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NATIONAL AGRO-FOOD POLICIES IN JORDAN

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1. Description of agro-food sector

1.1 Importance and role of agro-food sector

1.1.1. Relative size to national economy

Agriculture in Jordan contributed substantially to the economy at the time of Jordan's independence, but it subsequently suffered a decades-long steady decline. In the early 1950s, agriculture constituted almost 40 percent of GNP; on the eve of the June 1967 War, it was 17 percent. By the mid-1980s, agriculture's share of GNP in Jordan was only about 6 percent, (Chapin Metz, Helen, 1989). In contrast, in Syria and Egypt agriculture constituted more than 20 percent of GNP in the 1980s.

Several factors contributed to this downward trend. With the Israeli occupation of the West Bank, Jordan lost prime farmland. Starting in the mid-1970s, Jordanian labor emigration also hastened the decline of agriculture. Many Jordanian peasants abandoned farming to seek for lucrative jobs abroad. Others migrated to cities where labor shortages had led to higher wages for manual workers. Deserted farms were built over as urban areas expanded, (Chapin Metz, Helen, 1989)

Agriculture's direct contribution to GDP has been around 5 percent since 1995, about 2-3 points less than its contribution in 1992. It is estimated, however, that 25-30 percent of economic activity depends on agriculture. In 1997, the average GDP per agricultural holding (roughly equivalent to a farmer) was estimated at about JD2, 700 or, on a per capita basis, around JD 4502. This is only one-third of the national average per capita income, (Hjort, Kim C., 1998).

In the year 2006, the agricultural sector share in the Jordanian GDP reached 6.2%. Such share fluctuated along the successive three years (2007-2009) between 6% and 7%, due to fluctuation in the agricultural production value, while the Jordanian GDP has kept steady growth over the same period, (Table 1). It should be mentioned that the values of agricultural production is the value added after deduction of the intermediate agricultural products used in the sector. While, the FAO country profile estimates the gross agricultural production value of Jordan as 2108 million US in 2009, (FAO, 2011), the value added generated by agricultural production in the same year was about 71% of the gross value. Such evidence shows how much is the agricultural sector self-finance or self-reliance.

1.1.2 Agro-food sector and the society

In November 1996, the legislature enacted "The Agricultural Policy Charter" (the Charter) which institutionalizes the policy reform undertaken as part of the restructuring program and establishes long-term goals and objectives for the Kingdom's agricultural sector and agricultural policies. The Charter is developed on the premise that rural areas in Jordan and the holding of farmland links current generations to a "homeland and natural and cultural habitat."

Another mandate in the Charter is the expansion of private sector participation in the agricultural sector. This is being supported in several ways. The most important means is removal of the government from the role of both primary buyer and supplier of feed and food grains and pulses.

In addition, economic incentives, such as exclusion of 75 percent of investment expenditures on agricultural projects from trade and domestic general sales taxes, are being provided to the private sector to encourage investment. Overall, the idea is to limit government's role in agriculture to provision of institutional support such as extension, research, and infrastructure investments.

The transition from a government-dependent or highly subsidized sector to a completely free market oriented sector, under what is called the adjustment program of the agricultural sector was not without costs. For example, most livestock holders have reduced, or in some cases liquidated, their holdings in the last two decades because the reduction in, and then subsequent elimination of, feed subsidies resulted in non-cost effective production. Vegetable farmers have faced significantly higher prices for water, challenging their competitive export position. Even so, the government has not slowed its pace of reforms, (UNDP, 2004).

The idea of culture has grown in tangent with global development matters, as environmental sustainability and economic equity. Often, advances in human development may also require cultural change. In the case of Jordan, however, years of resource scarcity have led to the development of many environmentally friendly practices that became embedded within the culture itself. Jordanians tend to light the room they are in within the house rather than lighting all rooms, which lends towards family gatherings in one area of the house. Cultural heritage is both tangible and intangible, and supporting crafts along with home-based micro enterprises are two dimensions of preserving cultural heritage. Jordanian crafts were restored and renewed through voluntary initiatives in order to promote traditional values and local heritage. A number of voluntary societies started during the past twenty years to rediscover traditional crafts through the initiation of income generating projects to improve the standards of living in rural areas, (Wright, 2005).

Crafts in Jordan are produced through different business formats that correspond to four different structures of production: Individual evidenced by the rising share of cultural products, services, and intellectual property in global trade, along with the challenges to cultural diversities and characteristics, which are related to modern globalization. Cultural diversity and preservation is an integral aspect of sustainable development, and human development. Human development can only be accomplished through a synergy of cultural preservation. Table 2 shows the employment in Sales and Craft in 2008.

Jordan's total land area is about 8 million hectares, only a small portion is suitable for producing crops (Table 3). It is currently estimated that there are less than 225,000 hectares of land that are cultivated. The pastures of rainfall rate below 200 mm^3 per inch per yea represent about 8% of the kingdom

land. Fallow, forest, and inland water account 3% of Jordan land. Desert share is more than 89% of the kingdom.

Another view on the cultivated land in Jordan by irrigation pattern shows that it is composed of irrigated and rain fed areas. Irrigated area is around one third of the total. However, the rain fed area has included recently large area of rainfall rate less than 200 mm^3 per inch per year i.e. less than the requirements for the cultivation of subsistence grains, where, such area should have been utilized as pastures. The minimum water requirements for grains are 250 mm^3 per inch per year. Such regions of less than 200 mm^3 rainfall face, frequently, poor years with rainfall much below basic requirements for crops. It is not only that but there is more frequent fluctuations in such rate The citizens of these area perform as risk aversion farmers to secure subsistence food crops and some grain feeds (barley) for their livestock to avoid poor rangeland yield. Therefore, as (Table 4) and (Figure 1) show the cultivated area had reached 2.38 million hectares in 2010. Nevertheless, two thirds of such area was rain fed and the majority of such rain fed area was rangeland deducted for cultivation of subsistent crops associated with most probably poor yield and high risky model of production system. Table 4, shows the high growth rate of expansion in irrigated area associated with a decrease in rain-fed area by 1%, associated with fluctuation in the area along the presented 8 years. A major conclusion that abstracted from such analysis, is the rural population in Jordan are valuable communities with respect to nature, natural resources availability and quality, which make them under uncertainty with respect to livelihood

1.2 Main agricultural commodities

Fruits and vegetables in Jordan are the main crops either measured as the share in the area or as income generated.

1.2.1 Crops

Area under fruits decreased from around 858 thousand hectares in 2003 to more than 827 thousand hectares in 2010. However, the share of irrigated area of fruits increased from about 39% in 2003 to more than 54% in 2010, associated with shrink in rain-fed fruits. The irrigated area has increased annually, at approximately, 4.3%, while the rain-fed fruits area decreased faster at 4.6% a year along the last decade, (Table 5) and (Figure 2).

In contrast, vegetable area had increased from 344 thousand hectares in 2003 to more about 481 thousand hectares in 2010, where most of it was irrigated, i.e. around 95%. The expansion in vegetables area included both irrigated and rain-fed at an average annual growth rate of 4.7% and 6.5%, respectively, (Table 6) and (Figure 3).

Table 7 and (Figure 4), showed that the Seasonal field crops have shown high rate of expansion of about 11.6% a year, in the area under irrigated system, which doubled the share of irrigated field crops in the total area of such set of crops from only 5% in 2003 to 10% in the year 2010.

The major vegetable crops in Jordan are Tomatoes, Potatoes, and Watermelon. Table eight and Figure 6; present the fluctuation in the area of these three crops over the period (1999-2009). However, it could be concluded that there was an apparent expansion in tomatoes area after 2005 which made such crop occupied more than 100 thousands hectare in recent years, associated with a similar increase in production of tomatoes from 324 thousand hectares in 1999 to almost 610 thousand tons in 2009, (Table 57).

Potatoes area had moved over cycle alike. It decreased from 40 thousand tons in 1999 to a minimum of 35 thousand hectares in 2004, and then started an increase up to 53 thousand hectares in 2009, (Figure 10, Table 8). Production of potatoes has passed a similar trend over the period 1999-2009. Potatoes produce was about 95 thousand tons in 19999 raised to 172 thousand tons in 2007 and then dropped to 99 thousand tons in 2009, (Table 9).

Fluctuation in the annual area allocated for watermelon was apparently very irregular as shown in Figure 5 and Table 8, with almost a similar fluctuation in production, (Table 8, Figure 6). A minimum area of watermelon was around 11 thousand hectares in 2002 and a maximum area of 26 thousand hectares in 2005. It was associated with a minimum production of 34 thousand tons in 2003 and a maximum level of production of about 105 thousand tons in 1999, (Table 9).

Table 10 presents the yield's time trend of the major vegetable crops in Jordanian agriculture. In general, such yield of the three vegetables is much less than the world average. The yield per hectare under Jordanian agricultural system has not surpassed 15% to 17% the world average. In addition, the fluctuation in the yield per hectare of the three vegetable crops under Jordanian agricultural pattern was relatively too high in comparison with the world average. Estimation of the coefficient of variation ranged between 30% for watermelon to 15% for both tomatoes and potatoes. Such variation coefficient is 6 times the world variation of melon, 4 times the variation in world's tomatoes yield and 1.5 times the world's average of potatoes yield.

The three major fruit trees in Jordan are oranges (citrus), olive, and apple. Table 11, presents the capacity of the three fruit crops in Jordan as million trees. While olive reached around 6.8 million trees, the citrus trees reached about 1.9 million trees and the apple trees number was about 1.5 million trees, in 2009. Figure 8, shows that time trend of the number of fruit trees has no steady state size in Jordanian agriculture. Fluctuation is the apparent pattern in the time series figures. This because of the same reasons cited above with respect to vegetables. Production of the three major fruit trees fluctuated almost at the same pattern of the area along the period 1999-2009, (Figure 9, and Table 12). The production of Jordan reached around 125 thousand tons, 90 thousand tons and 31 thousand tons, of olives, citrus and apples, respectively, in the year 2009.

To compare the yield of the major three fruit trees in Jordan with the world average, Table 13 and Figure 10, are not suitable, even though it shows the official figures from the department of statistics of Jordan, as it presents the yield per tree. Therefore, (Table 14) was compiled and calculated from FAO database in terms of yield per hectare to conduct the required comparison. On the average, the variation in orange yield in Jordan reached 14%, i.e. about five folds that of the world's yield. However, among yeas the yield per hectare of orange in Jordan reached 77% as a minimum of the world yield in 2007 and 119% as a maximum of the world yield n 2006, i.e. between 12-20 tons per hectare a year).

In conclusion, the Jordanian agricultural model is a risky one, as the irrigated area is very limited and the majority of arable land is under rain-fed. In addition, the very limited water resources, even, for fully irrigated area makes the farmers taking risk aversion decision with respect to input usage as will be seen later in this study

1.2.2 Livestock

Livestock production was limited in the late 1980s. Jordan had about 35,000 head of cattle but more than 1 million sheep and 500,000 goats, and the government planned to increase their numbers. In

late years of eighties of previous cencury. The annual production of red meat ranged between 10,000 and 15,000 metric tons, which covered less than 33 percent of domestic consumption. A major impediment to increase livestock production was the high cost of imported feed. Jordan imported cereals at high cost for human consumption, but imported animal feed was a much lower priority. Likewise, the arid, rain-fed land that could have been used for grazing or for fodder production was set aside for wheat production.

Jordan was self-sufficient, however, in poultry meat production (about 35,000 metric tons) and egg production (about 400,000 eggs), and exported these products to neighboring countries, up to late 1980's' (Chapin Metz, Helen, 1989).

The cattle performance indicators under Jordanian agricultural system are presented in (Table 15). The total stocks of cattle are small. Over the period 2000-2009, the total population did not surpass 81 thousand heads. Apparent fluctuation was clear along the whole period. The off-take rate for slaughtering did not match with the norms of cattle performance, as the optimum rate would not surpass 50% (Abu Akkada and Soliman, 1980). In some years in Jordan, it passed 100%. This is because the data of FAO, considers the endogenous slaughtered animals. Endogenous slaughtered include to non-domestic sources, which, are slaughtered in domestic slaughtered houses, and considered of domestic supply. The first are the imported live animals and the second are the migrated herds across the border with nomadic Tribes from Syria, Iraq, or Saudi Arabia seeking for water or green range and/or supplementary feed distribution by the government (Soliman, 1977). In spite of the fluctuation in the average carcass weight per head, there was slightly positive trend in such weight. It rose from 162 Kg in 2000 to around 200 kg in 2009. Due to fluctuation in slaughtered animals the mea production, also, fluctuated along the same period. The maximum was around 19 thousand tons in 2008.

Fluctuation in milking animals share in the national herd was more sever than the slaughtered animals. This is because, the feed supply fluctuations associated with the fluctuations in rainfall rate, and due to drastic continuous changes in culling and replacement rate in the flocks in Jordan, (Soliman, 1975). The cattle farms holders prefer to replace their high milk yield exotic breeds cows with new milking ones to keep the daily supply of fresh milk constant or at least stable. Therefore, the percent of milking cows in total cattle stock surpasses in most years the optimum rate, which is 50%. Thereof, the domestic milk supply has kept growing from 162 thousand tons in 2000 to 314 thousand tons in 2008, even though it dropped to 245 thousand tons in 2009.

Sheep and goats are the main livestock types in Jordan. It should be mentioned that a specific phenomenon is characterizing the sheep and goats flocks in Jordan, Iraq, and Saudi Arabia. The three countries have joint adjacent borders. The Nomadic and semi-nomadic Arabic Tribes living in these areas move from one country to another searching for either water points, and/or green range area. When one of these three countries was providing a program of concentrate feed supplements while the other two had drought or poor range areas. Those tribes do not hold well-defined identity, as they are nomadic, (Soliman, 1998). Rainfall in these concerned regions is low (below 150mm[3)] which fluctuates between poor years to moderate years. Such fluctuation affects much the feed supply in terms of range areas. When the rainfall is good, ranges grow moderately, thereof, shepherd men keep ewes for rebuilding the herds, leading to decrease in the off-take rate to its minimum. During poor years, the shepherd men get ride of large proportion of their herds, including ewes, to get a balanced carrying capacity of the herds on rage acreage. Accordingly, the off-take rate may surpass 70% in sheep herds. Goats are more resistant to drought conditions. Therefore, the off-take rate would stay within norms, i.e. up to 45%. Therefore,

investigation of the sheep and goats stock performance indicators in Table 16 and Table 17, reflect the human and natural resource patterns in Jordan concerning sheep and goats stocks. The relatively high milk yield of goat than ewe in Jordan implies the type of "Sham-Goat breed" which is common in Syria, Jordan, Iraq, and probably Lebanon. The demand for mutton meat in these countries is dominant (Soliman, 1990).

Broiler production and commercial laying hens performance in Jordan is presented in (Table 18 and Table 19). There was a trend of declining in both broiler and table eggs productivity over the last decade, which made the dressing weight per broiler around 1 Kg, while this industry standard surpassed 1.5 kg (Goueili, Soliman and Mashhour, 1988). In addition, table eggs yield per hen decreases from 245 pieces to around 190, while the modern industry performs an average of 250 per laying hen.

1. 2. 3. Food Consumption Pattern

Most of the consumers in Arab countries -but few, mainly Egypt- prefer mutton and lamb meat, in particular, the domestic breeds with fat tails rather than cattle and beef meat (Soliman, 1990). Therefore, as (Table 21) shows one-third of red meat consumption is from mutton and goats. Poultry meat is the main source of meat consumption in the Jordanian market. Annual per capita consumption of poultry meat was 27 Kg in 2007. Due to such relatively high consumption level of poultry meat in Jordan, the production was not enough for satisfying the domestic market and around 16% of the supply was imported in 2007. In addition, the opportunity to export large quantities of poultry meat was very little, as gulf countries have established their own industries.

Whereas Jordan's production of cereals is of minor share in the supply, imports play the major role in fulfillment the domestic supply. Wheat is the bulk of cereals imports. The presented supply in (

Table 69) does not include the 280 thousand tons of wheat reserved as a strategic and buffering stock. Transit trade plays an apparent role in wheat exports, as the wheat exports of about 30 thousand tons surpassed the production volume. Due to frequent poor rainfall years, imports of Barely reached 804 thousand tons in 2007. Maize imports, also, occupy a large proportion of total food imports.

Vegetables, particularly, tomatoes, are the highest exportable food items. Self-sufficiency rate reached 186% for total vegetables and 251% for tomatoes in 2007. Olive fruits and Olive oil are the second exportable items from Jordanian market, where, self-sufficiency ratio reached around 112% and 118%, respectively, in 2007. Self-sufficiency of fruits, other than, citrus has reached 124%

The grand food supply per capita per day supplies the individual Jordanian consumer with 3015-kilo calories, of which 87% from vegetal sources and the rest from animal sources. Daily per capita protein supply, reached more than 78 gram, of which one-third was animal protein in 2007, (Table 22). Such level of animal protein is considered a good sign of intuitively rich food, as it one third content from animal sources is a safe rate health wise (Soliman and Eid, 1995). However, the fat consumption per day, which reached 91 grams, of which about 30% animal fat, is not heath recommended pattern. The optimum allowance of daily fat consumption should not pass 50-60 grams per day with less than 10% from animal origins, (Soliman and Eid, 1995)

1.3 Agricultural sector structure

Serious water studies in Jordan began in the 50's of the last century. These studies have shown that the main source of water in Jordan is rainwater, characterized by scarcity and irregularity. With the increase in population growth, this has been a challenge for planners and governments that should provide water with acceptable specifications. In general, the most important water sources in Jordan as follows, (Kareem, 2000):

A. **Conventional sources** which, in turn**,** are two types:

i. Surface and rain water:

The rain season in Jordan is between December and March. In this period, 80 % of the annular rainfall takes place. This is about 8,500 million cubic meters over an area of 90,000 sq km, the area of Jordan. Climate factors play an important role in the distribution of this quantity over that area. The amount of precipitation ranges from less than 100 mm (in the desert) up to 600 mm (in the mountains of Ajloun). The quantities increase towards the north and west. The total volume of surface water in Jordan is 495.78 million cubic meters, of which the Yarmulke River constitutes 55 %. Floodwater constitutes 3 % of the total annual rainfall. In Jordan, 17 water dams represent an important source of water. The total capacity is between 0.7 million cubic meters (Buweidah Dam) to 82 million cubic meters (King Talal Dam); some are still under construction (Wehda Dam on the Yarmouk River). This is a joint venture between Jordan and Syria and is expected to have a capacity of 225 million cubic meters, with a storage capacity of 125 million cubic meters.

ii. Groundwater:

The northern area of Jordan (the northern desert) with its basalt rock formation is an important water reservoir. The limestone layers constitute another reservoir along with the sandstone layers.

However, the latter is deeper and its water has more salt content. Subterranean water can be divided into the following categories

a. Renewable water resources:

The volume in Jordan is 257 million cubic meter and is fed by rainwater.

b. Non-renewable water:

There are two aquifers: the Rum aquifer in Disi area, which is a sandstone aquifer that extends into Saudi Arabia to the south. 152 million cubic meters per year of water can be pumped from it for the next 100 years. The Jafr aquifer is smaller and 18 million cubic meters per year can be extracted from it for the next 50 years.

B. Non-conventional sources:

Wastewater is the main source of non-conventional water. It will play a vital role as a water source in the future if processed properly. At present, there are 14 wastewater treatment plants. There are plans for the number to reach 34 with a capacity to reach 100 million cubic meters. However, the present use of this water is restricted to landscapes irrigation. The total water flow from the Khirba al-Samraa wastewater treatment plant for the years 1988, 1992, 1995 was 25, 45 and 66 million cubic meters, respectively.

1 Residential use:

The first groundwater well in Jordan started operating in the 30's of the past century. Since then, the main source of residential water has been the groundwater. At the end of the 50's, the first water distribution network was established. Now, 98 % of Jordanian homes are connected to that network. The volume of water used for residential purposes has reached 219 million cubic meters per year.

2 Industrial use:

The amount used for industrial purposes is 21.3 million cubic meters per year.

3 Irrigation:

The non-irrigated (Rain Fed) lands in Jordan are limited to the north, where fruit and olive trees as well as some vegetables are planted. As to the rest of the areas, such as the Jordan valley and the desert, they are irrigated lands due to the climate and produce fruits and vegetables throughout the year. The total area of irrigated land in 1995 was 350,000 donums in the Jordan valley and 305,000 donums in the semi-desert areas. The total amount of surface water used is 757 million cubic meter. There is a huge increase in the need for water in Jordan during the next quarter of a century (Kareem, 2000).

Thus, Jordan relies on rain as the major source of water, but rainfall varies considerably from season to another and leaked around 5% into the ground, while congregate at more than 3% in the form of run-off, and is more than 90% evaporation. Although there is a shortage of water in Jordan, there is some competition between residential, industrial and agricultural uses, where, 75 % of the water is used in agriculture and industry, which use large amounts of water. For example, the manufacture of one ton of leather requires 40-60 cubic meters of water, (Ministry of Water, Jordan, 2009).

With the use of treated wastewater for irrigation is increasing, especially in the Jordan Valley. Jordan is generally among the poorest four hydraulically countries at the global level, and within the Arab

States it is within the category of below the per capita water poverty line. Therefore, any shortage of water resources prevents the expansion of agricultural land.

3.1 Farm structures

The eastern half of Jordan is desert or pre-desert plains with very little rainfall. Rainfall is somewhat higher in the western part of the country—the highlands and the Jordan Valley— but even then, it is highly erratic. The climate favors year-round production of horticultural products and so, where irrigation water is available, vegetables and annual fruits are the primary crops.

The Jordan Valley and the Ghors of Karak form are actually, the "fruit and vegetable" basket of Jordan. A large share of the land in these two areas is irrigated with water supplied by the government from dams and other water works. Land productivity in these two areas has declined in recent years as a result of decades of intensive farming and continuous irrigation. Traditional canal irrigation systems are being replaced with water efficient systems and so salinity problems should decline. However, intensive use of the land is likely to continue, especially if Jordan's horticultural exports expand as expected after admission to the WTO.

In the 1950s, the government developed the original irrigation systems in the Jordan Valley and then distributed the land to farmers. Each holding is limited to 30-40 dunum (3-4 hectares) and cannot be divided into smaller holdings. However, because of inheritance laws, there can be, and often are, several owners of a single holding. The Jordan Valley land law has recently been amended to permit leasing of land for up to 30 years as compared to the original regulation which limited leasing to a 10 years time horizon. It is expected to increase producer incentives to invest and further develop holdings in the Jordan Valley.

Much of the land in the Badia and western highlands is irrigated from groundwater. These regions are very productive as long as rainfall is sufficient each year to replenish groundwater reserves. The reliance on rainfall for the continual replenishment of water resources makes long term sustainable agricultural production risky in these areas.

In 1983, the average farm size was 6.3 hectares; Data from the 1997 Agriculture Census suggests that the average size has fallen to 4.2 hectares. As shown in (Table 23), Jordan's farm sector is composed primarily of farms of less than 30 dunum (3 hectares). The smallest farms are often found in the highlands where inheritance customs result in smaller and smaller holdings. Larger farms are located in the dry plains bordering the desert that occupies the eastern two-thirds of the country. Neither of these farms—the very smallest or the larger farms—are likely to be highly profitable unless water is available from ground or other sources.

Cash crop farms dominate in the valleys along the western border. These farms produce vegetables, citrus fruits, or bananas under irrigation and sell the bulk of their products. They tend to be the more profitable than farms in other areas of the country and therefore they also tend to be early adopters in terms of technological advances. In irrigated areas of the highlands, farmers typically produce vegetables, fruits, and olives while some farmers are experimenting with cut flowers and other non-traditional agricultural products. Farmers in the irrigated highlands also sell the bulk of their output. In rainfed areas of the highlands (the area between the Jordan Valley and the plains bordering the desert), farmers typically produce cereals, olives, tobacco, grapes, apples, and nuts. Subsistence farms are usually the smallest holdings and are located in rain fed areas with few alternative employment opportunities. Most subsistence farmers produce both livestock and crops but primarily for family consumption.

1.3.2 Agricultural labor

Whereas, rural population represents around 22% of Jordan's population the agricultural community is less than one-third of the rural population. Agricultural labor has not passed 7% of the total economically active population and around one-fourth of the Jordanian agricultural community, (Table 24). Therefore, agriculture sector share in employment in Jordan is not high in comparison with other Mediterranean countries, such Egypt, Morocco, and Algeria. The labor force currently consists of an estimated 1.667 million workers. Of those, 77.4% are occupied in the services sector, 20% in the industrial sector, and 2% in agriculture, as shown in (Figure 11).Unemployment currently stands at 13%, down from the 14.% figure in 2009 and the 14% - 15% that was common in the previous decade This figure is expected to improve slightly to the 12% - 11.%, but with its high birthrate and young population, of which up to 57% are Palestinian, this is still a poor country; 14.2% are estimated to live below the poverty line, (economy watch Internet Site, Jordan, 2011)

1.3.3 Inputs usage and machinery

Investigation of the data in (Table 25) throws lights in the input usage in Jordanian Agricultural system. It shows that the system has adjusted a wrong policy of intensifying chemical fertilizers, since 2001. The density of nitrogen fertilizers per hectare of agricultural land in Jordan was 83 kg of nitrogen in 2000, which was far beyond the world average of only 18Kg, as shown by the footnote beneath (Table, 25). Such large density of nitrogen fertilizers (as nutrients) has gradually declined over time to reach only 5 Kg in 2007. This policy seems, at least apparently, rational because most of Jordanian agricultural production is under a high risky model due to rainfall fluctuation and even unsecured ground water supply. Therefore, minimization of capital inputs density such as mineral fertilizers is a rational risk aversion policy, where the producers work on base of a model of minimization losses rather than maximization of profits. In case of poor years of rainfall there would be at least some low yield but with minimum cost, which is better than to face in such poor years high costs per hectare associated with low level of yield.

Unfortunately, there was no complete set of time series data available on agricultural machinery use in Jordan. However, Table 25 shows a sort of trend of increase in the density of agricultural tractors density from 186 hectares served by 1-tractor in 2000 to 174 hectares served by one agricultural tractor in 2004. It was higher than the world rate of 183 hectares served by one agricultural tractor. Such policy contradicts with the rational declining trend of the fertilizers intensification policy. The reason of more intensive machinery use is the probably the scarcity of agricultural labor leading to the high wage rate in farming operations due to the high rate and level of education Jordanian population which, let the young people aspiration and attitudes highly positive towards urban jobs and the vise versa with agricultural wok.

1.4 Agro-food industry

1.4.1 Description, importance

The Jordanian food industry is the second most important sector in the country on the basis of FDI and national investment according to the Jordanian Investment Board. The agro-food industrial sub-sector represents 15.4 percent of the national industrial sector, In 2008, and the sub-sector enjoyed exports of US$497 million or 13 percent of total industrial exports. This represented a direct contribution of four percent to national GDP, (Al-Mahasneh, 2009)

The total number of registered agro-industrial enterprises was 3,366, i.e. nine percent of total industrial enterprises and employed more than 27,000 workers, i.e. 10 percent total industrial workers.. Fully 79 percent of agro-industries in Jordan can best be defined as small and medium enterprises (SMEs), and have been established close to Amman – as a source of workers and of markets. Estimated 97 percent are privately owned, , (Al-Mahasneh, 2009).

Access to information, training, extension services and R&D for agro-industries is provided by a number of private, quazi-public or public sector agencies, some of which are in the form of agribusiness incubators – providing services linked to funding, technical assistance and supervision.

Although the food processing industry in terms of strength and potential is stronger than the agricultural sector in Jordan, because of the lack of raw materials, dependency on imports (in terms of raw materials) is likely to increase. Raw materials are imported from Syria and Lebanon (fruit and vegetables), USA, Europe and Australia (grain and wheat), with the exception of tomatoes in food processing, (Unido, 2011).

1.4.2. Main Products

The most important agro-industrial sub-sectors are bakery products, vegetable oils, animal fats and milling products. The meat processing industry is active and it has specialized in frozen processed meat products, these products are exported to the neighboring countries

The major vegetables grown locally are tomatoes (representing about 31% of total production), potatoes (about 10%) and cucumber (about 9%). Among the fruit tree products olives represent the most important production. Vegetables sub-sector covers the industry, which processes fruits and vegetables, namely tomatoes. Companies mainly produce processed tomatoes and cooked vegetable products. Processed tomato is a large component of Jordan's agro-food sector. The industry produces a wide range of products coming from the local tomato crops (peeled tomatoes in cans, tomatoes cubes in cans, tomatoes concentrate, triple concentrate, ketchup, etc.). There are also other companies which use Jordanian raw materials in the processing of ready cooked meals. There is scope for producing freeze and de-hydrated dried fruits and vegetables, right now most of the freeze products are imported from Central and Eastern Europe.

Jordan produces 35 litre of milk per capita while the domestic milk consumption is equivalent to 50 litres per capita. The country imports about 8000 tons of powder milk each year. Dairy products are generally yogurt and cheese (Halloumi type). Milk in bottles or pack is available on the local market but highly priced as it is pasteurised milk, (Unido, 2011).

Bakery includes mills, cereals and breads, is very dynamic and scattered, in fact it accounts for the greatest number of companies in the local food production. Statistics from Jordan Investment Board indicate that the grain milling firms represent 20 – 40% of total investments in the food sector.

Cocoa, chocolate, and sugar product are traditional ones in the Arab world, in addition to the ethnic production (Halawa). The companies export to their traditional Arab and Gulf countries' market and even to the US, for an amount of 2.184 million JD (15% of domestic production).

The size of the market of the soft drinks, including fruit juice, and supply of mineral water are close to 80,000 tonnes of which 65,000 ton locally produced and 12,000-15,000 imported. In fact the sector is

ready to receive new investments; recently a big multinational enterprise has entered the mineral water market to satisfy the local demand, (World Eonomy Watch, 2011)

1.4.3 Structure and typology

The food industry products in Jordan are either, entirely, from domestic production, partially from domestic production, or completely from imports. (Table 26), shows such classification, using ratio of processed value to production volume as an indicator. Nevertheless, the products that have "NA"across its row under the column of the percentage of processed products from the total production implies that it is totally from imports, where there is no domestic production. This class includes rice, Cassava, Sesame oil and sesame meal, palm oil, other oil crops and butter and ghee. Except sesame oil, which is imported as seeds and then totally processed at home, the rest are imported as oils and are packed locally in commercial packages. Wheat, barley, maize, pulses, and animal fats are domestically produced at a limited level. Therefore, the bulk of processed products relays mainly on imports. The food industries of these products are milling in domestic plants, oil extraction plants and then they are packed.

Only fruits and vegetables that include other types of industries, such as making juices, marmalades, James, and peeled fruits, frozen and preserved fruits and vegetables. Jordan produces, relatively a considerable volume of alcoholic beverages, particularly beer and non-food alcohol products. The produce is from either domestic produced barley or grapes, while the non-food alcohol products are entirely from imported raw materials, (Unido, 2011).

1.4.4 Investments

About US$747 million was invested in agro-food industries. Growth areas already identified for investment include packaging, freezing and de-hydration, and the production of fruit and vegetable juices and pastes. A recent initiative of the Jordanian Ministry of Trade and Industry aims to promote and develop national agro-food industries during the period 2009-2011 as a platform for regional expansion, (United Nations, 2005).

Agro-industrialization is not without challenges, however, and the country faces climate change (with decreased rainfall and risk of further desertification), shortages of fresh water, instability of energy supplies and prices. Given the reality of geo-position, leads o the instability of neighboring territories which may have negative impacts on the national economy. This is not; however, sufficient reason not to plan and invest with confidence for a country has the intellectual capacity to provide the services, facilities, technical resources, skilled manpower, R&D centers and more, that could enable it to become a regional focal centre for agro-industrial development, (Market Publisher, 2011).

1.4.5 Agro-food trade flows

The main agro-industry competitors in regional markets are likely to be Saudi Arabia, Syria, Lebanon and Egypt. Global competition will come from Turkey, Italy, Spain and the US. There are, however, major opportunities for agro-food processing industries to supply domestic, regional and international markets and not necessarily dependent upon limited quantities of Jordanian produce. Agro-food exports represent the third most important manufactured goods after textiles and pharmaceuticals, (WTO, 2009).

Among the first 11 export markets to Jordanian food Domestic market, there was no EU country or even American one in 2009 imports flow of agro-food commodities, (Table 27). The share of the first 11 countries exported to Jordan was around two thirds of the imports value, which reached around $2.323

thousand millions in 2009. The Jordanian food imports flow by commodity in 2009 showed that the 15 commodities which occupied the first rank, value wise represented about 61% of the total imports value which reached 2323 thousand million US$.. The cereals and Feed (Soybean Cake) represented about 38% of imports value of food in the year 2009, (Table 28). The share of animal Products imports was more than 16% of the total imports. Beverages and tobacco products together shared by more than 5% in total food imports of Jordan. Beverages and tobacco, as individual commodities, had a hare more than any animal product commodity, even though the frist was a healthy set of food items while the later set is harmfull to health.

The exports flow of food items of Jordan by country in 2009 is presented in (Table 29). The total agricultural exports value of Jordan reached around 1.31 billion US$ in 2009. There are 15 countries occupied the first fifteen ranks in terms of exports value. Twelve countries of those 15 were Arab countries, besides, Israel, Russian Federation, Turkey, and Rumania. The only EU country among these countries was Rumania. However, the Rumanian market share was around 1.1% of the agricultural exports of Jordan. The total value of Jordanian exports to those 15 markets represented more than 92% of total Jordanian Agro-food exports.

The exports flow of food items of Jordan by commodity in 2009 is presented in (Table 30). The 15 commodities that occupy the first rank according to their share in e total exports value represent two-thirds of such value. Wthin these 15 commoditie, vegetable exports ccupy the first share, i.e. around 33%, followed by animal products and feeds, of about 22% and non-alcholic beverages sharing by 4.5%, then fruits with a share of less than 3% of totl agro-food exports.

2. Current Agricultural and Food Policies

2.1. Retrospective View of Agricultural Policies

In the past, subsidies were widely used to support the rural sector. However, under Jordan's agricultural sector restructuring program, subsidies have been abolished and support is now provided through other, non-market distorting means. In November 1996, the legislature enacted the "Agricultural Policy Charter", called simply the the Charter, which institutionalizes the policy reform undertaken as part of the restructuring program and establishes long term goals and objectives for the Kingdom's agricultural sector and agricultural policies. The Charter is developed on the premise that rural areas in Jordan and the holding of farmland links current generations to a "homeland and natural and cultural habitat". In addition, because of the fragility of the environment in much of the country, rural peoples can play important roles in protecting the environment and managing natural resources efficiently. Agricultural policy therefore, aims to promote efficient and sustainable use of rural resources while increasing economic opportunities in rural areas so that farm incomes are more equitably distributed within the sector and are closer to urban incomes, (Hjort, 1998).

The Government of Jordan also faces the absolute necessity of ensuring that the population has access to basic foodstuffs at stable prices that preserve the living standards of limited opportunity and the lowest-income groups. As a result, policies also are directed at increasing Jordan's food self- sufficiency through export of high-value agricultural products and import of lower value goods. To support a growing horticultural export economy, the government is promoting production of quality products at internationally competitive prices. This is being implemented through provision of more water for

irrigation, an enhanced research and extension program, and expanded marketing services such as grading and residue testing using internationally accepted measures of qualityassurance, (Chapin, 1989).

Another mandate in the Charter is the expansion of private sector participation in the agricultural sector. This is being supported in several ways. The most important mean is removal of the government from the role of both primary buyer and supplier of feed and food grains and pulses. In addition, economic incentives, such as exclusion of 75 percent of investment expenditures on agricultural projects from trade and domestic general sales taxes, are being provided to the private sector to encourage investment. Overall, the idea is to limit government's role in agriculture to provision of institutional support such as extension, research and infrastructure investments.

The transition from a government-dependent or highly subsidized sector to a completely free market oriented sector under the agricultural adjustment program is not without costs. For example, most livestock holders have reduced, or in some cases liquidated, their holdings in the last decade because the reduction in, and then subsequent elimination of, feed subsidies resulted in non-cost effective production. Vegetable farmers have faced significantly higher prices for water, challenging their competitive export position. Even so, the government has not slowed its pace of reforms

In general, the Government ofJordan has supported producers through a combination of means including procurement of domestic production and provision of inputs (seeds for cereals, water, credit, and livestock feed). The following two profiles provide two lists of laws andregulations that were issued to implement the economic adjustment program in agricultural sector in Jordan during the ast decade.

2.1.1 Laws Related to Agro-Food Sector in Jordan[6]

1 Drugs & Pharmaceuticals and Temporary Law and amendments no. 80 for 2001 Published in the Official Gazette no. 4522 Dated 13 Dec. 2001.

2 Food Control Temporary Law and amendments no. 79 for 2001, Published in the Official Gazette no. 4522 , Dated 13 Dec. 2001.

3 Imports & Exports Law and amendments no. 21 for 2001 Published in the Official Gazette no. 4494, Dated 1 July 2001.

4 New Botanical Items Protection Law no. 24 for 2000 Published in the Official Gazette no. 4443, Dated 2 July 2000.

5 Specifications & Standards Law no. 22 for 2000, Published in the Official Gazette no. 4426, Dated 16 April 2000.

6 Patents' Law and amendments no. 32 for 1999, Amending few articles of the law in accordance with amended, law no. 71 for 2001

7 General Sales Tax Law and amendments no. 6 for 1994, Several articles of the law were amended separately such as: Amended law no. 32 for 2004, Amended law no. 23 for 2003,Amended law no. 36 for 2000, Amended law no. 15 for 1995.

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[6] Ministry of Industry and Trade (2011) Jordan (http://www.mit.gov.jo/tabid/475/Jordan.aspx , 2/12/2011)

8 Customs Law and amendments no. 20 for 1998, Several articles of the law were amended separately such as: Amended law no. 16 for 2000, Amended law no. 27 for 2000, Amended law no. 10 for 1999.

2.1.2 Regulations Related to Agricultural Sector in Jordan[6]

1 Non-Jordanians Investments Regulation no. 54 for 2000 canceling Non-Jordanian Investment Promotion Regulation no. 39 for 1997, Published in the Official Gazette no. 4465 Dated 16 Nov. 2000.

2 National Production Protection Regulation no. 55 for 2000, Published in the Official Gazette no. 4465 Dated 16 Nov. 2000.

3 Regulation no. 37 for 2000 amending Trademarks' Regulation no. 1 for 1952, Published in the Official Gazette no. 4453 Dated 13 Aug. 2000.

4 Consular Fees & Services Regulation no. 77 for 2000 canceling Consular Fees & Services Regulation no. 1 for 1989 and amendments Published in the Official Gazette no. 4767 Dated 31 Oct. 2000.

5 Imports & Exports Permits Regulation no. 114 for 2004 Published in the Official Gazette no. 4677 Dated 30 Sep. 2004 issued in accordance with Article 12 of Imports & Exports Law and amendments no. 21 for 2001

6 Food Control Fees Regulation and amendments no. 99 for 2003 Published in the Official Gazette no. 4620

7 Dated 16 Sep. 2003 issued in accordance with Article 27, a of Food Control Temporary Law and amendments no. 79 for 2001

8 Anti-Dumping and Subsidy Regulation no. 26 for 2003 Published in the Official Gazette no. 4587 dated 2 Mar. 2003 issued in accordance with Article 26 of National Production Protection Law no. 50 for 2002

9 Integrated Circuits Designs Protection Regulation no. 93 for 2002Published in the Officiall Gazette no. 4571 Dated 31 Oct. 2002 issued in accordance with Article 23 of Integrated Circuits Designs Protection Law no. 10 for 2000

10Industrial Drawings and Forms Regulation no. 52 for 2002 Published in the Official Gazette no. 4547 dated 16 May 2002 issued in accordance with Article 18 of Industrial Drawings & Forms Law no. 14 for 2000

11Patents' Regulation no. 97 for 2001 Published in the Official Gazette no. 4522 Dated 13 Dec. 2001 issued in accordance with Article 38 of Patents' Law and amendments no. 32 for 1999

12Audiovisuals Classification Licensing and Monitoring Regulation no. 63 for 2004 Published in the Official Gazette no. 4656 Dated 29 April 2004

2.2 Objectives of Current Agro-Food Policies

Although the country's ultimate agricultural potential is small, both economic factors and environmental constraints, apparently, limited production, as reflected by up to 100,000 hectares of potentially arable land that has laid fallow. The government has expressed considerable concern about its "food security" and its high food import bill. Therefore, it has plans to increase crop production since the last decade of the passed century. However, despite increasing investment there is a slow pace of progress.

Therefore, Jordan is implementing a two-pronged agricultural development policy. The long-term strategy which aims at to increase the total area under cultivation by better harnessing water resources to increase irrigation of arid desert areas for the cultivation of cereal crops, the country's most pressing need. In the short term, the government is attempting to maximize the efficiency of agricultural production in the Jordan River valley through rationalization or use of resources to produce those items in which the country had a relative advantage, (Agriculture in Jordan, 2011).

Rationalization has started with a controversial government decision to regulate cropping and production, primarily in the Jordan River valley. Farmers there had repeatedly produced surpluses of tomatoes, cucumbers, eggplants, and squashes because they were reliable and traditional crops. At the same time, underproduction of crops such as potatoes, onions, broccoli, celery, garlic, and spices led to unnecessary imports, (Cordella, 2006). The government has offered incentives to farmers to experiment with new crops and cut subsidy payments to those who continued to produce surplus crops. Thereof, cucumber production dropped by 25 percent and tomato harvests dropped by more than 33 percent, while self-sufficiency was achieved in potatoes and onions.

Production of wheat and other cereals fluctuated greatly from year to year, but never came close to meeting demand, because even a high yield harvested crop of a good rainfall year has not met domestic demand. Accordingly, expansion of dry-land cereal farming in the southeast of the country is a major agricultural development goal. There is a plan called for the irrigation of a 7,500-hectare area east of Khawr Ramm (known as Wadi Rum) using 100 million cubic meters per year of water pumped from a large underground aquifer. Another plan envisioned a 7,500-hectare cultivated area in the Wadi al Arabah region south of the Jordan River valley using desalinated water from the Red Sea for irrigation.

2.3 Price and Income Support Policies

The Jordan Valley Authority is under the institutions of the Ministry of Water and Irrigation. While, the ministry, in general, oversees the supply of water to Jordanian citizens, municipalities, industry, and agriculture, the Jordan Valley Authority provides water to agriculture and oversees development within the Valley to ensure that water demand does not exceed availability. The water has been supplied to horticultural producers at below cost until recently Producers in other areas of the country do not have access to subsidized water, relying instead on tube wells or rainfall.

The Agricultural Credit Corporation makes soft loans available to farmers and investors in agribusiness. The loans fall into one of two classes—either operational or developmental. Operational loans are from 12-24 months in duration while development loans may be made for up to 15 years, although the bulk of long term loans are for 8 years, (Johansson, Dahl and August, 2009)

Prior to the fall of 1997, the ministry of supply announced a minimum and maximum purchase price for durum wheat before or during the planting season. Announced prices would have had little effect on subsistence farmers' planting decisions—instead rainfall expectations are the most important factor. However, large-scale commercial operations in the south would base their planting decisions on those prices. After harvest, most farmers with surplus wheat transported the grain to ministry of supply collection centers located throughout the country. At the ministry of supply centers, the grain is tested for quality, priced between the minimum and maximum based on its quality, and the farmer is issued a check. A very small proportion of farmers sold wheat to traders at the farm gate who then in turn took it to the ministry of supply collection centers. The subsidy to wheat producers under the announced purchase program has

varied from JD0.05 million to JD2.5 million since 1990. The value of the subsidy varies because domestic prices are measured against fluctuating world prices for wheat. For example, in 1996, when world commodity prices were quite high, wheat producers were actually taxed but then in 1997, a subsidy was given to producers, (Altenburg, and Eckhardt, 2006).

No procurement price was announced during the 1998 planting season for non-seed durum wheat. However, as the main harvesting season began, the government did announce that it would purchase wheat from producers at a base price, which could below that of previous years but it would reflect the international wheat prices.

The government of Jordan, has almost phased out the wheat price subsidy. The only remaining specific subsidy to wheat producers is the sale of certified seed. The Ministry of Supply (MOS) purchases seed at announced prices from registered seed producers. The seeds are then sold by the Jordan Cooperatives Corporation to farmers in the next planting season. The seed discount had been about 10-15 percent of the average cost of seeds purchased by MOS. Nevertheless, currently, the the Jordan Cooperatives Corporation spends significant costs for cleaning, fumigating, and other handling costs associated with preparing the seeds for sale to farmers. These costs generally are not recovered by JCC when selling to farmers.

It seems that Jordan has great opportunity to expand its vegetables and fruits exports and even to expand in production. The time trend farm price per ton in US$ of vegetables and fruits produced in Jordan was compared with EU and USA along the same time trend series, (Table 31). Almost along most of the series, the domestic Jordnian farm price per ton was much less than the Eu average farm price of tomatoes giving Jordan high comparative advantage than both EU and USA production in such vegetable crop. With respect to potatoes Jordanian farm price was less than EU farm price, except the last three years (2007-2009), where Jordanian price surpassed the Eu price. Such analysis coincide with the policy analysis text shon above abstracted from he review of literature. Watermelone has the same relative trend of tomatoes, giving Jordanian production a high comparative advantage relative to Eu and USA production.

With respect to Fruits, oilve farm price was all years less than EU farm price, providing the indicator of the comparative advantage for Jorda in producing such crop for imports to EU market. However, it was not the case of the USA farm price. However, due to distance difference, it is not a precise comparison, as the cheaper farm price of olive in USA could be due to the high cost of transportation. It seems logical to see the farm pric of apple in Jordan is higher than USa price, as USa is one of the most important market of apple. Concerning Citrus, the farm price in Jordan was ifluctuated between less than to equal EU farm price of citrus and was higher than the USA price, for the same reasons mentined to explain the differences of apple farm price.

Although, Jordan has less farm price of several vegetable crops and fruits than, at least EU market, the high fluctuation in such prices along the last decade makes the conclusion about the comparative advantage of Jordan in production of these crops thoughtful. The set of (Figure 17) to (Figure 22) of the time tren of the frm price in Jordan Eu and USA provide illustrative evidences of such fluctuaton in Jordan's price lvel over time. Reasons were mntioned above wen the study described the agricultural ector structure in Jorda. The main one was the pattern of rainfall fluctuations.

2.4 Input Use Policies

The Jordan Cooperatives Corporation focuses on provision of inputs and supplies, throughout the country, to farmers at its outlets. Producers who are members of the Jordan Cooperatives Corporation can purchase inputs at a slight discount relative to market prices. The Jordan Cooperatives Corporation does not participate in any marketing functions. Prior to 1989, the Jordan Cooperatives Corporation made below-market interest loans to members. Many of those loans remain outstanding today and so the Jordan Cooperatives Corporation has offered at various times to forgive some portion of the principal and interest on outstanding loans. One of the primary functions of the Jordan Cooperatives Corporation was to distribute certified seeds to farmers at subsidized prices. This role has been abolished in 1999, as mentioned under price and income poliies, (Hjort, et al, 1998).

2.5 Rural Development Policies

Agriculture employment is dominated by non-Jordanians due to rural-urban migration, the unfavorable working environment, and low wages, thus making the sector unattractive to Jordanian employees. Therefore, only 38% of paid employees in this sector are Jordanians.

Studies analyzing cross-country data have shown that the percentage of Microfinance of Medium and Small Enterprises (MSMEs) in an economy has not been definitively correlated with economic growth. Nations with highly varying numbers of small and large enterprises are found to be equally competitive with similar results, regarding productivity and economic growth, (Wright 2005). Job creation follows an equally distorted pattern. In some of the least developed nations, microenterprises in rural areas employ significant percentages of the workforce and offer the lion's share of paid employment for poor populations. However, much of the conducted microeconomic research undermines the possibility that Microfinance of Small and Medium enterprises (MSMEs) are especially effective job generators, especially if the overall net impacts (job creation minus loss) are factored in Altenburg, (Eckhardt, 2006) Regarding child mortality, the Jordanian MDG is to reduce child mortality of those less than 5 years old by 67% between 1990 and 2015. In 2008, approximately 99% of births in Jordan were attended to a specialist. Also, approximately 103% of children were immunized against measles in 2009 (the fact that the percentage is overe 100% is due to the fact that many non-Jordanian children, principally Iraqi children, have also been immunized), (WHO, 2009). The percentage under 5 mortality rate realized for 1990 – 2009 dropped by 28.2% within the same period (from 39 deaths per 1000 live births to 28 deaths per 1000 live births). The continuing improving mortality rates can be attributed to increased vaccination levels. Iodine deficiency has also been reduced, from 38% to 33% between 1994 and 2000; new laws ensure that salt has iodine, flour has iron and vitamin A is given at schools. However, one important issue is regional disparity; while Amman has relatively low infant mortality rates, the North, South and rural areas all show increased rates of mortality, (WHO, 2009). Also, many of these infant deaths occur in the first month after birth (neonatal mortality), at a rate of 14 deaths per 1000 births in for 2009 onwards. Jordan appears to be underachieving on this front, as shown by the sharp jump in under 5 mortality, between 2007 and 2009, (WHO, 2009)

Rural-to urban migration has become a core fact of life in Jordan. The percentage of citizens living in urban areas almost doubled from 40% to 72% between 1952 and 2004, (UNDP, 2004), By 2009, the percentage of citizens living in urban areas grew to 82.6%, (DOA, 2009), This is due to rural-to-urban migration and the fact that immigrants usually prefer to immigrate to cities rather than rural areas. Combined, the three largest cities (Amman, Zarqa and Irbid) makeup 71.4% of the Jordanian population as

of 2009. However, rising rural-to-urban migration leads to increasing pressure on housing, basic amenities, increasing demand for food (leading to inflation) and rising inequalities in living standards, both within the country, and within urban centers themselves, (UNDP, 2004).

From 2006 to 2008, Jordanians spent 29% more on food, while their expenditure on housing increased by 4.6%, and transportation expenditures increased by 21.7%. Although, it should be noted that spending on medical care declined by 20.9%, and spending on education dropped by 17.2%. Expenditure growth hits a 13.2% mark, (DOS, 2008) The real income of households decreased by 10.4% between 2002 and 2008.

Average household spending rose from JD 6,205 (US$ 8,760) in 2002, (DOS, 2002) to JD 8,520 (US$ 12,000) in 2008 (DOS, 2008), with an increase of 37.3%; hence, growth in family spending exceeded income growth by 12.2% (22.3% increase in average family annual income less the 37.3% increase in spending). To cover the income expenditure gap, the poor have had to either borrow or sell existing assets, such as land and family heirlooms, in order to survive - an indication of the further deterioration of the meager wealth of the poor and the widening gap in wealth between rich and poor. While it is noted that families may have under reported earnings and over reported expenditures, causing some of the disparity between income and spending, it is important to note that even if this explanation holds true, the gap between spending and income has been rising since 2002, which indicates a deterioration in the spending power of households relative to income. The average Jordanian households spend JD 8,520 (US$ 12,000) annually. One quarter of this is spent on housing related expenditures; 37.6% is spent on food items and 5% on education.

In addition to poverty, the other aspect, directly affecting equitable growth is regional disparities. Outside of urban areas, there are drops in educational levels, employment opportunities, and access to services, due to a lack of economic activity in rural areas, (Johannisson, et al, 2009). Agricultural employment is dominated by non Jordanians due to rural – urban migration, the unfavorable working environment, and low wages, thus making the sector unattractive to Jordanian employees. Therefore, only 38% of paid employees in this sector are Jordanians. From a purely geographic perspective, the growth of large enterprise in Jordan throughout the past decade was associated with increasing concentration in major Jordanian cities, especially Amman as shown in Table 3.6.

The MSMEs have been seen as a vehicle to help control the urban-rural divide. Although the widespread growth of MSMEs in Jordan created many growth poles in small towns and rural areas, their density still favors Amman, Aqaba and Zarqa. The nature of the employment generated by (Micro finance of small and medium enterprises) MSMEs also ensures that they play a greater role in pushing for the equality of income distribution, (Patricof, et al, 2005). Certain empirical data reveals that nations with a high percentage of MSME industrial companies have indeed shown greater levels of equitable income distribution. MSMEs are dispersed in both urban and rural communities, and provide employment and salaries for disadvantaged laborers and employees, such as the unskilled, women with household obligations and the elderly, as opposed to commercial banks.

Even though, MSMEs tend to advance a more egalitarian distribution of income than larger enterprises, as they are usually more labor-intensive, microfinance has not served the poorest of the poor. That is, the individuals and households who require a loan the most. This is a result of the high expenses related to each small loan, and the higher risks associated with non-collateral loans. The very poor typically

are unable to obtain any formal loans, as they do not possess collateral, nor can they join a borrowing group. Even with moderate improvements, interest rates on micro-finance loans are still excessive, as opposed to commercial banks. Rates are also excessive, compared to the return on investment rates of projects typically found in rural areas, such as trading and husbandry. This is understandable, as no microfinance institution declared that it is in their mission statements to serve the poorest of the poor, (CGAP, 2009). Thus, it is imperative that stakeholders find other methods of poverty alleviation, such as grants, subsidies and other services, (Nelson, 2007)..

Though the role of cooperative socities in development of MSMEs in Jordan remains small, this is not because of limited number of them and volunteer activity in the country. There are over 1,000 cooperative scocities registered, yet only 25% of them, mostly in rural areas, indicates lack of effectivness of rural cooperatives in coducting such an aim. Furthermore, micro-finance institutions need to reach the poor and thus operate in rural areas where population density is low (with large covered areas), increasing the cost of operating in these areas, (Montgomery, et al, 2003)

2.6 Agro-Environmental Policies

Organic agriculture is one of the main priorities in Jordanian agricultural policy agenda. As its role in magnifying the value added is vital. Total area certified as organic reaches about 1.06 thousand hectares, Table 32). Most of it is devoted for permanent crops, in particular fruit trees, i.e. 96% and only 1% is organic vegetables' acreage. 300 hectares are under conversion to organic.

In addition, because of the fragility of the environment in much of the country, rural peoples can play important roles in protecting the environment and managing natural resources efficiently. Agricultural policy therefore aims to promote efficient and sustainable use of rural resources while increasing economic opportunities in rural areas so that farm incomes are more equitably distributed within the sector and are closer to urban incomes, (Namrouqa, H. June 2009).

Still, the Jordanian environment is faced with many challenges. The Jordanian Ministry of Environment estimates that environmental neglect and abuse costs the Kingdom JD 330 million yearly (approximately 5% of GDP) due primarily to the fact that the environment is not taken into account in national and regional development plans. Water wastage alone costs the Kingdom approximately 100 million Jordanian Dinars yearly, (Namrouqa, 2010).

Energy exploitation, natural resource depletion, land degradation, chemicals, and waste are among Jordan’s leading environmental concerns. The main cause of Jordan’s increasing air pollution is the rapid increase, at 7% yearly, in the number of automobiles in the country, ((GFN, 2010).)

This problem is likely to grow in the coming years, affecting national health significantly. A recent Country Environmental Analysis has shown that the collective damage caused by CO2 emissions from road vehicles in Jordan amounted to 130 million Jordanian Dinars annually. In specific, heavy-duty automobiles, minivans, minibuses, and light duty automobiles accounted for 60% to 90% of these gasses. However, passenger cars were the main cause of carbon monoxide and hydrocarbons, that is, 80% of such pollution. Electricity production, mining, and cement creation were among the worst industrial polluters, (Namrouqa, June 2009)

Regarding solid waste collection, Jordan collects approximately 90% of urban solid waste and 70% of rural solid wastes, although frequently dumping them in open, unregulated sites, except for Amman,

which has more sophisticated waste disposal mechanisms. Regarding dangerous wastes (such as medical wastes), disposal is insufficient. For example, roughly, half of such waste is burned in old-fashioned incinerators, and the remainder is dumped in open municipal landfills, (Namrouqa, 2009).

The Arab Sustainability Leadership Group (ASLG) has noticeable efforts to bring awareness of environmental issues. This group is an amalgam of enterprises, NGOs, and public agencies, designed to promote sustainability in the work place, in conjunction with strong business growth. In addition, in May 2002, the heads of Jordan's 99 municipalities offered a declaration of support, regarding the World Earth Charter[7] By implementing this Charter, governmental municipalities have agreed to the concept of strategic, sustainable development, in conjunction with the JOHUD and the Ministry of Rural Affairs.

The productivity of Jordan's farmland has decreased by approximately 50% over the last 15 years, due to the overuse of various animals for food, and Jordan's rapid population increases. On the other hand, Jordan is increasing the amount of land that is designated 'protected areas,' reaching 6% of forest spaces (that is, twice the MENA average), (Namrouqa, September, 2009)

Starting in 2008, there has been an increase in the number of illegal logging violations across Jordan's green cover, covering less than 1% of Jordan's total area. In rural forest areas, deforestation has become a significant issue, with lumber transferred to the capital, where each ton is sold for over 120 million JD, even though the practice carries a fine of at least JD 100 per tree and a three-month imprisonment. In 2008 alone, the Ministry of Environment and the Royal Environment Protection Department (Rangers) fined approximately 17,670 individual firms for illegal practices. The majority of which constituted logging without public authorization, and improper industrial waste disposal. Of these individuals firms, the vast majority (17,600 individuals/firms) received warnings and/or reprimands, while the remaining 74 companies/farms were shut down, (Namrouqa, June 2009.)

The Royal Society for the Conservation of Nature (RSCN) is designed for the preservation of nature, in conjunction with rural economic growth. It seeks to do this via the private sector and free market. The collective impact of these initiatives and the general adoption of business approaches have been to revolutionize nature conservation strategies in Jordan.

No longer, are protected areas seen as the preserves of the elite, of little relevance to the social and economic needs of 'ordinary' Jordanians; they are now being recognized as engines of rural development, able to offer alternative and sustainable livelihoods for some of the poorest communities in the Kingdom. Such environmental entrepreneurship, combined with a people-centered philosophy, has also enabled RSCN to generate more popular support for conservation, minimize its need for government financial support, and become a national and regional leader in sustainable development",, (www.rscn.org).

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[7] The Earth Charter is an international declaration of fundamental values and principles considered useful by its supporters for building a just, sustainable, and peaceful global society in the 21st century. Created by a global consultation process, and endorsed by organizations representing millions of people, the Charter "Seeks to inspire in all peoples a sense of global interdependence and shared responsibility for the well-being of the human family, the greater community of life, and future generations."

2.7 Infrastructure Policies

Jordan has good infrastructure including an extended network of permanent roads, a seaport at Aqaba, three international airports capable of handling modern freight planes and a number of grain storage silos. A modern information and communications technologies (I.C.T) sector has been established in recent years and estimated 96 percent of all households have telephone, 40 percent with home computers and Internet connection and 98 percent are connected to the national electricity grid. It is considered an excellent base to build up a viable agro-industries sector that has regional implications. No other regional country has such advanced I.C.T facilities, (Market Publisher, 2011)

Jordan has a reliable and stable banking industry with a variety of services available but, notwithstanding assets of this kind, neither agriculture nor agro-industries have featured as focus for investment. The same holds true for small and medium enterprises investment. Some effort will be required to redirect investment and to take advantage of on-going efforts to simplify financial business practices, complex laws, and cumbersome regulations. The private sector has become recognized as a leading service provider – in the financial sector and elsewhere within industry, and is expected to take an increasing role with the shift to an open market economy. The country is well served with a stable and technically skilled labor force that is generally cheaper than that of neighboring countries. Table 81; throw lights on the time trend of infrastructure investments of agricultural sector along the period (1994-1997). Table 81, presents the investments in infrastructures related to agricultural sector in Jordan.

2.8 Consumer Policies

Like most countries, Jordan has conflicting interests in terms of its agricultural sector policies. Because some portion of the population is very poor and therefore vulnerable to high food prices, the government is very sensitive to the price of food staples. At the same time, in the interest of food security, it is also important to provide farmers with positive production incentives that maximize efficient and sustainable production of suitable agricultural products. In the past, subsidies were widely used to support the rural sector. However, under Jordan's agricultural sector restructuring program, subsidies have been abolished and support is now provided through other, non-market distorting means.

The government of Jordan also faces the absolute necessity of ensuring that the population has access to basic foodstuffs at stable prices that preserve the living standards of limited opportunity and the lowest-income groups. As a result, policies also are directed at increasing Jordan's food self- sufficiency through export of high-value agricultural products and import of lower value goods. To support a growing horticultural export economy, the government is promoting production of quality products at internationally competitive prices. This is being implemented through provision of more water for irrigation, an enhanced research and extension program, and expanded marketing services such as grading and residue testing using internationally accepted measures of qualitya assurance

3. Trade policies

3.1 General presentation of agro-food trade

Jordan ranked fourth in the Middle East in the 2009 Global Trade Enabling Report, after the UAE, Bahrain, and Qatar. The nation is emerging as a free market economy and a member of the WTO (World Trade Organization).

Jordan's trade sector is growing rapidly, in spite of the regional insatiability in Iraq and Lebanon, Jordan is emerging as a stable alternative. Jordan also has more Free Trade Agreements than any other Arab country in the world. For instance, it has signed FTA with the European Union, the United States, Canada, Syria, Algeria, Tunisia, Singapore, Malaysia, and Libya. The country is also a partner of the Agadir Agreement, the Greater Arab Free Trade Agreement, and the Euro-Mediterranean free trade agreement (Ministry of Industry and Trade "MOIT", 2006).

Jordan has abundant sources of potash and phosphate, which contribute a major share to its exports. In addition, there has been an annual increase of 9% in the exports of manufactured goods. The nation relies on foreign trade to fulfill its requirement for energy. Transport, mining, manufacturing, and other export-oriented sectors of Jordan were severely impacted in the late 2000s by the global financial crises. Re-exports also declined sharply during the recession (World Economy watch, 2011).

Exports fell to $6.989 billion from $7.782 billion in 2008. Jordon imported goods worth $12.31, which was lower than the $14.99 billion worth of goods imported in 2008 (Ministry of Industry and Trade, Jordan, 2011), (Table 34 and Figure 18). Jordan primarily exports the following commodities: Clothing, Fertilizers, Potash, Phosphates, Vegetables, and Pharmaceuticals. Jordan exports primarily to the following partners: India (16.2% of exports), Iraq (16.1%), US (13.2%), Saudi Arlabia (6.9%) and UAE (4.6%).

Jordan primarily imports the following commodities: Crude oil, Machinery, Transport, equipment, Iron and Cereals. Jordan has some tiny oil reserves, which it is not exploiting, so all its oil needs are imported. It has 6.031 billion cu m of gas reserves. It produces 250 million cu m for domestic use, and imports a further 2.72 billion cu m. Jordan imports primarily from these countries: Saudi Arabia (21.2% of imports), China (10.4%), Germany (6%), US (4.6%), Egypt (4.5%) and Ukraine (4.3%), (Table 34 Figure 19).

Jordan's foreign trade policy is based on the norms of economic openness and integration into the rapidly globalizing world economy. It incorporates the country's vision and possessiveness in viewing economic partnerships as necessarily achieving both mutual interests and fair dividends. Jordan has made giant strides on the path of economic and trade liberalization in addition to reinforcing mechanisms and functioning of a market-oriented economy that is built on an active role of the private sector in managing economic activities. This was made possible through an intensive reform process bringing about a modern and conducive regulatory environment for business and investment.

Today, Jordan is at the forefront of the Middle Eastern liberal economies that gained wide respect and recognition for their reforms and economic endeavors. In fact, Jordan is cited as an example in economic policy for emerging nations that could creatively overcome the dilemmas of the scarcity of material and natural resources, (MOIT, 2006)

3.2 Trade agreements

Jordan continues to face some challenges in its stride movement towards improving its terms of references and competitiveness in the international market. The political and economic stability of the country and a sound track record of social development and inward investment in recent times have considered recognition of good governance until the Arabic spring movements in 201, which has shown a breath flow around such stability in Jordan. Jordan has made effort to liberalize the economy, to seek open borders and to become a respected partner in international trade. The country has enforced copyright and

intellectual property laws. Trade-related legislation has been passed, pro-privatization programs implemented and inward investment has been encouraged, which have resulted in a number of multilateral trade agreements with key multi-national companies.

3.2.1 Intra MPCs trade

Free Trade Area Agreement with Egypt

It was signed: Dec 10 1998 and entered into Force in Dec. 28 1999. The trade preferences as of January 1st , 2005 were a total exemption of customs duties and charges having equivalent effect on all traded goods of national origin, except textiles, ready made clothes and enforcement iron products as shown in the table 1 of the agreement.

Free Trade Area Agreement with Syria

The date of Signature was Oct. 8, 2001, and entered into Force: May 21. -. The trade preferences as of January 1, 2005 were a total exemption of customs duties and charges having equivalent effect on all exchanged goods of Jordanian and Syrian origin.

Free Trade Area Agreement with Morocco

The date of Signature was June 16 1998. The date of Entry into Force was Oct. 3 1999. The trade preferences as of January 1st , 2005 were a total exemption of customs duties and charges having equivalent effect on all exchanged goods of Jordanian and Moroccan origin mentioned in table (1) of the agreement, of a total of 56 goods. In addition, other group of goods of customs category is of 0-25% duties). There is third group of commodities under customs duties of more than 25%. The customs and charges having equivalent effect to be reduced gradually for five years of the agreement date of effect according to reduction percentages mentioned in table (2) of the agreement for the Jordanian side, and table no (3) for the Moroccan side to reach 25% of the customs duties and other charges having equivalent effect. Moroccan goods exempted from reductions are mentioned in annex (4) of the agreement, and Jordanian goods are mentioned in annex 4 of the agreement.

Free Trade Area Agreement with Tunisia.

The date Signature was April 22 1998, and the date of entry into force was June 16 1999. Item recorded in annex 4 of the agreement are exempted of gradual liberalization and reduction is postponed. In addition, there are total exemption of customs duties and charges having equivalent effect on exchanged goods of Tunisian origin mentioned in annex no., 1 and goods of Jordanian origin mentioned in annex No., 2 of agreement date of effect. Except what is mentioned in paragraph 2-1 of the agreement, gradual reduction of 10% on Jordanian and Tunisian goods as of agreement date of effect. There are items of Tunisian origin mentioned in annex 3 of the agreement and items of Jordanian origin mentioned in annex 4 of the agreement.

Free Trade Area Agreement with United Arab Emirates

The date it was signed was May. 21st 2000, and the date of entry into force was Nov. 24 2001. The trade preferences as of January 1, 2005 were a total exemption of customs duties and charges having equivalent effect as of Jan. 1 2003 on all goods of Jordanian and UAE. origin.

Trade Cooperation Agreement with Algiers

It was signed in May 19 1997. The date of Entry into Force: was Jan. 31 1999. The trade preferences as of January 1st , 2005 were a total exemption of customs duties and charges having equivalent effect on all exchanged goods of Jordanian and Algerian origin, except goods mentioned in annex 1 of the agreement.

Free Trade Area Agreement with Lebanon

It was signed in Oct. 1 1992. The date of Entry into Force was July 8 1993. The trade preferences as of January 1st , 2005 were exemption of fruits and vegetables of all customs duties and other charges having equivalent effect when importing directly within the adopted agricultural calendar among both countries, exemption of live stock, botanical and meat products and non-processed natural materials exchanged between countries of customs duties and other charges having equivalent effect. In addition, there is exemption of all industrial products of national origin of both countries. All customs duties and other charges having equivalent effect mentioned in annex (1) of the agreement, and goods mentioned in annex (2) of the agreement are exempted of one third of fees and other charges having equivalent effect.

Trade Cooperation Agreement with Palestinian National Authority

It was signed: Jan. 26 1995. The date of Entry into Force: was to be valid from the date of signature. The trade preferences as of January 1st , 2005 were a total exemption of customs duties and other charges having equivalent effect on all exchanged goods of Jordanian and Palestinian origin, taking into consideration goods allowed to be exchanged mentioned in lists (A) & (B) according to Paris Protocol.

Free Trade Area Agreement with Kuwait

The date of signature was Dec. 25 2001 and entered into Force since April 9 2005. The trade preferences as of January 1st , 2005 were a total exemption of customs duties and other charges having equivalent effect on all industrial and agricultural products of origin of any contracting parties

Free Trade Area Agreement with Sudan

It was Signed: Feb. 6 2003 and entered in force Aug. 29 2003. The trade preferences as of January 1st , 2005 were a total exemption of custom duties and other charges having equivalent effect on all goods of Sudanese origin to be exported directly to Jordan as of agreement date of effect. It cited that there would be gradual reduction of customs duties and charges having equivalent effect on goods of Jordanian origin exported to Sudan by 25% on Jan. 1st. 2005, by 40% on Jan. 1st. 2006, by 70% on Jan. 1st. 2007 and 100% on Jan. 1st. 2008

Free Trade Area Agreement with Bahrain

It was signed in July 21 2001 and entered in force by May 29 2005. The trade preferences as of January 1st , 2005 were a total exemption of custom duties and other charges having equivalent effect on all industrial and agricultural goods of Jordanian and Bahraini origin exchanged between countries. The following items are excluded: Tobacco and similar products (chapter 24), liquors and alcohols.

Free Trade Zone with Saudi Arabia

Jordan has been actively involved in promoting inter-regional free-trade zones, signing an agreement with Saudi Arabia that provides for a free-trade zone before 2005.

Djibouti Agreement

It is a multi-objectives agreement of Economic. Trade, and Technical objectives. It was signed on 3 April 1984, which was the same date of entry

Greater Arab Free Trade Area (GAFTA)

GAFTA was declared within the Social and Economic Council of the Arab League as an executive program to activate the Trade Facilitation and Development Agreement that has been in force since January 1, 1998. The GAFTA includes in its membership 17 Arab countries (MIT, Jordan, 2011):

GAFTA is one of the most important economic achievements in the area of Arab common work. It contributes to efforts towards establishing the Arab Common Market. As of January 1st, 2005, the agreement reached full trade liberalization of goods when the full exemption of customs duties and charges having equivalent effect between all Arab countries members of the GAFTA. Sudan and Yemen are excluded as being less developed countries where customs duties and charges having equivalent effect are reduced by 16% annually on January 1st , 2005. Both countries reach full exemption by the end of 2010 (pursuant to the resolution of the Arab League Council at its 14th meeting in Beirut regarding offering less developed Arab countries preferential treatment). The Arab countries that do not require authentication of certificates of origin and accompanying documents by embassies and consulates (Ministry of Industry and Trade, Jordan, 2011):

To contribute further to economic integration among Arab countries through liberalizing trade in both goods and services, Arab countries are currently engaged in negotiations to liberalize services and investments among them.

Council of Arab Economic Unity:

The Council of Arab Economic Unity agreement was established in June 1957 by a resolution of the Arab Economic and Social Council of the Arab League. The Council's objective is to achieve economic integration among Arab countries with the view of establishing an Arab Common Market. The Council of Arab Economic Unity held its first session in Cairo in June 1964, being responsible for administrating the Agreement on Arab Economic Unity and supervising its implementation (Ministry of Industry and Trade, Jordan, 2011). Jordan, Somalia, Egypt, Iraq, Sudan, Tunisia, Yemen, Syria, Mauritania, Emirates, Palestine, and Libya signed establishing Countries of The Council of Arab Economic Unity. However, the current embers of the Council of Arab Economic Unity are Jordan, Egypt, Sudan, Yemen, Mauritania, Palestine, Somalia, Iraq, and Syria. It should be mentioned, that certification fees were cancelled but authentication is still required among the member's governments.

The Council of Arab Economic Unity has under its umbrella a number of agreements that aim to encourage Arab investments. These agreements have the following objectives:

Non-Double Taxation, Tax Evasion, and Establishing Common Rules on Income and Capital Agreement, signed on Dec. 3 1997. Members up to date are Jordan, Sudan, Egypt, Syria, Iraq, Libya, and Yemen.

1 Non-Double Taxation and Income Tax Evasion Agreement, signed on Dec. 6 1998. Members up to date are Jordan, Sudan, Egypt, Syria, Iraq, Libya, and Yemen.

2 Investment Promotion and Protection Agreement signed on June 7 2000. Members up to date are Jordan, Sudan, Egypt, Syria, Iraq, and Libya.

3 Investment Dispute Settlement in Arab countries signed on Dec 6 2000. Members are Jordan, Egypt, Syria, Iraq, and Libya.

Agadir Agreement

Agadir Agreement is the Agreement establishing a free trade area amongst Arab Euro-Mediterranean Countries. Agadir Agreement was signed in Rabat on Feb. 25, 2004 pursuant to Agadir Declaration, which was signed by Jordan, Egypt, Tunisia, and Morocco on May 8. 2001. Building on the common grounds that the four countries share within the context of their bilateral trade agreements and Association Agreements with the EU, they perceived the importance of Arab joint cooperation in line with the Executive Program for Establishing the Greater Arab Free Trade Area. The aim is establishing an Arab Common Market.

It is entered into force on July 6th 2oor6, adopts the "Pan-EUROMED Rules of Origin" that allow for diagonal accumulation of origin amongst its member countries through the possibility of using production input components originating in any of the member countries of the follwing agreements: Agadir Agreement, EU countries or EFTA countries. All have to comply with the required rules of origin in order to export their products to EU markets exempted from customs duties under their Association Agreements with the EU.

The Agreement also aims at harmonizing of general and sector's economic policies in member countries in relation to foreign trade, agriculture, industry, financial and taxation systems, services, and customs with the view of achieving objective competition amongst member countries. The agreement provides for full liberalization of trade in industrial and agricultural goods as of its date of entry into force. Moreover, member countries are committed under the Agreement to eliminate all non-tariff barriers including quantitative restrictions, financial, administrative, and technical barriers that may be imposed on imports. A Technical Unit is established in Amman, Jordan to supervise the implementation of the Agadir Agreement and offer advice and technical support in all related matters, (MOIT, Jordan, 2011).

3.2.2 Trade agreements with the EU

Since 1991, its economic policies have focused on economic stabilization, market liberalization and reducing the size of the government. Jordan has participated in the WTO General Agreement on Trade in services since 2000. It was one of the seven Mediterranean partners that officially opened negotiations on liberalization of services and establishment of the Euro-Mediterranean Trade at the Ministerial Conference in Marrakech. This liberalization provides Jordan with access to the EU services market, the largest in the world, and provides benefits from EU service technologies, company links, and investments, (Economy Watch Internet Site, Jordan, 2011).

Jordan signed with EU an association Agreement on 24 Nov., 1997, which has been entered into application since the first of May, 2002. Recently, a protocol between European Union & Jordan has been signed to establishing dispute and Settlement Mechanism of the bilateral trade in 11 Feb. Its date of entery was 1 July 2011

Such important free trade agreement was signed between Jordan and the European Union, which took effect in January 1999. It aims to eliminate tariffs on nearly 500 industrial goods over 5 years and to spur local industrial activity. Essentially, Jordan's products will be eased onto the European market as duties and taxes on European products are removed. Another significant part of the agreement will lift the ban on majority foreign ownership of Jordanian firms. Jordan also became a member of the World Trade Organization (WTO) in December 1999 and is currently in talks with the European Union regarding a free-trade agreement with the European Free Trade Association (EFTA), (WTO, 2008) and (World economy watch, 2011).

3.2.3 International trade agreements & globalization

Within the context of its accession to the World Trade Organization (WTO), which came into effect on April 11, 2000, Jordan undertook several reforms to bring its economic policies and trade regime into compliance with the WTO agreements. Special legislations of intellectual property rights were amended and drafted. Laws of Standards and Metrology, Agriculture, National Production Protection, General Sales Tax, Customs, and Import and Export were amended, as well as non-Jordanians' Investments Regulations.

On the other hand, and because of joining WTO, Jordan liberalized its services sectors providing market access to foreign investors and service providers of WTO Members in accordance with Jordanian laws and regulations. Whereas in goods' trade, Jordan committed to reduce customs tariffs to reach 30% as a maximum in 2000, to be reduced to 25% in 2005, and to reach 20% in 2010 with the exclusion of a limited number of goods. Customs tariffs on some agricultural products, such as tomatoes, cucumbers, and olive oil are bound at 30%. while the maximum tariff on certain agricultural products such as citrus products, grapes, garlic, and figs, and would not exceed 50% in specific calendar months.

Jordan finished with success the first review of its trade policy within the framework of the World Trade Organization during the period 10-12/11/2008, which is first review since Jordan's accession to the WTO in 2000. In its statement addressed to the trade policy review body and the Member States Jordan shed the light on the importance of the role played by the review mechanism in promoting the principle of transparency and deepening the understanding of Member States of the policies exercised by the member under review. The revision was conducted for the reforms made by Jordan to promote its economy, assuming that the adoption of the economic liberalization leads to economic growth despite the various challenges facing the Jordanian economy. These challenges are mainly poverty, unemployment and inflation as well as the current global financial crisis. Jordan also highlighted its next steps to liberalize further the economy to ensure full integration in the world economy and stressed its commitment to fulfill all its obligations under the World Trade Organization, which have contributed positive results in terms of economic growth and increased exports.

During the meeting many of the Member States praised the policy of economic openness and liberalization of trade regime adopted by Jordan during the past few years. the Government's efforts in improving the business environment resulting in high rates of growth in GDP as a result of steady growth in the volume of Jordanian exports and attract a lot of Arab and foreign investments, and promoting trade and economic relations and enhancing Jordan's trade and economic relations with countries worldwide, (Cassing, J., 2006).

3. 2.4 Other Bilateral agreements with non-Arab countries

Associated with opening economy policies of Jordan, several bilateral agreements were established with Asian, North, and South American countries, (Table 83). It seems that such agreements have promoted the Jordanian trade volume. E.g., In July 1997 Jordan signed an -Investment Promotion and Protection Agreement with USA. However, it was entered into application in June 2003. In October 2000, Jordan also signed a free trade agreement with the United States, and as a result, exports to the United States have risen rapidly. In 1999, Jordan provided US$13.1 million worth of exports to the United States, and in 2000, this figure had jumped to US$27 million (www.nationsencyclopedia.com/economies/Asia-and-the-Pacific/Jordan, 2011). It should be mentioned that, the recorded agreements with EU countries in (Table 83) are addendum to EU common agreement with the Union.

3.3 Tariff and non-tariff barriers

Regarding subsidies in the agricultural sector, Jordan is to reduce total domestic subsidies offered by the government to local agricultural producers by 13.3% out of JDs (1,539,199) over a period of seven years as of date of joining WTO. The ceiling of agriculture exports subsidies has been fixed at 0%. While for export subsidies in the industrial sector, which are considered, prohibited under WTO agreements, a special program by the Central Bank of Jordan to subsidize exports loans' interests was cancelled by December 31, 2002. In addition, under Jordan's commitments under the WTO, the exemption of profits resulting from exports from income tax is to end by the end of the year 2007. (This program was extended to the end of 2007 as a result to the exemption given to Jordan and other developing countries during the fourth ministerial meeting of WTO in 2001).

It is noteworthy that Jordan submitted its application in 1994 to what was known then the General Agreement on Tariffs and Trade (GATT) which was changed later to become an application request to join WTO in 1995 (the legal successor to GATT). Accession negotiations were concluded in signing the Accession Protocol that became part of Law No. 4 for the year 2000 (Law of Ratification of Jordan's Accession to the World Trade Organization).

Accession to WTO provides Jordan's goods and services with market access to more than 150 countries within clear and transparent trade procedures and laws and regulations in accordance with WTO rules and agreements. On the other hand, national economic reform procedures and new legislations that were enacted in preparation to joining WTO, contributed to creating a conductive business environment attracting investments. In addition, joining WTO provides new market access opportunities for Jordan's goods and services that would result from the Doha Development Agenda (Multilateral trade negotiations round that was launched in WTO Fourth Ministerial Conference in Doha in 2003

4. Future prospects

4.1 Agro-food sector outlook

The scarcity of water resources is one of the main challenges for Jordan and a limiting factor for economic development especially for agriculture. The demand on water resources is increasing with time for both agriculture and non-agricultural purposes.

Jordan receives rainfall of about 6,000 million cubic meters, and the Syrian catchment of the Yarmouk River Basin receives an additional 2,065 million cubic meters. High evaporation and infiltration results in a relatively small annual stream flow of about 878 MCM, excluding Jordan River flow. The potential for further development of surface water resources rests principally with the construction of the proposed Al Wehdeh Dam on the Yarmouk River. This dam would provide an annual safe yield of about 105 million cubic meters, of which 55 million cubic meters for manufacturing and industrial uses in Irbid region. The remaining 50 million cubic meters would be used to intensify agricultural production in the Jordan Valley, (Raddad, 2005).

In addition to the overall constraints of this resource, there are other problems which limit its large scale usage for irrigation purposes. One of the most significant problems is the exceeding of the safety limits which leads to the depletion of fresh water resources and an increased salinity of water. Other problems include the growing costs of water pollution and excessive pumping of groundwater especially in the highlands e.g. the Dheleil and Azraq basins, (Ministry of Water resources, Water Authority Report, 2010).

Jordan is considered among the poorest countries in the world in terms of water resources. The climate is generally arid, with more than 90% of Jordan's total area receiving less than 200 millimeters

rainfall per year and more than 70% of the country receiving less than 100 millimeters of precipitation on a year. Only around 2% of the land area, located in the north-western highlands, has an annual precipitation exceeding 300 millimeters. The northern highlands may receive as much as 600 millimeters. About 5.5% of Jordan's area is considered dry land with annual rainfall ranging from 200 to 300 millimeters. The pattern of rainfall is characterized by an uneven distribution over the various regions, and strong fluctuation from year to year in terms of quantity and timing.

Jordan is characterized by a pronounced scarcity of renewable fresh water resources, which averages at about 680 million cubic meters per year, or approximately 135 m^3 per capita for all uses. Thus, Jordan's water resources are, on a per capita basis, among the lowest in the world.

The water resources of Jordan consist of groundwater and fossil water which are found in aquifers at different depths throughout Jordan. Other sources of water include surface water flows from precipitation in the Jordan River Basin, increasing treated waste water as well as non-conventional water resources such as brackish water

Jordan is located at the heart of a difficult regional grouping of countries. The country has faced internal challenges because of the changing patterns of regional allegiances, conflicts within neighboring states and across international borders, the large-scale movement of displaced people within states, and the refugees that have crossed into the country and taken temporary residence. Conflict and displaced people in large numbers bring additional risk to the many complex socio-economic and political issues that have affected the region since the demise of Turkish hegemony in the region in the early part of the 20th century and the establishment of the state.

The current global economic recession and follow-on effects are expected to have mixed impact on the Jordanian economy. Economic growth will slow, and there are likely to be reduced remittances from Jordanians working in the countries of the Arabian Gulf as salaries are cut and jobs are lost. Reductions in foreign aid and in DFI are also likely. Economic forecasts suggest that 2010 and 2011 will see a return to greater normality in international finance markets, but Jordan will continue to confront difficulties and not least with factors that remain largely outside the control of the state. The country remains vulnerable to fluctuations in international oil markets, high unemployment is socially destabilizing and projections for climate change show further pressure on natural resources and particularly water supplies. However, Government can do much to continue to foster a socio-economic environment that increases the role of the private sector and improves the competitiveness of the domestic economy. This remain, perhaps, the greatest opportunity for making change into the next period, (Cordella, 2006).

Migration remains a complex issue within the country. This is the out-migration of well educated Jordanians seeking to gain experience and higher earnings mainly in countries of the Arabian Gulf. The inward-migration of people who are willing to undertake the low-skilled jobs those are no longer attractive to Jordanians. Sometimes migration is temporary and people return home, although increasingly people are remaining for longer periods and establishing the networks and social stability that comes with a

permanent move. This is particularly so with minority populations within the country that provides services, occupy unskilled posts and accept low-paid employment.

Jordanians are moving professionally and socially into levels of employment demanding skills, academic education and advanced technologies such as I.C.T and, in so doing, are following regional and international markets of supply and demand for people with training and mobility. The challenge for Jordan and for national development long-term will be to provide the resources, funds, facilities and infrastructure, which will encourage these qualified people to remain, linked to their home country. Given the technical base required of modern agro-processing industry human resources - technicians, managers, entrepreneurs and services people – are likely to become the crucial industrial resource into the next period, (Wright, 2005).

Public supported agricultural and agro-industrial R&D is invested largely in the national agricultural R&D centers and the universities, but sharing across programs and sectors is poor with lack of coordination, competition, and inefficiencies arising. This results in duplication of work and wasted effort and funding. The country recognizes existing deficiencies and efforts are in hand to make the changes required, but the limited financial and human resources available with which to improve the institutional and technical performance of existing systems hinder this. It is essential, however, that more emphasis be placed on unifying national R&D investment – that some form of strategic direction be defined that will provide the support services, information, technologies and human resources required of agro-industries development. This will be essential for prioritizing the use of limited R&D funds available. More commercially led R&D investment is required, (United Nations, 2005)

4.2 Agro-food policies' evolution outlook

4.2.1 Evolution of Water Resources Use

The current Problem: There is a sever scarcity in water for irrigation, associated with overuse, inefficient use, decline in aquifers, which lead to serious shortages in the very near future.

In addition, there is under pricing of water, inefficiencies of conveyance and inequitable pricing between uplands and Jordan Valley.

Table 85,shows Jordan's increasing need for water during the next quarter of a century as predicted by concerned ministries' planners and officials in Jordan. Jordan allocates around 340×106 m3/year of water to irrigation. This comes from several sources. 74.5% from surface water, 17% from treated wastewater and 8.5% from groundwater. Jordan allocates more than 30% of its water resources to irrigation in the Jordan Valley, and 80% of the water is of good quality. The water consumed by crop are 200 million cubic meters for fruit trees, 110 million cubic meters for vegetables and only 30 million cubic meters for field crops, (Khamis Raddad, 2005).

Jordan would achieve more water savings if they grew crops with low water requirements. Using a new, modified drip-irrigation system, especially for fruit trees, farmers would save at least 30 × 106 m3/year. Accordingly, the decision makers should keep the following in mind:

1. To give priority to water harvesting and storage projects.
2. To control water waste as much as possible.
3. To conduct studies on pumping water from greater depths seeking for new water sources.
4. Respecting water agreements with neighboring countries and making sure others respect them.

5. To replace old water networks with newer ones.
6. Desalinate the seawater.
7. To develop the people's awareness towards saving water consumption.

Policy Change

• Raise the price of water to social opportunity cost. Richard, (1993) provided evidence that the comparison of the various estimates of operating and maintenance fees of water (0.024 JD/Cu. M. - 0.112 JD/Cu. M) as long run marginal costs, implies that VAMP of water > operating and maintenance fees. The following list presents a profile of the shadow price estimates per 1-cubic meter of water in Jordanian Dinar in 1993.

Crop	Shadow price of Water (JD/Cu. M) (1)
Oranges	0.775
Grapes	0.737
Straw berries -	0.926
Onions	0.387
Eggplant	0.201
Tomatoes-w	0.189
Tomatoes-s	0.290
Bananas	0.179

(1) Under the assumption of constant return to scale: AP = MVP = Shadow price of Water

• Reduce conveyance losses through investment and upgrading of system.

• Expand water supplies through investments in dams/weirs

•The changes must be gradual: e.g., raising water fees over a period of four to five years. This is linked to "compensations," as improvements in the water conveyance system will not happen overnight

•Pushing on water pricing must be accompanied by offsetting benefits to growers. Privatization and improved delivery efficiency are plausible benefits, which are also consistent with Mission Goals.

•Political considerations strongly suggest that water pricing will be instituted, if at all, gradually and in phases.

• Trade policy change may be a more effective political economy lever than O&M water pricing to achieve water conservation goals.

• Jordan's relatively unsubsidized agriculture can be an asset in multilateral negotiations over water rights. Particularly, if increasing reliance on markets is seen as strengthening Jordan's hand, the government is likely to push for further liberalization of the sector.

•. Jordan would achieve more water savings if they grew crops with low water requirements. Using a new, modified drip-irrigation system, especially for fruit trees, farmers would save at least 30 × 106 m3/year

Constraints

• The efficiency gains of setting the price of water equal to Operating and Maintenance costs may

not be very large if this is the case, there will be fewer benefits to distribute to strengthen the winners and appease the losers from the policy change.

• Farmers would be willing to pay OPERATING AND MAINTENANCE fees of water if the government bared the costs of maintaining the irrigation system.

• From a budgetary perspective, water charges are a sideshow: the water subsidy is between one and two

• Trade policy may be the most economically effective and politically feasible lever of water policy change. If the marginal revenue of water in fruit cultivation has decreased from the current value that greatly exceeds any suggested OPERATING AND MAINTENANCE charge, by increasing competition from abroad may be the most effective way of encouraging water conservation. Currently, allowing subsidized fruit from Syria, for example, to enter into the country raises equity and foreign policy issues.

• In any case, the bottom line should be the marginal value product of water, not total water use. Economizing on water "for its own sake" makes no economic sense. Is water "scarce" for municipalities and industry? What is the marginal value product of water in phosphates mining in Jordan? What is the marginal utility of water to urban consumers? There are no studies of these questions. Yet they need to be done to be able to talk sensibly about the political economy of water.

• Jordan allocates around 340×106 m^3/year of water to irrigation. This comes from several sources. 74.5% from surface water, 17% from treated wastewater and 8.5% from groundwater. Jordan allocates more than 30% of its water resources to irrigation in the Jordan Valley, and 80% of the water is of good quality. The water consumed by crop are 200 million cubic meters for fruit trees, 110 million cubic meters for vegetables and only 30 million cubic meters for field crops, (Khamis Raddad, 2005)

4.2.2 Evolution of Range Management and Livestock

The Current Problem: Over grazing, Range degradation, erosion, and desertification, leading to inefficient resource allocation in livestock subsector.

Policy Change:

. • Allocation of the land as private property with restrictions, e.g., prohibiting use of tractors beyond the 200 mm. isohyets' as in Syria.

• To establishment a proper range management system and associated institutions.

• To adapt the strategy of establishing the program for Availability and Accessibility and Adequacy of Supplementary feed mix during poor years.

• Abolishing the government holding of the land as state land as a mechanism to try to control the Bedouins and other Trans-Jordanian pastoralists

As Bedouin do not see how proposed changes will help them and their families, a part of the solution may lie in improved education, information, and strengthening the extension service in this area.

• Amelioration of the range requires changes in property rights, which implies the need for extensive consultation between the government and the local population if serious political costs are to be avoided

• Reform of barley prices will partially compensate those livestock owners who are also rain-fed farmers; it should be strongly encouraged. The impact on increased cultivation of marginal land should be monitored

• Four phases are recommended to assure the success of the program:

A. Set up pilot perimeters to monitor systems and demonstrate benefits.

B. Set up informal grazing associations "using perimeters whose utilization would not be challenged by other groups."

C. Require herders who are able to settle disputes with their neighbors.

D. Once the concept is well defined and accepted (presumably because of success), then extend the system legally to the whole country, (World Bank, 1990)

Constrains:

• Some large farmers have already acquired land as private property through plowing and want to keep it

• Any calls to solve the problems of range management though the government would face with negative response of the Bedouins

• Any proposal to ameliorate these problems will create some opposition: because allocating land in private property will alienate small herders, while cooperative proposals will face the opposition of the "big men."

• Given the manifest difficulties of the extension service, the probability of success in this area in the near term is not encouraging

• Allocating land rights to groups (COOP.) is skeptical given the pride and individualism for which Bedouins are famous

4.2. 3. Evolution of Rain-fed Farming

Current Problem: Such Area suffers from Low productivity and incomes, urbanization of agricultural land and land holdings fragmentation associated with inheritance laws. In addition, there are lack of investment, lack of profitable appropriate technological packages, distortion in barley price policy, and poor infrastructure

Policy Change:

• Raise barley prices up to international level.

• Encourage fruit production on land with slopes over 8 percent.

• Use urban wastewater for supplementary irrigation instead of for Jordan Valley farmers.

•Tax the conversion of agricultural land to urban real estate.

•"Impose a minimum plot size for (various crops).

• Additional external funds are needed to:

a) Improve the quality of wastewater treatment,

b) To complete the various water projects

c) To satisfy the environmental conservation conditions.

• To limit the expansion of Amman in every direction except to the East, thereby minimizing the impact of reducing agricultural land loss on urban real-estate values

Constrains:

• It will be difficult to persuade Jordan Valley farmers of the need to pay water charges if they are simultaneously being deprived of urban wastewater in addition to the costs of environmental concerns with using this water.

• Slowing the expansion of cities will add to the government's political difficulties with the urban poor, especially in the current context of structural adjustment, with phasing out subsidies and increased unemployment.

• Proposals for coping with land fragmentation typically evade the real issue. Accordingly, progress against fragmentation will be marginal at best. Therefore, it is unlikely to receive much attention from important policy makers.

4.2.4 Evolution of Technology

Conservation of genetic resources requires funds and technology. However, the developing countries generally lack these funds and the technology to protect these resources. Therefore, funds should be made available from the rich countries Therefore; International cooperation is needed to advance the interest in the genetic resources to a high priority level since it is hard for a nation, troubled by food production problems and high national debt to have genetic resources on their high priority.

In the light of the weak infrastructure availability of funds, availability of trained human resources in many of developing nations, the international agriculture research centers should take a leading role in the biodiversity activities

Human resources development is very essential for the maintenance of biodiversity activities. Higher education out side the developing countries are expensive and therefore unless scholarships are made available for people from these nations it would be difficult to build such base.

The efforts in biodiversity may be done by individuals who have special need for germ plasma and therefore these collection will be at serious risk degree programs can be started at national universities and training for higher degree can be obtained at selected universities in North America and Europe Furthermore short term courses for technicians can be held at the international centers or regional institutes. Considered based on three inter-related sectors – public goods, innovative institutions and finance.

1. Public goods and facilitative policies are required that will increase public investment in agro-food R&D and market information systems. This can be accomplished with the establishment of a national fund that will direct R&D into a number of key agro-technologies and agro-industrial technologies. These should include:

2. Agro-technologies: They include alternative energies, biotechnologies, clean production

practices, water efficiency in agriculture, modern agro-food practices, high quality/value products, market-led processing, and good agricultural practices.

Three Agro-industries: They include establishing a national agro-food database, food-testing and quality-monitoring/analysis laboratories, maintenance of quality standards, adoption of traceability practices, contracting systems for producer associations/groups to supply processors, industrial services for providing marketing, technical, finance, etc. Agro industries also include information, linking agro-industries services into existing R&D centers and universities and generally constructing an agro-industrial public sector to augment existing services in support of agro-production.

4 Infrastructure: It covers the augmenting and improving existing supplies of energy, water and transportation at reasonable cost; development of industrial manufacturing centers that will foster SME development; priority investment in pro-environmental issues – energy, water, climate mitigation, early warning systems for food supply/demand and similar.

'Agribusiness' as a sector needs to be recognized and promoted, and this can be done by establishing a national food and agricultural marketing company with responsibilities to promote, guide and lead by example in support of 'Jordanian Agro-Industries'. Industrial sector support will come from access to incentives and soft loans for establishing more agro-food projects (and in particular those that target 'small-scale', 'income-generating', 'rural' and similar). Jordanian exporters should be encouraged to exploit foreign markets, which will help stabilize prices, improve food safety, and raise the quality of products manufactured in the country. Agreements are required across the region to encourage integration and harmonization between countries that will help improve regional food security and price stability. Regional producers should be seeking to exploit distant markets as shared ventures (and particularly markets in the EU)

5. Concluding remarks

Jordan is divided into three main geographic areas with different climate: the Jordan Valley, the Highlands, and the Eastern Desert. The cultivated area is equivalent to 3.4% of the total land, mostly in the Jordan Valley. Although intensive irrigation and modernization processes are available, the local agriculture has to cope with the limited water resources. The contribution of the agricultural sector to the country's GDP is 3.8% in 2000 and currently it employs 5.7% of the workforce in Jordan.

About 80% of local agricultural production consists of fruits, vegetables, and citrus. These constitute 70% of agricultural exports, where agricultural exports (mainly to the Gulf markets) are 10% of Jordan's total export.

The meat production in Jordan is limited, though the production of poultry is more active. The total national poultry production is about 120-140000 tons per year, and it accounts for a small share in the region's market. However, imported poultry from Brazil and Thailand contributes progressively in reducing

the domestic production. The meat processing industry is active and it has specialized in frozen processed meat products, these products are exported to the neighboring countries

The major vegetables grown locally are tomatoes (representing about 31% of total production), potatoes (about 10%), and cucumber (about 9%). Among the fruit tree products, olives represent the most important production (see the special brief). As shown in figure 2, most importantly Jordan exports tomatoes, cucumbers, eggplants, and curettes, while it mainly imports grain (wheat and barley). The Jordanian Government has signed a bilateral agreement with Syria, Lebanon, and Turkey, in order to import/export according to their respective needs. This sub-sector covers the industry, which processes fruits and vegetables, namely tomatoes by companies specialized mainly in producing processing tomatoes and cooked vegetable products. Processed tomato is a large component of Jordan's agro-food sector. The industry produces a wide range of products coming from the local tomato crops (peeled tomatoes in cans, tomatoes cubes in cans, tomatoes concentrate, triple concentrate, ketchup, etc.). There are also other companies, which use Jordanian raw materials in the processing of ready cooked meals. There is scope for producing freeze and de-hydrated dried fruits and vegetables, right now most of the freeze products are imported from Central and Eastern Europe.

Dairy products With an output of 165 000 tons of fresh milk, Jordan produces 35 liters per capita while the domestic milk consumption is equivalent to 50 liters per capita. The country imports about 8000 tons of powder milk each year. Dairy products are generally yogurt and cheese (Halloumi type). Milk in bottles or pack is available on the local market but it is highly priced as pasteurized milk.

Bakery products this sub-sector, which includes mills, cereals and breads, is very dynamic and scattered, in fact it accounts for the greatest number of companies in the local food production. Statistics from Jordan Investment Board indicate that the grain milling firms represent 20 – 40% of total investments in the food sector.

Cocoa, chocolate, and sugar product this sub-sector is a traditional one in the Arab world, with all its industries representing the ethnic production (Halawa). The companies export to their traditional Arab and Gulf countries' market and even to the US, for an amount of 2.184 million JD (15% of domestic production).

Soft drinks, production of mineral water the size of the market should be close to 80,000 tones of fruit juice of which 65,000 ton locally produced and 12-15 000 imported. In fact, the sector is ready to receive new investments; recently a big multinational enterprise has entered the mineral water market to satisfy the local demand.

Microfinance has not served the poorest of the poor, that is, the individuals and households who require a loan the most. The very poor typically are unable to obtain any formal loans, as they do not possess collateral, nor can they join a borrowing group. Even with moderate improvements, interest rates on micro-finance loans are still excessive, as opposed to commercial banks. Rates are also excessive, compared to the return on investment rates of projects typically found in rural areas, such as trading and husbandry. This is understandable, as no microfinance institution declared that it is in their mission statements to serve the poorest of the poor. Thus, it is imperative that stakeholders find other methods of poverty alleviation, such as grants, subsidies and other services.

Though the role of cooperative societies in development of MSMEs in Jordan remains small, this is not because of limited number of them and volunteer activity in the country. There are over 1,000

cooperative societies are registered, yet only 25% of them, mostly in rural areas, indicate such an aim. For example, the Jordan Hashemite Fund for Human Development (JOHUD) provides services in supporting MSMEs start up and growth.

ANNEX of TABLES

Table 49 Agricultural Sector Share in Jordanian GDP

Year	GDP	Agricultural Production (million US$)	% (Agricultural Prod./GDP)
2006	15,645	963	6%
2007	17,765	1,197	6.7%
2008	22,697	1,514	6.7%
2009	25,092	1,500	6.0%

Source: Compiled and Calculated from World Bank (2011) "World Bank Indicators", Wash. D.C., USA

Table 50 Employment in Crafts small and medium firms

Crafts Professions	Sales in ('000) JD	Number of Employees	Productivity/ Employee (JD)
Ceramics as crafts	8,962	317	28,271
Metal, copper and silver	18,923	1,125	16,820
Leather Works	1,774	287	6,181
Weaving	37,941	790	48,027
Wood works	62,423	545	114,538
Pottery	23,056	350	65,874
Total	123,420	3,414	36,151

Source: Department of Statistics (2008) "Economic Surveys", Amman, Jordan

Table 51 Land Use in Jordan,

Type of Land	2008		2009	
	(000) Ha	%	(000) Ha	%
Inland water	54	1%	54	1%
Forest area	97.5	1%	97.5	1%
Pastures	742	8%	742	8%
Agricultural Area	197.8	2%	224.1	3%
Fallow land	31.4	0%	58.9	1%
Country area	8878	100%	8932	100%

Source; Compiled and Calculated from: FAO, UN (2011) "FAO STAT, [www.fao.org]"

Table 52 Agricultural Land Pattern by Irrigation System

Year	Irrigated Area (000 hectares)	Rain-fed Area (000 hectares)	Total Area	% irrigated Area from total area
2003	713.170	1673.210	2386.381	29.89%
2004	761.248	1947.505	2708.752	28.10%
2005	800.452	1673.416	2473.867	32.36%
2006	834.530	1687.826	2522.356	33.09%
2007	810.998	1060.884	1871.882	43.33%
2008	928.364	1385.514	2313.878	40.12%
2009	948.195	1293.712	2241.907	42.29%
2010	1025.021	1568.780	2593.801	39.52%
Average	852.747	1536.356	2389.103	36.09%
Annual Growth Rate %	5.2%	-0.9%	1.2%	

Source; Compiled and Calculated from: Department of Statistics (2011), Amman, Jordan

Table 53 the Area of Fruit Trees (000) Ha in Jordan (2003- 2010)

Year	Irrigated Area (000) Ha	Rain-fed Area (000) Ha	Total Area	% irrigated Area
2003	331.98	525.930	857.912	38.70%
2004	334.292	526.013	860.305	38.86%
2005	334.570	526.014	860.583	38.88%
2006	337.346	526.014	863.359	39.07%
2007	433.267	379.787	813.054	53.29%
2008	439.065	379.787	818.853	53.62%
2009	442.681	379.882	822.563	53.82%
2010	447.246	379.882	827.128	54.07%
Average	387.556	452.913	840.469	46.29%
Annual Growth Rate %	4.3%	-4.6%	-0.5%	

Source; Compiled and Calculated from: Department of Statistics (2011), Amman, Jordan.

Table 54 the Area of Vegetables (000) Ha in Jordan (2003- 2010)

Year	Irrigated Area	Rain-fed Are	Total Area	% irrigated Area
2003	323.992	20.243	344.235	94.12%
2004	349.651	19.391	369.042	94.75%
2005	380.539	21.117	401.656	94.74%
2006	408.617	14.490	423.107	96.58%
2007	326.068	8.697	334.765	97.40%
2008	402.057	16.646	418.703	96.02%
2009	388.680	23.114	411.794	94.39%
2010	448.851	31.956	480.806	93.35%
Average	378.557	19.457	398.014	95.17%
Annual Growth Rate %	4.7%	6.5%	4.8%	

Source; Compiled and Calculated from: Department of Statistics (2011), Amman, Jordan

Table 55 the Area of Field Crops (000) Ha in Jordan (2003- 2010)

Year	Irrigated Area	Rain-fed Area	Total Area	% irrigated Area
2003	57.196	1127.038	1184.234	4.83%
2004	77.305	1402.101	1479.406	5.23%
2005	85.343	1126.285	1211.628	7.04%
2006	88.568	1147.323	1235.891	7.17%
2007	51.663	672.400	724.064	7.14%
2008	87.242	989.081	1076.323	8.11%
2009	116.834	890.716	1007.550	11.60%
2010	128.925	1156.943	1285.868	10.03%
Average	86.634	1063.986	1150.620	7.64%
Annual Growth Rate %	11.6%	0.4%	1.2%	

Source; Compiled and Calculated from: Department of Statistics (2011), Amman, Jordan

Table 56 Area (000) Ha of Major Vegetables Cultivated in Jordan

Year	Tomatoes	Potatoes	Watermelon
1999	81.919	40.184	23.314
2000	73.694	40.087	22.794
2001	80.299	37.199	31.666
2002	81.152	36.731	10.652
2003	85.057	37.636	15.653
2004	76.562	35.021	16.398
2005	90.248	37.97	25.769
2006	90.229	45.475	12.864
2007	112.38	48.475	13.918
2008	112.656	52.87	21.155
2009	105.403	35.431	17.598

Source: Department of Statistics, Amman, Jordan

Table 57 Production (tons) of Major Vegetables Cultivated in Jordan

Year	Tomatoes	Potatoes	Watermelon
1999	323.992	94.659	105.13
2000	299.916	88.052	89.844
2001	293.278	96.338	120.666
2002	354.292	97.075	35.011
2003	310.195	101.344	34.248
2004	359.832	105.334	71.777
2005	415.871	122.396	94.586
2006	449.487	165.332	83.903
2007	598.933	172.077	84.998
2008	545.566	160.028	91.876
2009	610.246	98.866	85.65

Source; Department of statistics, Amman, Jordan

Table 58 Comparison of Vegetables Productivity in Jordan versus World Average

Year	Potatoes			Tomatoes			Watermelons		
	World	Jordan	Jordan/ World	World	Jordan	Jordan/ World	World	Jordan	Jordan/ World
2000	16.3	2.2	13%	27.3	4.1	15%	24.5	3.9	16%
2001	15.8	2.6	16%	27.1	3.7	13%	25.3	3.8	15%
2002	16.5	2.6	16%	28	4.4	16%	26.8	3.3	12%
2003	16.5	2.7	16%	28.5	3.6	13%	25.5	2.2	9%
2004	17.5	3	17%	28.6	4.7	16%	27.4	4.4	16%
2005	16.8	3.2	19%	28	4.6	16%	27.7	3.7	13%
2006	16.6	3.6	22%	28.1	5	18%	27.8	6.5	23%
2007	17.3	3.5	21%	32.8	5.3	16%	28.1	6.1	22%
2008	18.1	3	17%	33.5	4.8	14%	28.7	4.3	15%
2009	17.7	2.8	16%	34.8	5.8	17%	28.7	4.9	17%
Average	16.9	2.9	17%	29.7	4.6	15%	27.1	4.3	16%
SD	0.7	0.4		2.9	0.7		1.5	1.3	
C. V.	4%	15%		10%	15%		5%	30%	

Source: compiled and calculated from: "FAOSTAT" "Statistics Division, (2011) (www.fao.org), and Department of statistics, Amman, Jordan

Table 59 Number of Major Fruit Trees in Million (1999-2009)

Year	Olive	Citrus	Apples
1999	5.58	1.884	1.824
2000	7.287	1.878	2.186
2001	6.383	1.93	2.313
2002	6.384	2.024	2.369
2003	5.322	2.135	1.922
2004	5.904	2.199	2.59
2005	5.332	1.788	2.297
2006	6.793	1.905	2.158
2007	5.152	1.899	2.158
2008	6.225	1.938	2.156
2009	6.825	1.882	1.503

Source; Department of statistics, Amman, Jordan

Table 60 Major Fruits Production in Jordan (1999- 2009)

Year	Olive	Citrus	Apples
1999	57.145	168.923	31.009
2000	137.549	162.227	38.527
2001	38.313	85.644	31.035
2002	134.285	124.595	37.468
2003	65.701	136.624	37.134
2004	180.9	124.207	39.23
2005	117.958	147.153	41.754
2006	160.738	127.774	42.424
2007	113.069	136.282	45.563
2008	146.828	139.242	46.381
2009	125.029	90.414	31.423

Source; Department of statistics, Amman, Jordan

Table 61 **Yield/ Tree of the Major fruits Cultivated in Jordan 91999- 2009)**

Year	Olives	Citrus	Apples
1999	10.241	89.662	17.001
2000	18.876	86.383	17.624
2001	6.002	44.375	13.418
2002	21.035	61.559	15.816
2003	12.345	63.993	19.320
2004	30.640	56.483	15.147
2005	22.123	82.300	18.178
2006	23.662	67.073	19.659
2007	21.947	71.765	21.114
2008	23.587	71.848	21.513
2009	18.319	48.041	20.907

Source; Department of statistics, Amman, Jordan

Table 62 Comparison of Orange Productivity Level and Variation in Jordan versus World Average

Year	Ton/Ha		Jordan/World
	World	Jordan	
2,000	17.4	18.3	105.0%
2,001	16.7	14.9	89.5%
2,002	16.8	15.3	90.8%
2,003	16.3	17.7	109.1%
2,004	17.0	17.7	103.9%
2,005	16.5	19.1	115.8%
2,006	16.6	19.7	119.0%
2,007	15.9	12.2	76.6%
2,008	16.7	14.1	84.6%
2,009	16.3	16.7	102.6%
Average	16.6	16.6	100%
SD	0.4	2.4	
Coefficient of Variation	3%	14%	

Source: Compiled and calculated from: FAO, (2011) "FAOSTAT" FAO "Statistics Division, Rome, Italy (www.fao.org

Table 63 Livestock Performance in Jordan: Cattle Stock

Year	Stocks (Heads)	Slaughtered Animals (Heads)	Off-Take (%)	Carcass Weight (Kg)	Meat Production (Ton)	Milking animals	% of Stock	Yield/ Milking Head	Milk Production (Ton)
2000	65308	40,200.0	62%	162	6,500	46,363	71%	3,490	161,812
2001	65370	61,700	94%	195	12,001	46,326	71%	3,514	162,765
2002	68067	55,850	82%	209	11,650	49,956	73%	3,541	176,913
2003	66260	53,265	80%	190	10,136	32,300	49%	5,257	169,800
2004	69280	83,540	121%	187	15,630	35,000	51%	5,729	200,530
2005	67520	39,911	59%	189	7,531	34,200	51%	5,751	196,680
2006	69100	67,467	98%	220	14,822	34,826	50%	5,891	205,148
2007	81000	60,000	74%	230	13,782	48,540	60%	5,282	256,380
2008	79380	95,000	120%	201	19,133	47,560	60%	6,601	313,960
2009	64520	65,000	101%	200	13,000	36,900	57%	6,629	244,600

Source: Compiled and calculated from: FAO, (2011) "FAOSTAT" FAO Statistics Division, Rome, Italy (www.fao.org

Table 64 Livestock Performance in Jordan: Sheep Stock

Year	Stocks (Heads)	Slaughtered Head	Off-take (%)	Carcass Weight (Kg)	Meat Production (Ton)	Milking animals (Head)	% of Stock	Yield/ Milking Head	Milk Production (Ton)
2000	1,933,99	962,335	50%	12	11,900	751,934	39%	40	30,077
2001	1,484,090	1,004,220	68%	12	12,423	577,013	39%	40	23,081
2002	1,457,910	1,177,000	81%	12	14,122	566,447	39%	40	22,658
2003	1,476,470	1,077,930	73%	12	12,668	860,000	58%	60	51,406
2004	1,529,090	1,286,400	84%	12	15,444	1,015,940	66%	58	58,443
2005	1,890,440	1,125,480	60%	12	13,300	1,158,860	61%	57	65,752
2006	1,971,520	1,050,000	53%	12	12,610	1,304,710	66%	65	84,544
2007	2,251,450	1,628,000	72%	12	19,545	1,325,940	59%	52	69,501
2008	2,493,360	1,290,000	52%	12	15,445	1,661,660	67%	45	75,263
2009	2,070,940	1,290,000	62%	12	15,658	1,340,290	65%	42	56,030

Source: Compiled and calculated from: FAO, (2011) "FAOSTAT" FAO Statistics Division, Rome, Italy (www.fao.org

Table 65 Livestock Performance in Jordan: Goats Stock

Year	Stocks (Heads)	Slaughtered Animals (Heads)	Off-Take (% of Stock)	Carcass Weight (Kg)	Meat production (Ton)	Milking animals	% of Stock	Yield/ Milking Head	Milk Production (Ton)
2000	461,393	138,000	30%	11	1,573	179,390	39%	71	12,648
2001	425,907	140,000	33%	12	1,610,000	183,692	43%	67	12,384
2002	557,289	120,000	22%	12	1,452,000	165,597	30%	68	11,324
2003	547,490	185,165	34%	13	2,481,211	410,000	75%	59	24,094
2004	501,120	237,340	47%	13	3,180,356	306,756	61%	59	18,150
2005	516,140	149,910	29%	14	2,023,785	280,968	54%	55	15,455
2006	473,810	127,000	27%	12	1,536,700	289,917	61%	70	20,187
2007	569,370	229,500	40%	13	3,075,300	310,615	55%	62	19,239
2008	1,083,330	314,200	29%	13	4,210,280	649,970	60%	43	28,127
2009	919,740	314,200	34%	14	4,304,540	255,930	28%	74	18,810

Source: Compiled and calculated from: FAO, (2011) "FAOSTAT" FAO Statistics Division, Rome, Italy (www.fao.org

Table 66 Livestock Performance in Jordan: Chicken Stock

Year	Broiler Chicks Million Birds	Carcass Weight (Kg)	Meat Production (Ton)	Laying Hens (000) Birds	Yield (eggs/Hen)	Production million Eggs
2000	105	1.13	118,503	3610	254	917
2001	104	1.12	117,201	3371	337	1,136
2002	103	1.06	109,998	3160	316	999
2003	113	1.09	123,362	1967	197	387
2004	127	1.00	126,659	2125	213	452
2005	133	1.00	132,638	1860	186	346
2006	116	1.00	115,815	2070	207	428
2007	134	1.00	133,821	2012	201	405
2008	140	1.00	140,459	2100	210	441
2009	140	1.01	141,189	1900	190	361

Source: Compiled and calculated from: FAO, (2011) "FAOSTAT" FAO Statistics Division, Rome, Italy (www.fao.org

Table 67 Livestock Performance in Jordan: Other Poultry Stock

Year	Duck			Turkey		
2000	Slaughtered(000)	(Kg) / Dressed Bird	Meat(Ton)	Slaughtered(000)	Kg / Dressed Bird	Meat (Ton)
2001	8	2.8	22	130	4	520
2002	2	2.8	6	86	4	344
2003	14	2.8	39	117	4	468
2004	36	2.8	101	57	4	228
2005	5	2.8	14	330	4	1320
2006	33	2.8	92	108	4	432
2007	66	2.8	190	382	4	1528
2008	6	2.8	17	3	4	12
2009	6	2.8	17	12	4	48

Source: Compiled and calculated from: FAO, (2011) "FAOSTAT" FAO Statistics Division, Rome, Italy (www.fao.org

Table 68 Average World Productivity of Livestock Types

year	Dressed Weight/ Bird (Kg)	carcass Weight/ Head (Kg)			Milk Yield/ Head (Kg)		
	Chicken	Cattle	Goats	Sheep	Cattle	Goats	Sheep
2000	1.46	205	12	15.7	2,218	83	42
2001	1.46	204	12	15.7	1,420	84	43
2002	1.47	206	12	15.6	1,437	84	44
2003	1.48	203	12.1	15.5	1,421	85	45
2004	1.51	205	12.2	15.6	1,437	87	46
2005	1.49	207	12.2	15.6	1,445	85	46
2006	1.51	210	12.2	15.6	1,466	85	46
2007	1.51	213	12.5	16.1	1,479	85	45
2008	1.53	212	12.4	15.7	1,445	84	45
2009	1.53	202	1.2	15.8	1,471	84	45

Source: Compiled and calculated from: FAO, (2011) "FAOSTAT" FAO Statistics Division, Rome, Italy (www.fao.org

Table 69 Food Consumption Pattern in Jordan in 2007

item	(000) Tons							Food Consumption		(Self-
	Product	Impo	Expor	Domesti	Feed	Seed	Processin	Tota	(kg/capita/	Sufficienc
Total Cereals	50	2610	36	2344	127	6	101	970	163.3	2.1%
Wheat	21	1108	30	819		2	25	802	135	2.6%
Barley	13	804	0	817	769	4	43	1	0.2	1.6%
Maize	15	533	2	546	507	0	28	11	1.9	2.7%
Other cereals	1	165	4	162	1	0	5	156	26.2	0.6%
Potatoes	97	74	28	143		15	35	93	15.7	67.8%
Sugar		315	35	280			0	280	47.1	0.0%
Honey	0	1	0	1			0	1	0.2	0.0%
Total Pulses	2	44	2	44	0	0	2	41	6.9	4.5%
Total Tree	1	12	0	13			0	13	2.1	7.7%
Olives	125	1	13	112			92	20	3.4	111.6%
Total Oils	23	123	17	129			22	107	18	17.8%
Sesame seed	3	0		3			3	3	0.6	100.0%
Olive Oil	20	0	2	17			20	16	2.7	117.6%
Total	1333	99	715	717	0		114	605	101.8	185.9%
Tomatoes	610	34	401	243			61	182	30.6	251.0%
Other	723	65	314	474	0	0	53	423	71.2	152.5%
Fruits	238	133	110	260			31	292	49.1	91.5%
Citrus	85	42	16	110	0	0	11	99	17.1	77.3%
Apples	32	23	2	52			5	47	8	61.5%
Other Fruits	121	68	92	98	0	0	15	146	24	123.5%
Total Meat	171	88	13	245			0	247	41.6	69.8%
Bovine Meat	14	46	8	51			0	53	9	27.5%
Mutton &	23	12	1	34			0	34	5.7	67.6%
Poultry Meat	134	29	3	159			0	159	26.8	84.3%
Meat, Other	0	1	1	1	0	0	0	1	0.1	0.0%
Eggs	39	3	3	38		12	2	24	4.1	102.6%
Milk	345	237	42	541	0		17	523	88.1	63.8%
Fish	1	49	2	48	14		0	34	5.7	2.1%

Source; Compiled and Calculated from: FAO (2011) "FAOSTAT", [www.fao.org]

Table 70 Daily Per Capita Food Supply in Jordan in 2007

Nutrient	Grand total	Vegetal Sources	Animal Products	Cereals (Total)
kcal/capita/day	3015	2631	384	1409
% of Total	100%	87%	13%	47%
Protein (g/capita/day)	78.2	50.9	27.4	39.5
% of Total	100%	65%	35%	51%
Fat (g/capita/day)	90.7	64.7	26	7.1
% of Total	100%	71%	29%	8%

Source: Compiled and calculated from: FAO (2011) "FAOSTAT", [www.fao.org]

Table 71Farm Size Distribution of Agricultural Holdings in Jordan

Holding Size	% of Total Holdings
Landless	18%
< 30 Dunums	60%
31-100 Dunums	15%
101 -500 Dunums	6%
> 500 Dunums	1%
Total	100%

Source: Compiled and Calculated from Department of Statistics (2005) "Agricultural Census of Jordan for the year 1997", Amman, Jordan

Table 72 Share f Agricultural Labor in Man Power in Jordan (000) Habitants

Year	Total	Rural	% (Rural/Total)	Agricultural	% (Agri./Rural)	Total Economically Active	Economically Active in Agriculture	% (Agri./Total)
2006	5,495	1,191	22%	407	34%	1,565	116	7%
2007	5,667	1,226	22%	401	33%	1,617	114	7%
2008	5,849	1,263	22%	398	32%	1,683	115	7%
2009	6,026	1,298	22%	395	30%	1,746	114	7%
2010	6,187	1,329	21%	390	29%	1,803	114	6%

Source: Compiled and calculated from: FAO, (2011) "FAOSTAT" FAO Statistics Division, Rome, Italy (www.fao.org

Table 73 Input Density in Jordanian Agriculture (2000-2007)

Year	Nitrogen Fertilizers (N Nutrients) Kg/Ha(of Agri. Area(1)	Hectare/ Tractor(2)
2000	83	186
2001	55	177
2002	21	178
2003	22	174
2004	11	NA
2005	36	NA
2006	22	NA
2007	5	NA

World Average: (1) 18Kg, (2) 183 Ha/ Tractor, Note: Jordan's Irrigated area ranged between 7% in 2000 to 9% in 2009, while the World average = 25%

Source: Compiled and calculated from: FAO, (2011) "FAOSTAT" FAO Statistics Division, Rome, Italy (www.fao.org

Table 74 **Share of Agro-Food Industries in Food Supply (000) Tons) of Jordan in 2007**

item	Production	Import Quantity	Export Quantity	Domestic supply quantity	Processing and Industries	
					quantity	% of Production
Wheat	21	1108	30	819	25	119.0%
Rice (Milled Equivalent)	0	159	3	156	6	NA
Barley	13	804	0	817	43	330.8%
Maize	15	533	2	546	28	186.7%
Starchy Roots + (Total)	97	76	28	145	35	36.1%
Cassava	0	1	0	1	1	NA
Potatoes	97	74	28	143	35	36.1%
Pulses + (Total)	2	44	2	44	2	100.0%
Pulses, Other	2	41	2	41	2	100.0%
Sesame seed	0	17	0	16	12	NA
Olives	125	1	13	112	92	73.6%
Vegetable Oils + (Total)	23	123	17	129	22	95.7%
Palm Oil	0	52	13	39	19	NA
Olive Oil	20	0	2	17	1	5.0%
Oil crops Oil, Other	0	2	0	2	2	NA
Vegetables + (Total)	1333	99	715	717	114	8.6%
Tomatoes	610	34	401	243	61	10.0%
Onions	29	28	1	56	6	20.7%
Vegetables, Other	694	37	313	418	47	6.8%
Fruits - Excluding Wine + (Total)	238	133	110	260	31	13.0%
Oranges, Mandarins	55	32	10	77	8	14.5%
Lemons, Limes	22	6	2	26	3	13.6%
Apples	32	23	2	52	5	15.6%
Dates	7	9	3	12	1	14.3%
Grapes	28	8	2	34	3	10.7%
Fruits, Other	52	29	87		5	9.6%
Alcoholic Beverages + (Total)	11	7	9	9	4	36.4%
Alcohol, Non-Food	0	4	0	4	4	NA
Animal Fats + (Total)	1	5	0	7	1	100.0%
Butter, Ghee	0	2	0	2	1	NA
Eggs + (Total)	39	3	3	38	2	5.1%
Milk - Excluding Butter + (Total)	345	237	42	541	17	4.9%

NA = Not Applicable. It is processed from imports, if the share is .greater than 100% of the production; it implies that a proportion is processed from imported raw materials.

Source: Compiled and calculated From: FAOSTAT, FAO Statistics Division 2011 [www.fao.org]

Table 75 Agro-Food Imports of Jordan by Country in 2009

Rank	Country	% of total
1	United States of America	9.98%
2	Saudi Arabia	9.20%
3	Egypt	7.09%
4	Russian Federation	6.96%
5	Syrian Arab Republic	6.42%
6	Brazil	5.48%
7	Argentina	4.56%
8	Ukraine	4.37%
9	Australia	3.47%
10	Turkey	3.43%
11	India	3.10%
12	Ireland	2.35%
13	Netherlands	2.30%
14	Lebanon	2.10%
15	France	2.04%
Other countries		27.15%
Total (000) US$		2,323,183

Source: Compiled and calculated from: FAO (2011) "FAOSTAT", [www.fao.org]

Table 76 Jordanian Agro-Food Imports Flow by Commodity

Rank	commodity	% of Total
1	Rice Milled	7.43%
2	Maize	6.64%
3	Other food reparations	5.77%
4	Sugar Refined	4.94%
5	Wheat	4.71%
6	Cake of Soybeans	4.59%
7	Barley	3.89%
8	Beef and Veal Meat	3.68%
9	Cheese of Whole Cow Milk	3.65%
10	Milk Skimmed Dry	3.22%
11	Sheep meat	3.14%
12	Non-Alcoholic Beverage	2.75%
13	Chicken meat	2.41%
14	Other Tobacco Products	2.40%
15	Palm oil	2.06%
Other Commodities		
Total 000) US$		2,323,183

Source: Compiled and calculated from: FAO (2011) "FAOSTAT", [www.fao.org]

Table 77 Jordanian Food Exports Flow by Country in 2009

Rank	Country	% of total
1	Iraq	39.66%
2	Syrian Arab Republic	11.26%
3	United Arab Emirates	7.34%
4	Saudi Arabia	7.15%
5	Unspecified	6.46%
6	Kuwait	3.99%
7	Qatar	3.44%
8	Lebanon	2.77%
9	Israel	1.94%
10	Bahrain	1.92%
11	Turkey	1.61%
12.	Russian Federation	1.51%
13	Occupied Palestinian Territory	1.26%
14	Oman	1.25%
15	Romania	1.12%
Other Countries		
Total Value US$		1,030,966

Source: Compiled and calculated from: FAO (2011) "FAOSTAT", [www.fao.org

Table 78 Jordanian Exports Flow by Commodity in 2009

Rank	items	% of total
1	Tomatoes	16.39%
2	Cucumbers and gherkins	6.77%
3	Other food preparations	5.57%
4	Non-Alcoholic Beverage	4.19%
5	Eggplants (aborigines)	3.91%
6	Oil Hydrogenated	3.62%
7	Milk Skimmed Dry	3.62%
8	Chicken meat	3.42%
9	Chilies and peppers, green	3.25%
10	Cigarettes	2.89%
11	Peaches and nectarines	2.86%
12	Cheese of Whole Cow Milk	2.70%
13	Sheep	2.35%
14	Other fresh vegetables	2.26%
15	Other feed compounds	2.26%
16	Preparations of Beef Meat	2.08%
17	Beef and Veal boneless meat	1.96%
18	Sheep meat	1.84%
19	Infant Food	1.84%
20	Hen eggs, in shell	1.61%
Other Items		24.6%
Total in US$		1,030,966

Source: Compiled and calculated from: FAO (2011) "FAOSTAT", [www.fao.org]

Table 79 Time trend of Farm Prices of Vegetables and Fruits in Jordan, EU and USA ($/Ton)

Commodity	Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Tomatoes	Jordan	100	62	100	116	109	97	104	128	159	189	126
	EU	734	705	627	723	930	847	1060	1123	1186	1297	1080
	USA	569	677	661	697	827	825	917	963	767	1003	895
Potatoes	Jordan	166	214	144	158	199	184	154	161	332	303	320
	EU	192	140	150	153	213	224	200	291	329	302	253
	USA	127	112	154	147	130	125	155	161	166	186	176
watermelon	Jordan	71	92	71	93	97	126	171	101	155	192	130
	EU	171	176	198	167	204	212	221	276	314	401	306
	USA	144	141	149	183	198	187	256	229	249	276	254
Olive	Jordan	434	513	441	353	515	516	564	705	992	986	1056
	EU	1082	987	891	995	1149	1272	1281	1305	1496	1469	1355
	USA	427	723	741	632	451	622	622	850	854	739	595
Apple	Jordan	341	343	279	250	332	315	221	311	366	426	496
	EU	441	353	384	412	549	587	533	581	736	804	682
	USA	470	282	348	417	414	300	381	500	635	511	509
Citrus	Jordan	323	258	264	257	253	344	360	378	471	508	494
	EU	347	256	289	290	372	392	355	423	485	536	535
	USA	142	93	100	110	92	97	114	158	255	175	165

Source: Compiled and calculated from: FAO, (2011) "FAOSTAT" FAO Statistics Division, Rome, Italy (www.fao.org)

Table 80 Potential Organic Agriculture

Type of Land	2009	
	(000) Ha	%
Agricultural area certified organic, of which:	1.03	97%
Permanent crops area certified organic	1.02	96%
Other Crops (Mainly vegetables)	0.01	1%
Permanent crops area in conversion to organic	0.03	3%
Agricultural area organic, total	1.06	100%

Source; Compiled and Calculated from: Source: Department of Statistics (2011), Amman, Jordan

Table 81 Infrastructure Expenditures Related to Agriculture, 1994-97 (1,000 JD)

Purpose	1994	1995	1996	1997	average
Agricultural Roads	173	181	224	193	193

Dams	521	1,021	1,160	901	901
Irrigation Systems	793	1,120	660	858	858
Rural Electricity	7,100	7,100	3,969	4,000	6,056
Total expenditure	8,587	9,422	6,013	5,951	8,007

Source: Compiled from Hjort Kim C, (1998) "An Introduction to Jordan's Agriculture Sector and Agricultural Policies" WTO Accession Unit Ministry of Industry and Trade, Amman, Jordan

Table 82 Foreign Trade Time Trend in (000) US$ in Jordan (2006-2010)

Foreign Trade Indicators	2006	2007	2008	2009	2010
Imports of Goods (million USD)	11,548	13,681	16,995	14,236	15,262
Exports of Goods (million USD)	5,204	5,725	7,938	6,375	7,023
Imports of Services (million USD)	2,854	3,356	3,926	3,657	4,158
Exports of Services (million USD)	2,850	3,436	4,353	4,192	4,880

Source: WTO - World Trade Organization - Last Available Data.

Table 83 Non-Arab Countries Bilateral Trade Agreements with Jordan

Country	Agreement	Date Signed	Date of Entry into Force
Tanzania	Promotion and Protection of Investment Agreement	8 Oct. 2009	
Azerbaijan	Non-Double Taxation Agreement	05-May-08	1 Jan. 2009
	Trade Agreement	7 Nov. 2006	1 Jun. 2007
	Investment Promotion Agreement	05-May-08	24 Dec. 2008
Bosnia and Herzegovina	Investment Promotion and Protection Agreement	02-Jul-06	24-Jul-07
Kazakhstan	Investment Promotion and Protection Agreement	29 Nov. 2006	01-Jul-08
Ukraine	Non-Double Taxation Agreement	30 Nov. 2005	1 Jan. 2009
	Economic and Trade Cooperation Agreement	2002	Valid
	Investment Promotion and Protection Agreement	30 Nov. 2005	Not in effect yet
	Non-Double Taxation Agreement	30 Nov. 2005	Not in effect yet
Italy	Investment Promotion and Protection Agreement	21-Jul-96	9 Nov. 1999
Bulgaria	Non-Double Taxation Agreement	9 Nov. 2006	1 Jan. 2009
	Trade Agreement	2001	Valid
	Investment Promotion Agreement	7 Aug. 2002	27-May-03
Poland	Investment Promotion and Protection Agreement	4 Oct. 1997	14 Oct. 1999
	Non-Double Taxation and Tax Evasion Agreement on Income.	4 Oct. 1997	1 Jan. 2000
Czech	Association Agreement with the European Union	24 Nov. 1997	01-May-02
	Investment Promotion and Protection Agreement	20 Sep. 1997	25-Apr-01
U.S.A.	Free Trade Agreement	24 Oct. 2000	2001

	Investment Promotion and Protection Agreement	02-Jul-97	12-Jun-03
Argentina	Framework Cooperation Agreement with MERCOSUR Countries	30-Jun-08	
	Trade and Economic Cooperation Agreement	22-Oct-08	Not in effect yet
Australia	Trade Cooperation Agreement	1988	Valid
Canada	Promotion and Protection of Investment Agreement	28-Jun-09	14 Dec. 2009
	Economic and Trade Cooperation Agreement	1986	Valid
	Non-Double Taxation and Tax Evasion Agreement on Income.	6 Sep. 1999	1 Jan. 2001
Mexico	Trade Cooperation Agreement	1975	Valid
Ethiopia	Trade Cooperation Agreement	1984	Valid
Guiana	Trade Cooperation Agreement	2003	Not in effect yet
Brazil	Trade Cooperation Agreement	1989	Valid
	Framework Cooperation Agreement with MERCOSUR Countries	30-Jun-08	
	Trade and Economic Cooperation Agreement	23-Oct-08	22 Sept 2010
Spain	Association Agreement with the European Union	24 Nov. 1997	01-May-02
	Investment Promotion and Protection Agreement	20 Oct. 1999	13 Dec. 2000
U.K.	Investment Promotion and Protection Agreement	10 Oct. 1979	24-Apr-80
Holland	Investment Promotion and Protection Agreement	17 Nov. 1997	1 Aug. 1998
Germany	Investment and Capital promotion and Protection Agreement	15-Jul-74	10 Oct. 1977
	Investment Promotion and Protection Agreement	23 Jan. 2001	25 Nov. 2001
Vietnam	Trade Cooperation Agreement	1997	Valid
Russian Federation	Economic and Technical Cooperation Agreement	21 Jan. 1969	Valid
Lithuania	Investment Promotion Agreement	13 Oct. 2002	05-May-03
Philippines	Trade Cooperation Agreement	1996	Valid
Congo	Economic, Scientific and Technical Cooperation Agreement	26 Sep. 2004	
	Investment Promotion Agreement	23-Jun-04	Not in effect yet
Romania	Trade Agreement	1995	Valid
	Economic and Technical Cooperation Agreement	20 Nov. 1968	Valid
	Investment Promotion and Protection	02-Jul-92	16-Mar-99

	Agreement		
	Agreement	Date Signed	Date of Entry into Force
Turkey	Trade Agreement for Business Relations Development between two countries on basis of equity and mutual interest.	17-Jun-80	Valid
	Trade and Economic Agreement	1980	Valid
	Mutual Investment Promotion and protection Agreement	2 Aug. 1993	23 Jan. 2006
	Agreement on Non-Double Taxation and Other Issues related to Income and Capital.	06-Jun-85	1 Jan. 1987
France	Investment Promotion and Protection Agreement	23 Feb. 1978	18 Oct. 1979
	Non-Double Taxation and Tax Evasion Agreement on Income.	28-May-84	01-Apr-85
Croatia	The (G-11) Framework Agreement on Economic, Trade and Cultural Cooperation	16-May-09	
	Trade Cooperation Agreement	10 Oct. 1999	14-Apr-05
	Investment Promotion and Protection Agreement	10 Oct. 1999	27-Apr-00
Belarus	Economic and Trade Cooperation Agreement	2002	2003
	Investment Promotion Agreement	16 Dec. 2002	Not in effect yet
China	Trade Cooperation Agreement	1979	Valid
Uzbekistan	Economic and Trade Cooperation Agreement	1997	Valid
Uruguay	Framework Cooperation Agreement with MERCOSUR Countries	30-Jun-08	
Indonesia	The (G-11) Framework Agreement on Economic, Trade and Cultural Cooperation	16-May-09	
	Trade and Economic Cooperation Agreement	03-Apr-86	Valid
	Investment Promotion and Protection Agreement	12 Nov. 1996	9 Feb. 1999
	Non-Double Taxation and Tax Evasion Agreement on Income.	12 Nov. 1996	1 Jan. 1999
Switzerland	Trade and Economic Cooperation Agreement	11 Nov. 1976	1 Sep. 2002
	EFTA Agreement	21-Jun-01	1 Sep. 2002
	Investment Promotion and Protection Agreement	25 Feb. 2001	11 Dec. 2001
Liechtenstein	EFTA Agreement	21-Jun-01	1 Sep. 2002
Norway	EFTA Agreement	21-Jun-01	1 Sep. 2002

Iceland	EFTA Agreement	21-Jun-01	1 Sep. 2002
India	Economic and Trade Agreement	1976	Valid
	Non-Double Taxation and Tax Evasion Agreement on Income.	20-Apr-99	1 Jan. 2000
Pakistan	The (G-11) Framework Agreement on Economic, Trade and Cultural Cooperation	16-May-09	
	Trade Cooperation Agreement	17 Feb. 2000	Valid
Seri Lanka	The (G-11) Framework Agreement on Economic, Trade and Cultural Cooperation	16-May-09	
	Trade Cooperation Agreement	1965	Valid
Korea	Trade Cooperation Agreement	19 Nov. 1972	Valid
Israel	Economic and Trade Cooperation Agreement	1995	Valid
North Korea	Trade Agreement	1979	Valid
	Investment Promotion Agreement	24-Jul-04	25 Dec. 2004
Malaysia	Trade Agreement	1994	Valid
	Investment Promotion and Protection Agreement	2 Oct. 1994	03-Mar-95
	Non-Double Taxation and Tax Evasion Agreement on Income.	2 Oct. 1994	1 Jan. 2001
Country	Agreement	Date Signed	Date of Entry into Force
Iran	Non-Double Taxation Agreement	28-May-03	1 Jan. 2009
	Trade Cooperation Agreement	19-Jun-95	4 Aug. 1998
Singapore	Free Trade Agreement	16-May-04	22 Aug. 2005
	Investment Promotion Agreement	16-May-04	Valid
Hungary	Trade Cooperation Agreement	1976	Valid
	Association Agreement with the European Union	24 Nov. 1997	01-May-02
Finland	Association Agreement with the European Union	24 Nov. 1997	01-May-02
Cyprus	Promotion and Protection of Investment Agreement	20 Dec. 2009	
Ecuador	The (G-11) Framework Agreement on Economic, Trade and Cultural Cooperation	16-May-09	
Georgia	Economic and Trade Cooperation Agreement	26-Apr-10	29-Jul-10
	The (G-11) Framework Agreement on Economic, Trade and Cultural Cooperation	16-May-09	
Honduras	The (G-11) Framework Agreement on Economic, Trade and Cultural Cooperation	16-May-09	

Paraguay	The (G-11) Framework Agreement on Economic, Trade and Cultural Cooperation	16-May-09	
	Framework Cooperation Agreement with MERCOSUR Countries	30-Jun-08	
Portugal	Promotion and Protection of Investment Agreement	17-Mar-09	
	Economic Cooperation Agreement	12-Feb-08	11-Sep-08
	Economic and Technical Cooperation Agreement	13-May-80	Valid

Source: Ministry of Industry and Trade, Amman, Jordan "http://www.mit.gov.jo/tabid/475/Jordan.aspx, 2/12/2010".

Table 84 Custom Duties Applied By Jordan after Joining the WTO Membership

Goods	Bound Customs Tariff Rate	Implementation Date of Commitment
Cigarettes and Tobacco	150%	April 11th, 2000
Certain types of Tobacco	200%	April 11th, 2000
Liquors	200%	April 11th, 2000
Specific goods that are subject to customs tariffs of: 20% in 2000 30% in 2000 30% in 2000	 15% 20% 25%	 2005 2005 2005
Specific goods that are subject to customs tariffs of: 30% in 2000	20%	Customs tariffs to be reduced gradually to reach 20% by 2008
Specific goods that are subject to customs tariffs of: 10% in 2000 20% in 2000 30% in 2000 30% in 2000 30% in 2000	 5% 15% 25% 20% 15%	Customs tariffs to be reduced gradually to reach the bound rate by 2010
Sector Initiatives		
Agricultural machinery	0%	April 11th , 2000
Medical equipment	0%	April 11th , 2000
Chemicals (except 58 tariff line items)	5.5% and 6.5%	Customs tariffs to be reduced gradually to bound rate by 2003 or 2007
Information Technology		Customs tariffs to be reduced gradually to reach 0% in 2003 or 2005

Source: Ministry of Industry and Trade (2011), Jordan (http://www.mit.gov.jo/tabid/475/Jordan, 2/12/2010).

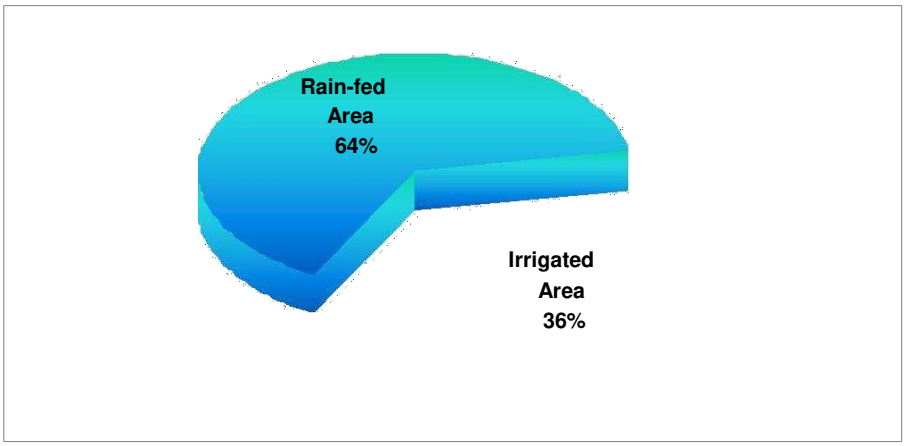
Table 85 Prediction of the water requirements in the fourth coming decades in Jordan

Year	Population (millions)	Water volume (MCM)
1995	4.3	1036
2000	4.95	1151
2005	5.69	1260
2010	6.54	1377
2015	7.52	1450
2020	8.85	1523
2025	9.95	1596

Source; Compiled from Kareem, Asem et al. (2000) water resources in the Arab world, Proceeding of the International Conference of agriculture economics in the Islamic world, Al-Azhar University,.Conference hall, Nasr City, Cairo, Egypt

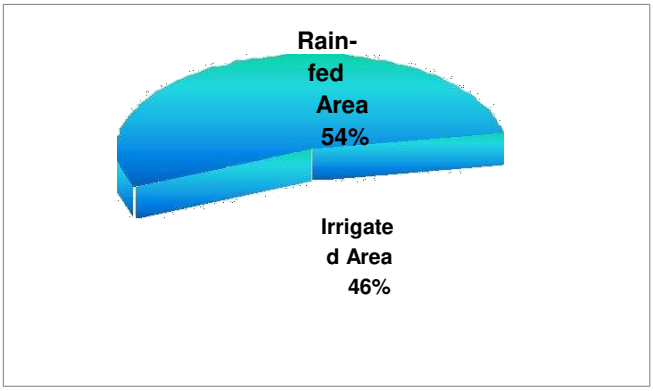
ANNEX of GRAPHS

Figure 6 the Total cultivated Irrigated and Rain Fed Areas in Jordan (Average of 2003- 2010)



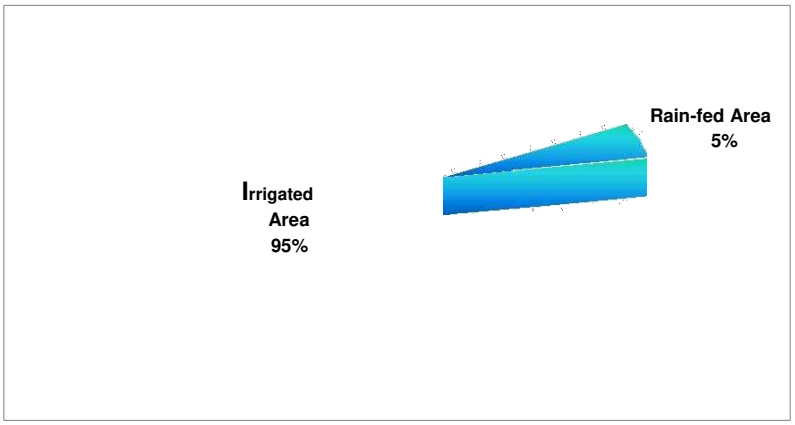
Source: Drawn from (Table 4)

Figure 7 the irrigated and rain fed areas of Fruits in Jordan (Average of 2003- 2010).



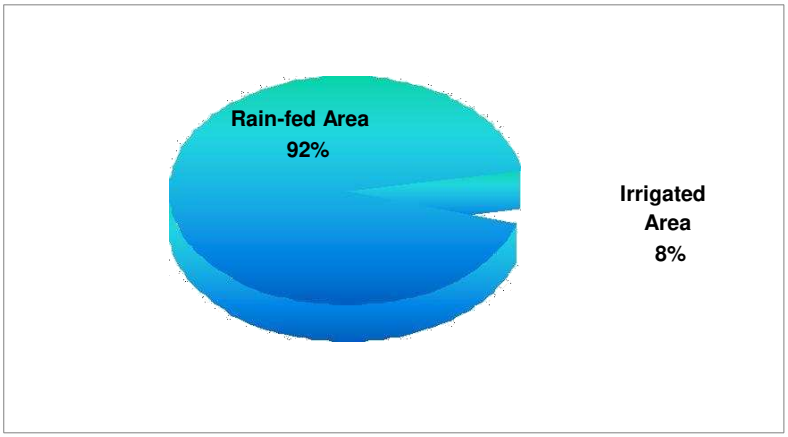
Source: drawn from (Table 5)

Figure 8 the irrigated and rain fed areas of vegetables in Jordan (Average of 2003- 2010).



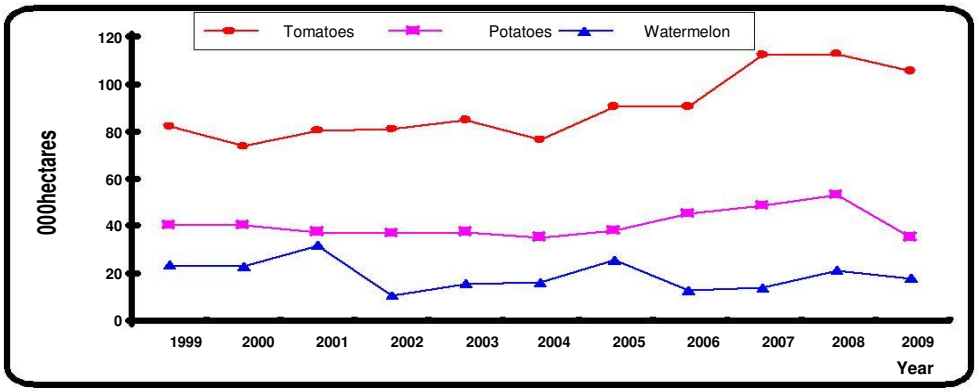
Source: Drawn from (Table 6)

Figure 9 the irrigated and rain fed areas of Field Cops in Jordan (Average of 2003-2010).



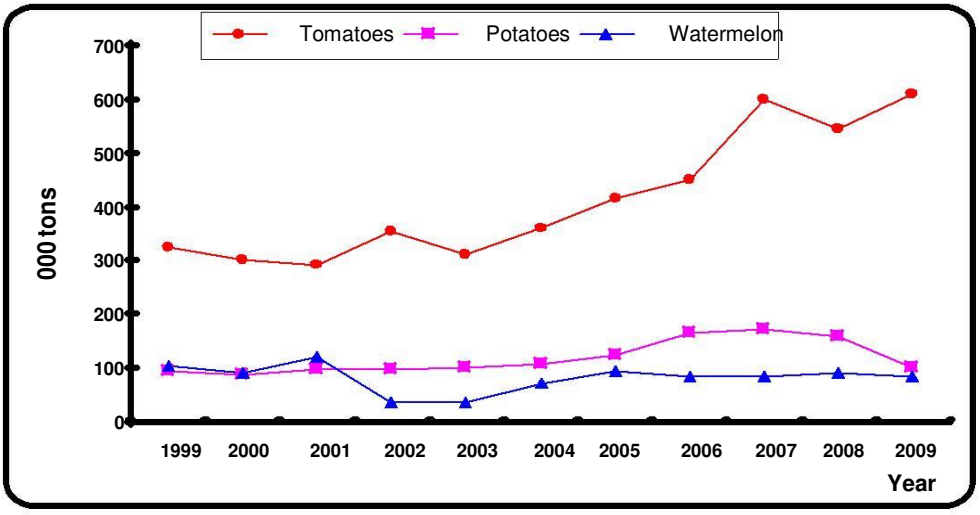
Source Drawn from (Table 7)

Figure 10 Area of major vegetables (000 hectares) in Jordan during the period 1999-2009



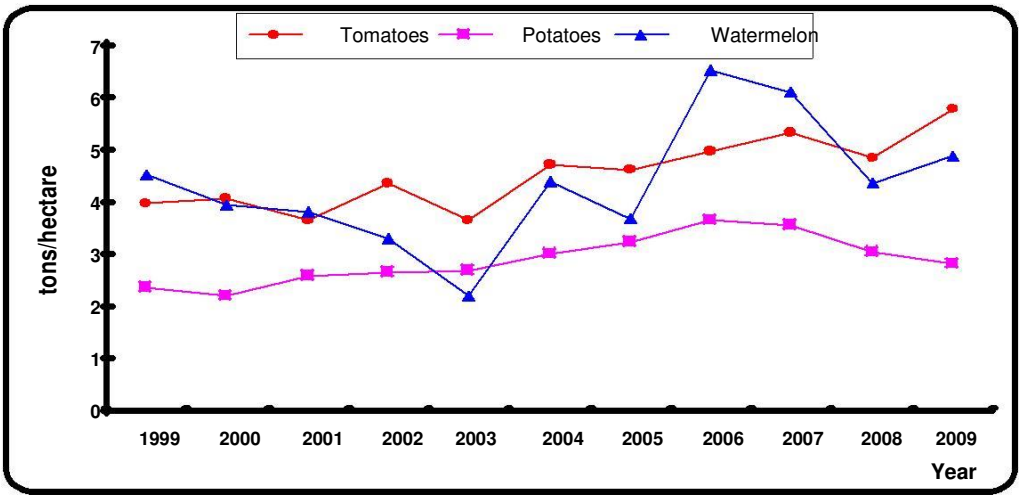
Source: Drawn from (**Table 56** 8)

Figure 11 Production of major vegetables (000 tons) in Jordan during the period 1999-2009



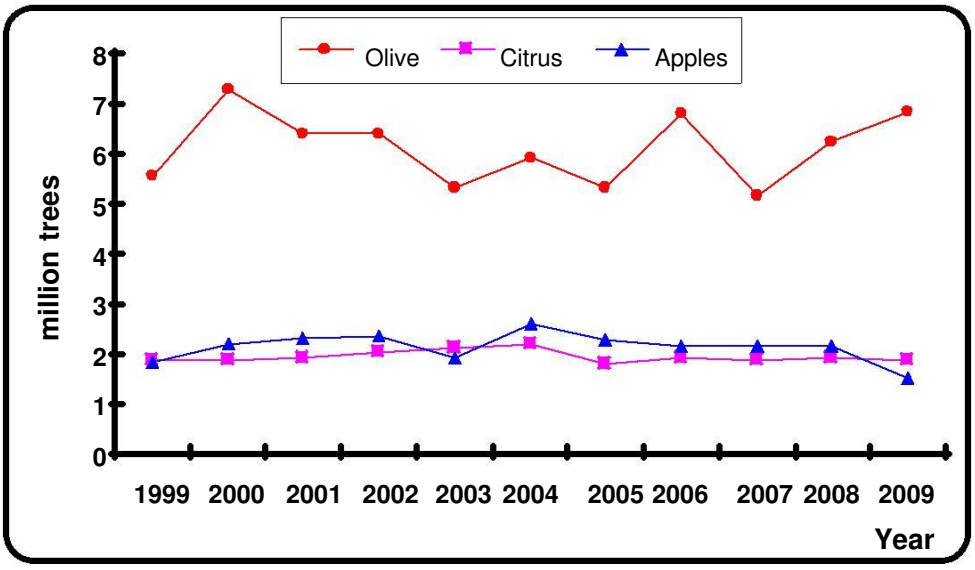
Source: Drawn from (**Table 58**)

Figure 12 Yield/ Ha of Major Vegetables in Jordan (1999-2009)



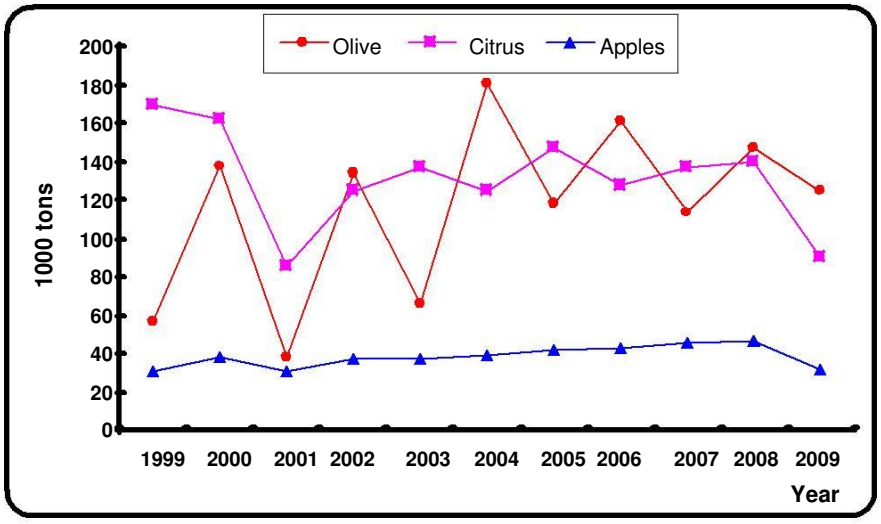
Source: Drawn from (Table 10)

Figure 13 Number of Major Fruit Trees in Jordan (1999-2009)



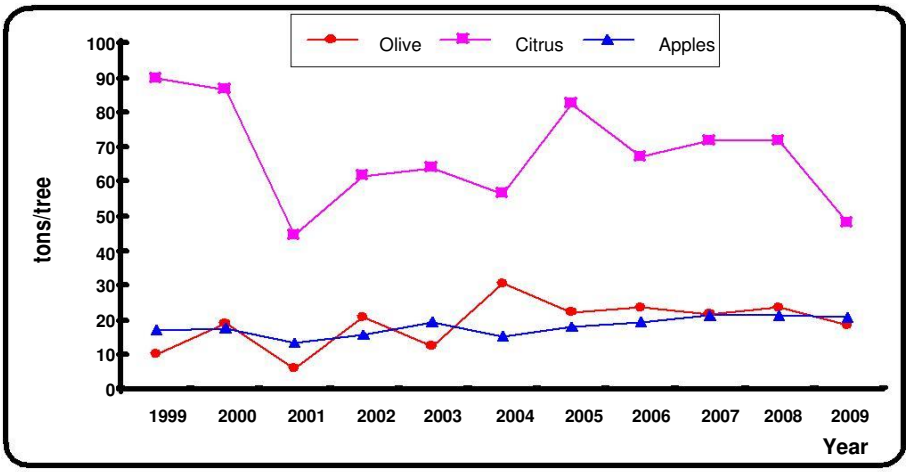
Source: Drawn from (Table 11)

Figure 14 Production (Tons) of Major Fruits in Jordan (1999- 2009)



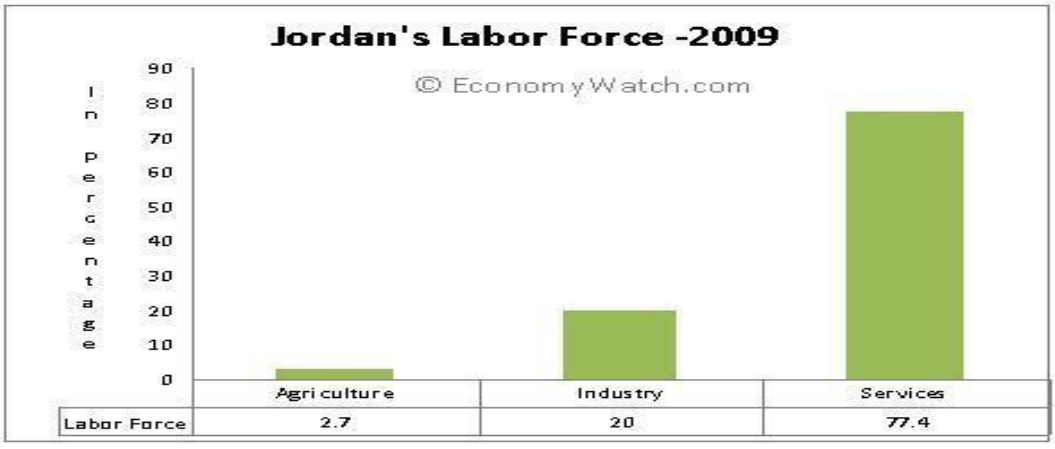
Source: Drawn from (Table 12)

Figure 15. The Yield/ Tree of Major Fruits in Jordan (1999 – 2009)



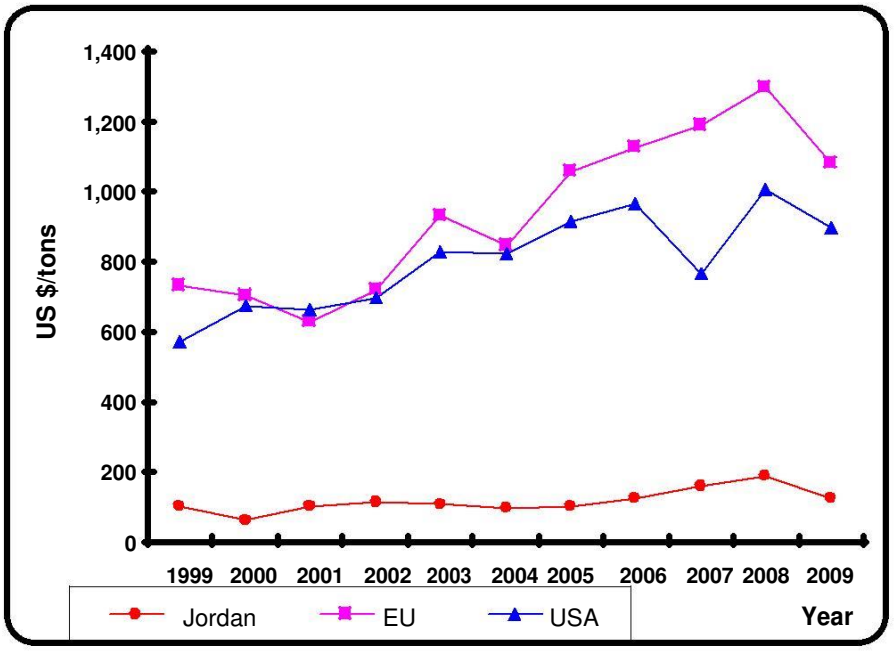
Source: Drawn from (Table 13)

Figure 16 Labor Structure in Jordan in 2009



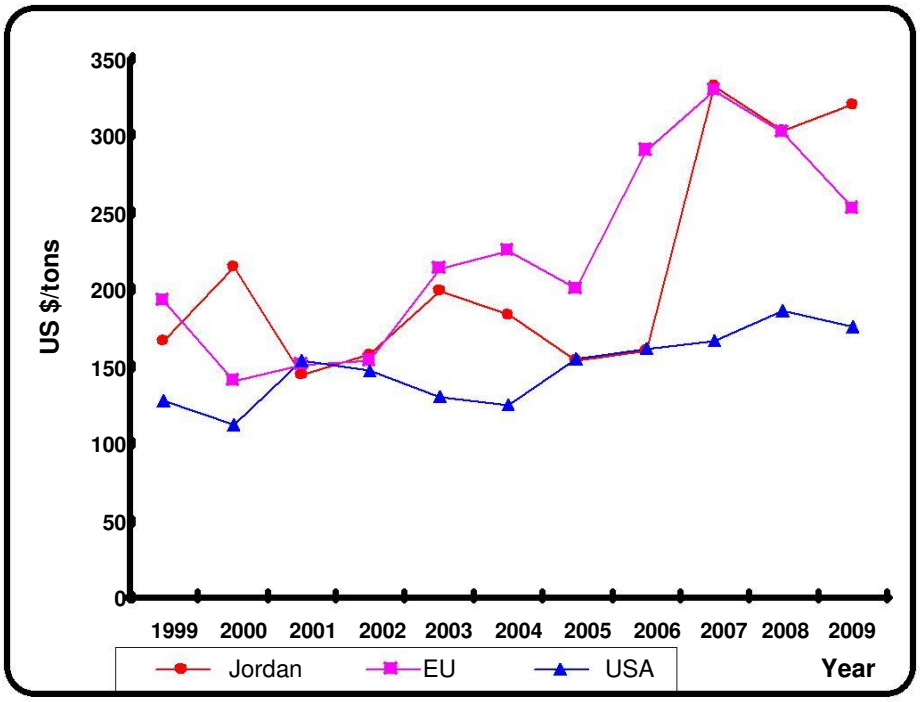
Reference: www.economywatch.com/world_economy/jordan/structure-of-economy.html, 2011

Figure 17 Time Series Trend of Farm Price in Jordan, EU, and USA of Tomatoes



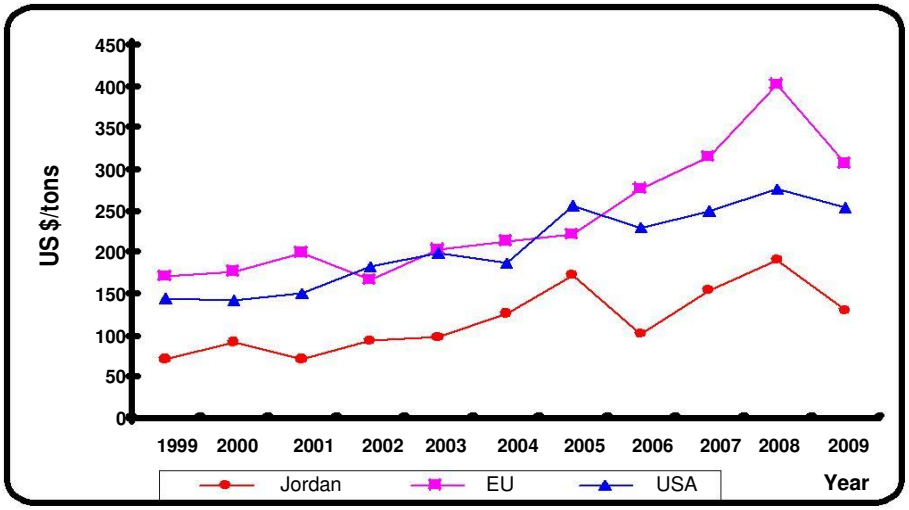
Source: Drawn from (Tabl 31)

Figure 18 Time Series Trend of Farm Price in Jordan, EU, and USA of Potatoes



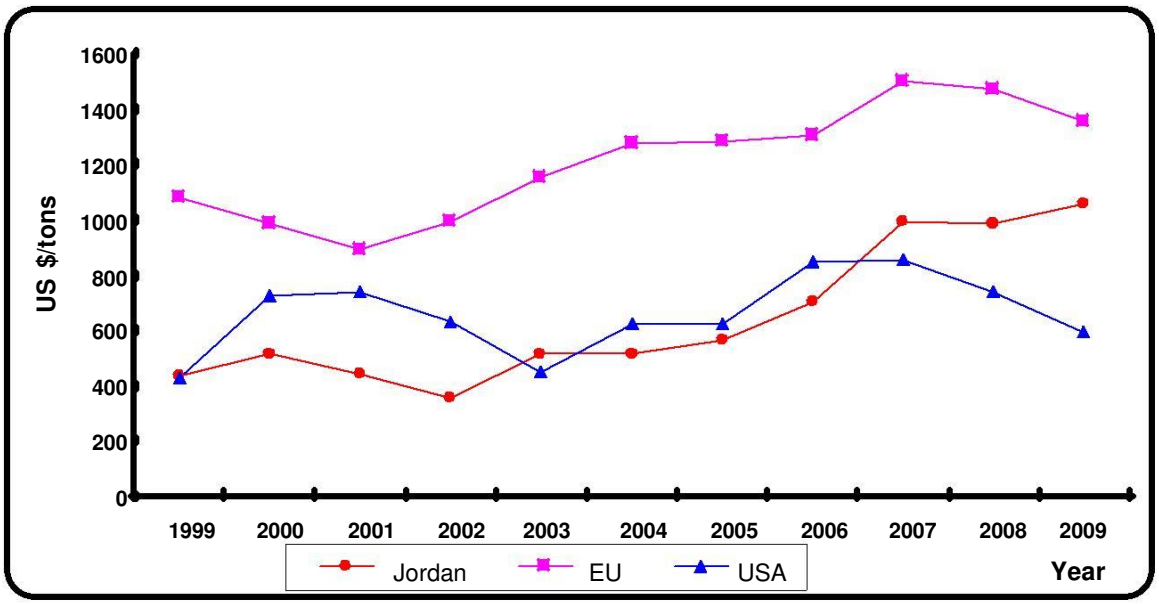
Source: Drawn from (Table 31)

Figure 19 Time Series Rend of Farm Price in Jordan, EU, and USA of Watermelons



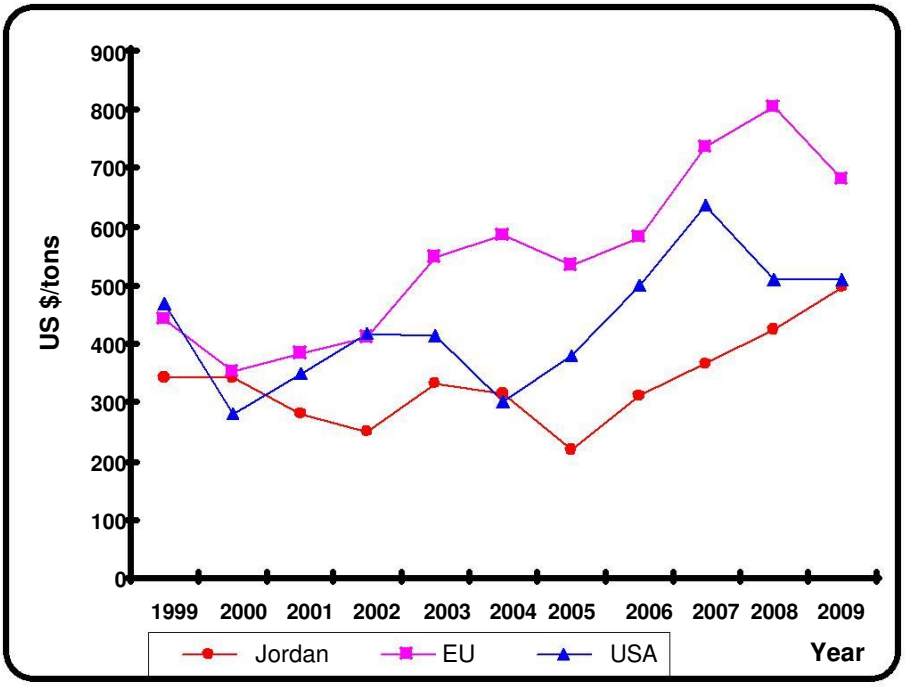
Source: Drawn from (Table 31)

Figure 20 Time Series Rend of Farm Price in Jordan, EU, and USA of Olive



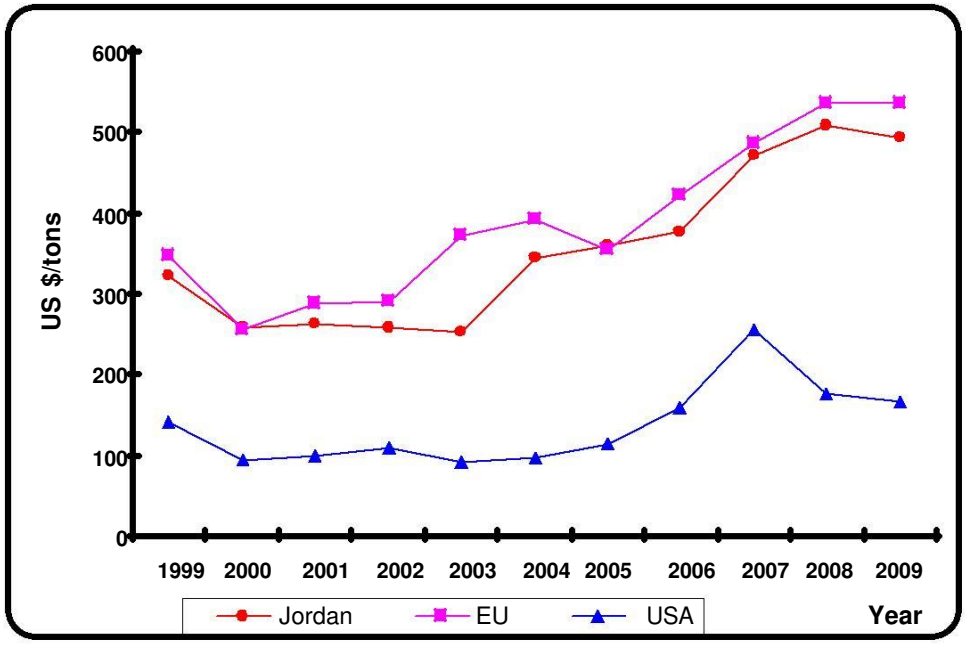
Source: Drawn from (Table 31)

Figure 21 Time Series Rend of Farm Price in Jordan, EU, and USA of Apple



Source: Drawn from (Table 31)

Figure 22 Time Series Rend of Farm Price in Jordan, EU, and USA of Citrus



Source: Drawn from (Table 31)

Figure 23 Jordan's Export Partners in 2008

Source: Ministry of Industry and Trade, Jordan (http://www.mit.gov.jo/tabid/475/Jordan.aspx, 2/12/2011)

Figure 24 Jordan's Import Partners in 2008

Source: Ministry of Industry and Trade, Jordan (http://www.mit.gov.jo/tabid/475/Jordan.aspx, 2/12/2011).

REFERENCES LIST

(1) Ababneh, M. (1994) Plant Genetic Resources Workshop, the National Center for Agricultural Research and Technology Transfer (NCARTT), Baqa', Jordan.

(2) Abandah, A., (1978) long-range or casting seasonal rainfall in Jordan, Department of Metrology, Publication No JNWS/78/11 17 p.

(3) Abu Akkada, Abdul Kader, Soliman Ibrahim (1980) " Food Security Program in Arab Countries: Livestock and Poultry Program" Arab Organization for Agricultural Development, Vol. 6, Khartoum, Sudan.

(4) Agriculture in Jordan (2011) (http://en.wikipedia.org/wiki/Agriculture_in_Jordan - cite_note-LOC-0)

(5) Al- Eisawi, D. (1994) "Plant Genetic Resources Workshop", August 2-4, 1994, National Center for Agricultural Research and Technology Transfer, (NCARTT).Baqa', Jordan.

(6) Al Eisawi, D. (1985) Vegetation in Jordan in A. Hadidi Studies in History and Archaeology of Jordan Vol.2, .pp 45-57, Dept. of Antiquities, Amman, Jordan

(7) Al-Mahasneh, M. A. (2009) Proceedings of the Regional Expert Consultation, Agro-Industries Development, "Countries of the Middle East and North Africa", FAO, Cairo, Egypt

(8) Altenburg, T, and Eckhardt, U. (2006) "Productivity enhancement and equitable development: Challenges for SME development, Summary," German Development Institute, Germany Backstopping Officer, Frank Van Rompaey Strategic, Research and Economics Branch, Program Coordination and Field Operations Division, UNIDO.

(9) Beintem, Nienke M. a, Rdous Abdul Nabi F, and Eidat Jam an l Alrush (2006) "Agricultural Science And Technology Indicators" ASTI Country Brief No. 36, June 2006, JORDAN KEY TRENDS.

(10) Cassing, J. (2006) " Jordan – United States Free Trade Agreement Economic Impact Study: Searching for Effects of the FTA on Exports, Imports and Trade Related Investments", Achievement of Market-Friendly Initiatives and Results Program (AMIR 2.0 Program) PSPI Component, "JUSFTA Economic Impact Study: Searching for Effects of the FTA on Exports, Imports and Trade Related Investments " Task No. 535.02.

(11) CGAP, (2009) "Access to Finance: Micro-credit and Branchless Banking in the Hashemite Kingdom of Jordan" Consultative Group to Assist the Poor.

(12) Chapin Metz, Helen (1989) "Jordan: A Country Study: Agriculture", Library of Congress, Washington D.C, [http://countrystudies.us/jordan/51.htm]

(13) Cordella, A. (2006) "Impact of Trade Liberalization on Agricultural Sector in Jordan", Achievement of Market-Friendly Initiatives and Results Program (AMIR 2.0 Program) PSPI Component, "Impact of Trade Liberalization on Agricultural Sector in Jordan," Task No. 533.

(14) Department of Statistics, (2010) "Household Income and Expenditure Survey, 2006 and 2008", Amman, Jordan.

(15) DOS, (2002). "Income and Expenditure Survey, 2002" Department of Statistics, Amman, Jordan.

(16) DOS, (2008) "Income and Expenditure Survey of 2008" Department of Statistics, Amman, Jordan.

(17) DOS, Jordan (2009). "Statistical Year Book 2009" Department of Statistics, Amman, Jordan

(18) EDA Rural Systems (2004) “The Maturing of Indian Microfinance,” New Delhi; Copestake, J. 2002. “Inequality and the Polarizing Impact of Microcredit: Evidence from Zambia’s Copper belt.” Journal of International Development 14, 743-755.

(19) FAO (2011) "Value of Agricultural Production", FAOSTAT, FAO Statistical Division, [www.fao.org]

(20) GFN, (2010) “Earth Over-Shoot Day,” Global Footprint Network, Retrieved from http://www.footprintnetwork.org/press/ECO-Day Media-Backgrounder, August 2010.

(21) Goueili, A., Soliman, Ibrahim, and Mashhour, A. (1988). "Economic comparison Between Some Commercial Layer Strains Under Egyptian Conditions" Proceedings of the 18th World's Poultry Congress and Exhibition P. 1396-1398 Organized by World's Poultry Science Association. Held at Nagoya, Japan.

(22) Haddad, N. (1981) A chickpeas production and strategy for winter planting., Workshop on Asco-chyta Blight and winter sowing chickpea, May 4-7, ICARDA, Aleppo, Syria

(23) Helou, Hala (2010) Agriculture, Food & Beverages Sector Profile1, Agri-Food Trade Service, Amman, Jordan

(24) Hjort Kim C, Zakaria, M., and Salah, Falah I., (1998) "An Introduction to Jordan’s Agriculture Sector and Agricultural Policies" WTO Accession Unit Ministry of Industry and Trade, Amman, Jordan

(25) http://www.nationsencyclopedia.com/economies/Asia-and-the-Pacific/Jordan.html#ixzz1ZON6InGi, 1/12/2011

(26) Johansson, B, Dahl strand, A. August, (2009) “Bridging the Functional and Territorial Views on Regional Entrepreneurship and Development: The Challenge, the Journey, the Lessons,” European Planning Studies, Volume 17, Issue 8 August 2009 , pages 1105 – 1115, retrieved from [http://www.informaworld.com/smpp/section?content=a912883342&fulltext=713240928, on February 4, 2010]

(27) Kareem, Asem. (2000) water resources in the Arab world, Proceeding of the International Conference of agriculture economics in the Islamic world, Al-Azhar University,.Conference hall, Nasr City, Cairo, Egypt

(28) Raddad, Khamis (2005) "Jordan Water supply and water use statistics in Jordan" IWG-Env, International Work Session on Water Statistics, Vienna, June 20-22.

(29) Loizides, P. (1979) "Crop rotation under Rain Fed Conditions in Mediterranean Climate in Relation to Soil Moisture and Fertilizer Requirements, Rain fed Agriculture in Near East and North Africa, FAO, Rome, 1980, p.23-25.

(30) Market Publisher (2011) " Food processing industry in Jordan", Market Report Database, Business Analytic Center (BAC), FA6A1752E15EN

(31) Ministry of Industry and Trade, Jordan (2011) (http://www.mit.gov.jo/tabid/475/Jordan.aspx, 2/12/2011).

(32) Ministry of Water (2009) Annual Report, Amman, Jordan.

(33) MOIT, Ministry of Industry and Trade (2011) "Assessment of Trade in Services of the Hashemite Kingdom of Jordan", A Project of the Ministry of Industry and Trade and United Nation Conference on Trade and Development (UNCTAD), Amman, Jordan.

(34) Montgomery, H, Weiss, J, Kurmanalieva, E. December (2003) “Micro Finance and Poverty Reduction in Asia; what is the Evidence?” Asian Development Bank Institute, Research Paper Series Number 53

(35) Namrouqa, H., (2009) “Auto-Emissions Key Factor in Poor Air Quality, Report” Jordan Times, Issue of June.

(36) Namrouqa, H., (2009) “Environment Ministry Records Over 17,000 Violations in 2008,” Jordan Times, Issue of January.

(37) Namrouqa, H., (2010) “Jordan: Energy, Water Consumption in Public Buildings Come Under Scrutiny” Jordan Times, The issue of April 2010

(38) Namrouqa, H., (September 2009). “Jordan Earns 1.5 Million Euros in Carbon Sale” Jordan Times

(39) Nelson, J., (2007) “Building Linkages for Competitive and Responsible Entrepreneurship”, UNIDO and the Fellows of Harvard College, page 47.

(40) Omar Deraz and Soliman Ibrahim (1975) " Evaluation of Animal Wealth in Jordan" Arab Organization for Agricultural Development, Khartoum, Sudan

(41) Patricof, A, Partners, A and Sunderland, J. August 2005. “Venture Capital for Development,” Prepared for the Brookings Blum Roundtable: “The Private Sector in the Fight against Global Poverty Session III: Does Size Matter? SME’s, Microfinance & Large Nationals,” August 4, 2005

(42) Ramadan, N., and S. Abu Tair (1993) "Agricultural Data, Ministry of Agriculture Data bank Division, Department of Agricultural Policy and Economic

(43) Richards, Alan (1993) "Bananas and Bedouins: Political Economy Issues in Agricultural Sector Reform in Jordan" USAID, May 24.

(44) RSCN, Royal Society for the Conservation of Nature, (2011), Website, (www.rscn.org)

(45) Saad, Abdul Hamid and Soliman, Ibrahim (1979) "Forecasting Model of grains in Morocco" Monoufeia Journal of Agricultural Research, Vol. 2, P. 33- 47, Issued by Monoufeia University, Faculty of Agriculture, Shebin El-Kom,. Egypt

(46) Soliman, Ibrahim (1977) "Alternative Strategy for Agricultural Development in Jordan: Livestock Sector", FAO and ECWA Joint Division, Amman, Jordan Regional Office & Rome Italy.

(47) Soliman, Ibrahim (1990). "Some Economic Aspects Affecting Small Ruminants Development in The Near East Countries (1990) "Small Ruminants Research &Development in the Near East" Editors AboulNaga, A. IDRC, Canada, Ottawa IDRC MR237e West-view Press, P. 192- 196

(48) Soliman, Ibrahim (1998) "The Impact of Regional and International Developments on the Meat Sector in Arab States" Invited paper, Proceedings of the Regional Symposium on Studying the comprehensive Outline for the Development of Meat Sector and the Promotion of Projects in the Arab world, Arab Organization for Agricultural Development, the Arab League's, Khartoum, Sudan, pp. 1 30

(49) Soliman, Ibrahim and Eid, Nafissa (1995) "Animal Protein Food Consumption Pattern and Consumer Behavior" Economic Research Forum for Arab Countries, Iran and Turkey, Working Paper No. 9516

(50) Soliman, Ibrahim and Eid, Nafissa (1995) "Impacts of Egyptian Socio-Economic Environment on Dietary Pattern and Adequacy" Egyptian Journal of Agricultural Economics, Vol.5, No.2, P. 757-782, Published by Egyptian Association of Agricultural Economics, Agriculturists Club, Dokki, Cairo, Egypt

(51) UNDP (2004) “Millennium Development Goals Report, Jordan”, New York, USA

(52) UNDP, (2004) “Jordan Human Development Report" United Nations Development Program. New

York, USA.

(53) Unido (2011) Retrieved from http:// Unido.org/ Mediterranean exchange.

(54) United Nations (2005) "Technology Transfer to Small- and Medium-sized Enterprises and Identifying Opportunities for Domestic and Foreign Direct Investment in Selected Sectors: The case of Some Clusters in the Agro-food and Apparel Industries", E/ESCWA/SDPD/2005/6, New York

(55) WHO. (2009) “Country Profiles, Jordan,” World Health Organization, Retrieved from http://www.emro.who.int/emrinfo/index.asp?Ctry=jor, on July 2, 2010 World Bank (1990) Kingdom of Jordan: Agricultural Sector Adjustment Loan: Livestock Subsector Survey", pp. 45, March 1990, Wash. Dc., USA

(56) World Economy Watch (2011) [www.economywatch.com/world_economy/jordan/ export-import.html] 15/11/2011

(57) Wright, G. (2005) "Impact of Trade Liberalization on Jordanian Manufacturing and Services Performance" Achievement of Market-Friendly Initiatives and Results Program (AMIR Program) PIPS Component, "Issues Paper on National Enterprise Strategy Project”, Task No. 531.01.

(58) WTO, World Trade Organization (2008) "trade Policy Review-Jordan", WT/TPR/G/206.