Assessing Porter’s Framework for National Advantage: 
The Case of Jordanian Agricultural Sector

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ABSTRACT
This study applied Porter’s Diamond Framework to explore the competitiveness of the Jordanian agricultural sector. A SWOT analysis was also used to review the strengths, weaknesses, opportunities and threats of the Jordanian agricultural sector.

Horticultural production can offer high returns and Jordan may have a comparative advantage in fruits and vegetables production. Given its natural resources and climate, one might expect Jordan to be capable of producing a variety of high-quality fruits and vegetables to meet stringent consumer demands in both domestic and international markets. But examination reveals poor production technologies, lack of marketing infrastructure, inadequate produce classification, in addition to unmet grading and packaging arrangements.

The Jordanian agricultural sector confirms Porter’s (1990) hypothesis, it derives considerable advantages from basic and generalized factors like lower labor cost. Jordan is a developing country with a large and rapidly growing population; this means that agricultural products face a considerable potential increase in demand. But in Jordan, the local demand relies on price rather than on quality and, as a result, the local market for agricultural products is not by any means sophisticated.

The diamond model showed that the current situation of the Jordanian agricultural sector does not reflect its full potential. Crucial issues concerning product quality and standards, packaging and marketing must be addressed if the sector is to be developed to meet its potential and compete globally.

Keywords: Porter’s diamond framework, Competitiveness, Jordanian agricultural sector.

INTRODUCTION
The agricultural trade sector is sensitive towards the fluctuations in global market, because Jordan is considered a food net-importer. The global competition is one of the most important challenges which face the Jordanian agricultural sector.

The agricultural trade of Jordan has seen a number of important changes. Agricultural exports grew much more moderately than exports of manufactures, resulting in a dramatic decline in the share of agricultural exports from about 50% of total exports in the early 1960s to less than 16% by 2004 (MoA, 2004).

Statistics indicated that the number of inhabitants depending on agriculture was approximately 18% of the total population in 2004. Jordan also has one of the highest population growth rates (2.2% in 2007) in the world (DoS, 2009). The inter-relationships between population growth and the depletion of natural resources, water in particular, are particularly significant in this resource-poor country.

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The goal of this study was to evaluate the competitiveness of the Jordanian agricultural sector.

The objectives to achieve the set up goal were:
- To shed light on the competitive challenges and achievements of the Jordanian agricultural sector.
- To determine the strengths, weaknesses, opportunities and threats of the agricultural sector in Jordan.

JUSTIFICATION

The Jordanian agricultural sector share in the Gross Domestic Product (GDP) has declined- in comparison with those of the other sectors- over the years from 8.1% in 1990 to 3.2% in 2007. This is due to the limitation of water resources and the dependence on the fluctuation of rainfall on one hand and the rapid development of the other economic sectors and structural changes in the Jordanian economy on the other hand (MoA, 2007).

In order to study the reasons behind the decline in the agricultural share in the GDP and the share in the agricultural exports in the total exports, this study used the ‘diamond model’ to analyze the agricultural cluster in Jordan and tempted to find how each determinant functions and interacts with the other determinants in the Jordanian agricultural sector.

LITERATURE REVIEW

Several studies have been conducted to estimate the comparative advantage of fruits and vegetables in Jordan. Al-Zu’bi (2003) conducted a study to analyze the competitive capacity of Jordanian exports of fruits and vegetables using Revealed Comparative Advantage (RCA) indicator, and the study found that Jordan enjoys a strong competitive advantage in most kinds of vegetables and fruits.

Al-Zubi (2003) used also “Porter's National Diamond Model” to come up with the strengths to modify them and weaknesses to suggest their solutions.

A Jordan Valley study has been carried out by the National Competitiveness Team (2000) to analyze the agricultural cluster in the Jordan Valley by using the diamond model. It concluded that the current situation of the agricultural sector does not reflect its full potential.

Finally, several international studies focused on Porter’s diamond framework. Ozlem (2002) tried to identify the sources of international competitive advantage to Turkey to contribute to an improvement in this framework and thus move towards a better understanding of the sources of competitive advantage. The findings were generally supportive of Porter, meaning that the diamond framework works well in a developing country setting.

Neven (2001) argued that Porter’s diamond model is superior in explaining cluster dynamics and Porter’s diamond theory seems better than other paradigms currently used in the study of clusters in developing countries.

THEORETICAL ISSUES

This study applied the Diamond Model for the Competitive Advantage which Michael Porter (1990) introduced in his book: The Competitive Advantage of Nations. It is the first theory of competitiveness based on the causes of the productivity with which companies compete instead of traditional comparative advantages such as natural resources and pools of labor. Because these factor endowments can hardly be influenced, this fits in a rather passive (inherited) view towards national economic opportunity.

As a rule, The Competitive Advantage of Nations has been the outcome of 4 interlinked advanced factors and activities in and between companies in these clusters. These can be influenced in a pro-active way by the government (Figure (1)) (Porter, 1990):

1. Firm strategy, structure and rivalry (the world is
dominated by dynamic conditions and it is direct competition that impels firms to work for increases in productivity and innovation).

2. Demand conditions (the more demanding the customers in an economy, the greater the pressure facing firms to constantly improve their competitiveness via innovative products, through high quality,… etc).

3. Related and supporting industries (spatial proximity of upstream or downstream industries facilitates the exchange of information and promotes a continuous exchange of ideas and innovations).

4. Factor conditions (contrary to conventional wisdom, Porter argues that the "key" factors of production (or specialized factors) are created, not inherited. Specialized factors of production are skilled labor, capital and infrastructure. "Non-key" factors or general use factors, such as unskilled labor and raw materials, can be obtained by any company and, hence, do not generate sustained competitive advantage).

The role of government in Porter's Diamond Model is "acting as a catalyst and challenger; it is to encourage - or even push - companies to raise their aspirations and move to higher levels of competitive performance …". They must encourage companies to raise their performance, stimulate early demand for advanced products and focus on specialized factor creation, stimulating local rivalry by limiting direct cooperation and enforcing anti-trust regulations.

ANALYTICAL FRAMEWORK

First: Porter's Diamond Framework

This study applied Porter's Diamond Framework to the Agricultural Sector in Jordan to explore the competitiveness of the Jordanian agricultural sector.

Second: SWOT Analysis

A SWOT analysis has been used to review the strengths, weaknesses, opportunities and threats of the Jordanian agricultural sector (Gosling, 1995).
determinants in the Jordanian agricultural sector by analyzing its determinants. Accordingly, apart from the examination of secondary data, field interviews with government officials have been conducted to perform this analysis following Porter’s methodology.

It may appear that Jordan has little to start with: no rivalry, no effective home demand, few supporting industries and no factors other than cheap labor. There are however also “hidden resources” that allow for a lot of leverage but that face significant frictions (in the physical and transaction cost sense). Making these hidden resources come to surface will require an effort that is like “plowing the sea” (Neven et al., 2001).

The diamond model can be an excellent tool in the process of seeking both where frictions and levers possibly lay and where countries need to start searching for them. Regional competitive advantage relates to the strength of endowed resources, factor conditions related to production in a region, rivalry and support from the government. This section takes the responsibility of applying Porter’s Diamond Framework on the Jordanian agricultural sector.

**A. Factor Conditions**

In regard to the factor conditions, the Jordanian agricultural sector confirms Porter’s (1990) hypothesis, it derives considerable advantages from basic and generalized factors like lower labor cost. The weaknesses that the agricultural sector suffers concerning advanced and specific factor conditions like specific research and education institutions and infrastructure are also in the line with Porter’s findings, since he argues that many industries in a developing country are more likely to derive most of their advantages from the basic and generalized factors.

The role of factor conditions in agricultural product competition depends on the form of international competition. Factor conditions are usually important to success. For example, agriculture depends heavily on climate and geography.

The study presents herewith the most important factor conditions that influence the Jordanian agricultural sector.

**1- Climate**

The climate is generally arid, with more than 90% of Jordan's total area receiving less than 200 mm of rainfall per year and more than 70% of the country receiving less than 100 mm of precipitation in a year. Only approximately 2% of the land area, located in the north-western highlands has an annual precipitation exceeding 300 mm, though the northern highlands may receive as much as 600 mm. About 5.5% of Jordan's area is considered dry land with annual rainfall ranging from 200 to 300 mm.

Jordan is a country with a diverse ecosystem. The Jordan Rift Valley with its specific climate conditions enables agricultural cultures all around the year. The warm climate permits the farming of a wide range of products ranging from vegetables and fruits to field crops. More importantly due to the mild weather enjoyed during the winter season, the Jordan Valley has a competitive advantage over Mediterranean countries (JNCT, 2000). While certain crops cannot be nurtured in the Mediterranean basin during the winter season, the Jordan Valley continues to produce such crops of fruits and vegetables in the cold season as well.

**2- Water Resources**

Jordan is characterized by a pronounced scarcity of renewable fresh water resources, which averages at 680 MCM per year, or approximately 145 m³ per capita for all uses. Thus, Jordan's water resources are, on a per capita basis, among the lowest ten countries in the world (MoA, 2006).

The water resources in Jordan are: surface water as stream flow from rivers and valleys and stored surface water in dams, ground water and the reuse of water.

**Surface Water**

High evaporation and infiltration result in a relatively small annual stream flow. There are 15 drainage basins in
Jordan that have a total average surface flow of approximately 693 MCM/year. Of the total amount of the surface flow: 359 MCM/year consist of base flow and approximately 334 MCM/year consist of flood flow.

Nine dams provide a gross storage capacity for irrigation water of about 217.9 MCM (MWI, 2004). The quantity of stored water in these dams in 2004 was 165 MCM which equals to 75.5% of the storage capacity and it declined to 86.7 MCM in 2005 which equals only 40% of the storage capacity due to fluctuations in rainfall in 2004/2005 season (MoA, 2006).

**Groundwater**

Groundwater is the major source of water supply in the country. There are 12 renewable and non-renewable groundwater basins in Jordan most of which are comprised of more than one groundwater aquifer system. The Disi aquifer (Ram), along with the Amman-Wadi Sir aquifer system and the Basalt aquifer contain approximately 80% of Jordan’s known groundwater.

There is excess pumping of groundwater especially in the highland areas (Dheleil and Azraq basins). This leads to a depletion of resources and an increased salinity of water.

**Wastewater**

Due to acute water shortage in Jordan, treated wastewater has become an essential resource in the Kingdom’s water strategy. Nevertheless, planned direct reuse of treated wastewater is limited to the irrigation of trees in the vicinity of the treatment plants and discharges to wadis where the treated wastewater reaches storage reservoirs and is then used for restricted irrigation.

A program of continuous monitoring of all watercourses carrying wastewater is being carried out by the Department of Environmental Health.

**Water Consumption According to Sectors**

There is a strong competition between the agricultural sector and other sectors regarding their shares of water consumption. Irrigation water for agriculture makes up the largest share of total average water consumption with 61% in 2005.

The Government of Jordan has proposed two strategic projects in order to provide the country with additional water. One is pulling water form Disi aquifer and the other is connecting the Dead Sea with the Red Sea and it is predicted that those two projects will supply Jordan in 2020 with an additional quantity of water which equals about 950 MCM (Prime Ministry, 2006).

**3- Agricultural Labor Forces**

The agricultural sector is labor-intensive and could provide rural employment. The share of agricultural employment in the total employment decreased from 16.8% in 1973 to 10.2% in 1980 and then decreased to 7.3% in 1990 and to 6% in 2007.

This decline is due to the decrease in the return on the agricultural production and to the transfer of employment to other sectors. The Jordanian labor market, especially in the agricultural sector, showed an increase in the employment of guest workers who are mainly engaged in operations that need unskilled labor or strictly physical work. It was estimated in 2004 that 27% of the paid agricultural labor force was guest labor (Athamneh, 2006).

**4- Land Resources**

The total land area of Jordan is approximately 88.8 million du; arable land is about 8.86 million du, but only 3.2 million du were cultivated in 2005. Most of this cultivated land is in the highlands (MoA, 2006).

Rain-fed agriculture is concentrated in the highland regions where most of the Kingdom’s population lives. It contributes to the incomes of around 80 thousand families most of which are of limited or low income (MoA, 2005).

Irrigated agriculture is considered one of the most efficient factors in the agricultural production; it contributes about 80% of the plant agricultural income, 34% of the total agricultural income and 1.22% of the GNP (MoA, 2006). The irrigated area is located in the Jordan Valley and the
Southern Dead Sea.

Natural rangeland in Jordan is an important source of livestock feed. The area of natural rangelands is about 80 million du and resembles about 90% of the total area of Jordan. Registered forestland comprised about 1.3 million du in 2005. Rainfall in this area is low, irregular and of uneven distribution. These lands are in a general state of degradation due to harsh environmental conditions, misuse from overgrazing and the cultivation of marginal areas. Limited areas in this region were put under irrigation by using ground water resources lately. Land receiving less than 50 mm of rainfall is effectively excluded from any agricultural use, whereas areas receiving less than 200 mm of rainfall can only be used for seasonal grazing.

5- Agricultural Investment and Capital Stock in Agriculture

Agricultural production is typically a risky business. Farmers face a variety of price, yield and resource risks, which make their incomes unstable from one year to another.

The share of agricultural investment of Jordan's gross fixed investment is low and most of this investment has been channeled into the irrigated sector.

Data of Investment Enhancement Institution indicated that there were 52 projects in 2005 that benefited from the institution facilities with a total value of 26 million JD, most of them are from domestic finance sources (MoA, 2006).

Agricultural Credit

At present, the Agricultural Credit Corporation (ACC) is the only specialized agricultural credit institution in Jordan. Most of the loans offered by ACC are medium-term loans for financing land reclamation, purchasing farm machinery, planting fruit trees, drilling deep wells, erecting greenhouses and purchasing drip irrigation systems. Most of the credits provided by ACC were less than 10,000 JD per loan, while loans that exceeded 30,000 JD constituted only 6% of the total. This indicates that ACC loans are not adequate, particularly to expand the production process and introduce technology. Short-term loans are also offered by commercial banks and are used to finance imports of agricultural equipment. Some big farmers with high-value collaterals can also obtain loans from commercial banks.

ACC provided agricultural credits in 2004 of about 10.9 million JD. Also ACC started in 2004 a Micro Credit Project which amounted to 25 million JD in order to eliminate poverty and unemployment problems. This project provides credits with only 5% interest rate and its period is five years. In 2005, the agricultural credit provided by ACC reached 16.4 million JD, about 4560 farmers benefited from it and about 57% of lenders were women working in agriculture or running small projects (MoA, 2006).

6- Agricultural Inputs

The availability of improved agricultural inputs on the Jordanian market is a vital requirement to speed up the adoption rate by farmers and thereby increase the growth of agricultural production. There are two sources of purchased inputs: domestically produced and imported. Certain inputs, such as fertilizers, plastic materials and pipes, concentrated feeds and veterinary medicaments are produced at home, but Jordan depends on imports for the majority of its agricultural inputs.

B. Demand Conditions

Regarding demand conditions, Porter believes that home demand has a considerable influence on competitive advantage and presents the composition, the size and pattern of growth and the internationalization of home demand as three broad attributes of it. Results confirm Porter’s (1990) hypothesis. Jordan is a developing country with a large and rapidly growing population; this means that agricultural products face a considerable potential increase in demand.

Home demand is local customers who push companies to innovate, especially if their needs or tastes
anticipate global or local demand. But in Jordan, the local demand relies on price rather than quality and, as a result, the local market for agricultural products is not by any means sophisticated. This particular feature has a direct impact on the development of agriculture in Jordan, as it discourages customary practices of product quality enhancement. Accordingly, the foreign demand on Jordanian agricultural products is meager.

Moreover, the fact that Jordan’s agricultural sector does not derive substantial advantages from the demand conditions is also in line with what Porter envisages for a developing country.

**Consumption**

Jordan is still unable to obtain self-sufficiency in food due to certain constraints pertaining to scarce natural resources, institutional, financial and technical constraints, as well as economic and social factors that have directly and indirectly affected the agricultural sector.

Jordan is self-sufficient in vegetables and some fruits, since it produces a surplus for export, mainly to the Gulf countries. More than one million tons of vegetables and about half a million tons of fruit were consumed in the year 2004.

The striking feature is the steady high rise in the consumption of fruit, which was more than doubled during the past decade. The population increase is one factor behind this, but more importantly, it may be attributed to the rise in incomes and the consequent change in the pattern of consumption for certain groups within the society (El-Habbab et al., B, 2002).

**C. Related and Supporting Industries**

The existence of some related and supporting industries that are internationally competitive will support the agricultural sector.

1- Extension and Research

**Extension**

Agricultural extension is considered an important element in the development of the agricultural sector. Although extension is one of the components supporting development, it is also supported and affected by the quality of agricultural research and the degree to which policy and prices support the use of technological adoption. Realizing that the Jordanian government tries to provide farmers with extension services through formal institutions such as the MoA and its institutions, extension services are still weak and do not meet the farmers' needs.

The low level of public extension coverage and the lack of relevant technology to be disseminated have given private firms a major role in introducing new technologies to farmers. However, this is not to suggest that the private firms are perfect substitutes for public extension. Public extension is still necessary for the transfer of improved technology to small farmers and women who are less commercialized and for matters related to the public interest. So a complementary working relationship between private and public extension services has to be established.

**Research**

The National Center for Agricultural Research and Extension (NCARE) has been given financial and administrative autonomy under the umbrella of the Ministry of Agriculture.

In addition, NCARE has the direct responsibility for the identification, testing, adoption and transfer of technical, management and policy information, thus contributing to the achievement of Jordan's national agricultural development goals.

2- Food Processing and Food Industry

Food industry in Jordan contributes in absorbing large quantities of agricultural products. Factories of food industry are considered one of the most important marketing channels for most of the primary agricultural products for industry, constituting 33% of the total exports and employing about 15% of the total labor.
Also, this channel polarizes 20% of the total investment directed to the transformative industry cluster. And it contributes a percentage of 8% of the total agricultural production (AOAD, 2001).

There are 42 factories for fruit and vegetable processing in different shapes: frozen, pickled and packed (Al-Hisni, 2004).

3- Transportation Facilities

The transportation cluster is considered one of the most important clusters that provide the marketing of fresh fruits and vegetables (FFV) with the needed facilities.

Jordan’s fleet of refrigerated trucks is composed of 600 trucks in addition to 100 refrigerated trucks from neighboring countries (Musalam, 2004), equipped to transport FFV and other food commodities. This fleet is mainly used for the export of fruits and vegetables to the neighboring Arab market. Most of the trucks are old and don’t meet the European specifications.

The cost of land transportation is high because of high fees and fines paid by trucks upon transit entrance to neighboring countries; for example it costs 75 JD for trucks of 18 tons capacity to export FFV to Syria and 79 JD to Lebanon (Al-Tarawneh, 2005).

Small quantities of high quality produce are air-shipped (to Europe and North America) by few Jordanian exporters via the Royal Jordanian Airlines. There is also some export of specialty produce and flowers by air to Saudi Arabia. The general practice is to partially refrigerate the air-shipped produce before packing. The harvested produce is placed in ventilated plastic boxes. The produce is packed in cartons prescribed by the European standards. After packing, the produce is stored in a refrigeration facility until it is transported to the airport in refrigerated trucks (El-Habbab et al.A, 2002).

4-Sorting, Grading and Packing Facilities

There are 46 grading and packing centers owned by the public and private sectors. They have been established in Jordan since the 1970s (Musalam, 2004).

5- Container Production Factories

There are 15 factories in Jordan for producing cardboard, plastic and polystyrene containers. There are also several wood containers of various dimensions and sizes produced by a large number of carpentry shops upon request.

Polystyrene boxes should be substituted by multi-uses plastic and wooden boxes. The local boxes made of corrugated cardboard are of good quality and are suitable for export to all markets (MEMARE, 1997).

6- Storage Facilities, Pre-cooling Units and Ripening Rooms

In handling perishable products, maintaining a cold chain is a major logistical issue. It determines the quality of the product as it arrives at its destination.

There are 27 refrigerated stores in Jordan. These stores are well equipped to receive and store fruits and vegetables (Al-Hisni, 2004).

As for fruit tree crops, storage is mainly restricted to apples and citrus (oranges). Other fruits are due to the relatively low production figures, not stored and marketed immediately during the harvest season. Many apple growers have their own cold storage rooms, while others rent such facilities for few months to store their produce.

Exporters’ interest in using pre-cooling units is still very low and at present there are only three such units in Jordan, all of which use the forcing air method (Al-Hisni, 2004).

Some kinds of fruits need to be stored in the industrial ripening rooms, such as avocado and banana in order to ripen. There are 80 centers in Jordan for industrial ripening (Al-Hisni, 2004):

D. Firm Strategy, Structure and Rivalry

There is an increase in competition in the domestic market between imports and goods produced domestically. Although this competition may be
important and beneficial, as it obliges producers to reduce their costs and improve the quality of their products, some inefficient producers may suffer, at least in the short-run.

According to Porter (1990), the existence of intense domestic rivalry is of special importance, since it encourages firms to upgrade. This section will describe the market structure and export status of fruits and vegetables in Jordan.

**Markets**

Since the 1970s, one central wholesale market, seven municipality wholesale markets and one cut-flower wholesale market have been established in various municipalities and locations in Jordan. The basic function of these markets is to provide a market place for producers, retailers and commission agents to conduct selling and buying transactions.

With very limited exceptions, the marketing of fresh horticultural produce in Jordan has always been a private-sector concern. The prevailing marketing channel involves the movement of produce to one of the wholesale markets. The produce is consigned to a commission agent, who auctions it to wholesalers, retailers and exporters.

Commission agents are estimated at 99 in the Amman wholesale market, 45 in Irbid, 25 in Zarqa and a small number in other markets. Those agents sell in wholesale markets on behalf of the producer on the basis of obtaining a commission of 5% of the sale value (Greater Amman Municipality, 2006). Many producers are tied to specific commission agents who provide them with advance finance in cash or in kind, such as production inputs, containers for collection and transport of crops. This results in perpetual indebtedness of producers towards the commission agent and leads to a poor bargaining position of farmers and a weakening of market competition (El-Habbab et al. A, 2002).

Marketing cost represents a considerable portion of total costs, even for the relatively short distances that most products have to travel from the producing areas in the Jordan Valley and highlands to Amman. For example, in 2003 twelve major crops represented 70% of fruit and vegetable production, the marketing costs ranged from 18% to 44% of the farm gate price, and those costs would have been considerably higher if post-harvest product losses had been taken into account (Sabillon et al., 2006).

**Strategy**

In general, fruits and vegetables are harvested and packed directly into various types of containers and sent without sorting, grading, weighing or pre-cooling to wholesale markets or to exporters’ packing facilities. In this case, containers normally have a mixture of fruits of different sizes and of different maturity levels. In addition, attractive-looking produce is packed on the top of each box and low-quality produce is hidden in the lower part.

It is believed that, for many products, post-harvest losses are quite high, owing to poor training and education of farmers in the use of post-harvest technologies (Al-Bdour et al., 2004). Products are transported to wholesale markets and to the exporters’ packing facilities by hired transporters, using small un-refrigerated and usually open-bed pick-up trucks.

**Exports**

Total exports from Jordan in the year 2006 amounted to 529 thousand tons of vegetables and 40.7 thousand tons of fruits. The main export markets are the low and medium quality markets of the United Arab Emirates, Kuwait, Qatar and Lebanon, while other neighboring countries have increased their efforts to serve the top end of the Gulf market. About 49% of the vegetable exports consist of tomatoes marketed mainly to the Gulf States, eggplant comes next (approx.11%), then cucumbers (approx. 8%) (MoA, 2006). About 31% of fruit exports consists of
clementine and lemons comes next (approx. 13%).

United Arab Emirates was considered the main export market for Jordan’s fruits and vegetables. It received about 133.4 thousand tons of these crops as average to the period (2001-2005), Syria came next (about 88.9 thousand tons), then Kuwait (70.5 thousand tons) then Bahrain (about 39.3 thousand tons) and Qatar (about 38.9 thousand tons). Jordan’s agricultural export to non-Arab countries is small, amounting to about only 2.7% of the total exported in the year 2004 (MoA, 2006).

Jordan lacks well-established export companies specialized in fresh horticultural produce. It should be noted that food quality standards will be raised in the near future in the Gulf markets, so quality is increasingly becoming the key issue for sustaining agricultural export growth.

Strategy

In the case of exports to the Gulf markets, the shipments are carried out directly from the wholesale markets or farms without undergoing prior grading or proper packaging. The only process applied to the product is re-packing and labeling. Accordingly, the Jordanian products are sold at low prices in the Gulf markets.

Nevertheless, Jordanian producers avoid European markets because they are not ready to comply with the pre-requisites set by international export standards. Needless to say that such processes lead to the improvement of product quality and boost the exports accordingly.

The modest volume of exports can be accredited to the general strategy truism farmers seem to practice in Jordan, “market what is being produced rather than produce what is being demanded”. This general trend poses higher risks to farmers and the agricultural sector than is generally assumed, since there is no guarantee that sufficient demand for the product can be secured.

SWOT Analysis

Agricultural sector is in a rather good position for developing and marketing significantly better horticultural crops.

Accordingly, apart from the examination of secondary data, field interviews with government officials have been conducted to perform SWOT analysis.

An examination of the Jordanian agricultural sector image, its distribution and its physical and human resources indicates the following strengths and weaknesses:

**Strengths**
- Strategic Location.
- Diverse ecosystem.
- The Jordan Valley region represents a natural greenhouse.
- The warm climate permits the farming of a wide range of products.
- The Jordan Valley has a competitive advantage over Mediterranean countries.
- Competitive labor cost.
- Relatively cheap guest labor.
- Small and high potential agricultural land resources.
- Jordan has a comparative advantage in producing most kinds of fruits and vegetables.

**Weaknesses**
- Scarcity of renewable fresh water resources.
- Overexploitation of renewable and non-renewable groundwater resources.
- Unskilled guest labor.
- High rate of land fragmentation and a reduction in the size of agricultural holdings.
- Sources of financing to purchase agricultural technology are limited in Jordan.
- Most of the loans offered by ACC are medium-term loans.
- ACC loans are not adequate.
- Local demand relies on price rather than on quality.
- Extension services are still weak and do not meet the farmers’ needs.
- Most of the primary inputs are imported.
- Most of the trucks are old and don’t meet the European specifications.
- Not enough flights are available.
- High cost of cardboard boxes.
- Jordan’s agricultural export to non-Arab countries is small.
- Low prices in the Gulf markets.
- Investment in Research and Development (R&D), high-tech products and post harvest research have been conferred less relevance.
- Agricultural sector depends heavily on traditional methods.
- Farmer strategy “market what is being produced rather than produce what is being demanded.”
- High marketing margins (between producer and consumer prices).
- Instability of prices.
- Weak lines between supply and market demand.
- High percentage of lost and damaged goods at different marketing stages.
- Inability of the present marketing system to increase exports to the traditional markets and to enter high income markets.
- Low price and quality competitiveness of local products.
- Weakness of the marketing infrastructure, especially in the area of wholesale markets.
- Modest volume of exports.
- Lack of data regarding the specific pricing of similar products in the destination markets.
- Lack of proper and informed data regarding the quantities demanded by foreign markets.
- Lack of production know-how and post-harvest technologies.
- Difficulties in meeting European certification requirements.
- Lack of trained labor to use required technology, especially in post-harvest and packing techniques.
- Absence of contract-based farming.
- The separation of research and extension.
- Absence of well-defined and comprehensive research plans.
- Lack of research programs necessary to sharpen the focus on priorities and goals according to present and future needs.
- Lack of coordination among concerned research institutions.
- Inadequacy of trained and qualified manpower.
- Limited budgetary support to research.
- High extension staff turnover and weak links with farmers.
- High costs of land transportation.
- Exporters’ interest in using pre-cooling units is still very low.
- The wholesale market is controlled and manipulated by commission agents.
- Overlapping of responsibilities, lack of coordination and unclear role among governmental institutions.
- Jordan lacks well-established export companies specialized in fresh horticultural products.
- No quality control to face global competition.

A review of Diamond’s framework suggests the following opportunities and mentions threats that are currently facing the Jordanian agricultural sector.

Opportunities
- Establishment of a large national company to market horticultural products.
- Numerous trade protocols and counter trade agreements are in effect.
- Jordan has become a party to the Euro-Med Partnership.
- Establishment of AFTA and the removal of trade barriers.
- Unmet demand in West European FFV markets.
- The Gulf market is a major market for Jordanian products.
- There is a considerable scope to increase Jordan’s exports to Europe and also to the Gulf countries through improvement of variety and quality.
- Implementing contract-based farming.
- Well-equipped refrigerated stores.
- Recent amendments in the agricultural policies.
- There are many centers for grading, packing and storage that could be utilized.
- Production possibility throughout the year (local companies can bridge a full-year period of harvesting and exporting of many products).
- Off-season production in the Jordan Valley has a very attractive return of exporting to Europe.
- The East Europe market is expanding and accessible to Jordanian trucks with relatively low costs.

**Threats**
- Climatic changes (frost, drought,…).
- Strong competitors in home and foreign markets with lower prices and higher quality.
- The existing economic and political blocks and globalization.
- Quality standards that are needed for European exports are hard to achieve, especially concerning the EuropeGAP.

**CONCLUSION**

At this point, it is worth drawing the main findings from the research outlined in the preceding sections and seeing what they might imply with respect to the potential for a competitive agricultural sector (Table 1).

Horticultural production can offer high returns and Jordan may have a comparative advantage in fruit and vegetable production. Given its natural resources and climate, one might expect Jordan to be capable of producing a variety of high-quality fruits and vegetables to meet stringent consumer demands in both domestic and international markets.

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<th>Export or Import Substitution</th>
<th>Strengths</th>
<th>Weaknesses</th>
<th>Potential</th>
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<tr>
<td>Import substitution</td>
<td>Cheap Labor</td>
<td>Water shortage</td>
<td>Medium</td>
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<td>Export potential</td>
<td>Favorable climate</td>
<td>Poor market infrastructure</td>
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<td>Local demand reliance on price rather than on quality</td>
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</table>

The Jordanian agricultural sector should focus on the cultivation of products that necessitate the least amount of water, yet generate high revenues; e.g., the production of strawberries needs 250 m³/dunum and yields JD 8 per m³ as opposed to bananas, which consume around 2000 m³ of water per dunum and yield only JD 1 per m³ (JNCT, 2000).

Sources of advantage and key findings that don't comply with the diamond in the Jordanian fruit and vegetable sector are listed in Table 1. In regard to the factor conditions, the Jordanian agricultural sector confirms Porter’s (1990) hypothesis, it derives considerable advantages from basic and generalized factors like lower labor cost. The weaknesses that the agricultural sector suffers concerning advanced and specific factor conditions, like specific research and education institutions and infrastructure, are also in line
with Porter’s findings, since he argues that many industries in a developing country are more likely to derive most of their advantages from the basic and generalized factors.

Regarding demand conditions, Porter believes that home demand has a considerable influence on competitive advantage and he presents the composition, the size and pattern of growth and the internationalization of home demand as three broad attributes of it. Results confirm Porter’s (1990) hypothesis. Jordan is a developing country with a large and rapidly growing population; this means that agricultural products face a considerable potential increase in demand. But in Jordan, the local demand relies on price rather than on quality and, as a result, the local market for agricultural products is not by any means sophisticated. This particular feature has a direct impact on the development of agriculture in Jordan, as it discourages customary practices of product quality enhancement. Accordingly, the foreign demand for Jordanian agricultural products is meager.

Moreover, the fact that Jordan’s agricultural sector does not derive substantial advantages from the demand conditions is also in line with what Porter envisages for a developing country.

The existence of some related and supporting industries in Jordan that are internationally competitive will support the agricultural sector. According to Porter (1990), the existence of intense domestic rivalry is of special importance, since it encourages firms to upgrade.

Examination reveals poor production technologies, lack of marketing infrastructure, inadequate produce classification, grading and packaging arrangements.

### Table 2: Sources of advantage and key findings that don't comply with the diamond in the Jordanian fruit and vegetable sector.

<table>
<thead>
<tr>
<th>Diamond Element</th>
<th>Key Findings</th>
<th>Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor Conditions</td>
<td>Jordan derives considerable advantages from basic and generalized factors like lower labor cost.</td>
<td>H</td>
</tr>
<tr>
<td>Demand Conditions</td>
<td>Jordan does not derive substantial advantages from the demand conditions.</td>
<td>L</td>
</tr>
<tr>
<td>Related and Supporting Industries</td>
<td>The existence of some related and supporting industries in Jordan that are internationally competitive will support the agricultural sector.</td>
<td>M</td>
</tr>
<tr>
<td>Firm Strategy, Structure and Rivalry</td>
<td>The existence of intense domestic rivalry is of special importance and encourages firms to upgrade.</td>
<td>M</td>
</tr>
<tr>
<td>The Role of Government</td>
<td>Crucial issues concerning product quality and standards, packaging and marketing must be addressed if the sector is to be developed to meet its potential and compete globally.</td>
<td>M</td>
</tr>
</tbody>
</table>

Key: The effect of the diamond element on the competitive advantage of the FFV sector has been assessed as either high (H), medium (M) or low (L).
The Jordanian agricultural sector regards price competition and exports to the Gulf countries as major strategic goals, overlooking significant elements such as quality and quality control. As a result, the investment in Research and Development (R&D), high-tech products and post harvest research have been conferred less relevance in Jordan. While in the international markets high-tech products are highly valued, the Jordanian agricultural sector depends heavily on traditional methods. Consequently, in Jordan, new farming techniques have been used with moderation.

In conclusion, the current situation of the Jordanian agricultural sector does not reflect its full potential. Crucial issues concerning product quality and standards, packaging and marketing must be addressed if the sector is to be developed to meet its potential and compete globally.

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