

# 21 HERBAL EXTRACTION



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## 1. INTRODUCTION

There has been a recent shift in the universal trend from synthetic to herbal medicine. It is an ancient wisdom that plants have therapeutic value and have been used to treat various diseases since the Neanderthal age. All ancient civilizations are known to use plants for medicinal purposes. Ayurveda and traditional Chinese medicines are well-known worldwide for their natural ingredients and multiple benefits. Nature has bestowed our country with an enormous wealth of medicinal plants; therefore, India has often been called the Medicinal Garden of the world. Today, people around the globe prefer 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. The increasing realization of the side effects of allopathic medications, coupled with the growing awareness about the medicinal benefits and therapeutic effects of herbal products, is pushing up the demand for herbal extracts, dietary supplements, and herbal-based beauty aids worldwide.

Uttarakhand, often called "Devbhumi" (Land of the Gods), is renowned for its rich diversity of medicinal and aromatic plants. Some notable herbs grown in the region include **rosemary, lemongrass, oregano, basil, lemon balm, chamomile, and stevia**. These herbs are used in culinary applications, traditional medicine, and herbal remedies. The state's favorable climate and fertile soil make it an ideal location for herbal farming, which has become an essential source of income for many local communities.

## 2. PRODUCT & ITS APPLICATION

Herbal extraction plants of Uttarakhand can produce various products derived from the state's rich medicinal and aromatic plants. These products include **essential oils, herbal extracts, tinctures, and dried herbs**. The applications of these products are diverse, ranging from **cosmetic and personal care products** (like skincare and haircare formulations) to **pharmaceuticals and nutraceuticals** (such as supplements and natural remedies). Additionally, these herbal products are used in **food and beverage industries** for flavoring and natural preservatives, as well as in **aromatherapy and traditional medicine** for their therapeutic properties.

## 3. DESIRED QUALIFICATION FOR PROMOTER

Anyone can start this project. Successful running of this project does not require any specific qualification. Promoters should know the ingredients, recipe, production process, packaging, etc.

## 4. BUSINESS OUTLOOK AND TRENDS

The Indian Medicinal Plant Extract Market is witnessing astonishing growth, as there has been a shift in the 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 worldwide as a rich source of therapeutic agents for preventing 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% from 2017 to 2022. As a result of increased investments and significant demand for medicinal extract in international 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 highlight the areas offering promising possibilities for industries to boost their growth. Indian Medicinal Plant Extract market has been rapidly growing over the years owing to factors like a shift in consumer demand for herbal and natural products, various schemes launched by the government, and key investments & expansions being made in the Indian medicinal plant extract industry, among others.

## 5. MARKET POTENTIAL AND MARKETING ISSUES, IF ANY

The market potential for herbal extraction plants in Uttarakhand is significant due to the state's rich biodiversity and the high demand for natural and herbal products. The region is home to over 5,000 species of vascular plants, many of which have medicinal uses<sup>2</sup>. This provides a strong foundation for the herbal industry, which is expected to grow as consumers increasingly seek natural and organic products<sup>2</sup>.

However, several marketing challenges need to be addressed:

1. **Transportation and Storage:** The hilly terrain and lack of proper infrastructure make transporting and storing raw materials difficult.
2. **Quality Control:** Ensuring consistent quality of herbal products can be challenging due to variations in raw material quality.
3. **Regulatory Compliance:** Navigating the complex regulatory landscape for herbal products can be time-consuming and costly.
4. **Market Access:** Gaining access to larger markets, both domestic and international, requires significant marketing efforts and resources.

5. **Competition:** The herbal market is becoming increasingly competitive, with many players vying for market share.

Addressing these challenges will be crucial for tapping into Uttarakhand's full market potential for herbal extraction plants.

## 6. RAW MATERIAL REQUIREMENTS

Raw material requirements for selected herbal extracts are given below :

- **Medicinal and Aromatic Plants:** Commonly used plants include lavender, rosemary, eucalyptus, peppermint, chamomile, **lemongrass, oregano, basil, lemon balm, and stevia.**
- **Essential Oils:** High-quality essential oils extracted from these plants.
- **Solvents:** Ethanol or other suitable solvents for extracting active compounds.
- **Packaging Materials:** Bottles, jars, and labels for storing and selling the final products.
- **Preservatives:** Natural preservatives to ensure the longevity of the extracted products.

## 7. MANUFACTURING PROCESS

The manufacturing process for various herbal extracts depends upon the nature of the individual herbs and the specific process requirements. The various unit operations extract herbs such as extractors, dryers, pulverizers, etc. Observance of specific and stipulated conditions for the production of herbal extracts is necessary to ensure that there would not be any deterioration in product quality or stability. Take care in Procurement: Identification is necessary before purchasing or growing fresh/dried herbs. Discriminate look alike, identical species, and adulterated herbs—cleaning and Drying of plant material specific to species and end products. Freeze drying, Spray drying, and Flash drying are important methods. Sun drying is usually the common initial step. Storage in a controlled atmosphere in an aseptic layout is necessary to maintain quality in color, actives, and fragrance. Temperature, airflow, and humidity are closely monitored. Pulverisation and Grinding media & temperature can play a vital role in final product quality. Sifting through various mesh sizes for different end uses is strictly followed. This directly determines the absorption and effectiveness of the herb. Plant materials contain microbial contamination, which resists most of the cleaning techniques. Total sterilization is mainly affected by 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, discoloration, 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 must be performed to determine the herb's safety. Pesticide Residue and Heavy metals are to be analyzed to ensure nil side effects. Clinical trials or post-marketing surveillance ensures that adverse drug interactions are avoided. The vital steps that should be ensured are: \* Distillation \* Hydro-distillation. \* Steam distillation \* Water-steam distillation \* CO2 Supercritical Extraction \* Hydro-diffusion \* Molecular Distillation \* Spinning Cone Column Distillation.

## 8. MANPOWER REQUIREMENT

Sr. No	Particulars	No.	No of month in year	Wages/Salaries per month (Rs. In Lakhs)	Annual Expense (Rs. In Lakhs)
1	Self-employed (Owner and Production Manager)	1	-	-	-
2	Skilled Labour	1	12	0.1	1.2
3	Un-Skilled Labour	2	12	0.08	1.92
4	Helper	1	12	0.06	0.72
5	Sales and Marketing Person	1	12	0.12	1.44
6	Chemical Engineer	1	12	0.25	3
<b>Total</b>					<b>8.28</b>

## 9. IMPLEMENTATION SCHEDULE

Sr. No.	Activity	Time Required (in months)
1	Acquisition Of premises	2
2	Construction (if applicable)	2
3	Procurement & installation of Plant & Machinery	2.5
4	Arrangement of Finance	1.5
5	Recruitment of required manpower	1
<b>Total time required (some activities shall run concurrently)</b>		<b>9</b>

## 10. COST OF PROJECT

Sr. No	Particulars	Annual Expenses (Rs. in lakhs)
1	Land	-
2	Building (Rented)	0.12
3	Plant & Machinery	18.50
4	Equipment and Furniture Exp.	0.42
5	Misc. Fixed Asset	0.02
6	Preoperative & Preliminary Exp.	0.06
7	Working Capital	45.18
	<b>Total Project Cost</b>	<b>64.30</b>

## 11. MEANS OF FINANCE

Sr. No.	Particulars	Annual Expenses (Rs. in lakhs)
1	Promoter's contribution	25.85
2	Bank Finance	38.78
	<b>Total</b>	<b>64.63</b>

## 12. LIST OF EQUIPMENT REQUIRED

### MACHINERY

Sr. No	Particulars	Unit	Price per Unit(Rs. in lakhs)	Total Amount (Rs. in lakhs)
1	Extraction Unit	1	8.00	8.00
2	Crushing Unit	1	3.50	3.50
3	Distillation Unit	1	4.00	4.00
4	Drying and Testing Unit	1	2.50	2.50
5	Packing Machine	1	0.50	0.50
	<b>Total Amount</b>			<b>18.50</b>

### EQUIPMENT & FURNITURE

Sr. No	Particulars	Unit	Price per Unit(Rs. in lakhs)	Total Amount (Rs. in lakhs)
1	Tools (Roasting Pan, Gas Stove, Induction, Grinder, measuring spoon, pot etc.)	0	0.10	0.10

2	Furniture and Set Up (Work Table, Storage shelves, Packaging Station etc.)	0	0.00	0.25
3	Fixture (Light, Fan, Cabinets etc.)	-	0.00	0.05
4	Others (Labelling Equipment, Gloves, Masks, etc.)	-	-	0.02
<b>Total Rs.</b>				<b>0.42</b>

The availability of raw materials and equipment from local manufacturers is a promising advantage for the entrepreneur. Choosing the right mix of products and suitable machinery and tooling to facilitate modern and flexible processes is essential. Here are some of the suppliers of business equipment an entrepreneur can consider:

### **1. Gupta Electronics**

Dispensary Road, Dehradun City,  
Dehradun – 248001,  
Uttarakhand, India

### **2. R. C. Electronics 54,**

Dispensary Road,  
Back Side of Kothali,  
Dehradun- 248001,  
Uttarakhand, India.

### **3. Vardhman Instruments and Chemical Goods Private Limited**

Chakrata Road, Dehradun,  
Uttarakhand, 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

### **13. SALES REALISATION**

<b>Sr. No</b>	<b>Product</b>	<b>Sales in Percentage</b>	<b>INR</b>
1	Herbal Extract	25.0%	9000000
2	Herbal Essential Oil	25.0%	6750000



<b>Total</b>	<b>50.00%</b>	<b>15750000</b>
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## 14. PROFITABILITY CALCULATIONS

The basis of profitability calculation:

Sr. No	Particulars	Annual Expenses (Rs. in lakhs)
A.	Sales realisation	157.50
B.	Cost of production	
i)	Raw materials	86.00
ii)	Utilities	0.32
iii)	Manpower Cost (Salaries/wages)	8.28
iv)	Administrative expenses	0.31
v)	Packaging Cost	0.50
vi)	Material Lost Cost	0.10
vii)	Selling & distribution expenses	0.84
viii)	Repairs & maintenance	0.10
ix)	Rent	0.45
x)	Interest	3.45
xi)	Misc. expenses	0.00
	Total (B)	100.35
	Gross profit/loss (A – B)	57.15
	Less: Depreciation	1.91
C.	PBIT	55.24
D	Income-tax	-
E	Net profit/loss	55.24
F.	Repayment (Annual)	-3.02
G	Retained surplus (E-F)	58.26

## 15. BREAKEVEN ANALYSIS

Fixed cost	
Land & Building Rent	0.45
Depriciation	1.91
Interest	3.45
Manpower	2.48
<b>Total Fixed cost</b>	<b>8.29</b>
Variable cost	
Raw materials	86.00
Utilities	0.32

ManPower	5.80
Administrative expenses	0.31
Selling & distribution expenses	0.84
<b>Total Variable cost</b>	93.27
<b>Contribution margin</b>	<b>40%</b>
Break-Even Point in Value	20.74

## 16. STATUTORY/GOVERNMENT APPROVALS

Setting up a spirulina superfood production unit in Uttarakhand would require several statutory and government approvals to ensure regulation compliance.

- 1. Business Registration:** Business registration has to be made with the appropriate local authorities within the Local Municipal Corporation or Panchayat.
- 2. Trade License:** A trade license is required to operate a retail business. GST Registration: Goods and Services Tax (GST) registration is a must for taxation purposes
- 3. FSSAI (Food Safety and Standards Authority of India) Approval:** This approval ensures that the product meets the food safety standards laid out by the Food Safety and Standards Act, 2006.
- 4. Pollution Control Board (State Pollution Control Board - SPCB) Approval:** The production unit will require approval from the Uttarakhand Environment Protection and Pollution Control Board (UEPPCB) to ensure compliance with water and air pollution control norms.
- 5. Organic Certification (As per requirement):** If you wish to market your spirulina as organic, you will need to obtain organic certification from recognized bodies such as India Organic (under the National Program for Organic Production - NPOP) or USDA Organic for international markets

## 17. BACKWARD AND FORWARD INTEGRATIONS

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

The Scheme applies to perishable and non-horticulture produce such as fruits, vegetables, dairy products, meat, poultry, fish, Ready to Cook Food Products, Honey, Coconut, Spices, mushrooms, retail shops for Perishable Food Products, etc. The Scheme would link farmers to processors and the market to ensure 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.

#### **Backward Linkage:**

- Integrated Pack-house(s) (with mechanized sorting & grading line/ packing line/ waxing line/ staging cold rooms/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 center associated with the retail chain of outlets with facilities like cold room/ cold storage/ ripening chamber.

## **18. TRAINING CENTERS AND COURSES**

There are few specialized Institutes that provide diploma certification in Spirulina production. The most famous and authenticate Institutions are as follows:

### **1. Central Food Technologies and Research Institute (CFTRI), Mysore**

Cheluvamba Mansion, Valmiki Main Rd,  
opp. Railway Museum, Devaraja Mohalla,  
CFTRI Campus, Kajjihundi, Mysuru, Karnataka 570020

### **2. Krishi Vigyan Kendra Dhakrani**

Herbertpur-Poanta Sahib Rd, Vikasnagar, Uttarakhand 248142

### **3. 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

#### **4. MIT College of Food Technology, Pune**

Gate. No.140, Raj Baugh Educational Complex,  
Pune Solapur Highway,  
Loni Kalbhor, Pune – 412201  
Maharashtra, India

The Swayam portal (link: <https://swayam.gov.in/> ) can also be accessed for enhanced learning on business commerce, accounting, production, marketing, and areas of entrepreneurship.

Entrepreneurship programs that help to run businesses successfully are also available from institutes like the Entrepreneurship Development Institute of India (EDII), and their affiliation is 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.