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CASE Network Reports

Scenarios for the Agricultural Sector in South and East Mediterranean Countries by 2030

Saâd Belghazi



Warsaw Bishkek Kyiv Tbilisi Chisinau Minsk

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Abstract

The paper builds predictive scenarios for the agricultural sector of eleven Mediterranean countries (Med 11), namely Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Palestine, Syria, Tunisia and Turkey. First, it assesses the performance trends of the Med 11 agricultural sector with a focus on production, consumption and trade patterns, incentives, trade protection policies and trade relations with the EU and productivity dynamics and their determinants. Secondly, it presents four scenarios based on the main value chains of the agriculture sector of Med 11: animal products, fruits and vegetables, sugar and edible oil, cereals and fish and other sea products. The four scenarios are: business as usual, Mediterranean One global Player, the Euro Mediterranean Area under threat and the EU and Med 11 as Regional Player.

Executive Summary

This paper builds predictive scenarios for the agricultural sector of eleven Mediterranean countries (Med 11), namely Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Palestine, Syria, Tunisia and Turkey. For some countries, in particular Palestine, Libya and sometimes Syria, statistics and data related to trade and incentive policies for the agricultural sector are missing.

First, the paper assesses the performance trends of the Med 11 agricultural sector with a focus on production, consumption and trade patterns, incentives, trade protection policies and trade relations with the EU and productivity dynamics and their determinants. Secondly, it presents four scenarios based on the main value chains of the agriculture sector of Med 11: animal products, fruits and vegetables, sugar and edible oil, cereals and fish and other sea products. The four scenarios are: business as usual, Mediterranean One global Player, the Euro Mediterranean Area under threat and the EU and Med 11 as Regional Player.

Agricultural GDP of Med 11, minus Libya and Palestine, amounted to 73.5 billion dollars at constant 2000 prices in 2007. Its share in the world agricultural production has remained constant at 5.5% from 1994 to 2007.

Five countries, Turkey, Egypt, Morocco, Algeria and Syria, make up more than 91% of the total agricultural production in the Med 11 countries (minus Palestine and Libya), with Turkey alone accounting for about 39 % of the production. The Med 11 countries production in cereal, roots and tubers exceed their respective consumption. Their animal production is on par with their consumption. Med 11 countries experience a huge shortage in vegetable oils and sugar. The exporting agricultural activities are mainly vegetables and fruits Turkey is the sole Med 11 country exporting significant amounts of cereals.

EU is the most important origin and destination for the Med 11 countries trade, and particularly for Palestine, Israel, and North African countries. EU exports to the Med countries, mainly cereals, face fierce competition from other exporting nations. The bulk of the EU export in Med 10 countries (Med 11 minus Libya) is oriented toward the Egyptian, Algerian and Moroccan markets.

The policies toward agricultural sectors are conservative in all of the Med 11 countries (minus Palestine and Libya). Domestic markets are heavily protected by tariffs. Governments support the agricultural sector with subsidies and domestic markets organization. The agricultural sectors were largely marginalized in the association agreements between EU and Med region. The EU applied a selective protection depending on the countries and the risks for the EU common market coming from individual Med countries producers.

During the last decade, the Med 9 average productivity per agricultural workers rose from 2.3 thousand US dollars per year to 3 thousands US dollars, at constant 2000 prices. The productivity rose in all the countries. With the exception of Lebanon and Egypt, agricultural productivity is greatly sensitive to the climate fluctuations, in particular to availability of rainfall that can greatly vary from year to year. But the rising trend of investment in irrigation and equipment, observed during the 2000's, limits the impact of climate changes on agricultural productivity.

During the last decades, the Med 11 active population in agriculture decreased at the slow pace of 0.2% per year.

The prospective scenario projections are based on the trends observed over the 1994-2007 period in five groups of products value chains: animal products, vegetables and fruits, sugar and edible oils, cereals, fish and other sea products.

The scenario I, Business as Usual (BAU), continues the trend observed during the last two decades. The comparison between observed data for the period 1994-2007 and the BAU projections shows a rise in the Med 8 (Med 11 minus Palestine, Syria and Libya) per capita production for all value chains, except for cereal which decreased slightly. The exports decreased for fruits, vegetables and sea products and rose for animal products, sugar, edible oils and cereals. The absorption rose for all products, mainly for fruits and vegetables and sea products. The Med 11 (minus Palestine and Libya) imports increased in cereals, fruits and vegetables, sugar and edible oils and sea products, while they decreased for animal products.

The Scenario "Mediterranean One Global Player" induces increases in production and imports, and a bigger rise in exports and absorption. Production, imports and exports increase for all value chains. Imports increase strongly for animal products and exports for fruits and vegetables and sea products. The domestic absorption decreases for fruits and vegetables. It rises for animal products and sea products. The consumption of sugar and edible oils remain stagnant, with a very slight decrease. The rise in cereals consumption is mainly due to an increase of the demand for animal feed. The "EU and Med as regional player" scenario is very close to the "Mediterranean One global Player". One observes that the magnitudes of the changes in the BAU scenario are smaller in all if the production, absorption and trade.

The worst effects come with the "Euro Mediterranean Area under Threat" scenario. In the Euro-Mediterranean under threat scenario the agricultural sectors becomes inward oriented. This scenario is the less favorable to revenue generation. Deficits are higher: production, absorption and exports decrease, while imports continue to increase. The productivity grows at a lower rate than in the BAU scenario. In this last scenario, the agricultural employment shows a small increase, while it is decreasing in all other scenarios.

1. Introduction

The analysis of agricultural trends and scenarios targets a set of eleven countries of the East and South Mediterranean region, Med 11, namely Morocco, Algeria, Tunisia, Libya, Egypt, Palestine, Israel, Jordan, Lebanon, Syria and Turkey. In the cases where data is not readily available, such as Palestine and Libya, the study applies only to the other nine countries (Med 9).

In preparation of the predictive analysis for the period up to 2030, we start by analyzing the observed trends in the economic characteristics of the Med 11 agricultural sector since 1994. We proceed then by providing an overview of the agricultural policies in the Med region; for this we build our analysis on the review published by the Food and Agriculture Organization (FAO) as well as on the trade policy review reports of the World Trade Organization (WTO). This review covers the period 2003-2010, but varies slightly amongst countries due to data availability. Subsequently, all the countries are not covered with the same detail. For instance no data was available for Syria agricultural policies. Syria was therefore largely excluded from the analysis.

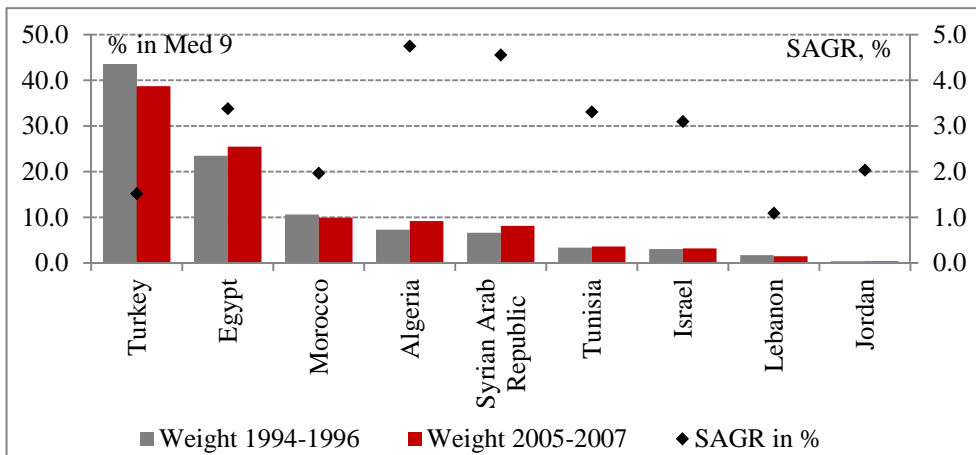
2. Assessing Economic Trends of the Med 11 Agricultural Sector

2.1. Growth performance of the agricultural sector in Med 11

Agricultural GDP of the Med 9 amounted to 73.5 billion dollars at constant 2000 prices in 2007. Its share in world agricultural production remained constant at 5.5% in 1994-2007.

In 2005-2007, five countries, Turkey, Egypt, Morocco, Algeria and Syria, made up more than 91% of the total agricultural production of the Med 9 countries (Figure 1). During the same period, Turkey accounted for about 39% of the Med 9 Agricultural GDP, Egypt for 25.5%, Morocco for nearly 10%, and Algeria for slightly more than 9%. The average growth of agricultural output between 1994-1995 and 2005-2007 was the highest for Algeria and Syria, slower for Egypt, Israel and Tunisia and the slowest for Morocco, Jordan, Turkey and Lebanon.

Figure 1. Agricultural GDP in Med 9 countries: % of weights in Med 9 and average annual growth rate of gross domestic products



Note. SAGR: Average Annual growth rate.

Source: FAO Statistical Yearbook 2009 in [www. http://www.fao.org/economic/ess/ess-publications/ess-yearbook/en/](http://www.fao.org/economic/ess/ess-publications/ess-yearbook/en/).

2.2. Demand patterns, food security and Med 11 comparative advantage

The food demand structure in the Med 11 countries depends on the average per capita income, its distribution, and dietary habits of the societies (Table 1).

Table 1. Consumption of 10 major vegetal foods (2003-2005)

Countries	Dietary energy consumption (kcal/person/day)					2007 GDP per capita (US\$ constant 2000 prices)
	Cereals and pulses	Sugar raw eq.	Potatoes	Soybean oil	Animal foods	
Med 11	1774	286	76	86	303	
Israel	1243	273	86	386	728	21 994
Libyan Arab Jamahiriya	1255	355	65	43	320	7 360
Lebanon	1140	324	187	219	505	5 273
Turkey	1721	243	102	56	360	5 114
Tunisia	1651	328	60	292	301	2 693
Jordan	1338	413	48	118	295	2 233
Algeria	1680	286	106	85	287	2 159
Egypt	2164	263	45	41	225	1 697
Morocco	1740	356	77	153	183	1 673
Syrian Arab Republic	1441	350	51	38	430	1 269
OPT	1025	213	23	82	283	
World	1996	196	62	84	429	5 924

Source: FAO Statistical Yearbook 2009.

The share of animal food in the total intake increases with per capita revenue. The consumption structure reflects quantitative as well as qualitative shifts. The shift in budget constraints leads to a shift in the food preferences function. The future demand structure of food products will depend on the relaxation of this constraint.

Although the availability of food is sufficient (2,700 to 3,500 calories per person per day), the primary energy content of food intake is low (only 20% is composed of animal products). Most of the meals consist of vegetables; fish – in coastal zones – and little meat. Usually used to add flavour or held for festive occasions. Vegetables are also used to accompany cereals, such as couscous or pasta, and constitute the basic ingredients of sauces enriched with olive oil and condiments. Salads (seasoned with olive oil) and fruit are part of all main meals. Cheeses are frequently combined with vegetable dishes. Fresh milk is barely consumed

as such, yet fresh sheep or goat's milk cheeses, cultured milk (labneh, rayeb, ayran, etc.) and yoghurt are staples of all Mediterranean diets. Culinary herbs and spices are widely used as well as acid flavouring, vinegar or lemon juice.

There is still a contrast in food intake structure between the countries on the northern shores, and those on the southern-shore. The diet in the latter countries is mainly vegetarian (10% or less of the calories are of animal origin); cereals are the basic ingredient and are complemented by pulses, which have a high protein content. Food intake in the riparian countries in the North has high animal products content and is twice as high as the southern diet.

In the southern Mediterranean countries, the available food supply has considerably grown over the past 40 years with an average increase of 800 kilocalories per person per day in 2005 as compared with the kilocalories observed in 1965. The food model of these populations departs from the Northern Mediterranean model; a slow westernization of dietary habits is noticeable. Greater emphasis on the major components (cereals and pulses) is in fact observed as well as a comparatively high level of consumption of simple sugars. Calories from cereals products are the cheapest.¹ For this reason, cereals share is bigger in the consumption panel of poorest households, and the share of fruit, vegetables and fish (foods that are highly recommended) is lower than in the consumption panel of the richest households.

2.3. Agro industry, agricultural trade deficits and Med 11 comparative advantages

Aside from fruits and vegetables, almost all the agricultural products consumed in the Med 11 countries went through agro-industrial processing. Agro-industry - commercial circuits substituted very quickly for the informal circuits where independent workers were the main intermediates and manufacturers.

The development of logistics and transports means and the opportunities of economies of scales, as well as economies in packing and preserving the food products quality, imposed the industrial plant as a necessary intermediate phase between the agricultural producer and the urban consumers. As a result of shortages and subsidies granted to basic food products such as cereals, oil, sugar and powder milk, the rural consumers progressively left auto-consumption and tradi-

¹ The cereals calorie lower costs explain not only the Med 11 countries households enhanced demand for cereals, but also their Governments choice to subsidise wheat flour and barley grains as a tool to fight poverty effects.

tional products and increasingly provided their household needs with manufactured food purchased on the market.

Table 2. Ratio of production to food supply (2003-2005)

Countries	Cereals	Vegetable oils	Sugar and sweeteners	Roots and tubers	Meats	Milk
Med 11	1.28	0.64	0.57	1.27	0.94	1.01
Algeria	0.54	0.16	0.00	1.12	0.87	0.43
Egypt	1.13	0.45	0.86	1.45	0.91	1.21
Israel	0.29	0.67	0.02	1.81	0.90	0.98
Jordan	0.10	0.31	0.00	1.16	0.77	0.61
Lebanon	0.32	0.44	0.02	1.32	1.00	0.57
Libyan Arab Jamahiriya	0.23	0.13	0.00	1.07	0.85	0.39
Morocco	0.89	0.60	0.47	1.20	1.00	1.24
OPT	0.13	0.49	0.00	1.12	0.88	0.89
Syrian Arab Republic	1.84	0.86	0.16	1.20	1.00	1.15
Tunisia	1.09	1.02	0.01	1.09	0.98	0.95
Turkey	2.18	0.82	1.16	1.25	1.02	1.22
World	2.15	1.66	1.15	1.74	1.02	1.21

Source: FAO Statistical Yearbook 2009.

Between 1960s and 1980s, the competitiveness of the manufactured food products relied, in the first step on imports, made cheaper by subsidies granted by the big exporting countries, USA and European countries. In the subsequent decades, the government policies in Med countries were driven by food self-sufficiency objectives.

Four Med 11 countries have an excess in cereal production, while seven have deficits. All have excess in roots and tubers (Table 2). The animal production is almost balanced with the consumption needs. Med 11 countries are in huge shortage of vegetable oils and sugar.

Yet, the situation differs across countries. While some countries achieved food self-sufficiency, like Turkey which covers largely its consumption needs, others like Syria and Egypt achieved this objective only partially, progress in cereals independence were balanced by deficits in sugar or in vegetables oil. Some countries, like Algeria and Morocco, were cereal exporters in 1950s and in the beginning of 1960s they became structural cereals importers.²

² Algeria and Morocco became structural importers thank to several factors. The main factor is the productivity stagnation due to changes in farms ownership and management and to domestic price policies giving negative incentives to producers. Governments were

2.4. External trade

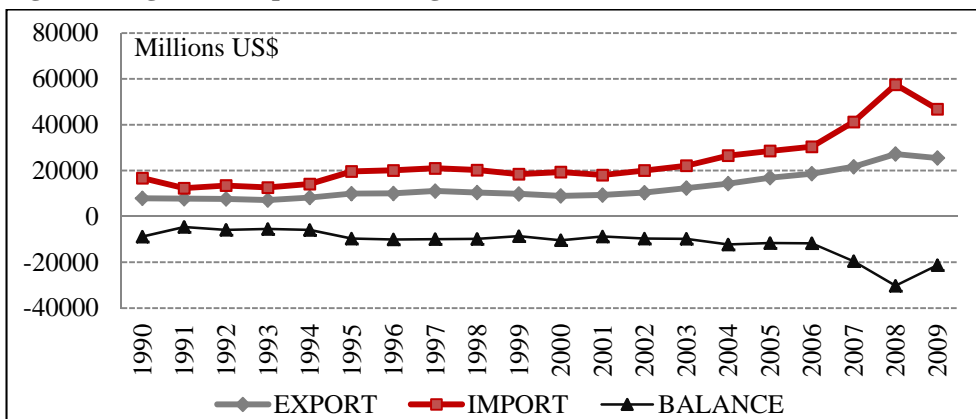
2.4.1. The global agricultural trade of the East and South Med countries

The region of East and South Mediterranean countries is a net importer of agricultural products (figure 2).

The trade balance in agricultural products improved for Turkey, Syria, Tunisia, Jordan, Lebanon and Egypt (figure 3) and thus for Med as a whole given that Turkey represents the largest part of Med trade in agricultural products. The trade balance became positive between 2000 and 2009 only for Turkey, reaching 114 per cent. It also improved greatly for Syria achieving nearly 98%. For Morocco, the balance deteriorated from 85% to 74%. No improvement was observed for Israel, which had a balance of 52%.

Analysis of individual countries' shares in agricultural exports and imports of the Med 9 group reveals the high weight of Turkey which represents 43% of the total Med exports in both 2000 and 2009 (figure 3). Egypt's share rose from 7% in 2000 to 11% in 2009, while Morocco's share decreased from 19% to 13%. The import shares of some countries did not change: Turkey (21%), Algeria (15%), Lebanon (6%) and Jordan (5%). Slight decreases are noted for Israel (12% to 9%), Egypt (22% to 20%), Tunisia (5% to 4%) and Morocco (10% to 9%). Increases were recorded for Libya (0% to 4%) and Syria (4% to 7%).

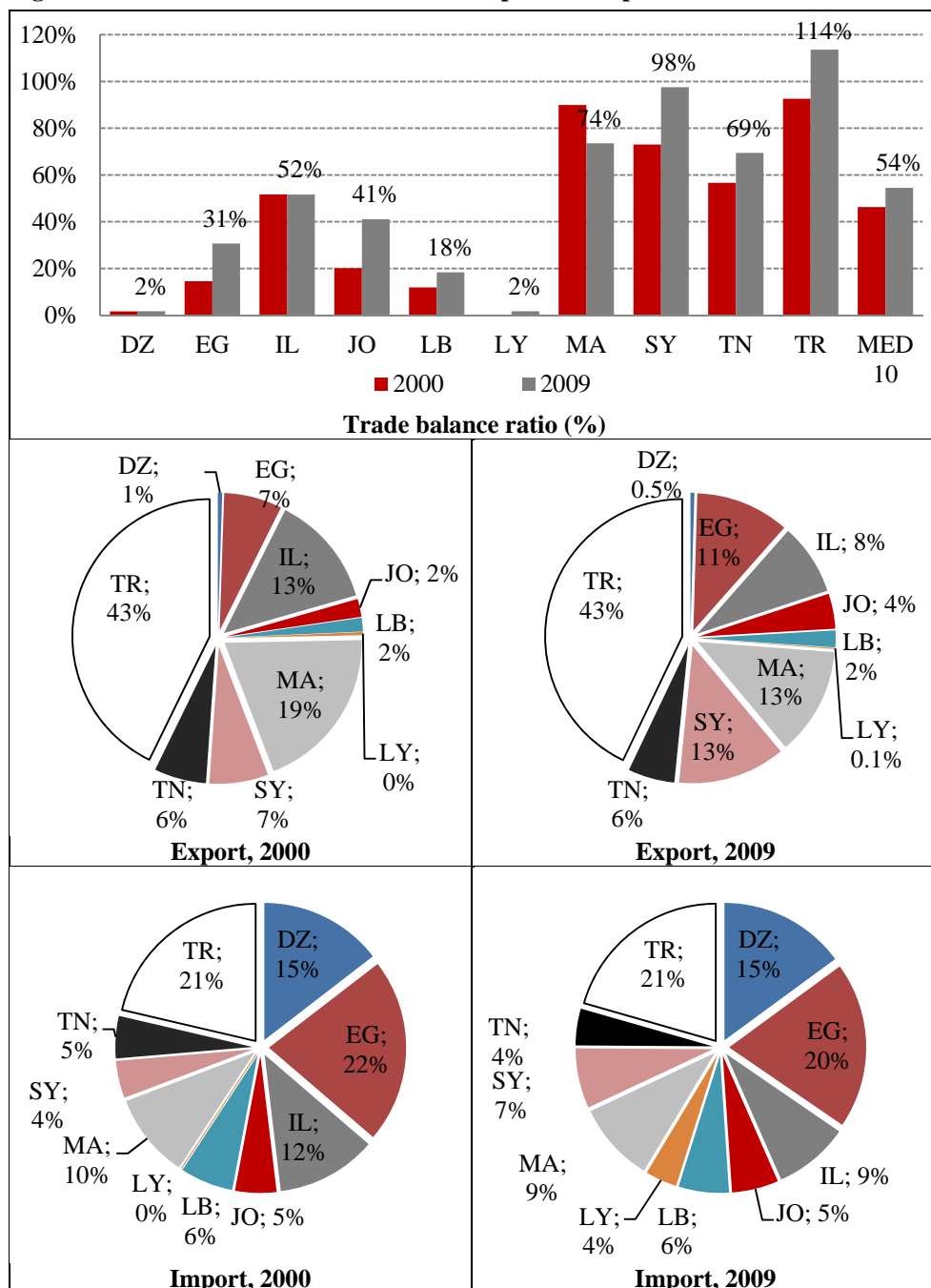
Figure 2. Agricultural products foreign trade and deficit of the Med 10 countries



Source: www.faostat.org.

not aware of the risk and relied on low price cereals imports. The same mechanisms worked for sugar and edible oils value chains.

Figure 3. Med 11 trade balance ratios and import and export shares 2000 and 2009



Source: www.faostat.org.

2.4.2. The agricultural trade of the East and South Med countries with European Union

The Med 10 (Med 11 without Libya) countries account for 6.8% of the total EU agricultural products imports in 2009 (table 3). The share of the main exporters, Turkey (3.2%), Morocco (1.7%) is increasing. Israel exports share to EU is hovering near 1%, with about 1 million Euros, while the Egypt agricultural exports were increasing from 512 million Euros in 2006 to 603 million Euros in 2010. The exports from Tunisia to EU fell from Euro 745 million (constant 2006) to Euros 438 million in 2010, a decrease of more than 41% in four years. The amounts imported from Jordan, Syria, Lebanon and Palestinian Territories are very small.

Table 3. European Union agricultural products imports from Med 10 – 2006-2010

Countries	2006		2008		2010		Share of total EU Agro imports in 2008, %
	Millions euro	% (*)	Millions euro	%	Millions euro	%	
Algeria	56.7	0.2	48.0	0.2	34.6	0.2	0.0
Egypt	512.5	6.7	551.1	6.7	602.9	8.5	0.5
Israel	1 086.7	10.9	1 024.3	9.1	1 009.2	9.1	0.9
Jordan	16.7	7.2	17.0	5.6	18.6	7.8	0.0
Lebanon	40.0	17.8	54.1	15.2	54.4	16.5	0.0
Morocco	1 792.8	24.8	1 961.5	23.3	1 912.0	24.8	1.7
OPT	6.9	54.0	4.5	62.1	5.5	59.6	0.0
Syria	174.7	5.0	72.8	2.0	80.0	2.3	0.1
Tunisia	745.4	9.8	644.4	6.8	438.2	4.6	0.4
Turkey	3 430.6	8.2	3 350.7	7.3	3 519.4	8.4	3.2
Total	7 863.0		7 728.4		7 674.8		6.8

* % of agricultural products in the total of EU imports from the country.

Note. Med 10 stands for Med 11 without Libya.

Source: Eurostat - Comext - DG Trade - March 2011.

The share of agricultural products in the total countries exports to EU are important for Palestinian Territories (59.6% in 2010, even if the considered amounts are small, with less than 6 million Euros) and for Morocco (24.8% in 2010). In 2010, these shares stood near 8.4% for Turkey, 9.1% for Israel, 8.5% for Egypt and 7.8% for Jordan.

Med 10 (Med 11 without Libya) countries imports from the EU amount to 13% of total EU agricultural products exports in 2008 (table 4). Turkey is the main importer from EU. The share of agricultural products in its total imports from EU is increasing.

Table 4. European Union agricultural products exports to Med 11 – 2006-2010

	2006		2008		2010		Share of total EU Agro exports in 2008, %
	Millions euro	%	Millions euro	%	Millions euro	%	
Algeria	1 502.1	15.1	2 581.5	16.8	2 333.1	2.5	2.5
Egypt	947.3	10.4	1 283.2	10.1	2 057.2	13.9	2.2
Israel	868.2	6.2	962.7	6.8	1 037.0	7.2	1.1
Jordan	285.7	10.7	308.9	10.5	440.6	15.8	0.5
Lebanon	404.7	12.7	437.7	11.2	671.2	14.2	0.7
Morocco	842.5	8.0	1 505.5	10.4	1 330.8	9.8	1.5
Palestinian territories	4.3	11.0	6.7	10.9	10.8	13.5	0.0
Syria	428.2	14.3	393.0	11.3	452.4	12.4	0.5
Tunisia	487.8	5.6	695.8	7.0	715.1	6.5	0.8
Turkey	1 849.8	3.7	2 278.2	4.2	2 907.3	4.7	3.2
Total	7 620.6		10 453.2		11 955.5		13.0

Source: Eurostat - Comext - DG Trade - March 2011.

EU exports to the Med countries faces a fierce competition from other countries and regions mainly for cereals.³ The bulk of the EU export in Med 10 countries is destined for Egypt, Algeria and Morocco. But, the amounts may vary from year to year, depending on the annual domestic production of these commodities and also on the importers strategies and the trade policy arrangements. For instance, the access to the Moroccan internal market is restricted by varying customs duties, which increase when the cereal harvest is good so as to reserve a set share of the domestic market for the domestic suppliers.

Table 5. European Union agricultural products trade balance with Med 11 – 2006-2010, millions euro

Countries	2006	2008	2010
Algeria	1 445	2 534	2 299
Egypt	435	732	1 454
Israel	-219	-62	28
Jordan	269	292	422
Lebanon	365	384	617
Morocco	-950	-456	-581
Syria	254	320	372
Tunisia	-258	51	277
Turkey	-1 581	-1 073	-612
Total	-240	2 723	4 275

Source: Eurostat - Comext- DG Trade - March 2011.

³ United States and Canada in North America, Argentina in Latin America, Russia and Ukraine in Europe and Australia in Oceania.

The EU agricultural trade balance varies from year to year. In 2006 it was negative but it was substantially positive in 2008 and 2010 (table 5). In these latter years, EU bilateral trade balance is negative only with Turkey and Morocco. But in any event this agricultural trade balance is very dependent on the trade between the EU and Algeria that is a large importer of EU cereals, with imports greatly dependent on the climatic conditions that affect local cereal production. The total trade balance with Med 10 is unstable due to large variations in cereal production in Med.

3. Agricultural Policies: Public Support, Trade Protection and Export Agreements

This review is based on WTO reviews. It is limited to six countries: Egypt, Israel, Jordan, Morocco, Tunisia and Turkey. It describes the main features of the long term strategies in agricultural policies, the domestic market protection through tariffs and quotas, the characteristics of the agricultural support policies and the market control and regulatory institutions.

The common features of the reforms are related to the WTO commitments of individual countries, which, however, try to control the access of imports to their markets, mainly through tariffs and quotas. The countries use incentives and transfers to producers with the aim to affect structural changes. The objectives of this policy are rather contradictory: modernizing the production tools and producers units, while preserving the small farmers income and limiting rural poverty. The majority of the Med 11 countries provide subsidies to consumers which generate distortions as the reductions in consumer prices push up the demand for food while blunting the impact of the producer support measures. The export sector is supported through direct subsidies and administrative support. But, the main export incentives come from the EU market access advantages obtained from uneven and complex negotiations with the European Commission. The WTO members⁴ from Med 11 countries are committed under WTO rules to keep their import tariffs below the bounded tariffs, to renounce non-tariff barriers and to reduce the level of protection of their agricultural production, even if the bounded tariffs applied to key products will stand at high levels. Applied tariffs are often lower than the bounded rates.

3.1. Agricultural policies long term trends

The Med 11 countries have long term strategies for their agricultural sector. The agriculture sector has a key role in growth model of Morocco, Turkey, Egypt,

⁴ Non members are Syria, Libya, Algeria and Lebanon.

Syria and Tunisia. The government measures support productivity and technical upgrading. Even though the trend of the overall economic policies in Med includes privatization, increased competition in local markets and development of competitiveness, the Med 11 Governments still resort to selective protection of some key agricultural products on domestic market and support the prioritised products on export markets.

In **Egypt**, the strategy for agriculture development 1997/98-2016/17 aims at increasing the annual growth rate of agricultural production, at encouraging domestic and foreign investment in the agriculture sector, especially in the newly reclaimed areas, to develop animal production, particularly small ruminants, poultry, and fisheries and to intensify agricultural research. To encourage the local crops valorisation, the Government provides financial assistance to the agriculture sector in the form of subsidized electricity and water, the latter being provided almost free of charge to farmers.

In **Israel**, historically, agriculture has been regulated by strict production and water quotas for each crop. The Government supports and supervises the sector through, inter alia, price support, direct support for investments, R&D, SPS measures, planning, and marketing.

In **Jordan**, the government adopted a National Strategy for Agricultural Development for 2002-2010. Its objectives are to create a suitable environment for private-sector investment in agriculture; improving processing and marketing of agricultural products; and conserving Jordan's natural resources, to contribute to improved employment and income opportunities, and to reduce the deficit in the agricultural trade balance. The main instruments of domestic support notified were government services, price support (for wheat and barley), and input subsidies. Subsidies were provided for irrigation water and feed for livestock. Export subsidies for agricultural products were bound at zero and, according to the authorities, no export subsidies have been provided since Jordan's accession to WTO. Income earned in agriculture is exempt from income tax. Relief from natural disasters affecting agriculture is provided on an ad hoc basis.

In **Morocco**, the main objectives of agricultural policy are food security, the improvement of farmers' incomes and the conservation of natural resources. The new *Plan Maroc Vert* adopted in 2008 aims to make agriculture the engine of economic growth in the next decade, through two pillars: the first is support for the high value added activities which include a strong export performance, the second is the "Agriculture Solidaire" oriented toward the small farmers sector.

The evolution of **Tunisian** agriculture reflects a sustained commitment by the Government, involving public investment in the infrastructure, subsidies for private investment, price stabilization, training and extension, and import protection

in the interests of rural development, food security and self-sufficiency, and social stability. With the exception of wheat, agricultural production activities have been substantially liberalized; input and interest rates subsidies have been practically eliminated; the price of water continues to be adjusted towards cost recovery; and the marketing boards have partially lost their monopolies.

Turkey's key policy objectives for agriculture are increasing producers' welfare; promoting rural development; ensuring food security and safety; and improving efficiency, productivity, quality, and competitiveness. The Turkish agricultural strategy has four objectives: (i) phasing out price support and credit subsidies, and replacing them with a less distortionary direct income support (DIS) system to farmers; (ii) withdrawing the government from direct involvement in crops production, processing, and marketing; (iii) reducing output intervention purchases financed from the budget leading to price cuts; (iv) and facilitate the transition diverse crops value chain to efficient production patterns.

3.2. Foreign trade protection and subsidies to agricultural sector

Only 6 countries of the Med 9 countries are WTO members. Algeria, Lebanon and Syria are non-members, while the Algeria and Lebanon have observer status. The concerned Med 6 have generally high *bound tariffs* (Table 6). These are higher for agricultural products than for manufactured products. The range for agricultural products is from 23% (Jordan) to 116% (Tunisia) while it is from 11.2 (Israel) to 40.5% (Tunisia) for non-agricultural products. The bounded tariffs for agricultural products reach, respectively for Tunisia, Egypt and Israel, 116.1 %, 96.1% and 73.3%. For Turkey and Morocco, these bounded tariffs are respectively 60.1% and 54.5%.

In all countries, the *applied tariffs* for agricultural imports are higher than the tariffs applied for non-agricultural products tariffs. The highest average tariff is observed in Egypt with more than 60%.⁵ For Morocco, Turkey and Tunisia, this rate is about 42% to 40%. For Israel, Lebanon and Jordan, it is less than 20%, while in Algeria it stands at 23%.

The MFN duty free imports amounts are high for Israel (67.3%), Jordan (51.6%), Turkey (30.6%) and Morocco (27.4 %). Government afford duty free imports to the agricultural product which are deemed not to compete with local production.

⁵ This is still 50% less than the average bounded tariff.

Table 6. Foreign trade protection indicators for Med 9 countries in 2010

	DZ	EG	IS	JO	LB	MA	SY	TN	TR
WTO accession date	Ob-server	30 June 1995	21 April 1995	11 April 2000	Ob-server	1 January 1995	Non member	29 March 1995	26 March 1995
<i>MFN tariffs (Final bound): Simple average of import duties</i>									
All goods		36.8	22.0	16.3		41.3		57.9	28.3
Agricultural goods (AOA)		96.1	73.3	23.7		54.5		116.1	60.1
Non-agricultural goods		27.7	11.2	15.2		39.2		40.5	16.9
Non <i>ad-valorem</i> duties (% total tariff lines)		0.2	5.9	0.1		0.0		0.0	0.1
<i>MFN tariffs (applied 2008): Simple average of import duties</i>									
All goods	18.6	16.7	6.8	10.8	6.8	21.4		21.5	9.7
Agricultural goods (AOA)	23.3	66.4	17.9	18.1	19.5	42.4		40.9	42.2
Non-agricultural goods	17.8	9.2	5.1	9.8	4.9	18.3		18.6	4.8
Non <i>ad-valorem</i> duties (% total tariff lines)	0.0	0.2	4.7	0.1	6.0	0.0		0.0	0.6
<i>MFN duty free imports (% of imports)</i>									
in agricultural goods (AOA)	0.0	.	67.3	51.6	.	27.4		13.3	30.6
in non-agricultural goods	0.6	.	76.7	45.6	.	1.2		35.2	38.4

Source: www.wto.org – WTO Trade Profiles and Tariff Profiles – October 2010.

3.2.1. Egypt

The simple average tariff⁶ on agricultural goods (ISIC Rev.2 definition) and the applied weighted average tariff on agricultural good were respectively 66.4% and 5.8% in January 2005. Applied tariffs are relatively high on meat and edible meat offal (21.2%), and edible fruits and nuts (14.4%). The highest agricultural tariff of 40% is charged on various fruits (apples, apricots, bananas, and pears). Lower tariffs are charged on oilseeds and oleaginous fruits, at an average rate of 2.9%, and on cereals at 3.3%. Egypt does not maintain tariff quotas (TQ).

⁶ This average is high because the very high tariffs applied to beverages and other products (Table 7).

The Government has been actively encouraging private sector participation in agriculture. Investment in the sector is eligible for benefits provided by the Investment Guarantees and Incentives Law (8/1997). A program to encourage the use of local cotton was terminated in 2003. Financial assistance to the agriculture sector is provided in the form of subsidized electricity and water, the latter being provided almost free of charge to farmers. The government subsidizes a number of food products for low-income groups, most notably bread, sugar, and oil. Outlays amounted to LE 8.2 billion in 2004, up from LE 4.1 billion in 2003. In May 2004, the Government reintroduced vouchers for basic foodstuffs following strong price increases over the previous two years. Subsidies for fertilizers and pesticides were removed in the mid 1990s.

3.2.2. Israel

Israeli farmers benefit from relatively high tariff protection. In 2005, the average MFN applied tariff (including the *ad valorem* equivalents of specific, compound, and alternate duties) on agricultural products was 41%.⁷

Around 40% of agricultural goods enter Israel duty free compared with around 51% of non-agricultural products. MFN applied tariffs are higher than the overall average rate in six subsectors: live animals (with an average tariff of 29.0%), meat products (64.6%), dairy products (120.6%), edible vegetables (63%), edible fruit (87.1%), and preparations of cereals, flour, starch or milk products (42.3%). The average MFN applied tariffs on these products, and on vegetable planting materials, sugars and sugar confectionery, and edible preparations have increased since the previous trade policy review (TPR) for Israel. Imports of some products are also submitted to tariff peaks of up to 560% on some edible fruits and nuts.

TQ apply to 12 product groups. However, for most of these products the in-quota tariff rate is above the MFN applied rate, thus rendering the quota redundant. As a result, these TQ are in general overfilled. All of Israel's trade agreements, except for the agreement with EFTA, provide for preferential TQ on agricultural goods. Seasonal tariffs are applied to 21 fruit and vegetable products during their harvest seasons.

Domestic support for agriculture, as measured by the current Total Aggregate Measure of Support (AMS), amounted to US\$282 million in 2003. In 2003, around 76% of product-specific AMS (plus "de minimis" support)⁸ was for milk

⁷ WTO secretariat estimates based on data provided by the Israelis authorities.

⁸ For developing countries, de minimis support under the AMS encompasses product-specific support which does not exceed 10% of the value of production of the product

production, while around 19% was for eggs. Price support constitutes the main instrument of income support, accounting for 88.1% of total product-specific AMS in 2003.

3.2.3. Jordan

The simple average applied MFN tariff on agricultural products is 17.1% (2008). Applied MFN tariffs average 16.7% on agricultural products. The applied MFN import duties for vegetables are in the range of 0-30% with a simple average of 16.7%. The MFN tariff for tomatoes and cucumbers, at 30%, is at the high end, although the self-sufficiency ratios of these products are far in excess of 100%. Import tariffs for fruit are in the range of 10-35% with a simple average of 25.6%. Imports of oranges carry an MFN tariff of 35% from May to end of February. Imports of bananas, grapes and apples are subject to even higher compound duties. Applied MFN tariffs in the livestock subsector are in the range of 0-30% with a simple average of 5% for live animals and 12.9% for meat (incl. edible offal). Import tariffs are: 5% on beef, lamb, and goat meat (HS 0201/0202/0204), with the exception of ground meat for hamburgers (21%),⁹ 22% on pork (HS 0203); and 0-30% for poultry meat (HS 0207). Live bovine animals, sheep and goats are subject to compound duties.

As part of its WTO accession commitments in agriculture, Jordan agreed to reduce its trade-distorting domestic support, measured in terms of the total AMS¹⁰, by 13.3% over a six-year implementation period starting in 2000. The final bound Total AMS, effective from 2006, is JD 1.33 million.

3.2.4. Morocco

Agriculture is the most heavily protected sector with a simple average tariff of 29.0%, and rates that vary from 2.5% (for most agricultural equipment) to 304% (on live sheep and goats and their meat). Variable duties are applied to sugar and cereals. In the case of sugar, the *ad valorem* equivalent of the duty (inversely proportional to the import price) may vary from a constant (minimum) rate to infinity. On numerous agricultural tariff lines the applied rates exceed the bound rates.

concerned, and non-product-specific support which does not exceed 10% of the value of total agricultural production.

⁹ Frozen boneless beef (HS 020230900) carries the rate of zero.

¹⁰ Total Aggregate Measure of Support.

Tariff preferences and preferential tariff-rate quotas are granted to imports of certain agricultural products. Tariff preferences amounting to as much as 100 per cent are granted to imports of certain products from the United States under the Free Trade Agreement (FTA) in force since 1 January 2006. Preferential tariff-rate quotas are available for imports of certain products from the United States, such as red meat and poultry meat, apples, almonds, and wheat and wheat products. Preferential tariff-rate quotas are also provided for by the Association Agreement with the EC, in particular with respect to cereals. With the exception of common wheat, for which the annual quota volume varies with domestic production, the import quantities for other cereals are fixed.

Numerous subsidies are granted to the agricultural sector (Table AIV.2) for, among other things, improvements, the purchase of agricultural equipment, and providing value added for agricultural products. State financial aid (in the form of subsidies or premiums) is provided under the Fonds de Développement Agricole - FDA (Agricultural Development Fund) through Crédit Agricole du Maroc (CAM). In 2009, the funds allocated to the FDA in the State budget amounted to DH 1.5 billion (Euro 133.4 million).

3.2.5. Tunisia

Customs duties are very high on most agricultural goods that compete with domestic production. In general, TQ imports fluctuate enormously from year to year, except for cheese, soft wheat and sugar, whose quotas are completely filled every year. According to the authorities, the underutilization reflects the level of demand for the products concerned among Tunisian consumers. However, cereals, under TQ, are imported exclusively by the *Office Tunisien des Céréales* (Tunisian Grain Board) and sugar by the *Office du commerce de Tunisie* (Tunisian Trade Board).

To import products subject to TQ it is necessary to obtain a “special TQ authorization” issued by the Minister for Trade, at the proposal of the TQ management committee. The Minister publishes an opening notice establishing the quantities, the TQ allocation procedure, the conditions of admissibility of applications, and the time-limits for submitting them. TQs may be allocated according to: traditional trade flows; the chronological order in which applications are filed; or in proportion to the quantities requested under the TQ. TQs for cereals are allocated through the Grain Board (see below) and those for sugar through the Trade Board.

Tunisia applies preferential TQ to several agri-food products originating in the EU in accordance with the Association Agreement. With respect to meat, dairy produce, cereals and sugar, which are also covered by WTO TQ, exports from the EC may draw either on the WTO quota or on the preferential quota. However, EC

exports under preferential TQ are zero-rated; moreover, these quotas also cover other agricultural products such as eggs, poultry, potatoes, hazelnuts, maize (corn), groats and meals, malt, starch, certain flours, fats, oils, glucose, and dog and cat food. Tunisia also intends to open additional preferential TQ under its bilateral agricultural trade agreements with each of the EFTA countries. The products concerned are milk powder (100 tonnes), cheese (50 tonnes), sugar and sugar confectionery (50 tonnes), and animal feed (50 tonnes).

Tunisia's last notification to the WTO concerning domestic support relates to the year 2002.¹¹ It indicates a zero current total AMS, as compared with a maximum commitment of 61.12 million dinars (Euro 45.55 million) on the following products: durum and soft wheat, barley, milk, olive oil, and sugar beet. The support declared for 2002 was "de minimis"; it consisted of fixed producer buying prices for wheat and intervention prices for other products. Tunisia reported expenditure of 61 million dinars (Euro 45.46 million) on measures exempt from the reduction commitment ("green box"), mainly under water and soil conservation and forestation programmes. In 2002, under its development programmes, which are also exempt from the reduction commitment by virtue of the special and preferential treatment in favour of developing countries, Tunisia spent 91 million dinars on encouraging investment in agriculture.

3.2.6. Turkey

Tariff protection for agriculture remains relatively high. The simple average MFN tariff in agriculture is 28.3% (up from 25% in 2003, partly due to the increase in the tariffs on grains and vegetable oils). Imports of agricultural products, such as live animals for breeding purposes are duty free. Tariff rates on some processed meat products range up to 225%, while some dairy products (e.g. butter-milk, and cream) carry duties up to 170%.

Under the Uruguay Round, Turkey agreed to reduce its budgetary outlays for export subsidies for 44 products by 24%, and the volume of subsidized exports by 14% in equal instalments over a ten-year period starting in 1995. Turkey did not make any commitments to cut financial support to agricultural producers because the authorities estimated that support – as measured by the AMS – was below the de minimis level of 10%, for which no reduction commitments were required.

Turkey and the EU have agreed to work towards bilateral free-trade in agricultural goods to complement its Customs Union that largely affect trade in industrial

¹¹ WTO document G/AG/N/TUN/32, 4 May 2005.

products. Processed agricultural products imported into Turkey from the EU are subject to customs duties comprising an industrial and an agricultural component: all industrial components enjoy duty-free treatment and customs duties applicable to agricultural components are below MFN rates. Some processed agricultural products are subject to zero duty but under quota. The limited coverage of agricultural products under the preferential regime with the EU and under Turkey's other bilateral agreements delays their exposure to greater competition: the products are generally subject to preferential tariff quotas.

3.3. The recent bilateral agricultural trade negotiations of the European Union with Med countries¹²

In 2007, **Jordan** negotiated a supplementary liberalization agreement followed by Egypt and Israel in 2009. For Jordan, the concerned number and volumes of agricultural products was small and the negotiations were quickly achieved. With **Israel**, considered as a developed country, the asymmetry principle was not applied. The implementation of the agreement with **Egypt** began in January 2011. It provides the EU agricultural exports with a freer and immediate access to the Egyptian market for about 90% of the agricultural and fish products. The tariffs of tobaccos, wines and alcohols, pork meat, sweeties, chocolates and food pastas and bakery products will be halved. The EU grants Egypt exporters a free entry for all its agricultural and food products to European Market, excepted for tomatoes, cucumbers, artichokes and strawberries, for which the current arrangements will continue to apply. However, SPS norms continue to apply to the Egyptian agricultural and agro-food exports. Without an internal upgrading of Egyptian producers, these measures will work as strict Non Tariff Barriers (NTB).¹³

¹² ABIS, Sébastien, TAMLILTI, Fatima, “Les dynamiques agricoles euro-méditerranéennes”, les Notes d'Analyse du CIHEAM, n°63, mai 2011.

¹³ Depending on the type of product, compliance with SPS regulations is verified by the Food Control Agency, the Agriculture Quarantine Body, and the Animal Quarantine Body. In addition to SPS regulations, a number of agricultural goods must fulfil quality controls upon importation. Agricultural goods subject to mandatory quality control include live animals, meat, dairy products, vegetables, grains, and edible oils. Furthermore, radiation inspection is mandatory for foodstuffs, edible oils, live animals, seeds, animal fodders, milk substitutes, and tobacco. A number of raw or processed agricultural products, such as juices, citrus fruit, and various types of vegetable, are also subject to quality control when being exported.

For the **Occupied Palestinian Territories'** agricultural and fisheries products, the EU granted in April 2011 a ten years free access except for fruits and vegetables, which represent the bulk of the very small amount actually exported to the EU.

With **Algeria** a policy dialogue committee was instituted and was to meet in June 2011, in the aim to assess a liberalization schedule for manufactured and agricultural products. Algeria asked for a postponing of the implementation of a EU-Algeria Free Trade Agreement from 2017 to 2020. Actually, only 252 agriculture, fisheries and food manufactured products benefits from EU market access preferential tariffs. The list of products to liberalize is still under discussion.

Discussion on the agricultural liberalization between EU and **Lebanon** are still a preliminary stage.

With **Tunisia**, the discussion with EU was very close to reaching an agreement when the 14th of January Revolution started. The main negotiation point concerns the free access of Tunisia olive oil to European market while the EU would prefer to keep restrictions on this product.

With **Morocco**, the conclusion of the negotiations were delayed during the Spanish Presidency of the European Union, because the Spanish Government faced a strong domestic resistance. The negotiations resumed with the Belgian Presidency in 2010. The agreement granted a better access for European food products, especially the manufactured, to the Moroccan market, for which a total free access will occur in 2012. A free access for agricultural products will concern immediately 45% of the EU export value and reach the level of 70% by 2020. The vegetable and fruits sector will benefit from a complete liberalization. The exceptions concern only six products, of which tomatoes, cucumbers, mandarins and strawberries. New quotas higher than the past quotas would be adopted.

But the European parliament refused to ratify the preferences offered to Morocco by the European Commission negotiators during its plenary session of the 7th of June 2011. The European producers association have demonstrated their capacity to impact the European Parliament decisions.

Nevertheless, European Commission and Morocco launched discussion about the Protection of the Geographical Indications.¹⁴ Six Moroccan products, of which

¹⁴ “A geographical indication is a sign used on goods that have a specific geographical origin and possess qualities, reputation or characteristics that are essentially attributable to that place of origin. Most commonly, a geographical indication includes the name of the place of origin of the goods. Agricultural products typically have qualities that derive from their place of production and are influenced by specific local factors, such as climate and soil. Whether a sign is recognized as a geographical indication is a matter of national law. Geographical indications may be used for a wide variety of products, whether natural, agricultural or manu-

argan oil, are registered in this category. Additionally, the EC agrees to support the second Plan Maroc Vert Pillar supporting the small Moroccan farmers with 70 million Euros.

European Union is encouraging the South-South trade, through financial and technical assistance to the Agadir Agreement where Jordan, Egypt, Tunisia and Morocco are involved.

factured. An appellation of origin is a special kind of geographical indication. It generally consists of a geographical name or a traditional designation used on products which have a specific quality or characteristics that are essentially due to the geographical environment in which they are produced. The concept of a geographical indication encompasses appellations of origin”, in http://www.wipo.int/geo_indications/en/about.html.

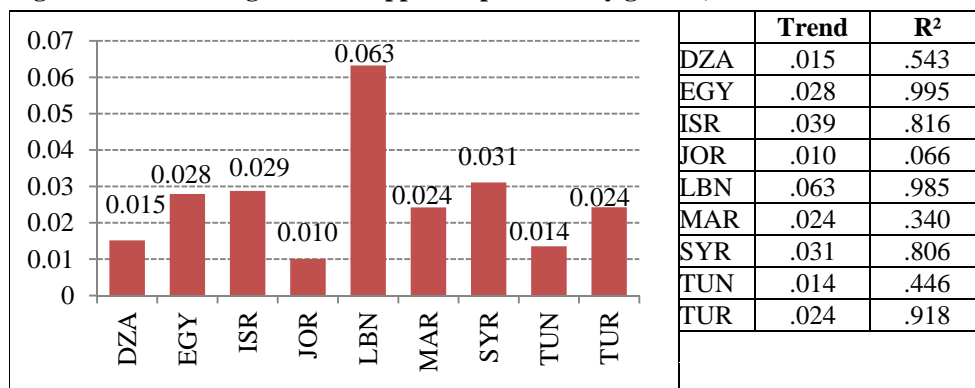
4. Productivity Growth and Employment in the Context of Climate Change

The productivity growth depends on modernisation of the traditional production structures. The climate instability, drought and extreme climatic events, cause big losses in the agricultural production. In the fishing sector, the productivity is decreasing in relation with the extraction pressures on the sea resources. East and South Mediterranean Government have programs aiming to ease the pressures on water and on biomass resources. These programs carry governance solutions and innovations, mainly equipment, at the microeconomic levels enabling a more efficient use of land, water and sea. They rely also on price policies and incentives provided through tariff protection, domestic market organisation and subsidies. The performance of these programs depends on the cognitive capacities of the farmers and the fishers to adopt the innovative solutions to face, collectively and individually, the natural shortages. The social impacts of these shortages lead to crisis of the sector of small producers, poverty and increased rural-urban and international migration. Meanwhile, the average size of the production units rise, thus generating scale economies and freeing new capacities for innovation investments.

4.1. Productivity trends per agricultural worker

The agricultural apparent productivity can be measured as the value added per active worker at constant prices. The figure 4 shows the average annual rate of growth of the apparent productivity of Med 9, based on series from 1990 to 2008 in the World Bank data base.¹⁵

¹⁵ The trend was estimated through the OLS regression of the following equation: $V = bT + C + u$, where V stands for the logarithm of the agricultural value added per worker at constant dollars of 2000, T for the time, C for the constant and u for the estimation error.

Figure 4. Med 9 – Agricultural apparent productivity growth, 1990-2008

Note. The estimated productivity trend numbers are annual increases for the entire period 1990-2008.

Source: Own estimates based on the World Bank data base – www.worldbank.org.

The productivity rose in all the countries. The highest increase is observed for Lebanon, Israel and Syria (6.3% to 3.1%), the slower increase (2.8% to 2.4%) is observed for Egypt, Turkey and Morocco and the slowest one - for Tunisia, Jordan and Algeria.

From 1994 to 2007, the Med 9 average productivity increased from 2.3 thousand US dollars per year to 3 thousands US dollars in constant 2000 prices (table 7).

Table 7. Agricultural output per active worker, thousands US\$ constant 2000 prices

	1994-1996	1999-2001	2005	2006	2007
Algeria	1.8	1.8	2.2	2.2	2.3
Egypt	2.0	2.4	2.7	2.8	2.8
Israel	25.9	30.4	42.7	42.9	42.6
Jordan	1.7	1.4	2.2	2.3	2.2
Lebanon	15.9	21.8	30.3	29.7	31.7
Morocco	1.8	1.6	2.1	2.6	2.1
Syrian Arab Republic	3.2	3.9	4.4	4.7	4.4
Tunisia	2.6	3.2	3.3	3.4	3.5
Turkey	2.3	2.6	3.2	3.3	3.1
Med 9	2.3	2.5	3.0	3.1	3.0
World	0.8	0.9	1.0	1.0	1.0

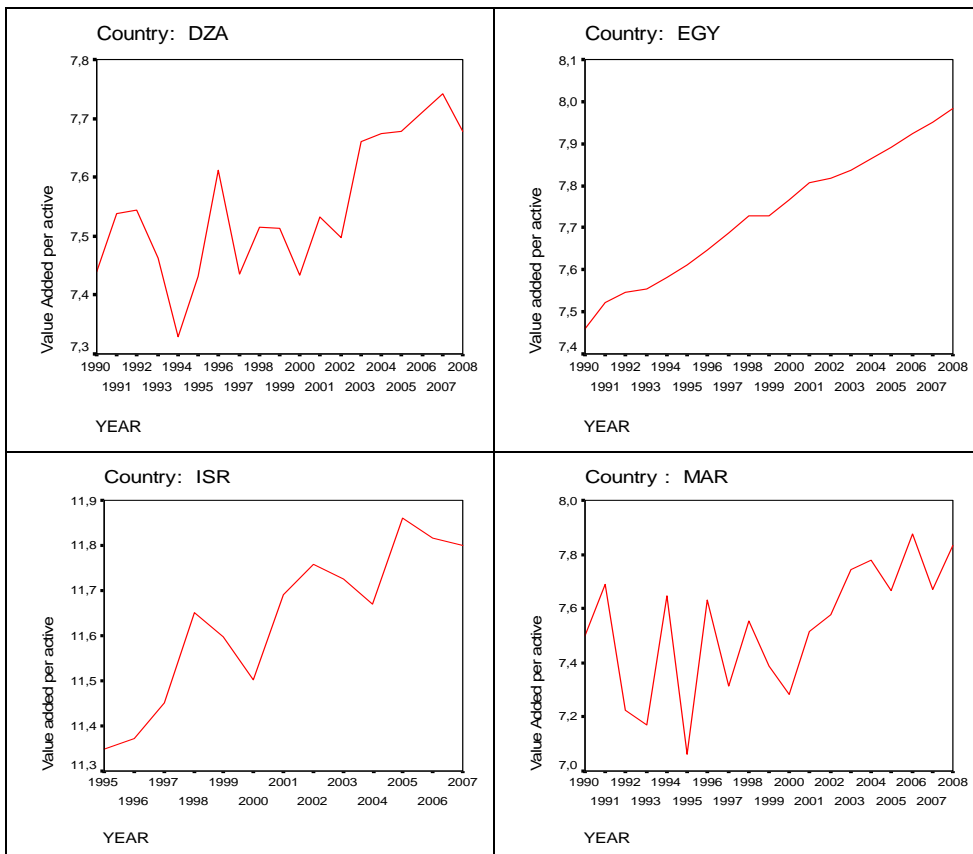
Source: FAO Statistical Yearbook 2009 in <http://www.fao.org/economic/ess/ess-publications/ess-yearbook/ess-yearbook2010/en/>.

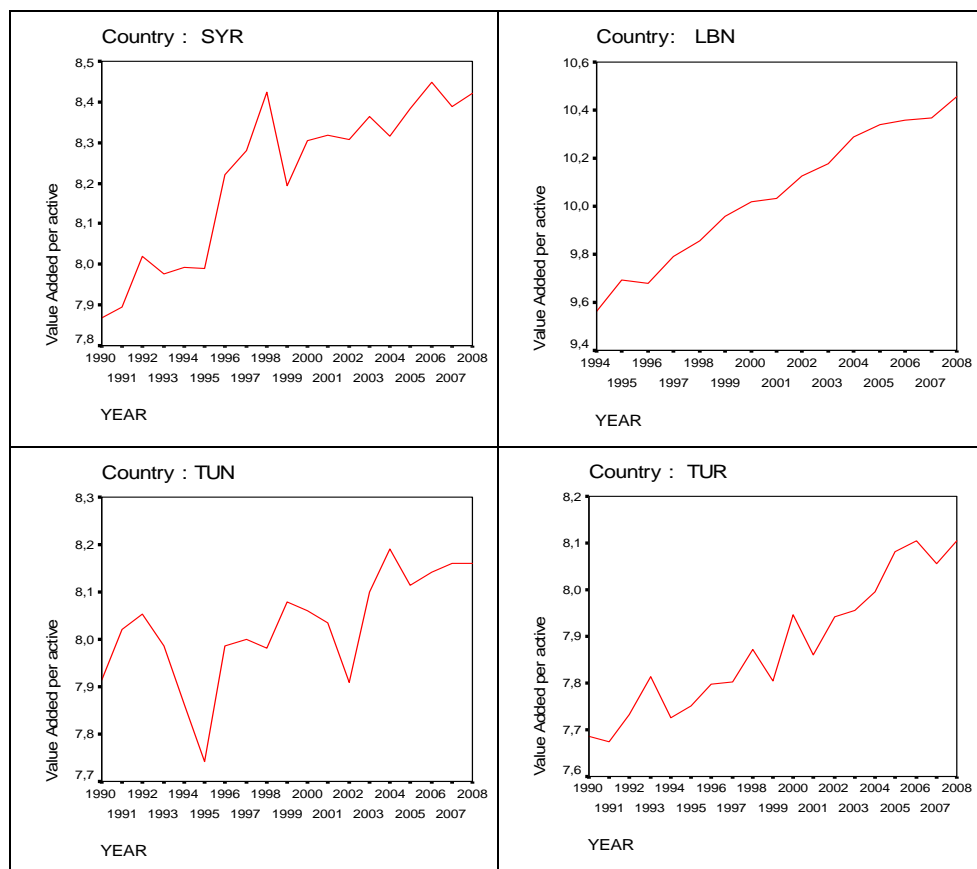
This numbers reflect large disparities; from 42.6 thousands for the agricultural Israel workers to 2.1 thousand dollars per Moroccan worker in 2007. The productivity improved for all the Med 9 countries.

The pace of apparent productivity growth in the agricultural sector in the Med 9 countries was higher than in the world (2%) during the period 1994-2007. The highest growth of apparent productivity was in Lebanon and Israel which achieved respectively 30.6 and 42.6 thousands dollars per worker (at 2000 prices) for 2005-2007 period. For the same period, the apparent agricultural productivity in Syria, Tunisia and Turkey was respectively 4.5, 3.4 and 3.2 thousand dollars (at 2000 prices). The agricultural apparent productivity in Egypt, Morocco, Jordan and Algeria stayed between 2.8 and 2.2 thousand dollars per worker.

The figure 5 shows that the apparent productivity (value added per active worker at constant prices) is highly instable for the countries where the share of irrigated land is low (Algeria, Morocco, Turkey and Tunisia). But, in all the Med 11 the apparent productivity rose, even for Morocco and Tunis after 2002. This change is related to technical changes and growth of irrigated land shares.

Figure 5. Med 9 apparent productivity growth: Value added per active, thousands US\$ constant 2000 prices in logarithms scale





Source: Author's estimates based on World Bank Data base in <http://data.worldbank.org/indicator>.

4.2. Productivity growth determinants: land, water and capital

The main productivity growth factors in agriculture are irrigation and equipment. These factors compensate structural rain scarcity in the region and climate change effects. The capital intensification is the main solution to limit the decreasing returns of land exploitation. This applies also for the fishing activities and other based on sea exploitation.

The share of irrigated land in arable permanent crops rose slowly from 17.3% in 1994-1996 to 18.5 % in 2007. The highest relative increases were observed in Israel, Morocco, Turkey and Syria, the countries with the bigger arable land areas.

Table 8. Irrigated lands and share in arable land and permanent crops

Countries	Irrigated land, thousand ha					Share in arable land & permanent crops, %				
	1994-1996	1999-2001	2005	2006	2007	1994-1996	1999-2001	2005	2006	2007
Algeria	558	568	569	570	570	7.0	6.9	6.8	6.8	6.8
Egypt	3276	3310	3422	3530	3530	100.1	98.2	97.1	99.9	99.8
Israel	195	198	220	225	225	45.6	46.8	57.8	60.0	59.8
Jordan	74	75	80	84	81	25.8	27.0	29.5	30.4	36.6
Lebanon	105	104	104	104	104	33.7	39.1	36.7	36.0	36.2
Libyan Arab Jamahiriya	470	470	470	470	470	20.9	21.9	22.5	22.9	22.9
Morocco	1258	1397	1484	1484	1484	12.7	14.6	16.5	16.6	16.6
OPT	17	16	16	17	17	7.5	7.3	7.1	7.6	7.6
Syrian Arab Republic	1099	1221	1428	1402	1396	20.0	22.5	25.7	25.1	24.6
Tunisia	364	393	418	418	418	7.5	7.9	8.5	8.4	8.5
Turkey	4191	4743	5215	5215	5215	15.4	17.9	19.6	20.2	21.0
Med 11	11607	12495	13426	13519	13510	18.6	20.4	21.9	22.3	22.7
World	263831	277629	283798	285662	286794	17.3	18.1	18.3	18.4	18.5

Source: FAO Statistical Yearbook 2009.

Table 9. Agricultural capital Stock per active and structure of the capital stocks

Countries/ areas	Agricultural capital Stock per agricultural worker, US\$ thousands constant 1995 prices			Share in capital stocks, %			
	1979-1981	1989-1991	2003	Ma-	Land	Live-	Other
				chinery	2003	stock	2003
Algeria	3 158	3 389	3 999	16.1	69.6	13.2	1.1
Egypt	3 723	3 966	5 308	2.7	76.3	20.6	0.4
Israel	37 143	45 365	42 142	17.0	64.4	14.7	3.8
Jordan	5 262	7 738	8 642	9.9	65.3	23.3	1.6
Lebanon	21 477	40 100	40 910	5.8	83.5	10.2	0.5
Libyan Arab Jamahiriya	44 406	91 763	84 429	8.1	77.6	13.8	0.5
Morocco	6 161	7 096	7 420	4.1	71.1	24.1	0.6
OPT	4 042	4 471	5 725	18.3	61.2	19.3	1.2
Syrian Arab Republic	11 729	11 010	16 867	8.3	77.8	13.5	0.4
Tunisia	11 524	13 222	14 945	3.3	85.9	10.3	0.6
Turkey	6 716	8 472	8 710	32.6	52.2	14.8	0.4
Med 11	6 099	7 020	8 029	16.6	66.4	16.5	0.5
World	3 522	3 321	3 171	16.0	54.7	24.2	5.1

Source: FAO Statistical Yearbook 2009 and www.faostat.fao.org.

The change in the weight of irrigated land share is correlated with the change of the agricultural capital stock per active worker. The available data show that for all the Med 11 countries the capital stock per worker rose from 6.099 dollars (at constant 1995 prices) in 1979-1981 to 8.029 in 2003, an average annual increase of 3.5%. Some countries, like Egypt, Algeria and OPT remain under the Med 11 average. During the analyzed period, Morocco and Jordan hovered at an agricultural capital stock close to the Med 11 average. Turkey stood at a level of capital per worker slightly higher. Syria and Tunis had a level near two-fold the average and Israel and Lebanon from 5 to 6 fold the average level.

4.3. Social factors: demography, poverty and rural employment

The development of the agriculture productivity is challenged by social factors. Demography and illiteracy are two determinant factors because they induce a very small reservation wage, limit incentive and capacities to innovate. They lead to crisis in rural households and to labour force migration. The mechanism induces at least productivity growth because only stronger units stay on the scene, with higher scale economies and investment capacities.

4.3.1. Demography and illiteracy

In the Med 9 countries, because of strong demographic growth in recent years, the population of working age has shown a marked increase. However, the economic growth is not keeping up with the pace of demography. The number of net entries into the labour market in the Arab Mediterranean countries between 1995 and 2025 can be estimated between 80 and 85 million, with some 45 million for the period 2005-2020, i.e. an average of 3 million entries annually over these fifteen years. Hence huge number of jobs would have to be created in these countries to prevent unemployment from increasing further above its already high level of unemployment. But tension in labour market is felt mainly by urban youth and graduates. The active population in rural areas has a very low reservation wage so that they accept low wages, thus dampening rural unemployment. In urban areas, on the other hand, reservation wages are high, particularly for educated youth, and unemployment is high.

According to FAO database¹⁶ illiteracy in 2005 stayed still at the level of 48% in Morocco, 30% in Algeria,¹⁷ 29% in Egypt, 10% in Jordan, 26% in Tunisia and 13% in Turkey. Yet, in absolute terms, the number of illiterates among the population has remained stable. Poor access to education and illiteracy affects mainly rural areas, especially agricultural and female workers. Illiteracy is responsible for marginalization of active rural population as it leads to low productivity growth of a large segment of the agricultural sector, mainly small and poor households that are the first to migrate to urban areas.

4.3.2. Poverty, migration and decrease of the rural active population

The permanent social crisis in the small farm agricultural sub sector is the cause of the unstoppable expansion of towns with all its corollaries such as overpopulation, uncontrolled urban sprawl cutting off agricultural land, destruction of the coasts, growth of unregulated spontaneous housing, development of squalid marginal districts, environmental pollution, land speculation, unplanned urbanism, rising crime, inadequate or inappropriate infrastructure. This phenomenon is illustrated by the decreasing trend of the share of agricultural workers in the total active population from 1961 to 2000 (figure 6).

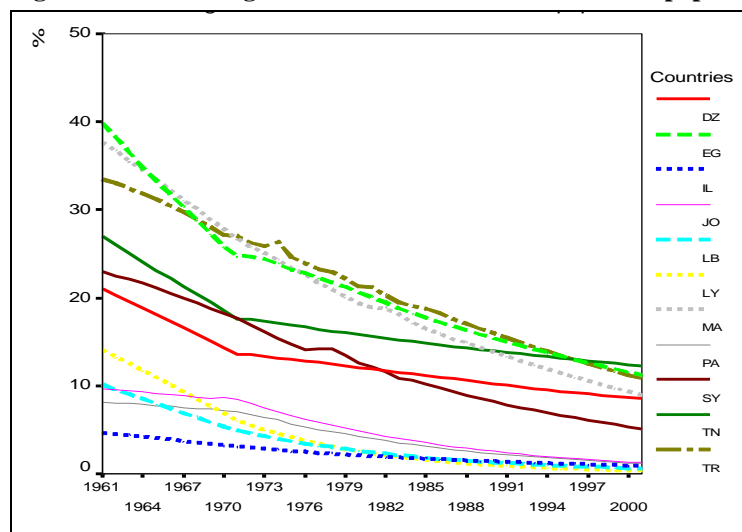
The active population in agriculture in Med 11 was near 25 millions in 1994-96 and 24.5 in 2007 (table 10). During the recent decades, the Med 9 and Med 11 active population in agriculture was decreasing at a slow pace, 0.2% per year, compared to the annual growth of 0.7% in rural population worldwide.

The countries with an important reduction in agricultural population are Lebanon, Libya, Israel and Turkey. Morocco, Palestine and Jordan experienced a small decrease while in Algeria and Egypt the growth rate of active agricultural population (aged between 15 and 60) is positive, and very high in Algeria (2.6% per year, probably this may be explained by the improvement of political situation and the return of the bulk of the farmers to their lands) and very small in Egypt (0.6% per year).

¹⁶ <http://faostat.fao.org/site/291/default.aspx>.

¹⁷ The World Bank data base reports that the literacy rate for adult in Algeria in 1995 (the more recent available year) amounted to 73%. Following the same source, this rate in Egypt was 66% in 2006, in Morocco - 56% in 2009, in Libya - 89% in 2009, in Turkey - 91% in 2009, in Tunisia - 78% in 2008, in Jordan - 92% in 2007, in Lebanon - 90% in 2007. See <http://data.worldbank.org/indicator/SE.ADT.LITR.ZS>.

Figure 6. Share of agricultural workers in the total active population



Source: <http://faostat.fao.org/site/291/default.aspx>.

Table 10. Economically active population in agriculture

Countries	Economically active population in agriculture, thousand					Share in total economically active population, %				
	1994-1996	1999-2001	2005	2006	2007	1994-1996	1999-2001	2005	2006	2007
Med 11	24 955	24 827	24 593	24 597	24 461	34	30	27	26	26
Med 9	24 711	24 596	24 382	24 390	24 257	35	31	27	27	26
Algeria	2 336	2 717	2 996	3 039	3 092	26	25	23	23	22
Egypt	6 483	6 573	6 839	6 847	6 900	35	31	28	28	27
Israel	66	62	57	56	54	3	3	2	2	2
Jordan	130	120	120	121	120	11	9	8	7	7
Lebanon	61	48	37	36	34	5	4	3	2	2
Libyan Arab Jamahiriya	116	105	88	84	82	8	6	4	4	4
Morocco	3 351	3 339	3 218	3 215	3 135	37	33	29	29	28
Palestine	128	125	123	123	122	15	12	10	9	9
Syrian Arab Republic	1 157	1 184	1 308	1 349	1 389	28	24	22	21	21
Tunisia	718	757	779	785	787	25	24	22	22	22
Turkey	10 411	9 796	9 028	8 942	8 746	46	41	36	36	35
World, million	1 186.8	1 228.7	1 272.0	1 279.6	1 287.2	46	44	42	41	41

Source: FAO Statistical Yearbook 2009.

5. Scenarios for the Med 9 Agriculture

5.1. The drivers of the Med 11 agriculture sector structural change

The preceding observations suggest that the main drivers in the agricultural structures and productivity are:

- population growth and living standards – consumption side;
- climate change – natural resources and environment side;
- cooperation – as technical and financial support and foreign trade – economic policy side;
- labour shortages, education and innovation, and investment – production side.

The East and South Mediterranean countries, with the exception of Turkey, are all cereals, sugar, and edible oil importers. They are relatively self-sufficient for animal products and all are the exporters of vegetables and fruits. The bulk of the exports are fresh, non-processed products.

The agricultural transformation in these countries, except for Israel, occurred after the demographic transition. The population grew at a pace higher than the production per capita. While the revenue per capita and the individual consumption improved, absorption and imports growth exceeded production and exports growth. Hence, in the next twenty years it should be a catching up of the demographic transition by agricultural expansion. This implies that production per capita of the agriculture sector would grow at a higher growth rate than the consumption per capita. Such a catching up would allow Med 11 countries to develop balanced food and agricultural trade with the rest of the world. This capacity will depend on the pace of the agricultural sector productivity growth.

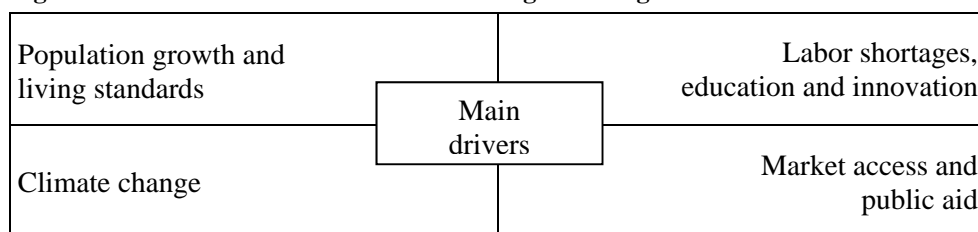
Several factors can contribute to the productivity growth:

- The food consumption changing patterns toward a bigger share of animal products, with a rising role of food processing industries, and the rising demand for food quality imply greater pressures on the agricultural producers for quality norms compliance;

- The climate change, which lead to water scarcity and extreme climatic events require preventive actions leading to more investments, modern equipment, technical and organisational innovations, and contribute to higher capital intensity in the agricultural sector;
- Quantity and quality of labor force is the main factor responsible for productivity growth. But the education and vocational training system requires long run investment and financial resources;

The agricultural policies which enable market access, protect their revenue through price policy stabilization and afford structural support to marginalized areas, while supporting extension and technical innovation adoption by the agricultural producers.

Figure 7. Main drivers of the structural change in the agricultural sector



Source: Author's assumptions.

5.2. The scenarios rationale

The figure 8 summarizes 4 scenarios regarding the Euro Med and international cooperation environment of the Med 11.

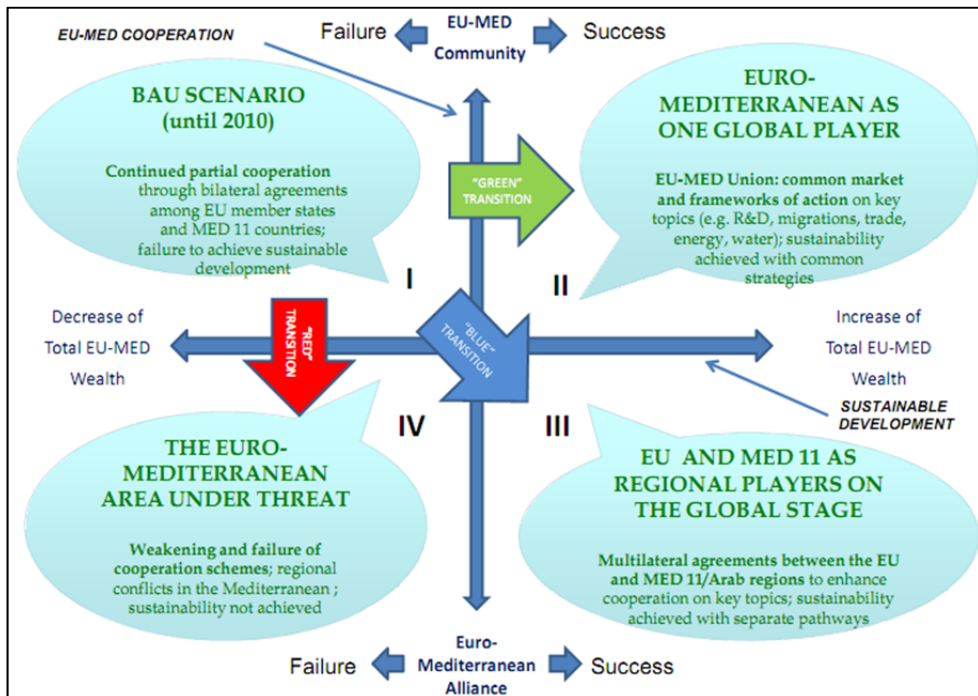
The first, called Business As Usual (BAU) continues the actual cooperation framework between Med 11 and European Union. The second suggests a profound Euro Mediterranean Integration. The third regards a limited cooperation between the two regionally integrated sides, the East and South Mediterranean countries, and the North Mediterranean countries. The fourth scenario is pessimistic with a general decrease of Mediterranean cooperation and trade.

The mechanisms underlying these scenarios suppose that international cooperation and foreign trade contributes to the acceleration of the agriculture structural changes with a positive impact on factor productivity.

Opening the access to EU market will change the pattern of food demand and create additional opportunities for exporters. This will generate more revenues and

help investments, innovations, and a better adaptation to climate change. The labor market pressure will be reduced with higher labor force mobility. With more trade opportunities Med countries would have more room to support specific value chains and push their country agricultural sector toward an enhanced Euro Mediterranean trade specialization.

Figure 8. Euro Med Scenarios



Source: Sessa – 2011.

5.3. The scenarios results

The projection was based on data by value chains in the Med 9 countries. The results are presented as aggregated for Med 9. The table 11 summarizes the international and Euro Med impacts on production, imports, absorption and imports. The behavior of the actors depends on the Euro Med cooperation framework.¹⁸

¹⁸ The projected behaviours for the four scenarios are very close to those built in the Centre International des Hautes Etudes Agronomiques Méditerranéennes (CIHEAM)- Mediterra 2008 report: “The future of agriculture and food in the ”Mediterranean countries”, 2008.It

Table 11. Scenarios hypothesis

Scenarios	Production	Imports	Absorption	Exports
BAU scenario	++	++	+++	+
Mediterranean One Global Player	+++	+++	++++	++++
EU and Med 11 as regional players	+++	++	+++	++
The Euro-Mediterranean Area under threat	+	++	++	-

Note. The sign “+” indicates change levels: - for small decrease; + for small increase; ++ for middle increase; +++ for high increase; ++++ very high increase.

Source: Author’s assumptions.

The scenarios summarized in table 11 are detailed by value chains in the table 12 and translated in illustrative growth rates.

Table 12. Med 9 value chains scenarios (growth rates in percent)

Value chains	Med 11 - BAU			Mediterranean One Global Player			The Euro-Mediterranean Area under threat			EU and Med 11 as regional player		
	Production	Import	Export	Production	Import	Export	Production	Import	Export	Production	Import	Export
Animals products	1.2	-1.1	6.3	1.5	1.4	7.9	0.9	-1.3	5.4	1.4	1.3	7.0
Fruits & vegetables	0.6	0.9	-3.6	0.7	1.2	4.5	0.4	1.0	-4.2	0.7	1.1	4.0
Sugar and edible oils	1.2	1.4	10.1	1.5	1.7	12.7	0.8	1.5	8.6	1.3	1.5	11.1
Cereals	-0.1	1.4	5.7	0.1	1.8	7.2	-0.8	1.6	4.9	0.1	1.6	6.3
Fish & crustacean, mollusks & other	3.8	1.9	-6.5	4.7	2.4	4.9	2.6	2.1	-7.7	4.3	2.2	5.9

Source: Author’s estimates.

The growth rates in table 12 are based on the BAU Scenario which continues the trends observed during the 1997-2007 period. Production and imports would grow at an average pace following the observed trend; exports growth would be very small while the absorption would grow at a high pace. Following the BAU

produces annual studies on the agricultural sectors of the Mediterranean countries and a transversal thematic report, and a regular publication under the title *Mediterra*. For the year 2008, the *Mediterra* report developed projection scenarios for 2030. Its approach is very similar to the one developed by Ricardo Sessa in the *Medpro* study.

scenario, the producers in the Southern and Eastern Mediterranean countries continue to specialize in a limited number of products. Even with limited access to the EU market, the agricultural policy will target primarily foreign markets to the detriment of local markets, encouraging a limited number of advanced producers, while the bulk of producers competing for the domestic market. They will adopt technical innovations without control of their impact on exhaustible resources, loss of biodiversity and chemical residuals in food products. The remuneration of producers in the upstream sector will remain low. The supply remains fragmented (fruits, vegetables, cereals) and controlled by intermediaries and the downstream industries.¹⁹ This scenario results from exogenous variables: no further improvement in Euro-Mediterranean agricultural trade relations, price instability of food procurement and vulnerabilities in agricultural trade, environmental degradation and regional divides enhancement, limited and low controlled technological innovation.

The Scenario II “Mediterranean One Global Player” will stimulate increases in production and imports, and a bigger rise in exports and absorption. Access to the EU market will be improved and much better than in the BAU. A bigger number of producers will receive targeted help and improve their capacities to comply with quality norms. They will obtain better prices and involve a virtuous investment and productivity circle. Agriculture and food are the key issues in Euro-Mediterranean cooperation that is built on new foundations of strategic priorities: responsible resources management, measures to ensure the security of food supply and to promote food that is good, clean and fair, integrated regional development, measures to combat climate change, emergence of a farm-to-table agro-food system, devising of a new Common Agricultural Policy that is open to the Euro-Mediterranean region.²⁰

¹⁹ CIHEAM, “Mediterra 2008”, page 272.

²⁰ The Scenario II “Mediterranean as One Global Player” is very close to the Mediterranean integration scenario in the Mediterra 2008 projections. “In this scenario world trends are resisted and a regional Euro-Mediterranean market is built up and regulated. The focus is on the quality and typicality of Mediterranean products, a model based on the Mediterranean diet and way of life is promoted, and the natural and cultural resources which are the region’s assets are developed. It is basically the result of a process where domestic and foreign markets are recovered, and the primary aim is to improve the food security and food safety of the local populations. And finally, it contributes to the balanced development of rural areas and promotes environmental protection and biodiversity. In this scenario the aim is to re localize production taking account of the natural vocations and economic potential of each of the Mediterranean countries, to encourage socially and ecologically responsible consumer behavior, to regulate trade policies as an imperative, to promote regional co-operation based on the complementarity of production systems and markets and to defend common positions in international negotiations (WTO)” Idem, page 270.

The scenario, “EU and Med 11 as regional players in the global stage”, relies on the hypothesis that the Med 11 countries compensate the difficult access of their agricultural exports to the EU market through the increase of trade between the East and South Mediterranean countries. A virtuous mechanism is working: better prices enabling more investment leading to higher productivity growth. This mechanism is analogue to the one observed in the “Mediterranean One Global Player” scenario. But, the purchasing power in the East and South Mediterranean countries is lower than in case of the improved access to the EU market, and their products are more similar, the benefits of the enhancement of the East and South trade is lower than in the scenario II. The effects of the scenario III are similar but smaller than the scenario II effects.

Less favorable effects come with the scenario “The Euro-Mediterranean Area under Threat”: exports decrease, production stay in quasi stagnation, imports continue to increase as in the BAU Scenario. Absorption increases slowly because of the reduction of the national revenue. The main external cause is the declining Euro-Mediterranean cooperation, resulting in development of social inequalities and growing migratory flows.

The table 13 presents the observed agricultural value chains balances numbers of the Med 9 for the 1994-2007 period and the BAU scenario projections for 2030.

Table 13. Business as usual scenario (BAU) - Med 9 agricultural value chains projection

Value chains	Observed in 2007, kg per capita per year				Scenario Business as Usual at 2030, kg per capita per year			
	Production	Import	Absorption	Export	Production	Import	Absorption	Export
Animals products	33.4	8.2	40.1	1.5	38.7	7.1	42.8	3.0
Fruits & vegetables	159.8	11.9	149.2	22.5	171.1	13.3	169.9	14.5
Sugar and edible oils	32.8	10.1	40.9	1.9	37.6	11.9	43.4	6.1
Cereals	152.4	234.4	375.2	11.6	150.5	277.9	405.7	22.7
Fish & other	15.9	4.2	19.8	0.3	24.8	5.3	29.9	0.1

Source: Author’s estimates based on Faostat data

(<http://faostat.fao.org/site/291/default.aspx>) – Source tables are given in annexes A3 to A6.

The projections are based on quantities (kg) per capita and fixed prices (in millions constant US\$ of 2000). The annex 6 tables present the global amounts for the individual scenarios. Our scenarios use the United Nations population data and projections for 2030 (look at annex 3).

The BAU scenario for 2030 continues the present trade relations pattern. The NTB limiting the Med 9 fruits and vegetables access to the EU common market, without other export opportunities, mean a higher offer of vegetables and fruits to the Med 9 domestic markets. The relative prices of vegetables and fruits would decrease while their absorption would increase. The fruits and vegetables are substitutable by animal products, but not by cereals. The cereal lands cannot be used for other activities, without additional investments, but they can be downgraded to pasturages.

The comparison between observed data for the period 1994-2007 and the BAU projections shows a rise in the Med 9 per capita production for all value chains, exception for cereal which decreases slightly. The exports decrease for fruits and vegetables and sea products and increase for animal products, sugar and edible oils and cereals. The absorption rises for all products, mainly for fruits and vegetables and sea products. The Med 9 imports increase in cereals, fruits and vegetables, sugar and edible oils and sea products, while they decrease for animal products.

The table 14 presents the Mediterranean one Global Player scenario results followed by the differences with the BAU scenario.

Table 14. “Mediterranean one global player” Scenario – Med 9 value chains projection for 2030

Value chains	Mediterranean One Global Player							
	Quantities, kg per capita per year				Difference, percentage with the BAU scenario			
	Production	Import	Absorption	Export	Production	Import	Absorption	Export
Animals products	40.1	9.7	46.1	3.6	3.7	35.2	7.9	19.4
Fruits & vegetables	174.1	13.7	149.6	38.2	1.7	2.8	-12.0	163.3
Sugar and edible oils	38.9	12.4	43.3	8.0	3.5	4.1	-0.3	31.4
Cereals	154.9	289.9	418.1	26.6	2.9	4.3	3.1	17.5
Fish & other	27.6	5.6	32.6	0.6	11.5	5.8	9.1	298.2

Source: Author's estimates.

The production improves for all value chains. Imports and exports also increase for all value chains. Imports increase strongly for animal products and exports for fruits and vegetables and sea products. The Med 9 domestic absorption decreases for fruits and vegetables. It rises for animal products and sea products. The consumption of sugar and edible oils is stagnant, with a very slight decrease. The rise in cereals consumption is due mainly to animal feeding increase.

The table 15 presents the Euro-Mediterranean under threat scenario. For this scenario the Med 9 agricultural sectors became inward oriented. The priority is given to food security. The agricultural sector serves as labor force reservoir. It retains especially poor workers because there is less job opportunities in urban areas. The productivity grows, but at a lower rate than the BAU scenario.

Table 15. “The euro mediterranean under threat” scenario – Med 9 value chains projection for 2030

Value chains	The Euro-Mediterranean Area under threat							
	Quantities, kg per capita per year				Difference, in percentage with the BAU scenario			
	Production	Import	Absorption	Export	Production	Import	Absorption	Export
Animals products	37.0	7.0	41.3	2.7	-4.3	-1.6	-3.4	-10.2
Fruits & vegetables	167.6	13.5	167.8	13.4	-2.0	1.3	-1.3	-7.6
Sugar and edible oils	36.1	12.1	43.0	5.2	-4.1	2.0	-0.8	-15.4
Cereals	138.4	283.6	401.5	20.6	-8.0	2.0	-1.0	-9.3
Fish & other	21.7	5.4	27.0	0.1	-12.4	2.7	-9.7	-13.8

Source: Author’s estimates.

Table 16. “The EU and Med as regional player” scenario – value chains projection for 2030

Value chains	EU and Med 11 as regional player							
	Quantities in kg per capita per year				Difference in percentage with the BAU scenario			
	Production	Import	Absorption	Export	Production	Import	Absorption	Export
Animals products	39.5	9.5	45.8	3.3	2.2	33.0	7.0	7.4
Fruits & vegetables	172.9	13.5	150.5	35.9	1.0	1.4	-11.4	147.4
Sugar and edible oils	38.4	12.1	43.7	6.8	2.1	2.0	0.7	11.6
Cereals	154.7	283.8	414.4	24.2	2.8	2.1	2.1	6.7
Fish & other	26.5	5.4	31.2	0.6	6.8	2.8	4.5	345.1
Total	39.5	9.5	45.8	3.3	1.6	4.9	-7.1	121.1

Source: Author’s estimates.

The reduction of production, export and absorption occurs in all value chains. The change of food consumption patterns stops leading to a significant decrease in animal products absorption.

The table 16 shows that the “EU and Med as regional player” scenario is very close to the “Euro med as one Global Player”. Changes relatively to the BAU scenario are somewhat smaller, in production, absorption and trade.

Table 17. Med 9 value chains projection for 2030: value added, value added per worker and workers numbers following the observed and BAU scenarios

	Observed - 1996 - 2007	Business as Usual	Mediterranean One Global Player	The Euro- Mediterranean Area under threat	EU and Med 11 as regional player
Agricultural Gross Domestic Product (Millions Constant US\$ of 2000)	68124	111738	114646	108202	113514
<i>Annual rate of change - 2007-2030</i>		2.17%	2.29%	2.03%	2.24%
Value added per agricultural worker (Constant thousands US\$ of 2000)	3,000	5,400	6,200	4,653	5,700
<i>Annual rate of change - 2007-2030</i>		2.59%	3.21%	1.93%	2.83%
Agriculture and fish active population (Numbers in million)	22473	20855	18599	23255	19750
<i>Annual rate of change - 2007-2030</i>		-0.32%	-0.82%	0.15%	-0.56%

Source: Author’s estimates.

Between the four scenarios, the Euro Mediterranean Under Threat is the less favorable to revenue generation as it provides the agriculture sector less opportunities than the BAU scenario and very much less than the outward oriented scenarios – Mediterranean One Global player and EU and Med 11 as regional player. The productivity improves for the four scenarios, but more with outward orientation scenarios than in the BAU, and very much more than in the Mediterranean Under Threat scenario. The EuroMed Area Under Threat scenario would retain more active labor force in the agricultural sector, with lower revenue per worker and more poverty.

6. Concluding Remarks

This paper assesses past trends in the agricultural performance in Med region and offers the prospective scenarios. It used the statistics of production and trade of the agriculture sector detailed for five groups of value chains. The behavior of the value chains agents rely on price and incentives. Unfortunately, the available data do not enable to elaborate coherent series of domestic and international prices and quantities of the main value chains.

The elaboration of the projections scenarios relies on the observed trends. For each scenario, the rate of growth has been adjusted to be compliant with elasticities that ensure the agricultural and food value chains dynamic equilibrium.

The agricultural sector is important for the East and South Mediterranean countries because it employs a large share of the active population. It is the main source of income for the poorer segment of the population. It generates a large share of foreign revenues.

Agriculture is the least opened sector to foreign trade in the Mediterranean economies. The agricultural policy and the trade policy of the Med countries try to reduce the social impact of its development and have a great bias towards food security and self-sufficiency. Productivity growth in the agricultural leads to a reduction of demand for labor in the sector and contributes to rural-urban migration factors. The migration of small and poor households enables land concentration which generates economies of scale.

The prospective scenarios exercise reveals that free trade helps in increasing production and generating more revenues. An inward orientation would lead to a lower productivity growth, lower migration of the agricultural workers to the other sectors and a lower decrease of poverty in rural area.

The European Union is the main partner of the Med 11 countries in agricultural trade. The agricultural trade policy of the European Union is the key variable of the future evolution of the Med 11 agriculture performance. The worst performance in terms of revenue and employment generation is the Euro Mediterranean under Threat scenario. The BAU scenario is not much better. It puts East and South Mediterranean agricultural export activities in a vulnerable situation, teased by the promise of a free access to the EU market and threatened by the implementation of selective protection measures.

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Annex

Table A1. Agricultural GDP and its share in total GDP – Countries weights

Countries	Average agricultural GDP				
	(Million US\$ at constant 2000 prices)		Weight in %		SAGR in %
	1994-1996	2005-2007	1994-1996	2005-2007	1994-2007
Med 9	55 986	74 323	100.0	100.0	2.6
Turkey	24 362	28 758	43.5	38.7	1.5
Egypt	13 135	18 929	23.5	25.5	3.4
Morocco	5 940	7 359	10.6	9.9	2.0
Algeria	4 090	6 814	7.3	9.2	4.7
Syrian Arab Republic	3 700	6 041	6.6	8.1	4.6
Tunisia	1 876	2 684	3.4	3.6	3.3
Israel	1 701	2 380	3.0	3.2	3.1
Lebanon	967	1 090	1.7	1.5	1.1
Jordan	215	268	0.4	0.4	2.0
World	987 675	1 298 472	1764.1	1747.1	2.5

Source: FAO Statistical Yearbook 2009.

Table A2. Agricultural GDP and its share in total GDP

Countries	Agricultural GDP, Million US\$ constant 2000 prices					Share in total GDP, %				
	1994-1996	1999-2001	2005	2006	2007	1994-1996	1999-2001	2005	2006	2007
Med 9	55 986	61 669	72 974	76 462	73 532	10.7	9.8	9.3	9.2	8.4
Algeria	4 090	4 884	6 469	6 786	7 187	8.7	8.9	9.3	9.6	9.8
Egypt	13 135	15 535	18 301	18 895	19 591	16.9	15.6	15.4	14.9	14.4
Israel	1 701	1 886	2 434	2 405	2 300	1.8	1.6	1.8	1.7	1.5
Jordan	215	169	270	272	263	3.0	2.0	2.4	2.2	2.0
Lebanon	967	1 044	1 121	1 069	1 079	6.5	6.1	5.5	5.2	4.9
Morocco	5 940	5 450	6 882	8 462	6 734	18.0	14.4	14.6	16.6	12.9
Syrian Arab Republic	3 700	4 649	5 715	6 303	6 104	21.5	23.8	24.1	25.2	23.5
Tunisia	1 876	2 391	2 604	2 695	2 752	12.5	12.3	10.8	10.6	10.1
Turkey	24 362	25 661	29 177	29 574	27 522	11.1	10.0	8.7	8.3	7.4
World	987675	1125094	1270313	1296153	1328951	3.6	3.5	3.5	3.4	3.4

Source: FAO Statistical Yearbook 2009.

Table A3. Population: observations and projections for 2030

Countries	1980-1995	1996-2007	2030 projection
Algeria	23 656	31 271	44 726
Egypt	53 661	69 738	110 907
Israel	4 373	6 189	9 219
Jordan	3 188	5 008	8 616
Lebanon	2 986	3 842	4 858
Libya	4 035	5 406	8 519
Morocco	23 442	29 241	39 259
Syrian Arab Republic	11 477	16 815	30 560
Tunisia	7 750	9 590	12 127
Turkey	51 666	64 953	90 375
OPA	1 961	3 275	7 320
Total	188 195	245 328	366 486

Source: <http://faostat.fao.org/site/291/default.aspx>.

Table A4. Agricultural value chains balances in kg per head – averages 1980-1995 and 1996-2007

		DZ	EG	IL	JO	LB	LY	MA	SY	TN	TR	PA	Total
1980-1995													
Population		23656	53661	4373	3188	2986	4035	23442	11477	7750	51666	1961	188194
Product per capita	Animals products	19.4	19.0	80.4	19.1	20.1	15.6	14.5	43.8	18.9	72.5	1.5	29.5
	Fruits & vegetables	57.8	118.8	323.5	132.2	277.8	114.5	88.2	164.7	128.0	245.6	9.4	150.9
	Sugar and edible oils	1.3	70.5	7.9	1.6	14.0	19.6	63.9	27.3	17.4	83.3	1.8	29.2
	Cereals	86.2	185.3	68.6	34.1	19.7	65.3	223.0	301.5	173.0	537.3	1.0	154.1
	Fish & other	3.5	4.7	53.4	0.1	28.5	0.5	1.2	0.5	17.8	10.3	0.0	11.0
Import per capita	Animals products	21.9	3.6	5.9	20.7	26.7	4.9	0.2	4.1	9.2	0.5	0.1	9.2
	Fruits & vegetables	3.0	0.7	11.3	36.1	19.9	32.2	0.1	4.5	2.0	0.6	8.8	10.9
	Sugar and edible oils	6.2	4.8	15.4	8.1	5.5	31.2	7.1	2.8	8.7	3.2	0.6	8.8
	Cereals	205.3	146.6	487.0	300.1	209.2	461.8	96.0	102.4	166.2	22.1	40.8	203.4
	Fish & other	3.6	4.3	9.1	3.9	9.3	2.2	1.6	1.4	1.5	1.3	0.0	3.5
Absorption per capita	Animals products	41.4	22.6	84.5	38.1	45.8	20.4	11.5	47.8	27.9	72.6	1.6	37.9
	Fruits & vegetables	60.4	116.8	179.2	93.7	256.8	145.7	71.1	163.4	125.0	227.9	-17.7	129.3
	Sugar and edible oils	7.6	75.3	22.5	9.3	19.4	50.8	70.9	30.1	20.4	85.5	1.1	37.3
	Cereals	291.6	330.1	553.7	319.8	223.4	527.1	317.8	390.9	335.7	527.4	41.7	350.8
	Fish & other	7.1	9.0	60.0	3.9	37.7	2.8	2.7	1.9	19.3	11.1	-3.6	13.8
Export per capita	Animals products	0.0	0.0	1.8	1.7	0.9	0.1	3.2	0.2	0.1	0.4	0.0	0.8
	Fruits & vegetables	0.3	2.7	155.7	74.6	40.9	1.0	17.2	5.8	5.0	18.4	35.9	32.5
	Sugar and edible oils	0.0	0.0	0.8	0.3	0.1	0.1	0.1	0.0	5.7	1.1	1.2	0.7
	Cereals	0.0	1.8	2.0	14.4	5.5	0.0	1.2	12.9	3.6	31.9	0.1	6.7
	Fish & other	0.0	0.0	2.4	0.1	0.0	0.0	0.2	0.0	0.0	0.5	3.7	0.6
1996-2007													
Population		31271	69738	6189	5008	3842	5406	29241	16815	9590	64953	3275	245327
Product per capita	Animals products	24.0	27.2	71.1	27.4	23.3	15.6	19.6	47.9	33.9	64.7	12.5	33.4
	Fruits & vegetables	78.8	160.4	241.5	124.7	244.0	113.4	115.3	122.9	161.0	274.0	121.8	159.8
	Sugar and edible oils	0.7	89.1	7.9	2.6	16.3	19.7	61.9	30.4	12.6	87.4	17.4	32.8
	Cereals	94.9	257.1	39.4	14.5	35.0	39.3	197.3	316.6	181.5	484.4	16.9	152.4

		DZ	EG	IL	JO	LB	LY	MA	SY	TN	TR	PA	Total
Import per capita	Fish & other	3.8	10.6	79.6	0.2	43.8	0.2	1.6	0.9	24.9	8.9	0.2	15.9
	Animals products	21.3	2.4	7.5	18.2	27.4	2.0	0.5	2.5	3.5	0.6	2.1	8.2
	Fruits & vegetables	3.5	0.8	20.4	13.0	21.2	37.2	1.4	5.6	3.3	1.9	22.7	11.9
	Sugar and edible oils	5.6	3.8	15.0	13.3	10.1	21.7	9.5	4.0	13.8	5.4	9.7	10.1
	Cereals	221.1	134.3	531.2	368.7	227.3	392.1	147.6	82.8	250.5	40.9	182.0	234.4
	Fish & other	0.5	5.2	11.8	9.0	9.3	1.5	1.5	2.8	0.5	3.6	0.5	4.2
Absorption per capita	Animals products	45.3	29.3	77.7	39.4	50.1	17.4	15.1	49.4	36.5	64.9	14.5	40.1
	Fruits & vegetables	82.0	156.4	197.8	88.5	228.6	149.8	100.4	103.5	154.1	246.9	133.1	149.2
	Sugar and edible oils	5.9	92.7	22.7	9.4	25.8	41.1	70.4	33.8	17.0	91.3	25.9	40.9
	Cereals	315.9	382.5	567.2	379.7	257.9	431.3	341.5	353.8	414.9	490.3	192.6	375.2
	Fish & other	4.2	15.8	90.3	8.9	52.4	1.7	2.6	3.7	25.3	11.7	0.7	19.8
	Export per capita	Animals products	0.1	0.2	1.0	6.1	0.6	0.1	5.0	1.0	0.9	0.4	0.2
Fruits & vegetables		0.3	4.8	64.0	49.2	36.5	0.9	16.3	25.0	10.2	29.0	11.3	22.5
Sugar and edible oils		0.4	0.1	0.2	6.5	0.6	0.3	1.0	0.6	9.3	1.5	1.2	1.9
Cereals		0.1	8.9	3.4	3.5	4.5	0.1	3.4	45.6	17.2	35.0	6.3	11.6
Fish & other		0.1	0.1	1.2	0.3	0.6	0.0	0.5	0.0	0.1	0.7	0.0	0.3

Abbreviations: Algeria: DZ ; Egypt: EG ; Israel: IL; Jordan: JO ; Lebanon: LB ; Libyan Arab Jamahiriya: LY ; Morocco: MA; Syrian Arab Republic: SY ; Tunisia: TN ; Turkey: TR ; Palestine: PA/

Source: <http://faostat.fao.org/site/291/default.aspx>.

Table A5. Agricultural value chains balances in kg per head – average annual rate of growth between the two periods - 1980-1995 and 1996-2007

		DZ	EG	IL	JO	LB	LY	MA	SY	TN	TR	OPT	Total
Population		2.8	2.7	3.5	4.6	2.6	3.0	2.2	3.9	2.2	2.3	5.3	2.7
Product per capita	Animals products	2.1	3.6	-1.2	3.7	1.5	0.0	3.0	0.9	6.0	-1.1	23.5	1.2
	Fruits & vegetables	3.2	3.0	-2.9	-0.6	-1.3	-0.1	2.7	-2.9	2.3	1.1	29.2	0.6
	Sugar and edible oils	-5.9	2.4	-0.1	4.8	1.5	0.0	-0.3	1.1	-3.2	0.5	25.7	1.2
	Cereals	1.0	3.3	-5.4	-8.2	5.9	-5.0	-1.2	0.5	0.5	-1.0	33.3	-0.1
	Fish & crustacean, mollusk & other	0.8	8.5	4.1	8.7	4.4	-7.7	3.3	5.0	3.4	-1.5	22.6	3.8
Import per capita	Animals products	-0.3	-4.1	2.5	-1.3	0.3	-8.7	9.7	-4.7	-9.2	2.0	37.7	-1.1
	Fruits & vegetables	1.8	0.8	6.0	-9.7	0.6	1.5	26.9	2.3	5.1	11.1	9.9	0.9
	Sugar and edible oils	-1.0	-2.5	-0.2	5.2	6.3	-3.6	2.9	3.8	4.7	5.3	32.4	1.4
	Cereals	0.7	-0.9	0.9	2.1	0.8	-1.6	4.4	-2.1	4.2	6.4	16.1	1.4
	Fish & crustacean, mollusk & other	-17.7	2.0	2.7	8.7	0.0	-3.9	-1.1	7.0	-10.4	10.9	36.4	1.9
Absorption per capita	Animals products	0.9	2.6	-0.8	0.3	0.9	-1.6	2.7	0.3	2.7	-1.1	24.7	0.6
	Fruits & vegetables	3.1	3.0	1.0	-0.6	-1.2	0.3	3.5	-4.5	2.1	0.8	NA	1.4
	Sugar and edible oils	-2.4	2.1	0.1	0.1	2.9	-2.1	-0.1	1.2	-1.8	0.7	36.9	0.9
	Cereals	0.8	1.5	0.2	1.7	1.4	-2.0	0.7	-1.0	2.1	-0.7	16.5	0.7
	Fish & crustacean, mollusk & other	-5.0	5.8	4.2	8.7	3.4	-4.5	-0.2	6.5	2.8	0.5	NA	3.7
Export per capita	Animals products	23.4	15.6	-5.8	13.5	-3.2	2.5	4.5	20.4	20.0	1.9	24.8	6.3
	Fruits & vegetables	0.5	5.9	-8.5	-4.1	-1.1	-1.0	-0.5	15.8	7.3	4.7	-10.9	-3.6
	Sugar and edible oils	69.1	24.2	-13.0	34.5	21.4	15.6	27.1	47.9	5.1	3.0	-0.6	10.1
	Cereals	19.6	17.5	5.3	-13.1	-2.1		11.1	13.4	17.1	0.9	51.7	5.7
	Fish & crustacean, mollusk & other	13.9	7.1	-6.9	9.0	86.5		12.1	-1.5	8.6	4.3	-46.0	-6.5

Source: Author's estimations.

Table A6. Scenarios projection at 2030 in quantities and values

	Med 11 - BAU				Mediterranean One Global Player				The Euro-Mediterranean Area under threat				EU and Med 11 as regional player			
	Produc-tion	Import	Absorp-tion	Export	Produc-tion	Import	Absorp-tion	Export	Produc-tion	Import	Absorp-tion	Export	Produc-tion	Import	Absorp-tion	Export
<i>Quantities in thousand tons</i>																
Animals products	14175	2619	15678	1116	14702	3543	16912	1332	13566	2577	15140	1002	14489	3485	16775	1198
Fruits & vegetables	62712	4884	62281	5315	63790	5022	54818	13994	61441	4950	61481	4910	63357	4952	55159	13151
Sugar and edible oils	13790	4356	15903	2243	14273	4536	15861	2947	13230	4442	15774	1898	14078	4445	16019	2504
Cereals	55150	101848	148690	8308	56772	106235	153245	9762	50732	103932	147131	7533	56699	104020	151856	8864
Fish, crus-tacean, mol-lusk, other	9087	1929	10963	53	10131	2040	11963	209	7964	1982	9900	45	9701	1984	11451	234
<i>Values at million constant US\$ of 2000</i>																
Animals products	17377	3211	19220	1368	18023	4343	20733	1634	16630	3159	18561	1229	17762	4272	20565	1469
Fruits & vegetables	156001	12149	154929	13222	158683	12492	136364	34811	152838	12313	152937	12214	157605	12320	137212	32713
Sugar and edible oils	4103	1296	4732	667	4247	1350	4719	877	3936	1322	4693	565	4189	1323	4766	745
Cereals	7835	14469	21124	1180	8065	15093	21771	1387	7207	14765	20903	1070	8055	14778	21574	1259
Fish, crus-tacean, mol-lusk, other	12619	2679	15225	73	14070	2834	16613	290	11060	2752	13749	63	13472	2755	15903	325
Total	197936	33805	215230	16511	203088	36111	200201	38999	191672	34311	210843	15140	201083	35447	200020	36511

Sources: author's estimation.