THE COMPARATIVE ANALYSIS OF AGRICULTURAL SECTOR PRODUCTIVITY IN NORTH CYPRUS AND THE EUROPEAN UNION

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Abstract

World population has been growing in recent years. This growing population has a problem with enough nutrition. Because of the restricted agricultural lands, necessity of getting more output with the same amount of input has been going out. In this way, scientific and technological studies try to find out to produce more goods with high quality, in the same restricted agricultural lands. Agriculture has gained an important role for the effective use of land. The aim of this study is to examine the importance of productivity in agriculture, towards sustainable development of North Cyprus. In this respect, the comparative analysis of agricultural sector productivity in the Northern Cyprus and European Union (EU) has been conducted. In North Cyprus most agricultural products and its prices are strongly affected by transport cost as well as import tariffs. General structure of the agriculture sector in North Cyprus is based on insufficient production with very low efficiency. To give an answer to demand of market, agricultural production must transfers from traditional agricultural production techniques to modern production techniques with high-level use of technological equipment. The study suggests that planned agricultural production is the only way to reach sustainable development. As a conclusion, the study emphasized the importance of the agricultural productivity, towards sustainable development of North Cyprus.

Keywords: Agriculture, sustainable development, comparative analysis, North Cyprus and EU

Kuzey Kıbrıs ve Avrupa Birliği'nde Tarım Sektörü Verimliliğinin Karşılaşmalı Analizi

Özet

Son zamanlarda hızla artan Dünya nüfusu önemli ölçüde gıda sorunuyla karşılaşmaktadır. Tarıma elverişli arazilerin sınırlı olması ise bu soruna tek çözümün mevcut tarım girdileri ile daha fazla ürün elde edilmesini gerekli kılmıştır. Dolayısıyla, bu alanda gerçekleştirilen bilimsel ve teknolojik çalışmalar tarımda verimliliğin artırılmasına odaklanmıştır. Bu çalışmada ise temel amaç Kuzey Kıbrıs'ın sürdürülebilir kalkınmasına yönelik tarımda verimliliğin önemimi ortaya koymaktır. Bu çerçevede, Kuzey Kıbrıs ve Avrupa Birliği (AB) tarımının verimliliği analiz edilmiştir. Çalışmada şu sonuçlar elde edilmiştir. Devamlı ticaret açığı veren Kuzey Kıbrıs'ta tarım ürünleri ve fiyatlandırması ulaşım maliyeti ve gümrük vergilerinden olumsuz etkilenmektedir. Avrupa Birliği ile karşılaştırıldığında Kuzey Kıbrıs tarım sektörünün genel yapısı yetersiz üretime, çok düşük etkinliğe ve verimliliğe dayanmaktadır. Kuzey Kıbrıs tarımında bu durumdan çıkıp sürdürülebilir kalkınma dinamizmini yakalamak için geleneksel üretim tekniklerinden modern üretime geçilmesi ve tarım üretimimin planlama kapsamına alınması gerekmektedir.

Anahtar Kelimeler: Tarım, Verimlilik, Kuzey Kıbrıs, AB.

1. Introduction

In this study comparative analysis of agriculture sector productivity in North Cyprus and EU investigated. The aim of the sturdy is to compare both agriculture sector of North Cyprus and EU. Study aimed to give recommendations to the agriculture sector of North Cyprus according to the exceptions of the sector. Study limited with the main development and productivity definitions, statistical datum and agriculture sector of North Cyprus and EU.

Rural development is not the same as agricultural development. The agrarian community requires full range dealers and so on. Often rural areas use surplus agricultural labor, either seasonally or full-time, in industry.

The evolution of agricultural production commonly occurs in three stages: (a) peasant farming, where the major concern is survival, (b) mixed farming, and (c) commercial farming.

For much mixed farming rather than highly specialized commercial farming is the first step away from subsistence agriculture. Production branches off into other enterprises besides the staple crop, such as fruits, vegetables and animal husbandry.

This change being with improved productivity through technological advances, capital formation, or using resources underemployed in subsistence farming, and it varies depending on the particular conditions of the farm.

The specialized farm, the most advanced agricultural phase in a market economy, usually emphasizes cultivating one crop. Such a farm is capital intensive, uses advanced technology, and expanding national and international markets. The farmer no longer grows crops for the family but the market (Nafzigeer, 1997).

The productivity of land in agriculture varies greatly, whether it be measured in terms of crude output per hectare, called the 'yield' or sometimes 'yield per hectare', or in terms of marginal physical products of land, in which the outputs of two pieces of land are compared with all other factor inputs identical or after deduction for the contribution of other inputs. Soil differ widely in their agricultural productivity, owing to physical and chemical properties, temperature, rainfall, hours of light, and accessibility both to markets and other inputs.

The productivity of land is also closely related to technology. The capacity of land to support added numbers of people, or the same numbers at higher levels of living, has been growing continuously through history. Discovery of new land adds to the stock of available land. Technological change expands it as surely.

During the process of economic development the agricultural sector is transformed, both internally and in its relationship with other economic sectors. The dimensions of this transformation are not only economic but also include formal and informal institutional changes which are sociological or political in character.

The dominance of the agricultural sector in poor countries, it was evident that the capital to finance industrial expansion, at least in the early stages of development, would have to be largely raised from agriculture by taxation, voluntary transfer (savings) or by encouraging the terms of trade to move against agriculture and in favor of industrial goods.

The surplus could be extracted through the following means:

(a) A marketed food surplus transferred at low prices.
(b) Export and cash crop production promoted both as a source of foreign exchange and to provide a base for taxing agriculture.
(c) Savings and taxes of farmers, which could be channeled into non-agricultural investment.
(d) Surplus labor, which would be siphoned off, as wage differentials grew.
(e) By turning the terms of trade against agriculture, thus forcing farmers to pay more for domestically produced manufactured inputs and to receive less for their produce then would otherwise be the case.

The results from import tariff and restriction policies, protecting domestic industry from foreign competition, which are simultaneously, raise agricultural input prices and produce an overvalued exchange rate which depresses local currency receipts from agricultural exports. Modes of extraction (a) and (b) corresponds to the product of the market contribution whereby the agricultural sector is encouraged to buy more domestically produced manufactured goods, but on disadvantageous terms which aid the transfer of farming profits to industry (Nixon and Colman, 1994).

The operationally most useful definition of sustainable development is provided by Bartelmus because it covers the core areas of satisfaction of human needs, preservation of natural resource base, environmental quality and social equity: the set of development programmers that means the targets of human needs satisfaction without violating long-term natural resource capacities and standards of environmental quality and social equity (Bartelmus, 1994).

2. Agriculture in North Cyprus

Cyprus is lying in the Northeastern corner of Mediterranean, between 32-34 east longitudes and 34-35 north latitudes. Surface area of North Cyprus is 3298 sq km and all

surface area of the island is 9251 sq km. Cyprus is the third largest island in the Mediterranean. It is situated in the crossroads of the east-west and north-south navigation routes and lies 60 km north of the Egypt and 30 km south of Turkey.

Cyprus is semiarid country exposed to unevenly distribute and unreliable rainfall pattern. Water is an important factor in agriculture. Water resources exclusively are dependent in rainfall. The major source of water is the underground water reserved which are quite poor. The climate of Cyprus is the typical Mediterranean type with its mild and rainy winters and hot and dry summers.

North Cyprus covers an area of 3298 sq km in the northern part of the island of Cyprus and includes the Pentadactylos Mountain Plain and Karpas Peninsula.

The population of North Cyprus is around 211191 and 59.6% of the population is living in the rural areas and around 16.5% of the total working population is engaged in the agricultural sector in 2001 (TRNC The Ministry of Agriculture and Forestry, 2003).

Agriculture sector has an important role in the economic development of North Cyprus. Difficulties of sector prevent rapid improvement of sector. Agriculture sector mainly based on traditional production techniques. Because of this reason, for the development of the economy, country has to shift from traditional structure of agricultural production to technological structure of industry and service based production. To achieve this aim improvement in productivity and production are two important branch of agriculture sector. Authority of sector decided to apply the policy to take measures to increase productivity, to improve technological infrastructure and give incentives to producers.

In 2002, employment in agriculture sector was 15.1% of total employment of country. In the same year agriculture took 10.9% of total GDP. Also agriculture sector took 47.8% of total physical production in GDP and took 41.6% of total export was made in agriculture sector. All of these percentages show that the economy of North Cyprus mainly based on agriculture (TRNC Prime Ministry, 2004 Year Program, 2003).

Agricultural Master Plan made for the improvement in productivity in agriculture sector. Plan also includes informing producers to produce efficiently. Sector gives incentives to producers in the all steps of agricultural production. These incentives include direct incentives, seeds incentives and etc.

An agriculture authority gains the role to find out domestic and foreign markets for the crop, to inform the producers to produce the product that has high level of demand. Government intervention has seen strongly in this sector. Especially the base prices decided by governments and governments buy almost all products. In the condition of natural disease, drought and epidemic disease governments compensate the producers. Agriculture Insurance has been organized for this reason (TRNC the Prime Ministry, 2003 Year Program, 2003).

To increase the profit of agriculture sector governments to take measures to put the production expenses at the low. To put the production expenses at the low. To achieve this aim government support the producer, the price, also the input and the technical information (TRNC the Ministry of Agriculture and Forestry, 2003).

As can be seen from Table 1, out of the total area of the country 56.71% is agricultural land, 566,042 hectares. Forestland takes 19.5% of total area 194,632, and villages, roads and rivers take 10.6% of total area, 106,669 ha.

Table 1. Land distribution in North Cyprus.

Land Distribution	Hectare	% of total land
Agricultural Land	566,042	56.71
Forest Land	194,632	19.5
Meadows	49,457	4.95
Villages, Roads, Rivers, etc...	106,669	10.69
Area not occupied	81,402	8.15
Total Land	998,200	100.0

Source: TRNC The Ministry of Agriculture and Forestry, Statistic and Planning Division, Nicosia, 2003.

2.1 Agricultural Structure and Policy in North Cyprus

To improve the production in. agriculture sector, the government in the areas of productivity, organization, incentives and marketing has implemented

Table 2. Agricultural export in total export of North Cyprus (million US $).

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Total	65.5	52.5	54.6	54.5	53.4	67.3	70.5	57.7	53.3	52.4	50.4	34.6	45.5
Agriculture	29.8	27.0	31.0	24.3	25.7	26.9	31.0	18.5	14.5	20.1	16.0	12.3	18.9
1.Citrus	24.5	21.6	22.2	16.6	15.8	22.1	22.6	15.1	12.8	13.1	13.4	9.9	17.1
2.Potatoes	2.4	2.4	3.3	1.3	0.7	1.4	0.9	0.4	0.6	1.1	0.1	0.5	0.2
3.Live Animals	0.3	0.1	0.5	-	0.3	0.4	1.0	0.2	-	-	0.3	0.0	0.0
4. Other	2.6	2.9	5.0	6.4	8.9	3.0	6.5	2.8	1.1	7.9	2.2	1.9	1.6
Proces.agr.goods	11.9	8.4	7.1	8.2	7.1	11.9	13.2	11.87	13.9	12.5	12.2	8.1	12.2

Source: TRNC The Ministry of Agriculture and Forestry, Statistic and Planning Division, Agricultural Structure and Production 2002, Nicosia, 2003.

new measures.

Exportation to many parts of the world is the main objective of the agriculture sector. North Cyprus is a small country. So, that its product range is not very large. The agriculture sector is the backbone of the economy (Statistics and Planning Division, 2002).

As can be seen from Table 2, the main export agricultural products of North Cyprus are citrus, potatoes and live animals. Total agricultural export was 45.4 million us $ in 2002. Citrus and potatoes are two important components of agricultural export products. They were 18.9 million US $ and 17.1 million US $ in 2002 respectively. From 1990 to 2002, agricultural export decreased

2.2. Agricultural Production in North Cyprus

Main features of developing countries are; the big portion of agricultural value added to total GDP, high portion of population working in agriculture sector, big share of agricultural export in total export. Agricultural has an important role for the economic development of the North Cyprus. But, because of the important obstacles, the sector cannot improve itself.

Government structures are designed to increase the agricultural production towards the development of economy. Governments aimed to increase productivity in agriculture, to improve technology used in agriculture and give subsidies to producer.

Agricultural value added to GDP of North Cyprus can be seen as Table 3. From 1995 to 2000, agricultural value added has decreasing trend. In 1995 total agricultural value added to GDP was 75.83 million $, in 1997 it felt to 53.39 million $ and in 2000 it was 71.41 million $.

Table 3. Agricultural value added to GDP in North Cyprus (million $, constant prices).

1995	1996	1997	1998	1999	2000
75.83	74.59	53.39	68.88	6751	71.41

Source: TRNC Prime Ministry, SPO, Statistical Year Book, Nicosia, 2002.

Total production of North Cyprus has been growing. With a parallel of increasing population, total employment had been increasing within a period of 1985-2001. In 1985 total employment was 61499 people within a 160287 total population. Number of working person in agriculture sector was 20595 person, this was a 33.9% of total employment. In 1990 it felt to 26,7%, in 2000 again it was sharply felt to 17,1%. Share of agricultural employment within a total employment has very shrunk decline from the 1985-2001. In 2001, share of agricultural employment declined to 16,5% from 1985-2001 agricultural employment has the average of 16,99% decline. Total number of working person in agriculture was 20595 in 1985 and 14931 in 2001. As can be seen from Table 4 agriculture sector has a general decline in the agricultural employment and agricultural employment share into the total employment within an analyzed period.

As can be seen from the Table.5 agricultural products have an important role within the exports of North Cyprus. Important components of agricultural products are citrus, potatoes and live animal. Citrus has a big share of total agricultural products. In 1985 agricultural products takes 77.6% of total exports. This amount was felt to 45.5% in 1990, 40.0% in 1995 and 31.7%

Table 4.Number of working person in agriculture sector.

Years	Total Population	Total Employment	Agricultural Employment	Agriculture (%)
1985	160287	61499	20595	33.49
1990	171469	71525	19094	26.70
1995	181363	76454	17383	22.74
2000	208886	89327	15236	17.10
2001	211191	90366	14931	16.50

Source: TRNC Prime Ministry, SPO, Statistical Year Book, Nicosia, 2002.

in 2000. In 2001 the share of agricultural products within the total exports has been increased by only 3.8% and reached 35.5%. From 1985 to 2001 share of agriculture in export products was felt by 42.1%. Industrial products are on of the important component of exported products of North Cyprus. From 1985 to 2001 industrial products has increasing share within the total exported products. In 1985 share of industrial products was 22.2%, in 1990 53.7%, in 1995 59.1% and in 2000 it increased to 67.9%. From 1985 to 2001 share of industrial products within the total exported products was increased by the average of 41.1%. The last component of exported products is minerals. Minerals have a very little share within the total exported products.

2.3. Agricultural Productivity in North Cyprus

Productivity could be defined as the efficiency relationship between the input values and the output values. Improvement in this relationship means the ability to produce more and more output values from less and less input values by generating greater efficiency in the means and methods of production. The simplest and the most easily understood measure of productivity is the partial productivity known as labor productivity. Dividing the physical output with the physical capital input derives labor productivity (www.econ.upm.edu.my).

There is several significance of productivity growth, which can be noted below:

- As the key determinant of a nations future standard of living.
- As a cure for inflation.
- Enhancement of savings.
- To offset the effects of raising real wages

Economic production is an activity carried out under the control and responsibility of an institutional unit that uses inputs of labor, capital, goods and services to produce outputs of goods or services (www.forum.europa.eu.int).

2.3.1 Labor Productivity

In the process of production, the rate and importance of any factors and input is by no means near the role and importance of labor force. This is why the labor force involved in it computes productivity rate and value of production. Therefore, when we talk about the rate of the productivity of labor force on a national level, we mean the value of per capita production generated on average by every employee within a specific year. In order to obtain a precise

Table 5. Composition of Exports in North Cyprus.

	Agricultural Products		Industrial Products		Minerals	
Years	Million US $	%	Million US $	%	Million US $	%
1985	35.9	77.6	10.3	22.2	0.1	0.2
1990	29.8	45.5	35.2	35.2	0.5	0.8
1995	26.9	40	39.8	59.1	0.6	0.9
2000	16	31.7	34.2	67.9	0.2	0.4
2001	12.3	35.5	21.9	63.3	0.4	1.2

Source: TRNC The Prime Ministry, State Planning organization, Economic and Social Indicators, 2002.

picture of its changes during the period, production should inevitably be measured and registered according to a fixed price.

National productivity is not only an economic criterion, but also an indication off all social, cultural and political aspects of a community in utilizing and integrating factors and resources at its disposal. Therefore, a low national productivity of labor forced is assign of inconsistent system inappropriate polices and strategies ineffective management and incorrect methods in using the resources and potentials available in a community. Labor productivity can be defined as total output or real gross domestic product divided by total man-hours (www.altavista.com).

The most obvious sources of a rising marginal productivity of labor are an increase in the capital goods that labor uses in production. Although changes in productivity are the main determinant of changes in real wage rates, but they are not the only determinant of changes in the standard of living (Reynolds et al., 1998).

According to the data on Table 6, agricultural productivity in North Cyprus was 4362.8 $ in 1995 and in 2000 it increased to the 4687.5 $.

3. Agriculture in European Union (EU)

Agriculture has historically been considered special for economic, social, political and strategic reasons. Because of this, in almost every industrial country and in many less developed countries governments intervene in the agricultural sector, in an attempt to modify its course and regulate the production and trade of agricultural commodities. Intervention is usually justified on the belief that on institutional structure rather than the free market will move the sector towards preferred directions. The specific objectives of government intervention are mainly:

1. The desire to maintain a certain degree of self-sufficiency in agricultural products, a specially food, because of the risk of interruption or curtailment of foreign supplies.
2. Saving foreign exchange by supplying agricultural products for domestic consumption from domestic sources rather than imports.
3. Stabilizing prices at levels reasonable for the consumer and the producer, as the means for reducing hardship and uncertainty, and for encouraging investment and growth in the agricultural sector.
4. The desire to improve the efficiency and productivity in the agricultural sector as the means for raising the level and the rate of growth of agricultural incomes.

Governments often justify their support to agriculture by asserting not only that farming is riskier than other enterprises, but also than conventional private markets provide limited mechanisms for hedging that risk (Hitiris, 1998).

3.1 Agriculture Policy in EU

Agriculture plays such a major role in the EU's macroeconomic policy, for there are no conspicuous market failures in this sector. A high degree of competition prevails, and externalities in the form of environmental damage are local rather than international problems. The roots of the Common Agricultural Policy (CAP), lies in the fact, that agricultural products are relatively standardized and easily traded

Table 6. Per capita productivity of agriculture (US$).

Years	North Cyprus	EU-15	EU-11
1995	4362.8	79867.3	77086.8
1996	4424.1	79909.4	77685.0
1997	3298.7	70345.9	67814.9
1998	4342.5	74135.6	71992.3
1999	4972.0	60954.3	61096.3
2000	4687.5	60080.9	62313.5

Source: 1-TRNC The Prime Ministry, State Planning Organization, statistical Year Book, Nicosia, 2001.
2-European Commission, Data for Short Term Economic Analysis, Theme 1, 2000.

internationally, so if an individual country stimulates production in order to maintain the income of farmers, there will be spillover effects on prices in other countries (Hansed et al., 1998).

Article 38.4 (now Art. 32), EC stipulates that the 'common market for agricultural products must be accompanied by the establishment of a common agricultural policy among the member sates'. There should be no illusion about the interventionist nature of such a common agricultural policy (CAP). In Europe modern agricultural policy has been applied more than a century. In the 1950s the six founding countries all applied border protection, combined with a variety of domestic interventions with different intensities. Agricultural quotas had been notoriously difficult to remove in the OEEC liberalization attempts while the Green Pool had failed (Pelkmans, 2001).

On 24 May 1991 a budget was produced which, although not as severe as originally proposed, maintain expenditure below the overall budget guidelines and prepared the ground for the more fundamental reform of the CAP promised by the commission in the McSherry Plan.

Opinions on the impact of the McSherry reforms have been mixed. However, they did enable the EU and the US to reach agreement on some of the trickier aspects of the Uruguay Round. Moreover, although the reforms did not represent a fundamental transformation of the CAP, which continued to dominate the EU budget, they did represent a first step on a path that will continue, into the next century. In the short term some of the best budgetary intentions of the McSherry reforms were undermined by the vagaries of the agrimonetary system.

The main objective of the EC is to integrate the market, preferably in its free form, with market-determined solutions to economic problems. The existing national agricultural policies of the member states had to be replaced by a common agricultural policy.

The goals of the CAP:

- To increase agricultural productivity
- To ensure a fair standard of living for the agricultural community
- To stabilize markets
- To secure availability of supply
- To ensure reasonable consumer prices

To achieve these objectives the member states set up in the 1960s the European Agricultural Guidance and Guarantee Fund (EAGGF) to finance a price support system and the development of the structure of European agriculture (Mc Donald and Dearden, 1999).

Shortly EAGGF so named to incorporate the two basic elements of the CAP it was expected that the revenues collected from the imposition of extra area import levies would be sufficient to finance EAGGF. Since then, the rapid rise in agricultural output has led to a reduction in EC imports and therefore to a reduction in receipts from levies (El-Agraa, 1998).

The particular policies by which the community would attain these objectives are also outlined but in broad terms which emphasize: (a) the social structure of agriculture; (b) the need to effect the appropriate adjustment by degrees; (c) the links between agriculture and the other sectors of the economy. But it was left to the institutions of the community, following agreed procedures, to work out the details of the common policy. To this effect a conference of agricultural ministries and farmers organizations was held at Stressa in 1958 and reached decisions on the standards for setting up and organizing a common agricultural policy which have shaped the CAP ever since. From its outset, the CAP was established on three principles, which guided every policy: the single market, community preference and financial solidarity.

A single market means the free movement of agricultural product within the community. This requires removing every distortion on competition (such as barriers to trade and subsidies), harmonizing legislation and operating a common intervention system. Market unification requires centralization of the administration, policies and market organization, which will bring about common prices. Community policies

is to set these prices in a way that will achieve its objectives, principally to provide the farmers with remunerations at levels comparable with those enjoyed by other sector of the economy.

Community preference within an integrated domestic market means protection from external influences, such as competitive imports and price fluctuations in the world markets. Protection is necessary because the production conditions in the community are inferior and the costs higher than those in the large exporting countries outside Europe. Market prices are also high because the community manages them as the main policy instrument for attaining its specific objective. Therefore community prices are higher than those of the international market, which are often distorted. Since the aim of the CAP is not self-sufficiency and in the world market many prices are set by interventionist policies, the principle of community preference also extends to embracing policies for export promotion.,

Financial solidarity means sharing the cost of the CAP between the member states and centralizing the necessary funding. This task was assigned to a specially created community organization, the European Agricultural Guidance and Guarantee Fund (EAGGF). The 'guarantee' section of the Fund finances the intervention policies of the Cap, while the 'guidance' section manages funds intended for policies of structural reform (Hitiris, 1998).

The importance of the agricultural sector as a contributor to the community's gross value-added and as an employer of factors of production is relatively small and declining. Despite increases in the volume of production, the contribution of agriculture in the community's GDP is small and declining. This trend is caused by both the relative construction of agriculture and the expansion of other sectors of the economy (Hitiris, 1998).

Instruments of CAP are; structural policies (including fund), regulated markets, variable price support systems, variable levies only, deficiency payments, direct income support (Pelkmans, 2001).

3.3 Agricultural Production in EU

The common agricultural policy (CAP) is a long-standing policy area of the European Union (EU). It absorbs a large part of the EU budget. An efficient use of these resources requires a rich system of EU agricultural statistics including those on farm structure and agricultural production as well as economic statistics.

Under the new methodology of the economics accounts for agriculture agricultural output comprises all (agricultural) output sold by agricultural units, held in stock on the farms, or used for further processing by agricultural producer (European Commission, 2002).

Table 7 shows the total GDP of EU-15 and EU-11 with current prices at euro & dollar, within the period of 1995-2000. From 1995 to 2000 GDP of EU-15 and EU-11 has increasing GDP at the euro level. Because of the exchange rate changes of each year, GDP has decreasing trend in the same period at the dollar base. According to the data's in Table 7, GDP of EU-15 was 6588.340 million euro and GDP of EU-11 was 5309.318 million euro in 1995. This amount has been increased to 8524.371 million euro in EU-15 and 6430.372 million euro in EU-11 in 2000.

Table 8 gives information about number of civilian employees in EU-15 and EU-11 within the period of 1995-1999. Total employees in EU-15 were 122522000 and EU-11 was 92143000 in 1995. In 1999 this number increased to 129892000 in EU-15 and 97580000 in EU-11.

As can be seen from Table 9, number of employees in agriculture sector decreased both EU-15 and EU-11 within the period of 1995-2000. With a parallel of decreased in number of employees in agriculture the share of person who are working in agriculture sector also decreased (see Table 10). In 1995 EU-15 1.92% of total employees was working in agriculture. During the period of sector lost its share and felt to 1.76%. In 1995 EU-11 2.1% of total employees was working in agriculture and it felt to 2.03% in 1999.

Table 7. GDP of EU (current prices, Euro & US $).

Years	EU-15 (million euro)	EU-11 (million euro)	EU-15 (million $)	EU-11 (million $)
1995	6588.340	5309.318	8774.839	7071.343
1996	6919.598	5534.944	8701.737	6960.466
1997	7287.921	5649.378	8061.942	6122.788
1998	7632.029	5882.895	8854.999	6849.475
1999	8016.767	6139.646	8130.605	6226.828
2000	8524.371	6430.372	7876.518	5941.663

Source: European Commission, Data for Short Term Economic Analysis, Euro Statistics, Theme 1, 2000.

Table 8. Number of civilian employees (total, 1000).

Years	EU-15	EU-11
1995	122522	92143
1996	123222	92598
1997	124266	93215
1998	126715	95119
1999	129892	97580

Source: European Commission, Data for Short Term Economic Analysis, Euro Statistics, Theme 1, 2000.

Table 9. Numbers of employees in agriculture (1000).

Years	EU-15	EU-11
1995	2349	1978
1996	2324	1967
1997	2327	1988
1998	2295	1973
1999	2299	1987
2000	2250	1814

Source: 1-European Commission, Data for Short Term Economic Analysis, Euro Statistics, Theme 1, 2000.
2-European Commission, Eurostat Year Book, Luxemburg, 2002.

Table 10. Share of employees of agriculture within the total employees (%).

Years	EU-15	EU-11
1995	1.92	2.1
1996	1.88	2.12
1997	1.87	2.13
1998	1.84	2.07
1999	1.76	2.03

Source: European Commission, Eurostat Year Book, Luxemburg, 2002.

4. Comparison of Agricultural Productivity in North Cyprus and EU

In North Cyprus agriculture is one of the important sectors. Government gives different types of subsidies for the development of the sector. Price stability fund, general agricultural fund, directly income support fund are the main revenues of subsidies. The Ministry of Agriculture and Forestry investigates to increase productivity and efficiency in the sector. Present agricultural policy has got similarities with CAP or standards of EU. There are not any printed documents in the agriculture sector of North Cyprus with CAP of EU (McDonald and Dearden, 1999:292)

Table 11 shows that, number of person working in agriculture sector was very high in North Cyprus. In 1995 North Cyprus, 22.74% of total employees were working in agriculture sector, while EU-15 has 1.92% and EU-11 has 2.1%. The difference between them was greater than 20 times. In 1999, North Cyprus has the share of 17.76% while EU-15 has 1.76% and EU-11 has 2.03%. Again the difference between was very large. North Cyprus was 10 times greater than EU-15 and EU-11 in the share of working person in agriculture to total working population. Number of total employees in agriculture was felt from 22.74% to 17.76% in North Cyprus from 1995 to 1999.

Table 12 shows gross value added of agriculture industry in EU-15 was 141059 million euro in 1995. From 1995 to 2000 EU-15 has an increasing agricultural value added. In 2000 it reached to 146937 million euro. EU-11 also has an increasing trend too. In 1995 the amount of agricultural value added of EU-11 was 114645 million euro and in 2000 it increased to 122866 million euro. As can be seen from Table 13 share of

Table 11 Working People in North Cyprus, EU-15 and EU-11 (%).

Years	North Cyprus	EU-15	EU-11
1995	22.74	1.92	2.1
1996	21.25	1.88	2.12
1997	19.47	1.87	2.13
1998	18.7	1.84	2.07
1999	17.76	1.76	2.03

Source: 1-European Commission, Data for Short Term Economic Analysis, Euro Statistics, Theme 1, 2000.
2-European Commission, Eurostat Year Book, Luxemburg, 2002.

Table.12 Gross Value Added at Basic Prices of the Agricultural Industry in EU (million euro).

	1995	1996	1997	1998	1999	2000
EU-15	141059	147407	147473	145420	142994	146937
EU-11	114645	121275	121456	121341	119018	122866

Source: 1-European Commission, Data for Short Term Economic Analysis, Euro Statistics, Theme 1, 2000.
2-European Commission, Eurostat Year Book, Luxemburg, 2002.

Table.13 Agriculture as a share of GDP in EU-15 and EU-11 (%).

	1995	1996	1997	1998	1999	2000
EU-15	2.14	2.13	2.02	1.9	1.78	1.72
EU-11	2.15	2.19	2.14	2.06	1.93	1.91

Source: European Commission, Eurostat Year Book, Luxemburg, 2002.

agricultural value added into the total GDP of EU-15 was 2.14 % in 1995. During the period, total share of agricultural value added has decreasing trend. In 2000 it felt to 1.72 % of total GDP. EU-11 has 2.15 % of agricultural value added within the total GDP in 1995 .The share of agriculture within the total GDP was decreased by small amount and reached to 1.91 % in 2000.

Table 6 gives information about the per capita productivity of agriculture in North Cyprus EU-15 and EU-11 at the dollar base within the period of 1995-2000 from 1995 Per capita productivity in agriculture of North Cyprus was 4362.883 dollar it reached to 4687.582 dollar in 2000. Per capita productivity of EU-15 was 79867.377 dollar in 1999; it felt to 60080.906 dollar in 2000. EU-11 has 77086.88 in 1995 and 62313.517 dollar in 2000. Per capita productivity of EU-15 and EU-11 has been decreasing while N. Cyprus has increasing trend at the same period. Per capita productivity of EU-15 and EU-11 approximately 18 times greater than per capita productivity of North Cyprus in 1995. With a parallel of decrease the productivity of EU-15 and EU-11, this gap was constructed. In 2000, per capita productivity of EU-15 and EU-11 approximately 12 times greater than per capita production of North Cyprus.

5. Conclusion

Agricultural value added and share of agriculture in total GDP has decreasing trend from 1985 to 2001. At the same time period number of working population in agriculture and the share of agricultural employment to total employment has also decreasing. In spite of this long run continuous decrease, per capita agricultural productivity nearly stable.

Agricultural production based on high labor force and traditional production techniques. Technological inputs and infrastructure rarely used in production process. Farmers are small-scale producers who invest little in mechanical equipment or chemicals. Labor is used intensively; mechanization and fertilization are used only infrequently in North Cyprus.

The purpose of this paper is, to find out the per capita agricultural productivity of North Cyprus and compare to EU agricultural labor productivity. In the light of these results the different production techniques of agriculture sector in North Cyprus and EU has been finding out.

Agricultural production mainly

based on improved technology and innovation in seed and irrigation techniques. To increase productivity, North Cyprus needs to improve its capital investment for modern equipment and innovation and also has to be investing technological inputs and infrastructure in the production process. Country has to be making long run technological investment to lower the unit cost of production and to reach higher productivity.

Agriculture plays a major role in the EU's microeconomic policy. The roots of the CAP lie in the fact that agricultural products are relatively standardized and easily traded internationally. One of the goals of CAP is to increase agricultural productivity.

Share of agricultural employees within the total employees in North Cyprus was 17.76% and share of employees of agriculture within the total employees in EU was 1.76% in 1999. With this low share of agricultural labor in total labor, Per capita agricultural productivity in EU was 60954.38$. Comparison of North Cyprus and EU, per capita agricultural productivity in North Cyprus was only 4972.02$ with the high share of labor input. This shows that the agricultural labor productivity is low in North Cyprus and needs to be improved by using technology, innovation, and modern and planned production techniques, like EU.

Changes in productivity will be affected by the policies of both firms and governments. The governments need to try to maintain a stable economic environment, thereby encouraging private investment by reducing uncertainty. Government at all levels can increase productivity by founding basic and applied research is by disseminating both the results of this research and information on technological developments in other countries; by science and technology; by investing in infrastructure such as roads, bridges, and airports, and by strengthening competitive forces throughout the economy.

The study clearly pointed out that, agricultural productivity should be improved by using appropriate production policies and techniques. CAP of EU is a good example for the agriculture sector of North Cyprus. CAP should be investigate and adapt to the sector of North Cyprus as soon as possible. This study also recommends that, productivity and technological improvement should be organized together to reached efficiency.

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