

Preliminary Feasibility Study on Production of Diagnostic and Laboratory Reagents





Prepared by
Economic Performance Sector
Central Department of Feasibility Studies
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I. Project Basic Information:

Project Name	Factory for the production of diagnostic and laboratory reagents
Project Surface Area	Land of surface area of 500 m^2 (Gharbia – Qalyubia)
Means of Disposition	Annual lease
Annual Lease/meter	EGP 50/m^2 (indicative price)
Life Expectancy	Five years
Targeted Products:	Production of diagnostic and laboratory reagents, whether chemical or cassette
Expected Labor	10 workers, technicians, and administrative officers
Investment Costs Expected	Approximately EGP 146,000,000 (about USD 10 million with the exchange rate of EGP 15/USD)
Feasibility Study Date	June 2021

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Introduction to the Activity of the Study:

- A chemical reagent or reactant is a substance or a compound that is added a system to cause a chemical reaction, or added to test if a reaction occurs. The terms reactant and reagent are often used interchangeably, however, a reactant is a substance consumed in the course of a chemical reaction, while the reagents are compounds or mixtures, usually composed of inorganic or small organic molecules that are used to influence the reaction to produce a particular product. Organic reagents include Collins reagent, Fenton's reagent, and Grignard's reagent. There are also analytical reagents that are used to confirm the presence of another substance.
- The project aims to produce diagnostic and laboratory reagents, which were produced either through various chemical preparations, or cassette reagents that rely on strips in their various forms, through which a test analysis with immediate results is performed.

II. Project Legal Feasibility Study

- The project may have the legal structure of sole proprietorship, partnership, limited liability company, or joint stock company.
- There are some legal limitations that must be taken into consideration to obtain the activity license from the concerned bodies, which are: the Egyptian Drug Authority (EDA), the governorate or the entity having jurisdiction over the land and its affiliated local units or the City Hall, the licenses obtained from the Industrial Development Authority (IDA) as per Law no. 15/2017, and the Civil Defense and Fire requirements that require specific procedures due to the nature of the industry.
- The project must comply with EDA regulatory rules for the registration and circulation of laboratory and diagnostic reagents in order to obtain a marketing authorization.
- In case of export, the project must obtain an import card indicating the nature and description of the products, or export through an intermediary company that undertakes the export and customs release procedures on behalf of the project.
- The costs of incorporation, attorney fees, licensing, registration with EDA, and specification tests to obtain certificates of validity and safety compliance for the local reagent and examination are estimated at approximately 100 thousand Egyptian pounds.

III. Project Environmental Feasibility Study

- The project is classified as the "B" list projects, since it is a pharmaceutical activity that relies on chemical treatments without any biological tests. Assessment of the environmental impact of the project must be according to the Environmental Screening Form "B", and the requirements of the Environmental Law. The project must take into account the environmental requirements for such activity due to the nature of the industry.

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- Environmental requirements, which need special measures to reduce pollution, emissions in this industry and waste disposal, must be met.
- Waste disposal costs were included in the costs of raw materials in the study according to the data received from the IDA.

IV. Project Social Feasibility Study

- The social feasibility study aims to analyze the social benefits and costs of various projects in order to select the projects that achieve the optimum social benefit. It is noted in this regard that the social feasibility study is concerned with additional aspects that were not examined in any of the other feasibility studies, because it focuses on the social effects of the project due to the project's contribution to achieving the economic and social goals of the society.
- The project is socially feasible. It creates new job opportunities; gives access to favorable employment outcomes; and provides ten (10) direct job opportunities, other than the indirect job opportunities.
- The project contributes to the national program to substitute imports for the benefit of society by relying on local manufacturing, providing foreign currency, and localizing the industry.
- The projects provides instant diagnostic reagents for COVID-19, which would help to take the necessary measures to reduce the Corona pandemic and its negative effects on the society.

V. Project Marketing Feasibility Study

1- Outcomes of the project's marketing feasibility study according to growth drivers and competitive strength:

- The project aims to bridge the gap in the trade balance of diagnostic and laboratory reagents, where Egypt's imports reached USD 180 million in 2018 from foreign countries such as (Germany - USA - UK - Korea - China - France - Australia - Taipei - Luxembourg - Finland).
- The medical supplies and devices sub-sector in Egypt is very diversified and produces a variety of products such as (diagnostic medical imaging equipment – oncology imaging equipment – radiology equipment – disposables – dental products – orthopedic products and prostheses – medical furniture – etc.)
- Investment in medical supplies and devices sub-sector reached USD 1579 million in 2017.
- The Egyptian market for medical supplies and devices will record a compound annual growth rate of 13.7% during the period 2017 – 2022, which will raise the market value to USD 1.2 billion by 2022.
- The Egyptian market for medical supplies and devices is the fifth largest in the MENA region. The Egyptian market is different from other markets in the region for various factors such as the presence of a large diagnostic imaging sector in Egypt, low per capita spending which indicates growth, strong dependence on imports, the

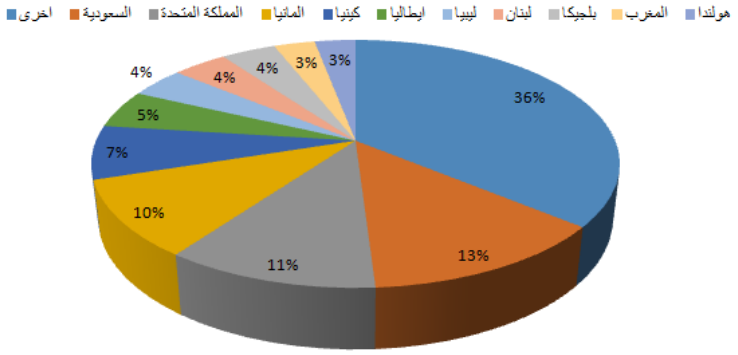
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increasing presence of international and diversified companies, both in the form of projects with partners locally or through sales offices.

- The project is of government interest as it localizes the industry and helps to replace imports and reduce dependence on foreign currency.

2- **Supply Volume:**

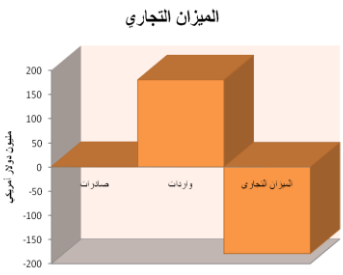
- According to the data received from the Industrial Modernization Center (IMC), there are limited manufacturers of diagnostic and laboratory reagents in Egypt (five companies), and there is a clear dependence on imports.
- According to the data of World Trade Center, the volume of Egyptian exports (in units) reached 43 tons in 2019.
- The value of Egypt's exports of medical supplies and devices amounted to USD 204 million in 2018. The top 10 importing countries from Egypt are (Saudi Arabia – UK – Germany – Kenya – Italy – Libya – Lebanon – Belgium – Morocco – the Netherlands) as shown in the following:



3- **Demand Volume:**

- Imports of diagnostic and laboratory reagents witnessed a compound annual growth rate of 19% reaching USD 180 million in 2018.
- There is an increase in the global demand for diagnostic and laboratory reagents that amounted to about USD 29 billion in 2018.
- There is a deficit in the trade balance with regard to this activity. The top ten most exporting countries are (Germany – USA – UK – Korea – China – France – Australia – Taipei – Luxembourg – Finland).

Trade Balance	الميزان التجاري
Imports	واردات
Exports	صادرات
USD	مليون دولار أمريكي



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4- Market Gap:

- According to the abovementioned, there is a gap in the demand for different types of diagnostic and laboratory reagents, which emerged through the deficit in the trade balance for diagnostic and laboratory reagents, as Egypt's imports reached USD 180 million in 2018. Therefore, the project under study would bridge such gap and thus export abroad, since all indicators indicate an increase in demand for such type of products, especially due to epidemics, the latest of which is the Corona pandemic.

5- Local Market:

- The main objective of the project is to cover the local demand and fill the gap in the trade balance on the diagnostic and laboratory reagents, whether chemical reagents or cassette reagents, which are experiencing severe shortcomings that are not sufficient to cover local needs.
- This project meets the needs of the local market, and would save the amounts paid in order to import large quantities of these products if they are locally manufactured.

6- Potential Export Markets:

- One of the opportunities available to the project is to meet the needs of the local market and export. The project could offer its products at competitive prices to the global market, which is witnessing a significant increase in the demand for these products due to the spread of awareness and interest in conducting periodic examinations, as well as the government programs for early detection of epidemics and diseases to eliminate them and limit their spread.
- It is possible to expand to invade some other markets provided that the production to be with special specifications that meet the needs of the countries to be marketed. The most important markets proposed for export are:
  - ✓ North America
  - ✓ The Commonwealth of Independent States (CIS) and Europe
  - ✓ Gulf area
  - ✓ The Middle East
  - ✓ Africa



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7- Products, expected sales volume and prices during the fiscal year:

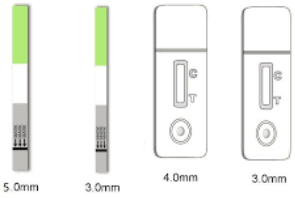
1- Diagnostic and Laboratory Chemical Reagents

- Diabetes reagents
- Urea reagents
- Bilirubin reagents
- Liver function reagents
- Uric acid reagents
- Creatinine reagents
- Hemoglobin reagents
- Pregnancy test



2- Diagnostic Cassette Reagents

- Hepatitis C test
- Hepatitis B test
- COVID test
- AIDS test



According to the industry, the attached prices are indicative and in light of the natural rates. They could be modified according to the date of the study, and be summarized during the annual production cycle according to the following table, and the data received from IDA and IMC:

Product	Measuring unit	Expected sales volume	Average unit sale price	Total expected annual sales
Diagnostic chemical and cassette reagents (on-specifications)	Reagent unit/ package	5 million units	EGP 40/unit	EGP 200,000,000

8- Expected Marketing Campaign Costs:

The annual costs of the marketing campaign, printing of brochures and publication in specialized magazines, especially at the beginning of the project to achieve the spread are estimated at EGP 500,000 (five hundred thousand Egyptian Pounds only).

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VI. Project Technical and Engineering Feasibility Study

1- Production Process:



- ✓ Diagnostic chemical reagents (preparation – packing)
- ✓ Cassette Reagents (cutting – pressing – packaging)

2- Machinery and Equipment Needed for Production Process:

Item
▪ Preparation tanks ▪ Incubator ▪ Water supply ▪ Refrigerator ▪ Water bath ▪ Magnetic stirrer ▪ Packing machine ▪ Cassette reagents cutting machine

The investment cost of machinery and equipment required for the project as per the data of IDA is estimated at EGP 5 million.

3- Location:

The project is implemented in Gharbia governorate in the Arab Republic of Egypt, due to the availability of utilities and licenses necessary for this type of industry; the governorate's proximity to sources of raw materials; as well as the availability of labor at reasonable prices; and the availability of land at reasonable prices.

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The location on the map:



The land surface area needed for the project is 500m^2.

According to the investment opportunities of Gharbia governorate, which are contained in some feasibility studies published on Investment Map website, and according to the data received from IDA and IMC, the average lease per meter square of vacant land without buildings is EGP 50 (indicative price). The conditions for undertaking the factory activity are met, all the utilities required for the project are available, and obtaining licenses is facilitated. Such prices are reviewed periodically by the relevant pricing committees.

Accordingly, the estimated annual lease of the land =500m^2 × EGP50 = approximately EGP 25000 (twenty five thousand Egyptian Pounds only), and it was included in the general and administration expenses according to what would be mentioned in the financial study.

4- Buildings:

According to the data received from IDA, the factory would need 60%-allocation of the total land area as an area for the manufacture and production operations. Accordingly, the construction ratio is estimated at an area of 300m^2, calculating the cost per meter square for buildings, including walls, security rooms, electricity and tanks, some of which are built of bricks and concrete completely finished. Considering the average price of EGP 4000 /m², the total estimated cost of buildings and constructions = 300 m² × EGP 4000 /m² = EGP 1,200,000 (one million and two hundred thousand Egyptian Pounds only).

5- Raw Materials, Packing and Packaging Materials:

- ✓ Raw Materials: chemicals – plastic cassette – packing plastic bottles
- ✓ Packing and packaging materials: plastic packages – cartoon packages

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The annual running cost needed to obtain the raw materials, packing and packaging materials to produce the production volume mentioned in the marketing study; 5 million units, according to the data of IDA, is approximately EGP 152 million.

6- **Utilities Consumption:**

- Electricity consumption= 48000 MWh.
- Water consumption= 150 m^3.

The annual running cost of energy and utilities as per the consumption rates needed to produce the production volume mentioned in the marketing study; 5 million units, according to the data of IDA, is approximately EGP 500 thousand.

VII. Project Financial Feasibility Study

1. Foundations and Hypothesis of the Financial Feasibility Study:

- In this financial feasibility study, data and revenue estimates are based on the volume and sales value as per 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.
- Buildings and machinery annual depreciation is estimated based on the technical study results. Same buildings and machinery sale value is presumed to be matching their book value at the end of the expected lifetime of the project.
- It is assumed that the first operating cycle requirements are obtained with 10% facility from the suppliers.
- It is taken into account that the estimated value of the fixed assets mentioned in this study is time-and-circumstance limited. Accordingly, such value may change by change of circumstances or by report time prescription or change of economic climate in general.
- 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 project life expectancy is five (5) years to test the indicators of economic feasibility of the project.
- 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, unlike the estimated growth rate in sales, which corresponds to a similar growth rate in costs of 10% annually.
- A tax rate (TR) of 22.5% for the annual profits of companies, 20% for the returns of treasury bonds issued by the Egyptian Ministry of Finance, was relied on, in accordance with the Egyptian legislation prevailing at the time of preparing the study.
- 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.

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- The criteria of Return on Investment (ROI), the Pay-back Period (PBP), the Net Present Value (NPV), and the Internal Rate of Return (IRR) were relied upon in evaluating the economic feasibility of the project, taking into account the Required Rate of Return on investment (RRR).
- RRR is determined as per the weighted average cost of capital (WACC), and presuming the project is fully financed by the owners.
- Future financial estimates contain estimated and other unforeseen risks, and other factors that may lead to different performance and actual results that the project would achieve from the expected performance according to the assumptions on which the estimated statements were prepared according to the prevailing business climate at the time of preparing the study.
- General and administration expenses and labor costs have been taken into account within the estimated income statements, assuming that most of the employment is direct labor in light of its ratio in the total employment.

2. Definition of Required Rate of Return (RRR)

- It is the minimum return required by the investor, in order to invest his/her money in a project inside Egypt, evaluated by the industrial risks of the economic activity of the project under study.
- The study is concluded by an RRR of 20% as per the industry risks in Egypt, and is calculated as follows:

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

- The risk-free rate (RFR) is calculated according to the official data published by the Central Bank of Egypt for treasury bonds due at the end of 2026, which is close to the evaluation period of the project within 5 years, using the weighted average yield of different bond issues for that 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%						

Average return before tax	متوسط العائد قبل خصم الضرائب
Average return after 20% tax discount	متوسط العائد بعد خصم الضرائب ٢٠%

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- A CRP of 5.33% was used according to the classification of Egypt globally issued by S&P "Standard & Poor's" – Moody's as per the latest update of the global professor Damodaran's website about the Egyptian market data for the year 2022.

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

- Third, the beta factor of the risks of the Egyptian market for the industry of the study is assumed to be 1.52 as per the average industry risk.

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

Thus, the RRR is determined as follows:

RRR=(11.43+5.33×1.52)= approximately 20%

3. Project Investment Cost

- According to Article (11) of the Executive Regulations of Investment Law No. 72 of 2017, enacted by Prime Minister Decree No. 2310 of 2017, the project investment cost is defined as follows:

  "Project investment cost shall mean such costs required to set up an Investment Project represented in property rights, in addition to 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."

The opening budget for the investment project can be prepared according to the results of the estimated technical feasibility study as follows:

Item	EGP
Long-term Assets	
– Incorporation, licenses, and pre-commencement expenses	100,000
– Lands	-
– Buildings	1,200,000
– Machinery and equipment	5,00,000
Total long – term assets	6,300,000
Current Assets	
– Reservoir of raw materials, production supplies, packing and packaging materials	152,000,000
– Cash and likewise (1)	2,900,000
Total current assets	154,900,000
Current Liabilities	

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– Raw materials, production supplies, packing and packaging materials suppliers	15,200,000
Total current liabilities	15,200,000
Working capital	139,700,000
Total investment	146,000,000
To be financed as follows:	
Property Rights	
Capital	146,000,000
Total investment financing	146,000,000

(1) To satisfy the expenses of the first operating cycle, including (labor wages 0.4 million - marketing expenses 0.5 million - electricity and utilities consumption of about 0.5 million - general and administration expenses that include the cost of land lease, allowances, stationery, professional fees, etc. of 1.5 million).

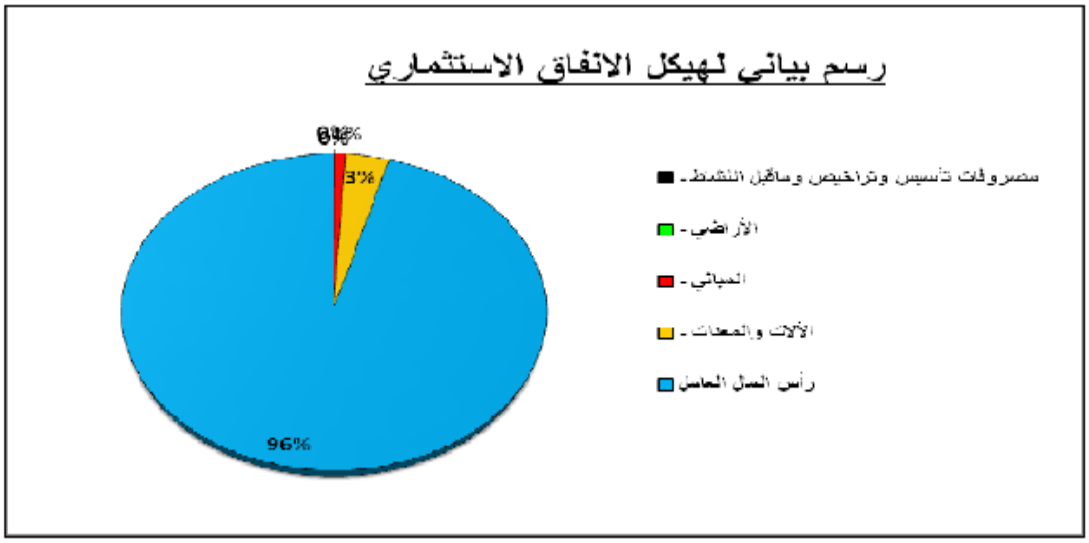


Diagram of Investment Spending Structure	رسم بياني لهيكل الإنفاق الاستثماري
Incorporation, licenses, and pre-commencement expenses	مصروفات تأسيس وتراخيص وما قبل النشاط
Lands	الأراضي
Buildings	المباني
Machinery and equipment	الآلات والمعدات
Working capital	رأس المال العامل

Thus, the total investment cost of the project is
Total long – term assets + working capital= approximately EGP 146,000,000
(Approximately one hundred and forty-six million Egyptian Pounds only)
Equivalent to an estimated average exchange rate of EGP 15 / USD
(approximately about USD 10 million)

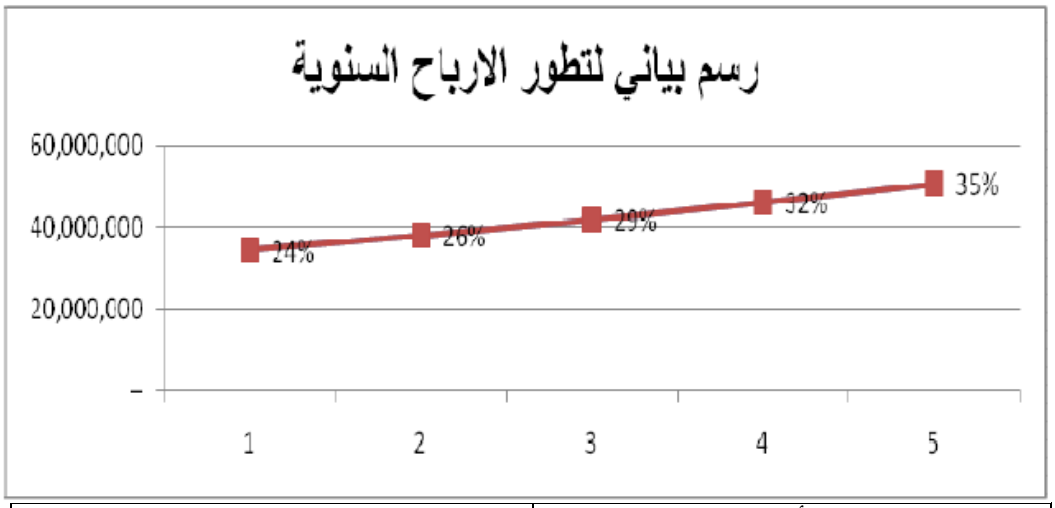
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4. **Expected Income Statements for the Years of Investment Project: Could be prepared as per the outcomes of the Technical Feasibility Study as follows:**

البيـــــــــــان	السنة الاولى	السنة الثانية	السنة الثالثة	السنة الرابعة	السنة الخامسة
إجمالي الايرادات	٢٠٠،٠٠٠،٠٠٠	٢٢٠،٠٠٠،٠٠٠	٢٤٢،٠٠٠،٠٠٠	٢٦٦،٢٠٠،٠٠٠	٢٩٢،٨٢٠،٠٠٠
يخصم:					
تكلفة المبيعات	(١٥٢،٩٠٠،٠٠٠)	(١٦٨،١٩٠،٠٠٠)	(١٨٥،٠٠٩،٠٠٠)	(٢٠٣،٥٠٩،٩٠٠)	(٢٢٣،٨٦٠،٨٩٠)
مجمل الربح	٤٧،١٠٠،٠٠٠	٥١،٨١٠،٠٠٠	٥٦،٩٩١،٠٠٠	٦٢،٦٩٠،١٠٠	٦٨،٩٥٩،١١٠
يخصم:					
مصروفات التأسيس وماقبل النشاط	(١٠٠،٠٠٠)				
اهلاك الأصول الثابتة	(٥٦٠،٠٠٠)	(٥٦٠،٠٠٠)	(٥٦٠،٠٠٠)	(٥٦٠،٠٠٠)	(٥٦٠،٠٠٠)
مصروفات عمومية وإدارية وتسويقية	(٢،٠٠٠،٠٠٠)	(٢،٢٠٠،٠٠٠)	(٢،٤٢٠،٠٠٠)	(٢،٦٦٢،٠٠٠)	(٢،٩٢٨،٢٠٠)
صافي الربح المحاسبي قبل الضرائب	٤٤،٤٤٠،٠٠٠	٤٩،٠٥٠،٠٠٠	٥٤،٠١١،٠٠٠	٥٩،٤٦٨،١٠٠	٦٥،٤٧٠،٩١٠
يخصم:					
الضريبة (بمعدل ٢٢,٥%)	(٩،٩٩٩،٠٠٠)	(١١،٠٣٦،٢٥٠)	(١٢،١٥٢،٤٧٥)	(١٣،٣٨٠،٣٢٣)	(١٤،٧٣٠،٩٥٥)
صافي الربح المحاسبي بعد الضرائب	٣٤،٤٤١،٠٠٠	٣٨،٠١٣،٧٥٠	٤١،٨٥٨،٥٢٥	٤٦،٠٨٧،٧٧٨	٥٠،٧٣٩،٩٥٥
معدل العائد على رأس المال (ROI)	%٢٤	%٢٦	%٢٩	%٣٢	%٣٥

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
Incorporation and pre-commencement expenditure	مصروفات التأسيس وما قبل النشاط
Depreciation of fixed assets	إهلاك الأصول الثابتة
General, administration, and marketing expenses	مصروفات عمومية وإدارية وتسويقية
Net accounting profit before tax	صافي الربح المحاسبي قبل الضرائب
Tax (at a rate of 22.5%)	الضريبة (بمعدل ٢٢,٥%)
Net accounting profit after tax	صافي الربح المحاسبي بعد الضرائب
Rate of Return on Investment (ROI)	معدل العائد على رأس المال ROI

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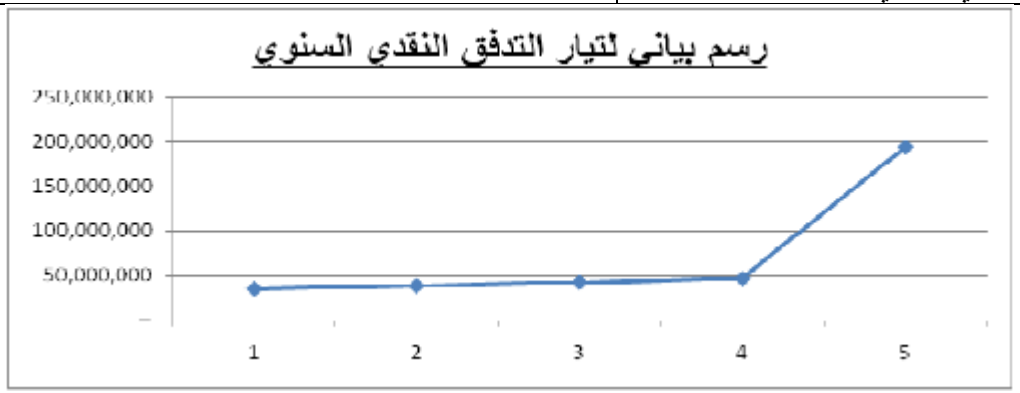
Development of Annual Profits	رسم بياني لتطور الأرباح السنوية

5. **Estimating the cash flow stream for the years of the investment project:**
According to the foregoing, the cash outflow in year (zero) = EGP 146,000,000.
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	٢٠٠،٠٠٠،٠٠٠	٢٢٠،٠٠٠،٠٠٠	٢٤٢،٠٠٠،٠٠٠	٢٦٦،٢٠٠،٠٠٠	٢٩٢،٨٢٠،٠٠٠
يخصم:					
تكلفة المبيعات	(١٥٢،٩٠٠،٠٠٠)	(١٦٨،١٩٠،٠٠٠)	(١٨٥،٠٠٩،٠٠٠)	(٢٠٣،٥٠٩،٩٠٠)	(٢٢٣،٨٦٠،٨٩٠)
مجمل الربح	٤٧،١٠٠،٠٠٠	٥١،٨١٠،٠٠٠	٥٦،٩٩١،٠٠٠	٦٢،٦٩٠،١٠٠	٦٨،٩٥٩،١١٠
يخصم:					
مصروفات التأسيس وما قبل النشاط	(١٠٠،٠٠٠)				
اهلاك الأصول الثابتة	(٥٦٠،٠٠٠)	(٥٦٠،٠٠٠)	(٥٦٠،٠٠٠)	(٥٦٠،٠٠٠)	(٥٦٠،٠٠٠)
مصروفات عمومية وإدارية	(٢،٠٠٠،٠٠٠)	(٢،٢٠٠،٠٠٠)	(٢،٤٢٠،٠٠٠)	(٢،٦٦٢،٠٠٠)	(٢،٩٢٨،٢٠٠)
صافي الربح المحاسبي قبل الضرائب	٤٤،٤٤٠،٠٠٠	٤٩،٠٥٠،٠٠٠	٥٤،٠١١،٠٠٠	٥٩،٤٦٨،١٠٠	٦٥،٤٧٠،٩١٠
يخصم:					
الضريبة (بمعدل ٢٢,٥%)	(٩،٩٩٩،٠٠٠)	(١١،٠٣٦،٢٥٠)	(١٢،١٥٢،٤٧٥)	(١٣،٣٨٠،٣٢٣)	(١٤،٧٣٠،٩٥٥)
صافي الربح المحاسبي بعد الضرائب	٣٤،٤٤١،٠٠٠	٣٨،٠١٣،٧٥٠	٤١،٨٥٨،٥٢٥	٤٦،٠٨٧،٧٧٨	٥٠،٧٣٩،٩٥٥
يضاف مصروفات غير نقدية/ تشغيلية					
اهلاك ومصروفات التأسيس وماقبل النشاط	٥٦٠،٠٠٠	٥٦٠،٠٠٠	٥٦٠،٠٠٠	٥٦٠،٠٠٠	٥٦٠،٠٠٠
صافي تدفق نقدي تشغيلي	٣٥،١٠١،٠٠٠	٣٨،٥٧٣،٧٥٠	٤٢،٤١٨،٥٢٥	٤٦،٦٤٧،٧٧٨	٥١،٢٩٩،٩٥٥
يضاف إيرادات اخرى للسنة الأخيرة					
صافي رأس المال العامل المسترد					١٣٩،٧٠٠،٠٠٠
القيمة التخريدية للأصول الثابتة					٣،٤٠٠،٠٠٠
صافي التدفق النقدي السنوي	٣٥،١٠١،٠٠٠	٣٨،٥٧٣،٧٥٠	٤٢،٤١٨،٥٢٥	٤٦،٦٤٧،٧٧٨	١٩٤،٣٩٩،٩٥٥

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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
Incorporation and pre-commencement expenditure	مصروفات التأسيس وما قبل النشاط
Depreciation of fixed assets	إهلاك الأصول الثابتة
General and administration expenses	مصروفات عمومية وإدارية
Net accounting profit before tax	صافي الربح المحاسبي قبل الضرائب
Tax (at a rate of 22.5%)	الضريبة (بمعدل ٢٢,٥%)
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	رسم بياني لتيار التدفق النقدي السنوي

Thus, the annual cash flow stream could be summarized as follows:

Years	0	1	2	3	4	5
Net Annual Cash Flow	(146,000,000)	35,101,000	38,573,750	42,418,525	46,647,778	194,399,955

6. Indicators of Project Financial Feasibility Study:

I: Return on Investment (ROI)

II: Pay-Back Period (PBP)

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III: Net Present Value (NPV)

I: Return on Investment (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:

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

السنة	صافي الربح المحاسبي بعد الضرائب	رأس المال المدفوع	معدل العائد على رأس المال المتوقع
١	٣٤،٤٤١،٠٠٠	١٤٦،٠٠٠،٠٠٠	%٢٤
٢	٣٨،٠١٣،٧٥٠		%٢٦
٣	٤١،٨٥٨،٥٢٥		%٢٩
٤	٤٦،٠٨٧،٧٧٨		%٣٢
٥	٥٠،٧٣٩،٩٥٥		%٣٥
متوسط معدل العائد البسيط على الاستثمار (ROI)			%٢٨,٩٢

Year	السنة
Net Accounting Profit After Tax	صافي الربح المحاسبي بعد الضرائب
Paid-in Capital	رأس المال المدفوع
Expected ROI on Investment	معدل العائد على رأس المال المتوقع
Average ROI	متوسط معدل العائد البسيط على الاستثمار

Project ROI Results:

In respect of the paid-in capital, the project has recorded an average percentage of net accounting profit of 29%, which exceeds the investors' required rate of return (RRR), which was previously determined at 20%, 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:

1. Its dependence on the net accounting profit, which may be based on depreciation and provisions estimates that may lead to a value that is different from the actual value achieved by the project; and
2. Not expressing the actual cash flows, which may give misleading results.

III: Pay-Back Period (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. It expresses the period elapsed from the life of the project until it achieves net cash flows from operating its assets equal to a value equal to the paid-in capital at the beginning of the project's operation.

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

Years	Zero	1	2	3	4	5
Net Annual Cash Flows	(146,000,000)	35,101,000	38,573,750	42,418,525	46,647,778	194,399,955
Net Cumulative Annual Cash Flows	(146,000,000)	(110,899,000)	(72,325,250)	(29,906,725)	16,741,053	211,141,008
PBP by Years	3.64					

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

Number of Years of negative cash flow	+	Absolute value of last negative cumulative cash flow / Cash inflows of the following year
3	+	29,906,725 / 46,647,778
3	+	0.64
PBP	=	3.64

Project PBP Results:

The project has recorded the PBP of all of its annual costs within three years and eight months in operation, and this period does not exceed the expected 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.

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IV: Net Present Value (NPV) and Internal Rate of Return (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 set up phase. On the other hand, IRR is the discount rate at which project NVP is zero.

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

By reviewing the estimated annual cash flow statements for the project, NPV can be calculated using a discount rate of 20%, and it represents the return requested by investors as follows:

السنوات	صفر	١	٢	٣	٤	٥
صافي التدفق النقدي السنوي	(١٤٦،٠٠٠،٠٠٠)	٣٥،١٠١،٠٠٠	٣٨،٥٧٣،٧٥٠	٤٢،٤١٨،٥٢٥	٤٦،٦٤٧،٧٧٨	١٩٤،٣٩٩،٩٥٥
معامل القيمة الحالية لدفعة عند معدل خصم ٢٠% وعدد (ن) من السنوات	١	٠,٨٣٣٣٣	٠,٦٩٤٤٤	٠,٥٧٨٧٠	٠,٤٨٢٢٥	٠,٤٠١٨٨
القيمة الحالية للتدفق النقدي	(١٤٦،٠٠٠،٠٠٠)	٢٩،٢٥٠،٨٣٣	٢٦،٧٨٧،٣٢٦	٢٤،٥٤٧،٧٥٨	٢٢،٤٩٦،٠٣٥	٧٨،١٢٤،٩٨٢
صافي القيمة الحالية للتدفقات النقدية	٣٥،٢٠٦،٩٣٤					
معدل العائد الداخلي	%٢٧,٧٨					

السنوات	Years
صافي التدفق النقدي السنوي	Net Annual Cash Flow
معامل القيمة الحالية لدفعة عند معدل خصم ٢٠% وعدد (ن) من السنوات	The Present Value Factor for an amount at discount rate of 20% and (i) years
القيمة الحالية للتدفق النقدي	Present Value of Cash Flow
صافي القيمة الحالية للتدفقات النقدية	NPV of Cash Flow
معدل العائد الداخلي	IRR

- PV of net cash inflows during the operating years = EGP 181,206,934
- PV of net cash outflows during the set up phase = EGP 146,000,000
- NPV = the present value of net cash inflows - the present value of net cash outflows.
- NPV = EGP 181,206,934 – EGP 146,000,000 = EGP 35,206,934

Project NPV & IRR Results:

The project recorded a positive NPV greater than zero, which means that the project fully recovered the capital and achieved RRR and exceeded with surplus, thus, the project is financially feasible and is able to face the potential risks and its exposure to a decrease in its profits within the limits of the achieved surplus.

The project achieves IRR of 28%, which exceeds the IRR of 20%, thus the project is financially feasible.

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VIII: Results and Recommendations:

According to the aforementioned:

- The project achieves ROI of 29%
- The PBP of the project is 3 years and 8 months
- The project achieves a positive NPV, and IRR of 28%

  Thus, the project is feasible to be set up as per the assumptions of the study.

Note:

Data mentioned in this technical feasibility study are only guidelines of estimates that are based on the data provided by Industrial Development Authority (IDA)

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