150. PROFILE ON CARAWAY PROCESSING AND PACKING

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I. SUMMARY

This profile envisages the establishment of a plant for the processing and packing of caraway with a capacity of 150 tonnes per annum.

The present demand for the proposed product is estimated at 1,887 tonnes per annum. The demand is expected to reach at 3163 tonnes by the year 2020.

The plant will create employment opportunities for 20 persons.

The total investment requirement is estimated at Birr 2.61 million, out of which Birr 1.1 million is required for plant and machinery.

The project is financially viable with an internal rate of return (IRR) of 19 % and a net present value (NPV) of Birr 1.05 million discounted at 8.5%.

II. PRODUCT DESCRIPTION AND APPLICATION

Caraway consists of the dried ripe fruits of Carum Carvi Linn. The characteristic agreeable aroma and sweet but slightly sharp taste is due to the presence of caraway oil (3-8%), protein, calcium oxalate, colouring matter, resins, sugar, tannins, and mucilage.

Caraway seeds are widely used for culinary purposes and flabouring bread, biscuits, cakes, cheese, apple sauce and cookies. They are an important ingredient of sausages and pickles.

Caraway seeds act as a mild stomachic and carminative. The young leaves of the caraway plant may be used in soups.

III. MARKET STUDY AND PLANT CAPACITY

A. MARKET STUDY

1. Past Supply and Present Demand

Caraway seed (Carum carvi), a member of the carrot family (Umbelliferae) contains two main essential oils, carvone (50-60%) and limonene (35-45%). The oil is secreted in ducts located in the pericarp of the fruit.

The primary use of caraway is for culinary purposes; however, it also has industrial and medicinal functions. The entire caraway plant is edible; the roots may be cooked similar to carrots and the leaves can be used in salads. The main culinary market for caraway, however, is for its seeds, which may be used as a spice to flavour foods such as breads, meats, and cheese. Medicinal uses of caraway are very broad and can relieve a wide range of ailments including toothaches, indigestion, eye infections, and colic. Additionally, caraway may be used as an antiseptic. More recently, it has been discovered that the largest constituent of the oil, carvone, has potential uses as an insect repellent, as a suppressant of sprouting in stored potatoes, and for inhibiting the growth of some fungi.

Since food processing plants are not well developed in Ethiopia, the product is mainly for export market.

The international export market for caraway was valued at 12.52 million USD in 2005, indicating an increase of 3.5 percent compared to 2001. The world total caraway export was 8,904 tons during 2005. The major exporters of the product are Canada, Finland and Poland with 26%, 13% and 11% share of the total export respectively (see Table 3.1).

Table 3.1

VOLUME AND VALUE OF WORLD CARAWAY SEED EXPORT

Total / Major Exporting Countries	Value (USD 000)	Quantity (TON)	Quantity % Share
World total	**12,526**	**8,904**	**100**
Poland	2,181	1,042	12
Canada	2,044	2,291	26
Finland	1,842	1,154	13
Netherlands	1,118	707	8
Germany	979	422	5
Egypt	976	936	11
Others	3,386	2,352	26

***Source** – ITC, calculation based on COMTRADE statistics.*

The major importers of caraway are USA, Germany and Austria accounting for 34%, 23% and 5% of the total import (See Table 3.2).

Table 3.2

VOLUME AND VALUE OF WORLD CARAWAY SEED IMPORT

Total / Major Importing Countries	Value (USD 000)	Quantity (TON)	Quantity % Share
World total	**11,824**	**9,439**	**100**
USA	3,168	3,254	34
Germany	2,430	2,159	23
Austria	827	517	5
Netherlands	689	509	5
Czech Republic	611	170	2
Others	4,099	2,830	30

***Source** – ITC, calculation based on COMTRADE statistics.*

The 2005 level of global caraway import is assumed to approximate the current demand for the product. Accordingly, the present global demand for caraway is estimated to be 9,439 tons.

2. Projected Demand

In projecting the global demand for caraway the average growth rate of the product's export registered during 2001 - 2005 i.e. 3.5% is assumed to continue in the near future. Accordingly, taking the estimated present global demand as a base and applying a 3.5 % growth rate the projected demand for the product is shown in Table 3.3. Moreover, it is assumed that with an aggressive marketing effort caraway export from Ethiopia will capture about 20% market share.

Table 3.3

PROJECT GLOBAL DEMAND AND ETHIOPIA'S MARKET SHARE

Year	Projected Global Demand	Ethiopia's Market Share (20%)
2008	9,769	1,954
2009	10,111	2,022
2010	10,465	2,093
2011	10,831	2,166
2012	11,211	2,242
2013	11,603	2,321
2014	12,009	2,402
2015	12,429	2,486
2016	12,864	2,573
2017	13,315	2,663
2018	13,781	2,756
2019	14,263	2,853
2020	14,762	2,952
2021	15,279	3,056
2022	15,814	3,163

3. Pricing and Distribution

Based on current international price of the product a Factory get price of Birr 25,000 per ton is recommended for the envisaged plant. The product can be directly exported to end users.

B. PLANT CAPACITY AND PRODUCTION PROGRAMME

1. Plant Capacity

The annual production capacity of the envisaged project is 150 tons of caraway powder, based on 300 working days per annum and single shift (8 hours) per day.

2. Production Programme

At the initial stage of the production period, the plant requires some years to penetrate into the market. Therefore, in the first and second year of production, the capacity utilization rate will be 70% and 90%, respectively. In the third year and thereafter, full capacity production shall be attained. The production programme is indicated in Table 3.4.

Table 3.4
PRODUCTION PROGRAMME

Description	Production Year		
	1	2	3-10
Caraway powder	105	135	150
Capacity utilization rate (%)	70	90	100

IV. MATERIAL AND INPUT

A. RAW AND AUXILIARY MATERIALS

The annual raw and auxiliary materials requirement and cost is indicated in Table 4.1.

Table 4.1

ANNUAL RAW AND AUXILIARY MATERIAL REQUIREMENT & COST

Sr. No.	Materials	Unit	Qty	Cost ('000 Birr)
1	Caraway fruits	ton	165	2,475
2	Packing material	kg	7,500	262.5
	Total			**2,737.5**

B. UTILITY

Electricity and water are utilities of the project. The annual utility requirement and cost is shown in Table 4.2

Table 4.2

UTILITY REQUIREMENT & COST

Sr. No.	Utility	Unit	Qty.	Cost ('000 Birr)
1	Electricity	kWh	120,000	56.88
2	Water	m3	1,000	10
	Total			**66.88**

V. TECHNOLOGY AND ENGINEERING

A. TECHNOLOGY

1. Process Description

Caraway is washed manually to remove dirts, soil and other adhering materials. It is then dried. Sun drying is widely used. Drying is followed by powdering in disintegrators /mills and micropulverizer. The power is then sifted and tested according to standard procedures depending on the mode of marketing. It is then packed for sales.

2. Source of Technology

Caraway processing plant can be acquired from different suppliers. The following company may be requested for an offer.

Food and Biotech Engineers
Kwaja, Faridbad, Haryana – 121003, India
Tel. +91 -129-2510924

B. ENGINEERING

1. Machinery and Equipment

The list of machinery and equipment required for the production of caraway powder is indicated in Table 5.1. The total cost of machinery and equipment is estimated at Birr 1,100,000, of which Birr 916,667 is required in foreign currency.

Table 5.1

LIST OF MACHINERY & EQUIPMENT

Sr. No.	Description	Qty
1	Disintegrator	1
2	Vibratory screen	1
3	Micropulverizer	1
4	Sifting machine	1
5	Weighing and packing	1
6	Miscellaneous equipment	Lumpsum

2. Land, Building and Civil Work

The total land required by the project is about 1,000 m^2 out of which the built-up area is about 300 m^2. The cost of building is thus estimated at Birr 450,000. The lease value of land is Birr 80,000 at a rate of one Birr per m^2 per annum for 80 years.

3. Proposed Location

Masha town is one of the best location of the envisaged project for its proximity to potential raw material sources.

VI. MANPOWER & TRAINING REQUIREMENT

A. MANPOWER REQUIREMENT

The envisaged project requires 20 work force. The list of manpower and labour cost is indicated in Table 6.1. The total annual labour cost is estimated at Birr 216,000.

Table 6.1

MANPOWER REQUIREMENT & LABOUR COST

Sr. No.	Manpower	Req. No.	Monthly Salary (Birr	Annual Salary (Birr)
1	General manager	1	3,000	36,000
2	Secretary	1	700	8,400
3	Sales officer	1	1,500	18,000
4	Production head	1	2,000	24,000
5	Accountant	1	2,000	24,000
6	Operators	3	2,100	25,200
7	Labourers	10	3,000	36,000
8	Guards	2	600	7,200
	Sub-Total	**20**	**14,900**	**178,000**
	Benefit (25% of BS)		3,725	44,700
	Total		**18,625**	**223,500**

B. TRAINING REQUIREMENT

On-the-job training shall be carried out during plant erection and commissioning by the experts of machinery suppliers. The training cost is estimated at Birr 15,000.

VII. FINANCIAL ANALYSIS

The financial analysis of the caraway processing and packing project is based on the data presented in the previous chapters and the following assumptions:-

Construction period	1 year
Source of finance	30 % equity
	70 % loan
Tax holidays	5 years
Bank interest	8%
Discount cash flow	8.5%
Accounts receivable	30 days
Raw material local	30days
Work in progress	2 days
Finished products	30 days
Cash in hand	5 days
Accounts payable	30 days

A. TOTAL INITIAL INVESTMENT COST

The total investment cost of the project including working capital is estimated at Birr 2.61 million, of which 36 per cent will be required in foreign currency.

The major breakdown of the total initial investment cost is shown in Table 7.1.

Table 7.1

INITIAL INVESTMENT COST

Sr. No.	Cost Items	Total Cost ('000 Birr)
1	Land lease value	80.0
2	Building and Civil Work	450.0
3	Plant Machinery and Equipment	1,100.0
4	Office Furniture and Equipment	100.0
5	Vehicle	200.0
6	Pre-production Expenditure*	290.4
7	Working Capital	390.9
	Total Investment cost	**2,611.2**
	Foreign Share	36

** N.B Pre-production expenditure includes interest during construction (Birr 140.37 thousand) training (Birr 15 thousand) and Birr 135 thousand costs of registration, licensing and formation of the company including legal fees, commissioning expenses, etc.*

B. PRODUCTION COST

The annual production cost at full operation capacity is estimated at Birr 3.39 million (see Table 7.2). The material and utility cost accounts for 82.67 per cent, while repair and maintenance take 1.47 per cent of the production cost.

Table 7.2

ANNUAL PRODUCTION COST AT FULL CAPACITY ('000 BIRR)

Items	Cost	%
Raw Material and Inputs	2,737.50	80.69
Utilities	66.88	1.97
Maintenance and repair	50	1.47
Labour direct	106.8	3.15
Factory overheads	35.6	1.05
Administration Costs	71.2	2.10
Total Operating Costs	3,067.98	90.44
Depreciation	212.5	6.26
Cost of Finance	111.98	3.30
Total Production Cost	**3,392.46**	**100**

C. FINANCIAL EVALUATION

1. Profitability

According to the projected income statement, the project will start generating profit in the first year of operation. Important ratios such as profit to total sales, net profit to equity (Return on equity) and net profit plus interest on total investment (return on total investment) show an increasing trend during the life-time of the project.

The income statement and the other indicators of profitability show that the project is viable.

2. Break-even Analysis

The break-even point of the project including cost of finance when it starts to operate at full capacity (year 3) is estimated by using income statement projection.

$$BE = \frac{\text{Fixed Cost}}{\text{Sales} - \text{Variable Cost}} = 67\ \%$$

3. Pay Back Period

The investment cost and income statement projection are used to project the pay-back period. The project's initial investment will be fully recovered within 5 years.

4. Internal Rate of Return and Net Present Value

Based on the cash flow statement, the calculated IRR of the project is 19 % and the net present value at 8.5% discount rate is Birr 1.05 million.

D. ECONOMIC BENEFITS

The project can create employment for 20 persons. In addition to supply of the domestic needs, the project will generate Birr 973,420 in terms of tax revenue.