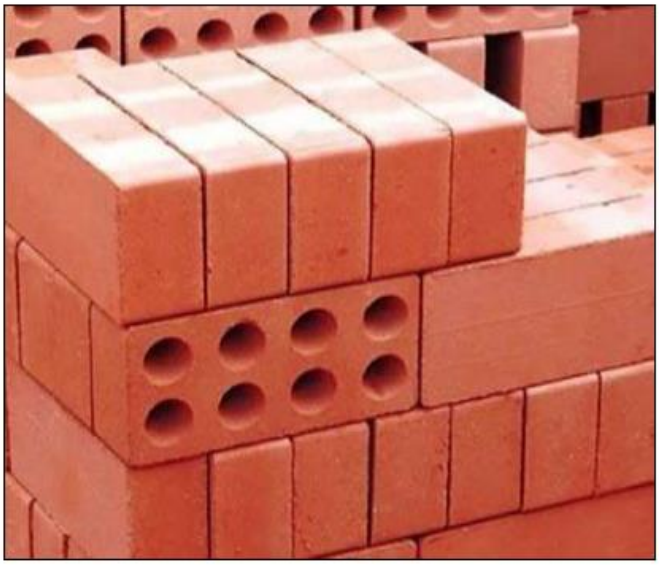
A Preliminary Feasibility Study on the Production of Clay Bricks



Prepared by
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May 2021

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I. Project Basic Information:

Project Name:	Clay bricks factory to be used in construction and building
Project Surface Area and Location:	15,000 m^2 at Qena Governorate
Permitted Act of Disposition	Sale (Ownership)
M^2 Price/year	EGP 680/m^2
Project Economic Life Expectancy:	5 Years
Project Products:	Different types and sizes of clay bricks to be used in construction and building
Expected Labour:	40 labourers and administrative officers
Expected Investment Costs:	~EGP 70,000,000 (about USD 4.5 million, if the EGP-USD exchange rate is EGP15.7=USD 1)
Expected Annual Profits:	~EGP 4 million
Feasibility Study Date	May 2021

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II. Project Market Feasibility Study:

1. Project market feasibility study according to the growth divers and competitiveness:

- Egypt is now in the best era of giant architectural projects from residential facilities to mega strategic projects such as the regions of Portsaid, New Ismailia, El Sokhna and Alamien. In addition, there is an expansion in the new architectural cities in Cairo and other governorates, as well as the mega project the New Administrative City, and other constructions for contractors and real estate companies. Moreover, there is a renaissance in the industrial field, which led to the increase in building factories.
- The raw materials used for the production of clay bricks such as energy, clay and sand are available in adequate types, and are extracted from different quarries in different governorates.
- Clay bricks are one of the most important materials used in building, where they are used in 80% of the buildings in Egypt.
- In accordance with the brick division of the Building Materials Chamber affiliated to the Federation Of Egyptian Industries (FEI), Egypt launched a new strategy in 2018 in order to support an develop the industry of clay bricks over the three coming years after witnessing some obstacles due to the flotation and the increase in gas prices. Moreover, Egypt seeks to support the manufacturers to overcome any obstacles, which will lead to the development and modernization of the industry.
- Clay bricks are characterized by being non-harmful to the environment, a good thermal insulator, where it is better in insulation than cement bricks and other bricks. Moreover, clay bricks are characterized by their lightweight, which helps in constructing high buildings, as well as being soundproof and energy saver due to being thermal insulator.

2. Supply Volume:

- In accordance with the brick division of the Building Materials Chamber affiliated to FEI, the number of factories operating in Egypt is 1320, with a production capacity of 6 billion bricks annually. 49% of clay bricks factories are in Giza governorate, especially in Arab abo Saed and El-Saf regions, 31% in Lower Egypt, and 16% in Alexandria and Beheira governorates.
- Only two local companies produce clay bricks automatically, which are characterized by their high quality and compliance with the required specifications. The remaining factories produce bricks in a semi-automatic way or a traditional primitive way.

3. Demand Volume:

- The demand for primitively manufactured bricks has decreased because they are not complied with the specifications. Such bricks were reliable on in the past due to their low price as they were used for constructions in slums, and as a result to the laws that limited random ways of construction, the demand on such bricks has decreased.
- There is an increase of demand on clay bricks due to the mega projects currently being built in Egypt and the expansion in new cities, provided that such bricks are complied with the specifications.

4. Market Gap:

- There is a huge demand gap for the bricks complied with standard specifications. As a result of the giant projects' dependence on contracting and real estate development companies, an engineering consultant requests special specifications, the demand on the bricks complied with specifications, which are produced by few companies in the market, has increased. Therefore,

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such factories sold all their production capacity, and some of them have sold pre-production reservations.

- Since most clay bricks factories don't produce high quality products, the export levels are very low, as the only country that clay bricks was exported to is Libya, and exportation stopped after Libyan revolution. However, there is a big chance to transport to Libya now after the stabilization of the conditions, provided that clay bricks are produced with high quality and the standard specification required.

5. Local Market:

- The main aim of the project is to cover high demand volume on clay bricks compiled with specifications in the local market, where there is severe deficiency in covering the local needs.
- If clay bricks produced locally, the project will fulfil the local market needs, and save the amounts paid to import huge quantities of clay bricks and clay bricks insulated from the inside with panels.

6. Potential Export Markets:

- The project has potentials to fulfil the local market needs and export to Libya, which is expected to import large quantities of clay bricks after the stabilization of conditions there and the development strategy, if the project's products are offered with competitive prices.
- The project might expand to export to other markets provided that the clay bricks are produced with special specifications that fulfill the needs of the countries to be marketing for.

7. Products, Expected Sales Volume and Prices During the Fiscal Year:

- According to what is prevailing in the industry, the below prices are indicative ones in light of the normal rates, and they might be modified according to the date of the study.

  They can be summarized through the annual production cycle according to the below table and the data received from the Industrial Development Authority (IDA) and Industrial Modernization Centre (IMC):

Product	Unit of Measure	Expected Sales Volume	Expected Average Selling Price in Normal Conditions	Expected Total Annual Sales
Hollow clay bricks with different types and sizes and complied with specifications	1000 Clay Bricks	18 million Clay Bricks	EGP 1800/1000 clay bricks	EGP 32,400,000

8. Expected Costs of Marketing Campaigns:

The annual costs of the marketing campaign, especially at the beginning of the project to achieve deployment are estimated at EGP 100,000 (Only One Hundred Thousand Egyptian Pounds).

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III: Project Legal Feasibility Study:

- The project can be incorporated as a sole proprietorship, partnerships, a limited liability, or a joint stock company.
- Some legal determinants must be taken into account regarding obtainment of licenses-to-operate from the competent authorities, which are: the governorate that has jurisdiction on land, its local units, or the city hall, licenses obtained IDA, and the requirements of Civil Defense Authority that need special procedures due to the nature of industry.
- In the case of exportation, the project must obtain an import and export card specifying the nature and description of the products, or exports through an intermediary company that undertakes the export and customs release procedures on behalf of the project.
- The fees of incorporation, attorney, licenses obtainment, registration in the chamber and the specifications tests to obtain the certificates of validity and conformity of products are estimated at about One Hundred Thousand Egyptian Pounds.

IV: Project Social Feasibility Study:

- The social feasibility study aims at analysing the social costs and benefits of different projects in order to choose the project achieving the highest social benefit. It is noted in this regard that social feasibility study consider additional sides because it focuses on the social effects of the project to achieve the economic and social goals of the society.
- The project provides new job opportunities.
- It provides direct job opportunities, in addition to the indirect ones.

V: Project Environmental Feasibility Study:

- The project is classified among the projects of List "C", and the environmental impact of the project must be assessed according to the Environmental Classification Model C and the requirements of the Environment Law. The project must consider the environmental requirements of this activity due to the nature of industry.
- The environmental requirements that need special procedures must be available to limit the pollution of this industry and the emissions, as well as getting rid of wastes.
- The costs of getting rid of wastes are included in the costs of raw material according to the data received from IDA.
- It is suggested to create a production line with appropriate crushers to use the crushes of bricks, solid wastes and remnants of house demolitions and recycle them to be used beside the ordinary clay to produce clay bricks.

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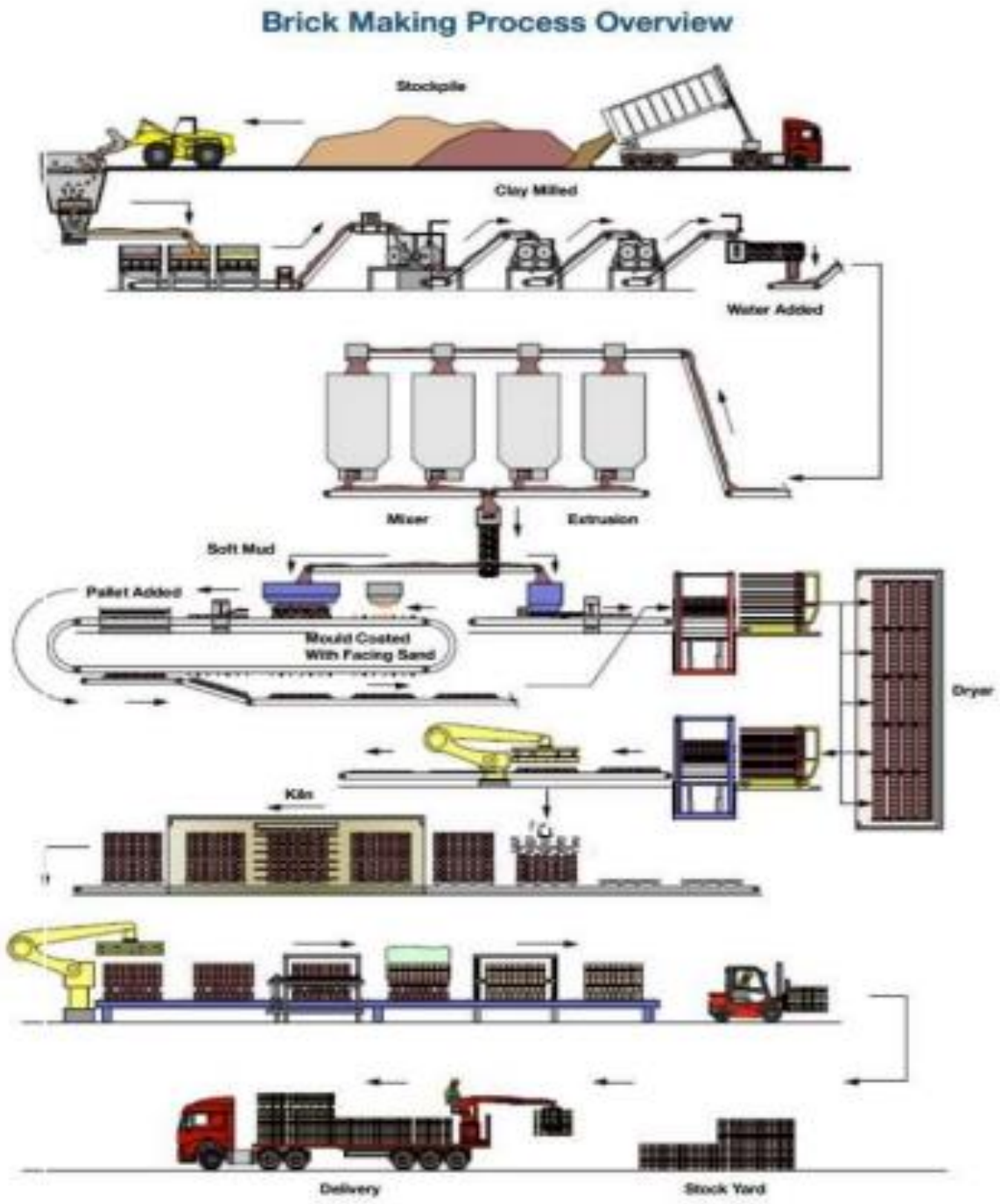
VI: Project Technical and Engineering Feasibility Study:

1. Production Process Phases:



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Production Process Phases can be Simply Summarized in the following steps:

- Processing and grinding of clay
- Mixing clay with materials and adding 10% of water to mixture
- Loading to the feeder box in preparation for the staring the production line
- Machine for extruding and forming inside the form
- First drying phase (green bricks)
- Oven fire phase (red bricks)
- Sorting phase
- Packing, packaging, shipping or storing phase

The most important required specifications can be simply summarized as follows:

- The shape: bricks must have a regular shape, and their angles and sides should be moderately appropriate, and if any superficial cracks are found, such cracks should not weaken the their properties. The brick must be homogeneous, fully burnt and free of any lime knots. Moreover, the percentage of good bricks free of visible cracks and defects must not be less than 95% of the exported quantity.
- Water Absorption: the water absorption amount of one brick in the 24 hour water immersion test must not be more than 30% in weight, provided that the average absorption of five bricks must not be more than 27% in weight for normal red bricks.
- Compressive Strength: the compressive strength of one brick must not be less than 30kg/ cm^2, and the average compressive strength of five bricks must not be less than cm^2 for normal red bricks.
- Efflorescence: It is the appearance of mineral salts (mostly lime) on the surface of the brick after being emerged with water and dried. Efflorescence is described by the following grades; zero and light, medium, heavy, or very heavy. When making the efflorescence on bricks, it must be light.
- Such tests are made in specialized labs and specifications compliance certificates are obtained and must be complied with in the production process phases and in exporting to clients. In addition, it is necessary to maintain quality to keep the good reputation of the project and avoid the rejection of the exported quantities.

2. Machinery and Equipment required for the Production Processs:

They can be identified as follows:

Item
• Loader • Clay bricks production line • Forming line • Hoffman fire oven size 70m x 50m • Chimney with a height of 75m complied with the environment specifications

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3. **Location:**

The project is set up in Qena governorate in Egypt, where all needed utilities and licenses for this industry are available, in addition to being near to the clay and raw material resources. Moreover, work force and lands are available for reasonable prices,

The location can be clarified on the map:

The surface area of the land available for setting up the project is 15000 m^2:

According to the investment opportunities of Qena Governorate and the data received from IDA and IMC, the average price of land m^2 is EGP 680, such land must have the conditions of establishing a clay bricks factory, all utilities required for the project, and easiness of licenses obtainment. The aforementioned prices are regularly reviewed by the competent pricing committees.

Accordingly, the total land cost is = 15000 m^2 x EGP 680 = EGP 10,200,000 (Only Ten Million and Two Hundred Thousand Egyptian Pounds).

4. **Buildings:**

According to the data published by bricks makers in the Building Materials Chamber, bricks factories are divided into 60% for production process and the remaining 40% are equally divided into two parts one for storing raw materials and the other for storing the final products "Red Bricks". Accordingly, the surface area of buildings is estimated at 9000m, whereas the cost of square meter of buildings in addition to the fences, security and electricity rooms, warehouses, trusses with helicopter flooring, and others with bricks and reinforced concrete including finishes. In case the average price is EGP 4000/ m^2 according to the data received from IDA, the total cost of buildings and constructions = 9000 m^2 x EGP 4000/m^2 = EGP 36,000,000 (Only Thirty Six Million Egyptian Pounds).

5. **Raw Materials:**

- Diversified desert clay

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- Sand

6. **Power Consumption:**
    - **Electricity Consumption** = 2700 kWh
    - **Water Consumption** = 36000 m^3
    - **Gas Consumption** = 2,160,000 m^3

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VII. Project Financial Feasibility Study:

1. Foundations and Hypothesis of the Financial Study:

- In this financial feasibility study, data and sales revenue estimates are based on the market study results.
- Investment cost values and other costs and expenses have been estimated based on the technical study results received from IDA and IMC.
- Machinery and equipment annual depreciation is estimated based on the technical study results. Same machinery and equipment sale value is presumed to be matching their book value at the end of the expected lifetime of the project.
- It is presumed that the first operating cycle requirements are obtained with a 50% facilities from suppliers.
- It is taken into account that the estimated value of the fixed assets mentioned in this study is time-and-circumstance limited; it is related to a specific period in specific circumstances. Accordingly, such value may change by change of circumstances or by report time prescription or change of economic climate.
- Pursuant to the Egyptian Accounting Standards, it is presumed that incorporation and pre-commencement costs are fully expired by the first year of revenue.
- The economic life of the project is estimated to be five years.
- The estimated income statements have been prepared on the presumption that there is no fundamental change in the revenue values and expected annual costs during the study period other than the estimated growth rate in sales, which corresponds to a similar rate of growth in costs of 10% per annum.
- Pursuant to the Egyptian legislation prevailing at the time at which this study has been prepared, a tax rate (TR) of 22.5% on companies' annual profits.
- Annual cash flows are estimated using the indirect estimation method; necessary adjustments have been applied to the results of the estimated income statements of the years in this study.
- The criteria of Return on Investment (ROI), Payback Period (PBP), Net Present Value (NPV), and Internal Rate of Return (IRR) have been applied to the assessment of the economic feasibility of the project. The required rate of return (RRR) on investment has also been taken into account.
- RRR on investment has been determined using the weighted average cost of capital (WACC) method, and it is presumed that the project is fully funded by the owners.
- Future financial estimates include estimated and intangible risks and other factors that may lead to a difference between project expected performance – which is based in this study on the business climate prevailing at the time of preparing it – and the actual performance and results achieved by the project.

2. RRR on Investment

- It is the minimum return required by an investor in order to invest in Egypt, provided that such return be assessed in light of the industrial risks to be faced by the project being the subject-matter of this study.
- It is concluded under this study that an RRR with a value of 18%, based on the risks of the study under consideration in Egypt is to be used and calculated as follows:

$$RRR = [RFR + (CRP \times \beta)]$$

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- Based on the official data published by CBE regarding the Egyptian treasury bonds to be mature at the end of 2026 – a period covering almost all project valuation period (five years) – the Risk Free Rate (RFR) is calculated using the Weighted Average Yield of various bond issues during the said period.

https://www.cbe.org.eg/en/Auctions/Pages/AuctionsEGPTBondsCouponHistorical.aspx

Weighted Avg. Yield (%)	Max. Yield (%)	Min. Yield (%)	Coupon	Accepted Amount	Submitted Amount	Required Amount	Type (New/Reopening)
١٤,٠٦٠	١٤,١٢٠	١٣,٩٠٠	١٤,٠٦٠	٨,٠٠٠,٠٠٠,٠٠٠	١٤,٣٢١,٥٥٠,٠٠٠	٨,٠٠٠,٠٠٠,٠٠٠	N
١٤,٣٤٧	١٤,٤٠٠	١٤,١٠٠	١٤,٠٦٠	٨,٠٤٩,٨٨٦,٠٠٠	١٢,٠٤٩,٨٨٦,٠٠٠	٧,٥٠٠,٠٠٠,٠٠٠	R
١٤,٣٥٩	١٤,٣٩٥	١٤,٢٤٠	١٤,٠٦٠	١٧,٢١٦,٠٥٠,٠٠٠	٢٥,٠٩٦,٢٥٠,٠٠٠	٨,٠٠٠,٠٠٠,٠٠٠	R
١٤,٤٠٣	١٤,٤٤٠	١٤,٢٥٠	١٤,٠٦٠	١٢,٢٣٢,٧٤٨,٠٠٠	١٦,٢٧٢,٨٨٧,٠٠٠	٧,٥٠٠,٠٠٠,٠٠٠	R
١٤,٢٩	متوسط العائد قبل خصم الضرائب						
١١,٤٣	متوسط العائد بعد خصم ضريبة ٢٠%						

Pre-tax average Yield	متوسط العائد قبل خصم الضرائب
Average Yield after 20% Tax	متوسط العائد بعد خصم ضريبة 20%

- Country Risk Premium (CRP) of 5.33% is used based on Egypt's global ranking issued by Moody's Cooperation and "Standard & Poor's" (S&P); and according to Egypt's 2021 market data as updated on Damodaran's website.

http://www.stern.nyu.edu/~adamodar/pc/datasets/ctryprem.xlsx

- Third, in respect of risks of the industry under consideration in the Egyptian market, the beta coefficient is estimated to be 1.20 based on the average risks of such industry.

http://www.stern.nyu.edu/~adamodar/pc/datasets/ betas.xls

Accordingly, RRR on investment is calculated as follows:

$$RRR = (11.43 + 5.33 \times 1.20) = \sim 18\%$$

3. **Estimation of Project Investment Cost:**

- In accordance with Article (11) of the Executive Regulations of Investment Law No. 72 of 2017 issued by Prime Minister Decree No. 2310 of 2017, Project Investment Cost is defined as follows:

"Project investment cost shall mean such costs required to set up an Investment Project. These include property rights; long-term liabilities invested in setting up or establishing fixed corporeal (tangible) assets or incorporeal (intangible) assets, conditional on payment of value thereof in cash; and working capital."

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The opening budget of the investment project can be prepared in accordance with the results of the estimated technical feasibility study as follows:

Item		Value (EGP)
LONG-TERM ASSETS		
Incorporation, licensing and pre-commencement expenditure		**100,000**
Lands		**10,200,000**
Buildings		**36,000,000**
Machinery and equipment		**12,000,000**
Total long-term assets		**58,300,000**
CURRENT ASSETS		
Stock of materials and production requirements		**1,500,000**
Stock of packing materials		**100,000**
Cash and cash equivalents	([1])	**11,173,000**
Total current assets		**12,773,000**
CURRENT LIABILITIES		
Suppliers of raw materials and production requirements		**750,000**
Suppliers of packing and packaging materials		**50,000**
Total current liabilities		**800,000**
Working capital		**11,973,000**
Total investments		**70,273,000**
TO BE FUNDED AS FOLLOWS:		
Equities		
Capital		**70,273,000**
Investment Total Funding		**70,273,000**

Investment Costs Graph	رسم بياني لهيكل الانفاق الاستثماري
Incorporation, licensing and pre-commencement expenditure	مصروفات تأسيس وتراخيص وما قبل النشاط
Lands	الاراضي
Buildings	المباني
Machinery and equipment	الآلات والمعدات
Working capital	رأس المال العامل

[1] The cash required to cover the expenses of the first operating cycle is divided up into the following: (EGP 2 million for labour payroll, EGP 100,000 for marketing expenses, about EGP 8.07 million for energy, gas and electricity consumption, and EGP 1 million for general and administrative expenses including food, allowances, stationery, professional fees…etc.).

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Hence, project total investment costs = total long-term assets + working capital = ~ EGP 70,000,000 (Only seventy million Egyptian pounds) or ~ USD 4.5 million (Only four million and 5 hundred thousand United States Dollars, if the exchange rate of USD 1 equals EGP 15.6.

4. Expected Income Statements for the Years of Investment Project

Such statements can be prepared according to the results of the technical feasibility study as follows:

البيـــــــــــان	السنة الاولى	السنة الثانية	السنة الثالثة	السنة الرابعة	السنة الخامسة
إجمالي الايرادات	٣٢,٤٠٠,٠٠٠	٣٥,٦٤٠,٠٠٠	٣٩,٢٠٤,٠٠٠	٤٣,١٢٤,٤٠٠	٤٧,٤٣٦,٨٤٠
يخصم:					
تكلفة المبيعات	(١١,٦٧٣,٠٠٠)	(١٢,٨٤٠,٣٠٠)	(١٤,١٢٤,٣٣٠)	(١٥,٥٣٦,٧٦٣)	(١٧,٠٩٠,٤٣٩)
مجمل الربح	٢٠,٧٢٧,٠٠٠	٢٢,٧٩٩,٧٠٠	٢٥,٠٧٩,٦٧٠	٢٧,٥٨٧,٦٣٧	٣٠,٣٤٦,٤٠١
يخصم:					
مصروفات التأسيس وماقبل النشاط	(١٠٠,٠٠٠)				
اهلاك الأصول الثابتة	(٤,٨٠٠,٠٠٠)	(٤,٨٠٠,٠٠٠)	(٤,٨٠٠,٠٠٠)	(٤,٨٠٠,٠٠٠)	(٤,٨٠٠,٠٠٠)
مصروفات عمومية وإدارية وتسويقية	(١,٦٠٠,٠٠٠)	(١,٧٦٠,٠٠٠)	(١,٩٣٦,٠٠٠)	(٢,١٢٩,٦٠٠)	(٢,٣٤٢,٥٦٠)
صافي الربح المحاسبي قبل الضرائب	١٤,٢٢٧,٠٠٠	١٦,٢٣٩,٧٠٠	١٨,٣٤٣,٦٧٠	٢٠,٦٥٨,٠٣٧	٢٣,٢٠٣,٨٤١
يخصم:					
الضريبة (بمعدل ٢٢,٥%)	(٣,٢٠١,٠٧٥)	(٣,٦٥٣,٩٣٣)	(٤,١٢٧,٣٢٦)	(٤,٦٤٨,٠٥٨)	(٥,٢٢٠,٨٦٤)
صافي الربح المحاسبي بعد الضرائب	١١,٠٢٥,٩٢٥	١٢,٥٨٥,٧٦٨	١٤,٢١٦,٣٤٤	١٦,٠٠٩,٩٧٩	١٧,٩٨٢,٩٧٧
معدل العائد على رأس المال (ROI)	%١٦	%١٨	%٢٠	%٢٣	%٢٦

البيان	Item
السنة الأولى	First Year
السنة الثانية	Second Year
السنة الثالثة	Third Year
السنة الرابعة	Fourth Year
السنة الخامسة	Fifth Year
إجمالي الإيرادات	Total revenue
يخصم:	Subtract:
تكلفة المبيعات	Cost of Sales
مجمل الربح	Gross Profit
يخصم:	Subtract:
مصروفات لتأسيس وما قبل النشاط	Incorporation and pre-commencement expenditure
اهلاك الأصول الثابتة	Depreciation of fixed assets
مصروفات عمومية وإدارية وتسويقية	General, administrative and marketing expenses
صافي الربح المحاسبي قبل الضرائب	Net accounting profit before tax
يخصم:	Subtract:

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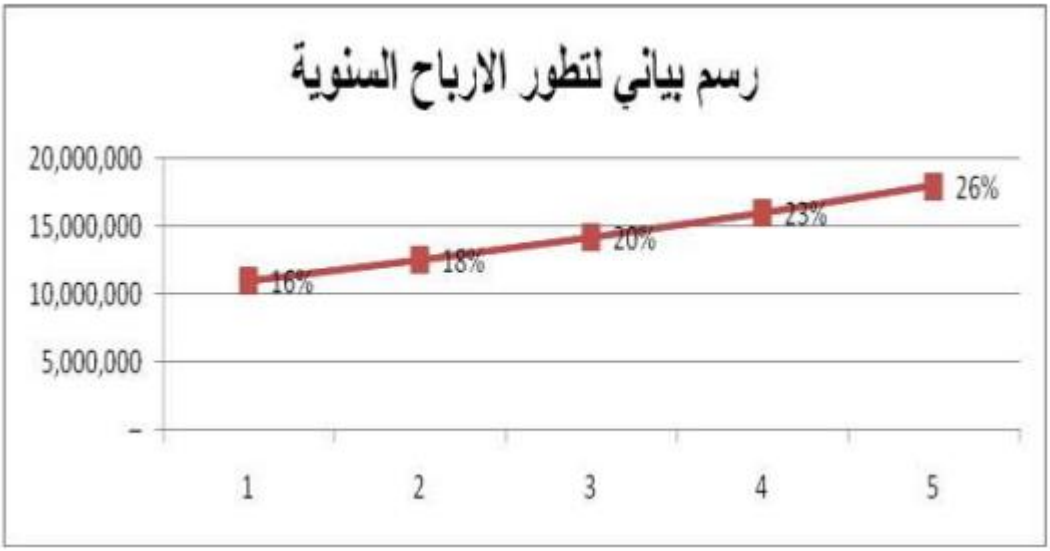
Tax (at a rate of 22.5%)	الضريبة بمعدل (22,5%)
Net accounting profit after tax	صافي الربح المحاسبي بعد الضرائب
Return Rate on Capital	معدل العائد على رأس المال



Annual Profits Development Graph	رسم بياني لتطور الأرباح السنوية

5. Estimating the cash flow stream for the years of the investment project:

According to the foregoing, the cash outflow in year zero = EGP 70,273,000.

The cash flow stream of the economic life of the project can be estimated indirectly through adjusting the net accounting profit by re-adding the depreciation premium because it is a non-cash expense, and by re-adding the incorporation and pre-commencement expenditure because they are calculated within the value of the outgoing investment costs in the year zero.

البيـــــــــــان	السنة الاولى	السنة الثانية	السنة الثالثة	السنة الرابعة	السنة الخامسة
إجمالي الايرادات	٣٥،٠٠٠،٠٠٠	٣٨،٥٠٠،٠٠٠	٤٢،٣٥٠،٠٠٠	٤٦،٥٨٥،٠٠٠	٥١،٢٤٣،٥٠٠
يخصم:					
تكلفة المبيعات	(٢٩،٦٠٠،٠٠٠)	(٣٢،٥٦٠،٠٠٠)	(٣٥،٨١٦،٠٠٠)	(٣٩،٣٩٧،٦٠٠)	(٤٣،٣٣٧،٣٦٠)
مجمل الربح	٥،٤٠٠،٠٠٠	٥،٩٤٠،٠٠٠	٦،٥٣٤،٠٠٠	٧،١٨٧،٤٠٠	٧،٩٠٦،١٤٠
يخصم:					
مصروفات التأسيس وما قبل النشاط	(١٠٠،٠٠٠)				
اهلاك الأصول الثابتة	(٢٦٠،٠٠٠)	(٢٦٠،٠٠٠)	(٢٦٠،٠٠٠)	(٢٦٠،٠٠٠)	(٢٦٠،٠٠٠)
مصروفات عمومية وإدارية	(٧٠٠،٠٠٠)	(٩٥٢،٠٠٠)	(١،٠٤٢،٢٠٠)	(١،١٤١،٤٢٠)	(١،٢٠٠،٥٦٢)
صافي الربح المحاسبي قبل الضرائب	٤،٣٤٠،٠٠٠	٤،٧٢٨،٠٠٠	٥،٢٣١،٨٠٠	٥،٧٨٥،٩٨٠	٦،٤٤٥،٥٧٨
يخصم:					
الضريبة (بمعدل ٢٢,٥%)	(٩٧٦،٥٠٠)	(١،٠٦٣،٨٠٠)	(١،١٧٧،١٥٥)	(١،٣٠١،٨٤٦)	(١،٤٥٠،٢٥٥)
صافي الربح المحاسبي بعد الضرائب	٣،٣٦٣،٥٠٠	٣،٦٦٤،٢٠٠	٤،٠٥٤،٦٤٥	٤،٤٨٤،١٣٤	٤،٩٩٥،٣٢٣
يضاف مصروفات غير نقدية/ تشغيلية					
اهلاك ومصروفات التأسيس وماقبل النشاط	٣٦٠،٠٠٠	٢٦٠،٠٠٠	٢٦٠،٠٠٠	٢٦٠،٠٠٠	٣٦٠،٠٠٠
صافي تدفق نقدي تشغيلي	٣،٧٢٣،٥٠٠	٣،٩٢٤،٢٠٠	٤،٣١٤،٦٤٥	٤،٧٤٤،١٣٤	٥،٣٥٥،٣٢٣
يضاف إيرادات اخرى للسنة الأخيرة					
صافي رأس المال العامل المسترد					٧،٣٠٠،٠٠٠
القيمة التخريدية للأصول الثابتة					١،٣٠٠،٠٠٠
صافي التدفق النقدي السنوي	٣،٧٢٣،٥٠٠	٣،٩٢٤،٢٠٠	٤،٣١٤،٦٤٥	٤،٧٤٤،١٣٤	١٣،٨٥٥،٣٢٣

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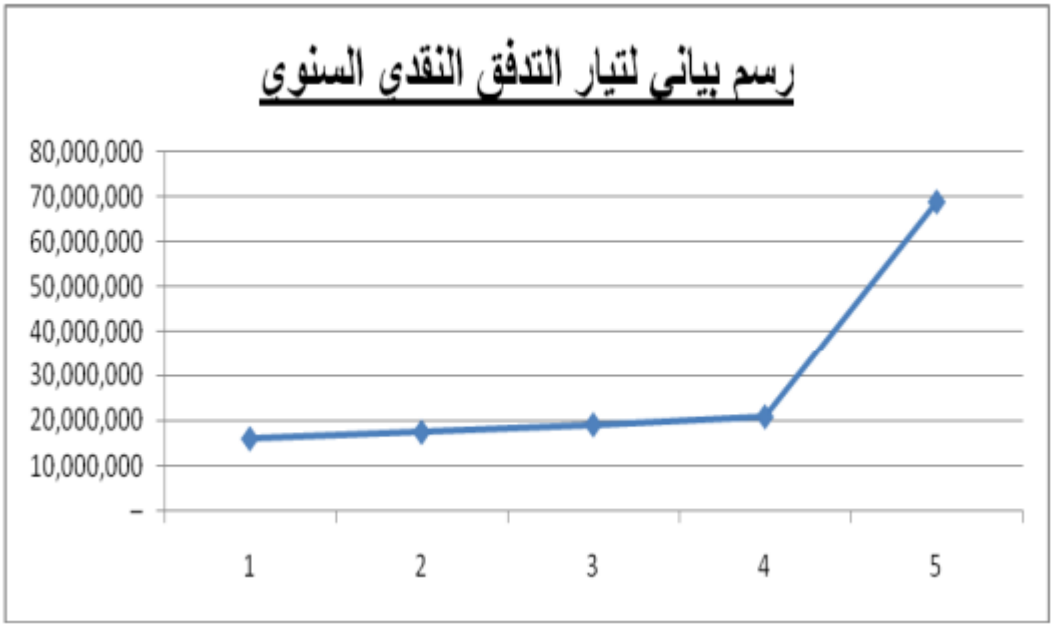
Item	البيان
First Year	السنة الأولى
Second Year	السنة الثانية
Third Year	السنة الثالثة
Fourth Year	السنة الرابعة
Fifth Year	السنة الخامسة
Total revenue	إجمالي الإيرادات
Subtract:	يخصم:
Cost of Sales	تكلفة المبيعات
Gross Profit	مجمل الربح
Subtract:	يخصم:
Incorporation and pre-commencement expenditure	مصروفات لتأسيس وما قبل النشاط
Depreciation of fixed assets	اهلاك الأصول الثابتة
General and administrative expenses	مصروفات عمومية وإدارية
Net accounting profit before tax	صافي الربح المحاسبي قبل الضرائب
Subtract:	يخصم:
Tax (at a rate of 22.5%)	الضريبة بمعدل (22,5%)
Net accounting profit after tax	صافي الربح المحاسبي بعد الضرائب
Adding non-cash and operating expenses	يضاف مصروفات غير نقدية/تشغيلية
Depreciation and incorporation and pre-commencement expenditure	اهلاك ومصروفات التأسيس وما قبل النشاط
Net operating cash flow	صافي تدفق نقدي تشغيلي
Adding other revenues for the last year	يضاف إيرادات أخرى للسنة الأخيرة
Net working capital	صافي رأس المال العامل المسترد
Salvage Value of Fixed Assets	القيمة التخريدية للأصول الثابتة
Net annual cash flow	صافي التدفق النقدي السنوي



Annual Cash Flow Stream Graph	رسم بياني لتيار التدفق النقدي السنوي

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Accordingly, the annual cash flow stream can be summarized as follows:

Years	Zero	1	2	3	4	5
Net Annual Cash Flow	**(70,273,000)**	**15,925,925**	**17,385,768**	**19,016,344**	**20,809,979**	**68,955,977**

6. Financial Feasibility Indicators for the Investment Project:
   I. ROI
   II. PBP
   III. NPV

I. ROI:

According to what was previously explained and by reviewing the estimated income statements for the project, the average ROI can be calculated as follows:

$$\text{Ratio of average net accounting profit to investment cost} = \frac{average\ net\ annual\ profit}{total\ investment\ costs}\ \%$$

Year	Net Accounting Profit After Tax	Paid-in Capital	Expected ROI on Investment
1	11,025,925	70,273,000	16%
2	12,585,768		18%
3	14,216,344		20%
4	16,009,979		23%
5	17,982,977		26%
Simple Annual Average ROI			20.44%

Project ROI Results:

In respect of the paid-in capital, the project has recorded an average percentage of net accounting profit of 20%, which exceeds the investors' RRR, which was previously determined at 18%, and this stresses that the project is financially feasible.

It is worth noting that this indicator is an aid tool to evaluate the project. However, it cannot be relied upon alone in determining the economic feasibility of the project, as this indicator is faulted for the following:

a) Its dependence on the net accounting profit, which may be based on depreciation and provisions estimates that may lead to a return value that is different from the actual value achieved by the project; and

b) Not expressing the actual cash flows, which may give misleading results.

II. PBP:

The payback period is the amount of time a project takes to recover its investment costs through the net cash flows expected to be achieved during the operating years. Therefore, such period covers the years the project took to reach the break-even point.

In accordance with the above mentioned, and by reviewing the estimated annual cash flow statements for the project, the payback period can be calculated as follows:

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Years	Zero	1	2	3	4	5
Net Annual Cash Flows	(70,273,000)	15,925,925	17,385,768	19,016,344	20,809,979	68,955,977
Net Cumulative Annual Cash Flows	(70,273,000)	(54,347,075)	(36,961,308)	17,944,963	2,865,015	71,820,992
Payback Period by Years	3.86					

$$Payback = last\ year\ of\ net\ negative\ cumulative\ cash\ flow + \frac{absolute\ value\ of\ last\ negative\ cumulative\ cash\ flow}{cash\ flow\ of\ the\ following\ year}$$

Number of Years of Negative Cash Flows	+	absolute value of last negative cumulative cash flow
		cash inflow of the following year
3	+	17,944,963
		20,809,979
3	+	0.86
PBP (months)	=	3.86

Project PBP Results:

The project has successfully recovered all of its investment costs within an approximated PBP of three years and ten months in operation, and this period does not exceed the projected economic life of the project, which is five years. This stresses that the project is financially feasible and its potential risks are reduced.

It is worth noting that the project has recovered its investment costs within a short period, which presents an opportunity for investors to reinvest the recovered capital in other projects or to make expansions in the project, and maximize ROI.

However, this indicator is criticized for having overlooked the time value of money, which will be taken into consideration later in NPV and IRR below.

III. NPV and IRR:

NPV is the difference between the present value of net cash inflows during the operating years and the present value of net cash outflows throughout the establishment phase. On the other hand, IRR is the discount rate at which project NVP is zero.

$$\text{Present value of cash inflows} = \Sigma \left[\frac{net\ cash\ flow\ during\ the\ year}{(1+r)i}\right]$$

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By reviewing the estimated annual cash flow statements for the project, NPV can be calculated using a discount rate of 18%, and it represents the return requested by investors as follows:

Years	Zero	1	2	3	4	5
Net Annual Cash Flow	(70,273,000)	15,925,925	17,385,768	19,016,344	20,809,979	68,955,977
The Present Value Factor for an amount at discount rate of 18% and (i) years	1	0.84746	0.71818	0.60863	0.51579	0.43711
Present Value of Cash Flow	(70,273,000)	13,496,547	12,486,188	11,573,934	10,733,555	30,141,293
NPV of Cash Flow	8,158,517					
IRR	21.92%					

- PV of net cash inflows during the operating years = EGP 78,431,517
- PV of net cash outflows during the establishment phase = EGP 70,273,000.
- NPV = the present value of net cash inflows - the present value of net cash outflows.
- NPV = EGP 78,431,517 - EGP 70,273,000 = EGP 8,158,517.

Project NPV and IRR Results:
The project has recorded a positive NPV that is greater than zero, which means that the project has recovered the entire capital and exceeded investors' RRR with a surplus stressing that this project is financially feasible and able to endure potential risks and decline in profits within the scored surplus limits.

Moreover, the project achieved an IRR at a value of 22%, which exceeds the investors' RRR that is 18%. This stresses that the project is financially feasible.

Thus, the results of the financial feasibility study can be summarized as follows:

Project Average Sales	39,561,048
Average total profit	25,308,082
Average Net Profit	18,534,450
Investment Costs	70,000,000
NPV	8,185,517
IRR	21.92%
ROI	20.44%
Payback Period	3.86

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V. Conclusions and Recommendations:

- The project achieves an ROI = 20.44%
- The project PBP = 3.8 years (3 years and ten months)
- Accordingly, this project is feasible.

Note: (Data mentioned in the technical feasibility study are indicative data received from IDA.

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