FEASIBILITY STUDY OF SAYDOON COMMERCIAL PORT

A Research Topic

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1.1 Thesis - statement of the study

The study presented herein is a real study for the engineering and economic evaluation of a harbour project in Sidon in the South of Lebanon. This harbour is not yet constructed, and the aim of this study is to find whether its construction is feasible or not.

The harbour is to be located in Sidon because sidon constitutes an economic unity with Beirut in the sence that this new harbour would act as a complement to Beirut harbour. In addition, the investors who are going to finance the project are willing to build the project there, simply because they are from Sidon region and want their city to be economically, environmentally and socially developed.In this study I am going to consider that the port in Sidon will be constructed under the name of Saydoon Commercial Port, and the construction proccess will take place in 1989. It is worth to mention here that several engineering designs and studies had been done for a harbour in Sidon. My study presented herein depends on the engineering design done by Mr. Ali Jomaa, an architecture engineer, for his graduating project presented to Beirut Arab University in academic year 1978-1979.

Since the project is to be located in Sidon, it is good to give an idea about some aspects of this city such as its geographical location, its recent physical and demographic expansion, and its industrial situation.

1.2 Geographical Location of Sidon.

Sidon is located in the middle of the eastern coast of the Mediterranian sea. It is on the longitude 35,33/ to the east of Grenwhich and on the latitude 33,63/ to the north of the Equator. Thus it is on the same time with Moscow and has the same climate as Changhahi and Loss Angeles.

The area of Sidon is estimated about 7.5 Km2. and covers around 7 Km2. of the sea coast. It is divided into 3 landed properties which are; AL-Wastani, Old Sidon and AL-Dekerman.

AL-Wastani covers an area of 2,5 sq.Km. and it includes around 1287 real estates, through which the Riad Solh street passes.

Old Sidon covers an area of 2 sq.Km. and it includes around 358 real estates most of which are old. This part of the city is the old city where the people used to live.

Al-Dekerman covers and area of 5 sq.Km. .It includes around 1965 real estates, and it is considered the new city, since most of the people moved to this side.

Sidon resembles a wide triangle, the vertx of which is the sandy cape where the port and the old town lie. The base is the nearby hills of Bramieh, Helalieh and Mar Elias. The sides are from Al-Awali river in the north to Seyneek river in the south. Opposite the coast some hundred meters away lies the tiny rocky island called " Al-Zeereh " . This island, which served as a natrual port in the past centuries , especially during wars, has now a lighthouse to guide ships.

Sidon of today is the heiress of the Phoenician Sidon. Its borders were Rejal Al-Arbeen quarter, Al-Awali River, Bramieh and Haret Saida. But Sidon of today has spread to reach Seyneek River in the south and Bramieh, Majdelyoun, Al-Salhieh and Lebaa which is known as grand Sidon. The orchards which separated Sidon from those hills have almost disappeared leaving the space for modern building construction.

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Sidon is connected by rail directly wiht Beirut 40 Km. Damasucs 90 Km. Aman and north Syria. There are roads connection with Homs, Hama, and Aleppo 450 Km. Baghdad 1150 Km. Kwait 1500 Km. Dhran and Rigadh 1800 Km. Thus it seems to occupy an important place in the Middle East. This shows the importance of the Sidon geographical location, which could be used as gate for the transit cargo transport to the above mentioned cities.

1.3 The Recent Physical and Demographic Expansion Of Sidon*1.

Sidon city has a population of aproximately 220000 of which about 45% are of Sidon origin and about 55% are foreigners. Its physical growth extended from the old city to cover general surrouding and hills.

Although the majority of shops and business offices are still located in the old business district, there has recently been a parall espansion and growth of the commercial and business facilities away from the cnetral district in the old city. The expansion has taken place mainly due to traffic congestion, parking problems and lack of space in the old city.

A further indication for the outward expansion of the city is given in the following facts:

a- The reale estate units in Sidon have reached in 1978 around 8400 units built on constructed area of 136600 sq.m. and the average increase was 5% during the 70's.

b- These units were increased from 1981 to 1985 by 1500 units and at the same time the constructed area was also increased by 147600 sq.m. . Now the real estate units in Sidon amount to around 12000 units.

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*1 Research and Documentation Center in Sidon. Book no. 2
Aug. 3/ 1985

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c- The number of schools and collegs increased during the 80's. It is estimated that there are around 39 schools in Sidon, of which about 20 are public and 19 are private. Also there are 3 universities and several colleges which teach Arts and Sciences.

d- The number of hospitals and medical centers has increased in the middle 80's. The number has reached 18 in the late 80's.

e- During the 80's, several projects have been constructed in Sidon. Also there are other projects that are under construction, and others will be constructed. In this manner, we may mention the construction of the new vegetables and fruits market " EL-Hosbah " which was completed in 1987; The construction of the educational center in Sidon and the public library; and in the future there will be plan for the construction of a new meat market, public gardens, and new municipality.

f- The beginning to from a new net work of roads.

The above mentioned projects and others indicate that Sidon is moving towards a new situation of growth since the implication of such projects will surely influence the economical and financial position of Sidon.

1.4 Industry in Sidon *1.

The industry in Sidon has developed in the past 10 years due to the encouraging factors which resulted from the present situation of Lebanon. The industrial development is based on certain crafts which the people in Sidon had learned from their grand-fathers.

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*1 Chamber of Commerce and Industry in Sidon and the South, pamphlet of 1987.

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However, the most important factore which encouraged people to chage into industry are the following :

1- Due to the present situation of Lebanon, many people from differnt parts of Lebanon were forced to leave their original homes and come to Sidon. This made the city over-populated and gave it a large number of workers.

2- Due to the increasing number of people in the city, Sidon became an important shopping center for its people and for South Lebanon.

3- Export and import trade developed due to the role that its seaport had played during the events, since Beirut port was closed for a period of time; Sidon port had to play an important role during that period, taking the advantage of that closure.

4- Due to the availability of craftsmen and experiences in Sidon, it is possible to change into big industries.

But the main question is whether it is possible to make use of all these factors to find a developed industry in Sidon and its suburbs.

According to the statistics of the Chamber of trading and commerce in Sidon and the South, till the end of 1977, the number of industrial institution registered was sixty-four; they were classied as follows;

a- 14 institutions for the industry and production of flagstone.

b- 20 institutions for the ironsmith business and the production of iron doors, windows and gates.

c- 11 institutions for the production of furniture.

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d- 2 institutions for the production of clothes and textiles.

e- 3 institutions for the dyeing and industry of animal skin.

f- 12 institutions for the production of Arabic and European sweets.

g- 2 institutions for the industry of soap and its derivatives.

Since 1987, around 90 new institutions have been registered. Those institutions are specialized in :

- The production of modern furniture.
- The production of Halawa, Tahina, and Chocalte.
- Paking food materials.
- Maintenance of Jewelery.
- Packing of fruit and citrus.
- Nylon socks.
- Digging water-wells.
- The production of refrigeration and airconditioning and electrical equipment.

In addition, there are many other projects that are being built like those specialized in assembling electrical conductors of different sizes and power, and other textile and petro-chemical industries.

All this tends to give a clear idea about the delopment of industry in Sidon and South Lebanon and supports the idea that the area is changing into an industrial center which is going to be the most important in Lebanon.

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A further notice concerning this issue is that the construction of a new sea port in the city will help the industrial situation of Sidon to improve since this sea port will facilitate the export and import which the industry totally depends on. In like manner, trade and transit will benefit and improve.

The importance of constructing a sea port will be discussed later in chapter 2.

CHAPTER TWO

2.1 MARKET SURVEY OF EXISTIMG PORTS

a- BEIRUT HARBOUR

b- SIDON-PORT

2.2 THE NEED AND IMPORTANCE OF SAYDOON COMMERCIAL PORT

2.1 Market Survey Of Existing Ports.

In order to determine whether there is a demand for a new port in Lebanon, a survey of the existing ports was conducted.

This survey was conducted on the Beirut harbour as well as on Sidon existing sea port. Yet there are other ports in Lebanon, but unfortunately, this survey will not include them because they are unreachable at the time being, and this is due to the war condition in Lebanon. Accordingly, it should be mentioned here that the main findings of this market survey is not sufficient . This is because of the unedequate corporations which face us during the survey and because the information given is not up to date. However, the findings do show that there is a need for a new harbour in Lebanon. In the meantime, I oppologize in advance for the following un-updated information.

a- Seaport of Beirut

The port of Beirut has at the present time five ship basins, 20 hectars each, protected by a jetty 1300 meters long. They are accessible at all times as they are protected by a dike 330 meters long. The quay has a length of about 2300 m of which 1100m from 2-5m deep.

The area of the port is distributed as follows:

customs	73150 sq.m.
Zone franch private	52350 sq.m.
Zone franch public	44750 sq.m.
Genral stores	3400 sq.m.

The warehouses occupy an area of 160000 sq.m. of which 125000 sq.m. are covered; there are facilities for loading and unloading.

Beirut port occupies an important place in the Middle East since it is connected by a rail directly with Damascus and from it to the Arab countries.

In order to see the progression of the growth activities at the Beirut harbour, I have presented historical statistics; the following table and figures give a summary of acitivites of Beirut harbour.

Table 2.1

Year	Passengers	Merchandize Tons	Zone franch Tons	Transit*1 Tons
1956	72212	1959774	546200	538800
1957	50945	2018174	571800	587200
1958	28812	1428077	345000	329000
1959	48684	1664012	443400	348900
1960	54797	1723059	449000	339000
1961	67200	1641358	374800	288300
1962	70768	1632503	410000	320000
1963	85510	1739274	483300	400200
1964	89245	2048379	382600	456500
1965	104769	2170244	400300	508908
1966	105653	2225674	459833	526475
1967	95091	2349876	469778	502584

*1 Source: Trafic Meartime Du port de Beyrouth 1968.

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The above information shows that there was an increasing average of passengers and merchandize that reach Lebanon through the port of Beirut. However, Beirut harbour is lacking in spce at the time being, in the sence that its five basins have the capacity of handling about 2 million tons of emported merchandize yearly. Yet the need of Lebanon for such merchandize is estimated to be five million, and this shows a serious gap between the supply and demand of Beirut sea port.

It should be mentioned here that it is impossible to build a sixth basin for Beirut sea harbour; this is due to the lack in space since the the port is surrounded by too many buildings that should be evacuated and damaged in order to build another basin.

One of the most major problems of Beirut harbour is its inability to handle more maerchandize; The port receives all kinds of merchandize, some of which has a very weak turn over. A statistical data shows that about 870 th tons of merchandize which occupy around 600m of dock, have a one year turn over; that is, they usually stay in the port at an average of one year.

The following table shows the kind of this merchandize and the area it occupies.

Table 2.2

Merchandize	Tons	Areas
Phosphate	250000	75 sq.m.
Chemical manure	400000	125 sq.m.
Wood	125000	250 sq.m.
Iron and Copper	60000	75 sq.m.
Citrus	35000	50 sq.m.

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This merchandize prevents other vital merchandize to be received, due to the lack in space in Beirut harbour.

Also information shows that Beirut harbour is unable to receive all the crowded ships arriving in Lebanon, in the sense that a lot of them wait for their turn to be unloaded.

The average of waiting ships was as the following :

Ships	Year
5	1971
9	1972
20	1973

In the mid 70's, around 55 ships wait their turn for landing yearly. This shows that there is a serious gap between the supply and demand of Beirut port. The above figures prove that there is a need for another sea harbour in Lebanon to support the Beirut harbour. This new sea harbour must have the capability of receiving all the arriving ships; thus saving time and money. Otherwise, the ships might change their directions to other harbours in the Mediterranian; thus affecting the Lebaneaser national income negatively.

b- Sidon Sea Port

The existing port in Sidon played an important role in the economy of the city in the past, especialy during the days of the Phoenicians and Crusaders. Also during the reign of Prince Fkhr Eddenn Al-Kaani, the port started its role as a link between the Eastern and Western missionaries .

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The products and manufactured of "Al-Sham" and the countries of the East travelled through this port. Yet this port did not lose its principal role until the year 1860 when the Beirut-Damascus road was opened. However, the port remained active and received 155 ships and 833 sail boats in 1909. Unfortunately, after that date Sidon port lost its activity and was restricted only to fishing boat activity.

Sidon port regained its activity during the first years of the Lebanese war that is in 1975-1976 when Sidon witnessed a great commercial activity and became the wholesale market for the South, Western Beirut, the Mountain, Beqaa, Al-Shof and other parts of the country. However, Sidon sea port was unable to receive big ships, and this forced the private sector with the help of the Chmber of Commerce and Industry and the Ministry of Economy to provide the necessary equipment which made the port capable of receiving ships with loads of 1000 - 1500 tons.

The situation in Sidon port during the years of the war was the following:*1

1- In 1975 the port received 13 ships with a total load of 16245 tons.

2- in 1976 it received 170 ships with a total load of 466607 tons.

3- in 1976 the state got this income:

L.L. 146252574 as municipal fees.

L.L. 563134226 as import fees.

4- The most important materials imported through Sidon port were:

Flour, Sugar, Rice, Wood, Oils, Tins, Cement, Thead, Plastics, Starch, Dried Fish, ironboards, Tissue Paper, Fuels, Fertilizers, Sheep, goats, Cows, Furniture, Soap and Marble, etc...

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*1 source: Chamber of Commerc and Industry in Sidon and The South

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5- In 1977, the quiet situation in Lebanon made Beirut port regain its life while Sidon port received the ships which wanted to avoid jams and delay in Beirut. In that year, Sidon port received 80 ships with a total load of 52596 tons.

6- In 1978, the movement was very active, and Sidor port received 257 ships with a total load of 188664 tons.

7- in 1979, Beirut port regained its life again, but the movement in Sidon port was still active, and it received 105 ships with a total load of 77938 tons.

8- During the years of 1975-1976, the number of the import custom returns for the domestic consumable good was 866. Also the number of the export custom returns to arab countries was 3750. To Syria, was 1966 and to Jordon was 154.

The above movements of Sidon port prove its importance among the ports in Lebanon. They also indicate that it could play an important role in the sea movements and transportation, if it had the opportunity to be constructed in a new manner to provide the required activity. In this sense, Sidon port would be a complement to Beirut port.

2.2 The Need And Importance Of Saydoon Commercial Port

Saydoon Commercial Port, which this project deals with, could be one of the most important sea harbours on the Mediterranean if it is feasible to be constructed. This port consists of all the elements required to

Facilitate the sea movements and transportation. It consists of warehouses, Passenger terminal, dry dock, and other elements which can make this port play an international role. In addition to the transporation and traveling movements, Saydoon Commercial port provides the activity of ships repairment by having a dry dock.

In this respect it is worth to mention here that on the whole eastern coast of the Mediterranean, there are only two dry docks; on in Alexanderia and the other in Cyprus.

The need for another dry dock in this area arises when we notice that around 18 ships were evacuated and damaged on the Lebanease coast due to the inadequate repairment tools in the area.

As it is mentioned before, Lebanon is in need for Saydoon Commerical Port, since the existing ports in Lebanon do not have the capability of receiving all the ships, and that would affect negatively the Lebanese economy in losing the opportunity of increasing its Gross National Income. In this manner, we may mention the following benefits that Saydoon Commercial Port could provide:

1- The capability of receiving additional number of ships would lead to an increase in the Lebanses National Income.
2- The ease of loading and unloading goods from and to the ships will lead to a decrease in the total cost of such goods so that their consumable prices will be decreased.
3- The role of solving the problem of the jam and delay in Beirut sea port will not make Lebanon loose the opportunity of additional income for those wating ships.

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4- The ability of offering new job opportunities to the poeple in the South will improve their economical and social conditions.

5- The port will develope new industries in the South as well as will improve the import and export trading.

6- The port will benefit those South villages that are located on the international transit road.

7- The port will benefit also some regions by allowing the toursits through this port to visit Sidon and the surrounding areas.

The above mentioned benefits will affect the Lebanese economical, social, and environmental conditions as a whole, yet Saydoon Commercial Port does affect Sidon city positively by.:

a- Providing job opportunities which help in solving the unemployment condition in the city.

b- Increasing the individual income.

c- Improving the trading proccess in Sidon, especially import and export.

d- Increasing in consumption power due to the increasing in income.

e- Providing a new financial investment in the area due to the improvement of the economical situation of the city.

f- Improving the existing industries by opening new consumable market through exports.

g- Developing new industries in Sidon that could meet the new economical situation of the city.

Generally, if this port becomes true, it will prevent the migration from the suburbs to the capital city by giving the people the opportunity

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to work near their homes. This port will help also in improving the living standard of the people tin the South, who live in poverty in the time being. Also this port will play a vital role among other ports, not only to Lebanon but also the surrounding Arab countries, especaily if it is accompanied by openning the planned road which connects Sidon to the Arab countries through Syria.

Fianally, Saydoon Commercial Port will become one of the major bases in the economy of Lebanon, because Lebanon does need such a port in order to match the development and improvement of other nearby countries.

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CHAPTER THREE

OPTIMAL CONSTRUCTION AREAS AND ENGINEERING DESIGN

Saydoon Commercial Port is located on the south of Sidon city. This location gives it a unique advantage of an easy transportation to and from the port without having jam and delay. The location also is very convenient one because it is far from inhabitants and buildings, and because it is on a public area and near to the industrial part of the city. The south side of the city is, therefore, the best place to construct a port.

Saydoon Commercial Port consists of many engineering elements, designes in an advanced style to show its importance among other ports in the Mediterranean.

Saydoon Commercial Port consists of the following elements:

1-Break water arms and peirs.

2- Passenger terminal.

3- Port management buildings.

4- Warehouses; which include the followings:

   a- Customs warehouses

   b- Transit warehouses

   c- Free area warehouses

   d- Cooling warehouses

   e- Freezing warehouses

   f- Wheat pipes

5- Sea management building.

6- Repairment machines area.

7- Dry-dock.

8- Signal tower.

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All the above elements have been designed to meet the needs of the port; namely, the ability of receiving ships, and imported and exported goods.

The optimal construction areas and engineering design of the above mentioned elements are as the following:

First:

Break water arms and peirs.

Saydoon Commercial Port area consists of about 1,300,000 sq.m. of land and 2,000,000 sq.m. of sea. This 2,000,000 sq.m. of the sea should be protected by break water arms, designed to have a length of 1000 m. and a depth of 48 m.

The cosntruction cost of the Break water arems according to the prices applied in Beirut port is as following:

Depth (45 - 48) 4000 m.

4000 * $ 5000 = $ 20,000,000

Peirs are designed so that huge ships could be landed. The lengthe of the peirs varies from 200m. to 410m..Their depths vary from 9.6m. to 15m.

The cosntruction cost of this element is estimated according to the following:

Depth (8 - 9.6) 800m.

800m. * $ 2500 = $ 2,000,000

Depth (14- 15)1250m.

1250m.* $ 3000 = $ 3,750,000

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The above Break water arms and peirs, need around 5 millions sq.m. of debris.

The cost of debris : 5000,000 * $ 3 = $ 15,000,000

Thus the total construction cost of the Break water arms and Peirs is estimated to be $ 34,070,000 *1

Second:

Passenger Terminal

The Passenger Terminal is designed in a way to show the importance of the port on the touristic and sea travelling levels. It consits of the following elements:

1- Travelling Station; which consists of the following:

a- Waiting Hall.

b- Passenger Hall.

c- Touring Ofices.

d- Customs-Offices.

e- Customs-Offices.

f- Free Market.

g- Electronical Search Division.

i- Restaurant and Amusement center.

The total area of the Travelling station is 4200 sq.m..

2- Arriving Station; which consists of the following:

a- Waiting Hall.

b- Passenger Hall.

c- Customs-House.

d- Touring Offices.

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*1 The calculation of this cost depends upon the engineer budget plan for 1989

e- Medical Centers and Quarantine.

f- Baggage receiving Hall.

The total area of the arriving station is 2100 sq.m..

3- Reception Hall, for Deplomatic and High Class People.

4- Waiting Terrace and Balcony.

5- Warehouses for arriving and travelling baggages.

6- Worker rooms, vehicles rooms.

7- Ships Supplies warehouses.

8- Restaurant for workers.

The above mentioned elements occupy an area of 9750 sq.m.

Thus, the optimal construction area of the passenger terminal is as follows:

1- Travelling station	4200 sq.m.
2- Arriving station	2100 sq.m.
3- Other elements	9750 sq.m.
	16000 sq.m.

The passenger terminal has an area of 16000 sq.m.

The cosntruction costs of this building based on the first quarter of 1989 prices are as following:

$ 200*[1] / sq.m.

So the passenger terminal construction cost will be:

16000 sq.m. * $ 200 = $ 3,200,000[*2]

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*1 Based on the engineering estimation cost of sq.m. of building

*2 This price is subject to price variance. PLS. refer to chapter 5

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Also the passenger terminal requires around $ 1600,000 of preparation and supplies.

Thus the total construction costs of the passenger terminal is estimated to be : $ 3,200,000 + $ 1600,000 = $ 4,800,000.

Third:

Port Management Building

The port management building consists of the following:

1- Offices for managing the internal transaction of the port .

2- Offices for employees.

3- Offices for commercial transactions.

4- Offices for shipping agencies.

5- Banking center.

6- Communication center (Telex, Telegrams and Telephones) .

7- Mechanical rooms.

8- Waiting Hall.

9- General Management offices..

10-General relation offices.

11-Central custom houses.

12-Warehouses and Store houses.

13-Conference rooms.

14-Cafeterias.

15-Moving ladders.

The optimal construction area of the port management building is estimated to be 12000 sq.m. on occupied area of 3000 sq.m. of land.

The estimated construction cost based on the first quarter of 1989 prices is as the following:

12000 sq.m. * $ 200 = $ 2400,000

Also the Port Management building required around $ 1,200,000 of equipments and preparations, therefore, the total cost of the Port Management building will be:

$ 2,400,000 + $ 1,200,000 = $ 3600,000.

Fourth: Warehouses, which consist of the following :

1- Customs warehouses.

a- Two one-floor customs warehouses. Each occupies an area of 6000 sq.m.

Thus the construction cost of these customs warehouses is as follows:

6000 sq.m. * 2 * $ 75[*1] = $ 900,000.

b- Two three-floor customs warehouses. Each occupies an area of 8000sq.m.

Thus the construction cost of this kind of warehouses is as follows:

8000 sq.m. *3*2* $ 75 = $ 3600,000.

2- Transit warehouses.

a- Two one-floor transit warehouses. Each occupies an area of 6000 sq.m.

Thus the construction cost of these transit warehouses is as follows:

6000 sq.m. * 2 * $ 75 = $ 900,000.

b- Two three-floor transit warehouses. Each occupies an area of 8000sq.m.

Thus the cosntruction cost of these transit warehouses is as follows:

8000 sq.m. *3*2 * $ 75 = $ 3600,000.

3- Free area warehouses.

a- Two One-floor warehouses. Each occupies an area of 6000 sq.m..

Their construction cost is as follows:

6000 sq.m. * 2 * $ 75 = $ 900,000.

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*1 Based on 1989 prices

b- Two three-floor warehouses. Each occupies an area of 8000 sq.m.

Their construction cost is as follows:

8000 sq.m. * 3 * 2 $ 75 = $ 3,600,000.

4- Cooling warehouses.

Two six-floor cooling warehouses. Each occupies an area of 2500 sq.m..

Their construction cost is as follows:

2500 sq.m. * 6 * 2 * 150[*1] = $ 4,500,000

5- Freezing warehouses.

Two six-floor freezing warehouses. Each occupies an area of 2500 sq.m..

Their construction cost is as follows:

2500 sq.m. * 6 * 2 * 150 = $ 4,500,000

6- Wheat pipes, their number is two and each one contains five pipes.

Their altitude is around 18 meters; each occupies an area of 2000 sq.m..

Their construction cost is as follows:

2000 sq.m. * 18 * 2 * 50 = $ 3,600,000.

Thus, according to the above information, we can estimate the construction cost and the optimal construction area of the warehouses as in the following table:

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*1 This price includes the construction cost plus the equipment cos / sq.m.

Table 3.1

OPTIMAL CONSTRUCTION AREA AND COSTS

OF THE WAREHOUSES

Type	Kind	Number	Area/sq.m.	Unit $ Cost	Total $ Cost
Customs warehouses	One floor	2	12000	450000	900000
Customs warehouses	Three floor	2	16000	1800000	3600000
Transit warehouses	One floor	2	12000	450000	900000
Transit warehouses	Three floor	2	16000	1800000	3600000
Free area warehouses	One floor	2	12000	450000	900000
Free area warehouses	Three floor	2	16000	1800000	3600000
Cooling warehouses	Six floor	2	5000	2250000	4500000
Freezing warehouses	Six floor	2	5000	2250000	4500000
Wheat pipes	Five pipes	2	4000	1800000	3600000
Total			98000	13050000	26100000

Therefore the optimal construction area of Saydoon Commercial Port warehouses is 98000 sq.m. whereas their construction cost is $ 26100000. However, these costs are subject to price variances during the years of construction.

Fifth: Signaling tower: its altitude is 80 meters, its diameter is 15 mteres; its construction cost with all the equipment is estimated to be $ 300000.

Sixth: Sea management building:

It consists of the following elements;

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1- Rescue center and five stations. Their area is 200 sq.m.

2- Four rooms for building management and equipment halls; their area is 600 sq.m.

3- Police station, which occupies an area of 500 sq.m.. It includes several rooms for police equiment and supplies. .

4- Medical emergency center of 200 sq.m..

So the optimal construction area of the sea management building is 1500 sq.m. and its construction cost is as follows:

1500 * $ 200 = $ 300000.

Also this building requires around $ 150000 supplies and equipment.

Thus the construction cost of the sea management building will be around:

$ 300000+ $ 150000 = $ 450000.

Seventh: Repairment machine area, which occupies an area of 6000 sq.m.

it costs around : 6000 * $ 200 = $ 1200000.

Eightth: Dry dock for repairment of ships. This occupies an area of 11000 sq.m.

It costs around $ 7000000 according to the cost prices of other dry dock in similar ports.

Nineth : General equipment for the port.

a- Levers, trucks, and buldozers; their cost is estimated to $ 2500000.

b- 11 fuel tanks which cost around $ 2000000.

Tenth : Landscaping of the project; it is estimated to be around $ 1000000.

Depending upon the above data, the optimal construction area of the project elements and their costs (1989) could be summrized in the following table:

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Table 3.2

SAYDOON COMMERCIAL PORT

OPTIMAL CONSTRUCTION AREA AND COSTS

Element	Area/sq.m.	Costs /$
Break water arms and peirs	1300000	40750000
Passenger terminal	16000	4800000
Port management building	12000	3600000
Warehouses	98000	26100000
Sea management building	1500	450000
Repairment machines area	6000	1200000
Dry dock	11000	7000000
Signal tower	15 D	300000
General equipment		4500000
Landscaping		1000000
		$ 89700000

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CHAPTER FOUR

ESTIMATED FUTURE DEMAND AND SUPPLY OF SAYDOON COMMERCIAL PORT

As stated earlier, Lebanon seems to need another port, and Sydoon Commercial Port can be that port. In this chapter I am going to identfy the port's future supply and to estimate its future demand in order to measure its future revenues.

The port main revenues will be generated from leasing its commercial spaces to public and from the import and export fees on the cargo shipped or landed on the port property.

It is worth to mentioning here that I consider the revenues to be credited to the inevestors' accounts who are going to build the port on their own account. In this sence, I consider also that an agreement will be made between the government and the investors stating that the investors will have the right to lease the port for a period of 30 years, beginning from the first constructions year. Within the leasing period, the investors will have the right to charge fees as they desire on condition that they do not harm the customer's rights and previliges.

4.1 The Port Future Supply

According to the engineering design, the port has the ability to receive ships with a total cargo of 1500000 tons yearly at maximum. The port offers deep peirs (8-15m.) by which huge ships could land easily . It also offers commercial spaces which are availabe for lease for a period of 5 years renewed upon the agreement of both sides.

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These commercial spaces are:

First:

Passenger Termical

In this section, atround 2085 sq.m. of commercial spaces are available for lease. They are distributed according to the following table:

Table 4.1

Passenger Terminals Commercial Spaces

Element	Number	Area/sq.m.	Total Area /sq.m.
Touring Offices	8	25	200
Touring Shops	8	20	160
Restaurant with bar	1	500	500
Bank	1	25	25
Free Market Shops	10	40	400
Canteen	1	600	600
Amusement Center	1	200	200
Totals		1910	2085

Second:

Port Managemet Building

The commercial spaces of this section are 3550 sq.m. distributed according the following table:

Table 4.2

Port Management Building Commercial Spaces

Element	Number	Area/sq.m.	Total area/sq.m
Shipping Agencies Offices	20	50	1000
Banking Centers	10	100	1000
Communication Centers	10	75	750
General Relation Offices	8	75	600
Canteen	1	600	600
Totals		850	3550

Thrid:

Warehouses

The Warehouses of Saydoon Commercial Port occupy an area of 94000 sq.m. distributed according the following table:

Table 4.3

Warehouses Commercial Spaces

Element	Kind	Number	Area / sq.m.	Total area/sq.m.
Customs	one floor	2	6000	12000
Customs	three floor	2	8000	16000
Transit	one floor	2	6000	12000
Transit	three floor	2	8000	16000
Free Area	one floor	2	6000	12000
Free Area	three floor	2	8000	16000
Cooling	six floor	2	2500	5000
Freezing	six floor	2	2500	5000
Totals			47000	94000

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Thus, the uncovered warehouses occupy an area of 94000 sq.m. which are totally available for rent.

Fourth:

Repairment Machines Area

This section occupies around 6000 sq.m.. It is available for rent to companies which are interested in repairement and rehabilitation businesses.

Fifth:

Dry - Dock

This section occupies around 11000 sq.m.. It is available for companies interested in reconstruction, repairment and maintenance of used shipps.

The above mentioned elements are totally available for rent to the public; however, htey are not expected to be rented within the first year of the project life. Yet it is estimated that all the elements will be rented within a period of 4 to 5 years. Consequently, the estimated demand of the project will identify exactly when those elements are going to be rented.

4.2 The Port Future Demand

In order to measure the future revenues of Saydoon Commercial Port, I should estimate the future demand of the port; so by estimating the demand function of the port, I can easily know how and when the commercial spaces of the project would be rented, and the port revenues could be estimated. In order to estimate the demand of the project, a forecasting technique should be used. In this procedure, I can not use the Mechanical Extrapolation and Econometric Models technique, because the first depends

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on past data and assumes that past trends will continue in the future, and the second relates the demand to one or more economic variables. As we noticed, both techniques depend on certain procedures that are not available in this project. For instance, the past trend used in measuring the demand of ports in Lebanon can not be assumed to be continued in the future. This is because of the serious gap presented in the Lebanese war which makes the present economic indicators differ from those previous to the war. Thus making past trend can not be assumed in forecastin the demand due to the difference in time and data before and after the war. The second technique can not be used also because the economic condition in Lebanon is not stable and the economic variable does not behave within the economic cycle of the country. The political situation of the country is the only independent variable that affects the other economic variables; so if we have to use Econometric Model we should relate the demand of the port to the political situation of the country; thus getting a negative result or a very small demand, which we can not accept because people tend to do projects inspite of the political situation of the country. So both techniques are useless in this study.

The most effecent technique I consider in estimating the future demand of the port is the opinion survey technique. This is done by conduction survey using questonairs asking the major trading and industrial powers in the country to give their opinions each according to his specialization and experiences.

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4.2.1 Major finding of the survey

Taking a sample of 75 merchants of related and unrelated businesses, I found out that the demand for the commercial spaces of the port are somehow satisfactory, while the estimation of the future quantities of carges that might be received and shipped through the port is somehow difficult, because there is no adequate past information as an indicator for forecasting the future received and shipped quantities of cargoes. Some experts suggested that Saydoon Port will surely receive the surplus quantities of cargoes at Beirut Port that is the 870,000 ton[*1]. Taking this quantity as a base, I can approximately estimate the future received cargoes by increasing a rate of 9 - 10% yearly, so that this quantity will not exceed 1,300,000 tons. In my turn, I can estimate the quantity received in the first years of the port life to be 500,000 tons. This estimation is based on the fact that the existing port in Sidon received around 466,607[*2] tons in 1976. Thus I consider the 500,000 tons as a base acceptable to forecast the future received cargoes with an average increase of 10% yearly. Concerning the shipped carges from Saydoon Port to abroad, there is no adequate estimation that could be applied in this study. Because Lebanon is a dependent country, its imports exceed its exports. Lebanon's exports constitute around 15% of its imports[*3]; and due to the war situation, the transit exports through the ports of Lebanon are very small or may be

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PLS. refer to chapter 2 page 10

*2 PLS. refer tp chapter 2 page 12

*3 Chamber of Commerce and Trading , Beirut

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negligable. Thus in this study, I am going to consider the amount to 15% of the estimated received quantity plus an increase of 5% for transit export cargoes yearly (considering a quiet situation in the country).

The following table indicate the estimated future quantities of imported and exported cargoes through the Saydoon Commercial Port.

Table 4.4

Estimated Quantities Of Imported & Exported Cargoes

Tons (000)

Items	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Import	500	550	605.5	665.5	732.1	805.3	885.8	974.4	1071.8	1178.9	1296.9	1300
Export	100	110	121	133	146.4	161.1	177.2	194.9	214.4	235.8	259.2	260
Totals	600	660	726.5	789.5	878.5	966.4	1062.1	1169.3	1286.2	1414.7	1556.1	1560

4.2.2 The Port future demand of commercial spaces

As I mentioned earlier, the major findings of the questionaire are somehow satisfactory. I noticed that some merchants are risk takers and others are risk averts. Yet, and inspite of the country present situation, I found that the majority of the merchants are risk takers in the sense that they are interested in investing their money in new investments.

The finding of the survey showed that the demand of the commercial spaces of Saydoon Commercial Port is according to the following table.

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*1 1300 Till year 2018; Totals = 27465.63 Tons

*2 260 Till year 2018; Totals = 5492.8 Tons

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Table 4.5

Estimated Demand OF Commercial Sapces Of

Saydoon Commercial Port

Elements	Number	1994	1995	1996	1997	1998
a.Passenger Terminal						
1- Touring Offices	8	2	4	2		
2- Touring Shops	8	2	5	1		
3- Restaurant with Bar	1		1			
4- Bank	1	1				
5- Free Market Shops	10	3	3	2	1	1
6- Amusement Center	1		1			
7- Canteen	1	1				
b.Port Management Building						
1- Shipping Agencies Off.	20	8	6	4	2	
2- Banking Center	10	2	4	4		
3- Communication Center	10	6	4			
4- General Relation Off.	8	2	4	2		
5- Canteen	1	1				
c.Warehouses						
1- Customs, One Floor	2			1	1	
2- Customs, Three Floor	2	1	1			
3- Transit, One Floor	2		1	1		
4- Transit, Three Floor	2	1	1			
5- Free Area, 1 Floor	2		1	1		
6- Free Area, 3 Floor	2	1	1			
7- Cooling	2	1	1			
8-Freezing	2	1	1			

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Table 4.5 Cont.

Estimated Demand Of Commercia Spaces Of
Saydoon Commercial Port

Elements	number	1994	1995	1996	1997	1998
d-Uncover Warehouses						
94000 sq.m.			56400 sq.m	37600 sq.m.		
e-Repairment Machine						
area	1		1			
f-Dry-Dock	1				1	

According to the above data, The commercial spaces of Saydoon Commercial Port are going to be leased within a period of five years.

4.3 The Port Future Revenues

The port future revenues are generated from leasing its commercial spaces, and from fess charged on imported and exported cargoes.

4.3.1 Revenues From Fees Charged On imported & Exported Cargoes

It is estimated that $3/ton is a fair fee on imported (received) cargoes, and $2/ton on exported (shipped) cargoes. These fees are the average fees that the port management might charge. It is esitmated also that an increase of 15% is applied to these fees every five years. Thus the estimated future revenues from fees on imported and exported cargoes are according to the folowing table

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Table 4.6

Estimated Future Revenues From Fess On Imported and Expoted Cargoes $(000)

Element	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	20
Import	1500	1650	1815	1996.5	2196.2	2778.3	3055.9	3361.5	3697.7	4067.5	5148.6	5
Export	200	220	242	266.	292.8	370.5	407.5	448.2	493	542.3	685.6	6
Totals	1700	1870	2057	2262.5	2488.9	3148.7	3463.4	3809.7	4190.7	4609.8	5834.2	5

Table 4.6 Cont.

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	201
5161	5161	5161	5941	5941	5941	5941	5941	6832	6832	6832	6832	683
689	689	689	792.4	792.4	792.4	792.4	792.4	910	910	910	910	91
5850	5850	5850	6733.4	6733.4	6733.4	6733.4	6733.4	7742	7742	7742	7742	774

4.3.2 Revenues From Leasing The Port Commercial Spaces

It is estimated that the port commercial spaces would be leased for a period of five years renwed with an increase of 30% every new leasing contract. Table 4.7 shows the leasing prices assigned to each unit within a period of five years and indicates the variance of the prices among years

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*1 Totals (Vertical)
*2 Import " Total = $115776.15
*3 Export " Total = $ 15435.75
*4 Totals (Horizontal) = $131211.75

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Table 4.7

Estimated Leasing Prices Of Saydoon Commercial Port

Spaces / Unit (000)

Element	Year 1	Year 2	Year 3	year 4	year 5
a.Passenger Terminal					
1- Touring Offices	25	28	31.36	35.12	39.34
2- Touring Shops	20	22.4	25	28.10	31.34
3- Restaurant with Bar	125	143.75	165.31	185.15	212.92
4- Bank	25	28	31.36	35.12	39.34
5- Free Market Shops	20	22.4	25	28.10	31.47
6- Amusement Center	100	115	132.25	152.08	174.90
7- Canteen	150	172.5	198.38	228.38	262.35
b.Port Management Building					
1- Shipping Agencies Off.	35	39.2	43.90	48.17	55.10
2- Banking Center	100	110	121	133	146.40
3- Communication Center	52.5	58.8	65.86	73.76	82.61
4- General Relation Off.	25	28	31.36	35.12	39.3
5- Canteen	120	144	172.8	207.36	248.83
c.Warehouses					
1- Customs 1 Floor	120	134.4	150.53	168.6	188.82
2- Customs 3 Floor	240	268.8	301.1	337.18	377.64
3- Transit 1 Floor	120	134.4	150.53	168.6	188.82
4- Transit 3 Floor	240	268.8	301.1	337.18	377.64
5- Free area 1 Floor	120	134.4	150.53	168.6	188.82
6- Free area 3 Floor	240	268.8	301.1	337.18	377.82
7- Cooling	450	540	604.8	677.38	812.85
8- Freezing	450	540	604.8	677.38	812.85
d.Uncovered / sq.m.	0.007	0.00805	0.00926	0.0104	0.0116
e. Repairment Machine Area	60	69	79.35	91.25	104.94
f.Dry-Dock	700	805	925.75	1064.61	1224.30

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Tables 4.8, 4.9, and 4.10 show the port future revenues generated from leasing its commercial spaces. The computations are generate by multiplying the estimated demand of port commercial spaces by the leasing prices assigned to each unit plus an increase of 30% every five years from the leasing date.

Table 4.8

SAYDOON COMMERCIAL PORT

ESTIMATED FUTURE REVENUES (PASSENGER TERMINALS)

U.S $(000)

Element	Leasing Date	Estimated Demand	1994	1995	1996	1997	1998	1999	2000	2001	2002
Touring	1994	2	50	50	50	50	50	65	65	65	65
shops	1995	4		112	112	112	112	112	145.6	145.6	145.6
	1996	2			63.2	63.2	63.2	63.2	63.2	82.2	82.2
Touring	1994	2	40	40	40	40	40	52	52	52	52
Officies	1995	5		112	112	112	112	112	145.6	145.6	145.6
	1996	1			25	25	25	25	25	32.5	32.5
Restaurant With Bar	1995	1		143.8	143.8	143.8	143.8	143.8	186.8	186.8	186.8
Bank	1994	1	25	25	25	25	25	32.5	32.5	32.5	32.5
Free area	1994	3	60	60	60	60	60	78	78	78	78
Market	1995	3		67.2	67.2	67.2	67.2	67.2	87.4	87.4	87.4
Shops	1996	2			50.2	50.2	50.2	50.2	50.2	65.3	65.3
	1997	1				28.1	28.1	28.1	28.1	28.1	36.5
	1998	1					31.5	31.5	31.5	31.5	31.5
Amusement Center	1995	1		115	115	115	115	115	149.5	149.5	149.5
Canteen	1994	1	150	150	150	150	150	195	195	195	195
Totals			325	874.9	1013.4	1041.5	1072.9	1170.4	1335.4	1376.9	1385.4

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Table 4.8 Cont.1

SAYDOON COMMERCIAL PORT

ESTIMATED FUTURE REVENUES (PASSENGER TERMINALS)

U.S. $(000)

2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	20013
65	84.5	84.5	84.5	84.5	84.5	109.9	109.9	109.9	109.9	109.9
145.6	145.6	189.3	189.3	189.3	189.3	189.3	246.1	246.1	246.1	246.1
82.2	82.2	82.2	106.8	106.8	106.8	106.8	106.8	138.5	138.5	138.5
52	67.6	67.6	67.6	67.6	67.6	87.9	87.9	87.9	87.9	87.9
145.6	145.6	189.3	189.3	189.3	189.3	189.3	246.1	246.1	246.1	246.1
32.5	32.5	32.5	42.3	42.3	42.3	42.3	42.3	54.9	54.9	54.9
186.8	186.8	242.9	242.9	242.9	242.9	242.9	315.8	315.8	315.8	315.8
32.5	42.3	42.3	42.3	42.3	42.3	54.9	54.9	54.9	54.9	54.9
78	101.4	101.4	101.4	101.4	101.4	131.8	131.8	131.8	131.8	131.8
87.4	87.4	113.6	113.6	113.6	113.6	113.6	147.6	147.6	147.6	147.6
65.3	65.3	65.3	84.8	84.8	84.8	84.8	84.8	110.3	110.3	110.3
36.5	36.5	36.5	36.5	47.5	47.5	47.5	47.5	47.5	61.7	61.7
40.9	40.9	40.9	40.9	40.9	53.2	53.2	53.2	53.2	53.2	69.1
149.5	149.5	194.4	194.4	194.4	194.4	194.4	252.7	252.7	252.7	252.7
195	253.5	253.5	253.5	253.5	253.3	329.6	329.6	329.6	329.6	329.6
1394.8	1521.6	1736.1	1790	1800.9	1813.2	1978	2256.8	2326.6	2340.9	2356.8

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Table 4.8 Cont 2 SAYDO N COMMERCIAL PORT

ESTIMATED FUTURE REVENUES (PASSENGER TERMINALS)
U.S. $(000)

2014	20015	2016	2017	2018	Totals
142.8	142.8	142.8	142.8	142.8	2260.8
246.1	332.8	332.8	332.8	332.8	4796.2
138.5	138.5	180.5	180.5	180.5	2494.9
114	114	114	114	114	1808.6
246.1	332.8	332.8	332.8	332.8	4796.2
54.9	54.9	71.4	71.4	71.4	987.6
315.8	410.6	410.6	410.6	410.6	6089.2
71.4	71.4	71.4	71.4	71.4	1130.5
171.4	171.4	171.4	171.4	171.4	2712.9
147.6	191.9	191.9	191.9	191.9	2846.6
110.3	110.3	143.3	143.3	143.3	1982.9
61.7	61.7	61.7	61.7	61.7	992.8
69.1	69.1	69.1	69.1	69.1	1042.6
252.7	328.4	328.4	328.4	328.4	4871.3
428.4	428.4	428.4	428.4	428.4	6782.4
2571.1	2959.5	3051.1	3051.1	3051.1	45416.3

Table 4.9

SAYDOON COMMERCIAL PORT

ESTIMATED FUTURE REVENUES (MANG. BUILDING) $000

Element	Leasing Date	Estimated demand	1994	1995	1996	1997	1998	1999	2000	2001
Shipping	1994	8	280	280	280	280	280	364	364	364
Agencies	1995	6		235.2	235.2	235.2	235.2	235.2	305.8	305.8
Offices	1996	4			175.6	175.6	175.6	175.6	175.6	228.3
	1997	2				98.3	98.3	98.3	98.3	98.3
Banking	1994	2	200	200	200	200	200	260	260	260
Centers	1995	4		440	440	440	440	440	572	572
	1996	4			484	484	484	484	484	629.2
Communica-	1994	6	315	315	315	315	315	409.5	409.5	409.5
tion	1995	4		235.2	235.2	235.2	235.2	235.2	305.8	305.8
Center										
General	1994	2	50	50	50	50	50	65	65	65
Relation	1995	4		112	112	112	112	112	145.6	145.6
Offices	1996	2			62.7	62.7	62.7	62.7	62.7	81.5
Cafetria	1994	1	120	120	120	120	120	156	156	156
Totals			965	1987.4	2709.7	2808.1	2808.1	3097.6	3404.3	3620

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Table 4.9 Cont.1

SAYDOON COMMERCIAL PORT

ESTIMATED FUTURE REVENUES (MANG. BUILDING)$000

2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
364	364	473.2	473.2	473.2	473.2	473.2	615.2	615.2	615.2	615.2	615.2
305.8	305.8	305.8	397.2	397.2	397.2	397.2	397.2	516.7	516.7	516.7	516.7
228.3	228.3	228.3	228.3	296.8	296.8	296.8	296.8	296.8	385.8	385.8	385.8
127.8	127.8	127.8	127.8	127.8	166.2	166.2	166.2	166.2	166.2	216	216
260	260	338	338	338	338	338	439.4	439.4	439.4	439.4	439.4
572	572	572	743.6	743.6	743.6	743.6	743.6	966.7	966.7	966.7	966.7
629.2	629.2	629.2	629.2	818	818	818	818	818	1063.4	1063.4	1063.4
409.5	409.5	532.4	532.4	532.4	532.4	532.4	692.1	692.1	692.1	692.1	692.1
305.8	305.8	305.8	397.5	397.5	397.5	397.5	397.5	516.7	516.7	516.7	516.7
65	65	84.5	84.5	84.5	84.5	85.5	109.9	109.9	109.9	109.9	109.9
145.6	145.6	145.6	189.3	189.3	189.3	189.3	189.3	246.1	246.1	246.1	246.1
81.5	81.5	81.5	81.5	106	106	106	106	106	137.8	137.8	137.8
156	156	208.8	208.8	208.8	208.8	208.8	263.6	263.6	263.6	263.6	263.6
3650.5	3650.5	4026.8	4425.6	4707.2	4745.6	4745.6	5234.9	5753.3	6119.5	6169.4	6169.4

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Table 4.9 Cont. 2

SAYDOON COMMERCIAL PORT

ESTIMATED FUTURE REVENUES (MANG.BULD.) $000

2014	2015	2016	2017	2018	Totals
799.7	799.7	799.7	799.7	799.7	12660.35
516.7	671.8	671.8	671.8	671.8	9962.99
385.8	385.8	501.5	501.5	501.5	6936.68
216	216	216	216	216	3473.85
571.2	571.2	571.2	571.2	571.2	9043.1
966.7	1256.7	1256.7	1256.7	1256.7	18638.12
1063.4	1063.4	1382.4	1382.4	1382.4	19119.63
899.7	899.7	899.7	899.7	899.7	14242.67
516.7	671.8	671.8	671.8	671.8	9962.99
142.8	142.8	142.8	142.8	142.8	2260.8
246.1	319.9	319.9	319.9	319.9	4744.62
137.8	137.8	179.1	179.1	179.1	2477.72
342.7	342.7	342.7	342.7	342.7	5425.85
6805.4	7479.3	7955.3	7955.3	7955.3	118950.10

Table 4.10

SAYDOON COMMERCIAL PORT

ESTIMATED FUTURE REVENUES (WAREHOUSES) $000

Elements	Leasing Date	Estimated Demand	1994	1995	1996	1997	1998	1999	2000
Customs:									
One Floor	1996	1			150.5	150.5	150.5	150.5	1505
One Floor	1997	1				168.6	168.6	168.6	168.6
Three Floor	1994	1	240	240	240	240	240	312	312
Three Floor	1995	1		268.8	268.8	268.8	268.8	268.8	349.4
Transit:									
One Floor	1995	1		134.4	134.4	134.4	134.4	134.4	174.7
One Floor	1996	1			150.5	150.5	150.5	150.5	150.5
Three Floor	1994	1	240	240	240	240	240	312	312
Three Floor	1995	1		268.8	268.8	268.8	268.8	268.8	349.4
Free Area:									
One Floor	1995	1		134.4	134.4	134.4	134.4	134.4	174.7
One Floor	1996	1			150.5	150.5	150.5	150.5	150.5
Three Floor	1994	1	240	240	240	240	240	312	312
Three Floor	1995	1		268.8	268.8	268.8	268.8	268.8	349.4
Cooling	1994	1	450	450	450	450	450	585	585
Warehouses	1995	1		540	540	540	540	540	702
Freezing	1994	1	450	450	450	450	450	585	585
Warehouses	1995	1		540	540	540	540	540	702
Uncovered	1994	56400sq.m.	400	400	400	400	400	520	520
Warehouses	1995	37600sq.m.		302.7	302.7	302.7	302.7	302.7	393.5
Dry-Dock	1997	1				1064.1	1064.1	1064.1	1064.1
R.M.A*1	1995	1		69	69	69	69	69	89.7
Totals			2020	4546.9	4998.5	6231.7	6231.7	6837.7	7595.8

*1 Repairment Machine Area

.../

Table 4.10 Cont.1

SAYDOON COMMERCIAL PORT

ESTIMATED FUTURE REVENUES (WAREHOUSES)$000

2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
195.7	195.7	195.7	195.7	195.7	254.4	254.4	254.4	254.4	254.4	330.7
168.6	219.2	219.2	219.2	219.2	219.2	285	285	285	285	285
312	312	312	405.6	405.6	405.6	405.6	405.6	527.3	527.3	527.3
349.4	349.4	349.4	349.4	454.3	454.3	454.3	454.3	454.3	590.6	590.6
174.7	174.7	174.7	174.7	227.1	227.1	227.1	227.1	227.1	295.3	295.3
195.7	195.7	195.7	195.7	195.7	254.4	254.4	254.4	254.4	254.4	330.7
312	312	312	405.6	405.6	405.6	405.6	405.6	527.3	527.3	527.3
349.4	349.4	349.4	349.4	454.3	454.3	454.3	454.3	454.3	590.6	590.6
174.7	174.7	174.7	174.7	227.1	227.1	227.1	227.1	227.1	295.3	295.3
195.7	195.7	195.7	195.7	195.7	254.4	254.4	254.4	254.4	254.4	330.7
312	312	312	405.6	405.6	405.6	405.6	405.6	527.3	527.3	527.3
349.4	349.4	349.4	349.4	454.3	454.3	454.3	454.3	454.3	590.6	590.6
585	585	585	760.5	760.5	760.5	760.5	760.5	988.7	988.7	988.7
702	702	702	702	912.6	912.6	912.6	912.6	912.6	1186.4	1186.4
585	585	585	760.5	760.5	760.5	760.5	760.5	988.7	988.7	988.7
702	702	702	702	912.6	912.6	912.6	912.6	912.6	1186.4	1186.4
520	520	520	676	676	676	676	676	878.8	878.8	878.8
393.5	393.5	393.5	393.5	511.6	511.6	511.6	511.6	511.6	665.1	665.1
1064.1	1384	1384	1384	1384	1384	1799	1799	1799	1799	1799
89.7	89.7	89.7	89.7	116.6	116.6	116.6	116.6	116.6	151.6	151.6
7731.3	8101.3	8101.3	8889.1	9874.6	10050.1	10531.5	10531.5	11555.6	12836.8	13065.7

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Table 4.10 Cont.2

SAYDOON COMMERCIAL PORT

ESTIMATED FUTURE REVENUES (WAREHOUSES)$000

2012	2013	2014	2015	2016	2017	2018	Totals
330.7	330.7	330.7	330.7	429.9	429.9	429.9	5946.5
370.5	370.5	370.5	370.5	370.5	370.5	370.5	5956.9
527.3	527.5	685.5	685.5	685.5	685.5	685.5	10851.7
590.6	590.6	590.6	767.7	767.7	767.7	767.7	11386.2
295.3	295.3	295.3	383.9	383.9	383.9	383.9	5693.2
330.7	330.7	330.7	330.7	429.9	429.9	429.9	5946.5
527.3	527.3	685.5	685.5	685.5	685.5	685.5	10851.7
590.6	590.6	590.6	767.7	767.7	767.7	767.7	11386.2
295.3	295.3	295.3	383.9	383.9	383.9	383.9	5693.2
330.7	330.7	330.7	330.7	429.9	429.9	429.9	5946.5
527.3	527.3	685.5	685.5	685.5	685.5	685.5	10851.7
590.6	590.6	590.6	767.7	767.7	767.7	767.7	11386.2
988.7	988.7	1285.3	1285.3	1285.3	1285.3	1285.3	20347
1186.4	1186.4	1186.4	1542.3	1542.3	1542.3	1542.3	22874.1
988.7	988.7	1285.3	1285.3	1285.3	1285.3	1285.3	20347
1186.4	1186.4	1186.4	1542.3	1542.3	1542.3	1542.3	22874.1
878.8	878.8	1142.4	1142.4	1142.4	1142.4	1142.4	18086.2
665.1	665.1	665.1	864.6	864.6	864.6	864.6	12823.3
2338.7	2338.7	2338.7	2338.7	2338.7	2338.7	2338.7	37608
151.6	151.6	151.6	197.1	197.1	197.1	197.1	2922.9
13690.9	13690.9	15022.3	16687.8	16285.5	16985.5	16985.5	259780.4

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CHAPTER FIVE

ECONOMIC EVALUATION OF THE PROJECT

5,1 Estimated Construction Cost During Years Of Construction And Estimated Engeneering Design, Supervision and Contractin Cost.

Since the construction of the port will need 5 years, it is important to consider here the prices variances during these years. For instance, I can not say that the prices of the basic materials needed for the construction proccess will remain the same during the 5 years; Therefore, I considered an increase of 15% in prices yearly, holding other factors constant.

The estimated future construction costs are as the following:

a- Break water Arms and Peirs:

This element is the first part that should be constructed. Within it, the primary landscaping is done. This part requires three years of construction, thus the cosntruction cost should reflect the changes in prices. The estimated future cost of this element is considered as the following:

1989: The primary lanscaping should be done; that is, in this year the cost of debris should be capitalized.

As computed in chapter three, the cost of debris is estimated to be $15000000.

1990: In this year, the Break water arms are constructed. The construction cost will reflect a 15% increase of the 1989 prices. Thus the cost of Break water arm is estimated as the following:

$20,000,000 * 1.15 = $ 23,000,000

1991: In this year, peirs are supposed to be constructed. Also the cost of this element will reflect the prices variances during this year.

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Thus the construction price is as the following:

800 * $ 3306.25[*1] = $2645000

Depth (14 - 15m.) 1250m.

125m. * $ 3967.50[*2] = $4959375

Thus total construction cost: $2645000 + $4959375 = $7604375.

b- Passenger Terminals:

The area of this unit is 16000 sq.m.. This unit needs around 2 years to be cosntruction of Break water arms i.e. in 1992.

The estimated construction cost of this unit is a follows:

1992 : $ 1946720[*3]

1993 : $ 3358092

This unit also needs equipment of $ 2550000 that could be installed in 1992. So the estimated construction cost of the passenger terminals is:

$ 1946720 + $ 3358092 + $ 2550000 = $ 7854812

c- Port Management Building:

The total area of this unit needs 2 years to be completed. Its construction will begin in 1992. The cosntruction cost of this unit is estimated to be $200/sq.m. taking into consideration an average increase of 20% annually.

So according to our computations, the estimated construction cost of this unit is as follows:

1992: $1460040

1993: $2518578

---

*1 P.L.S. refer to chapter three; 2500 * 1.15 * 1.15
*2 Refer to chapter three; 3000 * 1.15 * 1.15
*3 This figure depends up on the engeneering budgeting plans

Equipment $ 1825050 (1992 prices)

Thus the total estimated cosntruction cost of the port management building is $ 5803668

d- Warehouses:

This unit includes several kinds of warehouses. The estimated construction cost of each kind is as follows:

1- Customs Warehouses.

The construction proccess of these warehouses will begin in 1992. The estimated cost /sq.m. in 1992 is $ 114. These warehouse are of 2 types: one-floor and three-floor.

Thus the estimated cosntruction cost of these warehouses is as follows:

1992 : 6000 sq.m. * 2 * $114 = $ 1368000

1992 ; 8000 sq.m. * 2 * 3 * $114 = $ 5472000

Total cost of this kind of warehouses is $ 6840000

2- Transit Warehouses.

These warehouse will be constructed in 1992 at an estimated cost price of $ 114 / sq.m.. They are of 2 type : one-floor and three-floor.

The estimate cosntruction cost of these warehouses is as follows:

1992 : 6000 sq.m. * 2 * $114 = $ 1368000

1992 : 8000 sq.m. * 2 * 3 * $114 = $ 5472000

Total 6840000

3- Free Area Warehouses.

These warehouse cost also in 1992 $114/sq.m..They are also of 2 Types

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as the above mentioned warehouses. So the estimated cost price of these warehouses is as the following:

1992 6000 sq.m. * 2 * $ 114 = $ 1368000

1992 8000 sq.m * 2 * 3 * $ 114 = $ 5472000

Total 6840000

4- Cooling Warehouses

These warehouses will be constructed in the last year of construction i.e. in 1993. The construction cost /sq.m. plus all the electronical equipment needed for such warehouses is estimated to be around 262 *sq.m. Thus the estimated cost of these warehouses is:

1993 2500 * 6 * $ 262 = $ 7860000

5- Freezing Warehouses

These will be constructed in 1993 at a cost price of $ 262/sq.m. So the estimated cost price of these warehouses including the required electronical devices is as the following:

1993 2500 * 6 * $262 = $ 7860000

6- Seeds Pipes

This unit will be cosntructed in 1992. Its construction cost is estimated to be as the following:

2000m. * 18 * 2 * $ 762 = $ 5472000

According to the above data, the estimated total cost of warehouses is as the following table.

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Table 5.1

ESTIMATED CONSTRUCTION COST OF

WAREHOUSES DURING YEARS OF CONSTRUCTION

Element	1992		1993	
Customs	$6840000			
Transit	6840000			
Free area	6840000			
Cooling			$7860000	
Freezing			7860000	
Seeds Pipes	5472000			
Totals	25992000	+	1520000	= $ 41712000

e- Sea Management Building

The total area of this building is 1500 sq.m.

This unit is assumed to be constructed in 1993 and it will take one year only. Thus theprices of 1993 will reflect its cosntruction cost which is estimated to be as following:

1993 1500 * $350 = $ 525000

Also this rquires equipment of $ 250000 (1993 prices)

Therefore the total cost of this building is :

$ 525000 + $ 250000 = $ 775000

f- Repairment Machine Area

The total area of this unit is 6000 sq.m.

This unit is assumed to be constructed in 1990. Thus its construction

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cost will refelct the prices of 1990, and it is estimated to be as the followin:

6000 * 230 * = $1380000

g- Signaling Tower

This tower has an altitude of 8m. and a diamter of 15m.

It is estimated to be constructed in 1992 at a construction cost of $622080.

h- Dry-Dock

This unit has an area of 11000 sq.m.. Its construction begins in the early stage of the project construction i.e. in 1990. It is estimated that this unit costs around $ 7000000 in 1989 depending on the construction prices of Dry-Dock in Cyprus Port (1988-1989).

Thus the estimated cost of this unit in 1990 is as the following:

$ 7000000 * 1.15 =$ 8050000

i- General equipment

This includes the Levers, Trucks, and Beldozers which the project requires plus eleven Fule Tank.

This equipment could be installed in 1993 and their estimated cost is around $ 6000000.

j- Landscaping of the project

This is the final stage of the construction proccess which will be done in 1993. It is estimated to cost around $ 2000000.

Depending on the previous information, I can now find the estimated total construction cost of the project from the following table:

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Table 5.2

ESTIMATED TOTAL CONSTRUCTION COST OF

SAYDOON COMMERCIAL PORT DURING YEARS OF CONSTRUCTION U.S.$

Elements	1989	1990	1991	1992	1993	Total
Break Water Arms & Peirs	15000000	23000000	7604375			45604375
Passenger Terminals				4496720	3358092	7854812
Port Management Building				3285090	2518578	5803668
Warehouses				25992000	15720000	41712000
Sea Managment Buildin					775000	775000
Repairment Machines Area		1380000				1380000
Signaling Tower				622080		622080
Dry-Dock		8050000				8050000
General Equipment					6000000	6000000
Landscaping					2000000	2000000
Totals	15000000	32430000	7604375	34395890	30371670	119801935

5.1.a. Estimated Engineering Dsign, Supervision and Contractin Cost.

According to the Lebanese engineering Syndicates, the engineering design% supervision cost is 6.5% of the annual cosntruction cost of the project, whereas the constracting cost is 6% of the same cost.

Accordingly, the estimated engineering design and supervision and contractin cost is as the following table:

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Table 5.3

ESTIMATED ENGINEERING DESIGN, SUPERVISION & CONTRACTING

Element	1989	1990	1991	1992	1993	Totals
Engineering Design and Supervision	975000	2107950	494284	2235733	1974159	7787126
Contracting	900000	1845800	456263	2063753	1822300	7188116

5.2 Specific assumption used in computation

The feasibility of this project which depends on the computation of the profit and loss statement, cash flow statement, not present value criterion and internal rate of return criterion, is based on the following specific assumptions:

a- Life of the project:

The life of the project is assumed to be 30 years depending on the leasing constract between the builders of the project and the government.

b- Value of the land:

Because the land which the port would be built on is a public area, the leasing contract states that the land would be offered without any cost, as investment from the government, on the condition that the whole project would return to the government custody after the leasing validity time.

c- Income taxes:

The leasing contract that the returns from the revenues of the

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the port to the investors will not be taxed. Also all the imported equipment needed for the port will not be taxed. The government will charge the customs fees and manucipality fees.

d- Depreciation and Replacment cost:

The depreciation method used in this computation is the straight line method for the buildings, warehouses and equipment. The life time of the buildings is 50 years and of the warehouses is 50 years, whereas of the equipment is 10 years. The replacement cost is considered as 10% increase in prices and equipment is estimated to be replaced every 10 years.

The leasing costract states that the government will compensate any salvage value after the leasing time.

e- The leverage factor:

It is assumed that the investors will finance the project by 65% of the yearly construction cost raised in form of equity funds, whereas the 35% shall be covered by a long term loan from the international Bank. Interests charged on the loans are assumed to be 7.50% and paid annualy. Repayment principle will start after 8 years from making the loan, on an equal repayment bases and will extend within a period of 10 years.

f- Cost of Capital:

The cost of capital required for this project is the weighted

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average of the cost of debt and equity. This is because part of investment is financed by a debt. The opportunity cost required for the investors is 9%, thus the cost of capital is the following:

$$\frac{(D * R) + E.OC}{D + E} = \frac{\$\ 47920774 * 7.5\% + \$\ 86856403 * 9\%}{\$\ 134777177} = 8.5\%$$

5.3 Capital Cost Of the Project

According to the previous assumptions, the capital cost of the project is shown in table 5.4

Table 5.4

INITIAL CAPITAL COST OF THE PROJECT
$ (000)

Cost of Land	000000
Construction Cost	119801935
Engineering Design and Supervision Cost	7887126
Contracting Fees	7188116
	134777177

5.4 Evaluation Of Saydoon Commercial Port

5.4.1 Revenues:

As stated in chapter 4 the revenues are generated from leasing the port commercial spaces and from charging the fees on the imported and exported cargoes. The following time schedule presents the estimated future revenues of the port, based on the computation shown in chapter 4, tables 4.8, 4.9 and 4.10.

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Table 5.4.1 REVENUES TIME SCHEDULE

Years	Revenues $(000)
1994	5010
1995	9279.27
1996	10778.58
1997	12343.73
1998	12601.67
1999	14254.43
2000	15798.90
2001	16538.93
2002	17327.82
2003	17756.35
2004	20271.60
2005	21886.10
2006	22347.94
2007	22928.04
2008	22940.31
2009	25501.80
2010	27580.25
2011	28245.25
2012	28934.50
2013	28950.45
2014	32140.65
2015	32140.65
2016	35733.89
2017	35733.89
2018	35733.89

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5.4.2 Operating Costs:

The Operating variable costs are assumed to constitute around 20% of the yearly gross revenues. These represent heat, light and power. Salaries and wages are assumed to $ 150000 for an averge of 125 employees and workers. An increase fo 5% is applied to this figure yearly. Insurance expenses are estimated to be $100000 with an increase of 10% every 10 years.

5.4.3 Profit Or Loss Statement:

The above information of revenues and costs will be presented in the form of profit or loss statement in table5.5, to show the net result from operation which forms part of the cash flow stream of the project.

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Table 5.5

SAYDOON COMMERCIAL PORT

ACCOUNTING PROFIT OR LOSS STATEMENT($000)

Elements	1994	1995	1996	1997	1998	1999	2000
Export & emport Fees	1700	1870	2057	2262.5	2488.97	3148.73	3463.41
Passenger Terminals	325	874.95	1013.35	1041.45	1072.92	1170.42	1335.41
Port Mang. Bldg.	965	1987.4	2709.72	2808.06	2808.06	3097.56	3404.28
Warehouses,DryDock&R.M.A *1	2020	4546.92	4998.51	6231.72	6231.72	6837.72	7595.8
Gross Revenues	5010	9279.3	10778.6	12343.8	12601.7	14254.4	15798.9
Less							
Operating expenses:							
Salaries	150	157.5	165.4	172.6	182.3	191.4	201
Insurance	100	100	100	100	100	100	100
Variable Expenses	100.2	185.6	215.6	246.9	252	285	315.0
Total Expenses	350.2	443.1	480.9	520.5	534.3	576.4	616.0
Gross Operating Revnues	4659.8	8836.2	10297.7	11823.2	12067.3	13678	15182
Less							
Depreciation:							
Building	273.17	273.17	273.17	273.17	273.17	273.17	273.17
Warehouse&Dry-Dock	1022.8	1022.8	1022.8	1022.8	1022.8	1022.8	1022.8
General Equipment	600	600	600	600	600	600	600
Replacement Cost G.E *2							
Interest Expense	3594.06	3594.06	3594.06	3234.65	2875.25	2515.84	2156.43
Net Income or Net Loss	(830.3)	3346.1	4807.1	6692.6	7296.1	9266.1	11129.5

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*1 Repairment Machine Area

*2 General equipment

Table 5.5 Cont. 1

SAYDOON COMMERCIAL PORT

ACCOUNTING PROFIT OR LOSS STATEMENT($000)

2001	2002	2003	2004	2005	2006	2007	2008	2009
3809.74	4190.71	4609.79	5834.15	5850	5850	5850	5850	6733.35
1376.93	1385.36	1394.8	1521.55	1736.03	1790	1800.96	1813.23	1978.01
3620.98	3650.48	3650.48	4026.83	4425.57	4707.24	4745.62	4745.62	5234.92
7731.28	8101.27	8101.27	8889.07	9874.5	10050.7	10531.46	10531.46	11555.6
16538.9	17327.8	17756.4	20271.6	21886.1	22397.9	22928.0	22940.3	25501.8
211.1	221.6	232.7	244.3	256.6	269.4	282.9	297	311.6
100	100	100	110	110	110	110	110	110
330.8	346.6	355.1	405.4	437.7	447.9	458.6	458.8	510.0
641.9	668.2	687.8	759.8	804.3	827.6	851.4	865.8	931.9
15897	16659.6	17068.6	19511.8	21081.8	21570.3	22076.6	22074.5	24569.9
273.17	273.17	273.17	273.17	273.17	273.17	273.17	273.17	273.17
1022.8	1022.8	1022.8	1022.8	1022.8	1022.8	1022.8	1022.8	1022.8
600	600	600	660	660	660	660	660	660
			6600					
1797.03	1437.62	1078.22	718.81	359.41				
12797.04	13326.02	14094.3	10237.02	18766.4	19614.6	20120.6	20118.5	22613.9

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Table Cont.2

SAYDOON COMMERCIAL PORT

ACCOUNTING PROFIT OR LOSS STATEMENT($000)

2010	2011	2012	2013	2014	2015	2016	2017	2018
6733.35	6733.35	6733.35	6733.35	7742	7742	7742	7742	7742
2256.82	2326.64	2340.89	2356.84	2571.6	2959.51	3051.05	3051.05	3051.05
5753.32	6119.54	6169.35	6169.35	6805.4	7479.27	7955.34	7955.34	7955.34
12836.76	13065.72	13690.91	13680.91	15022.29	16687.84	16985.5	16985.84	16985.84
27580.25	28245.25	28934.5	28950.45	32140.65	34869.07	35733.89	35733.89	35733.89
327.46	343.82	361	379	398	417.91	438.81	460.75	483.79
110	110	110	110	121	121	121	121	121
551.61	564.91	578.69	379	642.81	697.81	714.68	714.68	714.68
989.07	1018.73	1049.69	1068	1161.81	1236.72	1274.5	1296.43	1319.47
26591.18	27226.52	27884.81	27882.45	30978.84	33632.35	34459.39	34437.45	34414.42
273.17	273.17	273.17	273.17	273.17	273.17	273.17	273.17	273.17
1022.84	1022.84	1022.84	1022.84	1022.84	1022.84	1022.84	1022.84	1022.84
660	660	660	660	726	726	726	726	726
				7260				
24635.17	25270.51	25928.8	25926.41	21696.83	31610.34	32437.38	32415.45	32392.41

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Table 5.5 shows a net loss in the first year of operation i.e. in 1994. This net loss derives from deducting all the expenses plus interest on loan from the gross revenues generated from exported an imported fees plus leasing fees of the port commercial spaces.

It is proved that in 1994, the expenses exceed the revenues; This is due to the fact that the revenues collected are generated only from a part of the port supplies. Yet in the following years, the net result from operations shows a positive result in the form of a net income that increases yearly and exceed expenses.

5.4.4 Cash Flow Statement:

The cash flow statement (table 5.6) shows outflowing cash (uses of funds) which are matched against inflowing cash (sources of funds), and the resultant deficit or surplus for each year. The accumulated deficit and/or surplus is carried over the following years so that at the end of the 30 years period, the accumulated surplus or deficit will be recorded.

The following is the cash flow statement.

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Table 5.6

SAYDOON COMMERCIAL PORT

CASH FLOW STATEMENT($000)

	1994	1995	1996	1997	1998	1999
CASH OUTFLOW						
Construction Cost*	119802					
Engineering, Design & Supervision*	7787					
Contracting*	7188					
Replacement Cost G.E						
Debt Sericing:						
Interest*	13395	3594	3594	3235	2875	2516
Repayment				4792	4792	4792
Total Cash Outflow	148172	3594	3594	8027	7667	7308
CASH INFLOW						
Draw Down On Equity*	86856					
Draw Down On Debt*	47920					
Net Flow From Operation	4660	8836	10298	11823	12067	13678
Total Cash Inflow	139436	8836	10298	11823	12067	13678
CASH SURPLUS OR(DEFICIT)	(8736)	5242	6704	3796	4400	6370
CUMULATIVE CASH SURPLUS OR (DEFICIT)	(8736)	(3494)	3210	7006	11406	17776

* Rolled over from 1989 to 1994

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Table 5.6 Cont. 1

SAYDOON COMMERCIAL PORT

CASH FLOW STATEMENT ($000)

2000	2001	2002	2003	2004	2005	2006	2007	2008
				6600				
2516	1797	1438	1078	719	360			
4792	4792	4792	4792	4792	4792	4792		
6948	6589	6230	5870	12111	5152	4792		
15182	15897	16660	17069	19512	21082	21571	22077	22075
15182	15897	16660	17069	19512	21082	21571	22077	22075
8234	9208	10430	11199	7401	15930	16779	22077	22075
26010	35218	45748	56947	64348	80278	97057	119134	141209

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Table 5.6 Cont. 2

SAYDOON COMMERCIAL PORT

CASH FLOW STATEMENT ($000)

2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
					7260				
					7260				
24570	26591	27227	27885	27882	30979	33632	34460	34437	34414
24570	26591	27227	27885	27882	30979	33632	34460	34437	34414
24570	26591	27227	27885	27882	30979	33632	34460	34437	34414
165779	192370	219597	247482	275364	299083	332715	357175	391612	426026

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The cash flow statement (table 5.6), shows a deficit in cash in the first 2 years of operations. This is because the uses of funds exceed the sources of funds. Yet the yearly increase in the net flow of operations generates a source of funds that makes the cash surplus reach to $426026000 at the end of operations. Thi figure shows the net result from operations which generated from sources and uses of funds of Saydoon Commercial Port.

Accordingly, Saydoon Commercial port is a feasible project from the accounting point of view, since it generates sources of funds that exceed uses of funds by $426026000. Yet this figure does not include the time value of money which is a very important factor that should be considered in measurment of the economic feasibility study.

In order to make the economic feasibility study, I adopt two criteria: the net present value and the internal rate of return.

5.4.5 The Net Present Value Criterion:

Net present value is defined as the difference between discounted benefits and discounted costs of a certain project. The rule states that to adopt any project for which the present value of the associated stream of net benefits or net receipts, discounted at the oppropriate of interest is greater than zero. In my study, the appropriate rate of interest is the weighted average of the cost of debt and equity which is calculate to be 8.50%. Table 5.7 shows the net present value of Saydoon Commercial Port.

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Table 5.7

SAYDCON COMMERCIAL PORT

COMPUTATION OF NET PRESENT VALUE ($000)

YEAR	CAPITAL COST	OPERATING COST	COST STREAM	REVENUE STREAM	NET REVENUE	PWF*1 (8.5%)	NPV*2
1989	16875		16875		(16875)	1	(16875)
1990	36483.5		36483.5		(36483.5)	0.9216785	(33626.06)
1991	8554.92		8554.92		(8554.92)	0.8495095	(7267.47)
1992	38695.38		38695.38		(38695.38)	0.7830075	(30298.77)
1993	34168.13		34168.13		(34168.13)	0.7217275	(24660.08)
1994		350.2	350.2	5010	4659.8	0.6652570	3099.96
1995		443.08	443.08	9279.27	8836.19	0.6132185	5418.52
1996		480.93	480.93	10778.58	10297.65	0.5652620	5820.87
1997		520.51	520.51	12343.73	11823.22	0.5210675	6160.70
1998		534.33	534.33	12601.67	12067.34	0.4803385	5796.41
1999		576.44	576.44	14254.43	13677.99	0.4428020	6056.64
2000		616.98	616.98	15748.90	15181.92	0.4082080	6197.38
2001		641.85	641.85	16538.93	15897.08	0.3763245	5982.46
2002		668.17	668.17	17327.82	16659.65	0.3469385	5779.87
2003		687.83	687.83	17756.35	17068.52	0.3198535	5459.42
2004	6600	759.76	7359.76	20271.60	12911.84	0.2948900	3807.57
2005		804.27	804.27	21886.10	21081.83	0.2718800	5731.73
2006		827.35	827.35	22397.94	21570.59	0.2506710	5407.12
2007		851.41	851.41	22928.04	22076.63	0.2311215	5102.38
2008		865.81	865.81	22940.31	22074.50	0.2131010	4704.1
2009		931.89	931.89	25501.80	24569.91	0.1964895	4827.72
2010		989.07	989.07	27580.25	26591.18	0.1811770	4817.71
2011		1018.73	1018.73	28245.25	27226.52	0.1670615	4548.50
2012		1049.69	1049.69	28934.50	27884.81	0.1540480	4296.49
2013		1068.00	1068.00	28950.45	27882.45	0.1420520	3960.76
2014	7260	1161.81	8421.18	32140.65	23718.84	0.1309930	3107.00
2015		1236.72	1236.72	34869.07	33632.35	0.1207975	4062.70
2016		1274.50	1274.50	35733.89	34459.39	0.1113975	3838.70
2017		1296.43	1296.43	35733.89	34437.46	0.1027310	3537.80
2018		1319.47	1319.47	71764.14*3	70444.67	0.0947150	6672.17
	148636.9	20975.2	169612.1	591517.5	421905.5		11467.30

*1 This is the cost of capital of the project.
*2 Column 6 * 7
*3 Revenue plus salvage values.

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Table 5.7 shows a positive net present value of $ 11467300. This conclusion state that the present value of revenue generated during the life time of the project exceeds the present value of money invested plus the expenses paid during the life time of the project. So according to the rule of net present value criterion which is to adopt any project that NPV is greater than zero, Saydoon Commercial Port is a feasible project sice it generate a positive NPV of $ 11467300.

5.4.7 Internal Rate Of Return Criterion:

The internal rate of return is defind as the discount rate which reduces the difference between discounted benefits and discounted costs to zero. The rule recommends that we adopt any project whose IRR is greater than the project cost of capital. The computation of internal rate of return includes the repayment of debt in the form of interest plus basic payment. Tble 5.8 shows the procedure used in computation of IRR.

Table 5.8

SAYDOON COMMERCIAL PORT

COMPUTATION OF INTERNAL RATE OF RETURN($000)

YEAR	EQUITY CAPITAL	DRAW ON DEBT	OPERATING COST	DEBT REPAYMENT BASIC	DEBT REPAYMENT INTEREST	TOTAL	TOTAL COST
1989	9000	6000			450	450	9450
1990	19458	12972			1422.90	1422.90	20880.90
1991	4562.63	3041.75			1651.03	1651.03	6213.66
1992	20637.53	13758.36			2682.91	2682.91	23320.44
1993	18223.00	12148.67			3594.06	3594.06	21817.06
1994			350.20		3594.06	3594.06	3944.26
1995			443.08		3594.06	3594.06	4037.14
1996			480.93		3594.06	3595.06	4074.99
1997			520.51	4792.08	3234.65	8026.13	8547.24
1998			534.33	4792.08	2875.25	7667.33	8201.66
1999			576.44	4792.08	2515.84	7307.92	7884.36
2000			616.98	4792.08	2156.43	6948.51	7565.49
2001			641.85	4792.08	1797.03	6589.11	7230.96
2002			668.17	4792.08	1437.62	6229.70	6897.87
2003			687.83	4792.08	1078.22	5870.30	6558.13
2004	6600		759.76	4792.08	718.81	5510.89	12870.65
2005			804.27	4792.08	359.41	5151.49	5955.76
2006			827.35	4792.08		4792.08	5619.43
2007			851.41				851.41
2008			865.81				865.81
2009			931.89				931.89
2010			989.07				989.07
2011			1018.73				1018.73
2012			1049.69				1049.69
2013			1068.00				1068.00
2014	7260		1161.81				8421.81
2015			1236.72				1236.72
2016			1274.50				1274.50
2017			1296.43				1296.43
2018			1319.47				1319.47
	85741.2	47920.8	20975.2	47920.8	36756.34	84677.14	191393.54

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Table 5.8 Cont

SAYDOON COMMERCIAL PORT

COMPUTATION OF INTERNAL RATE OF RETURN($000)

YEAR	RECIEPT	NET RECIEPT	PWF(10.72)*1	NPV
1989		(9450)	1	(9450)
1990		(20880.90)	0.9032805	(18861.31)
1991		(6213.66)	0.8162359	(5071.81)
1992		(23320.44)	0.7371650	(17191.01)
1993		(21817.06)	0.6660141	(14530.47)
1994	5010	1065.74	0.6017748	641.34
1995	9279.27	5242.13	0.5437713	2850.52
1996	10778.58	6703.59	0.4913937	3294.10
1997	12343.73	3796.49	0.4441712	1686.29
1998	12601.66	4400.01	0.4013750	1766.05
1999	14254.43	6370.07	0.3627004	2311.00
2000	15748.90	8183.41	0.3279390	2683.66
2001	16538.93	9307.97	0.2966031	2760.77
2002	17327.82	10429.95	0.2679989	2795.22
2003	17756.35	11198.22	0.2423176	2713.53
2004	20271.60	7400.95	0.2190998	1621.55
2005	21886.10	15930.34	0.1980693	3155.31
2006	22397.94	16778.51	0.1791616	3006.06
2007	22928.04	22076.63	0.1663019	3671.39
2008	22940.31	22074.50	0.1465425	3234.85
2009	25501.80	24569.91	0.1325461	3256.65
2010	27580.25	26591.18	0.1198943	3188.13
2011	28245.25	27226.52	0.1044514	2843.85
2012	28934.50	27884.81	0.0981166	2735.96
2013	28950.45	27882.45	0.0887708	2475.15
2014	32140.65	23718.84	0.0802255	1905.23
2015	34869.07	32632.35	0.0726722	2371.46
2016	35533.89	34459.39	0.065751	2266.08
2017	35733.89	34437.46	0.0595096	2049.35
2018	71764.14	70444.67	0.0542459	3821.33
	591517.5	400124		0.00*2

*1 10.715819%
*2 0.23; due to rounding error

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By adopting the trial and error method, the internal rate of return of Saydoon Commercial Port is exactly 10.715819%. This IIR makes the net present value of Saydoon Commercial Port equal to zero(.23) Knowing that the cost of capital of Saydoon Commercial Port is 8.50%, the internal rate of return criterion shows that Saydoon Commercial Port is a feasible project since its IRR 10.72% is greater than its cost of capital.

CONCLUSION

Considering all the previous assumption to be valid and all the above computations to be correct, Saydoon Commercial Port is a feasible project.

From accounting point of view, this project is a good investment since it generates a cash surplus of $42602600 during its operations. Also from an economic point of view, and after considering the time value of moey, this project is feasible because it genrates both net present value of +$11467300 and IRR of 10.72% which is greater than the project cost of capital.

The methodology used in this study depends on measuring the benefits and returns of this project to the region of Sidon and to the founders of the project. The benefits are measured by the need and importance of this project not only to the region of Sidon but also to the Whole country(chapter 2).

The returns of this project are measured by estimating the port future supply and demand (chapter4).

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The initial cost of capital and operating expenses are derived from the real time being prices, tacing into consideration the price variances among years and from the engineering budgeting plans ، og construction cost (chapters 3 & 5).

Using the previous mentioned computation and other specific assumptions (chapter 5), the feasibility study is based on profit and loss statement, cash flow statement, net present value criterion, and internal rate of return criterion (Chapter 5).

RECOMNDATION

Saydoon Commercial Port is a feasible project if and only if the previous assumptions, considerations and computations are valid and correct. Accordingly, I financially recommend the investment of resources (money, skill and power), in this project, because my study proves its feasibility and success and indicates that it is a profitable project in the sence that its financial returns will satisfy its founders. This has been proved in my study when measuring the revenues of the project by estimating its supply and demand functions and matching them with the costs which in turm indicate the profitability factor of the port. Thus financially and economically speaking, I recommend Saydoon Commercial Port as a profitable project.

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