

CWANA Chapter 1 Boxes

Box 1.1. Climate change and the Nile Delta: What happens when sea level rises?

The Nile Delta is one of the oldest intensely cultivated areas on earth. It covers an area of about 25,000 km². Almost 40 million inhabitants live in the Nile Delta. Deserts surround the low-lying, fertile floodplains. The area is suitable for intensive agriculture. Most of a 50 km wide land strip along the coast is less than 2 m above sea level and is protected from flooding by a 1 to 10 km wide coastal sand belt only, shaped by discharge of the Rosetta and Damietta branches of the Nile. Erosion of the protective sand belt is a serious problem and has accelerated since the construction of the Aswan Dam.

Rising sea levels due to the expected global warming would destroy weak parts of the sand belt, which is essential for the protection of lagoons and the low-lying reclaimed lands. The impact would be very serious. One third of Egypt's fish catches are made in the lagoons. Sea level rise would change the water quality and affect most fresh water fish. Valuable agricultural land would be inundated. Vital, low-lying installations in Alexandria and Port Said would be threatened. Recreational tourism beach facilities would be endangered and essential groundwater would be salinized. Dykes and protective measurements would probably prevent the worst flooding up to a 50 cm sea level rise. However, it would cause serious groundwater salinization and the impact of increasing wave action would be serious (Source: UNEP, 2002a).

Box 1.2. Conflict in Darfur : the impact of climate change and environmental degradation

Ecological degradation in the Sudano-Sahelian ecozone, and especially in Darfur, mainly caused by climate change, has been so severe that the traditional means for the prevention and management of inter-ethnic disputes have been rendered virtually unworkable. Indeed, many of the current disputes are not being fought along traditional political borders, but along ecological borders (in this case the borders of the semi-arid plains roamed by 'Arab' pastoralist nomads and those of the wet oases settled by 'African' Fur farmers) that divide richer and poorer ecozones. To continue to treat the conflict in Darfur, and many other parts of Africa, as purely ethnic, tribal, political or religious, and to ignore the growing impact of ecological degradation and depletion of the resource base, could ultimately lead to a distorted understanding of the real situation, and consequently limit the possibility for genuine conflict resolution.

In Darfur, as in most other parts of the continent, human and animal life depends on the delicate balance of soil, climate, water and flora. During the last four decades, this equilibrium has been upset. In addition to the persistent drought (six drought disasters over the last hundred years and 3 of them occurred in the last 20 years), unsustainable methods of land use, such as large-scale mechanized rain-fed farming and overgrazing in marginal lands, are destroying the ecosystem. As a result of the ecological deterioration and armed conflicts, millions of people have been forced to abandon their homelands and have become displaced; so many in fact that Sudan has the highest proportion of internally and externally displaced people – one in every five! (El-Nour, 1992.)

Climate change can impact dramatically livelihoods and ecosystems. In these regions, lying between the isohyets 100 mm and 600 mm, a mere decline in the mean annual rainfall precipitation could bring people and livestock to the brink of disaster. Along with the general decline in rainfall, stripping of vegetation in large areas has allowed the movement of sand dunes, which in turn have killed almost all remaining plant life.

The diagram below correlates rainfall data to conflict intensity in a 40 year period (1950-1990) in Darfur region. It reveals an increase in incidents of conflict with corresponding decrease in rainfall and a lag between minimum rainfall and maximum conflict intensity of roughly one year, a relaxation period for the impact of the drought to take full effect.

Source: M. Suliman, Sudan Civil Wars: New Perspective, Cambridge Academic Press, U.K., 2000.

It is no longer possible to analyse properly or understand any major social phenomenon in the region, without due reference to climatic and ecological transformations. Ignoring the consequences of the huge ecological changes that have taken place, can only spell peril to the people of Darfur (Bachler and Spillmann, 1992; Suliman, 2000.)

It is hoped that in the case of Darfur, an integrated strategy for environmental rehabilitation could go hand in hand with attempts at conflict management and resolution. This would constitute a pioneering example to follow when addressing similar conflicts in comparable regions.

Box 1.3. The case of the Aral Sea

The Aral Sea in Central Asia has been deprived of water sufficient to maintain its water levels since the 1960s. The fresh water which used to sustain the Aral Sea has been used by some neighboring countries to produce export crops. Large amounts of water from the two main rivers feeding the Aral Sea were diverted into the desert to irrigate about 2.5 million hectares. It used to receive about 50 km³ of fresh water per year in the 1960s, whereas by the early 1980s it received zero fresh water. By the 1990s, the surface area of the Aral Sea had shrunk by half and its volume had gone down by 75%. Its salinity had increased fourfold, preventing the survival of most of the sea's fish and wildlife. The resulting negative environmental impacts include fisheries loss, water and soil contamination, and dangerous levels of polluted airborne sediments. Commercially useful fish catches of about 40,000 tonnes annually have been eliminated. Soil salinity has affected about 40% of the irrigated land. The regional water table has fallen. As a result, many oases near the shore have been destroyed. Winds have picked up salt particles and pesticides-laced particles with devastating consequences for surrounding regions. By 1990, more than 95% of the marches and wetlands had given way to sand deserts. Communities face severe health problems. Drinking water is polluted, chronic bronchitis and kidney and liver diseases have increased by 3000 per cent. Infant mortality rate is one of the world's highest. (Sources: UNEP, 1992; UNEP, 1997; UNEP, 2002b).

Box 1.4 : Feminization of agriculture in Darfur

On the southern edge of the Sahara desert and lying within Africa's arid and semi-arid zones, Darfur offers extremely difficult conditions for growing food, raising livestock and living. Drought is a regular, unwelcome visitor to the region. Declining rainfall over recent years has led to low production of crops, which makes households vulnerable to food crises. The most vulnerable people are either subsistence farmers or small scale pastoralists whose means of livelihood is threatened by the drought.

Women's contributions to household food production in the Sudan range from 30 percent to 80 percent, women in Darfur contribute the highest. Darforian women are indispensable to achieving food security. They contribute as much as 80 percent of the labor in agricultural production. They do hoeing, planting, weeding, watering plants, harvesting, processing—besides undertaking the everyday household management tasks of gathering fuel wood, collecting water, preparing and cooking food, cleaning, caring for children and livestock, and engaging in marketing and business activities. When a crisis such as drought or civil unrest hits, the burden on women to provide food can become overwhelming. Both the number and the percentage of rural households headed by women have been increasing in the Sudan. But the feminization of agricultural work has become particularly prominent in certain parts of the country, caused mainly by sickness, war, and the out-migration of men to urban areas. The foregoing factors have led to the breakdown of traditional gender-based divisions of labor.

Women have their own fields known as *jubra* around the house, where they cultivate quick maturing varieties of dura (sorghum), millet, corn, sesame, and vegetable crops. Even poor women have easy access to the land and are intensively involved in *jubra* farming. The *jubra* play an increasingly important role in the maintenance of the household food security during and after the drought. Traditionally a husband gives some land and livestock to his wife/wives, according to the number and sex of her/their children; wives get more land and livestock for boys.

Men and women used to have complementary roles, sharing or dividing tasks in crop production, livestock raising, fishing and the care and use of the forests. Their role in subsistence agriculture is increasingly important because of high rates of male migration during drought and famine. The loss of male labor and the inability of female heads of households to hire replacement labor have led to adjustments in women's cropping patterns and farming systems, resulting in a decrease in production and, in some cases, to production shifts toward less-nutritious crops.

A phenomenon found in many regions and countries today is the trend towards the so-called "feminization" of agriculture, or the growing dominance of women in small-scale agricultural production and the concomitant decrease of men in the sector. This trend makes it more imperative than ever to take action to enhance women's ability to carry out their tasks in agricultural production and their other contributions to food security. This development goes hand in hand with the increasing number of female-headed households around the world. A major cause of both these developments is male out migration from rural areas to towns and cities in their own countries or abroad, and/or the abandonment of farming by men for more lucrative occupations.

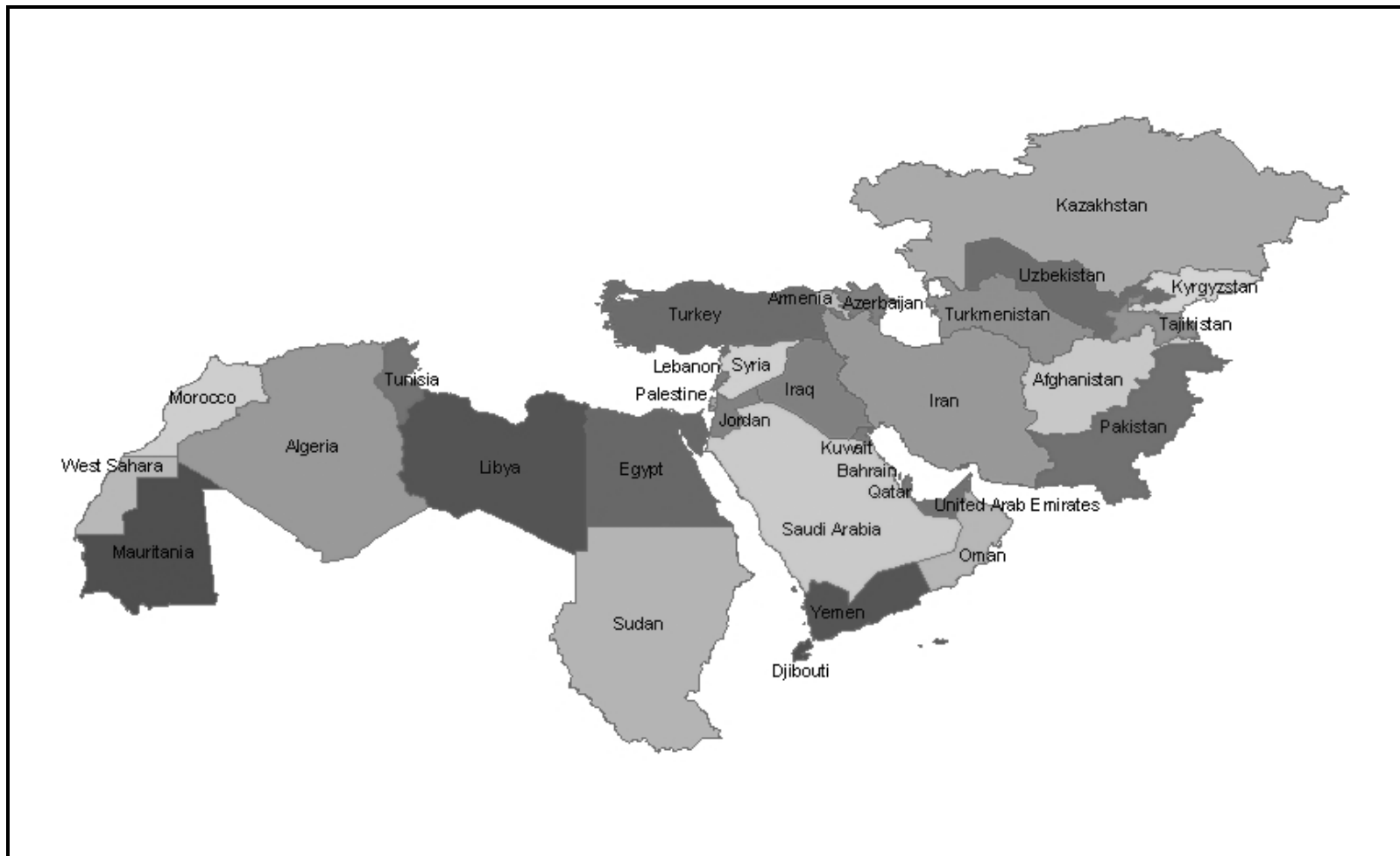


Figure 1.1a. CWANA Region (countries)

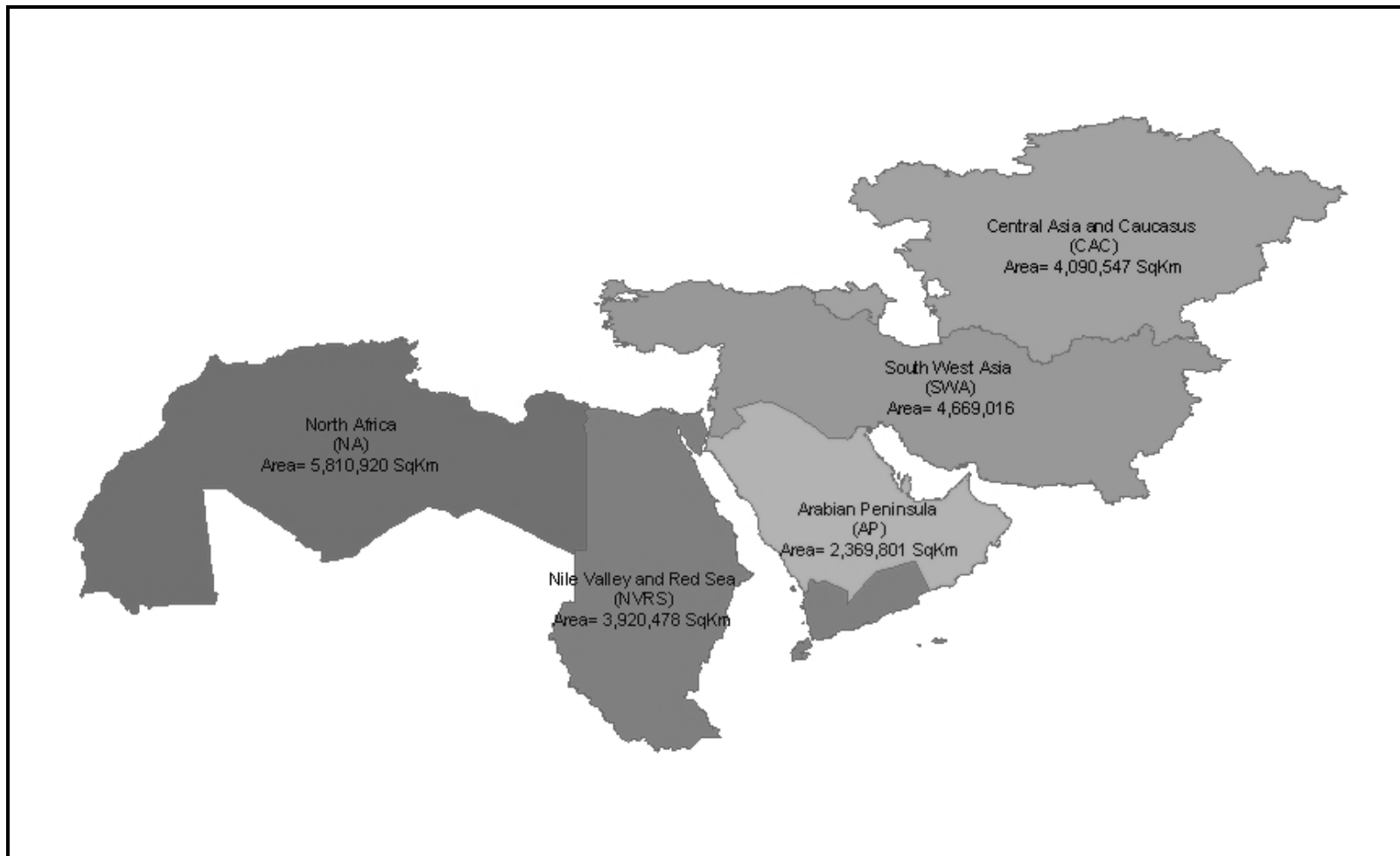
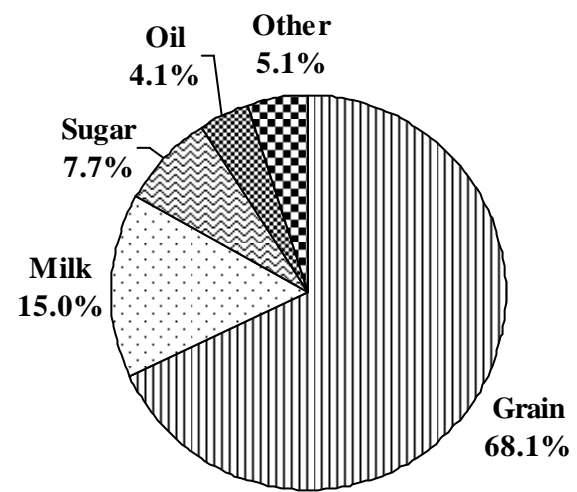


Figure 1.1b. CWANA Region (Sub-regions)

Figure1. 2 Percent of net imports of food groups in Arab region 2003



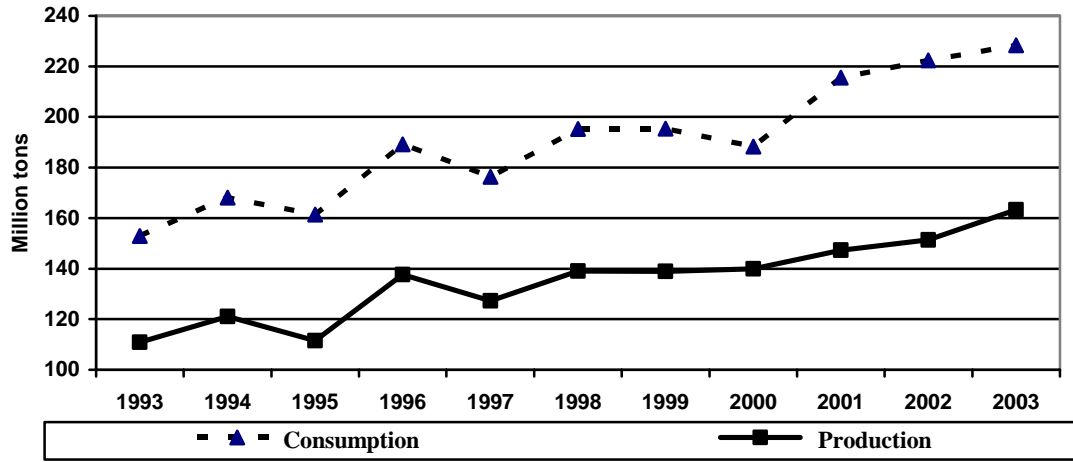


Figure 1.3 The food gap in the Arab region, 1993-2003. Source : www.AOAD.org.com and adapted by Sonia Ali

CWANA Chapter 1 Tables

Table 1 : Regional Sub-Division of the CWANA Regionremove Somalia (Ali AyoubA suggestion that the columns match with the figure 1a, so delete this table it presented better in figure 1a (Fardous Abdennebi)

CWANA Countries	Regional Sub-Divisions
Algeria	North Africa
Libyan Arab Jamahiriya	
Mauritania	
Morocco	
Tunisia	
Djibouti	Nile Valley and Red Sea
Egypt	
Somalia	
Yemen, Republic of	
Sudan	
Bahrain, Kingdom of	Arabian peninsula
Kuwait	
Oman, Sultanate of	
Qatar	
Saudi Arabia	
United Arab Emirates	
Afghanistan	South West Asia
Iran, Islamic Republic	
Iraq	
Jordan	
Lebanon	
Palestine	
Pakistan	
Syrian Arab Republic	
Turkey	
Armenia	Central Asia and Caucasus
Azerbaijan	
Kyrgyz Republic	
Tajikistan	
Turkmenistan	
Uzbekistan	
Kazakstan	

Table 2 : CWANA Climatic Regions in 1000km2 (Source World Atlas of Desertification, UNEP, 1997)

Sub-region	Total area	Hyper-arid	Arid	Semi- arid	Dry sub-humid
North Africa	4498	4028	47	231	299
Nile valley	4559	2797	392	505	472
Arabian Peninsula	2374	2813	0	0	0
West Asia	718	406	27	129	161
Central Asia	3843	1294	513	1659	275
Caucasus	898	43	288	403	74
Total	16890	11381	1267	2927	1281
% of total area		21	37	4	7.6

Table 3 : Characterization of major aridity zones in the CWANA region

Types of aridity zones	% of the land area	Location	Characteristics	Type of agriculture
Hyper arid zones	67%	75% located of it in North Africa, the Nile valley and the red sea sub regions 25% in the Arabian Peninsula and West and Central Asia	Low annual rainfall (0-100 mm) unequally distributed in time and space True desert Plain of loose red sand Scarce vegetation	Meager agricultural activities
Arid zones	7.5%	West and Central Asia, the Caucasus and the Nile Valley and the Red Sea	Precipitation between 100 to 300 mm Inter annual variability rainfall range : 50 to 100% short grass and sparse thorn scrub Wild life (gazelles and reptiles) Strong winds and summer thunderstorms causing sand storms	Nomadic grazing Opportunistic rain cropping and pearl millet in depressions and foothills Low carrying capacity
Semi arid zones	17.3%	North Africa Central Asia	Total precipitations between 400 and 800 mm	Rainfed agriculture : Croplands and permanent pastures Variation of yields because of inter annual variability in rainfall Animal (Cattle) and rainfed husbandry
Sub humid zones	7.6%	North Africa South Sudan Caucasus and Central Asia	Large variety of vegetation types Rainfall : more than 800 mm a year Temperate climate to tropical climate	Productive arable farming

Table 4 : Issues regarding natural resources by sub region

Issues	North Africa	Nile Valley and the Red Sea	West Asia	Arabian Peninsula	Central Asia & Causes
Soils	Soil erosion by wind and water Soil salinization and nutrient loss Sand encroachment	Soil nutrients loss Sand encroachment Soil erosion Soil Stalinization	Soil erosion by wind and water Rangeland deterioration Soil salinization	Soil salinization Soil erosion by wind Some water erosion	Soil erosion by wind Rangeland degradation Some soil salinization and water erosion
Forests	Deforestation Loss of forest quality	Deforestation	Deforestation Overexploitation of vegetation	Some deforestation	Some deforestation
Rangelands	Overgrazing Loss of palatable species	Overgrazing Loss of palatable species Invitation by noxious plants	Overgrazing Loss of palatable species Invitation by noxious species	Overgrazing Loss of palatable species	Overgrazing Loss of palatable species
Biodiversity	Habitat degradation Loss of fauna and flora	Habitat degradation and loss Overexploitation of species	Habitat degradation and loss Overexploitation of species	Overexploitation of fauna and flora	Habitat loss Forest loss and degradation
Freshwater	Water stress and scarcity Deteriorating water quality	Seasonality of water resources Water stress and scarcity Deteriorating water quality	Increasing water demand Over exploitation of ground water Deteriorating water quality	Increasing water demand Over exploitation of groundwater	Water scarcity Water pollution

Table 5 : Economic indicators in Arab countries

	Yemen	United Arab Emirates	Tunisia	Syria	Saudi Arabia	Qatar	Oman
Population 2004 (million)	20.7	3.1	9.9	18.2	24.9	0.6	2.9
Average population growth rate 2000-2005	3.5	1.9	1.1	2.4	2.9	1.5	2.9
GDP (billion\$) 2004	13.1	93.1	28.8	24.1	2.0	26.4	24.3
Growth rate of output 1990 - 2002	5.9	4.2	4.6	4.7	...	...	4.3
Agriculture	5.6	...	1.8	4.5	...	...	...
Industry	6.5	...	4.7	8.7	...	...	...
Manufacturing	3.0	...	5.5	9.6	...	...	...
Services	5.8	...	5.3	3.3	...	...	...
Government surplus / deficit of GDP 2003	-2.7	-8.3	-2.1	-3.5	...	5.0	6.0
Saving % of GDP 2003	18.1	38.4	21.9	17.0	...	54.5	19.7
Interest rate spread 2003	4.5	4.4	3.0	4.5	...	3.5	5.8
Highest marginal tax rate ^(*) % of 2004							
Individual	35.0	0.0	35.0	17.3	...	0.0	0.0
Corporate	35.0	0.0	35.0	58.0	...	35.0	12.0
Value of export % of GDP 2004	31.3	94.3	44.0	36.2	...	74.6	64.2
Value of Import % of GDP 2004	29.9	74.4	47.0	30.9	...	32.4	36.9
Current account balance % of GDP 2004	3.5	14.2	-2.8	3.3	...	36.2	10.0

Source : The Arab World Competitiveness Report, World Economic Forum, Switzerland, 2005

(*) Marginal tax rate is the changes in tax due to change in the taxed activity

Table 5 (continued)

	Morocco	Libya	Lebanon	Kuwait	Jordan	Egypt	Bahrain	Algeria
Population 2004 (million)	31.1	5.7	3.7	2.6	5.6	73.4	0.7	32.3
Average population growth rate 2000-2005	1.6	1.9	1.6	3.5	2.7	2.0	2.2	1.7
GDP (billion\$) 2004	49.3	30.2	19.5	51.6	10.7	74.3	10.4	79.1
Growth rate of output 1990 - 2002	2.6	...	4.9	2.9	4.7	4.5	...	2.2
Agriculture	0.1	...	1.7	...	-2.4	3.2	...	3.6
Industry	3.3	...	-0.8	...	4.9	4.6	...	2.0
Manufacturing	2.8	...	-2.4	...	5.6	6.5	...	-1.9
Services	2.9	...	3.0	...	4.8	4.6	...	2.3
Government surplus / deficit of GDP 2003	-3.8	11.8	-14.6	20.3	-0.5	-5.6	-1.8	5.1
Saving % of GDP 2003	23.5	46.1	9.1	26.8	29.6	22.9	17.6	44.3
Interest rate spread 2003	8.8	4.0	4.7	3.0	6.3	5.3	7.2	2.8
Highest Marginal tax rate % of 2004 ^(*)								
Individual	44.0	90.0	20.0	0.0	25.0	40.0	0.0	40.0
Corporate	35.0	64.0	15.0	0.0	35.0	40.0	0.0	30.0
Value of export % of GDP 2004	25.7	56.7	18.6	60.8	52.8	25.7	90.3	44.9
Value of Import % of GDP 2004	30.5	31.9	52.9	37.6	72.6	28.2	67.6	25.8
Current account balance % of GDP 2004 ^(**)	0.2	21.3	-12.2	28.8	5.6	3.2	3.1	13.1

Table 6 : Some Economic Indicators Affecting Poverty in Arab Countries

Country	Per Capita Share of GDP PPP\$ 2003	Human Poverty Index%	Adult illiteracy rate% 2003	% of Population 2004	Human Poverty Index 2000/01	% Real Growth Rate of GDP 2004	Average Family Size 1991-1994	Unemployment Rate			Gini Index
								% 1999 - 2001			
								Total	Male	Female	
1. High											
Emirates	22420	...	22.7	1.0	16.59	3.6	...	2.3	2.2	2.6	...
Qatar	19844	7.8	10.8	0.2	13.09	9.9	5.6	...	...	...	...
Kuwait	18047	...	17.1	0.8	12.46	7.2	6.5	0.8	0.8	0.6	...
Bahrain	17479	...	12.3	0.2	9.11	5.5	5.6	6.2	4.2	2.0	...
2. High moderate											
Oman	13584	21.1	25.6	0.9	25.08	2.5	7.0	...	...	...	...
Saudi Arabia	13226	14.9	20.6	7.9	17.66	5.3	7.4	4.6	3.9	9.1	...
Libya	12000	15.3	18.3	1.8	15.70	0.9	...	...	...	...	...
3. Low moderate											
Tunisia	7161	18.3	25.7	3.2	19.90	5.8	5.4	14.9	...	...	39.8
Algeria	6107	21.3	30.2	10.3	22.60	5.3	7.0	29.8	33.9	29.7	35.3
Lebanon	5074	9.6	13.5	1.2	10.46	5.0	4.8 ^(*)	...	...	...	...
Jordan	4320	8.1	10.1	1.8	7.96	6.7	6.9	14.5	13.4	20.8	36.4
Morocco	4004	34.5	49.3	9.9	35.20	3.5	6.0	11.6	11.6	12.5	39.5
Egypt	3950	30.9	44.4	23.4	31.07	4.1	4.9	9.2	5.6	22.6	34.4
Syria	3576	13.8	17.1	5.8	18.19	3.4	6.0	11.7	8.3	24.1	...
4. Low											
Djibouti	2086	29.5	34.5	0.2	...	3.0	6.6	...	...	...	...
Sudan	1910	32.4	41.0	10.9	32.20	7.3	6.3	...	...	...	...
Mauritania	1766	40.5	48.8	0.9	...	5.2	...	...	...	...	39.0
Comoros Islands	1714	31.2	43.8	0.2	...	...	6.2	...	...	...	...
Yemen	889	40.3	51.0	6.6	41.84	...	5.8	11.5	12.5	8.2	33.4
5. Unspecified											
Iraq	...	...	...	8.2	30.50	...	7.3	...	...	...	...
Palestine	...	6.5	8.1	1.2	...	2.7	...	31.3	33.5	17.1	...
Somali	..	...	...	3.3	...	...	...	...	...	...	...
Total or average	5008			100.0	27.37						

Source : (1) IMF, World Economic Outlook, April 2005

(2) UNDP, Arab Human Development Report 2004, New York, 2005.

(*) 1997

Table 6 (continued)

Country	% National Poverty Line			1990-2003 Annual Growth Rate of GDP	Av.% Annual Growth Rate of Population 2000-2005	Inflation Rate 2004	% of Total Expenditure to GDP 2000-2005
	1992 - 2000						
	National	Urban	Rural				
1. High							
Emirates	3.0	...	...	-2.1	1.9	3.8	30.1
Qatar	11.0	...	...	...	1.5	3.5	25.6
Kuwait	11.0	...	...	-2.3	3.5	1.8	39.1
Bahrain	15.0	...	...	1.5	2.2	4.9	27.5
2. High moderate							
Oman	17.0	...	...	0.9	2.9	1.6	38.4
Saudi Arabia	21.0	...	...	-0.6	2.9	0.2	31.1
Libya	...	...	...	...	1.9	1.0	29.9
3. Low moderate							
Tunisia	7.4	3.5	13.1	3.1	1.1	3.4	32.8
Algeria	12.2	7.3	16.6	0.6	1.7	5.4	33.3
Lebanon	19.0	...	...	2.9	1.6	3.0	39.5
Jordan	11.7	...	...	0.9	2.7	3.4	35.7
Morocco	19.0	12.0	27.2	1.0	1.6	2.0	27.9
Egypt	22.9	22.5	23.3	2.5	2.0	8.1	27.0
Syria	22.0	...	...	1.4	2.4	3.5	39.9
4. Low							
Djibouti	45.1	...	86.5	-3.3	1.6	2.0	36.5
Sudan	...	...	...	3.3	2.2	6.5	14.3
Mauritania	50.0	30.1	65.5	1.6	3.0	7.0	31.4
Comoros Islands	...	...	...	-1.3	2.8	4.3	...
Yemen	41.8	30.8	45.0	2.4	3.5	12.5	37.1
5. Unspecified							
Iraq	45.0	...	...	...	2.7	...	...
Palestine	...	...	...	-6.0	3.6	...	...
Somali	...	...	...	...	4.2	..	..
Total or average							

Source : (1) IMF, World Economic Outlook, April 2005

(2) UNDP, Arab Human Development Report 2004, New York, 2005.

Table 7 : Typology of Countries According to the Share of Agriculture in GDP and Countries Dependant on Imports for Major Staple Crops

% of agriculture in GDP	Countries	Countries dependent on imports for major staple products
Less than 10%	UAE, Saudi Arabia, Oman, Jordan, Djibouti, Bahrein	UAE, Saudi arabia, Jordan, Djibouti,
Between 10 and 20%	Yemen, Turkey, Tunisia, Algeria, Morocco, Lebanon Egypt, Iran	Algeria, Yemen, Tunisia, Morocco, Egypt, Iran
More than 20%	Turkmenistan, Tajikistan Syrian Arab, Republic Sudan , Pakistan, Mauritania Kyrgyz republic, Armenia	Armenia, Tajikistan , Sudan , Kyrgyz republic

Source : FAO country profiles

Table 8 : National saving rates in some Arab countries

Country	National saving rate
Jordan	24.4%
Egypt	15.4%
Morocco	18%
Sudan	21%
Mauritania	2%
Tunisia	21%
Yemen	16%
Syria	30%

Table 9 : Population growth rate by countries and sub regions

Sub region/Countries	Population growth rates
Arabian peninsula	3.2%
Nile valley and the Red Sea	2.9%
Caucasus	1.2%
Tajiskistan and Turkmenistan	1.9%
Azerbaidjan and Kyrgyzstan	1
Egypt, Morroco, Tunisia and Turkey	Less than 2%
Oman	4.2%
Yemen	3.7%
Saudi Arabia, Jordan and Libya	3.3%

Table 10 : Percentage of the population with adequate sanitation

Countries	Percentage of population with adequate sanitation
Algeria	91%
Syria	83%
Tunisia	80%
Iran	81%
Oman	78%
Jordan	77%
Lebanon	63%
Pakistan	47%
Morocco	41%
Egypt	32%
Kyrgyzstan	30%
Sudan	22%
Somalia	12%

Table 11 : Percentages of low birth weight infants

Countries	Percentage of low birth weight infants
Algeria, Morocco, Tunisia, Iran, Jordan, Kuwait, Oman, Saudi Arabia, Turkey, Turkmenistan, United Arab Emirates	Less than 10%
Sudan, Afghanistan	15% to 20%
Pakistan	25%

Table 12 : Agricultural GDP as Share of the Total GDP; Major Imports and Food Consumption of Dietary Energy Supply

	Agricultural GDP as share of total GDP	Major imports	Food consumption share of dietary energy supply
Afghanistan	-	-	-
Algeria	10%	Wheat Dry cow milk Maize	Wheat : 48%
Armenia	26.2%	Wheat	Wheat : 53%
Azerbaijan			
Bahrain	0.7%	Chicken	-
Djibouti	3.7%	Wheat	Wheat : 36%
Egypt	16.8%	Wheat Maize Cake of soy beans	Wheat and products : 32% Maize and products : 18%
Iran	12.1%	Wheat Oil of soybeans Rice milled	Wheat : 49% Rice: 10%
Jordan	2.2%	Wheat Maize	Wheat : 31% Maize : 12%
Kuwait	-	-	-
Kyrgyz Republic	38.6%	Wheat	Wheat and products : 59%
Lebanon	11%	Cattle	Wheat : 32%
Libyan Arab Jamahiriya	-	Flour of wheat Paste of tomato Wheat	Wheat and products : 38%
Mauritania	20.8%	Sugar Oil of soybeans	Wheat and products : 33% Sugar and products : 15%
Morocco	16.1%	Wheat	Wheat and products : 44%
Oman	3.2%	Dry whole cow milk Rice milled	-
Pakistan	23%	Oil palm	Wheat and products : 41% Milk and products : 11%
Palestine	-	-	-
Qatar	-	-	-
Saudi Arabia	5.1%	Barley Sheep Rice	Rice and products : 14%
Somalia	-	-	-
Sudan	39.2%	Wheat	Sorghum and products : 32% Milk and products : 13% Wheat and products : 13%
Syrian Arab Republic	22.6%	Sugar Maize	Wheat : 40% Sugar : 12%
Tajikistan	24.3%	Beef and veal Sugar Wheat	Wheat and products : 58% Sugar and products : 8%
Tunisia	10.3%	Wheat Maize Barley	Wheat and products : 49%
Turkey	13.1%	Cotton Skins Tobacco leaves	Wheat and products : 44% Sugar and products : 8% Milk and products : 5%
Turkmenistan	28.8%	Sugar	Wheat and products : 61% Milk and products : 7%
United Arab Emirates	3.6%	Rice milled	Wheat and products : 23%

			Rice milled: 15%
Yemen	15.2%	Wheat Sugar Oil Palm	Wheat and products : 45% Sugar and products : 11%

(Source : <http://www.fao.org/countryprofiles> Table I – table 12; major imports; Iran, sugar and dry milk must be included
(Reza Mehrnejad))

Table 13 : Self-sufficiency Ratios of group of foods in Arab countries in 2003

Countries	Grain	Legumes	Vegetables	Fruits	Sugar	Oils & Fats	Meat	Fish	Egg	Milk & dairy products
Emirates	0.0	6.9	43.2	64.5	0.0	0.0	27.0	75.5	37.3	11.0
Qatar	4.6	2.3	21.7	21.8	0.0	0.0	18.6	95.6	35.8	14.0
Kuwait	4.0	0.0	49.7	17.8	0.0	0.0	45.9	34.3	90.7	13.3
Bahrain	0.0	0.0	13.8	15.5	0.0	0.0	33.6	172.7	96.2	9.4
Oman	2.3	0.0	75.2	80.4	0.0	0.0	15.1	140.8	158.6	13.1
Saudi Arabia	29.4	0.0	82.3	64.0	0.0	1.5	52.8	45.0	105.7	37.7
Libya	10.6	53.1	93.7	95.2	0.0	25.2	91.0	93.6	99.7	53.2
Tunisia	49.2	63.5	100.1	102.6	0.0	32.6	99.6	87.1	100.0	89.0
Algeria	38.0	25.4	99.9	88.6	0.0	6.6	91.5	83.9	100.0	42.3
Lebanon	14.1	22.2	93.9	119.5	1.1	18.6	88.5	31.9	110.3	32.5
Jordan	3.9	12.5	150.0	88.8	0.0	40.2	82.6	7.3	106.6	40.4
Morocco	61.6	97.8	106.5	117.7	48.6	31.9	99.1	138.1	100.0	63.5
Egypt	73.1	53.2	102.6	102.2	84.1	47.3	92.8	82.8	100.5	83.1
Syria	91.7	112.5	115.2	99.2	11.8	67.2	100.1	55.8	100.1	88.7
Djibouti	0.0	0.0	0.0	0.0	0.0	0.0	47.8	65.0	0.0	0.0
Sudan	85.5	77.3	99.9	99.8	101.2	101.3	100.5	102.4	99.9	98.9
Mauritania	37.0	73.6	72.9	80.9	0.0	0.3	95.3	117.7	100.0	81.1
Yemen	14.9	51.8	98.3	95.9	0.0	4.7	57.2	134.5	100.4	27.2
Somali	61.9	83.0	95.0	113.1	57.4	79.6	100.0	101.8	100.0	98.5
Iraq	56.6	67.1	99.9	97.8	0.3	18.7	97.0	100.0	100.0	64.0
Palestine	17.3	40.2	153.5	135.7	0.0	98.7	93.2	16.6	100.0	95.5

Source : www.AOAD.org.com

Table 14 : Main Production Systems in the Middle East and North Africa

Region	Production system	Land area (percentage of region)	Population density ¹ (inhab/km ²)	Cropping systems	Livestock
Middle East and North Africa	Irrigated farming system	2	200 ² As above?		
	Large scale irrigated sub system			High value cash and export cropping and intensive vegetable and fruit cropping	-
	Small scale irrigated sub system			Mixed cereals, fodder and vegetables, fruit trees	-
	Highland mixed farming system	7	123		
	Subsystem 1			Rainfed cereal and legume cropping Tree crops, fruits and olives on terraces, vines	-
	Subsystem 2			-	Sheep on commonly managed lands (transhumance)
	Rain fed mixed farming system	2	108	Tree crops and vines	Cattle
	Dryland mixed farming systems	4	77	Cereals (Barley, Wheat, Fallow, Fodder)	Cattle, Small ruminants
	Pastoral farming system	23	3		Goat, sheep, camel and cattle
	Sparse (Arid) farming system	62	6,06	Date palms, fodder and vegetables	Camel, sheep and goats
	Coastal Artisanal Fishing System	1	9	Vegetables, fodder	Fish, goats, sheep
	Urban based farming systems	1	55	Horticultural cropping (fruit, vegetables)	Poultry

Source : FAO and the World Bank, 2001 and adapted by Rym Ben Zid

¹ Population density is the population divided by the cultivated area.

² The assumption is that the w

Table 15 : Percentage of Irrigated Area with respect to Cultivated Area and Type of Land and Water Management for each of the Major Production Systems

Production system	Percentage irrigated area/cultivated area	Type of land and water management
Irrigated farming system		
Large scale irrigated sub system	100%	Large scale irrigation Intensive year round cropping : cropping intensity 120-160% Large scale centralized management of water access and distribution Water access and distribution managed centrally but land attributed to many tenants (0.5-5ha) organized in Water users associations Large scale fully irrigated individual schemes
Small scale irrigated sub system	A low percentage	Traditional irrigation practices Small units (0,02-1 ha)
Highland mixed farming system	23%	Supplementary irrigation in summer for vegetables or high value fruits (source of water)
Subsystem 1		
Subsystem 2		
Rain fed mixed farming system	4.3%	Supplementary irrigation in summer for vegetables or flowers
Dryland mixed farming systems	18%	Small irrigated areas grown in vegetables
Pastoral farming system	1%	Small scale irrigation (1-2 ha)
Sparse (Arid) farming system	0,1 %	Irrigation schemes set up in oasis
Coastal Artisanal Fishing System	-	-
Urban based farming systems	High percentage	Family gardens

Source: FAO and the World Bank, 2001 and adapted by Rym Ben Zid

Table 16 : Irrigated Area with Respect to Cultivated Area and Irrigation Efficiency³

Region	Cultivated area (Million ha)	Potential for expanding cultivated areas (million ha)	Irrigated areas (Million ha)	Potential for extending irrigated areas (Million ha)	Ratio : irrigated areas/cultivated areas	Irrigation efficiency	Irrigation patterns
Middle East and North Africa	65	21	21	14	32%	50%	Large perennial waterways, sophisticated water management techniques, shallow groundwater and seepage, small scale irrigation, large scale irrigation schemes, groundwater

Source : FAO and the World Bank, 2001 and adapted by Rym Ben Zid

³ Irrigation efficiency is the amount of water used towards the amount of water withdrawn.

Table 17 : Main Production Systems in Central Asia

Region	Production system	Population density (inha/km2)	Cropping systems	Livestock
Central Asia	Irrigated farming system	40	Cotton, rice, wheat, barley, fruits and vegetables ⁴	-
	Horticulture mixed	42	Wheat, maize, oil crops, fruits, vegetables (greenhouses),	Cattle, sheep and goats
	Highland mixed	164	Cereals, legumes, tubers, vegetables, fodder, fodder trees	Sheep, goats, cattle
	Rice Wheat	410	Irrigated rice, Wheat, vegetables	Dairy, goats and sheep
	Sparse Mountain	16	-	Cattle, Yak, Sheep and goats
	Small scale cereal livestock	11	Wheat, Barley	Sheep and goats and some cattle
	Pastoral (1) ⁵	11	Cereals, fodder crops, potatoes for subsistence	Sheep, cattle
	Pastoral (2) ⁶	38	Rice, wheat, fodder crops	Cattle, sheep, goats
	Sparse Arid ⁷	5	Extensive cereal cultivation	Sheep
	Sparse arid ⁸	17	-	Cattle, sheep, goats

Source : FAO and the World Bank, 2001 and adapted by Rym Ben Zid.

⁴ Some farmers have to work off farm because some markets have been lost after the fall of the wall and the collapse of the Soviet Union.

⁵ This production system is found in the following countries : Kyrgyz Republic, Tajikistan, Turkmenistan.

⁶ This production system is found in the following countries : Afghanistan, Pakistan.

⁷ This production system is found in Turkmenistan

⁸ This production system is found in Afghanistan and Pakistan.

Table 18 : Percentage of Irrigated area with respect to Cultivated Area and Type of Land and Water Management

Region	Production system	Percentage irrigated area/cultivated area	Type of land and water management
Eastern Europe and Central Asia	Irrigated farming systems	86%	Medium to large irrigated farms in major irrigation systems (cotton cultivation) Small scale irrigation systems
	Horticulture mixed	15%	Scattered irrigation schemes, green houses, protected structures
	Highland mixed	16%	Scattered irrigation schemes
	Rice wheat	77%	Tube wells, Ground water irrigation systems
	Sparse mountain	10%	Traditional irrigation water supply systems
	Small scale cereal livestock	-	-
	Pastoral (1)	-	-
	Pastoral (2)		Groundwater irrigation systems
	Sparse arid (1)	Limited	Very small irrigation schemes
	Sparse arid (2)	Limited	Scattered irrigation schemes

Source: FAO and the World Bank, 2001 and adapted by Rym Ben Zid

Table 19 : Irrigated Area with Respect to Cultivated Area and Irrigation Efficiency

Region	Cultivated area (Million ha)	Potential for expanding cultivated areas (million ha)	Irrigated areas (Million ha)	Potential for extending irrigated areas (Million ha)	Ratio : irrigated areas/cultivated areas	Irrigation efficiency	Irrigation patterns
Central Asia	>300	25 to 35 % in the case of the countries of the former soviet union Not very important in the case of Afghanistan and Pakistan	> >29	From 4.2 to 8.7 in Turkey No potential in Pakistan and Afghanistan because of depletion of ground waters	10% to 40% (very low in case of the countries of the former soviet union and close to 40% for Pakistan and Afghanistan)	Not very efficient because of the lack of maintenance in case of the countries of the former Soviet Union but	Very large irrigation schemes in Central Asia (countries of the former Soviet Union) Small scale irrigation (reservoir, tube wells...) (Pakistan and Afghanistan), Scattered irrigated areas and settlements (Pakistan and Afghanistan)
South Asia	213	Not important	85	10	40%	Not so efficient	Small scale irrigation (reservoir, tube wells...), Scattered irrigated areas and settlements

Source: FAO and the World Bank, 2001 and adapted by Rym Ben Zid

Table 20 : Women' contribution to agricultural labor

Countries	Women' contribution to agricultural labor
Egypt, Morocco, Somalia, Syria, Turkey	50% to 70%
Irak, Jordan, Kyrgyzstan, Lebanon, Pakistan, Sudan and Tunisia	30 to 49%
Mauritania	28%
United Arabs Emirates	4%

Source : Kasnakoglu

Table 21 : Percentage of female-headed households

Countries	Percentage of female-headed households
Pakistan, Sudan	25%
Egypt, Morocco	16%
Yemen	13,6%
Lebanon, Oman, Tunisia	11%
Turkey, Syria, Jordan and Iran	6%

Source : FAO, 1995, Hartl

Table 22 : Percentage of land area owned by women

Countries	Period	Percentage of land area owned by women
Syria	2004	5%
Lebanon	2004	7%
Jordan	2004	11 %
Egypt	End of the 1980s	24%
Oman	-	0 %
Iran	-	A few
United Arab Emirates	-	4.9 %

Source : Forni, 2001, FAO, 1995, FAO, 1996a

Table 23 : CWANA Land Use in million hectares (Source: WRI et al., 1998)

Sub-region	Cropland	Permanent Pasture	Forests and Woodlands
North Africa	25	108	18
Nile valley	19	169	60
Arabian Peninsula	4	121	2
West Asia	12	13	0.8
Central Asia	75	91	37
Caucasus	6	48	6
Total	141	550	124

Table 24 : Croplands per capita (1994)

Sub region/Country	Croplands per capita (ha)
North Africa	0.330
Caucasus	0.264
West Asia	0.260
Central Asia	0.244
Nile valley	0.156

Source : WRI et al. (1998)

Table 25 : Sub-regional Arable and Permanent Crops percent of land area (Source: FAO, 2006c).

Sub-region	1975	1980	1985	1990	1995	2000	2005
North Africa	4.7	4.6	4.7	4.9	5.5	5.6	5.6
Central Asia	11.0	11.0	11.0	10.8	10.4	10.0	10.0
West Asia							
Arabian Peninsula	1.1	1.2	1.4	1.7	1.9	1.9	1.9
Mashriq	15.9	16.3	16.4	16.5	16.3	16.3	16.3

Table 26 : Sub-regional Cereal Production in million tones (Source: FAO, 2006b).

Sub-region	1975	1980	1985	1990	1995	2000	2005
North Africa	18.5	19.1	23.2	24.5	24.1	27.9	28.0
Central Asia	18.9	25.7	25.6	31.5	15.1	18.4	19.0
West Asia							
Arabian Peninsula	1.5	1.1	2.6	4.9	3.5	3.2	3.1
Mashriq	3.7	6.0	5.6	6.8	8.9	4.5	5.0