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Assessing Some Economic Indicators For Pomegranates Deseeding Project in Egypt (Value Added)

Afaf Zaki Othman*, Rania Mohamed Barghash, Hamdi Abdo Sawlhe

**Agricultural Economics Department, National Research Centre, Cairo, Egypt
Division, National Research Centre, Cairo, Egypt-, 33 El-Bohoth St., Dokki, 2622 Cairo, Egypt. 12622 Cairo, Egypt**

Abstract : Studying pomegranate marketing is highly important to ensure that farmers continue planting the crop. It is also important to devote more attention to improving the productivity and quality of the produced crop in order to fulfill the required standards in both domestic and international markets. Therefore, this study has been conducted to investigate the problem of deteriorating revenues from pomegranate and failing to compete and reach high-value markets such as agro-processing markets. Based on that, the study aimed to assess the economic feasibility of establishing a mini-processing unit for deseeding and packing pomegranates in different size packs that serve the needs of consumers and agro-processors. The study applied descriptive and quantitative statistical analysis methods in order to estimate some of the economic feasibility and project evaluation indicators like Return on Investment, Return on Shareholders' Equity, Gross Profit Margin, Net Present Value, and Profitability Index. Findings revealed that Gross Profit Margin reached 8% during the first year of the project life, and around 13% in the year five, indicating that production costs have been declining relative to revenues as project life goes on. Profitability index amounted to LE 1.99, indicating that the project is profitable.
Keyword : Pomegranate, Agroprocessing Projects, Economic Feasibility.

Introduction:

Egypt is one of the oldest countries in which the agricultural sector has been developed throughout the history. Until today, agriculture still represents a main source income for a large segment of the population. However, as per capita share of Gross National Product increases (GNP), share of agricultural activity declines, while agricultural economic projects' share rises, which can explained by the fact that the importance of agriculture declines as per capita share of GNP rises, where it declined from 50% at low income levels to as low as 5% at high income levels. And despite the reduction of agricultural sector's contribution to GNP to as low as 17%, it accounts for 20% of Egypt's total exports and foreign currency earnings. Pomegranate is one of the important fruit crops in Egypt. Farmers, especially in Upper Egypt, depend on pomegranates as a basic source of income. Pomegranate is also used by International Medical Institutions, implying the significance it represents in medicinal uses, and that such Institutions are convinced by the medical benefits of pomegranate [(1)]. Therefore, studying pomegranate marketing is considered highly important to ensure that farmers continue planting the crop. It is also important to devote more attention to improving the productivity and quality of the crop in order to fulfill the required standards in domestic and international markets.

Study Problem:

The study investigates the problem of the deteriorating revenues from pomegranate in production regions due to higher production costs, which led to lower average income to producers and failure to compete to reach high-value markets such as agro-processing markets, and in turn failure to obtain fair prices for their product.

Study Objective:

The study aims to identify the reasons for farmers' reluctance to produce pomegranate. In addition, the study aims to assess the economic feasibility of establishing a mini-processing unit for pomegranates deseeding and packing in different size packs that serve the needs of consumers and processors, which helps promote the expansion of pomegranate production in Egypt.

Methodology and Sources of Data:

The study applied descriptive and quantitative statistical analysis methods in order to estimate some of the economic feasibility and project evaluation indicators like Return on Investment, Return on Equity, Gross Profit Margin, Net Present Value, and Profitability Index.

Return on Investment:

Return on investment (ROI) measures the overall project efficiency in realizing profit from investing available resources and assets. The higher ROI the higher the profitability of the project. As such, ROI is an indicator of the total profitability of the project.

Return on Equity:

Return on investment (ROE) measures the rate of return for ownership interest (shareholders' equity) of common stock owners. It measures the efficiency of a firm at generating profits from each unit of shareholder equity. Accordingly, ROE plays an important role in investors' decisions regarding investments in shares or rights. The higher ROE the better for investors. It can be calculated by dividing Net Profit over Average Property Rights [(2)].

Gross Profit Margin:

Gross Profit Margin is the one of the most important ratios used to assess the profitability of a project. It is calculated by subtracting the cost of goods sold from total revenue. The resulting gross profit margin is then divided by total revenue to obtain the percentage of gross profit margin, which indicates the margin available to absorb sales cost, other expenses, and losses, in order to reach net profit.

Net Present Value:

Net Present Value is the present value of cash flows at a given rate of return compared to initial investment. It can be calculated as follows:

Net Present Value = Present Value of Cash Inflows – Present Value of Cash outflows [(3)]

Profitability Index:

Profitability index is the ratio of cash inflows to cash outflows. A ratio of 1 means that cash units neither realize profit nor loss. A value higher than one means that each cash unit realizes profit. A value lower than 1 indicates that cash unit realizes losses [(4)], and so does the financial attractiveness of the proposed project.

The current study has been conducted to assess the economic feasibility of establishing a mini-processing unit for deseeding pomegranates and the packing of arils in Asiout Governorate, which ranks first in terms of pomegranates production and exports share, with area under pomegranate amounting to 8602 thousand feddans during 2012. It is worth noting that soil characteristics and favorable climate conditions in Asiout are the reasons for the top rank it occupies, which encouraged developing new ideas based on the concept of value

added to raise the marketing and trade value of Egyptian pomegranates in local markets, agro-processing markets, and export markets, especially in the light of the increasing demand for the crop over the last five years by foreign countries like Russia and Ukraine, and Arab countries like Saudi Arabia, Kuwait, Syria, and Iraq [(5)]. But unfortunately, the rise in production cost to reach LE 10000 per feddan led to lower revenue thus farmers reluctance to expand crop producing areas.

Results and Discussion :

Current Situation of Pomegranates Production In Egypt

Average area under pomegranates amounted to 7.5 thousand feddans representing 0.64% of the average area under fruit crops in Egypt over the period 2008-2013. Average production of pomegranates amounted to 68.3 thousand tons representing 0.76% of the average production of fruit crops in Egypt over the same period, with productivity amounting to 8.9 tons/feddan [(6)]. On the other hand, total production cost per feddan of pomegranates inside the valley amounted to LE 14946 thousand during 2013. Of this total, land rent amounted to LE 3500, whereas variable cost amounted to LE 11446. Variable cost can be decomposed to the following items: cost of labor wages, estimated at LE 5665 representing 49.5%; cost of seedlings, estimated at LE 920 representing 8%, and machinery cost, which accounts for 7.9%.

Geographic Distribution of Pomegranates Across Egypt

Table (1): Geographic Distribution of Pomegranates Production Areas Across Egypt over the Period 2008-2013

Governorate	Area (fed.)		Governorate	Area (fed.)	
	Avg.	%		Avg.	%
Asiout	5398.7	72.72	Asiout	58045.5	84.82
Nubaria	787	10.6	Nubaria	5491.5	8.52
North Sinai	306.33	4.13	Sohag	777.8	1.14
New Valley	159	2.14	North Sinai	752..2	1.1
Giza	128.17	1.73	Giza	746	1.09
Sohag	125.33	1.69	Minya	498.8	0.73
Country Total	7423.17	100	Country Total	68430.5	100

Source: Calculated based on data collected form the Central Agency for Public Mobilization and Statistics [(7)]

Data in Table (1) indicate the geographic distribution of pomegranates production areas across Egypt over the period 2008-2013. Findings revealed that Asiout ranked first in terms of planted area, which averaged 5.4 thousand feddans representing 72.72% of the average area under pomegranates in Egypt. Nubaria, North Sinai, the New Valley, and Giza followed with areas representing 10.6%, 4.13%, 2.14%, and 1.73%, respectively. In addition, Asiout ranked first in terms of production quantity that averaged 58.05 thousand tons representing 84.82% of the average pomegranates production in Egypt. Nubaria, Sohag, North Sinai, and Giza followed with production quantities representing 8.52%, 1.14%, 1.1%, and 1.09%, respectively, over the study period 2008-2013.

Problems of Pomegranates Production in Egypt

Findings indicate that main problems encountered in pomegranates production include the following:

1. Problems related to farmers: the reasons for these problems include lack of awareness on the working mechanisms and systems of pomegranate markets thus inability to deal with market variables, in addition to lack of knowledge about alternative marketing opportunities. Findings revealed that farmers only focus on producing the crop without caring to keep up with market requirements. Also, excessive use of inputs, particularly pesticides, leads to higher production cost and low quality due higher rates of harmful residues, which all lead to difficulties in marketing and exporting the crop, and ultimately lower returns to farmers.

2. Problems related to the Government and Civil Society: the reasons for these problems include lack of specialized active entities that provide technical and marketing support to pomegranate farmers like

associations, unions, and companies. In addition, executive bodies at the Governorate lack a clear vision on how to develop the pomegranates sector, especially from the perspective of crop processing, where they never tried to achieve maximum benefit by establishing industrial entities near production areas instead of moving the product to other places for processing. The absent role of agricultural extension and lack of real agricultural services to farmers, either from Governmental or Non-Governmental entities, resulted in producing a crop that does not fulfill the currently required standards.

3. Problems related to infrastructure and facilities: the reasons for these problems include lack of service stations or centers that offer value added services near production areas like deseeding, packing, and cooling, in addition to lack of refrigerated trucks to transport the produced crop. Such problems complicates the situation due to negatively affecting the quality and safety of the final product.

No doubt, the mentioned problems led to negative impacts on the average revenues thus economic and social conditions of pomegranate producers, resulting in inability to adapt and respond to the ongoing market changes, which limited their role to crop production as a result of inability to perform value-added services in post-harvest stages, leading to lower market value and prices of the produced crop [(8)].

Significance of the Proposed Project :

Based on the previously mentioned problems, the research has been conducted in an attempt to find a solution that helps raise revenues earned by pomegranate farmers. This solution is summarized in establishing part of the infrastructure required to perform post-harvest services, like deseeding, cooling, and packing of pomegranates near production areas in order to increase the number and kinds of value added to pomegranates in a way that increases its marketing opportunities and opens new market windows via processors, exporters, and high-value domestic markets, especially in the light of the growing demand for pomegranate products by numerous agro-processing and export companies, particularly value added products like deseeded, packed, and cooled pomegranates. Accordingly, an idea was born to establish a mini-processing unit for deseeding pomegranates, and the packing, cooling, and marketing of arils to consumers and agro-processing companies and plants. The unit should also be responsible for the sorting and packing of raw pomegranates to export companies, in addition to processing other kinds of fruits and vegetables to local markets in season.

Project Description:

Site: the project shall be established over an area ranging between 200m^2 and 300m^2 in one of the regions with concentrated pomegranate orchards in Asiout, which will reduce the time and costs required to transport the raw crop from orchards to the unit for processing, preparation, and will also reduce the time and costs required to transport the final products from the unit to expected clients.

It should taken into account that pomegranate production season takes between 5 to 6 months/year, which is the proper time when the proposed mini-processing unit will be working to process the raw crop. As for the second half of the year, the unit will be operated to process other horticultural crops for domestic market, which guarantees that it works all year round. Agricultural residues resulting from processing and sorting operations shall also be sold to drug and chemicals companies, which utilize them in producing several products.

Planned Size of Production:

Production and sales plan for the proposed mini-processing unit shall proceed as follows: in year one, 170 tons of deseeded pomegranates are prepared, packed, and sold to regular consumers and agro-processors, in addition to sorting and packing of 150 tons of raw pomegranates for export companies, plus the processing and packing of 175 tons of vegetables and fruits to be sold in local markets off pomegranates' season.

Project Cost:

Total capital cost required for establishing the proposed unit reached LE 545644, including the following items:

1. Cost of Fixed Assets, estimated at LE 416850, including the establishment of buildings, equipment, furniture, trucks, and miscellaneous items.
2. Operation Cost for at least two production cycles, estimated at LE 118794. This includes the costs of raw materials, direct labor, and administrative and marketing expenses.
3. Pre-operation cost, estimated at LE 10000, including fees paid to consultants and experts, in addition to the cost of initial studies. Table (2) lists the items and costs required for establishing the proposed projecct:

Table (2): Proposed Financial Plan for Establishing the Project

Ser.	Item	Total (LE)
1	Fixed Assets	
	Buildings, Construction, and finishes	15000
	Machines and the Equipments	246600
	Furnishings	2250
	Telephone and Means of Communication	500
	Cars and Means of Transportation	150000
	Tools and fixtures	2500
	Total Fixed Assets	416850
2	Working Capital	
	Marketing expenses (for sale)	1527.8
	Raw materials	106983.3
	Direct labor	8000
	Fixed costs	2221.9
	Administrative expenses	61.1
	Total Working Capital	118794.1
3	Pre-operation Cost	
	The value of pre-operating expenses	10000
	Total pre-operating expenses	10000
	Total (amount)	545644.1
	Total (%)	100%

Source: Calculated based on data collected from the Center for Information and Decision Support, Council of Ministers [9]

When proposing the establishment of any project, it is useful to study the market where the product is expected to be sold. The following section presents a description of the proposed product market in terms of marketing potentials and expected production volume over the project life based on studying demand for the given product.

Product Description:

Pomegranate is mainly consumed fresh. However, it is considered less attractive to consumers due to the difficulty of deseeding the fruit. But awareness about its nutritious and medicinal values opened the door for an outstanding economic activity for producing non-traditional products from fresh pomegranate arils, either for direct consumption or as basic inputs for many food and drug industries.

Types and regions of clients expected to purchase the processed products, i.e., packed pomegranate arils, vegetables, and fruits are the following:

1. Large Retail Stores, including chains of modern stores (supermarkets), and large stores (Hyper markets).
2. Middle agents, wholesalers, and consumption institutions like hotels, restaurants, etc.
3. Food processing projects and manufacturers of concentrates and juices.
4. Drug and medical compounds manufacturing companies, and pigments manufacturing companies.

The previously mentioned expected clients are mainly located inside cities and urban regions, in addition to industrial zones across Egypt such as the industrial zones in Obor city, 6th of October, 10th of Ramadan, and Borg El-Arab.

Supply and Demand Analysis:

Supply and demand of a certain product in the market are the two main factors that should be carefully studied before establishing the proposed project in order to assess the market share it is expected to acquire thus determine the annual sales volume and production process.

First: Demand Side

Demand for pomegranates is increasingly growing due to its nutritious and medicinal values, in addition to its sweet taste. It is also a main component on the table of many Middle Eastern countries. The increase in per capita share of Gross National Product at a compound annual rate that reached 13.7% over the period 2009-2013, in addition to social and demographic changes led to developments in consumption patterns, thus more demand for processed food products.

Based on that, the project has been designed to target population categories concentrating in urban areas, constituting 43% of the total population in Egypt over the last five years, with annual rate of increase estimated at 1.92%. This of course increases the annual opportunities and rates of demand for the project products, together with the hidden demand expected to arise with the annual increase in population, and changing consumption patterns that led to more demand for value added products, based on which per capita annual consumption is expected to reach two 0.3-kg packs. As a result, total hidden demand is expected to reach 2820 tons.

Agro-processing factories' needs of the product are also expected to increase with the expected improve in quality. For instance, assuming that there is at least five food processing companies in Egypt that use pomegranate arils in producing juices and concentrates, and that average annual requirement for each company is estimated at 150 tons, then total demand for pomegranate arils shall reach 750 tons per year.

Second: Production Plan (Supply Side)

Technical Description of the Products

The proposed mini-processing unit shall deseed pomegranates, and prepare and pack arils with the help of a group of male and female workers. The final products are expected to take several forms, where part of the deseeded pomegranates will be packed in small plastic packs weighing 150 grams and sold to consumers. The second product, also packed in plastic packs weighing 5 kgs or more, will be sold to agro-processors, including juices and concentrates' processing companies. The third product consists of packs destined for export companies, and finally, the fourth product consists of packs of fresh vegetables and fruits.

Production Schedule:

The proposed unit is expected to operate on daily basis in order to produce those planned quantities of the main products that realize the planned annual sales. The planned for production quantities of the main product is expected to reach around 495 tons of pomegranate arils, vegetables, fruits, and export-oriented pomegranates during the first production year of the project life. Table (3) presents quantities produced of the main product and commodity stock, taking into account the annual increase in production volume, estimated at 1.9%.

Table (3): Production Quantities of Different Packs Over the First Five Years of the Project Life (in tons)

Ser.	Product	Year 1	Year 2	Year 3	Year 4	Year 5
1	Pomegranate arils required for producing 150-gram packs	40	42	44.1	46.3	48.6
2	Pomegranate arils required for producing 5-kg packs	130	136.5	143.3	150.5	158
3	Packs of pomegranate arils for export companies	150	157.5	165.4	173.6	182.3
4	Packs of fresh fruits and vegetables	175	183.8	192.9	202.6	212.7
Total	Production Volume Required To Cover Sales	495	519.8	545.7	573	601.7

Source: calculated based on unpublished data from the Ministry of Trade and Industry [10]

Proposed Production Costs:

The proposed mini-processing unit will consist of an operation and production area containing production lines and equipments, changing room for sorting and packing workers, a control room, toilets, and a small cold storeroom to preserve the final products. It is worth noting that working capital the primary responsible element for the volume of production. It can be decomposed to the following items:

- **Cost of Direct Raw Materials**

Raw pomegranates is the basic input for producing pomegranate arils required to produce the proposed products. Quantities required shall be supplied by farmers located around the project area, taking into account the conversion/waste ratios during processing. During the first year, the unit needs to buy some 505 tons of raw pomegranates, 210 tons of fresh vegetables to be sorted and packed, in addition to the packs, plastic bags, and some miscellaneous items.

- **Direct Labor Cost**

One of the most important factors required to execute the mini-processing unit activities is the direct labor who perform this role, which is abundantly available in the project area. Training of the hired labor is expected to be easy for two reasons, the first relates to the area where the project is executed, where the number of unemployed individuals has been increasing due to lack of activities other than traditional farming; whereas the second reason is that the workers shall be trained by technical experts working at the Horticultural Industries' Project in Upper Egypt, which shall provide them with the required technical skills.

The unit will need to employ a number of direct male and female workers to receive, deseed, and pack the processed pomegranates for different clients. The following Table presents the cost of direct labor required for producing the planned volumes over the first five years of the project life, taking into account an annual increase of 5% in the cost of production.

- **Fixed Cost**

Fixed cost required for establishing the proposed mini-processing unit comprises the costs of indirect materials, indirect labor, in addition to other items including electricity, water, duties, maintenance, risk ratio, and depreciation of fixed assets. The estimated fixed cost during the first year amounted to LE 72544, with expected annual rate of increase amounting to 5%.

Total Production Cost and Cost Per Ton of Packed Pomegranate Arils, and Packed Vegetables and Fruits:

In this section, production cost per ton of packed pomegranate arils, and packed vegetables and fruits over the first five years of the project life are explained:

First: Cost per ton of pomegranate arils, packed in 150-gram packs for consumers (in LE)

Figures in Table (4) indicate production cost per ton of pomegranate arils, packed in 150-gram packs for marketing to regular consumers during the proposed five-year period. It is clear that production cost per ton amounted to LE 6.4628 in year one, and reached LE 7.7755 in year five, up 20%, whereas total cost of this product amounted to LE 258.512 in year one, and reached LE 378.046 in year five, up 46%. Direct cost of raw materials constituted the largest part of production cost, with a rate of increase amounting to 34% over the proposed five-year period, taking into account the increase in total production from 40 to 49 tons.

Table (4): Production Cost Items Per Ton of Pomegranate Arils, Packed in 150-gram packs (LE)

Year	Production Cost For Product (1)				
	Detailed Cost Items				
	Cost of Direct Raw Materials	Cost of Direct Labor	Fixed Cost	Total Production Cost	Total Cost Per Unit
Year 1	243.644	11.636	3.232	258.512	6.462.81
Year 2	268.618	12.218	3.393	284.229	6.767.36
Year 3	296.151	12.829	3.563	312.543	7.087.15
Year 4	326.506	13.471	3.741	343.718	7.422.92
Year 5	359.973	14.144	3.928	378.046	7.775.48

Source: calculated based on unpublished data from the Ministry of Trade and Industry [10]

Second: Cost per ton of pomegranate arils packed in 5-kg packs for agro-processors (in LE)

Figures in Table (5) indicate production cost per ton of pomegranate arils packed in 5-kg packs for agro-processors during the first five years of the project life. It is clear that production cost per ton amounted to LE 4.5859 in year one, and reached LE 5.4941 in year five, up 20%, whereas total cost of producing 130 tons of this product amounted to LE 596.168 in year one, and reached LE 868.153 in year five, up 45.6%. Direct cost of raw materials constituted the largest part of production cost, with a rate of increase amounting to 47.7% over the proposed five-year period, taking into account the increase in total production from 130 to 158 tons.

Table (5): Production Cost Items Per Ton of Pomegranate Arils, Packed in 5-kg packs for Agroprocessors (LE)

Year	Production Cost For Product (2)				
	Detailed Cost Items				
	Cost of Direct Raw Materials	Direct Labor Cost	Fixed Cost	Total Production Cost	Total Cost Per Unit
Year 1	547.846	37.818	10.503	596.168	4.585.91
Year 2	604	39.709	11.029	654.738	4.796.62
Year 3	665.91	41.695	11.58	719.185	5.017.86
Year 4	734.166	43.779	12.159	790.104	5.250.17
Year 5	809.418	45.968	12.767	868.153	5.494.09

Source: calculated based on unpublished data from the Ministry of Trade and Industry [10]

Table (6): Production Cost Items Per Ton of Packed Pomegranate Arils Destined for Export Companies (LE)

Year	Production Cost For Product (3)				
	Detailed Cost Items				
	Cost of Direct Raw aterials	Direct Labor Cost	Fixed Cost	Total Production Cost	Total Cost Per Unit
Year 1	776.4	43.636	12.119	832.156	5.547.71
Year 2	855.981	45.818	12.725	914.525	5.806.51
Year 3	943.719	48.109	13.362	1.005.190	6.078.25
Year 4	1.040.450	50.515	14.03	1.104.995	6.363.57
Year 5	1.147.096	53.04	14.731	1.214.868	6.663.17

Source: calculated based on unpublished data from the Ministry of Trade and Industry [10]

Third: Cost per Ton of Pomegranate Arils Packed for Export Companies (in LE)

Figures in Table (6) indicate production cost per ton of pomegranate arils destined for export companies during the first five years of the project life. It is clear that production cost per ton amounted to LE 5.5477 in year one, and reached LE 6.6631 in year five, up 20%, whereas total cost of producing 180 tons of this product amounted to LE 832.156 in year one, and reached LE 1214.868 in year five, up 45.6%.

Fourth: Cost per Ton of Packed Vegetables and Fruits (in LE)

Figures in Table (7) indicate production cost per ton of packed vegetables and fruits during the first five years of the project life. It is clear that production cost per ton amounted to LE 2.416 in year one, and reached LE 2.857 in year five, up 18.2%, whereas total cost of producing 175 tons of this product amounted to LE 422.858 in year one, and reached LE 607.714 for producing 213 tons in year five .

Table (7): Production Cost Items Per Ton of Packed Vegetables and Fruits (LE)

Year	Production Cost For Product (4)				
	Detailed Cost Items				
	Cost of Direct Raw Materials	Direct Labor Cost	Fixed Cost	Total Production Cost	Total Cost Per Unit
Year 1	357.809	50.909	14.139	422.858	2.416.33
Year 2	394.485	53.455	14.846	462.786	2.518.56
Year 3	434.92	56.127	15.589	506.635	2.625.90
Year 4	479.499	58.934	16.368	554.8	2.738.61
Year 5	528.647	61.88	17.186	607.714	2.856.96

Source: calculated based on unpublished data from the Ministry of Trade and Industry [10]

Table (8): Expected Project Income (LE)

Details	Year 1	Year 2	Year 3	Year 4	Year 5
Net Sales	2.320.227.1	2.582.412.7	2.874.225.4	3.199.012.8	3.560.501.3
Of which the following cost items of sold products are subtracted					
(-) Beginning Stock of Raw Materials	0	80.535.0	80.535.0	80.535.0	80.535.0
(+) Purchased Raw Materials	2.006.234.4	2.123.083.6	2.340.699.7	2.580.621.4	2.845.135.1
Total Cost of Available Raw Materials	2.006.234.4	2.203.618.6	2.421.234.7	2.661.156.4	2.925.670.1
(-) End Stock of Raw Materials	80.535.0	80.535.0	80.535.0	80.535.0	80.535.0
Cost of Available Raw Materials	1.925.699.5	2.123.083.6	2.340.699.7	2.580.621.4	2.845.135.1
(-) Direct Labor Cost	144.000.0	151.200.0	158.760.0	166.698.0	175.032.9
(+) Fixed Cost	75.544.0	74.543.7	76.643.4	78.848.1	81.163.0
Total Production Cost	2.142.243.5	2.348.827.3	2.576.103.1	2.826.167.5	3.101.331.0
Products under Processing	2.142.243.5	2.348.827.3	2.576.103.1	2.826.167.5	3.101.331.0
Cost of Processed Products	2.142.243.5	2.348.827.3	2.576.103.1	2.826.167.5	3.101.331.0
Cost of Processed Products Ready for Sale	2.142.243.5	2.348.827.	2.576.103.1	2.826.167.5	3.101.331.0
Cost of Sold Products	2.142.243.5	2.348.827.3	2.576.103.1	2.826.167.5	3.101.331.0
Total Revenue	177.983.6	233.585.4	298.122.2	372.845.3	459.170.3
Operation Cost					
(-) Administrative Expenses	3.400.0	3.455.0	3.512.8	3.573.4	3.637.1
(+) Marketing Cost (Selling)	46.650.0	48.080.0	49.581.5	51.158.1	52.813.5
Total Operation Cost	46.650.0	48.080.0	49.581.5	51.158.1	52.813.5
Net Revenue after Deducting all due taxes	131.334	185.505	248.51	321.687	406.357

- No interest rate or tax on income

Source: Calculated based on data in Tables 3-6.

Financial Analysis :

Figures in Table (8) indicate revenues expected from the proposed project over the first five years of the project life. As clear, total sales value, i.e., total revenue in year one, amounted to LE 2.320 million, whereas net revenue (net sales value - total cost) amounted to LE 177.98 thousand. Net sales value (total revenues – operation cost) amounted to LE 131.334 thousand. The is also clear that sales value in year five increased by 53.5% compared to year one, while net return increased by 200%, indicating a rise in profit ratio, as clarified next.

Breakeven Point and Expected Profit:

In administrative accounting, breakeven analysis is considered an important tool that is used in making administrative decisions regarding the size of production that guarantees covering the firm's total cost (variable and fixed costs), or the value of sales that covers the firm's total cost. In other words, breakeven point is that point where Total Revenue equals Total Cost, i.e., profit at this point is zero [(2)]. It can be calculated using three methods: total sales volume, total sales value, or the point where Total Revenue equals Total Cost. Breakeven point is used in determining the volume of sales that guarantees generating a proper profit for the project.

Tables (9), (10), (11) and (12) present the quantity and value of sales for each proposed product. It can be noted from Table (9) that the proposed production volume amounted to 40 tons worth LE 280.07 thousand in year one. Breakeven quantity amounted to 23 tons worth LE 160.705 thousand. Results indicate that breakeven quantity accounted for 57% of the total sales volume.

On the other hand, figures in Table (10) indicate that total sales volume required to reach breakeven point is estimated at 85 tons of the total sales of the 5-kg packs, where it is planned that the project produces 130 tons worth LE 653.986 thousand in year one. Results also indicate that breakeven sales volume accounts for 65% of the planned production volume in year one of the project life.

As regards the sales volume of packs destined for export companies over the first five years of the project life, results indicate that breakeven quantity is reached at 91 tons representing 61% of the total sales of this product, estimated at 150 tons, in year one.

For vegetables and fruits packs, it is planned to produce 175 tons worth LE 477.909 thousand in year one. It was found the breakeven sales volume is realized at 136 tons representing 77% of the total sales volume in year one, as shown in Table (12).

Table (9): Breakeven Figures for Product One, i.e., 150-gram Packs of Pomegranate Arils (Quantity in ton and Value in Egyptian Pound)

Product Number (1)	**Production Volume**				
Details	Year 1	Year 2	Year 3	Year 4	Year 5
Annual Sales Volume	40	42	44	46	49
Annual Sales Value	280807	312538	347855	387163	430912
Breakeven Quantity	23	21	20	18	17
Breakeven Value	160705	157456	154935	153037	151681
Final Sales Price	7020	7441.4	7887.9	8361.1	8862.8
Breakeven Price	6622.8	6922.5	7237.6	7569	7917.4
Breakeven to Total Sales ratio	57%	50%	45%	40%	35%
Net Profit for the Processing Unit	397.4	518.9	650.2	792.1	945.5
Net Profit for Product (1)	15894.7	21793.4	28675	36680.2	459968.3

Source: Calculated based on data in Tables (2) and (8)

Table (10): Breakeven Figures for the Second Product, i.e., 5-kg Packs of Pomegranate Arils Destined for Agro-processors (Quantity in ton and Value in Egyptian Pound)

Product Number (2)	Production Volume				
Details	Year 1	Year 2	Year 3	Year 4	Year 5
Annual Sales Volume	130	137	143	150	158
Annual Sales Value	653986	727886	810137	901683	1003573
Breakeven Quantity	85	79	74	70	66
Breakeven Value	425897	422523	420409	419428	419479
Final Sales Price	5030.7	5332.5	5652.4	5991.6	6351.1
Breakeven Price	4745.9	4951.7	5168.4	5396.2	5636
Breakeven to Total Sales ratio	65%	58%	52%	47%	42%
Net Profit for the Processing Unit	284.8	380.8	484.1	595.3	715.1
Net Profit for Product (2)	37018.1	51972.6	69382.5	89594.4	113000.9

Source: Calculated based on data in Tables (2) and (8)

Table (11): Breakeven Figures for the Third Product, i.e., Packs Destined for Export Companies (Quantity in ton and Value in Egyptian Pound)

Product Number (3)	Production Volume				
Details	Year 1	Year 2	Year 3	Year 4	Year 5
Annual Sales Volume	150	158	165	174	182
Annual Sales Value	907525	1010075	1124214	1251250	1392641
Breakeven Quantity	91	85	79	74	70
Breakeven Value	551995	543906	537888	533683	531087
Final Sales Price	6050.2	6413.2	6798	7205.8	7638.2
Breakeven Price	5707.7	5961.6	6228.7	6509.7	6805
Breakeven to Total Sales ratio	61%	54%	48%	43%	38%
Net Profit for the Processing Unit	342.5	451.5	659.2	696.2	833.2
Net Profit for Product (3)	51369.3	71117.6	94135.9	120889.5	151905.8

Source: Calculated based on data in Tables (2) and (8)

Table (12): Breakeven Figures for the Fourth Product, i.e., Vegetable and Fruit Packs Destined for Local Market (Quantity in ton and Value in Egyptian Pound)

Product Number (4)	Production Volume				
Details	Year 1	Year 2	Year 3	Year 4	Year 5
Annual Sales Volume	175	184	193	203	213
Annual Sales Value	477909	531913	592019	658917	733375
Breakeven Quantity	136	129	124	118	114
Breakeven Value	370264	374687	379678	385230	391340
Final Sales Price	2730.9	2894.8	3068.5	3252.6	3447.7
Breakeven Price	2576.3	2673.7	2776.4	2884.7	2998.8
Breakeven to Total Sales ratio	77%	70%	64%	58%	53%
Net Profit for the Processing Unit	154.6	221.1	292	367.9	448.9
Net Profit for Product (4)	27051.5	40621.8	56347.4	74523.1	95481.8

Source: Calculated based on data in Tables (2) and (8)

Table (13): Financial and Economic Indicators (Value in LE)

Product (1)	**Production Volume**				
Profitability Ratios	Year 1	Year 2	Year 3	Year 4	Year 5
- Return on Assets (ROA	24%	27%	29%	29%	28%
- Return on Investment (ROI)	24%	27%	29%	29%	28%
- Return on Investment (ROE)	24%	27%	29%	29%	28%
Performance Ratios	Year 1	Year 2	Year 3	Year 4	Year 5
Asset turnover	343%	299%	259%	223%	194%
Inventory Turnover (once)	0	0	0	0	0
Gross Profit Margin's Ratio	8%	9%	10%	12%	13%
Gross Profit Margin's Value	177.984	233.585	29.122	372.845	459.17
Operating Profit Margin's Ratio	6%	7%	9%	10%	11%
Operating Profit Margin's Value	131.334	185.505	248.541	321.687	406.357
Project Evaluation					
Payback Period				25	Months
Net Present Value after 5 years				537.827.1	LE
Internal Rate of Return (IRR)				35%	Annual
Profitability Index				1.99	LE

Source: Calculated based on data in Tables (2) and (8)

Financial and Economic Indicators

After paying all dues to farmers, the proposed project is expected to generate a net economic surplus estimated at LE 131334 in year one. It is also expected to generate a Return on Investment estimated at 24%, which will allow a Payback Period of 25 months only. By the end of the second working year, the project is expected to generate a net surplus of LE 185505, and a Return on Investment estimated at 27%. At year five, net surplus is expected to reach LE 406357, while Return on Investment is expected to reach 28%, as shown in Table (13). The table also shows that Gross Profit Margin ratio reached 8% in year one, then gradually increased to reach 13% in year five, indicating that the project realizes an increasing Gross Profit Margin ratio, which means that production cost relative to sales value declines as project life goes on.

Other figures in Table (13) show that operating profit margin's ratio reached 6% in year one, then increased until reaching 11% in year five, indicating that operating profit is expected to increase as project life goes on. Profitability index is estimated to reach LE 1.99, which means that the project generates profit.

It is therefore clear that executing such project is expected to have strong positive impacts on farmers' livelihood by improving their living standards, in addition to positive impacts on many young males and females by providing a good number of permanent employment opportunities. As a result, the sponsoring association will be able to play its role towards beneficiary members in a way that guarantees the sustainability of offering this kind of services in the future, even after the end of temporary development interferences offered by aid and support associations.

Based on what proceeded, the study recommends promoting expansions in pomegranate planted areas in main production Governorates, and helping pomegranate farmers by offering them the required support where providing production inputs at reasonable prices is concerned. In addition, it is necessary to disseminate awareness about the nutritious value of pomegranates among consumers, provide marketing information related to pomegranate, and provide extension guidance about proper marketing operations in order to achieve economic efficiency in the production of this important crop.

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