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January 2013

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Importance of Citrus in Egyptian Agriculture

Egypt is almost one of few agricultural patterns which are fully irrigated and intensively cultivate the available land more than two seasons a year. The total agricultural area in Egypt was around 3.7 million hectares of which 78% arable land and 22% permanent crops in 2010. The arable land composes of two subcategories. The major one includes perennial field crops that occupied 56% of the total agricultural area and vegetables that occupied 22% of the total agricultural area in 2010. Fruit trees are among the permanent crops category, which was 12% of total agricultural area in Egypt in 2010 and sugar cane is among permanent crops category which represented 4% of the total agricultural area in 2010, (Soliman, et. al., 2011)

(Tables 1) shows the share of the fruit trees area in the agricultural land use in Egypt. The fruits area represented 16% of Egyptian agriculture land in 2010, while oranges occupied 6% of such acreage in the same year. In addition, orange acreage in Egypt is mainly concentrated in new land, where two-thirds of such acreage was in new land in 2010, (Table, 1). Oranges occupied more than one third of Egypt's fruit trees acreage and had the largest share in the value of agricultural exports, i.e. 16.4%, (Table 2). On the other hand, it is concluded from (Table 3), that orange occupied the first place in fruits domestic supply and consumption, where it shared in production by 30%, in exports by 48%, in processing by 30%, in per capita consumption by 28%, in the year 2009

With respect to water use, oranges occupy the 6th rank as cubic meters of water per hectare. Sugar cane, Rice, Mango, Alfalfa and Groundnut preceded Citrus in water consumption rate. While the average water consumption per hectare in Egypt is around 6,690 Cubic meters/ha, orange consumes 7,461 cubic meters of irrigation water per ha, (Table 4).

A profile of Major Changes in Egyptian Economy Policies

It should be mentioned that the concerned time series period (1981-2010) included Eras of dramatic changes in the Egyptian economy system. The first Era ended by 1986, when Egypt was still to large extent under planned economy. The period 1965-1986 was the Era of the Egyptian Government interventions in the agricultural sector. The control of crop area and install of the producers' price and compulsory purchase of the major crops were the policy instruments used.

Thereafter, Egypt has practiced a package of economic policies, known as structural adjustment program (SAP). The program has applied earlier on the agricultural sector, since 1986/1987, compared with other sectors in Egyptian economy, when the Ministry of agriculture

started to eliminate taxes and subsidies in agriculture products and selling the public agricultural companies. Structural adjustment program aims to improve the conditions of the supply structure on base of the comparative advantage principles, to correct distortions in economic policies, development of the local resources, and promote institutional transformation to reduce vulnerability to external shocks in the future (Hazell, et al, 1995).

The full application of the program had almost completed by 1995. Accordingly, The second Era (1987-1995) included the boom of the economic reform program, which aimed at moving the economic system strongly towards privatization and free market mechanism, including freeing the exchange rate and interest rate as well as inputs and outputs prices, keeping only subsidy within the limits of the common Egyptian bread, quotas of some food items that have being distributed via rational cards and fuel prices. Since 1991/1992, the Government of Egypt has applied the reform policies on all sectors in the Egyptian Economy. The main structural changes were liberalization of both monetary and financial markets. Therefore, it liberated both interest and exchange rates. Investment structure has shifted to the private sector. Currently, the private sector share in Egyptian investment surpassed 70%. Those policy instruments were associated with privatization mechanisms of public firms. All those amendments have impacts on the resources use, the food supply, and unemployment and not only income growth, but also on its distribution (Mohammed, 2000).

The SAP application in the agricultural sector composed of five instruments. These are:

(1) Remove the farm price control,

(2) Eliminating restrictions on crop area,

(3) Cancellation of Government control in purchasing crops,

(4) Phasing out the subsidies on agricultural production inputs,

(5) Cancelling the Government deregulation, this prevented the entry of private sector in processing and marketing of agricultural products and agricultural production inputs (Hazell, et al, 1995). It was a transitory period associated with unsatisfactory performance of the Egyptian economy, including agricultural sector.

The third Era was (1995-2010) which represents the Era after the reform policies application and on forth. The economy in general has shown some reasonable improvements in the macro performances. However, Agricultural sector was the least improved one. Also, the social judge was of the least priority in the successive development five years plans till the 25th of January revolution, 2011, (Soliman, Ibrahim, 2013).

Lessons from Previous Agricultural Development Plans

Agricultural development efforts have experienced major changes since 1980 in the different fields of agricultural production, due to expansion of agricultural areas, and improving productivity. These efforts have led to the increase of the agricultural land from 2.5 million hectares in 1980 to approximately 3.7 million Hectares in 2007, as well as increasing cropped area from some 4.4 million Hectares in 1980 to 6.4 million Hectares in 2007. The horizontal and vertical improvement in cultivated and crop productivity, achieved an average annual growth rate in agriculture of 3-4%.

However, such achievements faced notable increase in population associated with expansion in their needs due to economic growth. Several lessons were learned from the application of previous strategies in eighties, nineties and at the onset of this century (MALR, 1982), (MALR, 1991).Among the major learned lessons:

1. The structural reform program was the core of the previous strategies. Therefore, its component of price liberalization has reached its ultimate to great extent, however, the associated institutional reform, suffered from much lag response and needs further reform. The limited water resources have not faced with proper policies towards rationalization of water use

2. Although small farm holdings are more than 80% of the Egyptian agricultural system, such sector of the majority has not supported with policies that let the stakeholders being adapted with the dramatic changes in agricultural sector and protect them from the negative impacts of market liberalization and globalization.

3. The newly reclaimed land, which reached about one million hectare, has generated communities lacking of the foundations of settlement and efficient institutional framework as well as efficient marketing system, (El-Zoghby, and Soliman, 1985).

4. The system of distributing the new reclaimed land was biased against the real stakeholders of the agricultural system, i.e. the small farmers and agricultural graduates from either universities or high agricultural schools, (Soliman and Imam, 1987).

5. The previous strategies have lacked of a proper vision towards achieving sustainable agricultural development through an integrated rural development program. Therefore, unemployment, risky migration to urban or abroad, poverty gap, all has expanded in rural communities, (Soliman, 2010).

6. In spite of full privatization of production and marketing firms of the agricultural system in Egypt, the private agricultural enterpriser have not shared in financing the agricultural research institutions in Egypt by any means (Soliman and Gaber, 2008).

7. Drying most of the area of internal lakes and transformed most of their water area for agricultural production wasted the main source of fish production in Egypt (such lakes were providing 70% of Egypt fish supply) and failed to cultivate economically the dried land. The fault was that the feasibility studies made had denied the valuation on social price and costs of the transformed natural fisheries (Soliman and Gaber, 1998).

8. Reluctant development plans for efficient agricultural and food marketing system distorted the implemented plans for raising agricultural productivity. Even high yield was violated with high losses and lack of sufficient specifications and lack of proper grading, sufficient storage, or efficient processing (Soliman, 1998)

9. The lag of issuing the act of protecting competitiveness and prevention of monopoly, for 15 years between liberalization and privatization of the market, in addition to lack of effective mechanism of implementation generated inherited power poles of monopoly in the Egyptian market, (Soliman and Gaber, 2008).

10. Two marketing functions supposed to be monitored by government under free market system. However, both are not conducted at proper effectiveness. These are Market

information system, monitoring and control on specifications, grades and safety, (Soliman and Gaber, 2008)

11. International and regional backgrounds have experienced many changes, most important of which is the international trend towards further liberalization of agricultural trade, at a time of when increase in food prices and supply disruption took place. These two big issues raised extra challenges that faced the agricultural development in Egypt (Soliman, Ibrahim, 2000c)

12. Environmental impacts on agricultural system in Egypt from the production, marketing and foreign trade dimensions had not received much attention, particularly its impacts on output specifications, yield losses and barriers on exportation (Soliman, Ibrahim, 2002b)

13. Previous agricultural development strategies did not pay specific attention to the endowment of Egypt's agro-climatic regions. Such strategies adopted a generic approach primarily linked to the Central National Plan (The World Bank, 2008).

14. Up to 1986 there were two exchange rates for the local currency (Egyptian Pound, EGP). First official exchange rate equaled 0.47 USD/EGP, and a free market exchange rate, which equaled US $ 1.43 /EGP. The official exchange rate applied on all exports of cotton and rice, but did not apply to other crops. While half exports of crops, rather than cotton and rice, applied the official price, the other half applied the free market price. This excessive exchange rate levels resulted in low producer prices. Accordingly, there were indirect taxes on agricultural exports, which was equivalent to a taxed export price policy. In 1990, the official exchange rate was US$ 0.5/EGP, while the exchange rate fell in the free market to US$ 1.34 /EGP. In 1991, there was a common exchange rate and the market exchange rate was US$ 3.30 /EGP (The World Bank, 2010)

15. It should be mentioned that since the last decade, accordance with economic reform era, the government has provided a grantee wheat price higher than the international price of wheat, to encourage farmers to deliver their wheat for being processed as subsidized common bread and to raise the wheat self-sufficiency as basic strategic crop. This policy has led to decrease the Berseem (Egyptian clover) area from one third to less than one-fifth of agricultural area in Egypt for wheat and sugar beet area (Soliman et al, 1997)

16. The manufacturing sector contributes about 20% of Egypt's GDP. It comprises a broad range of activities. A key objective of the Government is to increase the competitiveness of private enterprises in the sector. Food processed products chemical fertilizers are among the most important outputs of industrial sector in Egypt (MALR, 2010)

The Policies Geared To Agricultural Supply

The first package of reforms concerning the Policies Geared to agricultural supply was implemented during the period (1987-1994). The State has oriented the application of the policy of economic liberalization to transition from central planning to indicative planning based on incentives. In this context, the ministry of agriculture developed so-called benchmark-cropping pattern, as a main production-policy, which take into account to secure the national needs of strategic crops, achieve market stability, water conservation, and limiting the expansion in water-consuming crops (rice and sugar cane). Such policy made agricultural land use (cropping pattern) and agricultural rotation to be determined by farmers' decisions, except rice area, which has limited by a border of 1.2 million acres. The farmer who cultivates rice in a region not allowed for such crop pays a heavy fine.

Whereas, other cereals, legumes, vegetables, fruits (including oranges) and fodders; area stayed unrestricted, barriers were induced to shrink the area under Egyptian cotton. Agricultural production input prices were liberated. Accordingly, the compulsory quotas delivery of major field crops was eliminated. Such policy was replaced by an optional delivery system for all crops, except sugar cane. The sugar cane should be delivered to domestic refineries at a price determined by Government. Such price is usually above the international price (Soliman, et al, 1994) The Government has established a grantee price policy for major subsistence crops, wheat and rice, (usually at a level above the international market), with optional delivery of the production to government milling plants and/or agricultural cooperatives, (Soliman and Gaber, 1997) and (Soliman, et al, 1997)

.Financial assistance to the sector is provided in the form of subsidized price of water, (Soliman, Ibrahim, 2002), the latter being provided almost free of charge to farmers. The price subsidy policy was kept valid for diesel fuel used for agricultural machinery operations (Soliman and Owaida, 1998), cottonseeds, and cotton protection operation (Soliman, Owaida, 2005). The national program to increase productivity of sugar cane was applied completely free of charge and funded entirely by a governmental institution called the national sugar cane Council. The program components were soil leveling by Laser instrument, adding soil structure improving materials and higher yield crop verities, (Soliman, et al, 1994). Later Sugar beet crop has introduced to the northern Nile Delta governorates.

The principal agricultural credit Bank activities were transformed towards commercial finance bank functions. When the importation and trading of agricultural requisites were privatized, the market performance has had negative impacts on small farmers, (Soliman, et al, 2003). That experience led the Egyptian government to intervene again through agricultural credit Bank and cooperatives in those markets. A quota per acre of agricultural requisites have being distributed through the outlets of the principal agricultural credit Bank branches and the common credit agricultural cooperatives in the villages, at subsidy of a maximum 50% of inputs international prices, (Soliman, et al, 2010a).

Objectives of the Existing Agro-Food Policies

Egyptian ministry of agriculture and land reclamation has committed with the following objectives to achieve developed sustainable Egyptian agriculture system (MALR, (2009) :

1 Sustainable use of natural agricultural resources;

2 Increasing the productivity of both the land and water units;

3 Raising the degree of food security of the strategic food commodities;

4 Increasing the competitiveness of agricultural products in local and international markets;

5 Improving the climate for agricultural investment;

6 Improving the standards of living and reducing poverty rates in the rural area

Input Policies

The Economic reform program in agriculture sector has not limited within liberalization of the market mechanism and privatization. It was associated with introduction and expansion of three packages of technologies, (Soliman, 1992)**:**

(1) The biological package, mainly introducing high yield varieties of the main subsistent crops, such as rice and wheat,

(2) The physical package, mainly expansion of agricultural machinery with introducing new systems such as combine harvesting system and leveling the soil using laser system, and

(3) The chemical technology, which is mainly, applied intensification of chemical fertilizers, to such intensive agricultural system,

Even though the private sector has conferred full opportunities to trade and to deal with marketing of these three packages of technology, the agricultural cooperatives and the governmental machinery stations have stayed as important outlets that provide these inputs at prices moderately less than free market price (partially subsidized). Soliman, et al (2003), showed the impact of such policies on the productivity of these inputs derived from production function estimates made on rice farms in the same region in 1986 (year of the onset of the economic reform application on agricultural sector) and lately in nineties of the twentieths century (in the year1997). Productivity estimated as the production elasticity coefficients. Apparently, the productivity of agricultural machinery labor has relatively increased as well as the fertilizers at the expenses of both human and animal labor. The interaction between higher yield rice variety and both machinery and fertilizers was positive at the expenses of human labor. This issue was not associated with an effective integrated rural development program that might offer alternative jobs for human excess labor. Such evidence supports the abundant increase in non-agricultural population of Egypt.

The production and trade of the seeds of the high yield varieties have left completely for the private sector at the market price without any subsidy. Only the ministry of agriculture provides the technical supervision and support. The agricultural research centers or the centers of seeds screening are allowed to sell the seeds at the market price. The commercial package is a sac contains 30 kilograms. In 2010, the seed prices of the main crops were US$ 18-20 per sac for wheat, US$ 280 per sac for rice, however the rice seeds sac I 25-30 kilograms. For hybrid maize the price varies by the variety, as the commercial unit is a sac weighing 12 kilograms, the price ranges between US$ 15-25[2].

As the nitrogen fertilizers are the major chemical fertilizers in the Egyptian agricultural system, there is still governmental intervention in its market mechanism. The two main commercial nitrogen fertilizer products are the Urea (46.5% Nitrogen) and Nitrate (33.5% Nitrogen). The agricultural cooperatives distribute quotas of these two types of fertilizers at partially subsidized price of US$ 14 per sac (50 Kg) while the free market price was US$ 17.5 in 2010. The quota is associated with the land holding card registered in the cooperative. Phosphate and Potassium fertilizers are distributed at free market price, (MALR, 2010).

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[2] [2] Unpublished data from the Ministry of Agriculture, 2010

Oranges production Policy[3]

Citrus is the first economic crop among all the fruit crops area wise. The total area of oranges reached approximately about 50% of the total fruit area in Egypt and production increased from some 2042 million tons in 2002, (FAO, 2011) to about 2803 million tons in 2009, (Table, 3), i.e. it has grown at about 2.5% a year. The agricultural development plan aims at promoting the cultivation of citrus area and raise export potential associated with increasing yield, (WP22 Report of Egypt, April 2011). The three main varieties of oranges produced in Egypt are *Washington Navel orange*, *the Common domestic variety orange,* and *Valencia orange*".

The *Navel orange* is one of the most important and most widespread varieties of oranges in the world. It is derived from buds mutation. Its main features are large fruit size with either big or small umbilicus, the -pulp is juicy, and of sweet taste. It is of a medium thickness crust. Recently, three distinct varieties of *navel orange* have been imported these are "Berant", "Skagsbonanza" and Frost" of higher yield and better quality. Generally, it is recommended not to cultivate such strain of oranges in dry desert areas of Egypt or in the Upper Egypt, because of the extreme sensitivity to high temperature and low relative humidity.

The Common domestic variety orange is of a high productivity per tree. The fruit is of medium size, with a high proportion of juice and of a thin thickness crust. Among its disadvantages are that its fruit contains many seeds (18-20 seed/ fruit) and a high rate of evaporation of the fruit moisture, in particular, at the end of the season. Among its advantages, beside high yield, are the goodness of cultivation in newly reclaimed desert land.

Valencia orange is derived from a Spanish variety of late maturity in Valencia Region. Its fruit is medium ranges between medium to large size. It is very juicy and few seeds per fruit (1-5). The crust is of medium thickness. It has the ability of storage till the end of July without affecting the trees crop in the successive year. The Egyptian crop of this variety has high competitiveness in American and European markets; even in Spain where it has been was established. This because the climatic conditions in these countries, particularly humidity and temperature work together on breaking down the color dyes which give the orange its lovely orange color that results in re-greening phenomenon, i.e. returning back to green chlorophyll A and B. Therefore, some companies recolor the fruits with orange color, which is against the European desire and decrease the demand for such home produced Valencia orange. There is a fear feeling is generated among the western consumers from such artificial color used for getting orange color fruits. In contradictory, the Egyptian Valencia summer orange is of natural color. The current total Area cultivated is around 20,000 ha, (Table 5).

Impacts of Variety and Season on Orange Production[4]

Table (5) Shows that "Naval" variety has the highest share of Egyptian orange area and production. Also "Naval" variety provides the highest yield. It follows by Valencia variety. However, the Valencia is a winter season variety. Even though, Valencia orange receives higher price, either in domestic market or in foreign markets. Obliviously, the common local variety has the lowest share either the area or the production and provides the lowest yield. However, it receives the lowest price. It is the

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[3] The Egyptian Corporation for Exports Promotion, Ministry of Industry and Trade, Cairo, Egypt, 2012,
[4] Ministry of agriculture and land reclamation, Egypt, "Agricultural Statistics Bulletin Volume 2, July, 2011

choice of low income households and has no export market. In general the yield of the old land orange area is slightly higher than the new land.

Economic feasibility of Egyptian Orange Production

The gestation period of orange farm enterprise is 4 years. The onset of the orange yield is collected by the end of the fifth year. The yield increases gradually till the tenth year. The production stability occurs at the 16th year and resists till the 30th year. The replacement starts from the year 31 with degradation in the orange yield. Replacement continues till the 40th year. From (Table, 6), it seems that there is a sort of economies of scale as the IRR increases in value with farm size category. Diversification of the citrus types of citrus gardens increases the return to investment much higher than specialization in one type, even if it is of the highest quality and the highest price, such as Valencia price.

Oranges Marketing5

Oranges as a group of fruits are of the most perishable agricultural food commodities that expose to damage during marketing due to the nature and extent of vulnerability to various natural factors, making the problem of losses an economic problem that harms the national economy. The aggregate loss from production place till consumption is a large part of the supply. The largest proportion of loss in orange is during post harvesting. It is a loss in the supply weight. Other type of loss is in quality. It is measured actually as a value, resulting from lower price paid for fruit piece than the regular level because of non-conformity with specifications for those standard or damaged parts of the fruit. The most recent Egyptian Trade Chamber's report in 2011, cited that the aggregate losses could reach 35% of the domestic supply

In other words, waste is defined as the amount of shortfall in the quantity and/or quality of commodities available for consumption, and this concept differs from the concept of damage, which reflects the spoilage that affects physically the fruits themselves for reasons difficult to measure accurately. In conclusion waste in oranges take several different images, among those images are:

(a) Quantitative loss, which reflects the decrease in the quantity of oranges, displayed because of damage, disrepair, or improper cooling that results in shortage in weight.

(b) Natural wastage of Oranges due to attacks of birds, insects, and rodents is also a sort of waste. The losses in the water content of fruits at storage, is another sort of waste. However, it is difficult to estimate the amount of this waste.

(c) Value losses in Orange fruits means the decrease in the monetary value of the crop because of differences in quality and the quality of the crop.

(d) Qualitative loss of orange fruits are the deterioration that degrade the fruits from the standard specifications, which results in decline in prices and hence market value. This type of waste is due to biological factors such as diseases, insects and environmental pollution and some types of fungi which being active at low temperatures. This type of waste is in quality, in terms of a change in color

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[5] The Egyptian Council for Horticulture Exports Promotion

or taste or smell or contamination of pesticides. The only way to measure is through physic-chemical analysis.

(e) Losses in Nutritive Value of Orange Fruits are intended as a decline in the nutritional value of the crop because of decrease in weight and quality together and therefore, difficult to estimate this type of waste. There are two major trends of product research in this concern. The first is interested in studying the causes of losses at the farm level and the factors affecting it, while the second trend addresses the causes of marketing at the stages of the wholesale, dealers, and retailers in different markets.

The most important factors causing the waste at the farm level for Orange fruits have been divided into four main groups:

(a) The biological factors includes various types of pests, insects, nematodes, rodents, and weeds; besides viral diseases,

(b) The technological factors are a combination of factors, technological and methodological use of modern machinery in the farming operations, as well as the use of modern methods in all the marketing functions of collecting, sorting, packing, and storage of Orange fruits

(c) The economic and social factors include low prices of farm and not usage of modern methods of production and marketing, and lack of savings and the lack of credit facilities for the introduction of modern agricultural scientific technology and lack of role of agricultural extension in the countryside

(d) The natural factors that have an impact on increasing the rate of loss of oranges such the temperature, wind and rain, where the high temperature degree increases the rate of respiration of the fruit, which loses a lot of qualities and the freshness and vitality, and thus reduce weight by increasing metabolic rate them.

Factors causing the loss in the post-harvest of Oranges during different stages of Marketing: are divided into three main groups:

 1- Determination of the optimal stage of maturity of oranges,

2- Technical and mechanical damage

3- The damage caused during storage.

.Estimates of Losses Percentage along the Value Chain

The Author made a survey by personal meetings with the traders in the largest wholesale market in Egypt (Obour Market, 15 Km from Cairo) and with some orange farmers in Qaluobia Governorate (45 Km from Cairo) and Some Green Grocers in Cairo. He got the average loss percentage in the traded supply between the farm and retailer. Such proportions have been varied by stage and by trading operation (Table, 7). It is noticed that the bulk of loss occurs during retail stage.

Supply and Price seasonality of the Egyptian Orange Market

The behavior of the supply quantity and price (wholesale) seems economically logic as shown by (Table, 8) and (Figure, 1). The higher the supply the lower is the price and vice versa. At the onset of

orange picking time the price reaches a minimum (onset of winter season, i.e. by the end of November. And increases gradually by a decrease in supply till the price reaches a maximum in the heart of the summer, where the supply is a minimum as the sum of stored winter crop and some of summer orange.

Estimation of the aggregate Marketing Efficiency

The aggregate marketing Efficiency is the ratio of the marketing costs to the total costs of the whole value chain6, as shown by the following equation

Marketing Efficiency = (Marketing costs/Total Costs) x 100

Using this equation for assessing the Egyptian orange value chain, using data collected from the purposive sample survey conducted by the author in 2013 (cited in the previous section), showed that such criteria was 67%. It indicates that about two-thirds of the Egyptian orange market revenue goes to the value chain stakeholders but the producers. As orange is a perishable good, it seems to some extend acceptable, however it is not a sound efficient market performance as the marketing functions are not provided properly in Egyptian orange market, such as grading, storage and transportation and some of these functions are very limited such as processing.

Agricultural Foreign Trade Policy

Before applying the economic reform program, the Government took control of trade in agricultural products allowing only little horticultural exports by private sector, under restriction of handing in 25% of the earned foreign currency to the Central Bank at the official exchange rate. That policy has been modified under the second Package of the reform policies directed to the demand-side to encourage private sector role in agricultural commodity exports. Dollar income was valued at the free exchange rate, associated with allowing the private sector to establish grading, loading and cold storage warehouses for exporting fruits and vegetables, (Soliman, et al, 2010b). However the Government has continued subsidizing the various food products, most notably bread, sugar, and oil, for low-income groups. Since 1999, Egypt has not submitted any notifications to the WTO Committee on Agriculture, (World Bank, 2008)

The total number of international agreements between Egypt and the rest of the world are 400. Among them 100 with European countries, 33 with African Countries, 85 with Asian Countries, 70 with north American Countries, 5 with south American countries, 2 with Australia. However, the study focuses upon the agreements between Egypt and EU countries**.** This is because: (1) such agreements, is among only 12 ones that are purely for trade promotion, (20 it has to be terminated or continued soon by June, 2013, and (3) EU is the main client of the Egyptian merchandise export. Its market absorbed two thirds of such value, even though EU merchandise exports to Egypt covers only one-third of the letter's merchandise imports. Therefore, the Egyptian merchandise exports to EU cover only 76% of the EU exports to Egypt, (Soliman, Ibrahim, et al, 2011). (Ministry of Trade and Industry, 2010). In addition, the EU market is the second important market for the Egyptian agricultural exports after Arab countries. Whereas EU share in the Egyptian agricultural exports is about 29%, EU share in Egyptian agricultural imports is only 11%. However, the net balance is

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[6] Soliman, Ibrahim and Jabber, M. (2006) "Agricultural Marketing Systems, Al Fekr Al-Arabi Press, Nassr City, Cairo, Egypt

negative, with a deficit of around 41% of the imports value of Egypt from EU. The other European countries receive 8% of the agricultural exports of Egypt and deliver to the Egyptian market 17% of its agricultural import with a deficit of the net balance of 90%, (Table, 9)

General Theme of the Egypt-EU Partnership Agreement

The partnership agreement between Egypt and EU was effective on June, 25th 2001. According to the Agreement, a free trade area (FTA) will be established during a 12-years transitional period, from the date the agreement enters into force. During the third year both parties will decide upon the procedures, to be implemented on the following year, to further liberalize their trade in agricultural products, maritime products and processed agricultural products. The Agreement permits Egypt to take certain exceptional measures for specific periods during the transitional stage, if and when certain domestic industries face a threat as a result of liberalization of imports of similar goods from the EU. The Agreement includes implementation of WTO and GATT regulations against anti-dumping, subsidy and safeguard measures. The Agreement allows each party to enjoy Most Favorite Nation Treatment MFNT) from the other party in trading services. The Agreement aims at increasing the flow of foreign capital, expertise and technology to Egypt. Egyptian exports of manufactured goods to the EU will be exempted from tariffs once the Agreement enters into force, meanwhile, EU exports of manufactured goods to Egypt shall be tariff-exempted, according to the lists and period specified in the Agreement. The agreement is valid until terminated by either party by notification to the other party. The Agreement shall cease to function after the elapse of 12 calendar months from date of notification. In addition, the agreement aims at developing balanced economic and social relations through cooperation. While it contributes to the process of economic and social development in Egypt, it also encourages regional cooperation to promote peaceful coexistence and economic and political stability. As well as promoting cooperation in other fields of mutual interest. Detailed rules of origin in the agreement protocol are cited under article (4.)It points out the working or the processes that are required to be carried out upon the product to acquire the originating status.

Agricultural Products Trade in Egypt-EU Partnership Agreement

Agricultural goods and agricultural processed goods shall not be tariff exempted but shall be treated according to the rules stipulated in the agreement, which defines certain quotas for specific goods with tariff privileges and certain market windows for exportation. Egypt and the EU agreed on exempting certain quotas of agricultural products from custom duties and reducing the tariffs on exports that exceed these quotas.

With Respect to Egyptian Agricultural Products Exports to EU of Egyptian origin, they are either eliminated from tariffs or the rates are reduced. For products which the EU tariff system stipulates a value-based fee and a specific fee, reductions shall only apply to the value-based fee. .For specific products, tariffs will be eliminated within the quotas specified. Beyond the set quotas for quantities, either full tariffs are applied or a tariff reduction is implemented. Other Products are liable to a 3% annual increase on tariffs based on the volume of the preceding year.

Orange Trade privileges in the agreement

As of December 1st and up to May 31st, they agreed upon entry price shall apply for fresh oranges within a tariff quota of 34000 tons, with regards to the preferential advantage of a value-based customs fee. The customs fee shall be reduced to a zero level, which was set at Euro 266/ton as of Dec 1st, 1999 and up to May, 31st, 2000 and readjusted to Euro 264/ton afterwards for the same period. The shipment's entry price is less than 2%, 4%, 6%, or 8% of the agreed upon price, the fixed tariff fee shall be equivalent to the 2%, 4%, 6% or 8% percent of the agreed upon entry price. If the entry price is less than 92% of the agreed price, the fixed tariff rate set by the WTO shall then apply. As for the remaining quota of fresh orange (26000 tons), the value -based tariff rate shall be reduced by 60%.

The Egyptian processed agricultural products, including processed orange, are subject to CAP (Common Agricultural Policies) to attain the domestic prices higher than those prevailing in the international markets. Thereof, the EU imposes the following duties on its imports of processed agricultural commodities:

1) Relative custom fees (between 2% and 12%) are applicable based on the processing operations of those commodities. Egyptian exports will be exempted from this custom fee.

2) A tariff fee on the agricultural components, equivalent to the difference between their international prices and domestic (EU) prices

3) A list of Egyptian processed agricultural products will be exempted from the relative custom fee while the tariff fee on the agricultural component will remain unchanged, whereas a number of other Egyptian processed agricultural products will enjoy a 30% exemption of the tariff fee on the agricultural component in addition to the complete exemption from the relative custom fee

4) An additional fee shall apply on commodities whose component includes ingredients of grains, rice, sugar or dairy products.

Non-Tariff Barriers on Egyptian Exports

A study applied the gravity equation model, as a common approach to assess the impact of domestic and foreign policies on Egyptian trade patterns using cross- section data in year 2010, (Bassiony, 2012). The results showed that the impacts of non-tariff barriers were significant with a positive sign. This indicated that NTMs have strong trade impact on Egyptian agriculture exports of vegetables and certain roots, tubers, fruits (including fresh orange), nuts; peeled citrus, melons and cotton. The positive sign may indicate to revealed competitiveness (RC) of these products in EU market. Therefore, the Egyptian exporters should satisfy EU requirements of non-tariff measures to raise their share in the EU markets. This paper concerned five types of measures. Sanitary and Sanitary measures, technical barriers to trade, license, quotas, prohibitions and other quantity control measures, and finance measures applied in European Union countries. Moreover, it concerned the export related measures applied by Egyptian government on exports

Growth of Land Use, Yield and Farm price of Egyptian Orange

The data used in this study were compiled from the agricultural statistics bulletin which is issued annually by The Economic Affairs Sector of the Egyptian Ministry of Agriculture and Land

Reclamation and the Food and Agricultural Organization of the United Nations (FAO) Statistical Data Base.

The average annual growth rate of orange area, yield and farm price was derived from the time trend model (Equation 1) using (Equation 2).

Equation 1: Linear Time Trend Model …**……….** $\hat{Y}_{ij} = b_0 + b_1 T_j$

Equation 2: Average Annual growth Rate ………… … $r_i = b1/\hat{Y}$

Where:

$\hat{Y}_{ij}$ = Expected value of the concerned variable I (Area, Yield or Farm price) in the year

b_1 = Estimated time response parameter

b_0 = Estimated constant of the function

r_i = Estimated average annual rate of change

Table 10, presents the estimated time trend models of the area, yield, domestic and world farm price of the citrus over the period (1981-2010). If the time response (regression) coefficient was statistically insignificant, the derived annual growth rate of the corresponding variable was considered of zero value, i.e. no significant growth had occurred. Another important performance that could be abstracted from (Table 10) was that Egyptian oranges had shown an annual average farm price lower than the average world level for the period (1981-2010). This conclusion might imply that there is an apparent sign of comparative advantage of Egyptian orange. However, It should be mentioned that the existence of a comparative advantage does not mean directly and certainly competitiveness of the Egyptian orange exports in the world market. The later criterion depends upon other techno-economic variables.

Table 10 also presents the derived average annual growth rate of the three studied variables (area, yield and farm prices) of citrus. Even though, oranges area has grown at 3.5% a year over the last two decades, its yield has not shown any significant growth over the same decades. The farm price has shown a significant moderate annual growth of 2.13%, which could be an incentive to expand the area not only as a promising exportable product but it is also the common Egyptian fruit for domestic consumption, particularly that there is summer orange in addition to the bulk supply of winter orange. Lately in this study the per capita consumption pattern of orange and the consumption function will be investigated.

Risk Assessment of Egyptian Orange Production in Egypt

The risks in crops area, yield and farm price levels were estimated using the instability coefficients (Equation 3) over a reasonable historical time trend, (1981-2010). The estimated average annual growth rate of orange area, Yield, local farm price and world Farm price (Table, 10) was also considered in estimating $\hat{Y}$ for getting the instability coefficient. The estimated coefficient of instability are presented in (Table 11)

Equation 3: Instability Coefficient .... $= \sum \left(|\hat{Y}_{ij} - \hat{Y}_{ij}| \right) \backslash \sum \left(\hat{Y}_{ij} \right)$

Where:

$\hat{Y}_{ij}$ = Actual value of the concerned variable i (Area, Yield or Farm price) in the year j,

$\hat{Y}_{ij}$ = Expected value of the concerned variable I (Area, Yield or Farm price) in the year j,

$|\hat{Y}_{ij} - \hat{Y}_{ij}|$ = Absolute value of the subtraction

Orange has shown an orange area instability coefficient of 27.7%. The instability in orange yield was less than its area. The yield instability of orange was about 17.4% (Table, 11). Even though, the instability in domestic farm price of orange was almost equal to that coefficient of the average world farm price of orange, i. e. around 13.3%, there was no association between the local farm price of orange and the comparable world price, (Table, 12). The effect of the average world price inflation of citrus on their domestic price level of orange was assessed using (Equation 4). Figures 2, 3 and 4 present the actual annual fluctuations of the orange area, yield and farm price of orange over the concerned period.

Equation 4: Response of Domestic Price to average world price in the year t: $\acute{P}_{di\ (t)} = b_0 + b_1\ P_{wi\ (t)}$

Where:

$\acute{P}_{di\ (t)}$ = domestic farm price of orange in the year t

$\acute{P}_{di\ (t)}$ = world farm price of orange in the year t

Impacts of National Economic Policies on Oranges Exports

The self-sufficiency ratio of Egyptian oranges production provides a potential indicator of the availability of surplus for exports. Therefore, this section of the study investigated the time trend of production, consumption of oranges over the period 1980-2008. Such period was divided under policy instruments -as presented earlier in this study- into three sub-periods. The first was 1980-1887, to reflect the sector performance before the implementation of the economic reform program, which included Privatization of the firms along most of agricultural products chains in addition to, liberalization .of the market mechanism and liberation of inputs and output prices, interest rate and exchange rate. The second included the transitional years of full implementation of the concerned policies package (1987-1995). The years after (1995-2008) represented the impacts of the full implementation of the program on the oranges exports performance

Impacts of the Economic liberation on Egyptian Oranges Self-sufficiency

The self-sufficiency is the resultant of production and consumption growth. Therefore, the time trends of both variables were investigated within the three concerned periods. Annual average of Egypt's Production and consumption of oranges was around 1526, and 1442 thousand tons, while the annual growth rate was statistically significant of about 2.28 percent, and 2.15 percent

respectively, during the period (1980-2008), i.e. the average self-sufficiency rate was about 106%.(Table, 13)

Before the economic emancipation program in Egypt (the period 1980-1987) The average annual production and consumption of Orange reached about 1154 and about 1061 thousand tons, respectively, which showed a self-sufficiency rate of about 109%, and an annual growth rate of production about 4.95%, Whereas, during the period of implementing of the economic liberation program (1991-1995) the average annual production and consumption of oranges was about 1483, and 15100 thousand tons, respectively, which reaching self-sufficiency of Orange about 103% and did not demonstrate statistical significant time trend growth rate, i.e. it vanished to zero. The period after the full implementation of economic liberation, the average annual production and consumption of oranges in Egypt reached about 1757and 1639 thousand tons, respectively, during the period (1995-2008), with an annual growth rate of about 2.74%, and 1.8% and a self-sufficiency ratio of about 107% , (Table 13)

Egyptian Orange Exports

The performance of orange export was investigated as quantity, value and average export price per unit by comparing the time trend analysis of the three variables within the three concerned periods, i.e. before, within and after implementation of the economic liberation program of Egyptian economy, as shown in (Table 13). Annual average Quantity and value of exports of oranges during the period (1980-2008) reached around 151.35 tons, and 54.11 million US$ associated with an annual growth rate of orange export quantity about 3.97%, while such exports did not demonstrate significant annual growth rate in its value, which reflected a decrease in the average export price of Egyptian orange at an annual rate of about -2.25% of the average annual price per ton of orange exports which was $ 371.24 during the concerned period.

Before the implementation of the economic liberation program, (the period 1980-1987), the average annual quantity and value of exports of oranges reached 220.88 tons, and $61 million, respectively, with an average annual price per ton of Orange around $501.25 associated with a statistically significant growth rate of about 6.71 percent. During the period of implementation of the economic liberalization (1987-1995) both the quantity and value of exports of oranges dropped at a significant rate of about -12.76%, and -201.85%, respectively. Thereof, the export price decreased by nearly -6% a year. During the period after liberation (1995-2008) the average annual quantity and value of exports of oranges approached 181 thousand tons, and US$ 57.83 million with a statistically significant growth rate of 13.4%, 18.02%, respectively. However, the annual average export price of Egyptian oranges was 295.57 dollars per ton with insignificant annual growth rate, i.e. approaching zero.

The Geographical Centralization of Egyptian Orange Exports

The most important market for Egyptian orange exports was Saudi Arabia, where the Egyptian orange exports amounted to about 188,940 tons, i.e. approximately 23.0% of the total Egyptian orange exports, with a total value of about 115.217 million dollars, which represented about 23.2% of the total Egyptian orange exports in 2009, (Table, 14). The Federal Russia market was the second client of the Egyptian orange in 2009, where approximately 145,769 tons of around 17.1% of the total Egyptian Orange exports reached the Russian market amounted to approximately $ 85.018 million dollars, i.e. 17.1% of the total orange exports value in 2009. Ukrainian market was the third customer of the Egyptian orange. Such market imported around 80,438 tons, i.e. 9.8% of the total

Egyptian orange exports which valued 9.55 of the total orange exports value in 2009. These last two countries were parts of the ex-Soviet Union, the main agricultural importer of the Egyptian agricultural products till mid of eighties. Therefore, historically, the Eastern Europe consumers prefer the Egyptian orange taste and prefer also its relatively low price. It should be mention that during the Era of Soviet Union, the trade with Egypt was according to the commodity swap, which is an agreement whereby a floating (or market or spot) price based on an underlying commodity is traded for a fixed price over a specified period. A Commodity swap is similar to a Fixed-Floating. The difference is that in an Interest rate swap the floating leg is based on standard Interest rates like LIBOR, etc. but in a commodity swap the floating leg is based on the price of underlying commodity like Oil, Sugar etc. No Commodities are exchanged during the trade. In this swap, the user of a commodity would secure a maximum price and agree to pay a financial institution this fixed price. Then in return, the user would get payments based on the market price for the commodity involved. On the other side, a producer wishes to fix his income and would agree to pay the market price to a financial institution, in return for receiving fixed payments for the commodity.

Among EU countries UK occupied the fourth market that imported Egyptian orange. Its share in total Egyptian orange exports was around 5.7% quantity-wise and the same percent monetary-wise. It was followed by Holland, which imported 5.1% of the Egyptian orange exports. Arabian-Gulf Countries, particularly United Arab Emirates (U.A.E.), and Kuwait, represented together an important customer of the Egyptian orange. The two Arab Gulf countries imported about 8.7% of the Egyptian orange exports in 2009. They have large number of Egyptian labor force. Price difference among markets could reflect, beside quality, the distance and the difference among varieties of orange "Laval" which is by definition cheaper rather than "Valencia" which is always more expensive. Finally such price difference could reflect additional services that should be conducted to make grading, packing and loading for the lots that supposed to be devoted to the European Markets.

The Market Share of Egyptian Orange in Imported Countries

The estimated market share to Egypt within the markets of importing countries (table 15) showed that Egyptian exports of oranges occupied the largest share of Ukraine market, i. e., 44.1%, and captured the second place in terms of market share index of Kuwait market, i. e., 15.42% of its orange market, followed by Russia market where the Egyptian orange occupied 13.96% of Russian orange market.

The Egyptian Orange Price versus the Major Competitors in the World

Table (15) showed that the Egyptian orange export price relative to both Spain and the United States amounted to around 50% in 2007 and 60% of the competitor's price level in 2008 in the world market. In other words, such indicator may refer to the competitiveness of the Egypt's export of oranges. Even though South Africa price is almost less than the Egyptian price, however, it was not added to the comparison here as the Orange export season in South Africa differs from the season of export in Egypt which indicates it is not a competitor of Egyptian oranges.

Domestic Demand for Egyptian orange

Orange is among the major perishable items of the Egyptian food basket. The ANCOV model was applied to estimate not only the impact of income on food commodities consumption, but it was also applied to estimate both the interaction of the income with the demographic region and the independent effect of such region (Rural versus Urban) on the consumption.

The estimation of consumption model required to utilize the cross section data of the household budget survey of Egypt in 2009. Such data allowed regional comparison of each food commodity and estimation of the income-consumption response function. The sample size was around 50,000 households representing all governorates in Egypt, conducted from July 2008 to the end of June 2009 by the Central Agency for Public Mobilization and Statistics (CAPMAS). It should be noted that the survey included data of quantities consumed of major food items and non-food expenditure subgroups for urban and rural households. There are economic and demographic factors covered in the survey. For the purpose of this study, we use the household expenditure data from the income groups for urban and rural households and the per capita income, quantity consumed of each concerned food item and the expenditure associated with such quantity.

The economic concept assumes that that the per capita consumption curve (Equation, 4) supposes not to be linear. In addition, the study concerns the comparison between urban and rural regions. Therefore, the appropriate model that combines both economic concept and easy mathematical derivatives, for the purpose of this study, is the power function or Cobb-Douglas function (Equation, 5).

Estimation of Demand for quality requires estimating the Expenditure- Income response, i.e. the same form of (Equation, 5) except replacing per capita quantity consumed by per capita expenditure in L.E. (Egyptian Pound) as by (Equation 6). Therefore, another function was estimated. The estimated regression coefficients of (Equation5) and (Equation 26) are the income elasticity coefficients of the quantity consumed of commodity i, $\acute{\epsilon}_{cy}$ and expenditure on commodity i $\acute{\epsilon}_{vy}$, respectively. The elasticity of demand for food quality ($\acute{\epsilon}_{qy}$) is the difference between the expenditure elasticity and quantity elasticity coefficients (Equation, 7). It should be mentioned that one Us\$ = 6.02 L.E. (Egyptian pound) in the year 2009, the year of the survey.

Equation 4 $C_{ij} = f(Y_{ij})$

Equation 5 $C_{ij} = B_0 + B_1 Y + \dot{e}_{ij}$

Equation 6 $V_{ij} = B0 + B1Y + \dot{e}ij$

Equation 7 $\acute{\epsilon}vy - \acute{\epsilon}cy = \acute{\epsilon}qy$

Where:

C_{ij} = Annual per capita consumption of commodity i in Region j in Kg.

Y_{ij} = Annual per capita income of commodity i in Region j in (L.E.)

V_{ij} = Annual per capita Expenditure on commodity i in Region j in L.E.

$\dot{e}_{ij}$ = Residual Variable

$\acute{\varepsilon}_{cy}$ Estimated income elasticity of the quantity consumed of food commodity i

$\acute{\varepsilon}_{vy}$ = Estimated income elasticity of expenditure on food commodity i

$\acute{\varepsilon}_{qy}$ = Estimated income elasticity of food quality of commodity i

However, the target model supposed to reflect the regional impact (Urban versus Rural) on food demand. Therefore, an additional model was derived. It included a structural variable (dummy variable) indicating the region. Therefore, if p is the number of quantitative variables, and q the number of factors (the qualitative variables including the interactions between qualitative and quantitative variables), the analysis of covariance model (ANCOVA) is written as shown by:

Equation 8 $Y_i = B_0 + \Sigma B_j X_{ij} + \Sigma B_{k\,(ij)} + \acute{\varepsilon}_i$

Where:

Y_i is the value observed for the dependent variable for observation i,

X_{ij} is the value taken by quantitative variable j for observation i,

k (ij) is the index of the category of factor j for observation I, and

$\acute{\varepsilon}_i$ is the error of the model at observation i

One of the features of ANCOVA is to enable interactions between quantitative variables and factors to be taken into account. The main application is to test if the level of a factor (a qualitative variable) has an influence on the coefficient (often called slope in this context) of a quantitative variable. Comparison tests are used to test if the slopes corresponding to the various levels of a factor differ significantly or not. A model with one quantitative variable and a factor with the interaction between both of them are illustrated as (Equation 9)

Equation 9 $Y_i = B_0 + B_i X_{i1} + \Sigma B_{k\,(i1)1} + B_{k\,(i1)2}\,X_{i1} + \acute{\varepsilon}_i$

The comparison of the parameters was made by using (ANCOV) to test if the factor has an effect on the slope. If not, then the impact of the qualitative (dummy variable)'s effect on the intercept is tested. Only, the final applicable model considered is that with all parameters are significant

The estimated food consumption function for fresh Orange have shown insignificant interaction effect of income with the demographic region, i.e. the local community has not direct effect on income allocation among concerned food commodities, i.e. difference in annual per capita consumption due to variation in annual per capita income was, entirely, independent from the local community, (Table, 16).

However, there was an independent significant effect of the demographic region on the per capita consumption of the orange consumption, if we accepted significance at less than 6%. The rural region showed less consumption than urban (the effect was negative in rural region), i.e. it decreased the intercept of the consumption function. The estimated per capita consumption of

orange in rural region was less than the corresponding level in urban by 0.157 kg per year, regardless the income level, (Table 17). Reasons behind that are socio-economic. First, the rural household earns almost two-thirds of urban annual per capita income, (Table, 18). Secondly, the rural households prefer to have tea after meals, rather than to have fruits, either because a glass of tea costs less or because it is an inherited habit. Such result reflects not only the less quantity per capita consumption in rural region as shown in (Table 13) but also shows that the consumer price in rural market is less than its price level in urban market.

Such lower price of oranges in rural market could be a resultant of less purchasing power in rural than urban, as (Table 18) showed. This factor decreased the demand in rural in comparison to urban leading to less market price in rural than urban. Another reason might be considered, that the marketing of perishable food commodities in rural market such as oranges does not require much marketing costs because these commodities are usually sold in rural markets without grading, modern packing, processing and/or retailing services

The same effect of rural region was recognized from the estimated response function of the expenditure on fresh orange fruits. It implied that the rural individuals spend less than the urban individuals on the same quantity of fresh orange.

Estimation of the demand elasticity coefficients for quality of the perishable food commodities were derived, using (Equation 6) and were presented in (Table 17). In general such derived elasticity coefficients was very low, i. e. 0.09. The orange is the common fruit by Egyptian taste. Therefore, its income elasticity for quantitative demand is relatively low while its demand for quality is very low. As in Egypt the income level of the majority is between medium to low level, the consumers prefer to get the largest quantity they can according to their purchase power rather than to go for quality. Thereof, only little proportion of households prefer to purchase orange according to quality and then higher price.

Obstacles Facing Exports of Egyptian Orange

The study abstracted the following obstacles from a panel discussion conducted with a group of the stakeholders working in the Egyptian orange value chain. They were reached via a neighbor of the author who trusted him then was able to convince them to meet the author for such discussion, in spite of the existing unstable socio-political situation in Egypt along the last few months [7]

1 The inaccurate estimation of the orange area and yield, thereof, it is not easy to determine the available supply for exports, which through shadows on the future export plans.

2 The orange farmers, particularly the small holdings, lack of appropriate experience to produce fruits that match with the world market specifications and frequently they have late ripening season of orange which let them losing the available exporting period.

3. Only, few grading and packing stations who have satisfactory experience to prepare the orange parcels for export specifications, which raise the probability of risk due to loss or infection that appear at importing ports.

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[7] The author has reached such views from a panel meeting survey with 15 stakeholders of Egyptian orange value chain, 5 farmers, 3 Exporters, 5 wholesalers and two enterprisers of warehouses

4. The market lacks of enough skilled labor for picking and packing of orange fruits and some dealers are looking for saving costs at the expenses of using appropriate transportation means.

5. The specialized cooperatives are reluctant in providing the services the have committed to do at their establishment. For example the quota of fertilizers at subsidized prices (at least one-third lessthan the market price) that supposed to be provided per Feddan of orange trees (4200m$^{2)}$ per year are 650 kg Ammonium Nitrates , (33.5% nitrogen) and 450Kg Urea (46.5% Nitrogen), condition that the farm has a registered holding in the cooperative records. However, such services does not provided regularly.

6. The unstable schedule of shipping the exportable lots causes delay in reaching the client markets on the proper dates desired by the consumers and/or the dates that had agreed upon before.

7. The storage capacity of the warehouses are not enough and some have not been modernized to match with the required specifications.

8. Some Amateurs enter, occasionally, the orange exportation n market. Therefore, they look for a quick high profit, under the role once and for ever. Therefore, the violate the trade principals, as to raise the price after contracting or they adjust the dates of delivery or to violate the pacifications or recall for delaying the implementation date of some contracted quantities because of the shortage in the available domestic supply. Some do not give much attention to reply properly the communications with the clients

9. The approximate rates of losses in the domestic supply are relatively high: 9% due to mechanical injuries, 17% during handling, transportation and packing; in addition to a proportion due to infection with some insects

10. The export market suffer from the bureaucracy and numerous corporations concerning with exports and the role of the trade attaché's offices associated with the Egyptian Embassies is not visual and very limited.

11. In recent years the domestic consumer's price of orange increased rapidly which has been attractive to deliver most of the production to the local markets, as the demand pulls the price up from one year to another

12. The individual parcels are usually small which raises the costs of shipping per ton per unit of time, associated with the lack of finance for such trading operations by the local banks. In addition the existing insurance system is not lacking of covering the actual risk which raises the costs of exported orange

Recommendations Cited by Stakeholders

1. To adopt an effective programs for education, training and transmission an up to date market information system
2. To develop the financing system towards speedy system with less bureaucracy
3. To establish a vertical integration system among the value chain stages from the producers to the wholesalers, exporters and domestic market retailers

4. To activate the foreign trade attaches' offices associated with the Egyptian embassies to implement parallel two programs a promotion one for Egyptian orange and a another one for accurate up to date market information system

5. To modern9ize the existing technologies of transportation grading, packing and storage of fruits in Egypt, including oranges.

6. The Egyptian government has to renegotiate the trade agreements with EU towards giving some real privileges for Egyptian orange exports in terms of quotas of the quantities and the allowed period to deliver the Egyptian orange to the European market

7. If the government cannot reach acceptable terms of trade with Eu, the best second alternative is to work on expansion the Egyptian market share the other Arab countries and Russian market as classical clients. The current political-economic atmosphere seems suitable for much success in this concern

8. If Using drip irrigation system is generalized on all fruit trees fields in Egypt such rate of water consumption of oranges will be shrinkage to almost 60% of its current rate,

9. Valencia orange is derived from a Spanish variety of late maturity in Valencia Region. Its fruit is medium ranges between medium to large size. It is very juicy and few seeds per fruit (1-5). The crust is of medium thickness. It has the ability of storage till the end of July without affecting the trees crop in the successive year. The Egyptian crop of this variety has high competitiveness in American and European markets; even in Spain where it has been was established. This because the climatic conditions in these countries, particularly humidity and temperature work together on breaking down the color dyes which give the orange its lovely orange color that results in re-greening phenomenon, i.e. returning back to green chlorophyll A and B. Therefore, some Spanish companies recolor the fruits with orange color, which is against the European desire and decrease the demand for such home produced Valencia orange. There is a fear feeling is generated among the western consumers from such artificial color used for getting orange color fruits. In contradictory, the Egyptian Valencia summer orange is of natural color. Thereof, feature is that the Egyptian Valencia acquires the yellowish color naturally before picking up from the trees, while other competitors have to spray their orange crop by a stream of a certain chemical to make it yellowish. The European customers prefer the naturally yellowish orange rather than the treated one, even though the material used is not harmful to health. However, such feature of the Egyptian orange requires promotion policy, which is beyond the capability of the exporters. It needs a support from the trade attaches at the Egyptian embassies, particularly in the countries where the Egyptian orange has a sound market share. Those attaches should also follow the market to see if the super markets and green grocers identify the Egyptian orange or they just use a loose title "Middle East orange" which implies something different to the European consumers.
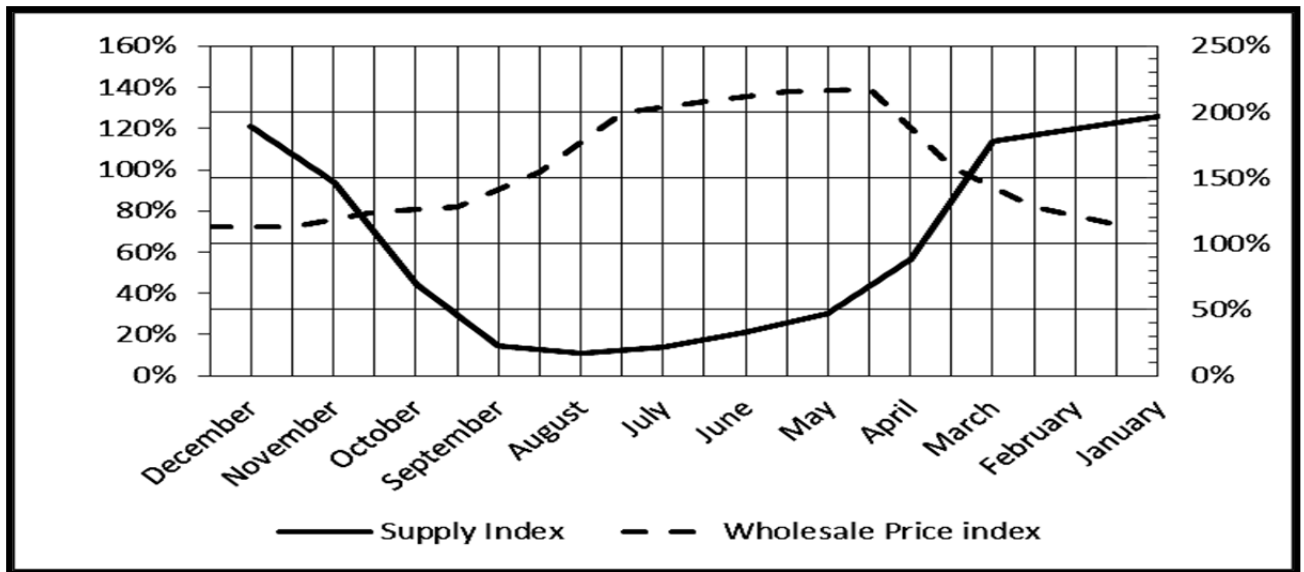
Source: Calculated and drawn from (Table 6)

Figure2 Oranges Area (000) ha (2081-2010)
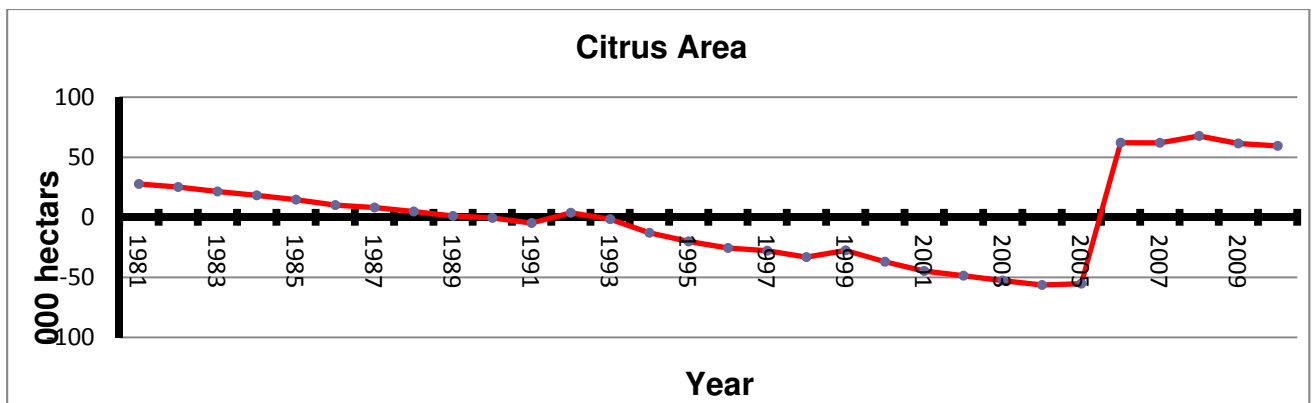
Source: Compiled and Drawn from: (1) Ministry of Agriculture and Land Reclamation (2010) "Agricultural Statistics Bulletin", Issued annually by The Economic Affairs Sector, Cairo, Egypt, and (2) http://faostat.fao.org/site/570/default.aspx#ancor

Source: Compiled and Drawn from: (1) Ministry of Agriculture and Land Reclamation (2010) "Agricultural Statistics Bulletin", Issued annually by The Economic Affairs Sector, Cairo, Egypt, and (2) http://faostat.fao.org/site/570/default.aspx#
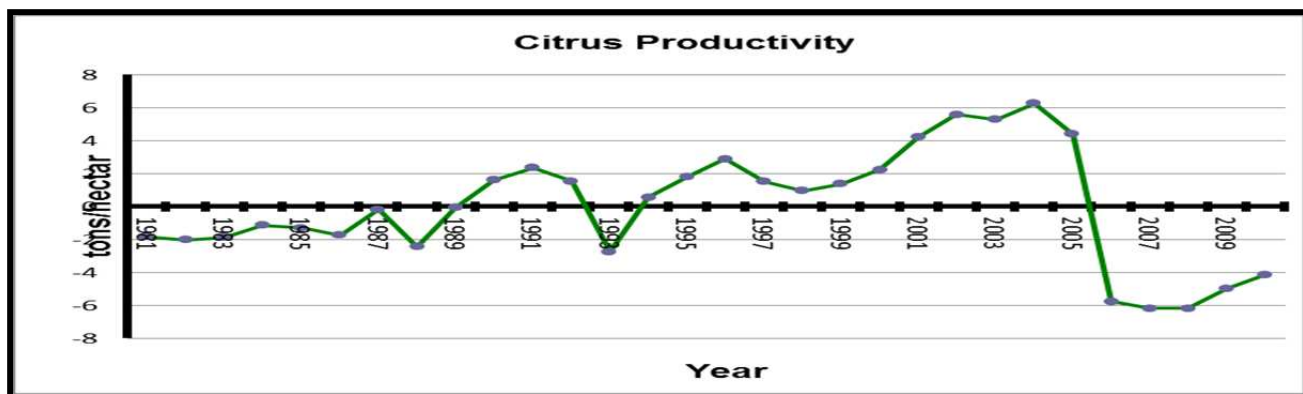
Figure 4 Average Local and World Price of Citrus US$/Ton (1991-2009)
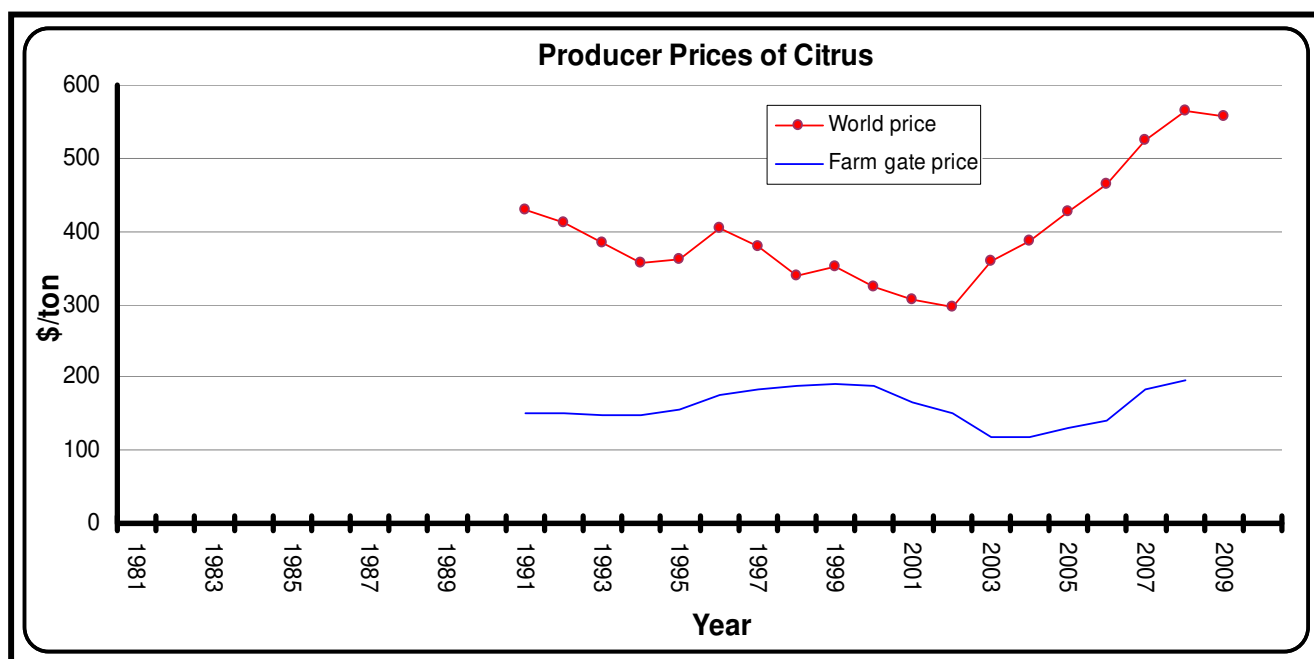
Source: Compiled and Drawn from: (1) Ministry of Agriculture and Land Reclamation (2010) "Agricultural Statistics Bulletin", Issued annually by The Economic Affairs Sector, Cairo, Egypt, and (2) http://faostat.fao.org/site/570/default.aspx#ancor

Table 1 Share of Oranges in Agricultural Land Use in Egypt

Land Use Pattern	New Land		Old Land		Total	
	(000) ha	%	(000) ha	%	(000) ha	%
Total Area	1,104	100%	2,585	100%	3,689	100%
Oranges	143	13%	73	3%	216	6%
Other Fruit Trees	227	21%	148	6%	375	10%
Total Fruit Trees	370	34%	221	9%	591	16%

Source: Compiled and calculated from: Ministry of Agricultural and Land reclamation, (2010) Sector of Economic Affairs, Agriculture Directorates of Governorates, Dokki, Cairo, Egypt

Table 2 Share of Concerned Crops in Total Agricultural Exports of Egypt in 2010

Commodity	(000)$	%
Oranges	402502	16.40
Dry Onions	170396	7.00
Cotton	140123	5.70
Potatoes	129562	5.30
Rice – total (Rice milled equivalent)	120932	4.90
Total Tomatoes	6740	0.30
Other Commodities	1481331	60.40
Total Agricultural Exports	2451586	100

Source: Compiled and Calculated from:

FAOSTAT: FAO Statistics Division 03 January 2013, http://faostat.fao.org/site/535/DesktopDefault.aspx?PageID=535#ancor

Table 3 the Share of Orange in Total Fruits Production in Egypt in 2009

| item	Production		Import		Export		Processing		Food		Per Capita (kg/yr.)		Self Sufficiency Ratio (%)
	(0000 Tons	%	(0000 Tons	%	(0000 Tons	%	(0000 Tons	%	(0000 Tons	%	(0000 Tons	%	
Oranges	2803	30	3	2	279	48	280	30	2247	28	28.1	28	111
Lemons	325	3	0	0	10	2	32	3	282	4	3.5	4	103
Bananas	945	10	5	4	9	2	95	10	846	11	10.6	11	100
Apples	558	6	53	40	0	0	61	7	550	7	6.9	7	91
Dates	1314	14	1	1	5	1	131	14	1178	15	14.7	15	100
Grapes	1485	16	9	7	55	10	156	17	1285	1	16.1	16	103

										6			
Other Fruits	1921	21	60	46	218	38	174	19	1602	20	20	20	109
Total Fruits	9351	100	131	100	576	100	929	100	7990	100	99.9	100	105

Source: Compiled and Calculated from: FAOSTAT | © FAO Statistics Division 2011 | 04 January 2011, http://faostat.fao.org/site/368/DesktopDefault.aspx?PageID=368#ancor

Table 4 Ranking of orange according to water use Density Among Major Crops in Egypt

Crops	(000) Hectare	% of total Cropped area	Water Use/ha (M^3)
Sugar cane	141	3%	18,585
Rice	703	14%	12,350
Mango	77	2%	12,250
Alfalfa	16	0.3%	11,900
Groundnut	65	1%	8,182
Citrus	166	3%	7,461
Grapes	71	1%	7,461
Cotton	242	5%	6,716
Tomatoes	226	5%	6,664
Potatoes	108	2%	6,378
Perennial clover	766	16%	5,995
Maize	774	16%	5,553
Sugar beet	104	2%	4,422
Wheat	1,141	23%	3,713
Faba beans	89	2%	2,849
Green beans	31	1%	2,618
One-cut clover	203	4%	2,242
Total	4,923	100%	6,690

Source; Compiled and Calculated from:

Egyptian Ministry of Agricultural and Land reclamation, (2009) "Sustainable Agricultural Development Strategy Towards 2030

Table 5 Egyptian Orange Area, Yield and Production by Season and Region in 2010

Production Indicator	Region	Summer Season	Winter Season		Total
		Valencia Variety	Naval Variety	Common Local Variety	
Area (feddan)	Old Land	29779	126000	31727	187506
	New Land	70238	32715	5914	108867
	Total	100017	158715	37641	296373
	%	**33.7%**	**53.6%**	**12.7%**	**100%**
Fruitful Area (Feddan)	Old Land	25328	110749	29140	165217
	New Land	42820	21752	4781	69353
	Total	68148	132501	33921	234570
	%	**29.1%**	**56.5%**	**14.5%**	**100.0%**
Yield/Feddan (Ton)	Old Land	9.83	10.14	8.90	9.87
	New Land	10.58	11.39	8.39	10.68
	Total	10.30	10.35	8.83	10.11
	%	**101.8%**	**102.3%**	**87.3%**	**100.0%**
Production (Ton)	Old Land	248984	1123089	259303	1631376
	New Land	452956	247791	40134	740881
	Total	701940	1370880	299437	2372257
	%	**29.6%**	**57.8%**	**12.6%**	**100.0%**

Source: Compiled and calculated from: Ministry of agriculture and land reclamation, Egypt, "Agricultural Statistics Bulletin Volume 2, July, 2011

Table 6 Estimated Internal Rate of return by farm size

Farm Size	A mix of Valencia orange, mandarin and Local Variety	Specialized in Valencia Variety
Less than 3 Feddan	40%	18%
3 Feddan +	548%	22%
Average	44.5%	23%

Source: Estimated from records of 12 farms in Qaluobia Governorate (3 per each stratum), in 2012

Table 7 Estimated Losses Proportion along the Egyptian orange value chain in 2013

Value Chain	Operation	Summer Season
Producer	During collection	1.20%
	During Grading	0.60%
	During Packing	0.45%
Wholesale trade	Purchase from Local Trader	0.9%
	Purchase From a Farmer at the wholesale market	0.75%
	Purchase at the farm gate	1.40%
	Purchase the garden with green fruits (Before Collection)	2%
	Purchase from Grading Station	0.5%
Retailer	Purchase from the wholesaler	4.6%
	Purchase at the farm gate	4.8%
	Purchase from the Farmer at his Green Grocer Gate	4.2%
	Purchase from the Garden Trader	4.5%
	Purchase from a grading Station	0.3%

Source; calculated from the two purposive surveys conducted with farmers and Obour wholesal Market and the panel survey conducted with some stakeholders in Jan. _Feb, 2013

Table 8 Seasonal Index of Both Supply and Wholesale Price of Egyptian Orange in 2012

Month	Supply Index	Wholesale Price index
January	197%	73%
February	188%	73%
March	178%	80%
April	89%	82%
May	48%	99%
June	33%	128%
July	22%	133%
August	17%	138%
September	23%	139%
October	70%	101%
November	147%	82%
December	189%	74%

Source: A purposive survey at the Main wholesale Market in Egypt "Obour Market, 15Km from Cairo, Feb., 2013

Table 9 Agricultural Trade Flow by Region

Region	Exports		Imports		% (Export/Import)
	(000)US$	%	(000)US$	%	
EU	343,826	28.62%	579,538	11%	59%
Other Europe	90,961	8%	946,140	17%	10%
Arab States	525,445	44%	234,028	4%	225%
Africa	79,754	7%	71,626	1%	111%
Asia	143,427	12%	595,574	11%	24%
Latin America	11,055	1%	1,122,918	21%	1%
North America	5,694	0%	1,627,296	30%	0.3%
Others	5,361	0%	243,107	4%	2%
Total Exports	1,201,312	100%	5,420,227	100%	22%

Source: Compiled and Calculated from: (1) FAOSTAT: Trade Matrix, (2) Central Agency for public Mobilization and Statistic, (3) Ministry of Economic Development (2009), Cairo, Egypt

Table10 Time Trend of Area and Yield and Farm Price of Citrus in Egypt

Item	Estimated Constant	Estimated Annual Change	Annual Average	Annual growth Rate (%)	R^2 %	F	Significance of Annual Trend	Average annual Growth Rate (%)
Area (000)ha	50.18	3.724	107.90	3.5	43.3	21.35	Significant at ≤ 5%	3.5
Yield (tons/ha)	16.88	-0.04	16.29	-0.23	0. 93	0.265	n. s.	0
Local Farm Price ($)	50.19	3.72	174.46	2.13	0.433	21.35.	Significant at ≤ 5%	2..
World Farm Price ($)	329.32	7.174	401.56	1.8	26.4	6.11	Significant at ≤ 5%	1.8

Source: Estimated from: (1) Ministry of Agriculture and Land Reclamation (2009) "Agricultural Statistics Bulletin", Issued annually by The Economic Affairs Sector, Cairo, Egypt. (2) http://faostat.fao.org/site/570/default.aspx#ancor

Table 11 Estimated Instability Coefficient of Citrus Performance in Egypt

Area (%)	Yield (%)	Local Price (%)	World Price (%)
27.7	17.4	13.2	13.5

Source: Estimated from: Time Trend Equations in (Table 5).and (Table 6) and Using
All variable trends for the period (1981-2010), But the world Prices for the period (1991-2010)

Table 12 World Price Effect on domestic Farm Price of Major Crops in Egypt

Estimated Parameter	Estimate	S.E.	t Stat	P-value	Lower 95%	Upper 95%	Adjusted R² (%)	F_{cal}
Intercept (b_0)	139.32	34.48	4.04	0.00	66.22	212.41	-3.8	-0.04
World Farm Price (P_t)	0.05	0.09	0.61	0.55	-0.13	0.24		

Source: Estimated from: (1) Ministry of Agriculture and Land Reclamation (2009) "Agricultural Statistics Bulletin", Issued annually by The Economic Affairs Sector, Cairo, Egypt. (2) http://faostat.fao.org/site/570/default.aspx#ancor

Table 13 Time trend of production, consumption and prices of Egyptian Orange exports

Period	Statement	Unit	Estimated time trend model	R^2	F_{cal}	Self-sufficiency	Annual average	Annual rate of change
1980-1987	production	Thousand tons	Yi = + 57.09 954.12 Ti	0.71	14.63 **	109%	1153.95	4.95%
	consumption	Thousand tons	Yi= 90.7 + 44 Ti	0.45	4.97[g m]		1061.00	
	The amount of export	Thousand tons	Yi= 91.67-0.12 Ti	.	.		220.88	
	Export value	Million dollars	Yi= + 36.66 48.19 Ti	0.27	2.16[g m]		61.021	
	Export price	$	Yi= + 33.62 382.58 Ti	0.86	35. **		501.25	6.71%
1987-1995	production	Thousand tons	Yi= 1372 + 27.73 Ti	0.19	1.67[g m]	103%	1482.91	.
	consumption	Thousand tons	Yi= 1327.04 + 27.52 Ti	0.16	1.29 [g m]		1437.11	..
	The amount of export	Thousand tons	Yi= x-12 e 141.99 Ti	0.66	9.11 *		121.3	-12.76%
	Export value	Million dollars	Yi= q e 133.39-71.18 Ti	0.84	42.96 **		With 39.38	-201.85%
	Export price	$	Yi= 548 + 38.17 e	0.80	27.27 **		395.33	-9.66%
1995-2008	production	Thousand tons	Yi= 1444.51 + 48.14 Ti	0.83	59.22 **	107%	1757.42	2.74%
	Consumption	Thousand tons	Yi= 1381.51 + 39.6 Ti	0.80	58.26 *		1639.11	2.42%
	The amount of export	Thousand tons	Yi= + 24.21 e 23.331 Ti	0.70	28.12 **		180.70	13.4%
	Export value	Million dollars	Yi=-9 987 + 10 423 Ti	0.54	14.22 **		57.83	18.02%
	Export price	$	Yi= + 6.8 251.37 Ti	0.11	1.43[g m]		295.57	.
1980-2008	production	Thousand tons	Yi= 1037.73 + 34.84 Ti	0.84	108.7 **	106%	1525.50	2.28%
	consumption	Thousand tons	Yi= 1092.72 + 31.04 Ti	0.78	74.05 **		1441.95	2.15%
	The amount of export	Thousand tons	Yi= 64.51 + 5.75 Ti	0.27	10.13 **		151.35	3.97%
	Export value	Million dollars	Yi= 37.50 + 1.19 Ti	0.05	1.55[g m]		54.11	.
	Export price	$	Yi= e DS 8.36 488.26 Ti	0.34	14.11 *		371.54	-2.25%

Source: Metwaly, Siham (2011) "An Economic study for The Situation of Production and export of Egyptian Potatoes and Oranges", Egyptian Journal of agricultural economics, vol. 21, issue 1 March 2011

Table 14 the Geographical Distribution Of The Egyptian Orange Crop Exports To Major World Markets

countries	Orange juice, single strength			Orange fruits			Aggregate orange products				
	Quantity (Tons)	Value ($000)	Price/ton ($)	Quantity (Tons)	Value ($000)	Price/ton ($)	Quantity (Tons)	%	Value ($000)	%	Price/ton ($)
Saudi Arabia	31	44	1419	188909	115173	610	188940	23.0%	115217	23.2%	610
Russian Federation				145769	85018	583	145769	17.7%	85018	17.1%	583
Ukraine				80438	47222	587	80438	9.8%	47222	9.5%	587
Iran (Islamic Republic of)				76126	46861	616	76126	9.3%	46861	9.4%	616
United Kingdom				47163	28267	599	47163	5.7%	28267	5.7%	599
United Arab Emirates				45905	26264	572	45905	5.6%	26264	5.3%	572
Netherlands				42105	25687	610	42105	5.1%	25687	5.2%	610
Kuwait				25879	17009	657	25879	3.1%	17009	3.4%	657
Sudan (former)	117	275	2350	24022	13155	548	24139	2.9%	13430	2.7%	556
Oman				20307	12373	609	20307	2.5%	12373	2.5%	609
Lithuania				13264	8501	641	13264	1.6%	8501	1.7%	641
Syrian Arab Republic				9616	6203	645	9616	1.2%	6203	1.3%	645
Malaysia				8424	4658	553	8424	1.0%	4658	0.9%	553
Finland				7100	4676	659	7100	0.9%	4676	0.9%	659
Jordan	83	149	1795	6452	3945	611	6535	0.8%	4094	0.8%	626
Bangladesh				5996	3605	601	5996	0.7%	3605	0.7%	601
Latvia				5944	3704	623	5944	0.7%	3704	0.7%	623
Bahrain				5610	3399	606	5610	0.7%	3399	0.7%	606
Qatar				5359	3072	573	5359	0.7%	3072	0.6%	573
Croatia				4951	2944	595	4951	0.6%	2944	0.6%	595
Unspecified				4447	2653	597	4447	0.5%	2653	0.5%	597
Italy	52	74	1423	4355	2715	623	4407	0.5%	2789	0.6%	633
Belgium				3817	2821	739	3817	0.5%	2821	0.6%	739
Denmark				3526	2184	619	3526	0.4%	2184	0.4%	619
Sweden				3117	2103	675	3117	0.4%	2103	0.4%	675
Sub Total	283	542	6988.04	788601	474212	15351.5	788884	95.9%	474754	95.7%	602
Other Countries	502	751	-5,341	33,216	20,533	-14,749	33,718	4.1%	21284	4.3%	631
Total	785	1,293	1,647	821,817	494,745	602	822,602	100%	496,038	100%	603

Source: Collected and calculated from FAO data. FAOSTAT, Database Results, Web site: http: //WWW.FAO.org.

Table 15 Market share of Egyptian Orange in the World Market and the Price competitiveness

Year	Items	Spain	South Africa	United States	Egypt	The rest of the world	World Total
2007	Quantity (000) tons	1414.2	1001.	341.9	271.	2245.4	5275.7
	%	26.8%	19%	6.48%	5.15%	42.6%	100%
	Price in USD	793	389	793	365	578.5	603.02
2008	Quantity (000) tons	1298.2	965.0	585.8	454.4	2337.9	5647.1
	%	22.98%	17.2%	10.37%	8.02%	41.4%	100%
	Price in USD	953	448	747	526	625.8	674.9

Source: Metwaly, Siham (2011) "An Economic study for The Situation of Production and export of Egyptian Potatoes and Oranges", Egyptian Journal of agricultural economics, vol. 21, issue 1 March 2011

Table 16 QUANTITY/INCOME RESPONSE: ORANGE

Source	Value	Standard error	t	Prop > |t|	Lower bound (95%)	Upper bound (95%)
Intercept	-0.232	0.490	-0.475	0.638	-1.225	0.760
LN(Per Capita Income)	0.245	0.059	4.175	0.000	0.126	0.363
RURAL	-0.157	0.081	-1.942	0.060	-0.321	0.007

F = 12.689, Adjusted R^2 =0.375

Source Estimated from Household Budget Survey of Egypt in 2009, Conducted by (CAPMAS), Central Agency for Public Mobilization and Statistics, Nasr City, Cairo, Egypt, by applying (Equation 5Equation)

Table 17 Average Per Capita Consumption and Consumer Price of Orange in 2009

RURAL	Weighted Average Kg/Capita Per Year	4.59
	Price/Kg (L.E.)	2.14
Urban	Weighted Average Kg/Capita Per Year	6.47
	Price/Kg (L.E.)	2.22
Per Capita Food-Income Elasticity of:	Demand for Quantity (1)	0.245
	Demand for Expenditure (2)	0.334
	Derived Elasticity of Demand for food quality = [(2) − (1)]	0.09
Annual Per Capita Expenditure (L. E.)	Rural	2924
	Urban	4843

Source Estimated from Household Budget Survey of Egypt in 2009, Conducted by (CAPMAS), Central Agency for Public Mobilization and Statistics, Nasr City, Cairo, Egypt

Table 18 EXPENDITURE/INCOME RESPONSE: ORANGE

Source	Value	Standard error	t	Prop > |t|	Lower bound (95%)	Upper bound (95%)
Intercept	-0.141	0.522	-0.271	0.788	-1.198	0.916
LN(Per Capita Income)	0.334	0.062	5.359	< 0.0001	0.208	0.461
RURAL	-0.120	0.086	-1.396	0.171	-0.295	0.054

F = 17.486, Adjusted R² = 0.458

Source Estimated from Household Budget Survey of Egypt in 2009, Conducted by (CAPMAS), Central Agency for Public Mobilization and Statistics, Nasr City, Cairo, Egypt, by applying (Equation 6)

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