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Evaluating Financial Viability of Olive Mills Enterprise in Jordan

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Abstract

The main aim of this study was to evaluate financial viability of olive oil mills enterprise. Thirty olive mills were investigated. A questionnaire was designed to obtain information from mills owners. The information obtained was mainly related to costs and returns. Cash flows were derived from costs and returns items of the enterprise. Three main discounted measures of project worth were used; these were Net Present Value (NPV), the Internal Rate of Return (IRR), and the Benefit Cost Ratio (B/C). The results of this study revealed that olive mills could be a viable encouraging, and profitable enterprise because of its capability to generate a highly positive and acceptable NPV (837966.05 JDs). The IRR (85%) and B/C ratio (2.3) values for this enterprise were economically accepted.

Keywords: olive mills, Net Present Value (NPV), Internal Rate of Return (IRR), Benefit to Cost Ratio (B/C)

1. Introduction

The importance of olive mills enterprise has developed significantly in Jordan in the last two decades. One of the most important fruit trees grown in Jordan is the olive tree. Olive production is a significant land use in Jordan. Nearly 72% of the fruit trees area and 36% the total cultivated area are planted with olive tree (Al-Shdiefat et al., 2007). The total production of olives in Jordan in the year 2012 was nearly 134000 tons. Around 100000 tons of the total production of olives were used to extract olive oil, from which 27500 tons of olive oil were extracted (Ministry of Agriculture or MOA, 2012). The olive trees planted in Jordan are used to make table olives as well as oil. The western mountain rain-fed area and the north-eastern irrigated desert region are the two main olive producing regions in Jordan.

In recent years, several Jordanian olive oil companies and olive products related companies formed the Jordanian Olive Products Exporters Association (JOPEA) to help in promoting olive oil production.

The association represents table olive producers, bottlers, and olive mills. Due to the increasing importance of olive mills enterprise in Jordan, this study is an attempt to investigate the economic feasibility of this enterprise. To achieve the objectives of this study cash flow analysis procedure was followed.

Three main reliable discounted financial indicators were used; The Net Present Value (NPV), the Internal Rate of Return (IRR), and the Benefit Cost Ratio (B/C). The Net Present Value or (NPV) considered being the result of subtracting the value of the initial investment from Present value of future net cash flows. If the value of NPV is positive the investment is to be made otherwise, it should not (Lin et al., 2000).

The IRR is an important indicator for any investment that gives a value to judge the investment (Bruce, 2003).

Baker (2000) indicated that if the value of the NPV is zero the discount rate at that value is the IRR of that investment. Accordingly, the IRR is the discount rate that generates a zero NPV. The IRR makes the sum of the PV (Present Value) of future CF (Cash Flows) equal to its current market value. At this point if the costs are higher than the IRR, it is advised to avoid the investment. Although the Benefits to Costs Analysis (BCA) approach is used mainly to investigate the feasibility of public investments, this approach is widely used in judging the economic viability of private enterprises (Orth et al., 1998). Bent et al. (2002) wrote that in any economic investment, the decisions could be analyzed using BCA. The main idea in CBA is the subtraction of costs from benefits (Boardman et al., 2001).

This study attempts to provide information on the economic viability of olive oil mills enterprise.

2. Olive Oil Industry in Jordan; Brief Review

In the year 2001, Jordan was considered the tenth olive producing country in the world. There are nearly 17 million olive trees in Jordan, generating around 100 JD million yearly incomes (MOA, 2012). The highest production of olive oil in the country was in the northern governorates of Irbid, Jerash, and Ajloun. Small and medium-size holders in these governorates were with the large number of olive farms. The olive mills enterprise is largely related and dependable on olive production. Due to the increase of olive production in Jordan, olive mills enterprise has largely expanded and developed in recent years. Around 27500 tons of olive oil were produced in the year 2012 through 122 olive mills with an average capacity of 3692 tons/hour. The country self-sufficiency ratio from olive oil in the same year (2012) was estimated to be 104.3%. The Manufacturing Process of olive oil includes Collecting and grading the olives, washing and milling the olives, creating an olive paste, pressing the olive paste to extract the oil, separating the oil from the vegetable water, and storing and packaging the oil.

Table 1. Quantities of olives produced in Jordan during the period 2005 - 2011

Year	Olive Quantities (Tons)
2005	142078
2006	243531
2007	163904
2008	138689
2009	221588
2010	171036
2011	131800

Source: MOA, 2012.

Table 2. Quantities of olive oil produced in Jordan during the period 2005 - 2011

Year	Olive Oil Quantities (Tons)
2005	20267
2006	37156
2007	24085
2008	18472
2009	36652
2010	27311
2011	27584

Source: MOA, 2012.

Table 3. Total number of olive mills in Jordan according to governorates

Governorate	Number of Olive Oil Mills
Amman	10
Irbid	46
Madaba	3
Zarqa	6
Jerash	13
Ajloun	12
Mafraq	11
Balqa	9
Karak	4
Tafeeleh	2
Maan	3
Aqaba	1
Total	122

Source: MOA, 2012.

Table 1 shows quantities of olives produced in Jordan during the period 2005-2011 while Table 2 shows quantities of olive oil produced during the same period. Table 3 shows the total number of olive mills according to the country governorates.

3. Materials and Methods

Cash flow analysis methodology was used in this study. A 10-year cash flow data were utilized in the analysis process. Comparison of costs and returns was made. The average financial costs and returns evaluation uses the cost-benefit analysis (CBA) approach, which includes several measurements from the enterprise using NPV, IRR, and BC ratio financial tools.

3.1 Sample

A sample survey of 30 operating olive mills was conducted. The sample size was determined to be 25% of the total olive mills in the country. The distribution of the sample among the country was based on the number of mills in each governorate. Table 4 shows the distribution of the sample according to the country governorates.

Table 4. Distribution of the sample according to the country governorates

Governorate	Number of Olive Oil Mills	% in the sample	Number in the sample
Amman	10	8	2
Irbid	46	38	11
Madaba	3	2	1
Zarqa	6	4	1
Jerash	15	12	4
Ajloun	12	11	3
Mafraq	11	10	3
Balqa	9	7	2
Karak	4	3	1
Tafeeleh	2	2	1
Maan	3	2	1

Source: MOA, 2012.

3.2 Data Collection

To obtain information from respondents, a structured questionnaire was designed. Total variable and fixed costs, total revenues, net income were the core of the collected data. The study covered the period March 2012 to August 2012. Secondary data sources include Department of Statistics, the Ministry of Agriculture sources, and other agricultural related agencies.

3.3 Data Analysis

Averages costs and revenues of the thirty mills were calculated to accomplish the required analysis. The financial indicators (NPV, IRR, and B/C ratio) for the investigated enterprises were calculated. The NPV was calculated as follows:

$$NPV = Ri \div (1 + i)^t$$

Where, t: time, i: discount rate, and Ri: net cash flow.

The IRR can be mathematically calculated as follows:

$$CF_0 + \frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \frac{CF_3}{(1+r)^3} + \frac{CF_z}{(1+r)^z} = 0$$

Where CF: cash flow in the last period being n, and r is the internal rate of return to be calculated.

The ratio of total value of benefits to the total value of the costs is the B/C ratio. A reliable measurement to accept the investment is when B/C ratio greater than or equal to one. B/C ratio is the ratio of the benefits to costs of an enterprise expressed in monetary basis (Ascott, 2006).

The financial feasibility for enterprise was analyzed at a discount rate of 12% over a 10 years period.

4. Results and Discussion

Average cash flows using average costs and average returns of the thirty mills were determined. The NPV, IRR, and B/C were calculated. Tables 5 and 6 show yearly average costs and yearly average returns of the investigated mills respectively. Table 7 shows cash flows of the mills for a period of 10 years and Table 8 shows the calculated financial indicators respectively. The calculations made under the assumption that both costs and returns increase by 1% annually.

Table 5. Yearly average costs

Fixed Costs	JDs
Land & building	107000
Vehicles	34000
Machinery, olive, and Equipments	318000
Fresh and wastewater reservoirs	13000
Total	472000
Variable costs	JDs
Labor	5000
Water & electricity	5000
Fuel	3000
Maintenance	7000
Cans (for olive oil)	10000
Taxes	5000
Miscellaneous	3000
Total	38000

Table 6. Yearly average returns

Item	Explanation
Production	30 kgs/ hr
Operating hours	24 hrs
Operating period	75 days
Quantity produced	54000 kgs (30×24×75)
Price of olive oil	4.5 JDs
Return from selling olive oil	243000 JDs (54000×4.5)
Return from selling dried olives	10000 JDs
Total returns	253000 JDs

Table 7. Cash flows of olive mills for a period of 10 years

Year	Fixed Costs (JDs)	Variable Costs (JDs)	Total Costs (JDs)	Returns (JDs)	Cash flow (JDs)
1	472000	38000	510000	253000	- 257000
2		38380	38380	255530	217150
3		38763.8	38763.8	258085.3	219321.5
4		39151.4	39151.4	260666.2	221514.8
5		39542.9	39542.9	263272.9	223730
6		39938.3	39938.3	265905.6	225967.3
7		40337.7	40337.7	268564.7	228227
8		40741.1	40741.1	271250.3	230509.2
9		41148.5	41148.5	273962.8	232814.3
10		41560	41560	276702.4	235142.4

Table 8. Financial indicators of olive mills

Indicator	Value
NPV (JDs)	837966.05
IRR (%)	85
B/ C Ratio	2.3

Table 8 shows that the NPV for this enterprise was positive and acceptable (837966 JDs). The IRR value for this enterprise was 85%, indicating that each money unit invested in this enterprise will provide returns higher with about 85% than the costs paid. The B/C ratio was higher than one. It was 2.3 indicating that this enterprise is viable. The benefits outweighed the actual costs that went in the enterprise.

5. Conclusions

The results of this study revealed that olive mills can be a viable encouraging, and profitable enterprise because of its capability to generate a NPV of 837966 JDs which is highly positive and acceptable. The IRR and B/c ratio values for this enterprise were also economically accepted. Since the benefits of olive mills outweighed the actual costs that went in the enterprise it is advised to adopt such enterprise in Jordan. The computed financial indicators for this enterprise confirm this advise.

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