

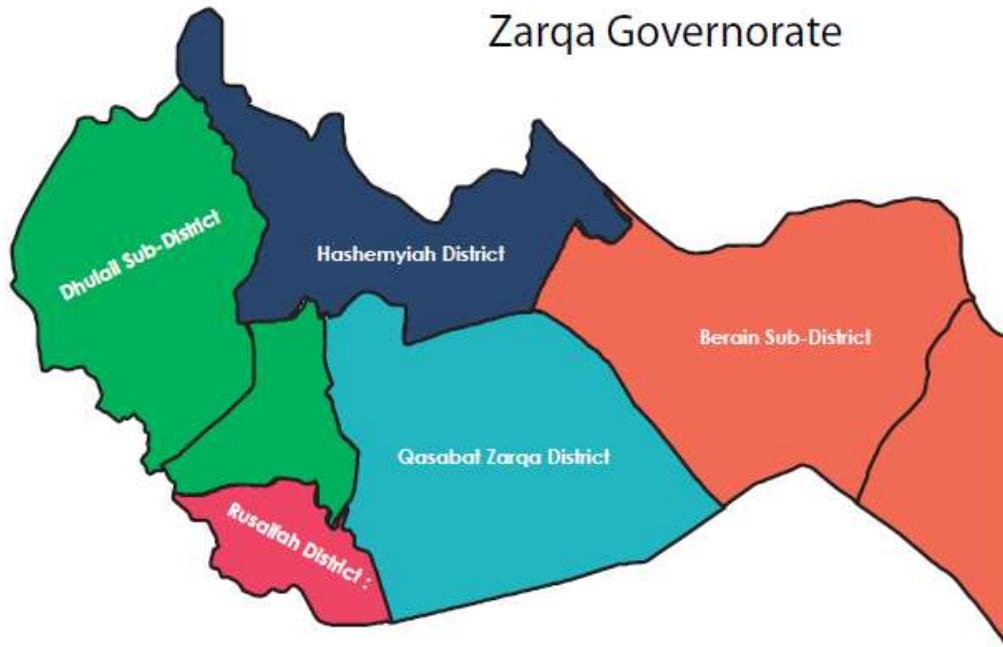
Pre-Feasibility Study
Production of Lightweight Construction Products Project from Pozzolana
“Volcanic Tuff”
Zarqa

April, 2017



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1. Executive Summary

This study aims to determining the Pre-Feasibility Study for the production of lightweight construction products made from Pozzolana "Volcanic Tuff" through mechanized and semi-automated processes. The project will be located in the District of Dhail of the Governorate of Zarqa. The following table shows the preliminary indicators of the project.

Table 1: Initial indicators of the project

Project Name	Production of lightweight construction products from Pozzolana "Volcanic Tuff".
Sector	Industry Sector - Manufacturing
Governorate	Governorate of Zarqa
Region	District of Dhail
Products	<p>The production of a range of lightweight construction products from Pozzolana "Volcanic Tuff", namely:</p> <ul style="list-style-type: none"> • Bricks with different sizes and colors, as is characterized by less weight up to 40%, and can bear tensile and compressive forces greater than the traditional brick, and it is characterized by savings in thermal insulation, energy, needed steel for construction, resistant to humidity and fungi (green construction) and above all, significant savings in construction costs. • Interlock Tiles used in tiling public yards, sidewalks, parks, home entrances and sidewalks and parking lots. This type of tile can be produced with various shapes and color. adding small amounts of Basalt and Diatomite will increase its tensile and compressive strengths without losing its main characteristic of being lighter and cheaper • Cement tiles used in paving sidewalks, yards, parking lots and home entrances. • Curbstone Bricks, which is used on the edges and sides of the roads, sidewalks and traffic islands that are in the middle of the roads, circles and others. • The possibility of future expansion to produce Pozzolana concrete for plaster, and to produce ready-mixed concrete upon the successful of this product to the market.

Project Description	<p>The project is based on manufacturing of all the above products through the following mechanized and semi-automated processes:</p> <ul style="list-style-type: none"> ● Processing the basic components of raw materials and additives. ● Building of components, and mixing them with water until reaching homogeneity. ● Adding colors as requested. ● Forming using special machines and moulds. ● Drying using drying system that is adjacent to the production area. ● Examining and inspecting the products. ● Packaging. ● Storage and selling.
Target Market	<ul style="list-style-type: none"> ● Local market. ● Export markets, particularly the nearby Arab markets; such as Saudi Arabia and Iraq.
Investment Cost	The investment cost of the project is about 1.4 million JD.
The Average return on investment	The average rate of return during the first ten years is about 13.1%
Internal Rate of Return	The internal rate of return is about 21%
Average added value of the project	The average added value of the project in ten years is about JD 435 thousand.
Risk Assessment	The Sensitivity Analysis indicates a low risk in case of 10% increase in investment cost, or 10% increase in operating costs, whereas a moderate risk in case of 10% decrease in revenues.
The Project Justifications	<ul style="list-style-type: none"> ● Availability of local raw materials in Azraq and Mafraq (close to project location), which have the qualities of light weight, insulation and aesthetic for the production of construction and decoration products. ● Obtaining foreign currency, and thus supporting the Trade Balance. ● Employment of National Labor. ● High added value due to reliance on the local raw materials. ● The possibility of marketing of project products inside and outside Jordan. ● The introduction of new products that have great benefits, most notably the saving in materials, energy, and high insulation, fire and humidity resistance, unlike other products such as polystyrene. ● High return on investment.

	<ul style="list-style-type: none">• Increased environmental awareness and interest in green buildings.• High construction costs in general makes the entry of these products easy, because they reduce the amount of steel, cement and concrete in buildings, in addition to reducing the energy needs in the buildings.• There are no similar factories using Pozzolana, but rather factories using cement and polystyrene or tyrmoston.
Partners/Stakeholders	<ul style="list-style-type: none">• The Ministry of Industry and Trade• Concerned municipalities.

2. The Macroeconomic Environment

2.1 An Overview of the Hashemite Kingdom of Jordan

The Hashemite Kingdom of Jordan is a landlocked country surrounded by land except at its southern extremity at the port of Aqaba, where that area is the only sea exit area in Jordan. The Kingdom is bordered at its west side by Palestine and the Mediterranean Sea, at its south and east by the Kingdom of Saudi Arabia, at north east by Iraq and at north by Syria.

Figure1 : Map of the Hashemite Kingdom of Jordan



Jordan is marked by three climatic zones from west to east including the Jordan Valley, most of which lies below sea level and is considered subtropical, and upland areas to the east of the Jordan Valley, ranging in height from 100 to 1500 meters above sea level and this is one of the areas dominated by Mediterranean climate, and the desert areas stretching to the east of the highlands.

The total area of the Kingdom is approximately 89.3 thousand square kilometers, and the semi-desert conditions prevail in over 80% of this area where there are some wet lands settings like Azraq Basin.

The kingdom is divided administratively into twelve governorates distributed into three regions: the Northern Region (includes the governorates of Irbid, Mafraq, Jerash and Ajloun) while the Central Region (includes the governorates of the capital, Zarqa, Balqa, Madaba) and the Southern Region (includes the governorates of Karak, Tafila, Ma'an, Aqaba), and the major cities are Amman (the capital), Zarqa and Irbid.

2.2 Population

Based on the General Census of Population and Housing in 2015, the population in the kingdom amounted to about 9.5 million people with a population density of 107.3 inhabitants per km², where the Capital City knocked off other governorates by population amounting to about 4 million people and a population density of 538.8 inhabitants per km², mainly because Amman is the most attractive governorate for Jordanians and for those coming to Jordan from other countries, followed by Irbid Governorate with a population of 1.8 million people, and then Zarqa Governorate with a population of 1.4 million. Tafila Governorate which is considered to be the least populous governorate whose population is about 96 thousand people.

Table 2: Number of population and population density in the Kingdom for 2015

Governorate	Population (people)	Area (Km ²)	Population density (people/ km ²)
Central Region			
Capital	4007526	7,579	528.8
Zarqa	1364878	4761	286.7
Balqa	491709	1120	439.0
Madaba	189192	940	201.3
North Region			
Irbid	1770158	1572	1126.1
Mafraq	549948	26551	20.7
Jerash	237059	410	578.2
Ajloun	176080	420	419.2
Southern Region			
Karak	316629	3495	90.6
Tafeileh	96291	2209	43.6
Maan	144082	32832	4.4
Aqaba	188160	6905	27.2
Total of Kingdom	9531712	88793.5	107.3

Source: Department of Statistics, Jordan General Population and Housing Census, 2015

On the other hand, the population growth rate has reached about 3% in 2010 and increased to 9% during the years 2013 and 2014 and then dropped a little during 2015 to reach about 8%, according to demographic surveys for the Department of Statistics. The reason for the high growth rates is attributed to the influx of large numbers of refugees from Syria to the Kingdom which resulted in a marked decline in per capita real GDP index by 5.4% to JD 1,197.4, based on the Statements of the Central Bank of Jordan.

The unemployment rate among Jordanians also witnessed a rise by 1.1 percentage to reach to 13%, due to the structural imbalances that the labor market is suffering from and the acquisition

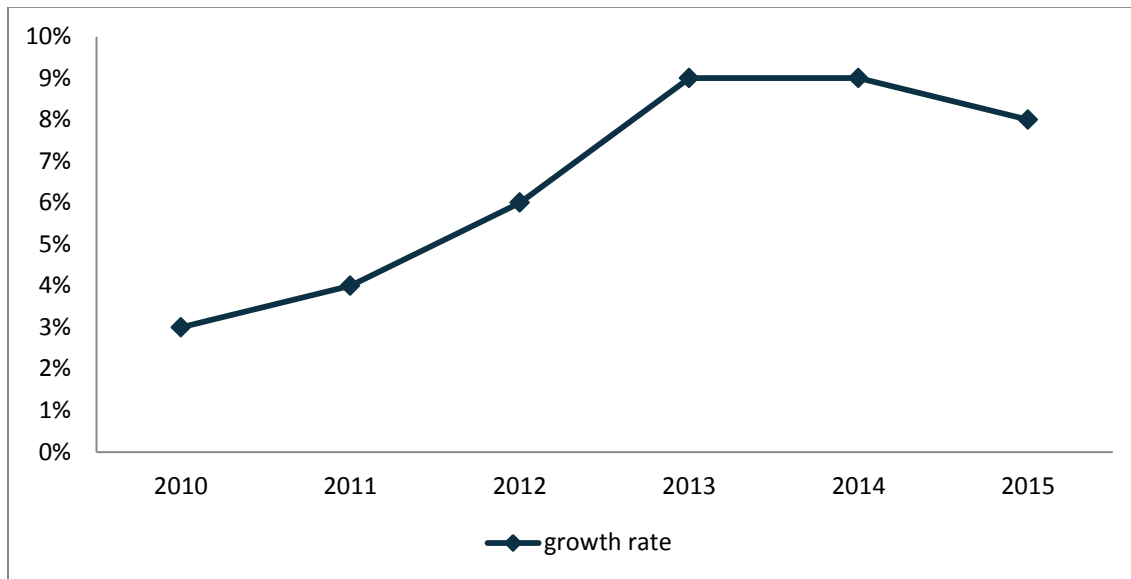
of the low-paid foreign workers on a large number of new jobs in the economy, according to the Central Bank of Jordan.

Table 3: Number of population and population growth in the Kingdom, thousand

	2010	2011	2012	2013	2014	2015
population	6698.0	6993.0	7427.0	8114.0	8804.0	9531.7
growth rate	%3	%4	%6	%9	%9	%8

Source: Department of Statistics

Figure 2: population growth rate in the Kingdom



2.3 Economic Indicators in the Kingdom ¹

Countries across the Middle East are still suffering from instability and closure or partial closure of borders; including the borders of important markets for the Kingdom's products. These factors led to a decline in the performance of many of the economic sectors, including the external sector, national exports, touristic income, and Foreign Direct Investment (FDI), and they contributed to a slowdown in the economic growth to about 2.4% in 2015, compared to 3.1% in 2014. The growth achieved in 2015 came from growth across several economic sectors, especially in the finance, insurance, and real estate services; the transport, storage, and communications services; the mining industry; the manufacturing industry; and the agriculture sector. These sectors contributed a combined 1.8 percentage points (or 75%) of the growth rate achieved during 2015, reflecting the diversity of the economic growth sources in the Kingdom.

Additionally, the general price level registered a decline in the prices of oil, commodities, and other related services in the global markets. Therefore, the general price level, measured by the relative change in the average consumer price index deflated by 0.9% in 2015, compared to the inflation of 2.9% in 2014.

The budget deficit, after aid, increased by 1.2% to a record 3.5% of GDP, compared with 2.3% in the previous year. In addition, the Balance of Payments' Current Account recorded a deficit of 8.9% of GDP, compared with 7.3% in 2014. At the end of 2015, the net public debt amounted to 22,847.5 million Jordanian Dinars (85.8% of the GDP), with an increase of 5.0% of the GDP. However, the total public debt reached 24,876.5 million Jordanian Dinars (93.4% of GDP). This increase resulted from financing both the general budget deficit and the guarantees for loans for the National Electricity Company and the Water Authority, as well as the slowdown of economic growth during 2015. The indebtedness of the National Electricity Company and the Water Authority recorded 6.7 billion Jordanian Dinars at the end of 2015.

On the monetary and banking front, most monetary indicators experienced positive development in performance in 2015, primarily in the Central Bank's foreign reserves, which maintained comfortable levels that amounted to about \$14.2 billion. The dollarisation rate decreased, which reflected positive demand for Jordanian Dinars in comparison to other major foreign currencies. With regards to the activities of licensed banks, the outstanding balance of credit increased by 9.5%, to reach 21,103.5 million Jordanian Dinars at the end of 2015. The total deposits registered with licensed banks increased by 7.7%, to reach 32,598.5 million Jordanian Dinars at the end of 2015. The increase in deposits came as a result of the high dinar deposits, which increased by 2,001.4 million Jordanian Dinars (8.3%), and higher foreign currency deposits, which increased by 336.1 million Jordanian Dinars (5.4%).

¹ The Central Bank of Jordan

Furthermore, many of the external sector indicators registered a drop in performance in 2015 due to the deepening instability in the region and almost full closure of the borders with Iraq and Syria. However, the drop in oil prices in the global markets contributed to the decline in the Kingdom's imports bill for energy, as it dropped by 40.6%, which in turn contributed to a decline in total imports and the trade deficit by 11.4% and 14.0%, respectively. Thus, the Current Account, excluding aid, declined to 11.9% of GDP, compared to 12.4% in 2014.

The Current Account deficit increased after aid, to reach 2,365.6 million Jordanian Dinars (8.9% of GDP) in 2015, compared with a deficit of 1,851.7 million Jordanian Dinars (7.3% of GDP) in 2014. This decline is due mainly to the decline in total exports by 6.6% and the decline in surplus in the services account by 27.7%, as touristic income decreased by 7.1%, and the decline in the surplus in the current transfers account decreased as a result of reduced foreign aid.

Capital and financial accounts resulted in a net inflow of 1,593.7 million Jordanian Dinars in 2015, compared to 909.0 million Jordanian Dinars in 2014; this was due to the Kingdom's higher net obligations towards the outside world. Foreign Direct Investment registered a net inflow of 909.4 million Jordanian Dinars, and the reserved investment registered an inflow of 918.4 million Jordanian Dinars due to the Kingdom issuing Eurobonds that are worth \$2.0 billion in the global markets. The withdrawal of bank loans on behalf of the Central Bank increased the use of funds from the International and Arab Monetary Funds by 543.3 million Jordanian Dinars. This led to the registration of a surplus in the overall Balance of Payments of 328.7 million Jordanian Dinars during 2015, compared to a surplus of 1,550.7 million Jordanian Dinars during 2014.

According to the Central Bank of Jordan, the increased international investment at the end of 2015 showed an increase in the external net liabilities of the Kingdom, which reached 24,357.5 million Jordanian Dinars, compared with 22,578.8 million Jordanian Dinars at the end of 2014. This was due to an increase in the external balance of assets and financial liabilities for all of the economic sectors in the Kingdom, which reached to 18,657.9 million Jordanian Dinars and 43,015.5 million Jordanian Dinars, respectively, during 2015.

Table 4: main economic indicators 2011 to 2015 in millions of dinars

	2011	2012	2013	2014	2015
Population (millions)	6.993	7.427	8.114	8.804	9.532
Unemployment rate	12.9	12.2	12.6	11.9	13.0
Production and Prices					
GNP at current market prices	20,288.8	21,690.0	23,611.2	25,141.2	26,289.6
GDP at current market prices	20,476.6	21,965.5	23,851.6	25,437.1	26,637.4
The rate of growth in GDP at constant market prices (%)	2.6	2.7	2.8	3.1	2.4
The total national disposable income at current prices	23,743.5	24,774.9	28,424.5	30,302.1	30,234.7
The rate of growth in gross national disposable income at current prices (%)	4.7	-0.2	8.6	3.1	-2.4
Change in the index of consumer prices (%)	4.2	4.5	4.8	2.9	-0.9
The change in the GDP deflator (%)	6.4	4.5	5.6	3.4	2.3
Money and Banking					
Exchange rate of the Jordanian dinar to the US dollar	1.410	1.410	1.410	1.410	1.410
Money supply (P2)	24,118.9	24,945.2	27,363.4	29,240.4	31,605.5
Net foreign assets of the banking system	9,370.1	6,665.5	6,923.4	7,932.3	8,137.3
Net domestic assets of the banking system	14,748.8	18,279.7	20,440.0	21,308.1	23,468.2
Net debt of the government	6,701.4	9,461.3	10,494.8	10,473.9	11,386.4
Private sector debts (Residents)	14,925.0	15,953.6	17,222.5	17,852.8	18,704.5
Other factors ⁽¹⁾	-6,877.6	-7,135.2	-7,277.3	-7,018.5	-6,622.7
Deposits in dinars at licensed banks	19,119.1	17,711.1	21,003.0	24,013.1	26,014.5
Foreign currency deposits at licensed banks	5,258.8	7,258.6	6,590.2	6,247.9	6,584.0
Rediscount rate (%)	4.50	5.00	4.50	4.25	3.75
Treasury bills interest rate for 6 months (%)	3.232	3.788	-	-	-
Public Finance					
Total revenue and foreign aid	5,413.9	5,054.2	5,758.9	7,267.6	6,796.4
Ratio to GDP (%)	26.4	23.0	24.1	28.6	25.5
Total spending	6,796	6,878.2	7,077.1	7,851.1	7,722.9
Ratio to GDP (%)	33.2	31.3	29.7	30.9	29.0
Overall deficit/savings (on an accrual basis)	-1,382.7	-1,824.0	-1,318.2	-583.5	-926.5
Ratio to GDP (%)	-6.8	-8.3	-5.5	-2.3	-3.5
Net outstanding balance of the domestic public debt	8,915.0	11,648.0	11,863.0	12,525.0	13,457.0
Ratio to GDP (%)	43.5	53.0	49.7	49.2	50.5

	2011	2012	2013	2014	2015
Outstanding external public debt ⁽²⁾	4,486.8	4,932.4	7,234.5	8,030.1	9,390.5
Ratio to GDP (%)	21.9	22.5	30.3	31.6	35.3
Foreign Trade and Balance of Payments					
Current account	-2,098.8	-3,344.9	-2,487.7	-1,851.7	-2,365.6
Ratio to GDP (%)	-10.2	-15.2	-10.4	-7.3	-8.9
Trade balance (Deficit)	-6,261.7	-7,486.6	-8,270.1	-8,495.6	-7,249.3
Ratio to GDP (%)	-30.6	-34.1	-34.7	-33.4	-27.2
Commodity exports	5,684.5	5,599.5	5,617.9	5,953.6	5,558.3
Imports of goods (FOB) ⁽³⁾	11,946.2	13,086.1	13,888.0	14,449.2	12,807.6
Balance of services (net)	896.0	1,332.3	1,209.5	1,778.9	1,286.4
Income account (net)	-187.8	-275.5	-240.4	-295.9	-347.8
Current transfers (net)	3,454.7	3,084.9	4,813.3	5,160.9	3,945.1
Capital and financial account (net)	2,298.9	3,808.9	1,811.1	908.9	1,593.7
Direct foreign investment in Jordan (net)	1,055.0	1,074.3	1,281.2	1,426.7	905.1

Source: Monthly Statistical Bulletin, Central Bank of Jordan

1. Includes the debts of public and financial institutions and other factors, as shown in the Monetary Survey Agenda.
2. This represents the total balance of drawn loans, minus total repayments.
3. Does not include imports of non-resident entities.

2.4 The Jordanian Investment Environment

Investment Law No. 30 for 2014

Investment Law no. 30 for 2014 is considered an appropriate legislative framework to attract foreign investments and stimulate local investments. It is considered a competitor to other investment laws in the region because it contains many advantages, incentives, and guarantees, and it offers a range of incentives and benefits in and outside the Development and Free Zones. The law includes a series of public provisions, such as foreign investment guarantees (depositing and withdrawal of capital, investment management, and transfers) and the inadmissibility of the disbarment of investment property. The law offers provisions to settle investment disputes, protection, and encouragement of mutual investment agreements between the Kingdom and other countries.

The following shows the major incentives granted by the law:

❖ Incentives and Benefits outside the Development and Free Zones

- The production inputs for the industrial and crafts sectors are exempted from customs duties.
- The return of the general sales tax on the production inputs for the industrial and crafts sectors within 30 days.
- Production inputs and fixed assets of the industrial and crafts sectors are exempted from customs duties and are granted a reduction in general sales tax to 0%.
- Returning to the sales tax on the services needed to practice economic activity within 30 days.
- The goods that are necessary for the economic activities of the following sectors are exempted from customs duties and are subject to 0% general sales tax:
 - Agriculture and livestock, hospitals and specialised medical centres, hotels and touristic facilities, touristic entertainment and recreation centres, call centres, scientific research centres and laboratories, art and media production, convention centres and exhibitions, transfers and/or distributions and/or extraction of water, gas and oil derivatives, air transport, maritime transport, and railways.

❖ Incentives and Benefits inside the Development and Free Zones

- 5% income tax on the income generated from economic activity within the Development Zone.
- 5% income tax on income generated from economic activity in the industrial sector.
- Tax exemptions that are granted in the Kingdom on goods and services exports.
- Reduction of sales tax to 0% on goods and services that are used by the establishment in order to exercise its activity inside the Development Zone.

- 7% sales tax on specific services provided by a registered company in the zone when these services are consumed in the zone.
- Exemptions from customs duties except for a specified number of goods.

❖ **The Reduction of Income Tax in the Least Developed Areas for Regulation No. 44 for 2016**

- The reduction of income tax in the least developed areas for Regulation No. 44 for 2016 was approved. It aims to create an attractive environment for investments that promote economic development through the reduction of income tax outside the Development Zones and in the least developed areas in the Kingdom. The regulation specified the areas that are considered least developed and identified the activities that are excluded from this reduction.
- Under the provisions of Articles 4 and 5 of this regulation, the areas that were categorised as least developed and enjoy the reduction in income tax are divided into four categories; each category enjoys a reduction in income tax on their activities for a period of 20 years.
- Category A includes the Northern Valley District, Deir Alla District, Shouneh Al-Janoubieh District, the Southern Valley District, Rweished District, the Northern Desert District, the North Western Desert District, Al-Azraq Province, Al-Jiza District except for the borders of the new Al-Jiza municipality, Al-Moakar District except for the borders of Al-Moakar municipality, and the Governorate of Aqaba except for the Aqaba Special Economic Zone. The reduction rate for this category is 100%.
- Category B includes the Governorates of Maan, Tafileh, Karak, and Ajloun. The reduction rate for this category is 80%.
- Category C includes the Governorates of Jarash, Mafraq, and Irbid except the borders of the Greater Irbid Municipality. The reduction rate for this category is 60%.
- Category D includes the Governorates of Madaba, Balqa, Amman except for the Greater Amman Municipality, and Zarqa except for the borders of Zarqa Municipality and Russaifeh Municipality. The reduction rate for this category is 40%.

❖ **Trade and Free Trade Agreements**

The most important agreements are:

- Jordan joining the World Trade Organisation in 2000, which led to the opening of the markets of 150 countries for Jordanian exports in goods and services, and provided new opportunities of access to other countries within a clear and transparent environment of laws, regulations, and procedures.
- A series of regional trade agreements, such as the Jordan Partnership Agreement with the European Union, Agadir Agreement, Free Trade Arab Agreement, the free trade agreement between Jordan and the European Free Trade Association, and the adoption of the Euro-Mediterranean simplification of the rules of the Origin System, which includes the decision

to simplify the rules of the origins of Jordanian products between Jordan and the European Union came into effect on July 19, 2016, and will remain in effect until December 31, 2026.

- A series of bilateral trade agreements with many countries, such as the free trade agreement between Jordan and the United States of America, the Qualified Industrial Zones Agreement, the free trade agreement between Jordan and Singapore, the free trade agreement with Turkey, the free trade agreement with Canada, and many other agreements.
- Jordan has signed more than 35 agreements with Arab and foreign countries in order to prevent double taxation between Jordan and these countries, thus protecting investors' rights.
- The Agreement of Promotion and Protection of Investments and the Movement of Capital between the Arab Countries was signed in 2000 with 11 Arab countries who are members of the Arab Economic Unity Council, in order to establish an appropriate environment for investments and economic cooperation between investors in the Arab countries, thus pushing and stimulating investment activities by providing encouragement and mutual protection for Arab investments.

Human Development Report for 2015

The Human Development Report that was issued by the United Nations Development Program in 2015 showed that Jordan fell 3 points to number 80. Please note that Jordan's place on the Human Development Report index value has improved slightly.

Global Competitiveness Report

The Kingdom's rank has improved by one point in the Global Competitiveness Report for the year 2016/2017, at 63 out of 138 countries compared to 64 out of 140 countries in the 2015/2016 report. It is considered an insignificant improvement, especially because of the reduction in the number of countries participating in this year's report. Amongst the Arab countries, Jordan was ranked after the United Arab Emirates, Qatar, the Kingdom of Saudi Arabia, Kuwait, and Bahrain, who were ranked 16, 18, 29, 34, and 39, respectively.

Doing Business Report

In the Doing Business Report that was issued by the World Bank Group, Jordan is still ranked 118, up one rank from the 2016 report, because of the variation in the performance of the different sub-indicators. Jordan ranked ninth among the Arab countries; the United Arab Emirates was ranked first among the Arab countries at 26, followed by Bahrain at 63 and Oman at 66.

2.5 The Economic Environment in the Short and Medium Term

Risks analysis implemented by BMI indicates that the Jordan's political and economic risks in the short and medium term are less than the overall average of the world and the Middle East. The state's risks and the operational risk are estimated to be within the acceptable levels. The international institutions' forecasts point out that the economic and foreign trade indicators are expected to achieve acceptable rates of growth with the exception of the continued increase in internal and external indebtedness.

Table 5: Assessment of short and long-term risks

	Long term		Short term		Operational risks	State risks
	political	Economic	political	economic		
Jordan	63.1	39.2	66.6	46.2	58.7	55.4
Turkey	60.2	49.4	58.4	56.9	55.9	56.1
Egypt	53.3	45	52.4	48.7	42.9	47.5
Lebanon	45.8	54	55.4	53.5	44.2	49.5
West Bank and Gaza	33.1	38.1	32.2	36.5	32.5	34.3
Syria	22.9	24.4	22.4	23.6	29.3	26.1
Regional average	49.4	46.9	51.2	48.7	46.6	48.3
global average	64.1	50.7	61.3	51.9	49.8	54.6

Source: the economy and state risks, IHS, 15/09/2016

Table 6: The most important key economic indicators 2016-2020

Indicator	2016	2017	2018	2019	2020
The growth rate of GDP	2.6	2.7	2.8	3.2	3.1
GDP (in USD billions)	39.6	42.1	44.8	47.8	50.9
Population (In millions)	9.8	10.1	10.4	10.7	11.0
Consumer Price Index (% change)	-0.7	1.8	3.3	4	3.2
Exports (in USD billions)	7.3	7.6	8.2	8.8	9.6
Imports (in USD billions)	18.3	19.2	20.1	21.3	22.8
Foreign direct investment, the net value (in USD billions)	1.5	1.5	1.6	1.6	1.7
Foreign direct investment, the net value (% of GDP)	3.7	3.7	3.6	3.4	3.3
Foreign exchange reserves (in USD billions)	13.9	14.9	15.7	16.8	17.7
Total external debt (in USD billions)	24.4	27.8	30.7	33.7	36
Total external debt (% of GDP)	61.6	66	68.6	70.4	70.6
Total external debt (% of foreign currency earnings)	127.3	138.3	143.6	147.5	147.8

Source: the economy and state risks, IHS, 15/09/2016

3. Market Study

3.1 Project Description

The project is to produce a range of lightweight construction products made from a Pozzolana (Volcanic Tuff), namely:

- Bricks with different sizes and colors, as is characterized by less weight up to 40%, and can bear tensile and compressive forces greater than the traditional brick, and it is characterized by savings in thermal insulation, energy, needed steel for construction, resistant to humidity and fungi (green construction) and above all, significant savings in construction costs.
- Interlock Tiles used in tiling public yards, sidewalks, parks, home entrances and sidewalks and parking lots. This type of tile can be produced with various shapes and color. adding small amounts of Basalt and Diatomite will increase its tensile and compressive strengths without losing its main characteristic of being lighter and cheaper
- Cement tiles used in paving sidewalks, yards, parking lots and home entrances.
- Curbstone Bricks, which is used on the edges and sides of the roads, sidewalks and traffic islands that are in the middle of the roads, circles and others.

There is a possibility of future expansion to produce Pozzolana concrete for plaster, and to produce ready-mixed concrete upon the successful introduction of the products to the market, and according to market requirements. There is also a possibility of producing more than one line/stroke of light bricks per single die casting upon the desire of the customer, and can also produce wheel stoppers, and single and double plant containers.

Light bricks are characterized by the following specifications:

- Light weight compared with cement bricks.
- Durability and ability to bear high tensile and compressive forces.
- Not affected by weather factors, and has a long life expectancy (more than tens of years).
- Aesthetic appearance, and can be produced in various colors.
- Stable colors over time.
- Their color doesn't change with the passage of time.
- Can be produced in various sizes and shapes.
- Can be produced on demand (as per customer needs).
- Achieve high savings in installation materials and cost, as it is easy to be installed.
- Stick perfectly with the mortars, because its rear surface is covered with concrete.
- Free of spots and stains that come as a result of water absorption and vulnerability to weather factors.

3.2 Description of Expected Products

The expected products of the project include the following:

- The production of lightweight bricks with all required sizes in the market, as follows:
 - "Load Bearing Bricks" used as building fronts and for dividing walls of 40 * 20 cm, with a height of 20, 15, and 10 cm.
 - Hordi Blocks in sizes of 20 * 40 cm, with a height of 18, 24, 28 and 32 cm.
- Production of Interlock Tiles in all sizes and shapes and multiple colors, ranging from the natural Pozzolana color (black and brown), as well as the colored one according to the desire, through adding coloring materials. It is worth mentioning that the thickness of this type of tile ranges from 6-10 cm, and the most famous one is 6.5 / 7 cm.
- Cement Tiles, both engraved and plain, with most popular measurements on the market: 40*40*4 cm, 40*30* 4 cm.
- Curbstone production of all sizes, in which the most famous measuring 15/20*30*50 cm, most in demand from the Greater Amman Municipality and the Ministry of Public Works And Housing (MoPWH), followed by the type measuring 12/15*30*50. Each longitudinal meter contains two curbstones.

3.3 Construction Sector In Zarqa Governorate

According to the studies by the Central Bank of Jordan (CBJ), the Construction Sector has witnessed a decline in its performance by 1.3% compared with a growth rate of 6.8% during the year 2014, to contribute in the declining of Gross Domestic Product growth rate at fixed prices by 0.1 percentage points compared to a positive contribution by 0.4 percentage points during 2014. In addition, its relative importance in Gross Domestic Product declined by 0.3 percentage points from its level in 2014 reaching 5.5%. Among indicators of the decline of the Construction Sector during 2015 are the followings:

- Decline in the size of licensed construction areas by 12.5%, compared to a growth of 7.2% during 2014.
- Decline in building permits by 9.6%, compared with a growth of 8.1% during 2014.
- Deceleration of the balance growth of credit facilities. Granted to the Construction Sector (7.7%, compared with a growth of 11.4% during 2014).

However, the growth rate of the construction sector at fixed prices for the last four years has reached to 3.3%.

Table 7: The Main Indicators of the Construction Sector during the Period (2012-2015)

Indicator	2012	2013	2014	2015
The added value at current prices (in million JD)	961.7	1066.6	1,140	844.4
Growth rate at fixed prices (%)	1-	8.7	6.8	1.3-
Gross Domestic Product deflator for the Construction Sector (1994 = 100)	206.4	209.4	210.8	217.2
The balance of credit facilities granted by licensed banks (in millions JD)	3682.6	4086.4	4552.8	4904.5
The number of registered construction companies	241	217	224	148
registered construction companies capital (in million JD)	16.3	10.3	11.1	7.7
The record for the amount of cement production (1999 = 100)	45	37	40.6	34.6
The number of granted building permits (license)	32466	36601	39578	35775
Licensed area for building (thousand square meters)	12907	13985	14992	13123

Source: Monthly Statistical Bulletin / Central Bank of Jordan.

With regard to the General Organization for Housing and Urban Development activity, the Organization implemented five projects during the year 2015 to develop lands (pieces of lands with services) with an estimated total cost of 3.6 million JD, as one of the projects has been accomplished with a total cost estimated at 1.8 million JD.

As part of the The Royal Initiative "Decent Housing for Decent Living", around 2,500 apartments were marketed during the year 2015, of which about 2,300 apartments were allocated to the Ministry of Education, bringing the number of allocated and sold apartments to approximately 8400 apartments (99% of the total number of apartments) until the end of 2015.

3.4 Market Size

A: The size of the demand of bricks in all forms, types and measurements

In order to reach the market size of bricks, we must first determine the size of the licensed areas in the Kingdom, including the size of these areas used for building using bricks as shown in the following tables.

Table 8: The number of licenses and licensed areas in the Kingdom during the period (2011-2015)

Year	2011	2012	2013	2014	2015	Average
A) for housing						
Area (Thousand m ²)	9719.9	10691.2	11817.6	12578.4	10879	-
B) for other purposes						
Area (Thousand m ²)	2,440.7	2,215.5	2,167.5	2,413.9	2,243.8	-
Total Areas	12,161	12,907	13,985	14,992	13,123	-
Percentage of licensed areas for non-housing purposes out of the total licensed areas	24.4	19.6	19.3	19.6	22.0	21.0

Source: Annual Reports, the Central Bank of Jordan, and the calculations of Study Teams

Table 9: The growth rate of the licensed areas in the Kingdom (thousand square meters / year)

Year	2010	2011	2012	2013	2014	2015	*2016	Average
Total licensed areas in the Kingdom	11,798.10	12,160.60	12,906.70	13,985.10	14,992.30	13,122.80	13,310.10	-
Growth rate for the kingdom	-	3.07%	6.14%	8.36%	7.20%	-12.47%	1.43%	2.29%

Source: Annual Reports and Monthly Statistical Bulletin of the Central Bank of Jordan, and calculations of study teams

* Preliminary results by CBJ

A time series extends to seven years has been reviewed, with the aim of true representation of the licensed areas during the period.

Considering a percentage of annual growth rate in licensed areas of 2.29%, and a conversion factor of (2) between the building area and the required area of brick of all types, shapes and measurements; we have reached to an estimation of the market size (demand) on bricks of all types, shapes and measurements as shown in the table below.

Table 10: Estimation of the market size of bricks of all types, shapes and measurements (thousand m² / year)

Statement	First year	Second year	Third year	Fourth year	Fifth year	Sixth year	Sevens year	Eighth year	Ninth year	Tenth year
Total Kingdom areas (expected) / thousand m ²	13927	14246	14572	14906	15247	15596	15953	16319	16692	17074
Built up areas from bricks of all types, shapes and measurements / (thousand m ²)	27853	28491	29144	29811	30494	31192	31906	32637	33384	34149

B: the demand size on plain scement tiles, interlocking tiles and curbstones

There is no precise information on the market size for cement tiles and interlocking tiles as well as Curbstones, as the needs of all these products are generally covered through the local production including different types of tiles used for paving sidewalks, squares and others. There are a number of large factories and workshops producing and manufacturing tiles of various types of plain tiles, while for the interlocking tiles, there are four companies that produce the product, namely:

- Hashim Khair Est. with a production capacity of 240,000 m²/annum.
- Alassas Company, one of the ready mix concrete companies Al-A'lami) with a production capacity of 300,000 m²/annum/
- The Jordanian Cypriot Construction Industries with a capacity of about 175,000 m²/annum.
- Bunyan for Cement and Concrete Manufacturing Products Company (one of Al-Manaseer Group) with a large production capacity that we did not get an estimate for.

Thus, the total available production capacity of major manufacturers is more than one million square meters, as sometimes these factories work more than one shift per day. Due to the large number of factories and workshops that are currently producing plain tile in all types and uses, including the common cement tile, it is difficult to reach an accurate estimate of the size of the local demand on common cement and interlocking tiles. However, by reviewing future projects of the Greater Amman Municipality and the trends of some major municipalities, as well as the Ministry of Public Works and Housing, we can give some estimate of the expected demand on the tiles, which is the subject of this research as follows:

- The Greater Amman Municipality has allocated 3 million JD per year over the past three years for the cement tiles and Curbstones, as mostly two-thirds of the allocated budgets were used.
- In 2017, the Greater Amman Municipality raised the budgeted amount to 10 million JD, in order to replace many cement tiles and Curbstones in the area of bridges and tunnels that have been affected by rain in the past two years, as well as to establish new squares and public services facilities, and complete several main streets, roads and secondary roads in the Capital.
- The increasing numbers of construction projects in the Kingdom in general during the period from 2006 – 2014. Thus, the need has increased for new roads, and the demand has increased on the cement tiles, parks and public squares, whether the plain or interlocking one, as well as the demand has increased on Curbstones.
- There are several projects for some of the major municipalities to establish different projects, and the production that is the subject of the research will be part of the consumption.
- The increasing numbers of International Development Programs that provide technical and financial support for municipalities, especially in areas affected by the recent number of Syrian refugees, which means increasing the municipalities capacity to implement infrastructure projects and increasing the demand on these products.
- The uses of the private sector is added to the above mentioned, especially tourism projects of hotels and restaurants and for housing purposes, as the sidewalks area is estimated of about 5% of the construction area in housing projects, since most contractors use them in front of the housing complex (building), and sometimes is used in tiling the basement / car parks. As for the Curbstones, the percentage is about 1.5% of the construction area. Note that the housing projects are annually estimated to be half of the licensed areas for residential purposes.
- Interlocking Tiles are used in a many villas and palaces, as well as in tiling squares and gardens.
- There are quite a number of main and secondary roads projects carried out in the Kingdom and including:
 - Desert Highway extending from Queen Alia International Airport to Ras al Naqab, with a length of 220 km, as the work will start this year on the project.
 - Rehabilitation of Ma'an–Al-Mudawrah Road, branches from the Desert Highway above with a length of 120 km, as an amount of 100 million JD has been allocated for the project since it is considered an important religious path.
 - Azraq-Ale`emari Road, with a length of 110 km, and the road is still under construction, and it needs cement tiles and Curbstones.
 - Maintenance and rehabilitation of Irbid - Amman Road.
 - Waqas - Northern Jordan Valley Road.
 - Irbid Ring Road.
 - Salt Ring Road.

- The completion of works on Berain - Amman Road.

Based on all the above, and taking into account that some of these roads need more than a year to be accomplished, we can estimate the market size for the products above as follows:

- Plain cement Tiles: 4 million square meters per year.
- Interlocking Tiles: 1.5 million square meters per year.
- Curbstones: 2.25 million linear meters, or 4.5 million bricks per year.

Considering the above mentioned growth rate of the Construction Sector by (3.3%), we can estimate the market size of these products in the next ten years, as shown in the following table.

Table 11: Estimating the market size of the sidewalks tile, interlock tiles and Curbstones Bricks

Statement	First year	Second year	Third year	Fourth year	Fifth year	Sixth year	Sevens year	Eighth year	Ninth year	Tenth year
cement Tile / thousand m ²	4268	4409	4555	4705	4860	5021	5186	5358	5534	5717
Interlocking Tiles / thousand m ²	1601	1653	1708	1764	1823	1883	1945	2009	2075	2144
Curbstones (thousand bricks)	4802	4960	5124	5293	5468	5648	5835	6027	6226	6432

Overview of Major Competitors

Field survey, meetings and contacts made with the main local producers of similar products to the proposed project products, have shown that there were no imports of such products, so there is only local competition for the proposed project of similar products.

Following are profiles of the main competitors in the production of different types of light weight bricks, cement tiles, interlocking tiles and curbstones in Jordan, and their contribution in the production based on the survey results.

Company Name	Assas for Concrete Products Co
Location	Al Qastal and Aqaba
General Description	Established in 1997 as a subsidiary of the Ready Mix Concrete and Construction Supplies Company, as it had supplied bricks and interlocking tiles for more than 200 projects in Jordan. It is a public joint stock company listed on the Amman Stock Exchange.
Main Products	<p>The company produces the following products:</p> <ul style="list-style-type: none"> • Hollow core slabs. • Concrete bricks (total capacity of 65,000 bricks / 8 working hours) • Hollow and solid bricks, and are available in several sizes, and used to build interior and exterior walls. • Fair Face bricks, and it used for interior and exterior walls, and can be painted directly without having to paint the plastering. • Split Stones, an industrial stones that can be produced with a number of specifications and colors (by controlling concrete mixture), and is used in outer walls or in buildings instead of Natural stone (building stone). • Insulation bricks, which consists of a brick that has insulating layer of Insulating Foam or Expandable Polystyrene. • Interlocking tiles, and is available in several forms, sizes and colors to meet the market needs, and provides several options in line with the size and nature of the project. Assas Company manufactures interlocking tiles for paving surfaces, footpaths and car parking, in addition to the plain cement tiles (maximum capacity: 300,000 m² / year). • Concrete Curb Stones, which is used in the pavements of roads, highways and homes sidewalks. The company produces this product in different sizes.
Prices	<ul style="list-style-type: none"> • Cement Tiles: 5.5 JD /m2 • Interlocking Tiles: 8.5 JD / m2 • Curbstones: 3.4 to 6.5 JD / meter

Source: Field studies and multiple interviews carried out by the study team.

Company Name	The Jordanian Cypriot Construction Industries Co.
Location	Amman, Nazzal neighborhood
General Description	The company was established in 1976 as a Jordanian / Cyprian joint investment, and its factory is located in Nazzal neighborhood on an area of 30,000 m ² . Since the company establishment, many developments have taken place on the technology and the volume of production of reach up to 175,000 m ² / year.
Main Products	Cement and Interlocking tiles for: <ul style="list-style-type: none"> • Decorations. • Gardens. • Mosaic Tile.

Source: Field studies and multiple interviews carried out by the study team.

Company Name	Al Bunyan for Cement and Concrete Manufacturing Products Company (Al-Manaseer group).
Location	Doukarh, Sweileh, Al-Huson, Jordan Valley
General Description	One of Al-Manaseer Group companies, and spread across several areas in the Kingdom, and started production in 2002.
Main Products	<ul style="list-style-type: none"> • Interlocking Tiles • Cement Tiles. • Curbstones. <p>The company is in the process for producing insulating bricks using foam.</p>
Prices	<ul style="list-style-type: none"> • Interlocking Tiles: 10-20 JD / m² • Curbstones: 5.5 to 7.5 JD / linear meter

Source: Field studies and multiple interviews carried out by the study team.

Company Name	Al Mukhtar Construction Industries
Location	Swaqah (South of Amman)
General Description	One of the regional companies of Al Mukhtar Group that was established in 2008. The factory is Located on an area of 87.00 m ² , with a production capacity of 200,000 m ³ per year of light weight brick (Thermostone).
Main Products	The company produces the following products: <ul style="list-style-type: none"> • Lightweight bricks (Thermostone) in all sizes. • Quicklime Production Line (CaO). • Hydrated Lime Production Line. • Production Line of Ready-Mixed Concrete, colorful plaster, and Ready-Mixed Plaster (internal and external), tiles grout and adhesives.
Prices	<ul style="list-style-type: none"> • Lightweight bricks: 0.8 - 2.0 JD per meter, depending on measurements.

Source: Field studies and multiple interviews carried out by the study team.

Company Name	Almethalia Company for Green Buildings
Location	Al-Tafeh / Zarqa
General Description	The trial production began in November 2016, with a production capacity of about 100 m ² per day, noting that the maximum capacity can be reached up to 200 m ² per day. The total investment cost amounted to 325,000 JD, noting that some assets of a former factory were utilized.
Main Products	The company produces lightweight concrete brick through the addition of polystyrene granules inside the mixture of concrete during the production of bricks, and there is a capacity to produce more than one course.

Source: Field studies and multiple interviews carried out by the study team.

3.5 Price Analysis

The following is a summary of the prevailing market prices for similar products even if they were traditional products.

Table 12: Prevailing Market Prices for Similar Products

Product	Price
Cement Bricks	piasters for a brick (65-25)
lightweight Brick (Thermostone)	JD per meters(2.0 - 0.8)
Curbstones	(3.4-7.5) JD per meters (2 bricks)
Cement Tiles	JD for the size: 30*30*4 (3.5) 40*40*4 JD for the size: (4.0)
Interlocking Tiles	6 JD or more for the black color 9 JD dinars or more for the colored ones

3.6 Marketing Strategy

Targeted Market

The project targets the following categories:

- Jordanian market in all Governorates.
- Export markets particularly Arab countries.
- Export to Europe at the later stage.

Expected Prices

Although the factory will produce high quality lightweight bricks and other products of Pozzolana avoiding all defects that have appeared in the local products, but it will sell at very competitive prices from the start of operation. The following table shows the proposed selling prices.

Table 13: The selling Prices for the Project Products

Product	Price
lightweight Brick (from Pozzolana)	(35-90) piasters for a brick with an average price of 40 piasters per brick
Curbstones	3.2 JD for meters (2 bricks), or 1.6 JD per brick
Cement Tiles	3.5 JD per square meter
Interlocking Tiles	7.5 JD per square meter

Expected Services and Products

The expected project services include the provision of the following products:

- The production of lightweight bricks in all desired colors and sizes with new forms, taking into account engineering requirements.
- Training the cadres of big companies (housing and construction) on how to deal with lightweight bricks, its installation and maintenance as an additional service free of charge.
- It can be thought of later, to provide all of required materials and subsidiary materials for the product including the mortar, such as ready mixes and other materials, so that makes it easier for contractors to deal with one company.
- Curbstones made from lightweight Pozzolana concrete.
- Lightweight Cement Tile in all sizes, colors and shapes and common forms.
- Interlocking Tiles made of lightweight Pozzolana concrete in all sizes, colors and shapes required in the market.

Promotion

The Promotion strategy of the project includes the following:

- Designing of an attractive website, and using social media.
- Making videos that describe the production process and products quality, and their distinctiveness from those in the market, in spite of their price competition and

displaying them on the website. In addition, the mechanism of dealing with them during electrical and plumbing installation can also be displayed.

- Participation in local and international exhibitions for the main products of the project.
- Direct marketing to major consumers, such as contractors and major design offices.
- Selling products through stores and shops that sell concrete products, and later opening an exhibition for the company.
- Conducting workshops necessary for engineers and engineering students in universities, in collaboration with the Jordanian Engineer Association (JEA), Contractors Association, Chambers of Industry and Commerce and universities.
- Participation in the local and international exhibitions and conferences to present the latest products and learn about the latest technical developments and new types of competitive products.

Selling

The Selling strategy of the project includes the following:

- Direct selling to big dealers, contractors and distributors.
- Selling to construction projects directly through the marketing staff.
- Presenting the products on sale at concrete products stores and shops owned by brick and tile workshops and the top sellers of construction materials.
- Selling to foreign markets (export).
- Opening of the show room at a later stage.

3.7 The Expected Market Share

The following tables show the expected market share for the project in the first ten years from the factory establishment for each product produced, as the project sales volume and percentage of annual growth of each product has been estimated based on the results of the field survey conducted by the study team; in which 14% of the study sample (consulting and engineering offices and construction and housing companies) reported that they would use or have the recommendation possibility to use project products made of Lightweight Pozzolana concrete without hesitation, while the percentage of rapid transition to use project products is 20.6%, and therefore we have taken the average of the two percentages (17.3%) as a growth rate in the second year, as it will decline to 15.3% and 13.3% respectively. The stability of production strategy has been chosen after this year as the entry of new local competition is expected to produce the same project products of Pozzolana concrete. The data of the biggest existing competitors show high ability to shift to the production of these products after their success in the local market.

Table 14: Project Market Share for the Production of Lightweight Bricks

Description	First year	Second year	Third year	Fourth year	Fifth year	Sixth year	Seventh year	Eighth year	Ninth year	Tenth year
Built areas from brick of all types, shapes and measurements/ thousand m ²	27853	28491	29144	29811	30494	31192	31906	32637	33384	34149
The project share (1000 m ²)	57.2	66	74.8	74.8	74.8	74.8	74.8	74.8	74.8	74.8
The project share (thousand bricks/ year)	715	825	935	935	935	935	935	935	935	935
Market Share (%)	%0.21	%0.23	%0.26	%0.25	%0.25	%0.24	%0.23	%0.23	%0.22	%0.22

Table 15: Project Market Share for the production of Cement Tiles

Description	First year	Second year	Third year	Fourth year	Fifth year	Sixth year	Seventh year	Eighth year	Ninth year	Tenth year
Cement Tile / thousand m ²	4268	4409	4555	4705	4860	5021	5186	5358	5534	5717
Project Share (1000 m ²)	52	60	68	68	68	68	68	68	68	68
Market Share (%)	%1.22	%1.36	%1.49	%1.45	%1.40	%1.35	%1.31	%1.27	%1.23	%1.19

Table 16: Project Market Share for the production of interlocking tiles

Description	First year	Second year	Third year	Fourth year	Fifth year	Sixth year	Seventh year	Eighth year	Ninth year	Tenth year
Interlock Tiles / thousand m ²	1601	1653	1708	1764	1823	1883	1945	2009	2075	2144
Project Share / thousand m ²	33.75	41.25	46.75	46.75	46.75	46.75	46.75	46.75	46.75	46.75
Market Share (%)	%2.23	%2.49	%2.74	%2.65	%2.57	%2.48	%2.40	%2.33	%2.25	%2.18

Table 17: Project Market Share for the production of Curbstones

Description	First year	Second year	Third year	Fourth year	Fifth year	Sixth year	Sevens year	Eighth year	Ninth year	Tenth year
Curbstones (thousand bricks)	4802	4960	5124	5293	5468	5648	5835	6027	6226	6432
Project Share/ thousand bricks	65	75	85	85	85	85	85	85	85	85
Market Share (%)	%1.35	%1.51	%1.66	%1.61	%1.55	%1.50	%1.46	%1.41	%1.37	%1.32

4. Technical Study

4.1 The Designed Project Capacity

The maximum production capacity is 1.1 million bricks, 80 thousand square meters of cement tile and 55 thousand square meters of interlocking tiles and 100 thousand bricks of curbstones a year, hence, the factory has been designed to match this production capacity.

The following table shows the required space for the project. In order to reach the designed capacity, it requires the purchase of a land area of 10,000 m², and the establishment of buildings, warehouses and factory equipment... etc., as shown in the following table.

Table 18: Construction Work and Cost Details for the Project

Item	Area (m ²)	Cost (JD / m ²)	Total costs (JD)
Site Preparation	10,000	3	30,000
Factory Building (Steel)	2,500	100	250,000
Administration and employee Building and services (Concrete)	300	200	60,000
concrete partitions materials	500	50	25,000
External Works			
Asphalt paving	2,000	10	20,000
Metal Fence	400	15	6,000
Water Storage (100 * 2 m ³)	-	-	30,000
Engineering and Emergency (10% of the Total Costs)	-	-	42,100
Grand Total Cost			463,100

4.2 The Required Fixed Assets

The following table shows the required fixed assets for the project.

Table 19: The Required Fixed Assets for the Project

Item	Unit	unit price (JD)	Value (JD)
Land (m ²)	10,000	15	150,000
Construction works	-	-	463,100
The Machines and the	-	-	418,000

Item	Unit	unit price (JD)	Value (JD)
Equipments			
Transportation Vehicles	-	-	145,000
Information Technology	-	-	20,000
Furniture	-	-	15,000
Others	-	-	7,000
Grand Total			1,218,100

* The numbers are estimated from the Market Study

The following table shows the details of required machines and equipment.

Table 20: Details of Required Machines and Equipment for the Project

Item	Unit	unit price	Value (JD)
Automatic tile manufacturing Machine (Block Maker), the Machine is working on the formation and the production of tiles with a capacity of 50 m ² / hour	1	10	120,000
Moulds for tiles forming in various forms, such as Square -Hexagon	Complete set	-	50,000
Mixer for mixing sand, cement and other materials. Equipped with feeding machine, conveyor belt and control devices	1	25,000	25,000
Brick Forming Machine with moulds	1	-	50,000
Bricks and Tiles Drying System, with a boiler and its full connecting pipes and supplies	1	-	60,000
Small crusher with its attachments of sieves	-	-	50,000
Pallets and storage racks	-	-	15,000
Electromechanical Works	-	-	30,000
Total			418,000

4.3 The Required Human Resources

The following table shows the human resources required for the project, as the number of required staff is 26 employees with total salaries of 126,600 JD.

Table 21: Required Human Resources for the Project

Item	Number of Employees	Salary (JD)	Total salary (JD)	Administrative	Operational
Director General / Technical Manager	1	1,200	14,400	14,400	-
Manager of Financial and Administrative	1	800	9,600	9,600	-
Marketing Manager	1	800	9,600	9,600	-
Quality Engineer	1	600	7,200	-	7,200
Technician	2	450	10,800	-	10,800
Marketing Officer	3	450	16,200	16,200	-
Accountant	1	400	4,800	4,800	-
Administrative / Procurement / Warehouses Officer	3	350	12,600	12,600	-
Security	1	350	4,200	-	4,200
Driver	2	300	7,200	-	7,200
Worker	10	250	30,000	-	30,000
Total	26		126,600	67,200	59,400

The following table shows the general job description of the main needed permanent jobs by the project.

Table 22: General Job Description for Jobs Required in the Project

Job	Job Description
Director General factory manager)(Works independently and within the authority vested in him. Planning and managing the factory, production operations and quantity control, following-up on sales and marketing activities, setting production quality and specifications, working to develop necessary plans for production, sales and marketing and supervision on the maintenance of buildings and factory facilities and their readiness for operation and conducting the production and maintenance programs.

Job	Job Description
Production Supervisor	Following-up the workflow in the factory, according to Factory Manager's directions, and supervising the workers. Developing daily and monthly plans for the implementation of the annual plan prepared by the Director, as well as training workers on new works.
Financial and Administrative manager	<ul style="list-style-type: none"> ▪ The financial and administrative manager performs the following tasks: ▪ Following-up on the preparation, reviewing, amending and adopting the administrative system, which includes the procedures, rules regulations, organizational and functional structure, tasks, competencies, job description cards and authority matrix. ▪ Budget preparation, including salaries, allowances, operating expenses, and cost of maintenance and operation programs, finished products and work in progress (WIG). ▪ Following-up on accounts and records and preparing budgets and financial statements. ▪ Following-up on staff and reviewing payroll and their payment.
Marketing Manager	Set marketing policies and following up on various sales processes and directing the marketing officer, as well as following-up central markets locally and export prices. Following-up the Kingdom's imports of competitive products and puts plans and alternatives to cope with imports, as well as plans to cope with local competitors.
Quality Engineer	Works to ensure that all products Conform to the Jordanian and International Standards that manufacturing is based on, and works to avoid mistakes in production before they occur. Therefore, the Quality Engineer will do all what it takes to obtain Local and International Quality Certificates for the factory, as well as the examination of random samples of products occasionally at the Royal Scientific Society and the accredited technical centers in the private sector.
Worker	Performs the required tasks as directed by the Factory Manager and his assistants.

4.4 The Required Licenses

The following table shows the necessary licenses required by the various authorities to implement the project.

Table 23: Licenses Required for the Project

Description	Authority
Company registration	Ministry of Industry and Trade
The establishment of the factory	Concerned Municipality

4.5 Project Timetable

The following figure shows the project timetable to implement the project, which amounts to 12 months, given that the start of production will be before the end of the establishment year, as follows:

Phase	First Year (months)											
	1	2	3	4	5	6	7	8	9	10	11	12
Studies	■											
Land Purchase and Registration		■	■									
Land Preparation and Building				■	■	■	■					
Pilot Production and complete employment								■	■	■	■	■
Total Duration	12 Months											

5. Financial Study

5.1 Financial Assumptions

The following table illustrates the financial assumptions of the project.

Table 24: The Financial Assumptions of the Project

Item	Assumption
Inflation Rate	3%
Financing Structure	Equity constitutes 75% of the investment and loans constitute 25%
Interest rate	9%
Working Capital	JD 178 thousand
Pre-Operating Expenses	3.5% of total investment
Tax Rate	9%
exemptions	Tax exemptions by 40% of the income tax
Assets Depreciation Rate	4%-20% of the asset value
Annual Salaries Increase	5% of salaries
Staff Benefits	25% of salaries
Raw materials cost	43% of total revenues
Electricity cost	4% of total revenues
Fuel cost	5% of total revenues
Maintenance and spare parts	1% of total investment
Accounts Receivable	2 months
Inventory	25% of raw materials cost
Depreciation	JD 82 thousand
Accrued expenses	16.8% of operation costs

5.2 Investment Cost

The project's Investment cost is estimated at JD 1.4 million distributed among fixed assets of JD 1.2 million, working capital and pre-operating expenses totaled of JD 228 thousand.

The following table shows the project's Investment cost.

Table 25: the project's investment cost

Item	Value (in thousand JD)
Fixed assets	1,218
Pre-operating expenses	50
Working capital	178
Total	1,446

5.3 Financing

The project will be financed by the partners' shares (shareholders) in the company by 75% which is estimated at about 5 million JD, while the other 25% of the project investment cost will be financed through bank loans of about 1.7 million JD. The following table shows the financing schedule for to the implementation of the project.

Table 26: Project financing schedule

Item	Value (in thousand JD)	%
Equity	1,085	%75
Loan	362	%25
Total	1,446	100%

5.4 Revenues

The following table shows the total revenues of the project.

Table 27: The Expected Revenues

Statement	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Production capacity of Bricks	1,100,000	1,100,000	1,100,000	1,100,000	1,100,000	1,100,000	1,100,000	1,100,000	1,100,000	1,100,000
Production capacity of Cement tiles	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000
Production capacity of Bricks of Curbstones	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Production capacity of Interlocking tiles	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000
Production and sales of Bricks	%65	%75.0	%85.0	%85.0	%85.0	%85.0	%85.0	%85.0	%85.0	%85.0
Production and sales of Cement tiles	%65	%75.0	%85.0	%85.0	%85.0	%85.0	%85.0	%85.0	%85.0	%85.0
Production and sales of Bricks of Curbstones	%65	%75.0	%85.0	%85.0	%85.0	%85.0	%85.0	%85.0	%85.0	%85.0
Production and sales of Interlocking tiles	%65	%75.0	%85.0	%85.0	%85.0	%85.0	%85.0	%85.0	%85.0	%85.0
Production and sales of Bricks	715,000	825,000	935,000	935,000	935,000	935,000	935,000	935,000	935,000	935,000
Production and sales of Cement tiles	52,000	60,000	68,000	68,000	68,000	68,000	68,000	68,000	68,000	68,000
Production and sales of Bricks of Curbstones	65,000	75,000	85,000	85,000	85,000	85,000	85,000	85,000	85,000	85,000
Production and sales of Interlocking tiles	35,750	41,250	46,750	46,750	46,750	46,750	46,750	46,750	46,750	46,750
Bricks price	0.40	0.41	0.42	0.44	0.45	0.46	0.48	0.49	0.51	0.52
Cement tiles price	3.5	3.61	3.71	3.82	3.94	4.06	4.18	4.30	4.43	4.57
Bricks of Curbstones price	1.6	1.65	1.70	1.75	1.80	1.85	1.91	1.97	2.03	2.09
Interlocking tiles price	7.5	7.73	7.96	8.20	8.44	8.69	8.96	9.22	9.50	9.79
Bricks revenues	286,000	339,900	396,777	408,680	420,940	433,569	446,576	459,973	473,772	487,985
Cement tiles revenues	182,000	216,300	252,494	260,069	267,871	275,907	284,184	292,710	301,491	310,536
Bricks of Curbstones revenues	104,000	123,600	144,282	148,611	153,069	157,661	162,391	167,263	172,281	177,449
Interlocking tiles revenues	268,125	318,656	371,978	383,137	394,632	406,470	418,665	431,225	444,161	457,486
Total Revenues – Thousand JD	840.13	998.46	1,165.53	1,200.50	1,236.51	1,273.61	1,311.82	1,351.17	1,391.71	1,433.46

5.5 The Projected Costs

Operating Costs

The following table shows the project's operating costs.

Table 28: Operating Costs

Operating Costs (in thousand JD)										
Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Salaries	59	62	65	69	72	76	80	84	88	92
Staff Benefits	15	16	16	17	18	19	20	21	22	23
Raw materials cost	361	429	501	516	532	548	564	581	598	616
Electricity cost	34	40	47	48	49	51	52	54	56	57
Fuel cost	42	50	58	60	62	64	66	68	70	72
Depreciation	82	82	82	82	82	82	82	82	82	82
Maintenance and spare parts	12	13	13	13	14	14	15	15	15	16
Others	6	6	6	7	7	7	7	7	8	8
Total	612	698	789	812	836	860	886	912	939	967

Administrative Expenses

The following table shows the projected administrative expenses of the project.

Table 29: General and Administrative Expenses

General and Administrative Expenses (in thousand JD)										
Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Salaries	67.2	71.9	76.9	82.3	88.1	94.3	100.8	107.9	115.5	123.5
Staff Benefits	16.8	18.0	19.2	20.6	22.0	23.6	25.2	27.0	28.9	30.9
Stationery	2.0	2.1	2.2	2.3	2.4	2.6	2.7	2.8	3.0	3.1
Professional Fees	2.0	2.1	2.2	2.3	2.4	2.6	2.7	2.8	3.0	3.1
Marketing Expenses	8.4	10.0	11.7	12.0	12.4	12.7	13.1	13.5	13.9	14.3
Other Expenses	5.0	5.3	5.5	5.8	6.1	6.4	6.7	7.0	7.4	7.8
Total	101.4	109.3	117.7	125.3	133.4	142.0	151.2	161.1	171.5	182.7

5.6 Projected Financial Statements

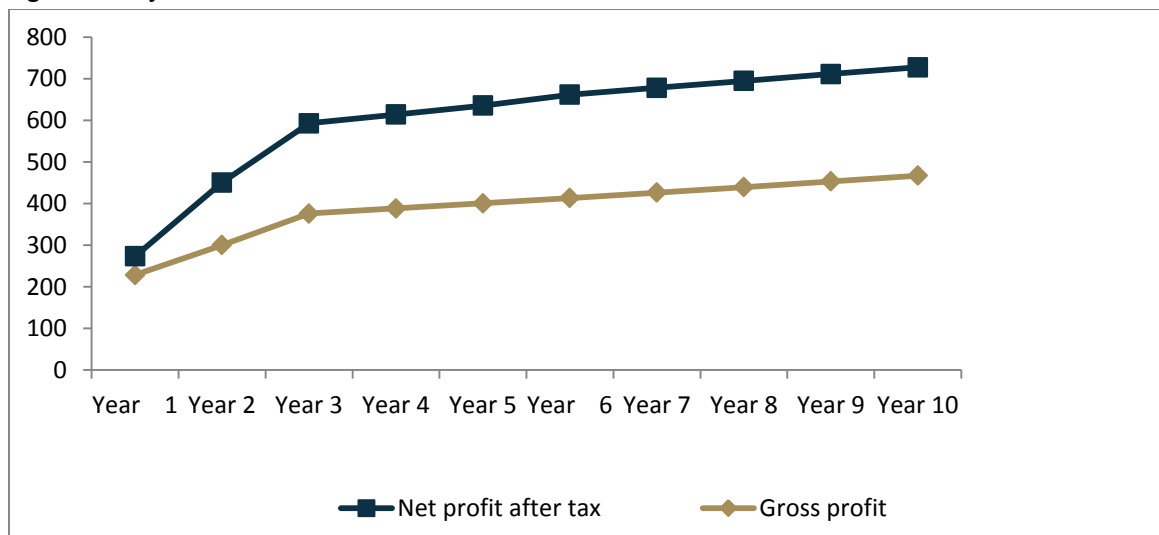
Income Statement

The following table shows the projected income statement of the project. It indicates that gross profit will increase from JD 228.6 thousand in the first year to JD 467 thousand in the tenth year. The net profit after tax will increase from JD 44.7 thousand in the first year to JD 260.3 thousand in the tenth year.

Table 30: The Projected Income Statement

Income Statement (in thousand JD)										
Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Revenues	840.1	998.5	1,165.5	1,200.5	1,236.5	1,273.6	1,311.8	1,351.2	1,391.7	1,433.5
Operating costs (cost of sales)	611.5	698.1	789.4	812.3	835.9	860.3	885.6	911.7	938.6	966.5
Gross profit	228.6	300.3	376.1	388.2	400.6	413.3	426.2	439.5	453.1	466.9
Administrative expenses	101.4	109.3	117.7	125.3	133.4	142.0	151.2	161.1	171.5	182.7
Net profit	127.2	191.0	258.3	262.9	267.2	271.2	275.0	278.4	281.5	284.2
financial expenses	32.5	27.1	21.7	16.3	10.9	-	-	-	-	-
Amortization	50.0	-	-	-	-	-	-	-	-	-
Net profit before tax	44.7	163.9	236.6	246.5	256.2	271.2	275.0	278.4	281.5	284.2
Tax	-	13.8	19.9	20.7	21.5	22.8	23.1	23.4	23.6	23.9
Net profit after tax	44.7	150.1	216.7	225.8	234.7	248.4	251.9	255.1	257.9	260.3

Figure 3: Projected Income Statement



Projected Balance Sheet

The following table shows the projected balance sheet of the project during the first ten years. It indicates that total assets will increase from JD 1.4 million in the year of incorporation to about JD 1.9 million in the tenth year. The Total liabilities will decrease from JD 404 thousand in the first year to about JD 162 thousand in the fifth year. Moreover, the Shareholders' Equity will increase from JD 1 million in the year of incorporation to reach JD 1.7 million in the fifth year.

Table 31: Projected Balance Sheet

Projected Balance Sheet (in thousand JD)											
Statement	Year of incorporation	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Assets											
Cash	178	111	145	196	280	328	416	567	718	870	1,022
Receivables	-	140	166	194	200	206	212	219	225	232	239
Inventory	-	90	107	125	129	133	137	141	145	150	154
Pre- Paid Expenses	-	25	30	35	36	37	38	39	41	42	43
Total Current Assets	178	367	448	551	645	704	804	966	1,129	1,293	1,458
Fixed Assets	1,218	1,218	1,218	1,218	1,218	1,255	1,255	1,255	1,255	1,255	1,255
Cumulative Depreciation	-	82	164	247	329	411	493	576	658	740	822
Net Fixed Assets	50	-	-	-	-	-	-	-	-	-	-
Total Assets	1,268	1,136	1,054	971	889	844	762	680	597	515	433
Cash	1,446	1,502	1,502	1,522	1,534	1,548	1,565	1,645	1,726	1,808	1,891
Shareholders Equity and Liabilities											
Accrued Expenses and Payables	-	103	117	133	136	140	145	149	153	158	162
Long Term Loans	362	302	242	182	122	62	-	-	-	-	-
Total Liabilities	-	404	359	314	258	202	145	149	153	158	162
Shareholders Contributions	1,085	1,085	1,085	1,085	1,085	1,085	1,085	1,085	1,085	1,085	1,085
Retained Earnings	-	13	58	123	191	262	336	412	488	566	644
Shareholders' Equity	1,085	1,098	1,143	1,208	1,276	1,346	1,421	1,496	1,573	1,650	1,728
Shareholders Equity and Liabilities	1,446	1,502	1,502	1,522	1,534	1,548	1,565	1,645	1,726	1,808	1,891

Cash Flow Statement

The following table shows the projected cash flow statement of the project during the first ten years. It indicates that the cash flow from operation will increase from JD 24 thousand in the first year to JD 335 thousand in the tenth year; while the Cash at the ending period will increase from JD 178 thousand in the year of incorporation to JD 1 million in the tenth year.

Table 32: The Expected Cash Flows Statement

Cash Flow Statement (in thousand JD)											
Statement	Year of incorporation	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Operation Activities											
Net Profit	-	45	150	217	226	235	248	252	255	258	260
Depreciation	-	132	82	82	82	82	82	82	82	82	82
Change In Working Capital	-	(153)	(34)	(35)	(7)	(7)	(7)	(7)	(8)	(8)	(8)
Cash Flow From Operation	-	24	199	263	301	310	323	327	330	332	335
Investing Activities											
Fixed Assets	(1,268)	-	-	-	-	(37)	-	-	-	-	-
Cash From Investing Activities	(1,268)	-	-	-	-	(37)	-	-	-	-	-
Financing Activities											
Capital (Equity)	1,085	-	-	-	-	-	-	-	-	-	-
Loan	362	(60)	(60)	(60)	(60)	(60)	(62)	-	-	-	-
Dividends	-	(31)	(105)	(152)	(158)	(164)	(174)	(176)	(179)	(181)	(182)
Cash Flow From Financing Activities	1,446	(91)	(165)	(212)	(218)	(224)	(235)	(176)	(179)	(181)	(182)
Net Cash Flow	178	(67)	34	52	83	49	88	150	151	152	152
Cash At The Beginning Period	0	178	111	145	196	280	328	416	567	718	870
Cash At The Ending Period	178	111	145	196	280	328	416	567	718	870	1,022

5.7 Financial, Economic and Social Analysis

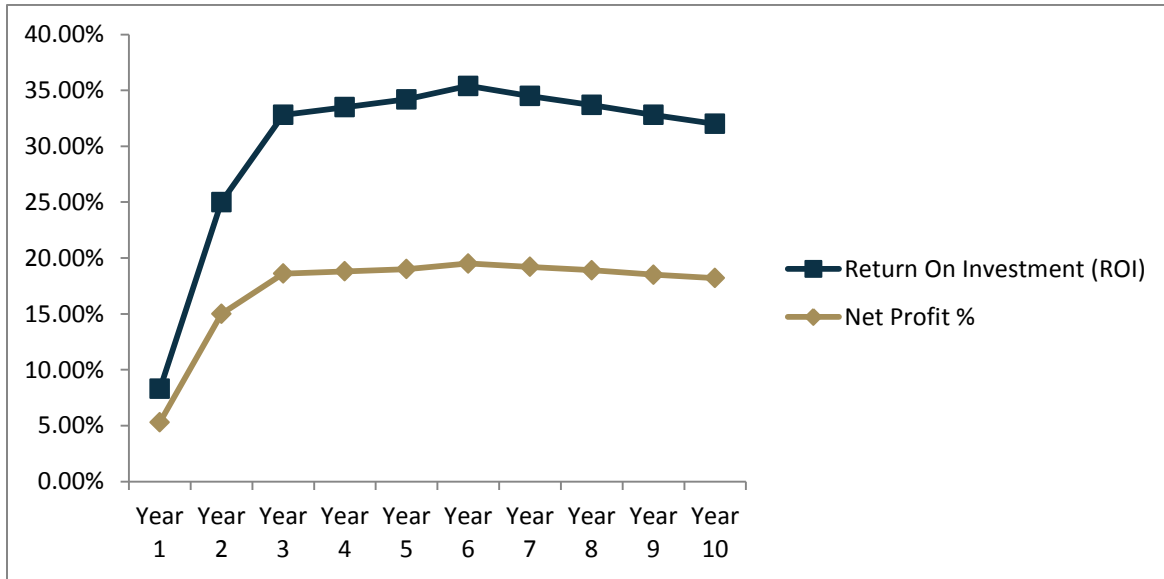
Financial Analysis

The following table shows the financial analysis of the project. It indicates that the net profit ratio will increase from 5.3% in the first year to 18.2% in the tenth year, and the return on investment will increase from 3% in the first year to 13.8% in the tenth year.

Table 33: Financial Analysis

Financial Analysis (In Thousand JD)										
Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Assets	1,502	1,502	1,522	1,534	1,548	1,565	1,645	1,726	1,808	1,891
Revenues	840	998	1,166	1,200	1,237	1,274	1,312	1,351	1,392	1,433
Profits	45	150	217	226	235	248	252	255	258	260
Capital (Equity)	1,085	1,085	1,085	1,085	1,085	1,085	1,085	1,085	1,085	1,085
Net Profit %	5.3%	15.0%	18.6%	18.8%	19.0%	19.5%	19.2%	18.9%	18.5%	18.2%
Return On Investment (ROI)	3.0%	10.0%	14.2%	14.7%	15.2%	15.9%	15.3%	14.8%	14.3%	13.8%
Return On Capital (ROC)	4.1%	13.8%	20.0%	20.8%	21.6%	22.9%	23.2%	23.5%	23.8%	24.0%
Net Profit On Revenues	5.3%	15.0%	18.6%	18.8%	19.0%	19.5%	19.2%	18.9%	18.5%	18.2%
Assets Turnover (Time)	0.56	0.67	0.77	0.78	0.8	0.81	0.8	0.78	0.77	0.76

Figure 4: The Financial Analysis



Economic Analysis

The following table shows the economic analysis of the project during the first ten years, we conclude that:

- The Internal rate of return is 21%. It exceeded six times the risk free rate, which means the economic feasibility of the project
- The present value of the project reached about JD 1.8 million. It exceeds the investment value with JD 343 thousand, which means the economic feasibility of the project.
- The profitability index of the project reached 1.65 times, which means that the expected value of the project will increase by one time and half the investment value, which proves that the project is feasible.
- The project payback period is 6.5 years.

Table 34: the Economic Analysis

Economic Analysis (in Thousand JD)											
Statement	Year of incorporation	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Net cash flow from operating and investing activities	(1,085)	(36)	139	203	241	250	262	327	330	332	335
terminal value	-	-	-	-	-	-	-	-	-	-	2,342
Net Cash flow	(1,085)	(36)	139	203	241	250	262	327	330	332	2,676
Internal Rate of Return (IRR)	21.0%										
present Value	1,789										
Net present value	704										
Profitability Index (Time)	1.65										
Payback period (Year)	6.50										

Social Analysis

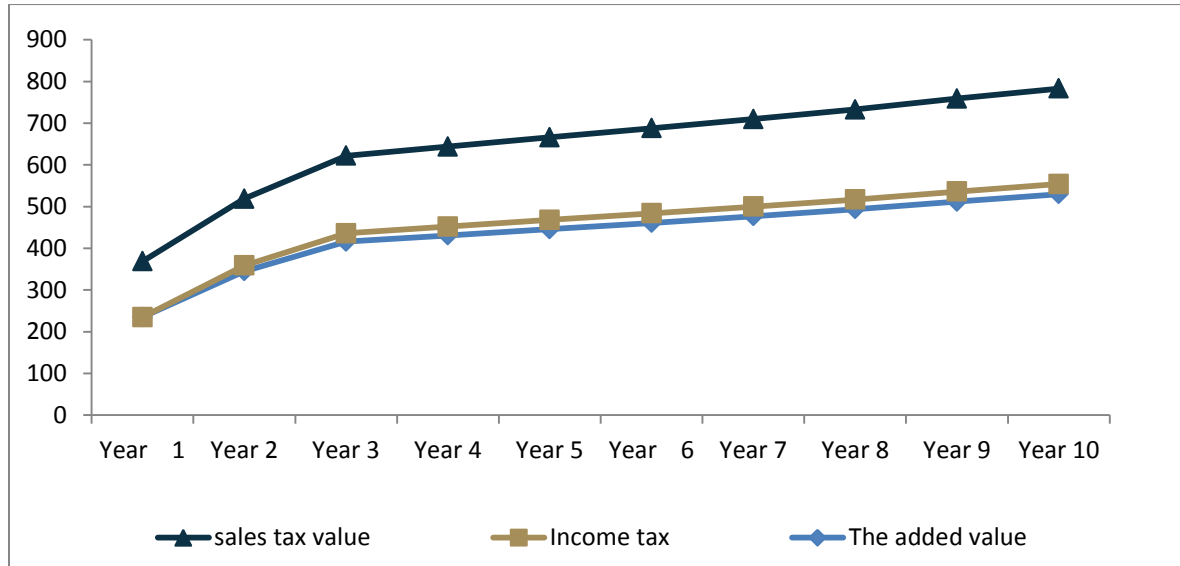
The following table shows the social analysis of the project. It is noticed that the number of staff required for the project will increase from 26 employees in the first year to 40 employees in the tenth year.

The added value of the project will also increase from JD 235 thousand in the first year to JD 530 thousand in the tenth year. The income tax will also increase from JD 134 thousand to reach JD 229 thousand in the tenth year.

Table 35: the Social Analysis of the Project

Social Analysis										
Statement	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Number of Employees	26	27	29	30	32	33	35	37	38	40
Jordanian employees	26	27	29	30	32	33	35	37	38	40
The added value –thousand JD	235	345	416	431	446	461	477	494	512	530
Income tax –thousand JD	-	14	20	21	22	23	23	23	24	24
sales tax value –thousand JD	134	160	186	192	198	204	210	216	223	229
Exports value –thousand JD	-	-	-	-	-	-	-	-	-	-

Figure 5: The Social Analysis



6. Risk and Sensitivity Analysis

6.1 Risk Analysis

The following table shows the risk matrix analysis that may face the project.

Table 36: Project Risk Matrix

Risks	Type of Risks	Risk Assessment
Financial Risks	<ul style="list-style-type: none"> ▪ Credit Risk Credit risk represents the risk of the company's financial loss as a result of the customer's default of the contractual obligation or that of the party dealing with the company through a financial instrument. These risks are mainly caused by trade receivables and others. ▪ Liquidity Risk Liquidity risk is the risk resulting from the company's inability to meet its financial obligations at time. The company's liquidity management is to ensure as much as possible that the company always maintain enough liquidity to meet its obligations as they become due and payable in normal and emergency conditions without incurring unacceptable losses or risks that affect the company's reputation. ▪ risk of currency fluctuation Currency risk is the risk of the 	<ul style="list-style-type: none"> ▪ The financial risks that may face the company are low, because the account receivables in the market are about two months. ▪ There is no risk of currency exchange, because the company sales and purchases by local currency ▪ There is no risk of inflation because the company's pricing is based on a periodic basis

Risks	Type of Risks	Risk Assessment
	<p>fluctuation of the value of financial instrument, due to fluctuations in foreign currency exchange rates.</p> <ul style="list-style-type: none"> ▪ inflation risk It is the risk associated with the possibility that the inflation or the rise in the cost of living might lead to the decrease the real value of the investment. 	
Business risk (sector risk)	<ul style="list-style-type: none"> ▪ Strategic Risk It is the risk resulting from taking bad decisions by the company's management, or implementing the decisions in a wrong way, or not taking the decisions at the right time; which leads to losses or causes loss of alternative opportunities. ▪ Legal and Regulatory Risks These risks are reflected as a result of non-compliance with laws, guidelines and instructions governing the work. Legal risks are caused by the company's break of the laws governing the work in the state in which the company operates. While regulatory risks arise from the company's violation of laws and standards issued by the regulatory authorities. ▪ Reputation Risk 	<ul style="list-style-type: none"> ▪ The risks are considered moderate before the company's establishment, because of getting the approval of the official authorities such as the municipality ▪ Reputational risk is moderate ▪ Market risk in the short term will be moderate because of the competition from other companies

Risks	Type of Risks	Risk Assessment
	<p>Reputation risk arises from influential negative public views which result in great losses of customers or money. It includes the actions of the company's management or its employees which project a negative image of the company, its performance and its relationships with customers and other stakeholders. Reputation risk also results from circulating rumors about the company and its activities.</p> <ul style="list-style-type: none"> ▪ Competition Risk Competition risk results from domestic and external competitors and reduces sales and profits. 	
<p>Operational Risk</p>	<p>Operational risk involves losses resulting from the failure of internal operations, human resources and systems. It includes:</p> <ul style="list-style-type: none"> ▪ IT Risks They are losses arising from downtime or systems failure due to the infrastructure, information technology, or the lack of systems, and any failure or malfunction in the systems. They include: the crash of computer systems, breakdowns in communication systems, programming errors, 	<ul style="list-style-type: none"> ▪ Operational risks are moderate ▪ Promotional and Marketing risks ▪ Information Technology risks are low ▪ Human resources risks are low

Risks	Type of Risks	Risk Assessment
	<p>computer viruses and opportunities losses due to breakdown.</p> <ul style="list-style-type: none"> ▪ Human Resources Risk Losses caused by employees or related to them (intentionally or unintentionally). It also includes acts that are intended as methods of cheating, abusing property or circumvent the law, regulations or company policy by officials or employees, as well as losses arising from the relationship with the customer, shareholders, regulators and any third party. 	
State Risk	<p>State Risk includes politicians' interference, civil unrest, wars, financial and monetary policies and high level of debts.</p>	<ul style="list-style-type: none"> ▪ State Risk is considered to be low, due to security and political stability; international reports indicate that State Risk is low both in medium and long terms

6.2 Sensitivity Analysis

First: Increase of Investment Cost By 10%

The following table shows the results of the sensitivity analysis when investment cost increases by 10%.

Table 37: Investment Increase by 10%

Index	Base	Impact	Change
Internal Rate of Return (IRR)	21.0%	19.1%	1.9%
The Present Value at a discount rate of 13% (in Thousand JD)	1789.2	1761.1	28.1
Net Present Value at a discount rate of 13% (in Thousand JD)	704.5	567.9	136.6
Profitability Index (Time)	1.6	1.5	0.2
Payback period (Year)	6.5	6.6	-0.1
The Net Profit Ratio – an average of 10 years	17.1%	17.0%	0.1%
Return on Investment - an average of 10 years	13.1%	12.1%	1.0%
Return on Capital – an average of 10 years	19.8%	17.9%	1.9%
Net Profit On Revenues - an average of 10 years	17.1%	17.0%	0.1%
Assets Turnover (Time) – an average of 10 years	0.7	0.7	0.1
The added value - an average of 10 years (in thousand JD)	434.9	435.0	-0.1
income tax - an average of 10 (in thousand JD)	19.3	19.2	0.1
sales tax - an average of 10 years (in thousand JD)	195.2	195.2	0.0

The above analysis refers to the feasibility of investment in the project, in light of the high cost of the total investment of the project, which increased by 10%. It is noted that:

- The internal rate of return reaches 19.1%, which is considered high for investment purposes
- The new payback period is 6.6 years, and it is reasonable for recovery purposes
- The return on capital is 17.9%, which is suitable for investment purposes

Second: Reducing Revenues by 10%

The following table shows the results of the sensitivity analysis when reducing revenues by 10%.

Table 38: Reducing Revenues 10%

Index	Base	Impact	Change
Internal Rate of Return (IRR)	21.0%	11.3%	9.7%
The Present Value at a discount rate of 13% (in Thousand JD)	1789.2	958.1	831.1
Net Present Value at a discount rate of 13% (in Thousand JD)	704.5	-126.7	831.1
Profitability Index (Time)	1.6	0.9	0.8
Payback period (Year)	6.5	9.1	-2.6
The Net Profit Ratio – an average of 10 years	17.1%	8.7%	8.4%
Return on Investment - an average of 10 years	13.1%	7.1%	6.0%
Return on Capital – an average of 10 years	19.8%	9.4%	10.4%
Net Profit On Revenues - an average of 10 years	17.1%	8.7%	8.4%
Assets Turnover (Time) – an average of 10 years	0.7	0.8	0.0
The added value - an average of 10 years (in thousand JD)	434.9	322.4	112.5
income tax - an average of 10 (in thousand JD)	19.3	9.7	9.5
sales tax - an average of 10 years (in thousand JD)	195.2	175.7	19.5

The above analysis shows the low sensitivity of the project in case of reducing the revenues or demand by 10%. It indicates that:

- The internal rate of return is 11.3%, which is considered low for investment purposes
- The new payback period is 9.1 years, and it is high period for recovery purposes
- The return on capital reaches 9.4%, which is acceptable for investment purposes

Third: Increasing the Operating Costs by 10%

The following table shows the results of the sensitivity analysis when increasing the operating costs by 10%.

Table 39: Increasing the Operating Costs by 10%

Index	Base	Impact	Change
Internal Rate of Return (IRR)	21.0%	14.5%	6.5%
The Present Value at a discount rate of 13% (in Thousand JD)	1789.2	1206.7	582.5
Net Present Value at a discount rate of 13% (in Thousand JD)	704.5	121.9	582.5
Profitability Index (Time)	1.6	1.1	0.5
Payback period (Year)	6.5	7.8	-1.3
The Net Profit Ratio – an average of 10 years	17.1%	10.8%	6.3%
Return on Investment - an average of 10 years	13.1%	9.1%	4.0%
Return on Capital – an average of 10 years	19.8%	12.7%	7.1%
Net Profit On Revenues - an average of 10 years	17.1%	10.8%	6.3%
Assets Turnover (Time) – an average of 10 years	0.7	0.8	-0.1
The added value - an average of 10 years (in thousand JD)	434.9	358.2	76.6
income tax - an average of 10 (in thousand JD)	19.3	12.8	6.5
sales tax - an average of 10 years (in thousand JD)	195.2	195.2	0.0

The above analysis shows the feasibility of the project in light of increasing the operating costs of the project by 10%. It indicates that:

- The internal rate of return is 14.5%, which is considered good for investment purposes
- The new payback period is 7.8 years, and it is reasonable for recovery purposes
- The return on capital reaches 12.7%, which is good for investment purposes