

Agricultural Situation Report of Cyprus and the Market and Trade Policies for Fruit/Vegetable and Olive Oil¹

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**Paper prepared for presentation at the 98th EAAE Seminar ‘Marketing
Dynamics within the Global Trading System: New Perspectives’, Chania,
Crete, Greece as in: 29 June – 2 July, 2006**

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¹ The present paper is part of the work conducted in the frame of the MEDFROL project (Market and Trade Policies for Mediterranean Agriculture: The case of fruit/vegetable and olive oil), funded by the SIXTH FRAMEWORK PROGRAMME. PRIORITY 8.1 “Policy-oriented research - Integrating and Strengthening the European Research Area”. Proposal/Contract no.: 502459.

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Agricultural Situation Report of Cyprus and the Market and Trade Policies for Fruit/Vegetable and Olive Oil²

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***Abstract.** During the last decade the Cypriot agricultural sector has been declining in terms of most indices in the economy, mainly due to the spiraling growth of tourism, as crucial investment outlays were diverted from agriculture to tourism; the most important factors of production being land and labor due to substantially higher yields accruing to both. The Domestic Resource Cost (DRC) revealed that the three products studied for the period 1997 to 2000, i.e. tomatoes, oranges and olive oil had a comparative advantage. However, the opening of the European market with EU accession led to the substantive undermining of competitiveness of agricultural products and to the reduction of the value of exports. It is believed that DRC ratios would be higher today than the ones reported, due to unchanged/decreased border prices and increased costs of tradable inputs. It is suggested that the tomato, orange and olive oil sectors will become more competitive in the European market if factors that are affecting their marketing, like differentiation of production and quality, are improved. New concepts like organic farming and products of origin are very important and may provide profitable outlets in the new globalized economy. Additionally, favorable climatic conditions are vastly for and conducive to the production of early season Mediterranean products with obvious premium attached in the market place.*

Keywords: Domestic Resource Cost, Competitiveness, Tomatoes, Oranges, Olive Oil

1. Introduction

During the last decade the agricultural sector in Cyprus has been declining in terms of most indices in the Cypriot economy. The most important reason for the accelerated decline is the spiraling growth of tourism in Cyprus since crucial investment outlays were diverted from agriculture to tourism; the most important factors of production being land and labor due to substantially higher yields accruing to both. Nevertheless, Cypriot agriculture retains its importance in the overall economy as it provides employment to a relatively large percentage of people in rural areas; it is a strategic supplier of food, provides raw materials for manufacturing and helps maintain the rural environment.

The broad agricultural sector is dominated by crop production, about 60% of value added, followed by livestock, about 30% of value added. Crop production can be separated into two main features. These are irrigated

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agriculture that includes mainly citrus, potatoes, vegetables, melons, deciduous fruit, table grapes and bananas, and rain fed or dry land agriculture that includes mainly cereals, fodders, olives, carobs, almonds and wine grapes.

Some of the problems that Cypriot farmers have to face are shortage of water, excessive land fragmentation, prevalence of smallholdings and competition from other sectors of the economy for land and labor. Before Cyprus' EU accession, the Government has been supporting the fruit, vegetable and olive oil sectors by providing input and loan subsidies, grants, marketing assistance and fixed prices on certain items. However, after EU accession all of the above measures virtually disappeared, but various support schemes administered by the Cyprus Agricultural Payments Organization (CAPO) have been implemented.

2. Natural conditions and land use

Cyprus is a small country with 9,251 km² (3,572 miles²) total area and a coastline of 648 km. The island has been divided since the 1974 Turkish invasion between the internationally recognized Cyprus Government that controls the southern part and the illegal Turkish- controlled northern part on a 1,5:1 proportion. From a total area of 925,100 ha the Utilized Agricultural Area (UAA) in the areas under the Cyprus government control represent 134,000 ha or 14.5% of the total area. The Cypriot climate is noticed for its temperate, Mediterranean attributes with hot, dry summers and cool winters. In terms of natural hazards, the area has a moderate earthquake activity. Although Cyprus is a fully developed economy with approximately US\$ 20,000 GNP per capita, it has severe water resource problems, water pollution from sewage and industrial wastes and coastal degradation and loss of wildlife habitats from urbanization. However, the advancement of technology has shifted attention to alternative ways of dealing with its adverse climatic conditions (i.e. Southern Conveyor Project and desalination plants along the coastal areas). These projects resulted in an increased water supply for agriculture.

2.1. Land resource potential and constraints

Land resource constraints usually do not allow the growth and expansion of the agricultural sector. Its relatively small size and its specific configuration do not allow any aspiration for economies of scale. Land fragmentation of agricultural land is a problem in Cyprus even though a continuous and well carried out program of land reform and reclamation pursued in the country has managed to improve this. The age-old tradition of passing on farm land from parents to children has, inevitably, led to severe fragmentation of land ownership thus forcing farmers to small-scale farming. Thus, such a major structural weakness is a permanent bottleneck for any plans for economies of scale in production. In turn these economies are badly needed for the maintenance of any notion of competitive advantage but land fragmentation is simply foiling this.

In Cyprus, 47% of the appropriate land area is in arable production and 25% is forests. The soils are of the Mediterranean type with high pH values, high CaCO₃ contents and low organic matter contents. The predominant soil types are calcareous lithosols and xerosols. Zinc deficiency

is the most prevalent micro nutrition disorder, especially in tree crops but iron and manganese deficiencies also appear (Papadopoulos and Stylianou, 1988). About 3% of the area has a sodicity problem (FAO, Terrastat). Soil and rock formations have given rise to another problem identified as shallowness of the soil. These kinds of soils, i.e. brown and red silty soils, have medium to low productivity. Furthermore, the shallowness of the soil has led to land degradation mainly due to soil erosion. Shallowness is a major limiting factor to the productive sustainability of the available agricultural land (Centre international de Hautes Etudes Agronomiques Méditerranéennes, CIHEAM).

2.2. Water resource constraints

Cyprus is a country with virtually no bodies of natural running water of any magnitude, (i.e. rivers and streams) or any large bodies of still water (i.e. lakes). A serious water resource constraint has been the fact that the more water rich northern part of the island has been under Turkish control since 1974. Therefore, its terrain and subterranean water resources have been deprived of the local agricultural economy. However, Cyprus has a reasonably developed network of artificial dams (about 50). The single and biggest project in agriculture irrigation has been the creation of the Southern Conveyor Project whose main aim is to use water from the dams network for agriculture predominantly in the water poor southern areas of the island. Furthermore, during the last decade, the Government has developed water desalination plants and allowed local private businesses to operate them with agreement to buy water at pre agreed prices. Despite the significant variations in land and water configuration of each region there is a disparity on both accounts. Table 1 (appendix) shows that an average of 79% of agricultural and irrigable holdings/farms are actually irrigated.

2.3. Land and water use

Reference to the use of land and water includes the actual use of agricultural land, crops planted, quantities produced, utilized areas and share of the population fully employed in the sector. In certain areas of the island due to the climatic conditions and combination with terrain morphology, rainfall is more regular with obvious effects on the kind and amount of agricultural products grown. The wettest district is more prone to develop temporary and permanent crops on a regular basis than the other rain poorer districts.

Data of 1999 show that forest areas in Cyprus cover 391,400 acres or 42.3% of its total area. This is broken into two main categories; forests and forested areas. The overall proportion of forested areas (42.3%) is near the EU average of 44%. However, the proportion of actual forests (18.6%) is about half of that of the EU (36.4%).

Recently, the Utilized Agricultural Area (UAA) was reduced. This decline is mainly due to the reduction of about 25% of the acreage devoted to vineyards. The reduction is due to the Uprooting Scheme that was implemented to deal with production surpluses and with the abandonment of grape growing. The total size of citrus cultivation and fruit production is also declining. During the past twenty years, the area devoted to permanent

crops was reduced by about 20%. As a result of the above reductions the amount of fallow land has increased.

The management of water resources in Cyprus has always been problematic due to the deficiencies present in the relevant laws, the fractured nature of jurisdictions and the total lack of a unified body of water management in the country. Recently, a political decision has been launched to create a unified water body. Following EU accession and in the frame of the Water Directive 2000/60/EC, efforts to introduce a common invoicing policy are well advanced (Georgiou and Skordis, 2004).

3. Performance of the Agricultural Sector

In 1990- 2001, the value of exports declined in nominal prices by 32.7% in citrus, 39.6% in potatoes, 71.5% in table grapes and 31.9% in wine products. With dairy products on the contrary, there was a stellar increase of 250% and in meat-based products of 290%. It should also be noted that during the last decade, the sector of animal production increased by 67.7% in gross value terms and by 59.8% in value added terms. Quite the opposite happened with vegetable production where increases were restricted to 14.2% and 20.8% grouping (Import- Export Statistics, 1990- 2001). The faster growth of the animal sector was due to the much higher tariff protection and the particularly generous subsidies. On the contrary, the agricultural sector could not deal with the same competitive pressures that faced in international markets, and after the partial liberalization of imports in 1995 as a result of the GATT agreement for agriculture, it started to recede in the local market as well. Furthermore, other large scale cultivation products (i.e. grapes, grains, olives) were facing structural and other problems and were totally dependent on subsidies.

3.1. Products

Cyprus produces a variety of agricultural products in sufficient quantities to satisfy its own needs and also export on a regular basis, mainly, to the EU. This of course does not hold universally as products of massive consumption like grains can never realistically be produced on the needed scale. Beyond that, there is also a line of products of increased importance to the overall economy due to the fact that they are produced in large quantities and are exportable to the EU. In terms of value, potatoes come first in the rankings with a median turnover of 26 million Cyprus Pounds (1 CYP= 1.72 Euro) and tomatoes, cucumbers and all types of melons are in second place at 23 million CYP. In third place we find grains with citrus in fourth, all in terms of production value in nominal prices.

The yardstick of acreage indicates that grains and wine grapes rank first among non- irrigable products. Following them are two important irrigable products that are also exported; citrus and potatoes (Table 2, Appendix). Sizeable land areas are also used for the growing of vegetables and mainly, tomatoes, cucumbers, leafy vegetables etc. In the mountainous and semi- mountainous regions apples, pears, cherries, peaches and other deciduous fruits are mainly grown. The total acreage of table grapes has been substantially reduced due to the seriousness of the problems faced in continuing to export them.

It is quite difficult to make comparisons using as an index the acreage due to the haphazard nature of their cultivations. However, the three most

traditional cultivations, olive trees, carobs and almond trees are quite important due to the fact that they constitute a part of the traditional environment of rural areas. Olive trees have witnessed substantive development in the last few years with the creation of irrigable orchards and olive orchards measured in acreage have now surpassed that of citrus. Most of the olive production is used for making olive oil in which Cyprus is self-sufficient. The degree of self-sufficiency in potatoes, citrus and table grapes surpasses 100%, as these products are main export items while grains are imported on a large scale to cover the needs of consumers and livestock farming.

In contrast with the agricultural sector, the livestock sector has achieved important strides due to government support and for other reasons already mentioned. Cyprus is self sufficient in pork meat, chicken and eggs. Despite the noticeable development of sheep and goat farming, the self-sufficiency rate is at 90%. Of all the sub-sectors cattle breeding is dependent on imports. This is due to the fact that most units are mixed (i.e. milk production and ox fattening in the same farm). Although there is self-sufficiency in fresh milk, substantial imports of dairy products still take place, while Cyprus famous cheese (halloumi) is exported in large quantities in many markets around the world.

3.2. Intermediate inputs

Land available for agricultural purposes is very limited due to the small size of the country. The big influx of tourists (about 2.5 million) force local growers to avoid the practice of fallow land and soil rotation that results in intensively farming. As a result, serious problems with soil erosion and land degradation have been observed. Furthermore, for higher yields, the farmers find refuge in the continuous use of fertilizers, which are sometimes overused. Fertilizer use is important for a bona fide researcher of the island rural economy. Pesticides and fungicides are also important intermediate inputs. Before the 1980s, all of the fertilizer needs of Cyprus were imported, as it had no local industry of its own. In the early 1980s the Government decided to establish such an industry of its own (The Cyprus Chemical Industries Ltd). However, this industry has recently terminated its operation. Following EU accession and the implementation of the RDP 2004 – 2006 certain provisions, like EUREPGAP, Integrated Production Management, etc, have been introduced in order to reduce the usage of fertilizers and pesticides.

3.3. Machinery and equipment

In 2001, there were 17,150 tractors compared to 13,316 tractors that were in use during 1985. As a result, the ratio of ha per tractor was reduced from 10.6 in 1985 to 7.8 in 2001. The number of other basic machinery used i.e. harvesters- threshers, milking machines, have increased slightly during the past few years (Table 3, Appendix).

3.4. Labor force and employment in agriculture

In 1960, a large part of the local population (64%) was actively engaged with agriculture. At least 40% of its economically active population had its main income coming from agriculture and general farming practices.

As the economy started powering ahead developing alternative sectors such as tourism, the slow but steady exodus from rural areas to the cities begun. Table 4 (Appendix) shows aptly the dramatic shift between rural and urban populations in Cyprus. The exodus from the rural areas that started in the 60s took a momentous rise in 1974 in the aftermath of the Turkish invasion that forcibly moved several thousands of Greek Cypriots living in the northern part of the Island to the southern part. In 1973, rural population was 58%, in 1976 was 47% and in 1992 was 32%. During this period, several communities lost an average of 50% of their populations to the burgeoning cities. Certain communities lost as much as 80% of their locals. The flip side of this is the spiraling population in urban centers from 262,000 in 1976 to 407,000 in 1992. The rate of abandonment of course did not continue with the same intensity but still persists to this day.

Recently, the rise of tourism has been rapid and far-reaching, with agriculture being one of the primary sectors that were affected in various ways. The rise of agro tourism the last few years is an attempt by planners along with crucial support and funding from the EU to remedy that and bring again balance to the employment mixture in the country. The number of full-time farmers has been reduced drastically in the last decades. In 2004 only 7% of the gainfully employed persons were engaged in agriculture. In the meantime the proportion of part time farming is close to 80% while the number of foreign workers is increasing. In certain agricultural sub-sectors, like livestock enterprises, the majority of workers are foreigners. Due to EU accession and the strong support of farming activities through the Rural Development Plan, which is funded by the EU, it is expected that the level of employment in agriculture will remain more or less stable in the coming years.

3.5. Price and incomes

Today, the economy relies primarily on services, i.e. tourism, financial services and shipping. The loss of agricultural land to the tourism industry has been an incident unraveling in Cyprus for years (Sinclair et al., 2005). The agricultural sector's contribution to the employment of the economically active population has shrunk substantially from the previous to 7% in full employment equivalent. It is actually estimated that about half of that concerns laborers that secure at least 50% of their income from agriculture. Most of the problems affecting the income level of farmers have to do with structural problems that beset agriculture for many years now like: the small size of agricultural plots, the low agricultural income and large dependence on off farm activities to supplement total family income, and the great disparities among farming incomes. A recent study by Eurostat indicates that agricultural farm income has decreased by about 25% in 2004 compared to 2000 (Statistics in Focus, 2006). Some of the reasons for the low farm income are discussed below.

Small size of agricultural plots: The median size of agricultural plots does not exceed 3.6 ha with an average of 5 plots per holding. More than one third of the farm units possess less than 1 ha and 56% less than 2 ha. Only 6% of the agricultural plots are above 10 ha. In mountainous areas, the median size of agricultural plots is 2.1 ha (Table 5, Appendix).

Low level of agricultural income and great dependence on non-agricultural activities for income supplement: The mean family income from agriculture is derived from non-farm activities by 58%. There is a great fluctuation in this depending on the agricultural zone. For instance in the semi mountainous, grape producing region and in the mountainous, fruit producing region, family income is about half of that of growers in the plains and coastal areas. Obviously, the hardest hit of all are growers in the arid, mountainous regions because they have limited or simply lack of employment opportunities aside from farming.

Great variation in agricultural income depending on the type of agricultural activity: According to the 1994 Agricultural Census certain sectors like pig farming, cattle breeding, flower and ornamental plants are enjoying higher incomes than others (Table 6, Appendix). Also in the sectors of chicken farming, potatoes and vegetables incomes are also substantially higher than the rest of agricultural production, i.e. citrus, grains and vineyards. In the period since the Census, disparities of income have become even more accentuated with the median agricultural income being only 3% of the most prosperous sector of cattle breeding.

Ageing of the agricultural population and the succession problem: Based on the 1994 Census, the mean age of farmers was 51 years. About 37% of the farmers were 55 or older and only 13% was below 35 years of age (Agricultural Census, 1994). It is more than evident that without the assumption of effective measures to stem the outflow and encourage the inflow from and to the sector, abandonment will continue in an increased tend; an incident that will have devastating environmental and ecological effects on Cyprus. Furthermore, the linkage between this and other sectors of the economy both downstream and upstream should not be taken lightly.

4. Upstream and Downstream Sectors

4.1. Upstream sectors

The upstream sector supplying inputs to the agricultural sector is quite important in the local economy even though that agriculture has declined. The market in Cyprus is filled with companies of varying capacities that are in the business of supplying inputs and services to the farmers. The production of goods was estimated by planners in 2004 at US\$ 850 million and the value of the products (inputs) sold to farmers in order to carry out their tasks are estimated to be about half of that (Statistical Service, 2005). More specifically, the upstream sectors (i.e. pesticides, fertilizers, feeding stuffs, propagation material suppliers) that have been in operation for many years employing thousands of workers are also linked to the overall economy.

The coop movement has been built up by the farming world for its own benefit and has become quite a diverse enterprise ranging from farming coops to banking coops. Cyprus is quite advanced with an enviable track record of development and monitoring far ahead compared to larger

Mediterranean countries. Quite a few banking coops are in business of consciously supporting farming activities and farmers' needs through the provision of preferential credit. Furthermore, the actual suppliers of farming inputs are some of these banking coops that happen to be among the largest financial institutions. In fact, one banking coop is substantially larger than most of the commercial banks.

Cyprus has a small manufacturing base and inevitably imports most of the inputs it uses for the production of final products. The same holds for its agricultural/farming sector. The addition of the transport cost inevitably means that most of these inputs are available at substantially higher prices to local farmers thus impairing the final cost calculus and eventually, their competitiveness.

4.2. Food processing sectors

Food processing in Cyprus is a 'has been' sector aside from highly specialized niche markets such as processed organic tea and traditional processed products (i.e. sweets, processed syrupy fruits, grape based sweets, traditional sausages etc). What remains today are tainted operations of once strong and competitive exports of products that enjoyed the status of core competences. The processing of grape fruits and the manufacturing of fruit juices and other products was one of the most important processing activities of agricultural products. However, in recent years, a diminishing course has been observed due mainly to the lack of competitiveness in the sector. On the same declining path we also find the exports of products from the grape fruit processing. The processing of oranges with their conversion, mainly, to juices is continuing at the same approximate levels whereas the same activity in lemons (i.e. lemon juice) has witnessed a major reduction. Grapes converted to wine are basically the activity of four large wine industries that have been operating for over one hundred years. Also there are a few small 'boutique' wineries that have sprung up in the last decade or so driven by national support programs. In addition, pure alcohol and spirit are also in production. The dairy industry provides the national brand of 'halloumi' cheese, which is made of sheep and/or goat milk in mixture with cow milk. A further long list of additional local cheeses follows as important mainstay in the food processing industry. There is no local production though of butter and powder milk.

4.3. Food consumption

Food consumption patterns in Cyprus are typical of those found in a Mediterranean country. Fresh fruits, vegetables and olive oil form a basis of dietary habits that the Self Sufficiency Rates (SSR) exceeds local needs. Data shown are for 1990, 1995 and 2001, because data beyond these years are not available. The information is presented in the form of tables for better comprehension (Table 7, 8 and 9, Appendix). According to these tables Cyprus is self sufficient in potatoes, tomatoes and citrus. It is worth mentioning that the SSR in potatoes and citrus exceeds twice the actual needs (225% and 214% respectively), while in tomatoes is 100%.

5. Trade in Agri-Food Products

In most cases, locally grown products cover Cyprus' needs. Others are imported to supplement local needs because of the large size of tourists. The main trading partners of Cyprus in agricultural products are EU member countries. About 80% of total exports have the EU as final destination and at the same time 12% of exports go to other European countries, which are not EU members. About 60% of the processed agricultural products are also exported to the EU, 10% to other European countries and 30% to other countries. The following tables show the value of imports and exports of the total agricultural products (Table 10, Appendix) and the value of the major imports and exports (Table 11, Appendix) from 1999 to 2003.

Country's imports are double its exports, resulting in a negative trade balance in recent years, close to \$250 million. Concerning the items imported the most important in terms of value are feeding stuff, mainly barley and maize, while in the export side the most important crops are potatoes, citrus and cheeses (mainly halloumi).

5.1. Trade performance: fruits, vegetable and olive oil

Cyprus offers a full range of citrus fruit available from October to June, with many of the popular varieties of oranges, lemons, grapefruit, and soft citrus. The main varieties of oranges grown are Navel, Oval and late Valencia. Cultivation of lemons is steeped in the history of Cyprus. The high demand for the preferred thin-skinned, juicy Cypriot lemons has ensured that the Island maintains its place as a major winter and spring supplier. Grapefruit has a high juice and sugar content which is the result of virtually perfect growing conditions. New plantations have been established and Cyprus has now an export capacity for both white and red flesh grapefruit varieties. The increasing demand for easy peelers in world markets has encouraged the expansion and adaptation of citrus production with particular emphasis on Nova as well as the Mandora and Minneola hybrids.

During the months of June to September, Cyprus is a major source of supply of table grapes to Europe. Table grapes are grown along the coastline and on the lower mountain slopes. Grape maturity varies by area thereby enabling the season to be extended.

In recent years there has been a major expansion in out of season vegetables. Particular success has been achieved in specialized items such as aubergines, courgettes, okra, methi, coriander, taro, chilies, beans, spinach, parsley and many others. Further, due to the favorable climatic conditions, the island is an ideal location for growing fresh aromatic herbs. Most of the herbs grown are indigenous to the Island and can be found in the wild. The plentiful sunshine and scarcity of rainfall ensure the strongest aroma of Cyprus herbs. A wide range of fresh cut herbs is exported including basil, sage, rosemary, marjoram, thyme, mint, anise, dill and others upon request.

Potatoes are by far the most important agricultural product exported. All potatoes exported are grown in the southeastern coastal region of the Island, known for its distinct red soil. The virtually frost free environment and the deep red soil amply supplied with water, creates ideal conditions for the production of high quality potatoes. The varieties grown are extremely versatile and can be used for consumption as well as industrial purposes.

The competitiveness of Cypriot exported commodities has been deteriorated following GATT implementation and EU accession. Competition has even become stronger in the local market and affects seriously certain commodities.

6. International Competitiveness of the Mediterranean Fruits, Vegetables and Olive Oil Sectors

In comparing one country's agricultural sectors competitiveness to another country a certain methodology and tools are needed. The sectors' competitiveness will be measured through the selection of similar specific products they produce and will be an analysis of price competitiveness. Quality is a variable not of concern in this segment despite its obvious importance. In the relevant paper by Gorton and Davidova (2001), a specific methodology is adopted which is used here in order to demonstrate the competitiveness of three products grown in Cyprus: tomatoes, oranges and olive oil.

The thrust of the above arguments by the two researchers dwells on the derived indicator of a country's international competitiveness Domestic Resource Cost (DRC). It is basically a measure of comparison of a country to produce a specific product with a cost advantage over others producing the same product in a different territory. It essentially compares a good's real opportunity cost with its aggregated value at international prices and constitutes thus an excellent tool of international competitiveness. The DRC of a specific product, i.e. tomatoes produced in Cyprus is obtained by dividing the cost of domestic factors of production (plus other considerations) by the value added in social prices. It is thus, a measure of efficiency or comparative advantage emanating through a core competence available to the Cypriot producers not available to their competitors if they are proven more price competitive because of that specific advantage. A DRC value greater than one ($DRC > 1$) simply means that the country examined does not possess a comparative advantage in producing the commodity in question. A value less than one ($DRC < 1$) means that the producing entity have a definite cost and price comparative advantage in producing the commodity vis a vis other international competitors.

In order to avoid drawing erroneous conclusions the following a priori statements should be established.

1. Cyprus joined the EU on May 1st, 2004 and thus data are yet not available on the specific products. All data used are 'infected' with subsidies and substantial PSEs (Producer Support Estimates) handsomely given out by the Government as a permanent feature to producers over the years. This creates a bias and an anomaly in the calculus of social cost vs. private cost for tradable inputs.
2. A high proportion of workers in the fields are foreign workers who are paid (in reality) lower wages than natives.
3. No differentiation is made between export/import prices through the central assumption of parity.
4. The best way to neutralize adverse effects of local irregularities weighted averages of the variables in question were used.

Table 15. DRC ratios for Cyprus' three commodities (3 year average; 1997/1998 – 1999/2000)

	<u>Tomatoes</u>		<u>Oranges</u>		<u>Olive Oil</u>	
1. Yield (kg/ha)	46,000		23,048		1,729	
	<u>CYP</u>	<u>EURO</u>	<u>CYP</u>	<u>EURO</u>	<u>CYP</u>	<u>EURO</u>
2. Farm gate price/ton	261.3	458.5	108.7	190.6	1,900.0	3,333.3
3. Adjusted border price	472.0	828.0	183.2	321.5	3,265.6	5,729.1
4. Social cost of non-tradable inputs*	65.2	114.5	40.7	71.4	437.0	766.8
5. Social Value Added**	378.5	664.0	86.9	152.4	2,674.5	4,692.2
6. Social Cost of Tradable Inputs***	93.5	164.0	96.4	169.1	591.1	1,036.9
7. DRC (4/5)	0.172		0.469		0.163	

* Social Cost of Non- Tradable Inputs: Non- tradable inputs: labor, land, depreciation, social contributions

** Social Value Added: Domestic production generates value added with the use of domestic non-internationally traded inputs valued in terms of social (shadow) prices

*** Social Cost of Tradable Inputs: Tradable Inputs: Seeds, Fertilizers, Chemicals, Fuel

Tomatoes: Tomatoes proved to have a definite cost and price comparative advantage in producing them having a DRC of 0.172. Most probably the reason has to do with the technology used and the fact that the product is grown mainly in greenhouses resulting to increased productivity, in terms of tonnage output per hectare, and increased prices especially in winter. The bulk of production of tomatoes originates with the vast network of coops that tend to focus on local realities and are ill equipped to undertake export activities. However, the export potential of tomatoes remains high.

Oranges: Citrus production has a DRC of 0.469, indicating that oranges are the least competitive crop among the three studied. Supportive to this finding is the fact that local exporters are beginning to find it extremely difficult to compete with other exporters from other countries. It seems that the main reason for reduced competitiveness in the foreign markets is the old fashioned composition of plantations in terms of varieties that do not meet consumer demand. Currently, new varieties are planted and new markets are being tried as far away as Hong Kong.

Olive Oil: According to table 15, olive oil proves to be the most competitive of the three measured (DRC 0,163) but it also has the greatest room for improvement as it is still organized as a labor- intensive industry. The sector already needs serious infrastructure investments and incentives to become more competitive. However, its export potential remains high.

Explanation note: All three products examined in this section have a comparative advantage in terms of DRC estimations. However, things are not static, and agricultural production costs and producer prices have changed since EU accession negotiations begun between EU and Cyprus in 2001. If we have to estimate new DRC ratios based on current data (not yet available), the agricultural situation in Cyprus would be different. It is believed that DRC ratios after 2001 would be higher than the ones reported due to unchanged/decreased border prices and increased costs of tradable

inputs. Moreover, certain subsidies provided to these products before EU accession are no more available.

7. Policy Outlook

The future of MEDFROL products studied in this report will depend upon the readiness of people involved in the production process to respond timely to the market pulse. Based on the current situation, the tomato, orange and olive oil sectors will become more competitive in the European market if factors that are affecting their marketing, like production cost and quality, are improved. New concepts like organic farming and products of origin are very important and may provide profitable outlets in the new globalized economy. Furthermore, climatic conditions in Cyprus are vastly favorable for and conducive to the production of early season Mediterranean products with obvious premium attached in the market place.

Currently the production cost in most crops, including olive oil, citrus and tomatoes, is higher in Cyprus compared to other EU members or third countries; a difference that is attributed mainly to the higher labor cost imposed by structural imbalances inherent in the agricultural sector. In order for the olive oil sector to become more competitive new technology that will minimize labor costs must be introduced. This is however, a long lasting process that may take several years before it is fully achieved. In the citrus sector one major problem is the existence of old fashioned varieties. The solution to this problem is the introduction of new and improved citrus varieties. It is assumed therefore, that due to the perennial nature of citrus, the situation in this sector will potentially be improved in a period of 5 to 10 years. Concerning the tomato sector its future looks more favorable, basically because of high yields and the possibility to compete on lower prices. In the mid to long-term, the tomato sector can become even more successful with increased export opportunities, especially if improvements in the processing industry are achieved.

In terms of exports, the volume of the three products examined is expected to remain more or less stable in the coming few years. The most important opportunity resulted from EU accession is the potential of agricultural products to be traded without restrictions or obstacles in the enlarged EU market. Evenly important is the possibility offered to farmers to maintain a minimum agricultural income through various support schemes dispensable by the EU or state-aid provisions.

Certain handicaps, like the absence or ill equipped producers' organizations indispensable to correctly organize the production and marketing of products and the late adoption of technological improvements, lead to the deterioration of competitiveness in foreign markets. It is expected that through optimal use of the financial means provided in the RDP agriculture in Cyprus will be reshaped in a sustainable manner, taking into consideration consumers' demand and citizens' worries for environment protection and animal welfare. Therefore, it is estimated that in the long-term certain agricultural commodities, like tomatoes, oranges and olive oil, will find the way to their export destinations securing better prices and higher income to their producers.

Agro tourism, along with other service- like activities could provide employment opportunities and raise family income in rural areas.

8. Conclusion

This report discussed the various conditions that don't allow Cyprus' agriculture to develop further. Some of these are the natural landscape, small size of plots, scarcity of water and others like, high labor costs, high input prices etc. Nevertheless, Cypriot agriculture has managed to prevail through appropriate restructuring and move on to other forms of activity in an evolutionary process. Despite the losses in traditional export markets (i.e. citrus, potatoes, leafy vegetables, table grapes and other long-favored products) trading still continue. The search is not for market share anymore but for profit maximization in the most cost- effective way possible. On the other hand, weaknesses lurk in the background and need to be tackled, but opportunities are still present and need to be catered to by a much more educated and experienced management approach.

The inability of farming to provide a sustainable income to most farmers in Cyprus has led to the incident of off farm income activities. Not only has agriculture maintained its key input to the overall economy but also it still manages to attract investment capital through its various niche opportunities that favor the risk/return balance with investors than other commercial activities. Good examples are the launch of organized cultivations of aromatic herbs on a commercial scale and are currently sustaining exports and the initiation and surprising progress of organic farming.

Cyprus possesses various unique attributes in terms of climate which ensures early season Mediterranean products, landscape beauty, biodiversity, colorful scenery, remarkable cultural attributes of its rural settlements, lack of nuisances due to vast inland territories and many others. The above can and do operate in a synergy. Thus, the total package of Cyprus agricultural landscape is one that offers the possibility of extending its biggest industry, i.e. tourism into it thus advancing the high value added product of agro tourism.

It is expected that the adoption of the EU blueprint in the agricultural sector will contribute to the neutralizing of structural bottlenecks and abnormalities. The factors holding back agriculture and its development are long standing obstacles that are essentially structural bottlenecks. The fractured natures of agricultural land ownership in Cyprus, the traditionally small average size of plots, low soil fertility and uneven terrain reduce the productive capacity and competitiveness of agricultural holdings. Thus, important sectors of Cypriot agriculture like grains, grapes and fruit tree cultivations become absolutely dependent on outside help (i.e. subsidies) in order to avoid negative repercussions.

The continued lack of serious employment alternatives in Cypriot countryside also tend to maintain the flow towards urbanization and thus deprive rural communities of the crucial presence of workers and consumers. If no renewal of the rural populations takes place then an ageing rural population's passing brings closure to rural life. The consequent abandonment of the countryside and agricultural activity removes the need

by the state to offer or maintain any expensive infrastructure (i.e. education, health services etc) thus multiplying the effects of the initial abandonment.

As an island, Cyprus is isolated from its major export markets, and has to deal with the traditionally higher cost of transportation compared to its competitors in international markets for agricultural products. Furthermore, where this would be an impetus for local production unfortunately, the calculus is heavily against local growers due to other cost increasing reasons like, labor, water and land. The tourism industry casts its heavy shadow over agriculture as it continues to attract resources.

Currently the Agricultural Policy in Cyprus is depicted in one single document, the Rural Development Plan (RDP) 2004- 2006 that is a bridge into the full application of the relevant EU agricultural programs that Cyprus is not due to access until 2007. The RDP is quite a multi pronged program of activities and measures as agriculture has been amassing problems and bottlenecks for some years now. For the first time, environmental management and policies on relevant issues are becoming a priority whose general economic development level does not correspond to its poorly managed natural environment. Cyprus macro priorities in agriculture for the future are essentially the modus operandi of the four RDP targets: competitiveness improvement in the primary sector and in agricultural products, reorganization of the social and economic fabric of rural areas, protection of the environment and sustainable development of natural resources, and adaptation of the institutional framework and the mechanisms of exercising agricultural policy.

In the micro level, productivity enhancement is a one-way street for agriculture. No matter how many and how big the handouts, grants, aid, etc that farmers are receiving from Brussels are, no improvement of long lasting nature will take place unless productivity is improved and the relevant products become competitive in the market place. Furthermore, the ability to engage in value added activities through processing of agricultural products are also absolutely paramount. Additionally, extension services and training must be made more widely and frequently available to the farming community, and local farmers must be kept up to date with information on their activities and trade, in tune with new and evolving technologies and skills leading to the quality improvement of their products.

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Table 1. Irrigable and irrigated land by administrative district (indicators of water use; 2004)

	LEFKOSIA		AMMOXOSTOS		LARNAKA		LEMESOS		PAFOS		TOTAL	
	Farms	Area (ha)	Farms	Area (ha)	Farms	Area (ha)	Farms	Area (ha)	Farms	Area (ha)	Farms	Area (ha)
Irrigable land	13,699	13,958	2,490	6,581	4,425	9,117	8,432	7,383	4,396	8,413	33,892	45,452
Irrigated land	13,535	12,023	2,348	4,506	4,169	5,908	8,267	6,724	4,745	7,020	33,064	35,931

Source: Statistical Service

Table 2. Main trading partners (exports and imports)

	<u>Agricultural Products</u> (000's CYP)	<u>Agricultural Products</u> (%)	<u>Modified Ag. Products</u> (000's CYP)	<u>Modified Ag. Products</u> (%)
EXPORTS				
EU	34,474	78.71	17,019	60.72
Other European countries	5,357	12.23	2,991	10.67
Arab Countries	1,136	2.59	5,167	18.43
Other Countries	2,832	6.47	2,853	10.18
TOTAL	43,799	100.00	28,030	100.00
IMPORTS				
EU	21,738	27.62	57,318	72.12
Other European countries	24,202	30.75	5,783	7.28
Arab Countries	1,937	2.46	255	0.32
Other Countries	30,840	39.18	16,123	20.29
TOTAL	78,716	100.00	79,479	100.00

Source: Imports & Exports Statistics 2001

Table 3. Agricultural machinery and equipment used

<u>Year</u>	<u>Temporary and Permanent Crops Area (000s ha)</u>	<u>Tractors in Use</u>	<u>ha per Tractor</u>	<u>Harvesters-Threshers in Use</u>	<u>Milking Machines</u>
1985	141.6	13,316	10.6	519	755
1990	141.5	14,500	9.8	580	790
1995	134.4	16,600	8.1	650	840
1998	138.2	17,000	8.1	660	900
1999	137.2	17,100	8.0	660	875
2000	135.2	17,150	7.9	665	870
2001	133.6	17,150	7.8	665	870

Source: FAOSTAT and Statistical Service

Table 4. Inter-temporal development of agricultural and urban populations in Cyprus

<u>Year</u>	<u>Agriculture (%)</u>	<u>Urban (%)</u>
1960	64	36
1973	58	42
1976	47	53
1982	38	62
1992	32	68
2001	31	69

Source: Statistical Service

Table 5. Agricultural units and plots ranked by acreage

<u>Grading by plot size (ha)</u>	<u>CYPRUS (1994)</u>		<u>EU-15 (1997)</u>	
	<u>No. of Agric. Plots (000s)</u>	<u>%</u>	<u>No. of Agric. Plots (000s)</u>	<u>%</u>
<5	36.8	82.1	3,866.9	55.6
5- 10	5.2	11.5	929.2	13.4
10- 20	1.9	4.3	757.7	10.9
20- 50	0.9	2.1	802	11.5
> 50	---	---	598.5	8.6
Total	44.8	100.0	6,954.3	100.0

Source: Papayiannis and Markou, 1999

Table 6. Median Farming Income by type of Farming Activity (1994)

<u>Farming Type</u>	<u>Income (CYP)</u>
Olive production	2,000
Grape growing	3,000
Fruit trees	3,500
Grains	4,000
Citrus	4,500
Sheep/Goats	6,000
Vegetables	7,000
Potatoes	8,000
Chicken farming	11,000
Ornamental plants and flowers	28,000
Cattle breeding	38,000
Pig farming	52,000

Source: Papayiannis and Markou, 1999

Table 7. Potatoes production and consumption profile

<u>Year</u>	<u>Area</u>	<u>Local Production</u>	<u>Imports</u>	<u>Exports</u>	<u>Consumption</u>	<u>SSR</u>
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	(ha)	(mt)	(000s CYP)	(mt)	(000 s CYP)	(mt)	(000s CYP)	(mt)	%
1990	8,00 0	185,90 0	30,848	14,209	2,76 5	146,07 4	28,99 5	54,035	344
1995	9,90 0	234,00 0	42,935	8,996	2,90 5	186,91 1	43,07 1	56,027	418
2001	5,71 5	121,00 0	24,998	8,625	2,26 5	75,763	17,51 1	53,862	225

Source: Statistical Service

Table 8. Tomato group and similar products production and consumption profile

Year	Area	Local Production		Imports		Exports		Consumpti on	SSR
		(ha)	(mt)	(000s CYP)	(mt)	(000s CYP)	(mt)		
1990	2,43 5	82,800	18,150	0	0	3,220	1,113	79,580	104
1995	2,47 0	97,000	21,162	260	168	1,157	232	96,103	101
2001	2,36 6	102,00 0	31,367	434	106	1,007	392	101.527	100

Source: Statistical Service

Table 9. Citrus group production and consumption profile

Year	Area	Local Production		Imports		Exports		Consumpti on	SSR
		(ha)	(mt)	(000s CYP)	(mt)	(000s CYP)	(mt)		
1990	7,25 0	200,00 0	19,005	0	0	118,00 8	21,86 4	81,992	244
1995	7,05 0	176,00 0	15,363	0	0	91,251	16,79 7	84,749	208
2001	5,34 5	122,30 0	16,931	0	3	65,193	14,71 7	57,107	214

Source: Statistical Service

Table 10. Export and import of total agricultural products (in 1000\$)

	Year				
	1999	2000	2001	2002	2003
Exports - Val (1000\$)	473,00 0	411,65 1	401,28 5	243,89 8	262,43 8
Imports - Val (1000\$)	682,12 9	707,25 6	646,86 4	488,20 5	513,34 2

Source: FAOSTAT

Table 11. Export and import of main agricultural products (in 1000\$)

	Year				
	1999	2000	2001	2002	2003
Barley					
Imports - (1000\$)	24,922	39,732	40,763	30,139	34,871
Exports - (1000\$)	0	0	0	0	0
Cheese of Sheep Milk					
Imports - (1000\$)	467	470	185	145	238
Exports - (1000\$)	5,505	6,411	6,672	9,643	11,137
Grapefruit and Pomelos					
Imports - (1000\$)	0	0	1	0	0
Exports - (1000\$)	8,203	4,761	6,594	7,443	11,170
Grapes					

Imports - (1000\$)	0	0	0	1	0
Exports - (1000\$)	3,197	2,521	2,426	903	2,193
Lemons and Limes					
Imports - (1000\$)	0	4	0	0	2
Exports - (1000\$)	2,718	1,485	2,145	4,075	4,398
Maize					
Imports - (1000\$)	21,466	21,203	23,573	23,869	30,573
Exports - (1000\$)	0	0	0	0	0
Olive Oil					
Imports - (1000\$)	1,032	34	253	58	140
Exports - (1000\$)	19	2	31	1,391	3,211
Olives					
Imports - (1000\$)	0	0	0	0	0
Exports - (1000\$)	19	12	10	11	13
Oranges					
Imports - (1000\$)	0	0	5	1	85
Exports - (1000\$)	5,510	3,913	4,581	6,792	8,402
Potatoes					
Imports - (1000\$)	3,644	2,992	3,648	2,967	3,545
Exports - (1000\$)	25,834	19,877	28,206	17,882	29,134
Tomatoes					
Imports - (1000\$)	91	59	53	52	59
Exports - (1000\$)	106	42	156	20	8
Vegetables Frozen					
Imports - (1000\$)	1,960	1,825	2,153	2,185	2,716
Exports - (1000\$)	62	26	11	9	1
Wine					
Imports - (1000\$)	4,087	3,927	4,566	4,982	6,066
Exports - (1000\$)	6,328	6,198	5,713	6,169	8,490