160. PROFILE ON CINNAMON PROCESSING & PACKING

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I. SUMMARY

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

The present demand for the proposed product is estimated at 6,340 tonnes per annum. The demand is expected to reach at 13,180 tonnes by the year 2022.

The plant will create employment opportunities for 15 persons.

The total investment requirement is estimated at Birr 3.18 million, out of which Birr 927,000 is required for plant and machinery.

The project is financially viable with an internal rate of return (IRR) of 17 % and a net present value (NPV) of Birr 965,960 discounted at 8.5%.

II. PRODUCT DESCRIPTION AND APPLICATION

Cinnamon is the dried bark, of cinnamon tree, cinnamonum zeylamicum. Cinnamon bark contains volatile oil (0.5-1.5%), mucilage, calcium oxalate, sugar, starch and phlobatannin etc. The chief constituent of the essential oil is cinnamic aldelyde (60-75%).

Cinnamon is used as spice. It has a pleasing, fragrant odour and a warm, sweet, aromatic taste. However, globally, the use of cinnamon as a spice has declined considerably in recent years owing to the synthesis of cinnamic aldehyde, but it is still used for flavouring cakes and pastries, in beverages and as aconstituent of curry powder.

Cinnamon is pungent aromatic, astringent, stimulant and carminative. It is useful for checking nausea and vomiting. It is also employed as flavoring agent and it has

antiseptic and antidiarrhoeal properties and is a powerful germicide. It is employed as a counter irritant in the treatment of muscular strains, rheumatism and inflammations.

III. MARKET STUDY AND PLANT CAPACITY

A. MARKET STUDY

1. Past Supply and Present Demand

Cinnamon *(Cinnamomum zeylanicum)* is an evergreen shrub or small tree, of the laurel family (Lauraceae) it is a very important spice for flavoring foods.

Cinnamon bark is widely used as a spice. It is principally employed in cookery as a condiment and flavouring material, being largely used in the preparation of of desserts such as chocolate, spicy candies, tea, hot cocoa and liqueurs. Cinnamon and sugar are often used to flavour cereals, bread-based dishes, and fruits, especially apples; a cinnamon-sugar mixture is even sold separately for such purposes. Cinnamon can also be used in pickling. Cinnamon bark can also be consumed directly and is one of the few spices that can be consumed directly.

In medicine it acts like other volatile oils has a reputation as a cure for colds. It has also been used to treat diarrhea and other problems of the digestive system. Cinnamon is high in antioxidant activity. The essential oil of cinnamon also has antimicrobial properties which allow extension of the shelf life of foods.

Cinnamon has also been reported to have remarkable pharmacological effects in the treatment of type II diabetes. Cinnamon has traditionally been used to treat toothache and fight bad breath and its regular use is believed to stave off common cold and aid digestion.

Cinnamon is also used as an insect repellent. It is widely used when a manufactured insecticide is not wanted or cannot be used because of possible health side effects or allergies.

The country's requirement for cinnamon has been met through domestic production and imports. There is no data available that indicates local production. Regarding import according to Customs Authority's "External Trade Statistics " During period 1997 – 2006, on average 230 tonnes of cinnamon valued at Birr 1.66 million were imported (see Table 3.1).

Table 3.1

IMPORT OF CINNAMON AND CINNAMON TREE FLOWERS NEITHER CRUSHED AND GROUND (TONNES)

Year	Import	Value
1997	228	1,046,620
1998	66	391,993
1999	124	851,682
2000	69	673,057
2001	231	1,968,032
2002	258	1,717,439
2003	180	1,282,104
2004	281	1,932,048
2005	408	3,106,585
2006	457	3,586,046
Total	**2,302**	**16,555,606**
Average	**230**	**1,655,561**

Source: *Customs Authority, External Trade Statistics.*

In estimating the current demand for cinnamon, the consumption side is considered. Accordingly, data from CSA's 1999/2000 Household Income, Consumption and

Expenditure survey was analyzed. Table 3.2 depicts the average amount of cinnamon consumed by different expenditure groups in urban and rural areas.

Table 3.2

CONSUMPTION OF CINNAMON BY INCOME GROUP (1999/2000)

Income (Birr)	No. of Persons			Per Capita Consumption (gm)		Total Consumption (KG)		
	Total	Urban	Rural	Urban	Rural	Urban	Rural	Total
<600	146,344	114,336	32,008			-	-	-
600-999	405,135	234,421	170,714			-	-	-
1000-1399	836,468	369,121	467,347			-	-	-
1400-1999	2,503,435	631,878	1,871,557			-	-	-
2000-2599	3,589,919	579,292	3,010,627			-	-	-
2600-3399	5,913,004	750,503	5,162,501		1		5,163	5,163
3400-4199	6,983,109	586,154	6,396,955		1		6,397	6,397
4200-5399	9,560,317	859,529	8,700,788	6	1	5,157	8,701	13,858
5400-6599	7,583,587	703,354	6,880,233	16	-	11,254		11,254
6600-8999	8,289,216	859,349	7,429,867	2	2	1,719	14,860	16,578
9000-12599	4,455,446	598,967	3,856,479	2	5	1,198	19,282	20,480
12600-16199	1,123,972	383,377	740,595	1	-	383		383
16200-19999	521,729	260,485	261,244	1	1	260	261	522
20000<	777,382	692,820	84,562	2	1	1386	85	1470
Total	**52,689,063**	**7,623,586**	**45,065,477**	**30.00**	**12.00**	**21,356.97**	**54,748.18**	**76,105.15**

***Source**: CSA, Report on Consumption, Income and Expenditure Survey of the 1999/2000.*

As can be seen from Table 3.2, given a total population of 52,689,068 at the time the survey was conducted, the per capita consumption of cinnamon is computed to be 2.8

gram for urban and 1.21 gram for rural. Accordingly, considering the total population size at regional and national level in 2007 the total consumption is given in the following Table 3.3.

Table 3.3

TOTAL CINNAMON CONSUMPTION 2007

SNNPRS	Population Size	Cinnamon Consumption	
		Per household(Kg)	Total (Tonnes)
Urban	1,338,000	0.0028	4
Rural	13,983,000	0.00121	17
Total	**15,321,000**	**0.00401**	**21**
County Level			
Urban	12,689,000	0.0028	36
Rural	64,438,000	0.00121	78
Total	**77,127,000**	**0.00401**	**113**

As can be seen from Table 3.3 the total country level consumption for cinnamon was 113 tonnes, while the SNNP regional state consumption was 21 tonnes. The respective urban and rural consumption of the product for the region were 4 and 17 tonnes, respectively.

Cinnamon has huge potential for export, though still relatively small Ethiopia has already started exporting cinnamon recently. As can be seen from Table 3.4 during the period 2003 – 2006 a total of 4 tonnes cinnamon (one tonne on average) has been exported.

Table 3.4

EXPORT OF CINNAMON AND CINNAMON TREE FLOWERS NEITHER CRUSHED AND GROUND (TONNES)

Year	Export	Value
2003	0.26	6,055
2004	0.11	2,613
2005	2.57	43,736
2006	1.09	24,941
Total	**4**	**77,345**
Average	**1**	**19,336**

Source: *External Trade Statstics.*

The global market for cinnamon has increased dramatically during the last few years. According to International Trade Center (ITC) world trade in cinnamon grew on average by 12% and 6 % annually in volume and value terms, respectively.

Summary of world imports of cinnamon which is classified under cinnamon and cinnamon tree flower crushed or ground and cinnamon and cinnamon tree flower neither crushed or ground for 2005 and major importers is shown in Table 3.5 and 3.6.

Table 3.5

WORLD IMPORT AND MAJOR IMPORTING COUNTRIES OF CINNAMON AND CINNAMON TREE FLOWER CRUSHED OR GROUND

Total / Major Exporting Countries	Value (USD 000)	Quantity (Tonnes)	Quantity % Share	Unit Value (USD)
World total	**26,642**	**15,223**	**100**	**1,750**
U.S.A	4,796	3,968	26	1,209
Germany	2,797	1,410	9	1,984
Canada	1,884	1,172	8	1,608
Japan	1,478	873	6	1,693
U.K	1,050	465	3	2,258
Others	14,637	15,223	100	-

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

Table 3.6

WORLD IMPORT AND MAJOR IMPORTING COUNTRIES OF CINNAMON AND CINNAMON TREE FLOWER NEITHER CRUSHED OR GROUND

Total / Major Exporting Countries	Value (USD 000)	Quantity (Tonnes)	Quantity % Share	Unit Value (USD)
World total	**109,660**	**84,065**	**100**	**1,304**
Mexico	31,589	6,227	7	5,073
USA	17,173	15,170	18	1,132
UAE	5,570	6,791	8	820
India	5,215	7,778	9	670
Others	50,113	48,099	57	-

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

In 2005, total world imports of cinnamon crushed and ground and nether crushed and ground reached 15,223 tonnes valued at USD 26.64 million and 84,065 tonnes valued at USD 109.66 million respectively. . The major importers of cinnamon crushed and ground are USA, Germany, Canada and Japan while major importers cinnamon neither crushed and ground were Mexico, USA, UAE and India.

The major exporters during the same period were sir lank followed by China, Indonesia and Vietnam.

Assuming that the 2005 global import indicates the demand in that year and applying a 12% growth rate which is equitant to the average growth rate registered by global cinnamon trade the current demand for the product is estimated at 124,547 tonnes. Assuming that locally produced cinnamon could capture 5 % market share the current export demand of the product is estimated at 6,227 tonnes.

Accordingly, the total current demanded (local plus export) for cinnamon is estimated at 6,340 tonnes.

2. Projected Demand

The local demand for cinnamon is determined by population and income growth. The international market for cinnamon is wide enough as compared with the attained export. The export market is also believed to be growing with development in infrastructure and facilitated environment to enter the international market. However, in order to be conservative the demand for the product is assumed to grow at a rate of 5% per annum. Projected demand for cinnamon is presented in Table 3.7.

Table 3.7

PROJECTED DEMAND FOR CINNAMON

Year	Projected Demand (Tonnes)
2008	6,657
2009	6,990
2010	7,339
2011	7,706
2012	8,092
2013	8,496
2014	8,921
2015	9,367
2016	9,835
2017	10,327
2018	10,844
2019	11,386
2020	11,955
2021	12,553
2022	13,180

3. Pricing and Distribution

Based on current international price of the product, a factory get price of Birr 35,000 per tonnes 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 production capacity of the proposed project is 150 tonnes per annum, based on 300 working days and single shift per day.

2. Production Programme

Table 3.8 indicates the production programme of the proposed project. At the initial stage of production, the project may require two years to penetrate the market. Therefore, in the third year and then after, full capacity production shall be attained.

Table 3.8
PRODUCTION PROGRAMME

Sr. No.	Product	Production Year		
		1	2	3-10
1	Cinnamon powder	105	135	150
2	Capacity utilization rate (%)	70	90	100

IV. MATERIALS AND INPUTS

A. RAW AND AUXILIARY MATERIALS

The principal raw and auxiliary materials of the project are cinnamon bark and packing materials. The annual raw and auxiliary materials requirement and cost are indicated in Table 4.1.

Table 4.1

RAW AND AUXILIARY MATERIAL REQUIREMENT & COST

Sr. No.	Raw Material	Unit	Qty	Cost ('000 Birr)
1	Cinnamon bark	Tonne	157.5	3,938
2	Packing material	Tonne	7.5	270
	Total			**4,208**

B. UTILITIES

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

Table 4.2

UTILITIES REQUIREMENT & COST

Sr. No.	Utility	Unit	Qty	Cost ('000 Birr)
1	Electricity	kWh	150,000	71.1
2	Water	m^3	1000	10
	Total			**81.1**

V. TECHNOLOGY AND ENGINEERING

A. TECHNOLOGY

1. Production Process

The cinnamon bark shall first be cleaned manually, hand-pick, while the material is moving on a belt conveyor. It then milled and screened to reduce its site. The cinnamon powder will further be conveyed to the micropulverizer to produce fine powder. The product will finally be weight and paced for sales.

2. Source of Technology

Different process machinery suppliers can be requested for their proforma. Among them, the following company can be a potential candidate.

S.P. Engineering Co.
Tel. +91-22-28180754
Fax: +91 -22-28046846
Website: http://www.indiamart. Com/spengineering co.

B. ENGINEERING

1. Machinery & Equipment

The total cost of plant machinery and equipment is estimated at Birr 927,000 of which Birr 772,500 is in foreign currency. The list of machinery & equipment is indicated in Table 5.1.

Table 5.1

LIST OF MACHINERY AND EQUIPMENT

Sr. No.	Description	Qty
1	Belt conveyor	1
2	Mill	1
3	Micropulverizer	1
4	Sifting machine	1
5	Weighing and packing unit	1
6	Miscellaneous equipment (handling bins, storage vessels and testing equipment)	set

2. Land, Building and Civil Work

The total area of the project is 1,500 m^2 of which the built-up area is 500 m^2. The cost of building is estimated at Birr 750,000. The lease value of land is Birr 120,000, at a rate of 1 Birr/m^2 per year 80 years.

3. Proposed Location

Gucha town of Enderacha woreda in Sheka zone is selected as the best location of the proposed project due to its proximity to major raw material resource.

VI. MANPOWER AND TRAINING REQUIREMENT

A. MANPOWER REQUIREMENT

The total manpower requirement of the project is 15 persons. The list of manpower and annual labour cost is indicated in Table 6.1.

Table 6.1

MANPOWER REQUIREMENT & LABOUR COST

Sr. No.	Manpower	Req. No.	Monthly Salary (Birr)	Annual Salary (Birr)
1	General manager	1	3000	36000
2	Secretary	1	700	8400
3	Accountant	1	2000	24000
4	Sales man	1	1000	12000
5	Production head	1	2000	2400
6	Operators	3	2100	25200
7	Labourers	5	1500	18000
8	Guards	2	600	7200
	Sub-total	**15**	**12900**	**154800**
	Benefit (25% of BS)		3225	38700
	Total		**16125**	**193500**

B. TRAINING REQUIREMENT

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

VII. FINANCIAL ANALYSIS

The financial analysis of the cinnamon 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	30 days
Work in progress	5 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 3.18 million, of which 43 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	120.0
2	Building and Civil Work	750.0
3	Plant Machinery and Equipment	927.0
4	Office Furniture and Equipment	100.0
5	Vehicle	200.0
6	Pre-production Expenditure*	290.4
7	Working Capital	794.2
	Total Investment cost	**3,181.6**
	Foreign Share	43

** 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 4.87 million (see Table 7.2). The material and utility cost accounts for 88.03 per cent, while repair and maintenance take 1.54 per cent of the production cost.

Table 7.2

ANNUAL PRODUCTION COST AT FULL CAPACITY ('000 BIRR)

Items	Cost	%
Raw Material and Inputs	4,208.00	86.37
Utilities	81.1	1.66
Maintenance and repair	75	1.54
Labour direct	92.88	1.91
Factory overheads	30.96	0.64
Administration Costs	61.92	1.27
Total Operating Costs	4,549.86	93.39
Depreciation	210.2	4.31
Cost of Finance	111.98	2.30
Total Production Cost	**4,872.04**	**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.

$$BE = \frac{\text{Fixed Cost}}{\text{Sales} - \text{Variable Cost}} = 57\ \%$$

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 6 years.

4. Internal Rate of Return and Net Present Value

Based on the cash flow statement, the calculated IRR of the project is 17 % and the net present value at 8.5% discount rate is Birr 965,960.

D. ECONOMIC BENEFITS

The project can create employment for 15 persons. In addition to supply of the domestic needs, the project will generate Birr 1.02 million in terms of tax revenue.