



PROJECT PROFILE ON HUMAN HEALTH HIGHER EDUCATION (DOCTOR OF MEDICINE)



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ADDIS ABEBA CITY ADMINISTRATION INVESTMENT COMMISSION
A.A.

PROJECT PROFILE ON HUMAN HEALTH HIGHER EDUCATION (DOCTOR OF MEDICINE)

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I. Executive summary

This project profile is prepared to assess the viability of running Human health higher education, in Addis Abeba city administration. Hence Market, Technical, Organizational and Financial study was made to investigate the viability of the envisaged project.

This project profile on Human health higher education has been developed to support the decision – making process based on a cost benefit analysis of the actual project viability. This profile includes marketing study, production and financial analysis, which are utilized to assist the decision-makers when determining if the business concept is viable. Ethiopia has a private sector driven Human health higher education.

The university at full capacity operation can receive 939 students, per year.

The total investment capital including establishing the school is Birr 305.70 million. Out of the total investment capital, the owners will cover Birr 91.71 million (30 %) while the remaining balances amounting to Birr 213.99 million (70 %) will be secured from bank in the form of term loan.

As indicated in the financial study, the cash flow projection of the project shows surplus from the first year on. The net cash flows of the project range from Birr (40.55) Million in the first year to Birr 34.65 million at the end of the 10th year of operation. At the end of the 10th year of operation period the cumulative cash balance reaches Birr 185.76 million.

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The Benefit-cost ratio and Net present value (NPV) have been calculated at 17% discount factor (D.F) for 10 years of the project activity. Accordingly, the project has NPV of 4.6 billion Birr at 17%D.F. and the benefit-cost ratio of 1.01 at 17% D.F.

Therefore, from the aforementioned overall market technical and financial analysis we can conclude that the Human health higher education business is a viable and worthwhile.

1. BACKGROUND INFORMATION

1.1 Introduction

This document was undertaken to show higher education of health sciences on degree level profile in Addis Ababa. In compiling the report, information from Addis Ababa investment commission, Ministry of education, Ministry of Health, Ethiopian custom commission and published sources have been augmented.

Presently, in spite of high demand and its crucial importance, number of health professionals in the country is very low compared to number of population. This constrained the achievement of health related development goals and also impeded accelerated progress towards health coverage.

Development of human resource for health is fundamental importance to Ethiopia's present and future demand. In Ethiopia, the demand for health professionals- particularly medical doctors is expected to increase considerably in the next few decades as a result of increased population growth, urbanization, access to health facilities and increasing income levels. Therefore, in a country like Ethiopia, it is important to identify gaps and potential in the development (training) of medical doctors.

1.2 Service Description and Application

Human health (Medical) education is education related to the practice of being a medical practitioner and additional training thereafter (e.g., residency, fellowship, and continuing medical education). Medical education and training varies considerably across the world. Various teaching methodologies have been used in medical education, which is an active area of educational research.

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In Ethiopia, after completion of high school, the degree of Doctor of Medicine (MD) is given after a training period of 6 years, the last one being a period of internship or externship.

Doctors, also known as physicians, are licensed health professionals who maintain and restore human health through the practice of medicine. They examine patients, review their medical history, and diagnose illness or injuries, administer treatment, and counsel patients on their health and well-being.

1.3 Project Location and Justification

1.3.1 Location of Addis Ababa

Addis Ababa is the seat of the Ethiopian federal government. It is located on the central highlands of Ethiopia in the middle of Oromia Region. The absolute location is around the intersection point of 9°1'48''N latitude and 38°44'24"E longitudes. This is very near to the geographical center of the country. It is, therefore, equidistant to the peripheral areas or is equally accessible to almost all parts of Ethiopia. Addis Ababa is located on a well-watered plateau surrounded by hills and mountains. The city is in the highlands on the edge of the Ethiopian rift valley or the eastern slopes of the Entoto Mountain ranges bordering the Great Rift Valley. The total area of Addis Ababa is about 540 km² of which 18.2 km² are rural. Addis Ababa's built-up urban area spans 474 km². It is also the largest city in the world located in a landlocked country.

1.3.2 Demography of Addis Ababa

According to the CSA (2013) population projection, Ethiopia's total population reaches about 105 million people in 2022. Of the total population 22.9% (24 million people) live in urban areas. Ethiopia's urban population is expected to triple by 2037 (World Bank, 2015). Addis Ababa hosts

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an estimated 3,859,638 people. Currently, Addis Ababa is experiencing an annual growth rate of 3.8% and is estimated to reach 4,696,629 inhabitants by 2032 (CSA, 2015).

1.3.3 Economic activity of Addis Ababa

The transformation of Addis Ababa has especially been rapid since 1991. According to the data from the city's Bureau of Finance and Economic Development (2006), per capital income of Addis Ababa has grown from USD 788.48 in 2010 to USD 1,359 in 2015. The city also achieved a decline in the poverty index from a high of 29.6 in 2012 to 22.0 in 2014. Moreover, the current poverty headcount index for Addis Ababa is estimated at 18.9 while the poverty severity account for 5 and 1.8 index points respectively. Even though, the poverty status of Addis Ababa has an improvement over previous years, there is still much work to be done to curb both the incidence and severity of poverty.

The major contributor to the economic growth of the city is the implementation of publicly financed mega urban projects like condominium housing, the Light Rail Transit, the international airport and industrial zone development (The state of Addis Ababa, 2017). The existence of international large and medium-size enterprises in and around Addis Ababa have also significant role in creating huge opportunity for employment and technology transfer. Furthermore, there are strong demand for goods and services following the existence of many embassies and inter-governmental organizations like the African Union, the United Nations Economic Commission for Africa.

The manufacturing sector's contribution to Addis Ababa's GDP is high. Despite the fact that 86% of the industries in the city are micro and small scale (cottage and handicrafts, and small-scale), the majority of the country's large and medium scale industries are found in the city. Noticeable increases are also registered currently in other aspects of industrial growth.

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The service sector is both the largest contributor to the city's economy and the largest employer. It contributes to 76.4% of the city's GDP while industry's share makes up (almost all) the rest. This sector is dominated by three major sub-sectors: Transport and communication; Real estate, Renting and Business services; and Trade, Hotel and Restaurants. According to the state of Ethiopian Cities 2015 report, the service sector has also been responsible for more than 50% of the growth in the estimated annual growth of the city's GDP. Although 75% of employment in the city is also generated in the service sector, a large proportion of the employed work in low skill and low paying jobs as shop salespersons, petty and 'gullit' traders, sales workers in small shops, domestic helpers or doorkeepers and restaurant service workers.

Analysis of the economic structure of Addis Ababa reveals that the services sectors (63%) dominates with industry (36%) in second place indicating that these sectors account for almost all of the Addis Ababa's GDP (The State of Addis Ababa, 2017).

Addis Ababa has a great share in the economy of the country due to its attractiveness to businesses, companies, individuals and foreign direct investment. Overall primacy index of the city is 24.8 based on urban employment and unemployment survey (CSA 2015). According to the State of Addis Ababa 2017 report, the simultaneous high rates of economic growth and urbanization in Addis Ababa indicates a likely further rising dominance of the city in Ethiopia's economy as well as growing agglomeration of economic activities in and around the city.

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1.4. Why is it beneficial to invest in Addis Ababa?

Addis Ababa is the largest and most economically significant city in the country. Ethiopia's urban population share is only 17 percent (as of 2012, World Bank 2015). The city is the only urban area in Ethiopia capable of delivering scale economies in terms of concentrated demand, specialization, diversity and depth of skills, innovation, and technology transfers. Thus, investors will be benefited in getting capable human power from the market.

The capital is the country's main industrial hub. The city dominates industrial capacity in almost all the branches of light manufacturing that Ethiopia prioritizes. As a result Addis Ababa completely dominates production in various subsectors. This can be taken as the political and social stability of the city.

Overall, the city has a beautiful environment, favorable location, and strong industrial base. Its advantage as an economic powerhouse of the country and human resource center are the most attractive features for local and overseas investors.

Moreover, investors will be getting a comprehensive set of incentives for priority sectors. These include:

- Customs duty free privilege on capital goods and construction materials, and on spare parts whose value is not greater than 15% of the imported capital goods' total value.
- Investors have the right to redeem a refund of customs duty paid on inputs (raw materials and components) when buying capital goods or construction materials from local manufacturing industries.

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- Income tax exemption of up to 6 years for manufacturing and agro-processing, and up to 9 years for agricultural investment.
- Additional 2-4 years income tax exemption for exporting investors located within industrial parks and 10-15 years exemption for industrial park developers.
- Loss Carry forward for half of the tax holiday period. Several export incentives, including Duty Draw-Back, Voucher, Bonded Factory, and Manufacturing Warehouse, and Export Credit Guarantee schemes.

1.4.1. The city benefit from the investment

The city will be benefited from investment. These are discussed below.

- Employment opportunity

Investment is expected to provide direct and indirect employment. These range from unskilled casual workers, semi-skilled and skilled employees.

- Improving growth of the economy

Through the use of locally available materials and exporting products, the investment contributes towards growth of the economy by contributing to the growth of domestic product. These eventually attract taxes including VAT which will be payable to the government hence increasing government revenue while the cost of local materials will be payable directly to the producers. In addition, domestic products save foreign exchange and exports also bring money to the country.

2. Marketing study

2.1 Market analysis summary

The current drive and emphasis by the government to expand the health coverage in the country requires training of health professionals including medical doctors. Having undertaken a thorough and comprehensive research of the market we realized that there was a vast opportunity for medical doctor professionals. Aware of the fact operating in such a market is largely dependent on good networking; the promoter intends to establish networks and strategic relationships with various stakeholders to sustain the market. In so doing the owner intend to ensure that the education they provide are of good quality.

2.2 Number of medical doctors in Ethiopia

Ethiopia has 28 public and 6 private medical colleges. The 14 public and 6 private medical colleges take students directly from preparatory schools based on students' achievement on the University Entrance Examination (UEE). They have a six years curriculum. Similarly, St. Paul Millennium Medical College recruit students based on UEE, admission test and interview results. The college uses a 5-year curriculum.

The rest 13 public medical colleges enroll first-degree holder students who have health and basic natural science backgrounds based on their undergraduate GPA, year of service, and results of admission test and interview. This curriculum is delivered over four and a half years' time.

According to National Human Resources for Health Strategic Plan (2016-2025) report, number of physicians (General practitioner, Specialists and subspecialists) was estimated to be 14,684 and 24,101 by 2020 and 2025 respectively.

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Taking compound annual growth rate of the years 2020 and 2025 from the same report, number of physicians has increased by 13%. Thus, in estimating the current (2022) number of physicians, increase by the same percentage (13%) was considered. Accordingly, the present year (2022) number of physicians is estimated at 18,750. Considering number of medical higher education and number of new graduates, the average increase of physicians from the year 2022 to 2031 is also estimated to increase by 13%.

2.3 Demand Projection of Number of Medical Doctors

The future demand for physicians depends mainly on the growth of population that uses medical services and people awareness on the importance of medical services. The World Health Organization (WHO, 2014) recommends a minimum of one physician per 1,000 in low-income countries. Thus, considering population growth rate and people awareness on the importance of medical services, demand for physician is assumed conservatively to reach the WHO standard of 1:1000 (physician: population).

The total demand projection and the supply gap worked based on the above assumptions are presented in table 2.

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Table 1: Projected demand supply gap analysis for medical doctors from 2022 to 2031

Year	Ethiopian Population	Total demand for medical doctors (1:1000)	Medical doctors in Ethiopia	Unsatisfied demand
2022	120,202,679	120,203	18,750	101,453
2023	123,207,746	123,208	21,188	102,020
2024	126,287,940	126,288	23,942	102,346
2025	129,445,138	129,445	27,054	102,391
2026	132,681,267	132,681	30,571	102,110
2027	135,998,298	135,998	34,546	101,453
2028	139,398,256	139,398	39,037	100,362
2029	142,883,212	142,883	44,111	98,772
2030	146,455,292	146,455	49,846	96,609
2031	150,116,675	150,117	56,326	93,791

The demand projection executed in table 2 reveals that the demand for medical doctors will grow from 101,453 in the year 2022 and 93,791 by the year 2031. As shown in table 2, the project will have unsatisfied demand for the coming 10 years' period. The projected demand will continue to be positive until 2031. It can be clearly noted that there is a huge gap between supply and demand figures, which can really be taken as the apparent demand-supply gap for medical doctors in Ethiopia.

3. Technology and engineering

3.1 Technology

Service process

The University Senate awards credentials, which are recognized by the country. The Ministry of Education is mandated to accredit private and public higher education institutions according to whether they fulfill the required standards.

Admission to the university level studies requires Ethiopian higher education entrance examination with minimum score decided by the ministry of education. Special privilege also considered for female students and students with disadvantaged/remote regions.

The education service is given at regular basis. The session will be held in morning and afternoon (8:30 AM-12:30 PM and 01:30PM -5:30PM) from Monday to Saturday. The Bachelor program in doctor of medicine mainly covers the modules shown below.

- Pre-medical modules
- Pre-clinical Year I
- Pre-Clinical Year II
- Clinical Year I (year 3)
- Clinical year II (Year 4 and 5)
- Internship (Year 6)

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The courses will be supported by lab sessions with class room instruction and practical exercise at health care facilities. At the end of the program the students will be give qualification exam and also conduct final year thesis work individually based on the interest of prospective graduate.

Main grading system

Letter grades are assigned to the marks earned out of 100% on a fixed scale (criteria referenced grading system) from A to F. The highest on scale is "A" and the lowest is "F". A student may not graduate with a CGPA of less than 2.0. He shall thus score at least a `C` grade in each of the modules he is required to take under the program.

A student who scores an `F` grade in a course under a module or in a module or a course taken as a module may be allowed to repeat the same twice. Any of the grades such student scores in the re-examinations may be taken into consideration in determining his academic status.

3.1.1 Service capacity

In determining the plant capacity of the essential oil production plant, the future demands of the product and the economies of scale of the available technologies were taken into consideration. According to the data obtained from the market study, the demand for medical doctors will reach 93,791 in 2031. Thus, the envisaged higher education for medical doctors training is intended to have a capacity of accepting 200 students.

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3.1.2 Service program

The project requires some years to penetrate into the market and capture a significant share. It will start providing service at 70% of its capacity and will grow by 10% each year considering the market penetration traits. The service program of the envisaged higher education is given in table 2.

Table 2: Service program

Year of Production	Fresh	2 nd Year Students	3 rd Year Students	4 th year Students	5 th Year Students	6 th year Students
Year 1	200					
Year 2	200	180				
Year 3	200	180	162			
Year 4	200	180	162	146		
Year 5	200	180	162	146	131	
Year 6	200	180	162	146	131	120
Year 7	200	180	162	146	131	120
Year 8	200	180	162	146	131	120
Year 9	200	180	162	146	131	120
Year 10	200	180	162	146	131	120

3.1.3 Materials and inputs

The main materials and inputs required for the provision of higher education for Bachelor of doctor of medicine are given on Table 3. The cost of these and other related materials are estimated to be of Birr 5,650,000.00.

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Table 3: Raw materials and consumables requirement at full capacity and estimated cost

S/No.	Material	Unit	Total cost (^000 Birr)
1	Curriculum <ul style="list-style-type: none"> ▪ Responsive to individual and societal need ▪ Compressive coverage ▪ Adaptive to changing 	Package	12,000.00
2	Educational Materials <ul style="list-style-type: none"> ▪ Quantitatively adequate ▪ User friendly, easily exploitable and challenging to both instructors and learners ▪ A judicious mix of print-audio-oral materials ▪ Closely related to the goals of the curriculum 	Lump sum	23,000.00
3	Cleaning materials	Lump sum	2,000.00
4	Stationary materials	Lump sum	2,500.00
5	Other miscellaneous materials	Lump sum	2,000.00
	Total		41,500.00

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3.2 Engineering

3.2.1 Land, buildings and civil works

The required area (m^2) and construction cost for the production facilities essential for the successful operation of the processing plant is shown in Table 4. A total area ready for the processing plant is $12,000 m^2$ out of which $10,360 m^2$ is to be covered by building while uncovered area of $1,640 m^2$ is left storage of waste materials and future expansions. In order to estimate the land lease cost of the project profiles it is assumed that all the project will be located in different land level from level 1/1 to level 4/3, their current market lease price is from 39,073.31 birr per M^2 to 2,800.71 birr per M^2 respectively. Therefore, for the profile a land lease rate of birr 3,885 per M^2 have been taken, which is between the ranges.

The cost of construction of building should be appropriate to the size and expected profitability of business, costs of building generally differs by the type of construction materials used, the type of foundation, wall height and location. The current building cost for simple storage and building is from 10,000.00 Birr per m^2 to 25,000.00 Birr per m^2 . The total construction cost of buildings and civil works, at a rate of Birr 20,000 per m^2 is estimated at Birr 220.92 million. Therefore, the total cost of land lease and construction of buildings and civil works is estimated at Birr **267.540** million.

The proposed plant layout comprises the following buildings and structures.

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Table 4 Building costs

S/No	Descriptions	Total area in M ²	Estimated cost per square meter (in Birr)	Total estimated cost (in Birr)
1	Class room (learning room)	5,000	20,000.00	100,000,000.00
2	Laboratory room	500	20,000.00	10,000,000.00
3	Dormitory	1,000	20,000.00	20,000,000.00
4	Clinic room	500	20,000.00	10,000,000.00
5	workshop	120	20,000.00	2,400,000.00
6	Generator room	20	20,000.00	400,000.00
7	Power station room	20	20,000.00	400,000.00
8	Administration office	500	20,000.00	10,000,000.00
9	Toilet and shower for female	100	20,000.00	2,000,000.00
10	Toilet and shower for male	100	20,000.00	2,000,000.00
11	parking	2,500	5,000.00	12,500,000.00
13	For expansion	1,640	0.00	0.00
12	Fence	2,400 M*2	3,000.00	14,400,000.00
	Sub total			184,100,000.00
	Contingency 20%			36,820,000.00
	TOTAL	10,360 M ²		220,920,000.00

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Table 5 Land lease period in Addis Abeba

Sector of development activity	Period of lease	Down payment
Education, health, culture and sports	90	10%
Industry (manufacturing)	70	10%
commerce	60	10%
For urban agriculture	15	10%
For others	60	10%

Sources: - city government of Addis Abeba land development and management bureau

Table 6 Land lease floor price in Addis Abeba

S/No	Land level	Current land lease floor price per M ²	Current lease price per M ² (Market price)
1	1/1	2,213.25	39,073.31
2	1/2	2,165.47	36,825.73
3	1/3	1,900.19	34,578.15
4	¼	1,552.93	31,119.21
5	1/5	1,531.91	29,096.45
6	2/1	1327.39	27,073.71
7	2/2	1,221.18	25,050.96
8	2/3	1,191.17	23,028.21
9	2/4	1,074.39	21,005.46
10	2/5	1,027.84	18,982.71
11	3/1	994.71	16,959.96
12	3/2	960.21	14,937.21
13	3/3	927.84	12,914.46
14	¾	904.77	10,891.71
15	3/5	873.74	8,868.96
16	4/1	814.06	6,846.21
17	4/2	786.45	4,823.46
18	4/3	748.80	2,800.71

Sources: - city government of Addis Abeba land development and management bureau

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3.2.2 Machinery and equipment

The list of machinery, equipment and other facilities required for provision of doctoral medicine higher education is estimated to be Birr **12,955,000.00** (Table 7).

Table 7: Lists of required machinery, equipment and other facilities

S/N	Description	Quantity	Unit Cost of Equipment(Birr)	Total Cost of the Equipment(Birr)
1	Laboratory equipment	Lump sum	3,500,000.00	3,500,000.00
2	Medical simulation equipment	Lump sum	3,700,000.00	3,700,000.00
3	Broadband internet line (supply & Network Installation)	4	250,000.00	1,000,000.00
4	Desk top computers networked (Supply & Installation)	100	15,000.00	1,500,000.00
5	Lap top computers	15	20,000.00	300,000.00
6	Scanner	3	20,000.00	60,000.00
7	Digital camera	1	30,000.00	30,000.00
8	Video camera	1	35,000.00	35,000.00
9	Photo copy machine	2	120,000.00	240,000.00
10	Duplicating machine	1	100,000.00	100,000.00
11	Generator set 11 KW (Supply & Installation)	1	40,000.00	40,000.00
12	Printer	50	20,000.00	1,000,000.00
13	Satellite TV-set (Supply & Installation)	10	15,000.00	150,000.00
14	Cafeteria facilities	Set (2)	150,000.00	300,000.00
15	Other miscellaneous items	Lump sum		1,000,000.00
Total				12,955,000.00

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4. Organizational structure

The selection of structure of the envisaged project is made based on the existing structure of manufacturing plants operating in the country, the capacity, complexity and technology mix of the plant. Organizational structure principles such as specialization, coordination, and departmentalization are also considered for design of structure that best suits the envisaged project

4.1. Manpower requirement and annual manpower costs

Table 8 Man power requirement and labour costs

S.no	description	Number	Monthly salary	Annual salary, Birr
1	President	1	50,000.00	600,000.00
2	V/President	1	40,000.00	480,000.00
3	Senior secretaries	2	24,000.00	288,000.00
4	Student dean	1	15,000.00	180,000.00
5	Planning & Evaluation Officer	1	14,000.00	168,000.00
6	Public & External Relations Officer	1	14,000.00	168,000.00
7	Instructor	15	600,000.00	7,200,000.00
8	Registrar	1	6000.00	72,000.00
9	Student Record Officer	1	5000.00	60,000.00
10	Head, finance & administration	1	18,000.00	216,000.00
11	Documentation attendant	3	15,000.00	180,000.00
12	House Keeping Supervisor	1	3500.00	42,000.00
13	Financial clerk	2	12,000.00	144,000.00
14	Head ,security guard	1	5000.00	60,000.00
15	Librarian	3	18,000.00	261,000.00
16	Plumber	2	9000.00	108,000.00
17	Electrician	2	9000.00	108,000.00
18	Cleaner	15	45,000.00	540,000.00
19	Guard	8	28,000.00	336,000.00
20	Secretary	4	28,000.00	336,000.00
21	Driver	1	5000.00	60,000.00
22	Casher	2	8000.00	96,000.00
	Sub total	69	971,500.00	11,703,000.00
	Workers benefit (15% of BS)	-	14,5725.00	1,755,450.00
	Total	69	1,117,225.00	13,458,450.00

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5. Financial Analysis

5.1 General

The financial analysis evaluation of higher education project is mainly consisted of capital investment as well as operating and maintenance costs. The capital investment costs include fixed investment costs (initial fixed investment and replacement costs) and working capital, while operating and maintenance costs comprise current expenses related to material inputs, manpower cost, utility, repair and maintenance costs, spare parts, Overheads, Sales and distribution, interest and depreciation expenses.

The financial analysis and evaluation has been conducted taking assumptions:

1. It is assumed that about 70% of the total capital investment costs including the working capital requirement could be covered through development bank loans of short and long-term credits. The remaining balance 30% will be covered by equity capital contribution of the project owner.
2. Even though the project might secure loans under different term and conditions as well as from different financial sources, for the purpose of calculation of debt service scheduling, the current development bank of Ethiopia credit terms and conditions have been used. Consequently. It is assumed that the project will secure loan facility on the basis of 11.5 % annual interest rate.
3. Even though the estimated project production life is more 10 years, the financial analysis has been undertaken for a period interval covering the first 10 years only, during which time

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most of the capital assets are assumed to be depreciated, debts recovered and pay-back period accomplished.

4. It is assumed that the project will be start up production activity at 70 % capacity. During years 2 & year 3 the projects is anticipated to gradually increase capacity utilization to reach 100% in year 4. Therefore, starting from year 4 the project will be operational at full capacity.
5. For the project under reference promotional, sales and distribution expenses have been estimated at 3% of the sales revenue.
6. Maintenance and spare parts costs are 1.5% of the fixed investment costs.
7. Furniture and fixture costs assumed to be 500,000.00

5.2 Initial Fixed investment costs

Table 9 Initial Fixed investment costs

S/No	Fixed investment type	Unit of measurement	Quantity	Unit price	Total Amount	Remarks
1	Land	Square meter	12,000	3,885 birr/M ²	46,620,000.00	The period of land lease will be 70 years and 10% of the total lease amount will be paid in the first year
2	Buildings and civil works	Square meter	5,670	lump sum	220,920,000.00	
	Sub total				267,540,000.00	
3	Machineries	set	2	Lump sum	12,955,000.00	
4	Transformer	set	1	Lump sum	2,000,000.00	
5	Truck and vehicles	Pcs	2	Lump sum	8,000,000.00	
6	Furniture and fixture	Pcs			500,000.00	
	SUB TOTAL				23,455,000.00	
	Fixed capital investment costs				290,995,000.00	
7	pre-operational expenses				2,000,000.00	
	Working capital				12,707,000.00	
	TOTAL INVESTMENT COSTS				305,702,000.00	

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5.3 Working capital

Working capital is the financial means required for smooth operation and maintenance of a project mathematically, it is a difference between current assets and current liabilities. In the particular case of the project under consideration, the current assets comprise receivables, inventories (local and imported material inputs, spare parts, work in progress, and products ready for delivery) and cash in hand, while current liabilities comprise accounts payable to creditors.

5.4 Project Financing

Fixed capital investment costs and working capital requirements are assumed to be financed by equity capital of the owner and through loans of short and long-term credits.

The company obtains loans under different terms and condition as well as from different sources, for the purpose of calculation of debt service scheduling the current development bank of Ethiopia credit terms and conditions have been used. Accordingly, it is assumed that the company will be able to obtain loan 70% of the total investment costs for construction of different buildings for purchase of machineries. The remaining balance that of the total investment costs will be expected to be covered by equity contribution of the project promoter.

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5.5 Production costs

As it is depicted in Annex Table 13 major categories of the total production costs are assembled into the following cost elements.

5.5.1 Material inputs

In the project under study the basic material inputs (see in table 3) are educational materials, cleaning materials and stationary etc. Therefore, the current prevailing local and international market prices have been used for estimation of material inputs costs. At full capacity operation the material inputs costs are estimated at Birr 5.65 million per annum.

5.5.2 Utilities

In estimating costs of utility expenses for operation and maintenance of the project, Costs of fuel, oil and lubricant, electricity and water consumptions have been taken in to consideration, the rates of which have been estimated on the basis of the proposed capacity utilization program of the project and at the current official charging rates. At full capacity operation the project will have the following utility expense per annum which amounts to Birr 5.44 million.

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Table 10 Utilities of the factory'000''Birr

Utility'000''Birr		Start-up			Full Capacity
		70 %	80 %	90 %	100 %
Capacity utilization		70 %	80 %	90 %	100 %
Project year		1	2	3	4
Item description	Unit of measurement				
Fuel					
Gasoline for service vehicle	50km*365days*47Birr/LIT*8km/Li	107	107	107	107
Gasoline for transport truck	(50km*300days*47Birr/LIT*8km/Li)*3	321	321	321	321
Sub-Total		428	428	428	428
Change of oil and lubricant	10% of the fuel consumption	43	43	43	43
Sub-Total		471	471	471	471
Electricity	260days*24 hrs.*325kwh* 1.00Birr/kwh	1,420	1,623	1,825	2,028
Sub- Total		2,839	3,245	3,650	4,056
Water	365days*100m ³ /day*15 Birr/m ³	384	438	493	548
Sub -Total		384	438	493	548
Telecommunication					
Telephone	5 lines* 1,500Birr/month/line+18Birr/line/month	31.08	31.08	31.08	31.08
Mobile	5 lines*1,500 Birr/month/line	30.00	30.00	30.00	30.00
Fax	2line*1,000Birr/month + 17 Birr/line/month	12.40	12.40	12.40	12.40
Internet	25,000Birr/month	300.00	300.00	300.00	300.00
Sub-Total		374	374	374	374
TOTAL		4,068	4,528	4,988	5,449

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5.5.3 Over heads

In the expenses under this title have been included land and building taxes, buildings, vehicles as well as machinery and equipment insurance, vehicles annual inspection; postage, telephone and e. mail, stationery and office supplies; printing and copying; audit fee; cash indemnity etc. The overhead costs and divided in to direct overheads and administration overheads.

Table 11 Overhead costs

<u>Direct Overhead”000”Birr</u>		Year 1	Year 2	Year 3	Year 4
Annual land lease Payment		6,660	6,660	6,660	6,660
Insurance					
Building and Civil works	0.10%	113.10	113.10	113.10	113.10
Machinery and Equipment	0.20%	94.50	94.50	94.50	94.50
Motor vehicle and Truck	1%	60	60	60	60
Vehicles annual inspection and registration	25,000 Birr per annum per vehicle	50.00	50.00	50.00	50.00
Work cloth	Two times per annum per workers at 1,000 Birr	140	140	140	140
Cleaning and sanitation	An estimate of 300 Birr/day	78.00	78.00	78.00	78.00
Sub Total		7,196	7,196	7,196	7,196
<u>Administration Overhead “000’ Birr</u>					
Audit fee	40,000 Birr per annum	40.00	40.00	40.00	40.00
Office cleaning and sanitation	2,000 Birr per month	24.00	24.00	24.00	24.00
Stationery and office supplies	2,000 Birr per month	20.00	20.00	20.00	20.00
Printing and Copy	2,000 Birr per month	24.00	24.00	24.00	24.00
Sub Total		108.00	108.00	108.00	108.00
GRAND TOTAL		7,304	7,304	7,304	7,304

PROJECT PROFILE ON HUMAN HEALTH HIGHER EDUCATION (DOCTOR OF MEDICINE)

5.5.4 Financial costs

As it has been outlined earlier under "project Financing" the current Development Bank of Ethiopia credit terms and conditions for newly establishing projects have been used to compute the financial costs, estimated to be incurred in connection with that of the total investment costs assumed to be covered through loan financing. The amount of the loan capital to be obtained and the financial costs to be incurred thereof have been determined depending on the amount of fixed investment cost and pre-production expenses.

5.5.5 Depreciation

Table 12 Depreciation in Birr"000"

Period			Start-up			
			70 %	80 %	90 %	100 %
Project year			1	2	3	4
Item description	Original Value					
Structure and civil works	220,920,000.00	5% of original value	11,046	11,046	11,046	11,046
Machinery and equipment	10,955,000.00	15 % of original value	1,643	1,643	1,643	1,643
Transformer	2,000,000.00	15 % of original value	300	300	300	300
Motor vehicles and trucks	6,000,000.00	15% of original value	900	900	900	900
Weighbridge	4,000,000.00	15 % of original value	600	600	600	600
Office equipment and furniture	500,000.00	20 % of original value	100	100	100	100
Pre-production expenses	2,000,000.00	25% of original value	500	500	500	500
Total			15,089	15,089	15,089	15,089

PROJECT PROFILE ON HUMAN HEALTH HIGHER EDUCATION (DOCTOR OF MEDICINE)

5.6 Break Even point and ROI

5.6.1 Break Even point (BEP)

Three kinds of break-even point

A. BEP Sales Revenue(BR)

B. BEP production (Volume)

C. BEP Percentage (%)

A. Break-even point(BEP) Sales

To determine BEP Annual Sales, multiply annual sales found in income statement by the annual fixed cost, and divided by Annual sales less Annual variable cost.

$$\text{BEP (sales)} = \frac{\text{Annual sales} \times \text{Annual fixed costs}}{\text{Annual sales} - \text{Annual variables costs}}$$

Annual sales = 30,000,000 Birr

$$\text{BEP (sales)} = = \frac{\text{Annual sales} \times \text{Annual fixed costs}}{\text{Annual sales} - \text{Annual variables costs}} = = \frac{30,000,000 \times 60,460,000}{30,000,000 - 12,688,000}$$

BEP (Sales) = 104,771,257 Birr

$$\text{B. BEP percentage} = \frac{\text{Annual fixed costs} \times 100\%}{\text{Annual sales} - \text{Annual variables costs}}$$

$$= \frac{60,460,000 \times 100\%}{30,000,000 - 12,688,000}$$

$$= 349\%$$

PROJECT PROFILE ON HUMAN HEALTH HIGHER EDUCATION (DOCTOR OF MEDICINE)

5.6.2 Return on investment

Return on investment = Net profit /Total capital requirement

$$= 47,549,000/305,702,000$$

$$= 16\%$$

The return on owners' investment (ROOI)

= Annual net profit /owners' investment

$$= 47,549,000/91,710,600$$

$$= 52\%$$

5.7 Project benefits

As it has been stated earlier the project is envisaged to reach full capacity operation four years after commencement of production activities which are assumed to begin with 70% of the estimated total capacity.

Thus, according to the computation in Annex Table 16 and Annex Table 18, the net income and cash flow statements analysis revealed that at full capacity operation the project will generate a total income (gross revenue) amounting to 140.85 million Birr per annum. The Net Income Statement shows a steady growth of gross profit starting from (-43.14) million Birr in year 1 reaching the peak of 87.5million Birr in year 10. In its 10 years of manufacturing activities, the project is expected to generate a total net profit of 263.78 Birr and contribute 174 million Birr to the government treasury in form of 35% income tax.

According to the current investment Law, machinery and equipment are anticipated to be imported duty- free. The liquidity position of the project is very strong. The corresponding Annex Table 18

PROJECT PROFILE ON HUMAN HEALTH HIGHER EDUCATION (DOCTOR OF MEDICINE)

of “Cash Flow Statement” shows the positive cumulative cash balance of Birr 1.97 billion and the project will not face any cash shortage throughout its production life.

The computation of the pay-back period as depicted in Annex table 23 indicates that the project will be able to reimburse itself from its net cash-income within nine years after commencement of production activities, the period which is considered to be very good for the project of this nature.

In Annex Table 24 of the Benefit-cost ratio and Net present value (NPV) have been calculated at 17% discount factor (D.F) for 10 years of the project activity. Accordingly, the project has NPV of 4.60 million Birr at 17%D.F. and the benefit-cost ratio of 1.01 at 17% D.F. These results are most appreciable, especially, when related to the external capital borrowing interest rate which ranges from 8.50% to 18.5 % for newly establishing projects.

Break-even point (BEP) have been undertaken the project under study when implemented will have BEP at about 349 % operation of the estimated full capacity

In addition to this, finally, summary of financial efficiency tests have been conducted in Annex table 22, Accordingly, all efficiency ratios indicated positive trends and consequently, it can be inferred that the project can operate in the frame work of free market mechanism on commercially and financially viable basis and is remunerative.

ANNEXES

PROJECT PROFILE ON HUMAN HEALTH HIGHER EDUCATION (DOCTOR OF MEDICINE)

NNEX II

CALCULATION OF ANNUAL PRODUCTION COSTS

Table 13 Annual total production costs''000''

Period	Start-up			Full capacity						
	70 %	80 %	90 %	100 %	100 %					
Project Year	1	2	3	4	5	6	7	8	9	10
Cost category										
I. Material inputs	3,955	4,520	5,085	5,650	5,650	5,650	5,650	5,650	5,650	5,650
II. Labor	13,458	13,458	13,458	13,458	13,458	13,458	13,458	13,458	13,458	13,458
III. Utility	4,068	4,528	4,988	5,449	5,449	5,449	5,449	5,449	5,449	5,449
IV. Repair and Maintenance and spare parts (1.5 % of fixed cost)	4,365	4,365	4,365	4,365	4,365	4,365	4,365	4,365	4,365	4,365
VI Direct overheads	7,196	7,196	7,196	7,196	7,196	7,196	7,196	7,196	7,196	7,196
A. Direct Production costs	33,042	34,067	35,092	36,118	36,118	36,118	36,118	36,118	36,118	36,118
VII. Administration over head	108	108	108	108	108	108	108	108	108	108
VIII. Marketing and Promotional expense 3 % of sales revenue	300	570	813	1,032	1,229	1,409	1,409	1,409	1,409	1,400
B. Operating costs	33,450	34,745	36,013	37,258	37,455	37,635	37,635	37,635	37,635	37,626
Interest	24,609	23,172	21,571	19,785	17,793	15,573	13,097	10,336	7,258	3,826
Depreciation	15,089	15,089	15,089	15,089	14,589	14,489	13,409	11,046	11,046	11,046
C. Total production costs	73,148	73,006	72,673	72,132	69,837	67,697	64,141	59,017	55,939	52,498

PROJECT PROFILE ON HUMAN HEALTH HIGHER EDUCATION (DOCTOR OF MEDICINE)

ANNEX IV CALCULATION OF WORKING CAPITAL REQUIREMENTS

- I. Minimum requirement of current assets and liabilities
 - A. Accounts receivable: 26 days at total production costs minus depreciation and interest
 - B. Inventory
 1. Material inputs: 26 days
 2. Spare parts : 90 days
 3. Work under process: two days at direct costs
 4. Product ready for delivery: 8 days at direct costs plus administration overheads
 - C. Cash on hand : 360 days
 - D. Accounts payable 26 days for material inputs and utilities

ii. Working capital requirement

Table 14 Calculation of working capital

Cost category	Minimum Days of coverage	Coeff-icient of turnover	Project year									
			Start up			Full capacity						
			1	2	3	4	5	6	7	8	9	10
I. Current asset												
A. A/R	26	10	3,345	3,475	3,601	3,726	3,746	3,764	3,764	3,764	3,764	3,763
B. Inventory												
1. Material inputs	26	10	396	452	509	565	565	565	565	565	565	565
2. Spare parts	90	4	1,091	1,091	1,091	1,091	1,091	1,091	1,091	1,091	1,091	1,091
3. Work under process	2	130	254	262	270	278	278	278	278	278	278	278
4. Product ready for delivery	8	32.5	1,125	1,156	1,188	1,219	1,219	1,219	1,219	1,219	1,219	1,219
C. Cash on hand	90	4	7,299	7,414	7,529	7,644	7,644	7,644	7,644	7,644	7,644	7,644
D. Current assets			13,509	13,850	14,187	14,523	14,543	14,561	14,561	14,561	14,561	14,560
II. Current liabilities												
A. A/p	26	10	802	905	1,007	1,110	1,110	1,110	1,110	1,110	1,110	1,110
III. Working capital												
A. Net working capital			12,707	12,945	13,180	13,413	13,433	13,451	13,451	13,451	13,451	13,450
B. Increasing in working capital			12,707	238	235	233	0	0	0	0	0	0

PROJECT PROFILE ON HUMAN HEALTH HIGHER EDUCATION (DOCTOR OF MEDICINE)

ANNEX V

PROJECTED SALES REVENUE

Table 15 projected sales revenue'000'

			Start up			Full capacity						
	U/m	Unit price										
Product mix												
Year			1	2	3	4	5	6	7	8	9	10
Student available			200	380	542	688	819	939	939	939	939	939
Sales revenue		150,000 per year/ student	30,000	57,000	81,300	103,200	122,850	140,850	140,850	140,850	140,850	140,000

PROJECT PROFILE ON HUMAN HEALTH HIGHER EDUCATION (DOCTOR OF MEDICINE)

ANNEX VI

PROJECTED NET INCOME STATEMENT

Table 16 Projected Net income statement "000"

Period	Start up			Full capacity						
	70 %	80 %	90 %	100 %						
Project year	1	2	3	4	5	6	7	8	9	10
Item description										
Product sales revenue	30,000	57,000	81,300	103,200	122,850	140,850	140,850	140,850	140,850	140,000
Less total production costs	73,148	73,006	72,673	72,132	69,837	67,697	64,141	59,017	55,939	52,498
Gross profit	(43,148)	(16,006)	8,627	31,068	53,013	73,153	76,709	81,833	84,911	87,502
Tax	0.00	0.00	3,019	10,874	18,555	25,604	26,848	28,642	29,719	30,626
Net profit	(43,148)	(16,006)	5,608	20,194	34,458	47,549	49,861	53,191	55,192	56,876
Accumulated undistributed profit	(43,148)	(59,154)	(53,546)	(33,352)	1,106	48,656	98,517	151,708	206,900	263,776

PROJECT PROFILE ON HUMAN HEALTH HIGHER EDUCATION (DOCTOR OF MEDICINE)

ANNEX VII DEBT SERVICE SCHEDULE AND COMPUTATION PAYMENT OF EQUAL ANNUAL INSTALLMENTS

Table 17 Debt services schedule and computation

Item description	Project year									
	1	2	3	4	5	6	7	8	9	10
A. Investment and working capital										
1. Investment										
2. Increment working capital										
Total										
B. Loan receipts and balances										
1. Loan receipts	213,991	201,499	187,570	172,090	154,723	135,415	113,886	89,882	63,117	33,274
2. Outstanding balance at end of year										
a. First year loan	213,991	201,499	187,570	172,090	154,723	135,415	113,886	89,882	63,117	33,274
Total										
A. Debt service										
1. First year Loan										
a. Interest	24,609	23,172	21,571	19,785	17,793	15,573	13,097	10,336	7,258	3,826
b. Repayment of principal	12,492	13,929	15,531	17,317	19,308	21,529	24,004	26,765	29,843	33,275

PROJECT PROFILE ON HUMAN HEALTH HIGHER EDUCATION (DOCTOR OF MEDICINE)

ANNEX VIII CASH-FLOW STATEMENT FOR FINANCIAL PLANING

Table 18 Projected Cash flow statement

Period	Start up				Full capacity					
	70%	80%	90%	100%						
Capacity utilization	70%	80%	90%	100%						
Project year	1	2	3	4	5	6	7	8	9	10
Item description										
A. Cash - inflow	336,504	57,341	81,637	103,536	122,850	140,850	140,850	140,850	140,850	140,000
1. Financial resource (total)	306,504	341	337	336						
2. Sales revenue	30,000	57,000	81,300	103,200	122,850	140,850	140,850	140,850	140,850	140,000
B. Cash – outflow	377,055	72,187	76,471	85,570	93,111	100,341	101,584	103,378	104,455	105,353
1. Total assets schedule including replacement	306,504	341	337	336						
2. Operating costs	33,450	34,745	36,013	37,258	37,455	37,635	37,635	37,635	37,635	37,626
3. Debt service (total)										
a. Interest	24,609	23,172	21,571	19,785	17,793	15,573	13,097	10,336	7,258	3,826
b. Repayment	12,492	13,929	15,531	17,317	19,308	21,529	24,004	26,765	29,843	33,275
4. Tax	0.00	0.00	3,019	10,874	18,555	25,604	26,848	28,642	29,719	30,626
C. Surplus (Deficit)	-40,551	-14,846	5,166	17,966	29,739	40,509	39,266	37,472	36,395	34,647
D. Cumulative cash balance	-40,551	-55,397	-50,231	-32,265	-2,526	37,983	77,249	114,721	151,116	185,763

PROJECT PROFILE ON HUMAN HEALTH HIGHER EDUCATION (DOCTOR OF MEDICINE)

ANNEX XII TOTAL INVESTMENT COSTS

Table 19 Total investment costs”000”

Period	Start up			Full capacity								
	1	2	3	4	5	6	7	8	9	10		11
Project year												
Investment Category												
1. Fixed investment costs												
a. Initial fixed investment costs	290,995											
b. Replacement												
2. Pre-operational capital expenditure	2,000											
3. Working capital increase	12,707	238	235	233								
Total investment costs	305,702	238	235	233								

ANNEX XIII TOTAL ASSETS

Table 20 Total Assets

Period	Start up			Full capacity								
	1	2	3	4	5	6	7	8	9	10		11
Project year												
Investment Category												
1. Fixed investment costs												
c. Initial fixed investment costs	290,995											
❖ Cost of land												
d. Replacement												
2. Pre-operational capital expenditure	2,000											
3. Current assets increase	13,509	341	337	336								
Total assets	306,504	341	337	336								

PROJECT PROFILE ON HUMAN HEALTH HIGHER EDUCATION (DOCTOR OF MEDICINE)

ANNEX XIV SOURCES OF FINANCE

Table 21 Sources of finance

Period	Start up			Full capacity						Total	
	1	2	3	4	5	6	7	8	9		10
Project year											
Sources of finance											
1. Equity capital	91,711	238	235	233							
2. Loan capital	213,991										
3. Current liabilities	802	103	102	103							
Total finance	306,504	341	337	336							

ANNEX XI SUMMARY OF FINANCIAL EFFECIENCY TESTS

Table 22 Summary of financial efficiency tests

Project year	Project year									
	1	2	3	4	5	6	7	8	9	10
Capacity utilization	70%	80%	90%	100%						
Financial ratio in %										
1. Gross profit : Revenue	-144%	-28%	11%	30%	43%	52%	54%	58%	60%	63%
2. Net profit : Revenue	-93%	-18%	7%	20%	28%	34%	35%	38%	39%	41%
3. Net profit : initial investment	-9%	-3%	2%	7%	11%	16%	16%	17%	18%	19%
4. Net profit : Equity	-31%	-11%	6%	22%	37%	51%	54%	58%	60%	62%
5. Gross profit : Initial investment	-14%	-5%	3%	10%	17%	24%	25%	27%	28%	29%
6. Operating costs : Revenue	112%	61%	44%	36%	30%	27%	27%	27%	27%	27%

PROJECT PROFILE ON HUMAN HEALTH HIGHER EDUCATION (DOCTOR OF MEDICINE)

ANNEX XV CALCULATIONS OF PAYBACK PERIOD

Table 23 Calculation of payback period”000”

Year	Amount Paid Back			Total investment	End of year
	Net Profit	Depreciation	Total		
1	-28,046	15,089	-12,957	305,702	-318,659
2	-10,404	15,089	4,685	238	-314,212
3	5,608	15,089	20,697	235	-293,750
4	20,194	15,089	35,283	233	-258,700
5	34,458	14,589	49,047		-209,653
6	47,549	14,489	62,038		-147,615
7	49,861	13,409	63,270		-84,345
8	53,191	11,046	64,237		-20,108
9	55,192	11,046	66,238		+46,130

PROJECT PROFILE ON HUMAN HEALTH HIGHER EDUCATION (DOCTOR OF MEDICINE)

ANNEX XVI CALCULATIONS OF NET PRESENT VALUE AT 17% D.F.

Table 24 Calculation of NPV at 17% D.F.

Project year	Gross Revenue	1/(1+i) ⁿ At 17%	Present value at 17%	Project costs			
				Total investment	Operating costs	Total	Present value at 17%
1	30,000	0.854701	25,641	305,702	33,450	339,152	289,874
2	57,000	0.730514	41,639	238	34,745	34,983	25,556
3	81,300	0.624371	50,761	235	36,013	36,248	22,632
4	103,200	0.53365	55,073	233	37,258	37,491	20,007
5	122,850	0.456111	56,033		37,455	37,455	17,084
6	140,850	0.389839	54,909		37,635	37,635	14,672
7	140,850	0.333195	46,931		37,635	37,635	12,540
8	140,850	0.284782	40,112		37,635	37,635	10,718
9	140,850	0.243404	34,283		37,635	37,635	9,161
10	140,850	0.208037	29,302		37,635	37,635	7,829
Total			434,684				430,071

A. Benefit- cost ratio at 17% D.F. = 1.01

B. NPV at 17% D.F. = 4,613,000 Birr