market if the domestic industry produced quality products of international standards. The apex chamber estimates global herbal industry to grow to Rs 90,000 crore by 2018, more than double from the current level of Rs 30,000 crore. Small-scale players in the sector are likely to witness brighter times ahead. India could make its presence felt in the world herbal market through quality products in view of growing bias towards herbal medicines, dietary supplements and skin and beauty aids because public perception of herbal products is a kin to organic food products. The Indian market can be divided into two categories. One that covers raw material needed by the industries and direct consumption for household remedies, while second category that comprises ready to use finished medicines, health supplements etc. There is a strong demand for raw stock of amla, isabgol, henna, ashwagandha and aloevera, and these materials are used in a big way in preparing ayurvedic formulations. The demand for plant based medicines, health products, pharmaceuticals, food supplement, cosmetics etc are increasing in both developing and developed countries, due to the growing recognition that the natural products are non-toxic, have less side effects and easily available at affordable prices. India has lot of potential for producing world class herbal medicines. For the Entrepreneurship it is one of the areas of great opportunity & potential.The Indian herbal Industry is on a roll and poised to grow in the coming years owing to its high demands for herbal products.

6. RAW MATERIAL REQUIREMENTS:

Raw material requirements for selected herbal extracts are given below

Amla for Amla oil, Amla Fruit, Aloe Vera Generally, three leaves provide one kg. of Aloe vera gel. Supply of Aloe Vera Leaves Aloe Vera is extensively cultivated. There is no particular constraint in expanding the area of cultivation of Aloe Vera to meet the projected increase in the demand. Therefore, the supply scenario of Aloe Vera Plant material is likely to remain comfortable. Guggul 700 to 900 Kg are produced per hectare of Guggul gum plantation. Gum is dried in shade and stored. Guggul is cultivated in Gujarat, Karnataka and Rajasthan. Vetiver For 1.5 kg of Vetiver oil 100 Kg Vetiver is required.The herbs are grown all over India in different climatic and seasonal conditions. The raw materials is available as Leaves, Stems, Barks, roots, Flowers, Seeds, Kernels and Shells. Depending on the physical properties, including shape and size one has to select the equipments.

7. MANUFACTURING PROCESS:

The manufacturing process for various herbal extracts depend upon the nature of the individual herbs and the specific process requirements. The various unit operations are used in the extraction of herbs such as extractors, dryers pulverisers etc. Observance of specific and stipulated conditions for the production of herbal extracts are necessary to ensure that there would not be any deterioration in product quality or stability. Take care in Procurement: Identification a must, before purchasing or growing fresh/dried herbs. Discriminate look a likes, identical species and adulterated herbs. Cleaning and Drying of plant material; to be specific to species as well as end products. Freeze drying, Spray drying and Flash drying are important methods Sun drying is usually the common initial step. Storage in controlled atmosphere in an aseptic lay out is a must to maintain keeping quality in terms of colour, actives and fragrance. Temperature, air flow and humidity are closely monitored. Pulverisation and Grinding media & temperature can play a vital role in quality of final product. Sifting through various mesh sizes for different end use is strictly followed. This directly determines the absorption and effectiveness of the herb. Plant materials contain microbial contamination which resist most of the cleaning techniques. Total Sterilization is

mainly effected through exposure to Ethylene Oxide and Gamma radiation. It is a must to automate or semi-automate filling. The gauge and material of the packing materials should prevent ingress of air and moisture. This avoids oxidation, discolouration or deterioration. Standard analytical methods are used to determine characteristics. Organoleptic tests can sometimes determine trace component levels. Chromatographic methods are used for quantitative analysis. Microbiological Examination and Toxicological tests have to be performed to determine the safety of the herb. Pesticide Residue and Heavy metals are to be analysed to ensure nil side effects. Clinical trials or post marketing surveillance ensures that adverse drug interactions are avoided. Distillation * Hydro-distillation. * Steam distillation * Water-steam distillation * CO2 Supercritical Extraction * Hydro-diffusion * Molecular Distillation * Spinning Cone Column Distillation.

8. MANPOWER REQUIREMENT :

The enterprise requires 19 employees as detailed below**:**

Sr. No.	Designation	SALARY	Salary ₹	Number	Number	Number	Number	Number
	Working Staff		**PER ANNUM**	**Year-1**	**Year-2**	**Year-3**	**Year-4**	**Year-5**
1	Production Manager	18000	36000	2	2	2	2	2
2	Operators	12000	60000	5	5	5	5	5
3	Helpers	10000	60000	6	6	6	6	6
			156000	13	13	13	13	13
1	**Fixed Staff:**							
2	Admin Manager	15000	30000	2	2	2	2	2
3	Accounts/Stores Assistant	12500	25000	2	2	2	2	2
	Office Boy	9000	18000	2	2	2	2	2
	Sub-Total		73000	6	6	6	6	6
	Total		229000	19	19	19	19	19

9. IMPLEMENTATION SCHEDULE:

Sr. No.	Activity	Time Required *(in months)*
1	Acquisition of premises	2.00
2	Construction (if applicable)	2.50
3	Procurement & installation of Plant & Machinery	2.50
4	Arrangement of Finance	1.00
5	Recruitment of required manpower	1.00
	Total time required *(some activities shall run concurrently)*	4.00

10. COST OF PROJECT:

Sr. No.	Particulars	₹ in Lacs
1	Land	10.00
2	Building	15.00
3	Plant & Machinery	35.00
4	Furniture, other Misc Equipments	3.00
5	Other Assets including Preliminary / Pre-operative	3.50
6	Margin for Working Capital	67.50
	Total	**134.00**

11. MEANS OF FINANCE:

Sr. No.	Particulars	₹ in Lacs
1	Promoter's contribution	33.50
2	Bank Finance	100.50
	Total	**134.00**

12. WORKING CAPITAL CALCULATION:

Sr. No.	Particulars	Gross Amt	Margin %	Margin Amt	Bank Finance
1	Inventories	33.75	0.25	8.44	25.31
2	Receivables	16.88	0.25	4.22	12.66
3	Overheads	16.88	100%	16.88	0.00
4	Creditors	-		0.00	0.00
	Total	67.50		29.53	37.97

13. LIST OF MACHINERY REQUIRED:

The major machineries required are, Water Extractor * Falling Film Evaporator * Filler Decanter * Tray Drier * Grinder * Solvent Extractor with Stripping Condenser and Rectifier * Mixing Tanks For Size reduction from the following. ∑ Jaw crusher ∑ Hammer Mill ∑ Magnetic Separator ∑ Belt Conveyor ∑ Dust Collection Equipment can be selected. Extraction equipment and for Filtration Nutch filter,or Enclosed filter press, for Evaporation/Distillation, Solvent Recovery, for Drying of extracts,Tray dryer, Vacuum dryer, Spray dryer are required. for Utilities, Equipments are Boiler, Coal fired boiler, Light diesel/Furnace oil fired baby boiler, Packaged boiler, Cooling Tower, Spray ponds,. Natural draft cooling tower, Forced/Induced draft cooling tower, Refrigeration Plant and Air Compressor are major.

Sr. No.	Particulars	UOM	Qtty	Rate (₹)	Value (₹ in Lacs)
	Plant &Machinery / Equipments				
a)	***Main Machinery***				
1	Extraction Unit	NOS	1	12.00	8.00
2	Crushing Unit	NOS	1	4.00	4.00
3	Distillation Unit	NOS	1	5.00	9.00
4	Drying, Testing, Packing	L.S.	1	3.00	5.00
5	Utility Equipments	L.S.	1	2.00	5.00
	Installation, Taxes And Transportation	L.S.		4.00	4.00
	Sub-Total				**35.00**

Sr. No.	Particulars	UOM	Qtty	Rate (₹)	Value
	Furniture / Electrical Installations				
a)	Office Furniture	LS	1	100000	1.00
b)	Stores Cupboard	LS	1	100,000	1.00
c)	Computer & Printer	LS	1	100000	1.00
	Sub Total				**3.00**
	Other Assets				
a)	Preliminary And Preoperative				350
	Sub-Total Other Assets				3.50
	Total				**41.50**

All the machines and equipments are available from local manufacturers. The entrepreneur needs to ensure proper selection of product mix and proper type of machines and tooling to have modern and flexible designs. It may be worthwhile to look at reconditioned imported machines, dies and tooling. Some of the machinery and dies and tooling suppliers are listed here below:

1. Fry-Tech Food Equipments Private Limited
   S. No. 4, Raviraj Industrial Estate,
   Bhikhubhai Mukhi Ka Kuwa Bharwadvash,
   Ramol, Ahmedabad - 380024,
   Gujarat, India

2. Hindustan Vibrotech Pvt. Ltd.
Office No. 2, Ground Floor,
   Vrindavan Building, Vile Parle East,
Mumbai – 400057,
   Maharashtra, India

3. Electrons cooling systems Pvt. Ltd.
   S-27, SIDCO Industrial Estate
   Kakkalur Industrial Estate
   Tiruvallur – 602003,

Tamil Nadu, India

4. Springboard Enterprises India Ltd.
1st, 2nd & 3rd Floor,
Plot No. 7, 8 & 9,
Garg Shopping Mall,
Service Centre, Rohini Sector 2
New Delhi – 110085

5. Flour Tech Engineers Private Limited
Plot No. 182, Sector 24,
Faridabad - 121005,
Haryana, India

6. P Square Technologies
3, Swami Mahal,
Gurunanak Nagar,
Off. Shankarsheth Road Bhavani Peth,
Pune - 411002,
Maharashtra, India

7. Ricon Engineers
10 To 13, Bhagwati Estate,
Near Amraiwadi Torrent Power,
Behind Uttam Dairy,
Rakhial, Ahmedabad - 380023,
Gujarat, India

14. PROFITABILITY CALCULATIONS:

Sr. No.	Particulars	UOM	Year-1	Year-2	Year-3	Year-4	Year-5
1	Capacity Utilization	%	60%	70%	80%	90%	100%
2	Sales	₹. In Lacs	153.00	178.50	204.00	229.50	255.00
3	Raw Materials & Other direct inputs	₹. In Lacs	117.55	137.14	156.73	176.32	195.91
4	Gross Margin	₹. In Lacs	35.45	41.36	47.27	53.18	59.09
5	Overheads except interest	₹. In Lacs	15.47	16.44	18.37	18.95	19.34
6	Interest @ 10 %	₹. In Lacs	10.16	10.16	6.78	5.08	4.07
7	Depreciation @ 30 %	₹. In Lacs	9.00	6.30	4.59	3.60	2.70
8	**Net Profit before tax**	₹. In Lacs	**0.82**	**8.46**	**17.53**	**25.55**	**32.98**

The basis of profitability calculation:
This unit will have capacity of 30 Ton/Annum. The growth of selling capacity will be increased 10% per year. (This is assumed by various analysis and study, it can be increased according to the selling strategy.)

Energy Costs are considered at Rs 7 per Kwh and fuel cost is considered at Rs. 65 per litre. The depreciation of plant is taken at 10-12 % and Interest costs are taken at 14 -15 % depending on type of industry.

15. BREAKEVEN ANALYSIS:

The project shall reach cash break-even at 39.61 % of projected capacity as detailed below:

Sr. No.	Particulars	UOM	Value
1	Sales at full capacity	₹. In Lacs	255.00
2	Variable costs	₹. In Lacs	195.91
3	Fixed costs incl. interest	₹. In Lacs	23.41
4	BEP = FC/(SR-VC) x 100 =	% of capacity	39.61%

16. STATUTORY / GOVERNMENT APPROVALS

The Ministry of Food Processing Industries has been operating several plan schemes for the development of processed food sector in the country during the 10th Plan. One of the schemes relates to the Technology Up-gradation/ Establishment/ Modernization of food processing industries.

The Indian food processing industry is regulated by several laws which govern the aspects of sanitation, licensing and other necessary permits that are required to start up and run a food business. The legislation that dealt with food safety in India was the Prevention of Food Adulteration Act, 1954 (hereinafter referred to as "**PFA**"). The PFA had been in place for over five decades and there was a need for change due to varied reasons which include the changing requirements of our food industry. The act brought into force in place of the PFA is the Food Safety and Standards Act, 2006 (hereinafter referred to as "**FSSA**") that overrides all other food related laws.

FSSA initiates harmonization of India's food regulations as per international standards. It establishes a new national regulatory body, the Food Safety and Standards Authority of India (hereinafter referred to as "**FSSAI**"), to develop science based standards for food and to regulate and monitor the manufacture, processing, storage, distribution, sale and import of food so as to ensure the availability of safe and wholesome food for human consumption.
Entrepreneur may contact State Pollution Control Board where ever it is applicable.

All food imports will therefore be subject to the provisions of the FSSA and rules and regulations which as notified by the Government on 5th of August 2011 will be applicable.

Key Regulations of FSSA

A. Packaging and Labelling
B. Signage and Customer Notices
C. Licensing Registration and Health and Sanitary Permits

17. BACKWARD AND FORWARD INTEGRATIONS

The objective of the scheme is to provide effective and seamless backward and forward integration for processed food industry by plugging the gaps in supply chain in terms of availability of raw material and linkages with the market. Under the scheme, financial assistance is provided for setting up of primary processing centres/ collection centres at farm gate and modern retail outlets at the front end along with connectivity through insulated/ refrigerated transport.

The Scheme is applicable to perishable horticulture and non-horticulture produce such as, fruits, vegetables, dairy products, meat, poultry, fish, Ready to Cook Food Products, Honey, Coconut, Spices, Mushroom, Retails Shops for Perishable Food Products etc. The Scheme would enable linking of farmers to processors and the market for ensuring remunerative prices for agri produce.

The scheme is implemented by agencies/ organizations such as Govt./ PSUs/ Joint Ventures/ NGOs/ Cooperatives/ SHGs / FPOs / Private Sector / individuals etc.

Backward Linkage:

- Integrated Pack-house(s) (with mechanized sorting & grading line/ packing line/ waxing line/ staging cold rooms/cold storage, etc.)
- Pre Cooling Unit(s)/ Chillers
- Reefer boats
- Machinery & equipment for minimal processing and/or value addition such as cutting, dicing, slicing, pickling, drying, pulping, canning, waxing, etc.
- Machinery & equipment for packing/ packaging.

Forward Linkage:

- Retail chain of outlets including facilities such as frozen storage/ deep freezers/ refrigerated display cabinets/cold room/ chillers/ packing/ packaging, etc.
- Distribution centre associated with the retail chain of outlets with facilities like cold room/ cold storage/ ripening chamber.

18. TRAINING CENTERS AND COURSES

There are few specialised Institutes provide degree certification in Food Technology, few most famous and authenticate Institutions are as follows:

1. Indian Institute of Food Science & Technology,
   Plot No.1, Near Maa-Baap ki Dargah,Opp to Nath Seeds,
   Paithan Road Aurangabad
   Aurangabad - 431005
   Maharashtra, India

2. MIT College of Food Technology, Pune
   Gate.No.140, Raj Baugh Educational Complex,
   Pune Solapur Highway,
   Loni Kalbhor, Pune – 412201
   Maharashtra, India

3. CSIR - Central Food Technological Research Institute (CFTRI)
   Cheluvamba Mansion, Opp. Railway Museum,
   Devaraja Mohalla, CFTRI Campus, Kajjihundi, Mysuru
   Karnataka – 570020

Udyamimitraportal (link : www.udyamimitra.in) can also be accessed for handholding services viz. application filling / project report preparation, EDP, financial Training, Skill Development, mentoring etc.

Entrepreneurship program helps to run business successfully is also available from Institutes like Entrepreneurship Development Institute of India (EDII) and its affiliates all over India.

Disclaimer:

Only few machine manufacturers are mentioned in the profile, although many machine manufacturers are available in the market. The addresses given for machinery manufacturers have been taken from reliable sources, to the best of knowledge and contacts. However, no

responsibility is admitted, in case any inadvertent error or incorrectness is noticed therein. Further the same have been given by way of information only and do not carry any recommendation.