Pre-Feasibility Study

Essential Oils Distillation Unit

Basil Oil

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1 EXECUTIVE SUMMARY

This project is about to produce essential oil through steam distillation process from 'Basil' (Ocimum Basilicum), also commonly known as 'Tulsi'. As essential oils extraction is a relatively young sector in Pakistan, we recommend that steam distillation process should be used in the beginning, which can be locally fabricated at affordable cost. As the sector would develop other more sophisticated methods can be used and new units can be brought in. As far as selecting the botanical herbs are concerned, one name has been selected, the herb is 'Basil' (Ocimum Basilicum), also commonly known as 'Tulsi'. This herb has been selected because its essential oil is in great demand around the world and production of A-Grade essential oil can be obtained in Pakistan.

Basil (Ocimum Basilicum) is one of the most famous herbs belonging to the family Lamiaccae. It is a native of Africa, India and Asia, cultivated in temperate climate throughout the world with about 150 varieties. In India and Pakistan, it is called “Tulsi”. Pakistan is blessed with an excellent climate and agriculture land quality. Both these factors contribute to the opportunity of production of highest-grade essential oils in Pakistan. The local climatic and soil conditions alter the chemotype (chemical composition) of essential oil in plants and make this essential oil most desirable

The essential oil distillation unit needs a total investment of about Rs. 3.457 million. Projected IRR, Net Present Value and Payback of this project are 31%, Rs 1,939,240 and 3.9 years respectively.

In this pre-feasibility study a complete steam distillation unit is proposed having a 'still', which has a capacity of holding one ton of herbal material for distillation at one time. Besides the steam distillation unit, a minimum 25 acres of land adjacent to the distillation unit would be required to grow the herb from which essential oil is to be extracted. At least 25 acres of land is required to grow the herb in such a quantity, which can be used to feed the distillation unit on constant basis at harvesting time.

2 INTRODUCTION

2.1 General Brief

Essential oil is an aromatic volatile substance (named after the French 'essence', not the English 'essential') extracted by distillation or expression from a single botanical species. The resulting oil should have nothing added either during or after this process. Essential oils are used as flavors and fragrances for food, soap, detergents, perfumes, lotions, etc.

This pre-feasibility has been prepared in order to provide general information on the opportunity for an investor to setup a steam distillation unit for extraction of essential oil from Basil (Tulsi), which would be specially grown for this purpose.

2.2 Project Rationale

Essential oils are obtained from blossoms, seeds, fruits, fruit peels, leaves, stems, barks, wood, roots, and plant secretions. Essential oils are found in hundreds of products but are generally used as odorants, flavorants, and pharmaceutical ingredients. As odorants, they are used in perfumes and other cosmetics, soaps, detergents, and other products ranging from animal feed to insecticides. As flavorants, they are present in a wide variety of foods, including soft drinks, baked products, ice creams, candy, confectionary, meat, and even pickle. As pharmaceutical ingredients, essential oils are used in dental products such as toothpaste, aromatherapy and phytotherapy products, and a large number of medicines.

Pakistan is blessed with an excellent climate and agriculture land quality. Both these factors contribute to the opportunity of production of highest-grade essential oils in Pakistan. The local climatic and soil conditions alter the chemotype (chemical composition) of essential oil in plants and make this essential oil most desirable.

The domestic Pakistani market for essential oils is infinitesimal and represents less than 1% of the world market. Therefore, the producers of essential oils in Pakistan would most likely be competing in the world market.

As a relatively new entrant to world market, it is imperative that the essential oils from Pakistan should fetch lower price in world market at the beginning. But once a regular supply is established, and the quality standard is consistently high, price and demand start to rise at very handsome rates.

2.3 Total Project Cost

The estimated cost of the project is about Rs. 3.457 million out of which the capital cost is Rs. 2.929 million and a provision for working capital is Rs. 0.528 million.

3 HOW ARE ESSENTIAL OILS OBTAINED?

Most commonly, the essence is extracted from the plant using a technique called 'distillation'. Since plants contain such a small amount of this precious oil, several hundred kilograms of plant material may be needed to produce a single ounce. There are four methods of distillation. The details are as follows:

3.1 Steam Distillation

Steam distillation is the most common method of extracting essential oils. Many old-time distillers favor this method for most oils, and say that none of the newer methods produces better quality oils. Steam distillation is done in a 'still'. Fresh, or sometimes dried, botanical material is placed in the plant chamber of the still and pressurized steam is generated in a separate chamber and circulated through the plant material. The heat of the steam forces the tiny intercellular pockets that hold the essential oils to open and release them. The temperature of the steam must be high enough to open the pouches, yet not so high that it destroys the plants or burns the essential oils. As the steam is released, the tiny droplets of essential oil evaporate and together with the steam molecules, travel through a tube into the still's condensation chamber. As the steam cools, it condenses into water. The essential oil forms a film on the surface of the water. To separate the essential oil from the water, the film is then decanted or skimmed off the top. The remaining water, a byproduct of distillation, is called floral water, distillate, or hydrosol. It retains many of the therapeutic properties of the plant, making it valuable in skin care for facial mists and toners. In certain situations, floral water may be preferable to pure essential oil; such as when treating a sensitive individual or a child, or when a more diluted treatment is required.

3.2 Cold Pressing or Cold Compression

Another method of extracting essential oils is cold pressed expression, or scarification. It is used to obtain citrus fruit oils such as bergamot, grapefruit, lemon, lime, mandarin, orange, and tangerine oils. In this process, fruit rolls over a trough with sharp projections that penetrate the peel. This pierces the tiny pouches containing the essential oil. Then the whole fruit is pressed to squeeze the juice from the pulp and to release the essential oil from the pouches. The essential oil rises to the surface of the juice and is separated from the juice by centrifugation.

3.3 Solvent Extraction

Another method of extraction used on delicate plants is solvent extraction, which yields a higher amount of essential oil at a lower cost. In this process, a chemical solvent such as 'hexane' is used to saturate the plant material and pull out the aromatic compounds. This renders a substance called 'concrete'. The concrete can be dissolved in alcohol to remove solvent. When the alcohol evaporates, an 'absolute' remains. Although solvent extraction is a cost-efficient process, it has certain disadvantages. Residues of the solvent may remain in the absolute and they can

cause side effects. While absolutes or concretes may be fine for fragrances or perfumes, they are not desirable for skin care applications.

3.4 Carbon Dioxide (CO_2) Extraction

Supercritical carbon dioxide extraction uses carbon dioxide under extremely high pressure to extract essential oils. Plants are placed in a stainless steel tank and, as carbon dioxide is injected into the tank, pressure inside the tank builds. Under high pressure, the carbon dioxide turns into a liquid and acts as a solvent to extract the essential oils from the plants. When the pressure is decreased, the carbon dioxide returns to a gaseous state, leaving no residues behind. Many carbon dioxide extractions are fresher, cleaner, and crisper aromas than steam-distilled essential oils, and they smell more similar to the living plants. Scientific studies show that carbon dioxide extraction produces essential oils that are very potent and have great therapeutic benefits. This extraction method uses lower temperatures than steam distillation, making it more gentle on the plants. It produces higher yields and makes some materials, especially gums and resins, easier to handle. Many essential oils that cannot be extracted by steam distillation are obtainable with carbon dioxide extraction.

4 VIABLE ECONOMIC SIZE

Before defining viable economic size of the proposed project, certain important aspects have to be decided before hand. First of all we have to decide which distillation process should be used and which botanical herb(s) should be cultivated for essential oil extraction and over what area.

As essential oils extraction is a relatively young sector in Pakistan, we recommend that steam distillation process should be used in the beginning, which can be locally fabricated at affordable cost. As the sector would develop other more sophisticated methods can be used and new units can be brought in. As far as selecting the botanical herbs are concerned, one name has been selected, the herb is 'Basil' (Ocimum Basilicum), also commonly known as 'Tulsi'. This herb has been selected because its essential oil is in great demand around the world and when they are cultivated in Pakistan, its chemotype (the ratio of different chemicals in a compound) changes to the most desirable combination of chemicals and produces A-Grade essential oil. This is because of the land and water quality in this region.

After deciding about the two basic requirements, we can now arrive at a basic viable economic model for the project. A complete steam distillation unit having a 'still', which has a capacity of holding one ton of herbal material for distillation at one time. Besides the steam distillation unit, a minimum 25 acres of land adjacent to the distillation unit would be required to grow the herb from which essential oil is to be extracted. At least 25 acres of land is required to grow the herb in such a quantity, which can be used to feed the distillation unit on constant basis at harvesting time.

5 CURRENT INDUSTRY STRUCTURE

World total production of essential oils is estimated at about 100,000 to 110,000 MT. USA is the largest producer and consumer of essential oils. The ten major essential oil crops account for 80% of the world market for essential oils.

The major essential oil world crops are Citrus (USA, Brazil, Mexico), mint oils such as peppermint (USA), spearmint (USA) and lemon fragrance oils such as citronella, lemongrass and listsea cubeba (China, India, South America). Eucalyptus oil is produced in Brazil, China, and South Africa, as well as in Australia. Cedarwood oil is confined to North America as a by-product of the timber industry. The clove industry is confined to Indonesia. The remaining 20% of the world essential oil market comprise over 150 crops. Most current essential oil producing countries, apart from the USA, have low labor costs. The major consumers of essential oils are the USA (40%), Western Europe (30%) and Japan (7%).

The domestic Pakistani market for essential oils is infinitesimal and represents less than 1% of the world market. At present, the local production of essential oils is almost non-existent. Only three people are actively running distillation units and extracting essential oils. They are Mian Faiz Rasool in Harappa, Dr. Rana Aslam Khan (Chairman Dept. of Horticulture, University of Agriculture - Faisalabad), and Mr. Nadir Khan in Swabi. Mr. Yawar Hussain Abdullah, who is from Madagascar, is the consultant of Malik Bashir Awan in Multan. He is an expert on basil oil.

Mainly wholesalers, who also happen to be the importers, control the domestic market of essential oils. Essential oils are imported for perfumery, pharmaceutical, cosmetics, toiletries, and confectionery industry. Multinational companies import essential oil themselves and through these major wholesalers. The two major wholesale markets for essential oils in Pakistan are Lahore and Karachi.

Standard Manufacturing Company has a monopoly in the distribution of essential oils at retail level in local market. Standard Manufacturing Company buys essential oils from different importers, repack it in different size bottles and then market it at retail and wholesale level under its own brand name. They virtually control the domestic market of essential oils, which are sold in oil form.

6 SALES & MARKETING ISSUES

The traditional structure for marketing of essential oils has commenced with the producer who sells to the flavour and fragrance houses who may or may not undertake some value adding to the product before it is sold to the end user who may be a food processing, pharmaceutical, soap, toothpaste, or perfumery company. Traders, agents and brokers who use their knowledge of market niches and buy directly from the producers and sell directly to the flavour houses or end users, have also supplemented this system.

In recent years, there have been some interesting trends in the marketing of essential oils around the world. Firstly, as producers have grown larger, there has been a trend for the end users to deal directly with the producer, which has been

advantageous to both parties in terms of price, resolution of issues relating to quality and also to ensure a consistent supply and demand.

A second and more recent trend has been the increase and centralization in R&D being undertaken by the major flavour houses. The major flavour houses, in order to maintain their position in the market, are now developing new flavors, mixes, etc. in accordance with the changing tastes and preferences of the consumer. The flavour houses then sell this new flavour to the end processor. This development on behalf of the flavour houses is in addition to the made-to-order products that the end user has traditionally requested from the flavour houses.

From the producers' viewpoint, the objective ought to be to establish contracts with the end user and to remain alert that all the requirements of the user, in relation to that essential oil, are being met. Flavour houses should not be neglected as they are developing the products of the future, and therefore, constitute an ideal route to get into essential oils market, although this route can be slow and arduous. Traders and brokers do have the capacity to move large quantities, but in a long-term arrangement, direct contact with end user is the ideal route for the producers.

Marketing of essential oils is extremely quality dependant. Therefore, the product should be value-added and targeted into niche markets rather than sold as bulk oil. Once, end users develop a product using specific oil, they often resist changing the suppliers as this may change the product. Therefore, it is often difficult for new producers to break into the market but once they have, they can easily expect constant demand. Knowledge of essential oil markets and good marketing skills always assist in marketing the product.

Based on the above mentioned scenario of essential oils marketing, the oil suggested in this pre-feasibility, Basil oil, should be sold to traders/wholesalers in the beginning as there exists the problem of acceptance of quality in international market. Getting your product accepted in international market is patience-testing and slow moving process. But once it is established, the price and demand both increase at a fast pace.

Basil oil is used mostly in perfumes, main market for Basil oil is France

7 PROJECT INPUTS

Following inputs are required for the project:

7.1 Land & Building

The basic requirement for this project, as is for any project, is land and building. One kanal plot would be required for housing the distillation unit and the office building. This one kanal plot would be part of the 25-acre field, which would be used for growing the herb from which essential oil would be extracted.

The land would be leased and average lease rate in most parts of Punjab is around 15,000 rupees per acre per year. For 25 acres it would be 375,000 rupees per year.

Table 6- 1: Area requirement for Construction

Description	Area (sq. ft)	Construction (Rs./sq. .ft)	Total in (Rs)
Management building	300	600	180,000
Production Area	1,500	350	525,000
Raw Material Store	500	350	175,000
Total Construction Cost	**2,300**		**880,000**

7.2 Machinery & Equipment

Steam distillation method of extraction would be used for extracting essential oils from Basil. The steam distillation unit would be fabricated locally and would be made of stainless steel. A 'steam generator' and a 'De-ionizing Plant' would accompany the distillation unit to complete the system.

Table 6 - 2: Machinery & Equipment Details

	Unit	Cost	Total Cost (Rs.)
De-ionizing Plant	1	500,000	500,000
Steam generator	1	500,000	500,000
Extractor	1	600,000	600,000
Farm Tools			100,000
Total Machinery			**1,700,000**
Contingencies @ 3%			51,000
Total Machinery & Equipment			**1,751,000**

De-ionizing plant is important, because for generating steam for distillation, water, which has ion percentage of less than 1%, is required. The de-ionizing plant would cost approximately about Rs. 500,000. It is easily available in local market.

Next requirement is a 'steam generator', which can generate a pressure of 4 Bar. It is sufficient for providing steam for a 'still', which can hold one metric ton of tightly packed herb for distillation at one time. This steam generator is fabricated locally. It would use diesel as fuel for generating steam. Approximate price of a steam generator is Rs. 500,000. This steam generator burns one liter of diesel every hour, making it a very cost effective and efficient source of generating steam.

The actual unit would consist of three main parts, a ‘still (Extractor)', a 'condenser', and a 'Florentine flask (Separator)'. These three parts would be mounted on a platform. Herbal material would be stuffed in the main belly of the 'still' over a mesh. The holding capacity of the 'still' would be one metric ton of tightly packed material at one time, which means the main belly of the 'still' would have a volume of approximately 5,000 liters. Besides 'still', there will be one 'condenser', where steam would be condensed back into liquid form, and a 'Florentine flask' where liquid would collect after condensation and oil would be separated from water. The complete distillation unit, properly mounted upon the platform, would cost approximately Rs. 1,600,000.

7.3 Basil Seed

7.3.1 Basil (Sweet Basil, Basil Linalool, Ocimum Basilicum)

There are several types of basil oil in international market, each derived principally from different cultivars or chemo types of sweet basil. The varieties used around the world are European French or Sweet Basil, Egyptian, and Reunion or Comoro. The European type is considered to be the highest quality, and characteristically contains linalool and methyl chavicol. Egyptian oil has lower quantity of linalool and higher concentration of methyl chavicol. Renuion or Comoro type has almost no linalool, whereas, the concentration of methyl chavicol is maximum. Methyl chavicol is moderately toxic, may be carcinogenic and is irritating to the skin.

We recommend that European/French type basil be cultivated here for extracting its essential oil. When this variety is grown in Pakistan, the soil and climatic conditions alters its chemotype and makes it most desirable for international market. This is so because it contains more than 40% linalool and about 10-15% methyl chavicol, which makes it A-Grade oil in international market.

The best quality European/French basil is known as 'Grand Vert'. The seed would be imported from France. One-kg seed costs about 10,000 rupees and is enough for plantation of eight acres. About 3.5-kg seed would be required for plantation of 25 acres. Transplant, rather then direct seed sowing, is recommended. Seed would be sowed for saplings around mid January. Emergence occurs within 10 to 14 days. Germination rate is about 90%. To encourage lateral branching and growth, the tops of saplings can be trimmed prior to field planting, when they are about 6 inches tall. By the second week of March, these saplings are ready to be transplanted into the open field.

Rows 24 to 36 inches apart, with plants spaced every 6 inches in each row are recommended. Basil can also be planted in a bed of 3 rows, 12 inches apart with 12 inches between rows. Large variations in growth and yield may occur due to climate conditions, plant type, and management practices.

Harvesting depends upon projected use. For essential oil, basil is harvested at full bloom. It is grown as a short-lived perennial with 3 to 5 cuttings per year. But in our climatic conditions, on average 3 cuttings are available every year. First cutting is available after 12-15 weeks after transfer to the field. Second and third cutting each is available after 60-70 days from last cutting.

Total cost of seed every year would be about Rs. 105,000. Land preparing and saplings growing would cost roughly Rs. 5,000 per acre per year.

7.4 Fertilizers

Fertilizer applications usually depend upon soil type and cropping history. For Basil, although there are no specific recommendations, but generally it is suggested that NPK, Potash (Sulphate), and Urea (For Nitrogen) be used in ratio of 1-1-1, i.e. one bag of each type, at the time of land preparation. The recipe should be repeated

shortly after first cutting. NPK, Potash, and Urea each cost approximately 1200 rupees, 1900 rupees, and 700 rupees per bag. So total cost of fertilizers for one acre of basil plantation comes out to be 3,800 rupees per year.

7.5 Electricity & Water

As the land is leased hence the electricity connection is already installed. Water is an important requirement for a steam distillation unit as well as the herb that is planted for essential oil extraction. For steam generator, a regular supply of clean water is necessary. Therefore, a water pump would have to be installed. The average cost of water and upkeep of water channels costs about 1,500 rupees per acre per year. Basil doesn't needs much water. It doesn't tolerate moisture stress. Although, water is required at regular intervals, but the quantity of water should be small.

7.6 Diesel

Diesel would be required for two purposes. First, as fuel for steam generator, and second, for electricity generator and peter engine of water pump. For steam generator, diesel is used at the rate of one liter per hour. For electricity generator, diesel consumption is estimated around half liter per hour, and for peter engine it is two liters per hour.

7.7 Human Resource Requirement

For managing a 25-acre farm, about seven people would be required.

Table 6- 3: Human Resource requirement

	Number of Personnel	Monthly Salary (Rs)	Annual Salary in (Rs)
Production Manager	1	15,000	180,000
Accountant	1	12,000	144,000
Foreman	1	12,000	144,000
Semi Skilled Workers	6	7,000	504,000
Total	**9**	**81,000**	**972,000**

Out of these seven, one would be the foreman and other six will be semi-skilled workers. Similarly, one production manager and one accountant would be hired for the distillation unit who will see the other operations of the business.

7.8 Packaging

The essential oil extracted would be packed in plastic drums. The international packing standard is 30-kg plastic drum. It is what would be used for packing at the proposed distillation unit. The number of drums used would depend upon the quantity of essential oil extracted. The cost of an export quality plastic drum, which can hold 30-kg of oil, would roughly cost Rs. 750. Used drums are easily available from Shah Alam market, Lahore. The price can vary at times, but generally this is

the average price charged. The only important point is that booking should be secured in advance, as these drums are also used extensively in local market for other purposes also.

7.9 Office Equipment

Details of office equipment requirements are mentioned below:

Table 6 - 4: Office equipment requirement

	Unit	Cost / Unit	Total Cost (Rs.)
Computer	1	28,000	28,000
Printer	1	12,000	12,000
UPS	1	8,500	8,500
Telephone Set	1	1,000	1,000
Total			**49,500**

7.10 Furniture & Fixture

Details of Furniture & Fixture requirements are mentioned below:

Table 6 - 5: Furniture & Fixture requirement

	Total Cost (Rs.)
Furniture Set	50,000
Electrical Fittings	20,000
Total	**70,000**

8 OUTPUT

The essential oil extraction percentage for French Basil is 0.23%. Approximately 11,500 kg of plant material is harvested for extraction per acre per cutting. Plant material should be harvested at early hours or late afternoon, because as sunlight increases it reduces the quantity of oil from the plant. Pickers would cut the plant material, load it on the carriage cart and bring it to the distillation unit for onward processing. Loading the plant material in the distillation 'still' should be done carefully. The plant material should be packed tightly inside the still so that when steam is passing through it, maximum oil is extracted.

It takes about four hours to complete distillation of 1,000 kg of plant material. At 0.2% extraction rate, two kilograms of essential oil would be extracted from 1,000 kg plant material. Approximately 22-kg essential oil would be extracted per acre per cutting (Three cuttings per acre per year). A total of approximately 1,750 kg of essential oil would be available for commercial sale every year.

It takes about four hours to distil 1,000 kg of plant material.

9 SELLING ISSUE

Sale of extracted essential oil is an important issue. The proposed project is export based. Basil oil do not have any significant local market. Basil is used mainly in perfumery industry and therefore, France is the main market for selling basil oil.

Although A-grade basil oil sells from 400 to 1,300 French Francs per kilogram (1 French Frank = 17 PKR), it is not possible to get this price in the beginning. It is a time consuming process to get your product recognized at the international level. It can take up to three years to achieve this target at times. The buyers are the wholesale dealers of essential oils in France. Although the quality of basil oil produced in Pakistan is A-grade, according to industry experts, it is not possible to get a price of more than 100 French Francs per kilogram in the beginning, i.e. 1,825 rupees per kilogram.

10 PROJECT'S ECONOMICS*

10.1 Project's Returns

Total Investment (Rupees)	Rs. 3.457 millions
Project IRR	31%
Payback Period (Years)	3.9
Net Present Value	1,939,240

11 REGULATIONS

There are no specific government regulations, which affect this project. If a steam boiler would have been used, then there were a lot of regulations, which need to be followed. But as we have recommended steam generator with a pressure of 4-bar, it helps avoid any government regulations that may affect this project negatively.

12 KEY SUCCESS FACTORS

There are certain factors, which would make this project a successful business venture, which are:

- Growing international demand for high quality essential oils.
- Ideal local climatic and soil conditions, which produce the best chemotype in herbs that are used for essential oil extraction.
- Availability of fertile land at very low rent rate.
- Low production cost compared to international standards.
- Easy availability of low cost labor.

* *For details please see attached financial statements at the end.*

13 Threats

As it is for any project, this project would also face certain threats. A serious threat is the destruction of cultivated herb due to a number of reasons like pest attack, extreme temperatures, and excessive rain.

Another threat is fall in international demand and consequent fall in price. Although this is a distant threat yet, it cannot be ignored.

14 FINANCIAL ANALYSIS - BASIL OIL

14.1 Project Costs - Basil Oil

PROJECT COSTS SCHEDULE- BASIL OIL			
Plant and Machinery			1,751,000
Furniture and Fixture			70,000
Office Equipment			49,500
Pre operating Expenses			98,000
Building Civil work Cost			880,000
Contingencies			80,000
Fixed Assets			**2,928,500**
Initial working Capital			528,299
Total Project Costs			**3,456,799**
Financing			
	Bank	50%	1,728,399
	Equity	50%	1,728,399
Total Financing		100%	**3,456,799**
Project Returns			
	IRR		**31%**
	Pay Back period Years		**3.9**
	NPV Rs.		**1,939,240**

14.2 Income statement - Basil Oil

Projected Income Statement	Essential Oil									
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**
Sales	**3,193,143**	**3,512,458**	**3,863,703**	**4,250,074**	**4,675,081**	**5,142,589**	**5,656,848**	**6,222,533**	**6,844,786**	**7,529,265**
Seed, Fertilizer, Water	357,350	375,218	393,978	413,677	434,361	456,079	478,883	502,827	527,969	554,367
Wages and salaries	648,000	712,800	784,080	862,488	948,737	1,043,610	1,147,972	1,262,769	1,389,046	1,527,950
Diesel Cost	189,696	208,666	229,532	252,485	277,734	305,507	336,058	369,664	406,630	447,293
Repair and Maintenance	17,510	17,685	17,862	18,041	18,221	18,403	18,587	18,773	18,961	19,150
Cost of Sales	1,212,556	1,314,368	1,425,452	1,546,691	1,679,053	1,823,600	1,981,500	2,154,033	2,342,605	2,548,761
Gross Profit	**1,980,587**	**2,198,089**	**2,438,251**	**2,703,382**	**2,996,028**	**3,318,989**	**3,675,348**	**4,068,500**	**4,502,181**	**4,980,504**
Administrative Staff salary	324,000	356,400	392,040	431,244	474,368	521,805	573,986	631,384	694,523	763,975
Telephone & telex	18,000	18,540	19,096	19,669	20,259	20,867	21,493	22,138	22,802	23,486
Printing & stationery	24,000	24,720	25,462	26,225	27,012	27,823	28,657	29,517	30,402	31,315
Legal & professional charges	20,000	20,600	21,218	21,855	22,510	23,185	23,881	24,597	25,335	26,095
Electricity	30,000	33,000	36,300	39,930	43,923	48,315	53,147	58,462	64,308	70,738
Bad Debts	3,041	3,345	3,680	4,048	4,452	4,898	5,387	5,926	6,519	7,171
Entertainment	12,000	12,360	12,731	13,113	13,506	13,911	14,329	14,758	15,201	15,657
Land Rent rent	375,000	393,750	413,438	434,109	455,815	478,606	502,536	527,663	554,046	581,748
Depreciation Plant & Machinery	175,100	175,100	175,100	175,100	175,100	175,100	175,100	175,100	175,100	175,100
Depreciation on F& F	7,000	7,000	7,000	7,000	7,000	7,000	7,000	7,000	7,000	7,000
Traveling & conveyance	12,000	12,360	12,731	13,113	13,506	13,911	14,329	14,758	15,201	15,657
Amortization	19,600	19,600	19,600	19,600	19,600					
Others	10,000	10,300	10,609	10,927	11,255	11,593	11,941	12,299	12,668	13,048
Operating Expenses	1,029,741	1,087,075	1,149,004	1,215,933	1,288,308	1,347,014	1,431,785	1,523,603	1,623,105	1,730,991
Operating Profit	**950,846**	**1,111,014**	**1,289,247**	**1,487,449**	**1,707,721**	**1,971,975**	**2,243,563**	**2,544,897**	**2,879,076**	**3,249,513**
Less:										
Financial expenses	259,071	216,812	167,273	109,200	41,123	-	-	-	-	-
	259,071	216,812	167,273	109,200	41,123	-	-	-	-	-
Profit Before Taxation	691,775	894,202	1,121,974	1,378,249	1,666,597	1,971,975	2,243,563	2,544,897	2,879,076	3,249,513
Income Tax	103,766	156,485	235,615	344,562	416,649	492,994	560,891	636,224	719,769	812,378
Net profit After Taxation	**588,009**	**737,717**	**886,359**	**1,033,687**	**1,249,948**	**1,478,981**	**1,682,672**	**1,908,673**	**2,159,307**	**2,437,135**

14.3 Cash Flow Statement - Basil Oil

Essential Oil **Cash Flow Statement**											
Operating activities	**Year 0**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**
Net profit	-	588,009	737,717	886,359	1,033,687	1,249,948	1,478,981	1,682,672	1,908,673	2,159,307	2,437,135
Amortization (Pre-operational Expenses)	-	35,600	35,600	35,600	35,600	35,600	-	-			
Depreciation	-	275,050	275,050	275,050	275,050	275,050	275,050	275,050	275,050	275,050	275,050
Raw Material Inventory	-	(125,073)	(6,254)	(6,566)	(6,895)	(7,239)	(7,601)	(7,981)	(8,380)	(8,799)	184,789
Finished Goods Inventory	-	(17,017)	(851)	(893)	(938)	(985)	(1,034)	(1,086)	(1,140)	(1,197)	(1,257)
Accounts receivable	-	(149,013)	(14,901)	(16,391)	(18,031)	(19,834)	(21,817)	(23,999)	(26,399)	(29,038)	(31,942)
Accounts payable	-	34,459	(7,211)	1,362	1,431	1,502	1,577	1,656	1,739	1,826	(11,942)
Tax Payable		103,766	52,719	79,129	108,948	72,087	76,344	67,897	75,334	83,545	92,609
Building rent prepayments	(375,000)										
Prepaid Payments		375,000									
Cash provided by operations	(375,000)	1,120,781	1,071,869	1,253,650	1,428,852	1,606,129	1,801,500	1,994,209	2,224,876	2,480,692	2,944,442
Financing activities											
Long term debt principal repayment		(245,305)	(287,564)	(337,103)	(395,175)	(463,253)	-	-	-	-	-
Addition to long term debt	1,728,399										
Owner's investment	1,728,399										
Cash provided by/ (used for) financing acti	3,456,799	(245,305)	(287,564)	(337,103)	(395,175)	(463,253)	-	-	-	-	-
Investing activities											
Capital expenditure	(2,928,500)			-	-	-	-	-	-	-	-
Cash (used for)/ provided by investing acti	(2,928,500)	-	-	-	-	-	-	-	-	-	-
Net Cash	**153,299**	**875,477**	**784,305**	**916,547**	**1,033,676**	**1,142,877**	**1,801,500**	**1,994,209**	**2,224,876**	**2,480,692**	**2,944,442**

14.4 Balance Sheet - Basil Oil

Essential Oil											
Balance Sheet											
Capital and Reserves	**Year 0**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**
Share Capital	1,728,399	1,728,399	1,728,399	1,728,399	1,728,399	1,728,399	1,728,399	1,728,399	1,728,399	1,728,399	1,728,399
Reatined Earnings	-	588,009	1,325,726	2,212,085	3,245,772	4,495,720	5,974,701	7,657,373	9,566,046	11,725,353	14,162,488
	1,728,399	**2,316,408**	**3,054,125**	**3,940,484**	**4,974,171**	**6,224,119**	**7,703,100**	**9,385,773**	**11,294,446**	**13,453,752**	**15,890,887**
Long Term Loan	**1,728,399**	**1,483,094**	**1,195,531**	**858,428**	**463,253**	**0**	-	-	-	-	-
Current Liabilities											
						-	-	-	-	-	-
Tax Payable		103,766	156,485	235,615	344,562	416,649	492,994	560,891	636,224	719,769	812,378
Accounts Payable	-	34,459	27,248	28,610	30,041	31,543	33,120	34,776	36,515	38,341	26,398
	-	**138,225**	**183,733**	**264,225**	**374,603**	**448,192**	**526,114**	**595,667**	**672,739**	**758,110**	**838,777**
	3,456,799	**3,937,728**	**4,433,389**	**5,063,137**	**5,812,027**	**6,672,312**	**8,229,214**	**9,981,440**	**11,967,185**	**14,211,862**	**16,729,664**
Fixed Assets											
Plant and Machinery	1,751,000	1,575,900	1,400,800	1,225,700	1,050,600	875,500	700,400	525,300	350,200	175,100	-
Building & Civil Works Cost	880,000	792,000	704,000	616,000	528,000	440,000	352,000	264,000	176,000	88,000	-
Furniture an Fixture	70,000	63,000	56,000	49,000	42,000	35,000	28,000	21,000	14,000	7,000	-
Office Equipment	49,500	44,550	39,600	34,650	29,700	24,750	19,800	14,850	9,900	4,950	-
Fixed Assets	**2,750,500**	**2,475,450**	**2,200,400**	**1,925,350**	**1,650,300**	**1,375,250**	**1,100,200**	**825,150**	**550,100**	**275,050**	**-**
Pre-operating expenses & Contengencies	178,000	142,400	106,800	71,200	35,600	-					
Current Assets											
Advance rent	375,000	-	-	-	-	-	-	-	-	-	-
Raw Material Inventory	-	125,073	131,326	137,892	144,787	152,026	159,628	167,609	175,990	184,789	-
Finished Goods Inventory		17,017	17,868	18,761	19,699	20,684	21,718	22,804	23,944	25,141	26,398
A/C Receivable(Net of Bad Debts)	-	149,013	163,915	180,306	198,337	218,170	239,987	263,986	290,385	319,423	351,366
Cash/Bank	153,299	1,028,775	1,813,081	2,729,628	3,763,304	4,906,181	6,707,681	8,701,890	10,926,766	13,407,458	16,351,900
	528,299	1,319,878	2,126,189	3,066,587	4,126,127	5,297,062	7,129,014	9,156,290	11,417,085	13,936,812	16,729,664
	3,456,799	**3,937,728**	**4,433,389**	**5,063,137**	**5,812,027**	**6,672,312**	**8,229,214**	**9,981,440**	**11,967,185**	**14,211,862**	**16,729,664**

15 Key Assumptions

Table 15-1: Revenue Assumptions

Sale Price in Year 1	Rs. 1,825
Sale Price Growth Rate	10%
Extraction of Basil Oil in 1,000 Kg Basil	2.3

Table 15-2: Operating Assumptions

Working Hours a Day	12
No of Working days	210

Table 15-3: Cash Flow Assumptions

Accounts Recieveable in Days	10
Accounts Payable in days	15
Raw Material Inventory in Days	70

Table 15-4: Expense Assumptions

Factory Overhead Growth Rate	5%
Machine Maintenance (% of sale)	1%
Upfront Land Lease (in months)	12
Growth Rate of Land Lease	5%
Growth Rate of Raw Material	5%

Table 15-5: Financial Assumptions

Financial Projections (in years)	10
Debt	50%
Equity	50%
Interest Rate on long-term loan	16%
Debt Tenure (in years)	5
Debt Payments per year	12

16 Annexure

Table 16 - 1: Raw Material & Machinery Suppliers

Raw Material Suppliers	Machinery Suppliers
Al-Maryam International A / 1284, Main Market Road, Hyderabad, Sindh Phone: 92-22-2617906 Mobile: 03003010717 Fax: 92-22-2612877 Web: www.almintl.webs.com	**Noorani Industries (Pvt) Ltd.** Samundri Road, Faisalabad - 38090, Pakistan. Tel: +92 41 8544 683, 8541 456 Fax: +92 41 8545 692 Mobile: 0300-8650205 Web: www.noorani.pk Email: noorani@fsd.comsats.net.pk
Niladri Exports Address: B/4064, Oberoi Garden Estate, Chandivali, Andheri (East), Mumbai - 400072, Maharashtra, India Phone: 91-22-28472041/28472042 Mobile: +919821030642 Fax: 91-22-28472043	**DDFC (Pvt.) Ltd** 27 KM Multan Road, Lahore-52801, Pakistan Tel: (0800-33321) www.ddfcgroup.com

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