273. PROFILE ON PRODUCTION OF WINE

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I. SUMMARY

This profile envisages the establishment of a plant for the production of wine with a capacity of 6,000 hectoliters per annum.

The present demand for the proposed product is estimated at 50,687 hectoliters per annum. The demand is expected to reach 84,394 hectoliters by the year 2017.

The plant will create employment opportunities for 57 persons.

The total investment requirement is estimated at about Birr 7.31 million, out of which Birr 5 million is required for plant and machinery.

The project is financially viable with an internal rate of return (IRR) of 25 % and a net present value (NPV) of Birr 4.94 million discounted at 8.5%.

II. PRODUCT DESCRIPTION AND APPLICATION

Wine is alcoholic beverage produced from grapes of various species. It is produced by fermentation of the juice of grape. Wine can be natural, fortified, sweet or dry, still or sparkling depending upon the alcoholic content and test.

III. MARKET STUDY AND PLANT CAPACITY

A. MARKET STUDY

1. Past Supply and Present Demand

Wine is an alcoholic beverage, naturally fermented juice of grapes. With little assistance by man grapes are converted by nature in chemical process, into alcoholic beverage. Wine products are classified as table wines, sparking wines, fortified or dressing wines and apretive wines.

Table wines are the most common wines available in the market. Sparking wines or champagne is produced by adding sugar and fresh yeast to the dry wine or table wine which has undergone first fermentation.

Wine is used as an important beverage in traditional to the most sophisticated and complex occasions enhancing and accompanying a wide range of stylish events.

Red, rose, white and sparkling wines are the most popular and are the most popular and are also know as light wines because of their low alcoholic content. Red wines are usually dry and go well with such main course dishes as red meat, spaghetti and highly seasoned foods. Rose or pink wines can be served best with seafood and salads. White wines can be very dry to sweet which has to be served chilled and are best with white meat and seafood. Champagne or sparkling wines are frequently, served at banquets, formal dinners and weddings. They can be white, pink or red.

Champagne from Champagne north of France is the wine of celebration, officially named champagne, while all other wines produced in other parts of the world are called sparking wine.

Wine in Ethiopia is available from import as well as domestic production. The last decade domestic production time series of wine depicts a maximum production of 64,526 hectoliters in 2005 and a minimum production of 17,913 hectoliters in 1999.

The average domestic production of wine in 1997-2005 was 32,356 hectoliters. Among the local producers Awash Winery is the leading supplier and best known brands include Guder and Axumit.

Imported wine in 2006 was the record high at 4,637 hectoliters the minimum import in the decade recorded in 1997 being only 457 hectoliters. Supply of wine is presented in Table 3.1.

Generally the total supply of wine is increasing at an average 3,370.7 hectoliters annually. The least square estimate for the 1997-2005 total supply of wine and champagne is:

$$Y = 3{,}370.\ X + 16{,}980$$

Though there is an export of wine to the maximum level of 265 hectoliters, the demand estimation in this study finds it as insignificant for consideration. Therefore applying this least square equation, the current effective demand for wine is 50,687 hectoliters.

Table 3.1

SUPPLY OF WINE AND CHAMPAGNE IN HECTOLITERS

Year	Imported	Local	Total
1997	457	35,345	35,802
1998	535	26,360	26,895
1999	551	17,913	18,464
2000	1,614	23,440	25,054
2001	2,221	24,829	27,050
2002	2,750	26,678	29,428
2003	1,402	32,006	33,408
2004	1,615	40,107	41,722
2005	2,151	64,526	66,677

***Source**: CSA, Annual Survey of Manufacturing Industry Customs Authority*

2. Demand Projection

Consumption of alcoholic beverages like beer, wine and spirits is highly related to the social attitude of the population having varying demand levels ion different regions, cultures and seasons.

In deriving the demand for alcoholic beverage, price, demographic composition, substitutes prices and income levels play important role. In general, beer and spirits are poor substitutes for wine while wine is a good substitute for beer and spirits.

With rising disposable income in some countries there is a shifting from the demand for beer to the demand for wine. Studies indicate that moderate wine consumption is associated with reduced health care expenditure.

The availability of more appropriate, easy drinking wines with affordable prices has made wine enjoyable and attractive. As shown from the supply series the consumption of wine in Ethiopia is positively growing. For the purposes of this study therefore, the least square equation.

$$Y = 3{,}370.7\ X + 16{,}980$$

Is applied and the projected demand is presented in Table 3.2.

Table 3.2

PROJECTED DEMAND FOR WINE AND CHAMPAGNE

Year	Hectoliter
2008	54,058
2009	57,428
2010	60,799
2011	64,170
2012	67,541
2013	70,911
2014	74,282
2015	77,653
2016	81,023
2017	84,394

3. Pricing and Distribution

Distribution is the single most important factor in the marketing of the product understudy Door to door delivery on a timely basis to bars supermarkets and liquor corners has no alternative for a product like wine.

The present price for common wine produced by Awash Wines is Birr 18 per bottle.

B. PLANT CAPACITY AND PRODUCTION PROGRAMME

1. Plant Capacity

We shall consider 10% of the market share of the total projected demand to be covered by the envisaged plant. Hence, the plant is assumed to have a production capacity of 6,000 hectoliters of assorted wine products from fresh grapes based on 300 working days and three shifts per day.

2. Production programme

The production programme is indicated in Table 3.1. Initially the plant required some years to penetrate into the market. Therefore, in the first and second year of production, the capacity utilization rate will be 70% and 85%, respectively. In the third and onwards, full capacity production shall be attained.

Table 3.1

PRODUCTION PROGRAMME

Sr. No	Product	Product year		
1	Wine (hectoliter)	4,200	5,100	6,000
2	Capacity utilization (%)	70	85	100

IV. MATERIALS AND INPUTS

A. RAW & AUXILARY MATERIALS

The plant uses fresh grapes, dry resin, sugar and chemical additives as major raw materials for the production of assorted wine products depending upon the market demand. In addition, glass bottles and packing materials are used as auxiliary materials. Except dry resin and chemical additives all the other inputs are locally available.

Annual consumption and cost of materials is shown in Table 4.1

Table 4.1

RAW AND ZUXILARY MATERIALS TEQUIRMENT AND COST

Sr. No.	Description	Unit of measure	Qty.(No.)	Cost (‘000 Birr)		
				FC	LC	Total
1	Fresh grape	Quintal	354		397.5	397.5
2	Dry resin	“	252	288	142	430
3	Sugar	“	984	-	738	738
4	Tartaric acid	“	0.75	4	2	6.00
5	Citric acid	“	3.2	5.6	2.8	8.4
6	Sodium benzoate	“	4. 5	8.5	4.3	12.8
7	Bottles (glass)	pcs	800,000	-	3,200	3,200
8	Plastic crate	“	67,000	-	670	670
	Grand total			306.1	5,156.6	5,462.7

B. UTILITIES

The major utilities are electricity, fuel oil and water. Annual requirement of utilities is indicated in Table 4.2.

Table 4.2

UTILITIES REQUIREMENT & COST

Sr. No	Utility	Qty	Cost ('000 Birr)
1	Electricity (kWh)	156,000	74.4
2	Furnance oil (lt)	21,000	114
3	Water (m^3)	4,000	22
	Total		210.4

VI. TECHNOLOGY AND ENGINEERING

A. TECHNOLOGY

1. Process Description

The technological process of wine production can be catagorized into three main stages.

1st stage: Reception of fresh grape. At this stage the following operations are carried out:

- weighing of grape
- sampling by automatic extractor for sugar content evaluation
- conveying of grape to pressing operation

2nd stage: Generally, wine-making operation takes place at this stage.

- Pressing and desteming of the grape
- Expulsion of the stalks to the external area.
- Transfer of the crushed grape to the verification lines.

Having completed the above operation, crushed grape is further processed according to the type of wine to be produced (white or red wine). Fore example, red wine is processed as follows.

- Partial fermentation (24-36 hrs) in auto-vinificator

- Extraction of the "flower" must where skins have been already removed.
- Filtration of must by plate filter and transfer to the secondary fermentation vats.
- Extraction of pomace from the vinificators and transfer by means of conveyor to a separator.
- Extraction of the first pressing must wine from the press separator and its transfer by pumping to the secondary fermentation vats.

3rd stage: final operations. This includes:-

- Decanting and filtration in order to remove any impurities
- Correction if required by various treatment methods
- Blending with other wine which is commonly known as "cutting".
- Stabilization by refrigeration in isobaric stainless steel vats (8 days equal to about 2 years of natural ageing)
- Pasteurization (80^0c) with the effect to remove active ferments.
- Bottling after pasteurization.

2. Source of Technology

The following companies may be contacted for an offer.

1. Wintech Engineers, MIDC estate, Ambad, Nasik 422 010, India
2. I.M.A industrial machine Automatiche S.P.A
   Via 10 maggio 1640064 ozzano Emilia (Bologna) Italy
   Tel. 051.651411-Fax 051 799330

B. ENGINEERING

1. Machinery & Equipment

The major machinery and equipment required for the wine-making plant are shown in Table 6.1 Total estimated cost of machinery and equipment including various charges is Birr 5.0 million.

Table 6.1

LIST OF MACHINERY & EQUIPMENT

Sr. No	Description
1	Fresh grape reception unit
2	Wine-making system
3	Must pumping system
4	Secondary fermentation
5	Must and wine filtration
6	Wine refrigeration unit
7	Bottling line
8	Auxiliary equipment

2. Land, Building and Civil works

The total land requirement is 6,000m^2 out of which the built-up area is 1200 m^2. Therefore, the cost of building is estimated at Birr 3.0 million. The lease value of land at a rate of 0.8 Birr/ m^2 for 99 years is about Birr 475,200.

3. Proposed Location

The envisaged plant shall be located in Arbaminch town, Arbaminch Zuria Woreda of Gamogofa Zone.

VII. MANPOWER AND TRAINING REQUIRMENT

A. MANPOWER REQUIRMENT

The manpower requirement and cost of labor are indicated in Table 7.1

Table 6.2

MANPOWER REQUIRMENT & LABOUR COST

Sr. No	Manpower	Req. No.	Monthly salary (Birr)	Annual Salary (Birr)
1	General manager	1	3,000	36,000
2	Admin. & Finance head	1	2,000	24,000
3	Secretary	1	700	8,400
4	Accountant	1	1,500	18,000
5	Sales men	2	2,000	24,000
6	Purchaser	2	2,000	24,000
7	Production head	1	2,000	24,000
8	Operations	10	6,000	72,000
9	Laborers	30	9,000	108,000
10	General service	8	2,400	28,800
	Sub-Total	57	30,600	367,200
	Benefit (25% BS)		7,650	91,800
	Total		**38,250**	**459,000**

VII. FINANCIAL ANALYSIS

The financial analysis of the wine 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	3 years
Bank interest	8%
Discount cash flow	8.5%
Accounts receivable	30 days
Raw material local	30days
Raw material, import	90days
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 7.31 million, of which 17 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	200
2	Building and Civil Work	800
3	Plant Machinery and Equipment	5153.75
4	Office Furniture and Equipment	125
5	Vehicle	250
6	Pre-production Expenditure*	555.33
7	Working Capital	229.33
	Total Investment cost	**7313.41**
	Foreign Share	17

** N.B Pre-production expenditure includes interest during construction (Birr 405.3 thousand) training (Birr 65 thousand) and Birr 85 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 3.86 million (see Table 7.2). The material and utility cost accounts for 59.96 per cent, while repair and maintenance take 2.67 per cent of the production cost.

Table 7.2

ANNUAL PRODUCTION COST AT FULL CAPACITY ('000 BIRR)

Items	Cost	%
Raw Material and Inputs	933.00	24.13
Utilities	1384.9	35.82
Maintenance and repair	103.08	2.67
Labour direct	164.8	4.26
Factory overheads	61.8	1.60
Administration Costs	247.2	6.39
Total Operating Costs	2,894.78	74.88
Depreciation	647.88	16.76
Cost of Finance	323.37	8.36
Total Production Cost	**3,866.03**	**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.

$$BE = \frac{\text{Fixed Cost}}{\text{Sales} - \text{Variable Cost}} = 22\ \%$$

3. Payback 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 4 years.

4. Internal Rate of Return and Net Present Value

Based on the cash flow statement, the calculated IRR of the project is 25 % and the net present value at 8.5% discount rate is Birr 4.94 million.

D. ECONOMIC BENEFITS

The project can create employment for 57 persons. In addition to supply of the domestic needs, the project will generate Birr 3.30 million in terms of tax revenue. The establishment of such factory will have a foreign exchange saving effect to the country by substituting the current imports.