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# Investment Opportunities Map

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Jordan Investment Board

## Sorbitol Production Project

Pharmaceutical Sector

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<b>The Project at a Glance</b>	
Project Name	Sorbitol Production Project
Project Production Capacity	300 mt /year
Manpower	10
Total Investment Cost	US\$ 605,000
Initial Working Capital	US\$ 49,000
Internal Rate of Return (IRR)	24 %
Breakeven Point	33 % of Production Capacity

# Sorbitol Production Project

## 1. Introduction

### 1.1 Product Uses and Description

Sorbitol is a natural sweetener widely used in several industries. It is a derivative of starch produced as viscous syrup packed in HDPE drums or as crystalline powder packed in multilayer bags.

The Sorbitol is sweet tasting, forming viscous solution, stabilizes moisture and is chemically inert.

The important role of sorbitol is the production of vitamin C and other pharmaceutical products used as a nutrient, sweetening agent and excipient.

Other uses of sorbitol are in food industry such as bakery, confectionery and frozen dessert applications. There are many other uses, but the proposed project aims to produce pharmaceutical and food industry grades of sorbitol.

### 1.2 Potential Consumers:

- Pharmaceutical industry
- Food industry
- Export markets

## 2. Market Aspects

### 2.1 Trade Balance

The Net external trade balance of sorbitol (table 1) indicated an average annual deficit of 49 tons during the years 1999 – 2003.

**Table (1)**  
**External Trade Balance of Sorbitol**  
**(Ton)**

Year	Imports	Re-Exports	Balance
1999	73	15	58
2000	50	-	50
2001	87	64	23
2002	68	20	48
2003	83	5	78
<b>Average</b>	<b>72</b>	<b>21</b>	<b>51</b>

Source: Department of Statistics.

### 2.2 Estimated Local Demand

In the absence of any local production of sorbitol, imports are the main source of supply. The average annual deficit of external trade represented the local demand on sorbitol, which amounted to 51 tons during the years (1999 – 2003).

### 2.3 Forecasted Future Demand

The pharmaceutical sectoral study indicated that the consumption of pharmaceutical products in Jordan increased annually by an average of 7 % during the years 1999 – 2003.

The average increase in demand for Sorbitol (as a result of the pharmaceutical and food production increase) during the last 5 years was 5 % per year .Table (2) illustrates the forecasted demand until year 2015.

**Table (2)**  
**Forecasted Future Local Demand (Market Size)**

Year	2005	2010	2015
Tons	56	71	91

## 2.4 Imports & Competition

There is no production of sorbitol in the regional countries. The expected competition to the project will be from the imports coming from foreign sources .Most of the sorbitol of pharmaceutical and food industries grades imports to Jordan come from Germany, France and the USA.

## 2.5 Project Capacity

The estimated current local demand for Sorbitol is 54 tons/year. Jordan's pharmaceutical production represents about 5 % of the total Arab countries production, so the estimated current demand on sorbitol by the Arab countries is more than 1000 tons/year.

The project's proposed annual capacity is 300 tons of pharmaceutical and food grade sorbitol based on 300 working days /year, and 8 working hours/day.

The project's annual production is expected to progress as follows:

**Table (3)**  
**Production Size Development**

Year	Capacity Utilization	Million Units
1	50 %	150
2	70 %	210
3+	90 %	270

## 2.6 Projected Sales Revenues

The current prices of Imported Sorbitol are:

- Pharmaceutical Grade : 2000 – 2800 US\$ /ton
- Food Grade : 800 – 1000 US\$ /ton

The overall average price of imported sorbitol is US\$ 1650 / ton. The project's proposed competitive sales price is US\$ 1500 / ton.

Table (4) illustrates the project's estimated annual revenues.

**Table (4)**  
**Projected Revenues**

Year	1	2	3
US\$	225,000	315,000	405,000

### 3. Technical Aspects

#### 3.1 Project Location

The location of the Sorbitol project is proposed to be in one of the industrial cities in the middle province of Jordan due to the following factors:

- Major local consumers (pharmaceutical and food industries) are located in this area.
- Availability of needed packaging materials.
- Adequacy of infrastructure.
- Availability of skilled manpower.

#### 3.2 Manpower

**Table (5)**  
**Manpower Requirements**

<b>Job</b>	<b>Required No.</b>
General Manager	1
Administrative Clerk	2
Engineer	1
Technician	2
Laborer	4
<b>Total</b>	<b>10</b>

The total annual salaries and wages of the above employees (including fringe benefits), in addition to overhead and administrative expenses are estimated at US\$ 54 thousand.

#### 3.3 Land & Buildings

**Table (6)**  
**Land and Buildings Cost**

<b>Item</b>	<b>Area m<sup>2</sup></b>	<b>Cost US\$</b>
Land (Industrial cities)	1000	28,000
Buildings	300	70,000

### **3.4 Raw Materials**

Starch is the main raw material used in the production of sorbitol .The average cost of raw material delivered to the project is US\$ 350 / ton. The quantity needed is about 400 tons at full capacity operation .Starch could be imported from several sources such as Italy and Holland.

### **3.5 Technology.**

Machinery and equipment will be accompanied with technical support from the supplier. A well known source of technology is India

## **4. Financial Aspects**

### **Basic Assumptions**

The financial analysis and indicators are based on the following assumptions:

1. Project operational life is 10 years.
2. Internal Rate of Return (IRR) is calculated at 100% equity ratio.
3. Income tax is calculated at 15% on net taxable income.
4. Net Present Value (NPV) is calculated at 12% discounted annual rate.
5. Initial working capital is based on the operating expenses needed for three months.
6. Operating expenses comprise raw materials, labor cost and overheads, utilities and other expenses.
7. Pre -operating expenses consist of studies fees, capital issue, licensing, training, trial operations and other similar expenses.

## 4.1 Project Investment Cost

**Table (7)**  
**Total Investment Cost**

<b>Item</b>	<b>US\$</b>
Land	28,000
Buildings	70,000
Machinery & Equipment	350,000
Transport means	30,000
<b>Sub- Total ( Fixed Assets )</b>	<b>478,000</b>
Contingency (10%)	48,000
Pre – Operating Expenses	30,000
Initial Working Capital	49,000
<b>Total Investment Cost</b>	<b>605,000</b>

## 4.2 Financial Indicators

- ROI = 20.5 %
- IRR = 24 %
- NPV = 347 Thousand US\$
- BEP = 33 % of Production Capacity
- Payback Period = 4 Years.