# International Journal of Agriculture Extension and Social Development

## Study the market and distribution channels of olives and olive oil in Irbid governorate

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**Abstract**

**Purpose:** The majority of this paper aims to explain and analyze the market and distribution channels for the olives and olive oil grown in Irbid City; Bani-Kenaneh region, studying the factors that affect production, and identifying the strengths and weaknesses as well as the opportunities and challenges for this sector.

**Background:** The olive sector is considered one of the most important agricultural sectors in Jordan (about 80 thousand Jordanian families depend directly or indirectly on olive cultivation as the main source of income). Olive oil production revenues are an important source of the national economy; contributing about 100 million JD. Marketing channels have been linked with an increase in production and growth of cultivated areas, in the last few years ago had an extension of olive cultivation to the eastern desert areas, which placed planting olives in these areas in front of the challenges most notably limited water resources, soil and irrigation water salinity and sometimes the nature of the installation of the strength of the soil. Therefore, it's essential to take measures to reconsider the expansion of olive cultivation in the groundwater irrigated areas which affect raising the cost of olive and olive oil production to higher rates compared with the same foreign product.

**Originality/value:** The purpose of this paper is to interpret the role of each factor in the olive and olive oil value chain as well as to reduce the knowledge gap by suggesting some empirical solutions that could present benefits to the value chain production in the study area.

The study area selection is related to my current career path and it has a potential contribution to achieving the olive and olive oil study objectives in the past and future, I mean the "Kafari" variety which is much more popular in the study area.

**Status of olive production in Jordan:** Jordan has a variety of olive crops grown in various agricultural areas. For small-scale farmers, olive crops are a major source of income as well as an important food item. Olive production differs from the planting of a few trees in the backyard for domestic consumption to the large-scale production in local markets. Olive cultivation is also based on smallholdings, the most important of which are low production inputs and low outputs. The use of improved varieties and production inputs such as pesticides, fertilizers production plants are not common in the smallholder sector.

**Materials and Methods:** To achieve the study objectives, a number of statistical methods were used including descriptive statistics and econometric analysis. This study used secondary data along with government statistics of private and international accredited agencies in order to calculate the value-added and marketing margins for different marketing channels and the Multiple Regression Analysis Model.

**Results:** This paper offers that the olive growers follow the traditional approach in order to market olives using a few channels, calculating the value-added and marketing margins for different channels showing the added value was 2 JD/kg and the pickle factories acquired 60% of the gross margin. Meanwhile, the added value for the olive oil was 6.5 JD/Kg and the top gross margin was 38% for the farmers. The study recommended adapting a certain policy that targets to increase the farmers' access to modern inputs as well as to improve extension services to accelerate development in this vital sector from different pivots, such as legislation and regulation along with packaging, promotion, specifications, and focus on post-harvest to improve product quality and quantity.

**Keywords:** Olive, olive oil, market

## 1. Introduction

The olive sector is considered one of the most important socio-economic sectors in Jordan; about 80 thousand Jordanian families depend directly or indirectly on olive cultivation as the main source of income. Olive oil production revenues are an important source of the national economy, contributing about 100 million JD, during the past few decades olive cultivation has witnessed rapid developments in terms of increasing planted area, as well as improving quantity and quality of olive products. In 2007 the cultivated area reached about 1.28 million donum, which

constitutes 70% of the cultivated area by fruit trees and about 35% of the total cultivated area in Jordan (Shdeifat, 2011) [27]. According to the Ministry of Agriculture (MOA), the estimated production of olive was around 168 thousand tons in 2007, where 15-17% were consumed for pickling, while and rest was used for oil extract has reached thousand tons. Marketing of produce had linked with the increase in production and growth of cultivated areas, in the last few years, olive cultivation has been an extension to the eastern desert areas, which puts planting olives in these areas in front of the challenges of the most notably the limited water

resources, soil and irrigation water salinity and sometimes the nature of the installation of the strength of the soil.

Therefore, it's essential to take measures to reconsider the expansion of olive cultivation in the groundwater irrigated areas which effect raising the cost of olive and olive oil production to higher rates compared with the same foreign product. Thus, this leads to reduce the competitiveness of the Jordanian product in foreign markets. Olive is growing in two major areas: the first is in western highlands (rain-fed) which divides Jordan from north to south, and the second is the North Eastern Desert (irrigated).

The next part describes the Literature on value chain and data used in this research. Then briefly presents key concepts which lead to an analysis of markets and, marketing channels and determine the main sources of income of farmers in the study areas in order to figure out and calculate the Benefit the in Agricultural Sector along with the olive and olive oil market chain production. This is followed a discussion of research outcomes. The final section presents the conclusion(s) and practical implications for future studies.

## 2. Literature Review
In this part of the study, basic concepts will illustrate: what are the market chain and some of its benefits in the agricultural sector, markets and marketing, marketing channels, market performance, and how to measure the market chain.

## 2.1 Key Concepts of Marketing Analysis
**Effective demand**
Agricultural market chain analysis defined effective demand as the power that pulls goods and services through the vertical system. Hence, market chain analysis needs to understand the dynamics of how demand is changing in both local and international markets and the implications for market chain organization and performance. Market chain analysis also needs to inspect barriers to the transmission of information in the changing nature of demand and incentives back to producers at various levels of the market chain (MSPA, 2010) [25].

**Production**
In agricultural market chain analysis, a stage of production belongs to any operating level capable of producing a saleable product serving as an input to the next stage in the chain or for the final consumer or user. Typical market chain linkages comprise input supply, production, assembly, transport, storage, processing, wholesaling, retailing, and utilization, with exportation included as a major stage for products destined for international markets. A stage of production in a market chain performs a function that makes a significant contribution to the effective operation of the value chain and in the process adds value.

**Market chain upgrading**
Upgrading refers to the acquisition of technological capabilities that enable firms to improve their competitiveness and move into higher-value activities. Upgrading in firms can take place of process, product, functional, and chain upgrading. Upgrading entails not only improvements in products but also investments in people, equipment, and favorable work conditions. Empirical

research in other countries and sectors. (e.g. Humphrey and Schmitz, 2000; Humphrey, 2003; Humphrey and Memedovic, 2006) [17-18] gave evidence of the importance of upgrading in the agricultural sector.
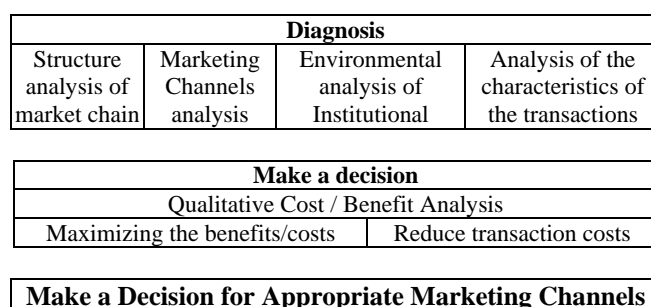
## 2.2 Market and marketing
The market can be defined as "an area where one seller or more exists to offer products/services and their substitutes with the competition in front of buyers". Previously the market was a place where buyers and sellers meet to exchange goods such as the village or Public Square, the concept of the market had evolved to be known as "The place where price make". This could be through the property exchange, which coincides with the transfer of goods (Backman and Davidson, 1962) [5], where the concept of exchange and relations. The concept of the market is also a group of active and potential participants for the product (Kotler and Armstong, 2003) [21]. Theoretically, shopping can be visualized as an ownership transfer process of the goods from the seller to the buyer, who may be the final consumer or even broker.

**Marketing efficiency**
Marketing efficiency means the ratio of output to input values in the marketing system has the highest value (Cramer and Jensen, 1982) [9]. Improving marketing efficiency is the common goal for farmers and marketing organizations and consumers together, and as a common approach, the higher efficiency of marketing means better performance

**Market Channels**
Marketing channels are considered as a group of interrelated components operating on delivering the product from the point of production to the final destination for the "Consumer" (Kotler and Armstrong, 2003) [21]. The role of marketing channels lies in creating benefits temporal, spatial, modulating, and possessive that cannot be obtained without paying the cost (Berman, 1996) [8].

| Diagnosis | | | |
|---|---|---|---|
| Structure analysis of market chain | Marketing Channels analysis | Environmental analysis of Institutional | Analysis of the characteristics of the transactions |

| Make a decision |
|---|
| Qualitative Cost / Benefit Analysis |

| Maximizing the benefits/costs | Reduce transaction costs |
|---|---|

| Make a Decision for Appropriate Marketing Channels |
|---|

**Fig 1:** The proposed model for diagnosis and decision-making to determine the marketing channels.

**A. Structure analysis of market chain:** by using the statistical and official methods with specialized studies prepared by interviews with those in charge of the production process and agents of agribusiness

**B. Marketing Channels' Analysis:** Marketing channels play a significant role in the competitiveness of the market chain system.

**C. Analysis of Institutional Environmental:** by evaluating factors (political, legal, economic, social, cultural and technological.

**D. Analysis of the transactions' characteristics:** This type of analysis is for alternative marketing channels, which is an analysis of the characteristics of the asset and qualitative assessment of transaction costs.

**2.3 Marketing functions:** The marketing functions have two completely opposite interfaces, the consumer and the producer.

**Consumer:** Seeks to maximize long-term satisfaction by acquiring products and services at the lowest price because of his limited income.

**Producer:** Seeks to maximize the long-term profits by selling large quantities of a few products at the highest possible prices.

**Table 1:** Marketing system

| The marketing system came to solve these differences | |
|---|---|
| **Product Target** | **Consumer Target** |
| Maximize long-term profits | Maximize the satisfaction of the products they receive with their limited incomes |
| Sell large quantities of a few products | Buy small quantities of a large number of products |
| Get the highest prices | Pay less prices |

**2.4 Market Performance**
Market performance can be evaluated by analyzing the costs and margins of marketing agents in different channels. A commonly used measure of system performance is the marketing margin or price spread. Margin or spread can be useful descriptive statistics if it is used to show how the consumer's price is divided among participants at different levels of the marketing system (Mendoza, 1995) (Anandajayasekeram and Berhanu, 2009) [24, 2]. One of the targets of the agricultural market chain analysis is to increase the quantity of agricultural production. Understanding the mechanisms of agricultural production greatly can help to design an appropriate policy that brings more gain to farmers and the whole society at large. Such analysis struggles to deal with dynamic linkages between productive activities that go beyond that sector.

**Marketing cost:** It's an embodiment of barriers to access to market participation by resource-poor smallholders. It refers to those costs, which are incurred to perform various marketing activities in the transportation of goods from producer to consumers. Marketing costs include handling costs (labor, loading and unloading, costs of damage, transportation and etc) to reach an agreement, transferring the product, monitoring the agreement to see that its conditions are fulfilled, and enforcing the exchange agreement (Holloway, 2002) [14].

**Marketing Margin:** It's a commonly used measure of the performance of a marketing system. It is defined as the difference between the price the consumer pays and the price that is obtained by producers or as the price of a collection of marketing services (Cramers and Jensen, 1982; William and Robinson, 1990 Holt, 1993) [10, 9, 28, 15]. For instance, a big margin may result in little or no profit or even a loss for the seller involved depending upon the marketing costs as well as the selling and buying prices (Mendoza, 1995) [24]. Under competitive market conditions, the size of market margins would be the outcome of the supply and demand for marketing services, and they would be equal to the minimum costs of service provision plus "normal" profit. There are three methods generally used in estimating marketing margin: (1) detailed analyses of the accounts of trading firms at each stage of the marketing channel (time lag method); (2) computations of share of the consumer's price obtained by producers and traders at each stage of the marketing chain; and (3) concurrent method: comparison of prices at different levels of marketing over the same period of time (Mendoza, 1995; Scarborough and Kydd, 1992) [24].

**Measuring the market chain:** The basic aspect of scientific research on the value chain cares about how to imagine "value" and measured where the added value, price, and profit margins are considered as income indicators of the actors in the value chain. We can also calculate the value-added by searching the distribution of value to all actors in the chain and estimate the share of each of the value-added.

**Analysis of the market chain performance:** Estimation of the marketing margins is one of the best analysis tools for market function where the marketing margins is calculated by the difference between producer prices and retail prices.
a. **Costs and revenues:** Variable costs are a cost that varies according to the amount of production. Fixed costs are costs that are independent of production. Revenue is the product sale price earned through the sale of products.

b. **Profits and margins:** Calculate the gross income, or operating profit, by deducting variable costs from Revenue.

**2.5 Study area data**
Determine the markets of olive oil in Irbid District, Bani-Kenaneh Dis., of Irbid Governorate. The total area of Irbid is estimated at 1571.8 sq km, representing 1.8% of the total geographical area of Jordan Governorate. Due to its unique geographical location close to the border with Syria and the Palestinian territories, Irbid is one of the most important commercial centers in Jordan. The total population of Irbid governorate is about 1137000 people, representing 17.8% of Jordan's population. The male population represents 51.2% of the total conservative population, while the percentage of females is 48.8%. The following table shows the social analysis of Irbid governorate with its nine identities, which includes information related to the population and the dependency ratio: (the ratio of working individuals to non-working individuals and including both young and old).

**Table 2:** Social Analysis of Irbid Governorate

| Region | population Person | %Percentage of Governorate | Dependency ratio | Space km2 | Population density (Person / km2) | %Age (years) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Less than 15 | From 15 - 64 | Above 65 |
| Irbid City | 421,320 | 38.7 | 66.3 | 235.8 | 1787 | 36.5 | 60.1 | 3.3 |
| Ramtha | 133,690 | 12 | 71.6 | 274.5 | 487 | 39.2 | 58.3 | 2.5 |
| Koura | 111,530 | 10.2 | 79.8 | 178.5 | 625 | 41.2 | 55.6 | 3.2 |
| Bani-Kenaneh | 85,700 | 8 | 68 | 252.9 | 339 | 36.6 | 59.5 | 3.9 |
| Northern Jordan Valley | 104,370 | 10 | 76.1 | 246.4 | 424 | 39.8 | 56.8 | 3.5 |
| Bani Obeid | 114,610 | 10.5 | 65.9 | 188.4 | 608 | 36.1 | 60.3 | 3.6 |
| Northern almazar | 54,100 | 5 | 72.3 | 86.2 | 628 | 38.3 | 58.1 | 3.7 |
| Al-Taibeh | 35,680 | 3.2 | 77 | 63.5 | 562 | 39.9 | 56.5 | 3.6 |
| Al-Wastiyyih | 26,970 | 2.4 | 72.5 | 45.8 | 589 | 38.3 | 58 | 3.7 |
| Total | 1,087,970 | 100% | 69.9 | 1571.8 | 692 | 37.8 | 58.9 | 3.4 |

*Source:* Department of Statistics (2014)

The official statistics on poverty indicators published by the Department of Statistics based on household income and the 2010 expenditure indicate that the poverty rate in Irbid reached 15%, which is slightly higher than the average in the Kingdom of 14.4%. The number of poor in Irbid governorate is 164 people representing 18.7% of the total number of poor in Jordan.

The number of workers in Irbid is estimated at 221,000 according to the statistics of the Department of Statistics (2012), which represents 17.4% of the population of the governorate, while the estimated number of unemployed is approximately 30 thousand people, or about 34.4% of the total workforce in Irbid, In the wholesale and retail trade, as well as maintenance of vehicles by 7.2%, in the transport and storage sector by 1.7% in the tourism sector, And about 2.7% of the total labor force in this agricultural sector has reached employment A foreign worker in Irbid, 30 043, representing 10.7% of the total number of foreign workers in Jordan.

**Table 3:** Economic statistics in the labor market.

| Indicator | Irbid Governorate | The Kingdom |
|---|---|---|
| Labor force | 221.269 | 1.268.093 |
| % Of the workforce | %17.40 | |
| Number of unemployed | 29809 | 175.470 |
| % Of the unemployed | %17 | |
| Number of foreign workers | 30.043 | 279.798 |
| % Of foreign workers | %10.70 | |
| Rate of participation in economic activity | 37.4 | 38 |
| Unemployment rate | 11.9 | 12.2 |
| Inflation rate | 5.12 | 4.77 |
| Average Annual Income (JOD) | 7877.2 | 8823.9 |
| Average annual household expenditure (JD) | 8638.6 | 9626 |
| Annual per capita income (JOD) | 1421.8 | 1660.2 |
| Average annual per capita expenditure (JOD) | 1535.2 | 1793 |
| Poverty Ratio (2012) | %15 | %14.4 |
| % Of middle-class families (2008) | 28.3 | 41 |

*Source:* Department of Statistics (2010).

**Types, Sources, and Methods of Data Collection**
**Secondary data**
It has relied on locally official and credible data such as

**Department of Statistics:** The outputs of field surveys for the agricultural sector and statistical numbers related to foreign trade.

**Olive Department at the Ministry of Agriculture**
Records and numbers of olive and olive oil.
**General Union of Mills' Owners and Producers of Olive in Jordan:** Important stats and numbers in matters relating to the production of oil.

**2.6 Methods of Data Analysis**
A number of statistical methods were used to determine the overall objective of analyzing the olive value chain and marketing channels for olive and oil by using descriptive statistics and econometric analysis to analyze the data collected by the olive producers.

**Descriptive and inferential statistics**
Descriptive statistics aim to describe, organize, classify, summarize and present data in a clear way (tables or graphic forms) through different statistical measures describing a variable (or more) in a particular society.

**Analysis of market performance**
Estimating marketing margins is one of the best tools for analyzing market performance. The margin of marketing is calculated through the difference between producer prices and retail prices. It is also necessary to calculate the profit margins in the value chain in several steps. It is necessary to know information about costs and revenues

**Costs and revenues**
Variable costs are costs that vary according to the amount of production.
Fixed costs are costs that are independent of production.
Revenue is the selling price of a product that is earned through the sale of products.
B - Profits and margins:
Gross income or operating profit is calculated by discounting variable costs of revenues:

**1. Gross income = Revenue – Variable costs**
Gross income is easy to calculate but it does not take fixed costs into account.
Profit margin is the gross profit per unit of products. This is done by dividing the gross income by the revenue earned from the sales and then multiplying by 100 to give a percentage. Again this ratio neglects fixed costs.

**2. Gross margin = Gross income / Revenue x 100**
Added value is the value that each actor adds to the chain since it is the difference between the price paid for the production and the price that it gets through the sale.

**3. Added value = Price received by actor – Price paid by actor**
The share of value is a value percentage of the total value for each marketing channel. This is calculated as an added value divided by the total added value. Then ×100 to give a percentage.

**4. Value share = Added value / Total Added Value x 100**
Net income or net profit is calculated by subtracting the total costs (both variable and fixed) from revenue:

**5. Net income = Revenues – Variable costs + Fixed costs**
Net margin is the net profit per unit of products. This is calculated by dividing the net income from revenue from sales. Then cross by 100 to give a percent.

**6. Net margin = Net income / Revenue x 100**
Sources: 1 - ICT Applications Module10 for Smallholder Inclusion in Agribusiness Supply Chains, World Bank
Sources 2 - Applications Module for IIRR, TRADING UP, Building cooperation between farmers and traders in Africa.

**3. Results and Discussion**
This section presents the main results of the study, the first section deals with the descriptive and explanatory analysis of the studied society. The second part deals with the analysis of the olive value chain which includes the mapping of the series and determining the factors and the roles of each, Value chain performance includes channels, costs, marketing margins, and profit share for players in the value chain. The third section presents the indicators of the development of the olive growing sector in terms of area and production of olives and oil in the study area from 2000-to 2014.

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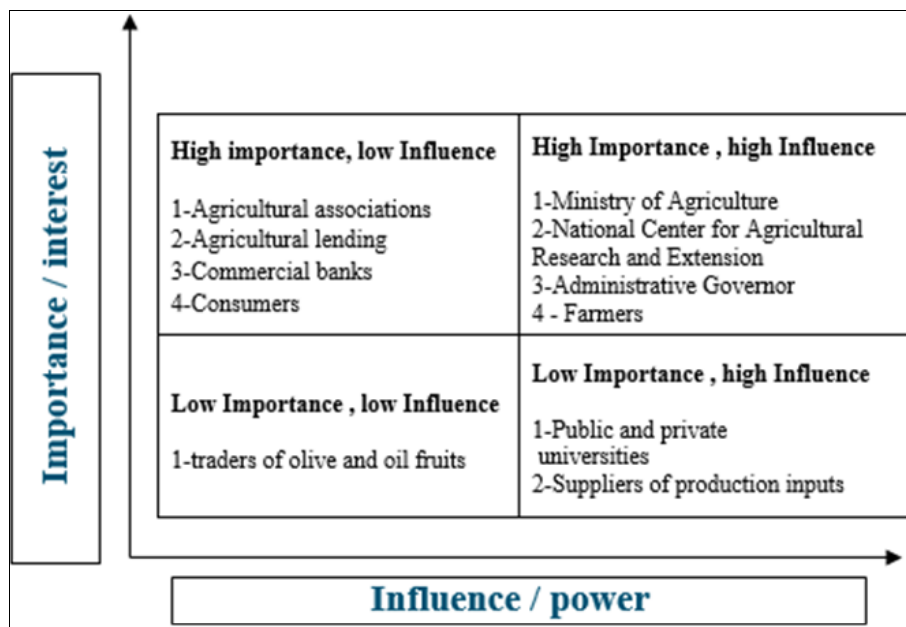**Table 4:** Economic statistics in the labor market.

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**Fig 2:** Matrix analysis (power, influence/importance) of the actors in the marketing chain.

In this matrix above, the actors specifically identified in the olive sector as having the most power and influence, are classified as (Ministry of Agriculture, National Center for Agricultural Research and Extension, the Administrative Governor, and Farmers). Actors that have influence and power are instrumental to the olive sector.

Both public and private universities and suppliers of production inputs are identified as actors having low importance but high influence. Those who have high importance, and low Influence include agricultural societies, agricultural lending, commercial banks, and consumers. It can be seen that traders are classified as having both low importance and low influence due to the lack of a direct role for them in the production processes, at least in the study areas.

**Table 6:** Analysis of different involved market actors by personal experience in the olive sector

| Main actors | Characteristics / Functionality | Interests | Problems and challenges | Actions |
|---|---|---|---|---|
| Suppliers of production inputs | Private functions | Achieve the profit through active participation in agricultural development | Market competition | selling of production inputs |
| Farmers | Private functions | Get the biggest amount of production at the lowest cost | 1-domestic and international competition scarcity and volatility of the rainy season<br>3 - high labor wages<br>4 - high prices of production inputs<br>5 .importation of products in the same production season | Making profits from production selling |
| Traders | Private functions | 1 .get a good profit margins<br>2 .open local markets and openness to global markets | 1-competition and monopoly<br>2-fluctuating supply and demand | contact points between producers and consumers |
| Consumers | The countryside and town residents | Access to safe healthy products at the lowest price | 1 .high prices<br>2 .products are unhealthy or undesirable<br>3 .Cheating product | Buy health and safe food |
| **Supporting actor** | **Characteristics / Functionality** | **Interests** | **Problems and challenges** | **Actions** |
| Ministry Of Agriculture | Headquarters of the agricultural pyramid | 1-organizing the agricultural sector in line with national objectives.<br>2-contributing to sustainable development while maintaining the environment<br>3- reaching self-sufficiency<br>4 .Rural development and linking production requirements of the internal and external markets. | 1-weak marketing structures for agricultural products and competitiveness<br>2 .lack of human staff to deliver adequate counseling<br>3 .Limited Budget | 1-training and qualification for small and large farmers<br>2-providing legislation services to facilitate and control agricultural process |
| National Center for Agricultural Research and | A governmental body- Scientific and | Agricultural Research and Extension | 1 .Challenges associated with agricultural labor<br>2. High cost production requirements. | 1 .conduct applied Agricultural research<br>2 .Disseminate |

| Extension | research arm of the Ministry of Agriculture | | | appropriate technologies to the local environment |
| | | | | 3 .conduct Economic and Social Research |
| agricultural credit corporation | A government body- Funding arm of the Ministry of Agriculture | Contribute to comprehensive agricultural development by offering financing services to meet workers' needs in the agricultural sector | 1- risks faced by the agricultural sector | 1 .finance marketing and export of Jordanian agricultural products |
| | | | 2. lack of a comprehensive national strategy that promotes the sector | 2 .Prepare feasibility and technical studies for project |
| | | | 3 .weakness of support devoted to research and technology transfer | 3 .provide technical and administrative advice for agricultural projects |

| **Supporting actor** | **Characteristics / Functionality** | **Interests** | **Problems and challenges** | **Actions** |
|---|---|---|---|---|
| Administrative Governor | Government agency | follow-up of agricultural issues | 1-fraud cases | Granting licenses for the establishment of associations dealing with agricultural work |
| | | | 2-controlling markets and following up on citizens' complaints | |
| Public and private universities | Private functions & Government agency | Serve the agricultural sector in vital fields that are working to make this sector a success | Loss of direct contact with farmers | Holding technical workshops and guidance advice to farmers to provide information and skills using modern agricultural methods |
| Commercial banks | Private functions | Achieving profits through participation in comprehensive development | Agricultural risk and loss of capital | Financing and supporting agricultural projects |
| Agricultural associations | Private functions | Union and teamwork | Engage the biggest number of farmers in order to gain power | Addressing local and international bodies to support the agricultural sector as a whole |
| Ministry of Industry and Trade | Government agency | Contribute to building and strengthening the national economy in competitive and diversified global partnership with the private sector to raise citizens' living standards. | Open alternative markets | Develop economic policies and legislation to ensure the protection of the rights of both consumers and businesses. |

**3.1 Main actors:** Key players in the market chain were generally identified in the study areas as suppliers of input producers, farmers, traders, and consumers. Each of these actors plays a specific role by adding value to the production process.

Producers of production inputs: At this stage of the market chain, there are many actors who participate directly or indirectly in the supply of agricultural inputs to the study area.

**3.2 Monitoring the indicators of the development of the olive tree growing sector in terms of area and production of olives and oil in the study areas (2000-2014)**

This objective was achieved by using the indices number, which is one of the most important tools of statistical analysis that shows the true reality of the level of economic indicators, and the use of indices is useful in knowing the change in the level of cultivated areas and change in the level of productivity of one dunum regarding olives and olive oil. There are many types of indices that are used in this area, but we will use the simple index, where the simple index number is appropriate to measure the indicators required and is made by dividing the year of comparison by the base year and then multiplying by 100 to a ratio. The following is an overview of the most important indicators that will be monitored by changing the simple index number:

The simple index number of the area planted with olive trees: Based on the data for several years from 2000 to 2014, the year of study, each year was adopted on the basis of the base year and the adoption of the following year as the year of comparison to see the evolution of the area production annually.

The simple index number of productivity of one dunum (2000) was considered the base year, and the reliance on the rest of the years as comparative years for the same period from 2000 to 2014, and as the year of study to determine the change in productivity.

**Table 7:** Monitoring the indicators of the development of the agricultural sector in Irbid Governorate in terms of area and productivity of olives and olive oil.

| S.No | year | Cultivated Area (Dunums) | olive productivity (Kg / dunum) | Oil productivity (Kg / dunum) | The index number of cultivated area (%) | The index number of olive (%) | The index number of oil (%) |
|------|------|--------------------------|----------------------------------|--------------------------------|------------------------------------------|--------------------------------|------------------------------|
| 1 | 2000/2001 | 51080 | 204 | 38 | | | |
| 2 | 2001/2002 | 51977 | 135 | 25 | 101 | 66 | 65 |
| 3 | 2002/2003 | 51343 | 274 | 47 | 98 | 134 | 123 |
| 4 | 2003/2004 | 52235 | 323 | 63 | 101 | 158 | 165 |
| 5 | 2004/2005 | 52994 | 204 | 38 | 101 | 100 | 100 |
| 6 | 2005/2006 | 54618 | 211 | 35 | 103 | 103 | 92 |
| 7 | 2006/2007 | 50223 | 236 | 43 | 91 | 115 | 113 |
| 8 | 2007/2008 | 50526 | 73 | 17 | 100 | 35 | 44 |
| 9 | 2008/2009 | 50635 | 112 | 21 | 100 | 54 | 55 |
| 10 | 2009/2010 | 50665 | 120 | 22 | 100 | 58 | 57 |
| 11 | 2010/2011 | 51945 | 212 | 38 | 102 | 103 | 100 |
| 12 | 2011/2012 | 51945 | 257 | 48 | 100 | 125 | 126 |
| 13 | 2012/2013 | 51945 | 212 | 38 | 100 | 103 | 100 |
| 14 | 2013/2014 | 56685 | 146 | 28 | 109 | 71 | 73 |

*Source* of figures: Irbid Directorate of Agriculture Governorate 2014

The indicator of the cultivated area: We note from the previous table the slight fluctuation in the cultivated area between each year and the following year, where the highest increase was in 2013 compared to 2012, and the increase in the cultivated area was 9%. The largest decline in space was in 2006 compared to the year 2005, with an estimated 9%, but the planted area remained constant in the years 2009, 2008, and 2007 compared with 2006.

Fruit productivity index: productivity relates to the total production of cultivated area. The results of the study indicate a great fluctuation in productivity despite the increase in the area. This is due to the decrease in total production which is due to a number of reasons, the most important of which is the decrease in rainfall. Productivity in 2007 compared to 2000 as the base year fell by about 65%, which is a large percentage. One can explain this decline by a group of factors, the most important of which is the low rainfall in that year and the impact of resistance on production, while the largest percentage of the increase in productivity was in 2003 compared to the year 2000, The rate of increase in productivity was 58%, which is explained by improved rainfall rates in this year specifically.

Oil productivity index relates to two factors: the total olive production and the conversion rate which depends on the tree variety. From the previous table, we see a clear correlation between oil production and olive productivity in most years. The highest percentage was in 2003 compared to the base year 2000 with an increase of 65%, which is a large percentage. The largest decline was 56% in 2007. This is due to a decrease in production quantities this year and consequently a decrease in oil production.

## 3.3 Marketing Performance
Market performance can be evaluated by analyzing the costs and margins of marketing agents in different channels. A commonly used measure of system performance is the marketing margin or price spread. Margin or spread can be useful descriptive statistics if used to show how the consumer's price is divided among participants at different levels of the marketing system (Mendoza, 1995) [24].

## The Marketing channels of Olive and Oil
The process of marketing olives in Jordan is almost identical in terms of the marketing pathways followed by the product to reach the end consumer. This is also the case for olive oil. After harvest, the farmer sends the largest part of the product to oil mills to obtain oil but keeps part of the production for domestic consumption through pickling. Only clean fruits without blemishes or insect injuries are pressed or pickled. The same applies to people who prefer to buy olive fruits directly from the farmers themselves (from the farm door). The pickling plants also purchase quantities of produce directly from the farms under certain conditions. The rest are sent by some farmers to the retail market, where this type is sold at prices ranging from (1.5-2) dinars per kilogram. These markets are also consumer markets.

The olives are put in boxes of polystyrene, which can accommodate up to 20 kg each. The cost of these containers is 30-50 piasters/box or by packing in bags up to 50 kg. The cost of these bags is about 5 piasters. (Each Jordanian dinar is 100 piasters)

Transport costs vary depending on the marketing channels.

Harvesting time varies from one region to another, but harvesting is often done by mid-October. The costs of harvesting vary with laborers being family members or seasonal employment or both. Family labor is often low in cost, unlike seasonal labor costs that require people to do this task at a fairly high cost, which is often up to (10-13) dinars per person for each working day.

The bulk of the production, as mentioned earlier, is often sent to oil mills or extraction plants, which are considered the preferred places for the consumer to purchase oil. The oil is filled in 16 kg metal sheets and the price is about 1.5-2 thousand dinars per ton. The rest of the oil is returned to the farms to be marketed to relatives or the ocean of acquaintances and friends at prices ranging from 65-85 dinars per 16 kg. Sheet. These prices depend largely on credibility and trust between the farmer and the consumer.

Part of the pressed oil is also purchased by the owner of the mill for export or for sale to wholesalers who will sell it in turn to the consumer. It is also worth mentioning that the costs of picking olive fruits as well as the cost of the pressing mill are the largest agricultural costs followed by transportation, storage, and packaging.
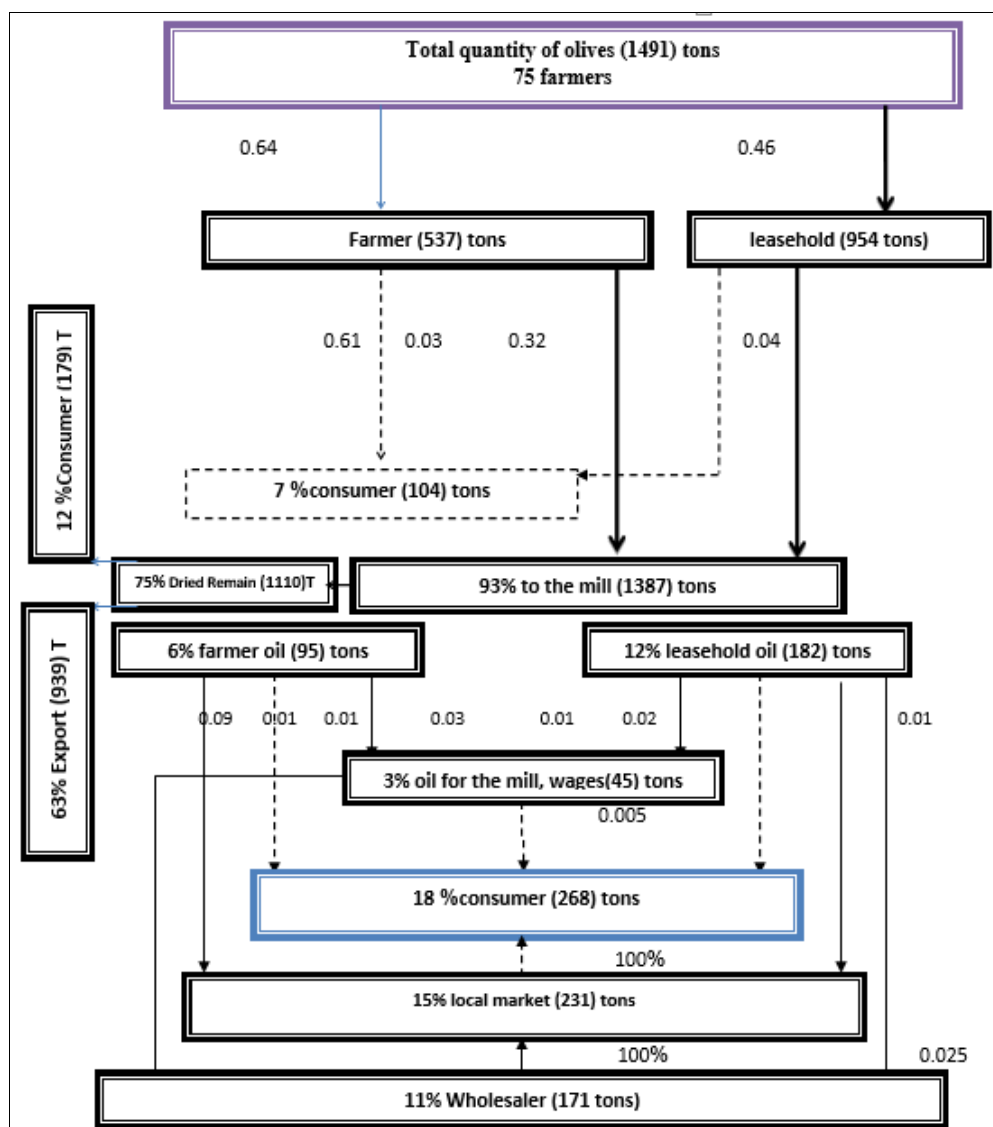
**Fig 3:** Marketing channels

**Marketing channels - olives**
The number of farmers who are included in the production (not lease) is (48) farmers representing (0.64) of the sample, and the amount of olives produced is (954) tons of olives.
The number of farmers who are not included in the production (lease production) is (27) or (0.36) of the sample size, and the number of olives produced here was (537) tons.

**The total quantity of olives produced from the research sample: (1491) tons**
**Marketing channels in case the farmer is the one who produces and markets**
C1 Farms - consumer (59 tons).
C2 Farms - fruits designed to reap oil (477 tons).

**Marketing channels in case the leasehold is one of the marketers**
C1 Leasehold - consumer (45) tons.
C2 Leasehold - fruits designed to reap oil (910) tons.

**2. Marketing channels of olive oil**
# Total quantity of oil produced from the sample (277) tons.

Olive conversion ratio to oil = (0.20)

**Oil Marketing channels if the farmer is the producer and marketer**
C1 Farms - (reap oil) - Consumable (30) Ton.
C2 Farmer - consumer (15) tons.
C3 Farms - Local Market - Consumable (45) tons.

**The marketing channels of oil in case the leasehold is the marketing**
C1 Leasehold – wages reap the oil - Consumable (15) Ton.
C2 Leasehold - consumer (15) tons.
C3 Leasehold - local markets - consumer (15) tons.
C4 Leasehold - wholesale markets - local markets - consumer (134) tons.

**The marketing channels of the oil from the mill paid as fees**
**The total amount of oil retained in the mill and paid as wages was (45) tons**
C1 Mill - consumer (7) tons
C2 Mill - Wholesaler - Local markets - consumer (37) tons)

# marketing channels to the Dried Remain (in Arabic jift) produce of fruits (calculated on the basis of the efficiency 100%)
The total quantity of dried produced = (1110) tons
C1 Presses - consumables (179) tons
C2 Presses - export - consumables (939) tons

## Market Performance
Market performance can be calculated by analyzing the costs and margins of marketing operators in different channels. The one generally used as a measure of system performance is the marketing margin or price spread. Margin or spread can be useful descriptive statistics if used to show how the consumer's price is divided among participants at the different levels of the marketing system (Mendoza, 1995) [24].

**Marketing costs:** Marketing costs are the embodiment of barriers to access to market participation by poor smallholders. It refers to those costs which are incurred to perform various marketing activities in the transportation of goods from producer to consumer. Marketing costs include handling costs (labor, loading and unloading, damage costs, transportation, etc.) before reaching an agreement, transferring the product, monitoring the agreement to see that its conditions are fulfilled, and enforcing the exchange agreement (Holloway 2002) [14].

**Marketing margins:** marketing margins can be used to measure the percentage of the final selling price obtained by an intermediary in the market chain and the relative size of the different market participants. The gross margins in the market chain indicate where the profits are added and/or generated in order to calculate the marketing margin.

**Table 8:** Marketing costs and the actor's benefits (Olives / kg)

| Items | Farm gate C1 | Local markets C2 | Pickles factories C3 |
|---|---|---|---|
| Purchase prices (JD) | 0 | 0.8 | 0.5 |
| Production costs (JD) | 0.45 | 0 | 0 |
| **Marketing cost (JD)** | | | |
| 1- Labour | 0.1 | 0.1 | 0.1 |
| 2- Transport | 0 | 0.05 | 0.05 |
| 3- overhead costs | 0.05 | 0.05 | 0.05 |
| 4 - packaging materials | 0.01 | 0.01 | 0.05 |
| 5 - Tax | 0 | 0.02 | 0.05 |
| total marketing cost | 0.16 | 0.23 | 0.30 |
| Total cost | 0.61 | 1.03 | 0.80 |
| Sale prices | 0.80 | 1.5 | 2 |

**Table 9:** Olive marketing margins in different channels.

| Marketing channels | Variable costs | Revenue (selling price) | Gross income (Revenue - costs) | Value Added (Return - the previous revenue) | gross profit margin (Total income / revenue) * 100 | Share value /Value Added (Retail price) * 100 |
|---|---|---|---|---|---|---|
| Farm gate | 0.61 | 0.80 | 0.19 | 0.80 | % 23 | % 40 |
| Local markets | 1.03 | 1.50 | 0.47 | 0.70 | % 31 | % 35 |
| Pickling factories | 0.80 | 2 | 1.20 | 0.50 | % 60 | % 25 |
| Total | | | | 2 | | %100 |

**Table 10:** Marketing costs and the actor's benefits (olives / kg)

| Items | Farmer | Mill | Local markets | Wholesalers markets | Export |
|---|---|---|---|---|---|
| Purchase prices (JD) | | 4.00 | 4.00 | 3.75 | 4.25 |
| Production costs (JD) | 2.5 | 0 | 0 | 0 | 0 |
| **Marketing cost (JD)** | | | | | |
| 1- Labour | 0.1 | 0.05 | 0.05 | 0.05 | 0.10 |
| 2- Transport | 0.05 | 0 | 0.05 | 0.05 | 0.10 |
| 3- Overhead costs | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| 4 – Packaging materials | 0.1 | 0.10 | 0 | 0 | 0 |
| 5 - Tax | 0 | 0.05 | 0 | 0 | 0.10 |
| Total marketing cost | 0.30 | 0.25 | 0.15 | 0.15 | 0.35 |
| Total cost | 2.8 | 4.25 | 4.15 | 3.90 | 4.60 |
| Sale prices | 4.5 | 4.60 | 4.80 | 4.90 | 6.50 |

**Table 11:** Oil marketing margins in different channels.

| Marketing channels | Variable costs | Revenue (selling price) | Gross income (Revenue - costs) | Value Added (Return – the previous revenue) | gross profit margin (Total income / revenue) * 100 | Share value Value Added (Retail price) * 100 |
|---|---|---|---|---|---|---|
| Farmer | 2.8 | 4.50 | 1.70 | 4.50 | 38% | 69.2% |
| Mill | 4.25 | 4.60 | 0.35 | 0.10 | 8% | 1.53% |
| Local markets | 4.15 | 4.80 | 0.65 | 0.20 | 14% | 3.07% |
| Wholesalers | 3.90 | 4.90 | 1 | 0.10 | 20% | 1.53 % |
| Export | 4.55 | 6.50 | 1.95 | 1.6 | 30% | 24.6 % |
| Total | | | | 6.5 | | 100% |

## 3.4 Marketing functions
The marketing functions are divided into 3 groups:
1) **Functions of exchange:** Which includes the purchases and sales0
2) **Physical functions:** Which include storage, transport, and manufacturing;
3) **Facilitating functions:** Which include staging and financing.

As for the exchange function of sales and purchase, the unfortunate situation is described as the sale of what was produced without reference to consumers' wishes or desires. Farmers usually sell their produce to relatives, friends, neighbors, and merchants. They also sell the produce to some of the state's institutions that deal with the olives and olive oil trade like the Civil and Military Consumer Establishments.

**Physical functions:** Include storage, transport, and manufacturing but suffer from obvious neglgence. No appropriate stores are available; olives and oil are usually placed in stores unsuitable for this purpose without control of temperature or humidity and other harming elements. Transportation means are often unsuitable for long-distance transport, given the mechanical damage which they may undergo, especially when they suffer from poor circulation (loading and unloading).

**Facilitator functions:** include sorting, insurance, finance, and information. They also suffer from a clear shortage. Sorting stations are not available. There is no sorting of olives whether marketed for the purpose of oil or for pickling as good fruits are mixed with bad ones, which adversely affects the quality of the product, as mentioned above

**Official marketing information** is almost non-existent. Information on international markets is completely unavailable. In many cases, information is missing on different markets within the country. Farmers may find some information about their own areas only. Lack of regulations for this sector and reliance on direct sales from producers to consumers or marketing intermediaries play a major role in the scarcity of marketing information.

## 4. Conclusions and Recommendations
### 4.1 The following have been concluded from this study
**Production**
1. The olive sector is still a traditional sector, relying on local varieties that are not improved the only traditional thing is the varieties, what about the production, harvesting, pressing, etc.

2. Low level of technical knowledge, especially among small farmers, who constitute a significant proportion.
3. The increase in production costs, especially prices of irrigation water, in we need supplementary irrigation when rainfall is below the level required for economic production.
4. High cost of fruits harvesting by hand and lack of mechanical harvesting means. Weak of farmer organizations.
5. Non effective agricultural extension.
6. Low productivity of trees.
7. High production cost of newly introduced improved olive varieties. Inadequate pests control programs and high costs of pesticides. Used for olive pest control such as olive fruit flies.
8. Absence of planning ahead of the establishment of the olive orchard, which has a specific role in the possibility of introducing agricultural mechanization.

### B. Manufacturing: (Processing)
1. Healthy olive fruits are not separated from unhealthy fruits during pressing which affects negatively the quality of the extracted oil.
2. Cleaning level is low which affects the quality of oil produced.
3. There is a lack of awareness in using suitable packaging pots or cans of different sizes (not suitable for marketing efficiently).
4. The current results show agreement with studies conducted by Bezabih (2008) [29], USAID (2011) in Nepal, report of the International Labor Organization (2013).
5. According to each study, objectives were carried out.

### C. Marketing
1. Low farmers' knowledge of post-harvest techniques and marketing.
2. Absence of marketing extension programs.
3. Low knowledge about marketing skills to improve competition of the Jordanian olive products.

### D. legislation
1- Weak legislation to protect national production.
2- Legislation and enforcement of laws related to quality control .
The current results show agreement with studies conducted by Mansur (2009) [10], USAID (2011) in Nepal, Ponte (2002) [30], (Bezabih, 2008) [29].
According to each study, objectives were carried out.

### 4.2 Recommendations of the study
The importance of olive production in Jordan in general and

in Irbid, in particular, is driven by economic, social, environmental, and cultural dimensions.

The economic importance of olives lies in its contribution to the agricultural national product on one hand, and its response to part of the food requirements of the population on the other hand. As well as its association with other sectors in providing production inputs for these sectors, such as the food industry, In addition to the high nutritional value of olive products, especially for rural communities who rely heavily on this product to obtain their nutritional needs.

This sector also provides opportunities for employment through the exploitation of some resources that cannot be exploited in other areas such as rugged terrain.

The social importance of olives is through the adoption of a large segment of rural households in this sector in whole or in part in the generation or support of income from other sources, as well as olive and its derivatives are the pillars of nutrition in rural areas so that the table is not devoid of olives and olive oil almost daily. It also helps to reduce migration by opening jobs for rural people.

Within the limits of this study the following recommendations can be taken in consideration to improve the olive production sectors in the study are

## A. Production
Most of the recommendations and development of production revolve around three main and important issues development the agricultural practices in the field of production, research and extension services, regulations, and legislation.

## Development the agricultural practices in the field of production
1. Selection of suitable land for olive growing.
2. Follow scientific methods starting with selecting good varieties and ending with good service operations and managing them on economic bases.
3. Increasing the number of trees per unit area.
4. Encouraging the farmers to rejuvenate the old trees through pruning.
5. Encourage farmers to use the minimum amount of suitable fertilizers.
6. Expansion of water harvesting and land reclamation projects.
7. Encouraging and/or obliging farmers to collect fruits at appropriate times and according to final use (olive oil, table olive)
8. Selecting good varieties and developing suitable cultural practices package.

## B. Developing research and extension
1. Implementation of extension programs to provide appropriate services to olive trees through guidance programs related to harvest and post-harvest techniques to raise awareness of the importance of proper transactions during and after harvesting.
2. Raise the allocation of scientific research in the field of establishment and management of farms and marketing as well as encourage research aimed at finding solutions to the phenomenon of alternate bearing in olive.
3. Developing and implementing an extension program that can utilize all scientific knowledge to improve the competence and capacity of olive production sector farmers in all processes from selecting the variety to tracking products in the market.
4. Increase the awareness of the importance of farmers' organizations and strengthen their capacity, especially in linking farmers to markets in this sector.

## C. Legislation
1. Review and improve the legislation and laws organizing the olive production sector concerning the testing of varieties, land fragmentation, organization structure of farmers, quality assurance, and marketing.
2. Develop a law for farmers' incentives that lead to improving the quality, and quantity.

## D. Promotion
1. Preparing and implementing promotional programs for local products in foreign and Arab markets.
2. To take care of holding festivals and exhibitions specialized in olives to promote local products internally.

** Further Studies in Another Location in Jordan are needed.

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