2. ECONOMY AND AGRICULTURE OF THE WANA REGION: SOME BASIC DATA[1]

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The West Asia and North Africa (WANA) region consists of countries[1] that share, for the most part, a common cultural heritage and identity based on religion (Islam), language (Arabic), and historical background (mostly under the same broad rule in the past, basically the Roman, Umayyad, Abbasid, then Ottoman empires). In most of these countries, a Mediterranean climate prevails and, consequently, the countries share some common agricultural features. However, despite these common characteristics, they are currently very diverse, partly because of their distant and recent historical divergences and their specificities in agroecological conditions and natural resources, but mainly because of their size, population, and economic development.

This chapter presents the most significant socioeconomic features of the region (Section 2.1) and its most important agricultural characteristics (Section 2.2). Consideration of the dominant farming systems in the WANA region and their main constraints (Section 2.3), mainly related to the prevailing agroecological conditions, may justify the strategic role of agricultural research for the future development of the region[2].

2.1 BASIC DATA ON SOCIOECONOMY

2.1.1 Demographic Features (Table 1)

The WANA region is currently (1996) the home of 431 million inhabitants. Since 1980 (277 million), the population has grown considerably. Although the annual rate of population growth has significantly decreased over the past years (from approximately 3% per year in the 1980s to 2.4% for the period 1995–2000), it remains rather high as it means an annual increase of about 10 million inhabitants during the previous 15 years.

All countries have faced a dramatic urbanization phenomenon: annual population growth in cities was higher than 4% in most countries during the period 1960–1994, but this rate has decreased very rapidly. In all the region, the urban population has surpassed the rural population, which still remains growing at a slower rate. In all countries, agriculture has to be more productive and more organized in order to satisfy the needs of the increasing number of urban people, concentrated generally in a few large towns[3].

Demographic features are highly variable according to the countries. Egypt, Iran, and Turkey each have more than 60 million inhabitants; together with Ethiopia, they comprise 57% of the population of the WANA region; while Bahrain, Cyprus, Eritrea, Kuwait, Lebanon, Oman, Qatar, and the United Arab Emirates each have less than 4 million people. The growth rate of the population is under 2% in a few countries (Egypt, Cyprus, Lebanon, Morocco, Qatar, Tunisia, and Turkey), but still exceeds 3% in Eritrea, Jordan, Libya, Oman, Saudi Arabia, and Yemen. Urbanization trends are also varying from country to country[4].

2.1.2 Socioeconomic Features (Table 2)

The gross national product (GDP) of the WANA region reaches around US$ 790 billion (1996). Although it is less than that of the largest European countries (France, Germany, Italy, and the United Kingdom), when taking into account the cost of life and the related "parity income coefficient," it is higher. The average GDP and "parity income" are US$ 1,840 and 4,100 per capita, respectively. Dramatic improvements in this domain have also been made over the last two decades: GDP and GDP per capita have increased by more than 50% compared to those in 1980, as a result of economic development.

The economic features are very diverse in the WANA region and classification of the countries varies according to the criteria used.

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[1] This chapter considers the 24 countries selected in Chapter 1 (see Section 1.1: What is the WANA region?), including those of North Africa (Algeria, Libya, Morocco, Tunisia), the Nile Valley and Red Sea sub-region (Egypt, Eritrea, Ethiopia, Sudan), West Asia (Cyprus, Iraq, Jordan, Lebanon, Syria), the "highland" countries (Iran, Turkey), and the Arabian Peninsula countries.

[2] **Note: All statistical data used in this chapter come from international organizations** (UNDP, World Bank, FAO). **It is important to point out the rather high degree of approximation of these data for some countries** (Iran, Iraq, Lebanon, Sudan, countries of the Arabian Peninsula), and sometimes their incoherence with data from national sources.

[3] The population of some capitals or other towns now (1996) exceeds 2 million: Cairo (9.9), Istanbul (8.1), Tehran (6.9), Baghdad (4.6), Algiers (3.9), Casablanca and Tripoli (each 3.4), Ankara (2.9), Riyadh (2.7), Khartoum (2.6), Addis Ababa (2.3), Tunis, Damascus and Aleppo (each around 2.1); most of these official data are most likely far below the actual ones.

[4] Ethiopia is still registering accelerated urbanization (annual urban growth rates of 4.7 and 5.2% during the periods 1960–1994 and 1994–2000, respectively). In Syria, urbanization has been keeping the same speed (4.4% over the two periods), while it is gradually slowing down in Jordan (4.9 and 4.7%), Oman (8 and 7.7%), Sudan (5.3 and 4.7%), and Yemen (6.8 and 6.6%). In the other countries, urbanization growth rate has notably decreased.

Table 1 - The WANA Region: Total and Rural Population

Italics: Approximate data. °: Rounded numbers. 0.–: Minimal (almost zero).

	Country/ Sub-Region	Total Population (TP)			Annual Rate of Urbanization 1994–2000	Rural Population 1996	
		1980	1996	Increase 1995/2000			
		Million	Million	% per year	%	Million	%
1	Algeria	18.7	28.8	2.3	3.6	12.3	43
2	Libya	3.1	5.6	3.3	4.0	0.8	14
3	Morocco	19.4	27.0	1.8	3.0	13.8	51
4	Tunisia	6.4	9.2	1.8	2.7	3.9	42
A	**North Africa**	**47.6**	**70.6**	**2.6**	**…**	**30.8**	**44**
5	Egypt	40.9	63.2	1.9	2.6	34.8	55
6	Eritrea	38.7	3.3	3.7	…	2.7	82
7	Ethiopia		58.2	3.2	5.2	50.1	86
8	Sudan	18.7	27.3	2.2	4.7	20.5	75
B	**Nile Valley/Red Sea**	**98.3**	**152**	**2.3**	**…**	**108.1**	**71**
9	Cyprus	0.61	0.76	*1.2*	*2.0*	0.3	45
10	Iraq	13.0	20.6	2.8	3.6	2.5	*25*
11	Jordan	2.9	4.4	3.3	4.7	1.2	27
12	Lebanon	2.7	*3.1*	*1.8*	*2.9*	*0.4*	*12*
13	Syria	8.7	14.6	2.5	4.4	*6.9*	*47*
C	**West Asia**	**27.9**	**43.5**	**2.6**	**…**	**11.3**	**26**
14	Iran	37.2	*61.1*	2.2	3.1	*24.4*	*40*
15	Turkey	44.5	61.8	1.6	3.7	17.9	29
D	**Highlands**	**81.7**	**122.9**	**1.9**	**…**	**42.3**	**34**
16	Bahrain	0.29	0.57	2.2	2.9	0.1°	9
17	Kuwait	1.37	1.7	3.0	0.5	0.–	2
18	Oman	0.99	2.3	4.2	7.7	2°	85
19	Qatar	0.21	0.56	1.8	2.2	0.–	8
20	Saudi Arabia	9.4	*18.8*	*3.4*	*3.6*	*3.6*	*19*
21	United Arab Emirates	0.75	2.26	2.0	2.7	0.3	15
22	Yemen	8.2	15.7	3.7	6.6	10.2	65
E	**Arabian Peninsula**	**21.2**	**41.9**	**3.8**	**…**	**16.2**	**39**
F	**Total WANA°**	**277**	**431**	**2.4**	**…**	**209**	**48**

Source: UNDP Human Development Report (1997); World Bank Atlas (1997); IMF, International Financial Statistics (1998).

Table 2 - The WANA Region: Some Socioeconomic Data

Italics: Approximate data. °: Rounded numbers.

	Country/ Sub-Region	Total Population 1996 (million)	Gross Domestic Product (GDP) 1996					Human Develop. Index 1994	Total Poverty 1992 (% of population)	Rural Poverty 1992 (% of poor living in rural areas)
			GDP (billion US$)	GDP/cap (US$)	Parity income coeffic.°	Parity GDP[b] (billion US$)	Parity GDP/cap (US$)°			
1	Algeria	28.8	43.4	1510	3.4	148	4550	0.74	22	53
2	Libya	5.6	25.0	4460	1.4	35	6240	0.80	24	22
3	Morocco	27.0	35.6	1320	2.8	100	3700	0.57	37	65
4	Tunisia	9.2	18.5	2010	2.6	48	5230	0.75	16	36
A	**North Africa[a]**	**70.6**	**122.5**	**1730**	**2.7**	**331**	**4680**	**0.68**	**27**	**56**
5	Egypt	63.2	67.9	1070	3.6	244	3850	0.61	22	61
6	Eritrea	3.3	0.58	180	5.3	3.1	950	0.27	65	92
7	Ethiopia	58.2	6.0	105	4.3	26	450	0.24	61	92
8	Sudan	27.3	7.8	285	3.8	30	1080	0.33	71	93
B	**Nile Valley/Red Sea[a]**	**152**	**82.3**	**540**	**3.6**	**303**	**1990**	**0.41**	**47**	**83**
9	Cyprus	0.76	9.2	12100	1.4	13	16900	0.91	16	26
10	Iraq	20.6	26.4	*1280*	*2.5*	*66*	*3200*	*0.53*	*24*	*34*
11	Jordan	4.4	7.2	1640	2.5	18	4100	0.73	17	29
12	Lebanon	*3.1*	*13.3*	*4360*	*1.1*	*15*	*4800*	0.79	20	17
13	Syria	14.6	*16.4*	1120	4.8	79	5380	0.76	39	68
C	**West Asia[a]**	**43.5**	**72.5**	**1670**	**2.6**	**191**	**4370**	**0.65**	**28**	**53**
14	Iran	*61.1*	93	*1520*	*2.7*	*251*	*4100*	0.78	25	48
15	Turkey	61.8	184	2980	2.1	386	6400	0.77	19	26
D	**Highlands[a]**	**122.9**	**277**	**2250**	**2.3**	**637**	**5190**	**0.77**	**22**	**39**
16	Bahrain	0.57	4.5	7890	1.7	7.7	13400	0.87	23	0
17	Kuwait	1.7	35.4	21100	1.1	39	23200	0.84	22	6
18	Oman	2.3	10.8	4700	1.7	18	7990	0.72	8	64
19	Qatar	0.56	6.5	11600	1.5	9.8	17400	0.84	25	28
20	Saudi Arabia	*18.8*	138	7300	1.3	179	9600	0.77	24	34
21	United Arab Emirates	2.26	36.3	16100	1.0	36	16100	0.87	23	24
22	Yemen	15.7	5.3	340	3.1	16	1050	0.36	27	72
E	**Arabian Peninsula[a]**	**41.9**	**236.8**	**5650**	**1.3**	**306**	**7330**	**0.63**	**24**	**59**
F	**Total WANA°[a]**	**431**	**791**	**1840**	**2.2**	**1770**	**4100**	**0.60**	**32**	**67**
	USA	265	7340	28000	1.0	7340	28000	0.94		
	Japan	126	4650	40900	0.57	2650	23300	0.94		
	Germany	82	2340	28900	0.73	1710	21100	0.92		
	France	58	1530	26300	0.82	1250	21500	0.95		
	Italy	57	1190	19880	1.0	1190	19880	0.92		
	United Kingdom	59	1150	19600	1.02	1150	20000	0.93		
	China	1215	807	750	4.4	3580	3330	0.63		
	India	945	350	380	4.2	1460	1580	0.45		
	Brazil	161	730	4400	1.44	1050	6340	0.78		
	Mexico	93	320	3670	2.1	670	7660	0.85		

a. Figures for sub-regions and the WANA region related to GDP per capita, human development index and poverty are weighted by population.
b. Parity GDP: Its amount has been estimated by multiplying GDP by the parity income coefficient; this is correct for countries with limited international trade, but is questionable for the other countries, mainly the large oil exporters with rather high parity income coefficients (Bahrain, Iran, Saudi Arabia).

Source: First six columns: from (or calculated from) the World Bank Atlas (1997); IMF, International Financial Statistics (1998). Human Development Index: 1997 UNDP Human Development Report. Total and rural poverty: see Rodriguez (1997) who referred mainly to the 1997 and 1992 UNDP Human Development Reports.

- According to their GDP, Iran, Saudi Arabia, and Turkey are classified among the "very powerful" countries (GDP higher than US$ 90 billion) and represent together around 52% of the GDP of the WANA region. Most of the other countries are considered as "relatively powerful" (GDP between US$ 6 and 90 billion), except the "economicaly small" countries (GDP less than US$ 6 billion): Bahrain, Ethiopia, and Yemen.
- According to their parity GDP per capita, the rich countries (parity GDP per capita higher than US$ 8,000) are Cyprus and the large oil-exporting countries with small populations: Bahrain, Kuwait, Qatar, Saudi Arabia, and the United Arab Emirates, but parity GDP of Bahrain and Saudi Arabia (US$ 13,400 and 17,400 per capita)—often recognized as very rich countries—is relatively far from that of the richest developed countries. Libya Oman, and Turkey are sometimes also classified among the "high-income" countries (more than US$ 6,000). All the other countries are generally considered as medium-income countries, except Eritrea, Ethiopia, Sudan, and Yemen, which are classified as low-income countries (parity GDP per capita lower than US$ 1,500).

This classification may be refined according to the UNDP "human development index" (HDI), which takes into account life expectancy/longevity, education (adult literacy rate; rate of education at primary, secondary and university level), and parity GDP per capita. According to this index, the rich countries listed above and Libya are considered as having high human development (HDI higher than 0.80); most of the other countries are among the medium human developed countries (HDI between 0.50 and 0.79), except Eritrea, Ethiopia, Sudan and Yemen, which have low human development (HDI less than 0.50).

The UNDP "human poverty index," which considers three other criteria (percentage of people who may die before the age of 40, percentage of illiterate people, social services available: health, drinking water, malnutrition affecting children less than 5 years old)[1], provides a complementary vision of the social conditions prevailing in the WANA region. According to this indicator, an average of around 32% of the total population of the WANA region are poor, with percentages lower than 20% in Cyprus, Jordan, Oman, Tunisia, and Turkey; percentages higher than 60% in Eritrea, Ethiopia, and Sudan; and percentages between 20 and 40% in the other countries. In all countries except Bahrain, Kuwait, Lebanon, and Libya, poverty affects mainly the rural population, which is estimated at 67% of the total number of poor people in the WANA region, with the highest rate of poor rural people in the poorest countries (Eritrea, Ethiopia, Sudan, Yemen: more than 70% of the poor people are in rural areas) and in Syria, Oman, Egypt, and Morocco (68, 64, 61, and 53%, respectively)[2].

According to the tentative classification proposed in Table 3:

- Countries with high income per capita and high human development are Bahrain, Cyprus, Kuwait, Libya, Qatar, and the United Arab Emirates.
- Countries with high income per capita and medium human development are Oman, Saudi Arabia, and Turkey, Oman being remarkable for its low percentage of poor people (8%; the lowest in the WANA region).
- Countries with medium income per capita and medium human development are Algeria, Egypt, Iran, Iraq, Jordan, Lebanon, Morocco, Syria, and Tunisia; in this category, Morocco and Syria are the countries with the highest percentages of poor people (37 and 39%, respectively).
- Countries with low income per capita and low human development are Eritrea, Ethiopia, Sudan, and Yemen; Yemen in this group having a surprisingly low percentage of poor people (27%).

It is worth mentioning the socioeconomic diversity among the countries within the five sub-regions, mainly between those of the Nile Valley/Red Sea and Arabian Peninsula sub-regions.

2.2 MAIN FEATURES OF THE AGRICULTURAL SECTOR

This section considers the relative importance of the agricultural sector in the regional and national economies and provides some background on agricultural performance (national production, international trade, food supply).

[1] For HDI estimates, see Rodriguez (1997) who referred to the 1997 UNDP report and to other publications (Jazairi et al., 1992; Reardon and Vosti, 1995; UNDP 1992 report on human development).

[2] Rural areas (1996) are inhabited by around 92 million people out of the total 138 million poor people estimated for all the WANA region; among these 92 million poor rural people, 32.7 are in Ethiopia, 18 in Sudan, 8.5 in Egypt, 7.3 in Iran, 6.5 in Morocco, 3.9 in Syria, 3.4 in Algeria, 2 in Eritrea, 1.5 in Saudi Arabia (all values in million), and the remaining in the other countries.

Table 3 - The WANA Region: Socioeconomic Classification of the Countries

High income per capita: > US$ 6000; Medium inc. per cap.: > US$ 1500 and < US$ 6000; Low inc. per cap.: < US$ 1500.
High human development: > 0.80; Medium human devel.: > 0.50 and < 0.80; Low human devel.: < 0.50.
Italics: Approximate data.

Classification/ Country		Total Population 1996 (million)	Parity GDP/Cap. 1996 (US$)	Human Develop. Index 1994	Total Poverty 1992 (% of popul.)
High Income per Capita and High Human Development	Kuwait	1.7	23200	0.84	22
	Qatar	0.56	17400	0.84	25
	Cyprus	0.76	16900	0.91	16
	United Arab Emirates	2.26	16100	0.87	23
	Bahrain	0.57	13400	0.87	23
	Libya	5.6	6240	0.80	24
High Income per Capita and Medium Human Development	Saudi Arabia	*18.8*	9600	0.77	24
	Oman	2.3	7990	0.72	8
	Turkey	61.8	6400	0.77	19
Medium Income per Capita and Medium Human Development	Syria	14.6	5380	0.76	39
	Tunisia	9.2	5230	0.75	16
	Lebanon	*3.1*	*4800*	0.79	20
	Algeria	28.8	4550	0.74	22
	Iran	*61.1*	*4100*	*0.78*	*25*
	Jordan	4.4	4100	0.73	17
	Egypt	63.2	3850	0.61	22
	Morocco	27.0	3700	0.57	37
	Iraq	20.6	*3200*	*0.53*	*24*
Low Income per Capita and Low Human Development	Sudan	27.3	1080	0.33	71
	Yemen	15.7	1050	0.36	27
	Eritrea	3.3	950	0.27	65
	Ethiopia	58.2	450	0.24	61

2.2.1 Role of the Agricultural Sector in the Regional and National Economies (Table 4)

In all countries, the socioeconomic importance of the agricultural sector has rapidly declined in the last three decades and is still decreasing. Agriculture represents the most important sector in the WANA region in social terms as it still mobilizes an average of 42% of the labor force. This percentage exceeds 55% in some countries which are among the poorest: Eritrea, Ethiopia, Sudan, and Yemen. In Algeria, Egypt, Iran, Morocco, Syria, Tunisia, and Turkey, it ranges between 25 and 50%. The remaining countries, which include oil producers (Iraq, Libya, all the Arabian Peninsula countries except Oman and Yemen) and small countries (Cyprus, Jordan, Lebanon), agriculture is currently a marginal sector.

In the WANA region, the agricultural GDP (AGDP) currently totals around US$ 110 billion and represents only 14% of the GDP[1]. With such a low AGDP, the average gross income of the agricultural population is relatively very low: it amounts to around US$ 1,530 per agricultural laborer, against US$ 6,880 per laborer in the other sectors (22% of the latter or 4.5 times less). In most countries, these differences result from the low productivity in agriculture, the low prices paid for food products, and the inadequate attention paid to agriculture by national economic policies.

Relative levels of agricultural incomes and productivity vary largely from country to another:

- Differences are very strong in the poorest countries (Eritrea, Ethiopia) and in richer countries (Morocco, Oman, Turkey, the United Arab Emirates) which are characterized by highly uneven urban and rural development.
- In Bahrain, Cyprus, Lebanon, and Kuwait, agricultural incomes are in line with the relative importance of the agricultural labor force in the country, as these countries enjoy flourishing intensified agriculture. Equal productivity and incomes also prevail in Libya and Syria, perhaps because of the efforts made recently to encourage agricultural production and reach food self-sufficiency.
- Iraq is the unique country where average agricultural incomes seem much higher than in other sectors, most likely as a result of the embargo since the Gulf war.

Agricultural exports are marginal (less than 10% of the total exports) in most countries, except in Jordan, Morocco, and Sudan (more than 40% of the total exports) and in Lebanon and Tunisia (around 20% of the total exports). Agricultural imports are important (more than 25% of the total import bill) in Algeria, Egypt, Iraq, Libya, Syria, and all the Arabian Peninsula countries (Mona, 1997) (see further).

The links of agriculture with the rest of the economy are still rather weak, but are rapidly improving. National agro-industrial sectors were very limited at the beginning of the 1990s (operating often with national and imported agricultural raw materials). According to the few statistical data available on agro-food industries (1999 Medagri Yearbook), in 1990, food industries represented 14% of the product (value) of all manufacturing industries in Turkey, 17% in Morocco, 19% in Iraq, 20% in Jordan, 23% in Egypt, 28% in Syria, and 46% in Yemen; however, added values of food industries were very low compared to the AGDP; the highest added value in the WANA region was observed in Turkey with only US$ 3.4 billion, i.e., 12% of the current AGDP[2]. Dramatic progress may have occurred during the past years, mostly owing to investments by foreign and international enterprises involved in food processing (including beverages), feed production, textiles, etc. The same evolution is reported (data not precise) for industries related to input production (seeds, pesticides, fertilizers, irrigation equipment, agricultural machinery).

Among the links of agriculture with the rest of the economy, it is worth mentioning the importance of food trade (including trade of locally prepared and sold food in restaurants and in the streets), generally implemented by individuals or very small family enterprises which often constitute an "informal" economy, for which few reliable data are available. In this respect, evolution may also be very rapid, with the recent presence of large national and foreign food enterprises (supermarkets, etc.) in some countries.

2.2.2 Agricultural Performance

WANA Region Overview

Agricultural production (Table 4) - According to the FAO production index, the WANA region has registered during the period 1980–1996 rather high agricultural development: total production has grown by 85% (3.9% average growth per year, against 2.4% for the population) and by 14% per capita, mainly as a result of intensification (growth of irrigated areas and increased use of improved seeds, fertilizers, pesticides, mechanization, credit, etc.) (see further).

[1] The four largest European countries (France, Germany, Italy, Spain, and the United Kingdom) have together around the same AGDP (US$ 112 billion in 1996), which represents 1.6% of their GDP; in these countries, the agricultural labor force represents around 2% of the total labor force.

[2] Other added values are: US$ 1.1 billion in Egypt (8% of the 1996 AGDP), US$ 0.6 billion in Syria, US$ 0.1 billion in Jordan, and US$ 0.17 billion in Cyprus (12, 15 and 17% of the 1996 AGDP for these three countries, respectively).

Table 4 - The WANA Region: Some Data on Agriculture

Italics: Approximate data. …: Data not available. °: Rounded numbers. 0.–: Minimal (almost zero).

Country/ Sub-Region		Agric. Labor Force (ALF)			Agric. GDP (AGDP) 1996		1996 Index of Incomes Agriculture: Other Sectors[b]	Ag. Production Index 1996/97: 1980[c]		Ag. Exchanges 1996		1996 Index of Agric. Self-Sufficiency[d]
		1980	1996	ALF / TLF[a]	AGDP	AGDP / GDP				Exports E	Imports I	
		Million	Million	% 1996	Billion $	%	%	Total	Per cap.	Billion $	Billion $	%
1	Algeria	1.35	2.3	25	5.4	12.4	41	194	126	0.1	2.7	68
2	Libya	0.14	0.12	7.5	*2*	*8*	*107*	121	65	0.05	1.3	*62*
3	Morocco	2.6	4.1	39	5.3	15	27	196	133	0.9	1.7	87
4	Tunisia	0.7	0.9	26	2.4	13.2	43	194	128	0.3	0.8	83
A	**North Africa**	**4.8**	**7.4**	**30**	**15.1**	**12.3**	**33**	**189**	**124**	**1.3**	**6.5**	**75**
5	Egypt	5.1	8.4	36	12.1	19.2	42	181	123	0.5	3.9	78
6	Eritrea	14.1	1.3	79	*0.11*	*20*	*7*	103	88	*0.1*	*2.3*	*5*
7	Ethiopia		21.8	84	3.4	57	25	138	88	*0.2*	*0.3*	97
8	Sudan	4.3	6.8	64	3.1	40	38	145	95	0.6	0.3	111
B	**Nile Val./Red Sea**	**24.7**	**38.3**	**63**	**18.5**	**23**	**18**	**156**	**104**	**1.4**	**6.8**	**77**
9	Cyprus	0.16	0.04	10	*1*	*10*	100	105	83	0.8	1	83
10	Iraq	1.1	0.7	12	*7.9*	*30*	*310*	125	77	0.–	1	*89*
11	Jordan	*0.7*	0.16	13	0.6	8.1	59	259	126	0.2	0.7	55
12	Lebanon	*0.1*	*0.1*	*11*	*1.6*	*12*	*110*	196	169	0.1	1.2	*59*
13	Syria	0.8	1.3	30	*4.9*	*30*	*100*	167	93	0.8	0.8	100
C	**West Asia**	**2.9**	**2.3**	**18**	**16**	**22**	***129***	**179**	**94**	**1.9**	**4.7**	**85**
14	Iran	4	*6*	*29*	*20*	*22*	*61*	221	128	1	3	*91*
15	Turkey	11	14	49	28	15.2	31	140	100	4.7	4.0	103
D	**Highlands**	**15**	**20**	**32**	**48**	**17.3**	**44**	**183**	**115**	**5.7**	**7**	**97**
16	Bahrain	…	0.004	1.4	*0.05*	1	*70*	…	…	0.–	0.3	*14*
17	Kuwait	…	0.007	1	*0.4*	*1*	*100*	147*	105*	0.03	1.1	*27*
18	Oman	0.14	0.25	39	*0.4*	4	*7*	…	…	0.2	0.8	*40*
19	Qatar	…	0.006	1.8	*0.07*	1	*55*	…	…	0.01	0.3	*19*
20	Saudi Arabia	1.3	0.8	13	*9.7*	7	*50*	470	232	0.4	4.3	*71*
21	UA Emirates	-	0.07	5.9	*0.7*	2	*33*	…	…	0.7	2.4	*29*
22	Yemen	1.2	2.7	55	0.9	17.6	18	137	73	0.1	0.8	56
E	**Arab. Peninsula**	***2.7***	**3.8**	**29**	**12.2**	**4**	***10***	***310***	***157***	**1.4**	**10**	***59***
F	**Total WANA°**	**50**	**72**	**42**	**110**	**13.9**	**22**	**185**	**114**	**11.7**	**35**	***83***

a. TLF: Total labor force.
b. Index of Incomes Ag.: Other Sectors = Average inc. in agric. (AGDP ÷ ALF): Average inc. in other sectors (GDP – AGDP) ÷ (TLF – ALF).
c. FAO Agricultural Production Index (base = 100 in 1980).
d. Index of Agricultural Self-Sufficiency: AGDP ÷ National consumption (= AGDP + Imports – Exports).

Source: - ALF, TLF, ag. production index, ag. exchanges: FAO Production Yearbooks (1982 and 1997) and Trade Yearbook (1997).
- AGDP and GDP: Medagri 1995–1999 (CIHEAM, Allaya); World Bank Atlas (1997); Atlaseco (1997–1999).
- Index of incomes and index of self-sufficiency: estimates from previous figures.

Agricultural growth has been uneven from country to another as indicated below:

- It has been remarkable in some countries: Saudi Arabia is in the top with a total 132% growth per capita over the period considered because of large investments made in irrigation schemes; agriculture in Lebanon (+69% growth per capita) has recovered a good level after its fall during the civil war; and Algeria, Egypt, Iran, Jordan, Morocco, and Tunisia have had sustained growth (around +25% per capita).
- Turkey and Kuwait have maintained the same level of production per capita during the last 16 years (1980–1996).
- Other countries suffered from a relatively strong deterioration of their agricultural production: Eritrea and Ethiopia (both –12% per capita), Iraq (–23%), Libya (–35%), and Yemen (–27%).
- Syria is a particular case as its agricultural growth per capita has been negative throughout the period (–7%), but positive since 1990[1].

A more refined analysis of these figures would show that:

- In most countries, agricultural growth rate was slightly higher during the 1980s than later. This issue of long-term sustainability of agricultural development will be discussed further.
- Agricultural growth has been uneven among commodities: it has been strong in horticulture (vegetables and fruits), meat (mainly poultry, in all countries) and sugar, and insufficient in cereals, oilseeds and milk (Allaya, 1993; Nordlom and Shomo, 1995).

Food imports/exports and self-sufficiency (Table 4) - Despite its considerable development, agriculture has not been able to meet demand which is increasing rapidly (at an annual estimated rate of around 4 to 4.5%) because of both population and income growth. In the entire WANA region, imports (around US$ 10 billion) in 1996 (a "normal" year) were much larger than exports (around US$ 1.4 billion) and the net imports (imports – exports) represented around 17% of the net national consumption (e.g.: AGDP + imports – exports), which means a rate of agricultural self-sufficiency (RASS = AGDP: national net consumption) of 83%.

International trade is more or less balanced in pulses, potatoes, vegetables, fruits, and eggs. Net exports are concentrated mainly on fish. Net imports are primarily in cereals; the gap currently reaches more than 30 million tons per year (almost 30% of the consumption), which cost some US$ 4.4 billion (of which US$ 1.9 billion is for wheat, 0.7 for maize, 0.6 for rice, and 0.4 for barley); those imports could increase to 80 million tons in 2020 (El-Beltagy, 1997; Mona, 1997) and import growth would involve wheat as well as other cereals for animal feed as a result of the increasing demand for protein (Nordblom and Shomo, 1995). Net imports of refined sugar, fats and oils, milk, and meat are also relatively high (around 60, 55, 25 and 20% of the volumes consumed in the mid-1990s, respectively) (Allaya, 1993; Mona,1997). Within the framework of liberalization of international trade, the rate of agricultural dependency of the WANA region is expected to grow in the future.

Food consumption - With such important net imports, the food diet has been not only maintained but slightly improved; from 1980 to 1996, calories per day per capita have increased from around 2,690 to 2,850 (+5.9%) (see Table 5), and consumption of proteins and lipids has grown at a much more significant rate (higher intake of meat, milk, and oils) (see Table 6).

Brief Country Analysis

These global figures vary considerably according to country.

- Turkey and Sudan are the unique net exporting countries. In Turkey, net exports are very limited (US$ 0.7 million, for a US$ 28 million AGDP in 1996) and food diet is the highest in the WANA region (3,570 calories/day/capita). In Sudan, exports (mainly cotton) are relatively high, but at the expense of the food diet (only 2,390 calories/day/capita).
- Syria has presented, for a few years, an even agricultural and food imports/exports balance, with a satisfactory average food diet (3,340 calories/day/capita).
- Egypt, Tunisia, Cyprus, and Morocco are moderately dependent in their agricultural and food consumption (RASS estimated at around 78, 83, 83, and 87%, respectively) and have at the same time a satisfactory food diet (more than 3,200 calories/day/capita); these countries could balance their agricultural and food international trade with a food diet similar to the average in WANA (2,850 calories). Iran is also moderately dependent, with a "normal" diet (2,860 calories).

[1] The FAO agricultural production index is not available for Bahrain, Oman, Qatar, and the United Arab Emirates.

Table 5 - The WANA Region: Food Diets (1980–1996)

Italics: Approximate data. …: Data not available.

	Country/ Sub-Region	Food Supply Calories/day/capita			Country/ Sub-Region	Food Supply Calories/day/capita[a]	
		1980	1996			1980	1996
1	Algeria	2690	3020	14	Iran	2650	*2860*
2	Libya	3470	3130	15	Turkey	3240	3570
3	Morocco	2790	3240	**D**	**Highlands**	**2980**	**3190**
4	Tunisia	2830	3250	16	Bahrain	…	…
A	**North Africa**	**2720**	**3180**	17	Kuwait	2990	3080
5	Egypt	3000	3290	18	Oman	…	…
6	Eritrea	2960	1590	19	Qatar	…	…
7	Ethiopia	1810	1850	20	Saudi Arabia	2830	2740
8	Sudan	2200	2390	21	United Arab Emirates	3420	3370
B	**Nile Valley/Red Sea**	**2400**	**2540**	22	Yemen	1950	2040
9	Cyprus	2920	3340	**E**	**Arabian Peninsula**[a]	***2960***	***2730***
10	Iraq	2770	*2250*				
11	Jordan	2690	2680				
12	Lebanon	2760	3280	**F**	**Total WANA**	**2690**	**2850**
13	Syria	3110	3340				
C	**West Asia**	**2820**	**2490**				

a. Average for Arabian Peninsula: estimates from the four countries 17, 19 to 22.

Table 6 - The WANA Region: Food Diets in Selected Countries (1961–1996)

Country	Year	Diet Components (calories or grams per day)			Consumption per Main Commodities (kg/capita/year)						
		Calories	Proteins	Lipids	Cereals	Food legumes	Oils and fats	Vege-tables*	Fruits*	Meat	Milk
Algeria	1961	1740	48	32	140	2.1	6.6	23	57	12	47
	1996	3020	81	71	231	6.2	18	64	56	20	93
Libya	1961	1600	38	32	120	1.1	6.2	83	103	11	38
	1996	3130	72	113	194	4.6	30	98	78	24	75
Morocco	1961	2140	57	35	185	4.7	7.2	27	47	14	29
	1996	3240	86	59	266	7.4	15	80	85	16	29
Tunisia	1961	2070	56	41	165	2.5	9	87	55	12	40
	1996	3250	88	85	223	8.6	19	144	104	20	74
Egypt	1961	2280	63	42	180	7	7.4	105	68	12	32
	1996	3290	88	58	248	8.2	9.8	139	108	18	38
Sudan	1961	1780	54	53	105	5.5	5.7	33	44	21	90
	1996	2390	74	72	162	5.5	8.5	26	31	18	142
Iraq	1961	1830	51	41	120	3.1	6.6	125	100	13	69
	1996	2250	45	86	132	2.2	27.6	104	87	7.4	17
Jordan	1961	2200	56	48	150	6.6	8.4	82	57	6.6	35
	1996	2680	69	79	153	2.8	17	180	98	31	39
Lebanon	1961	2350	61	58	150	7.3	11	87	130	20	64
	1996	3280	83	107	138	14	22	233	263	32	86
Syria	1961	2310	62	56	175	5.4	9.9	93	108	10	68
	1996	3340	87	92	231	5.1	18	85	122	22	89
Turkey	1961	2820	89	69	200	9.5	12	121	177	17	180
	1996	3570	101	100	226	12	21	183	152	21	144
Yemen	1961	1730	50	30	155	6.3	3.5	28	48	8.4	25
	1996	2040	54	38	166	5.7	8	28	32	11	25

*: First (1961) figures for vegetables and fruits are related to 1971 (data not available for 1961).

Sources for both tables: FAO Production Yearbooks and Medagri (CIHEAM, Allaya)
(data not available for other countries for 1961 and 1996).

- Some countries are highly dependent; among these are the five small oil-exporting countries of the Arabian Peninsula (average RASS estimated at 29%), and Lebanon, Libya, and Algeria (RASS estimated at 59, 62 and 68%, respectively); however, the populations of these countries enjoy rather high-calorie food diets (more than 3,000 calories/day/capita). Jordan and Saudi Arabia are also highly dependent (RASS estimated at 55 and 71%), with the food diet slightly under the WANA average.
- Eritrea, Ethiopia, Yemen, and Iraq are facing the worst food situation (only 1,590, 1,850, 2,040, and 2,250 calories/day/capita, respectively), with very different profiles. Eritrea and Yemen rely heavily on food imports/grants[1]. Ethiopia is almost self-sufficient (very limited international exchange). In Iraq, the current moderate RASS is due to limitations of food imports (formerly very important) owing to the embargo.

Iraq, Jordan, and Libya are the unique WANA countries which have registered a slight deterioration in their food diet during the period 1991–1996, owing mainly to international political reasons[2].

2.3 FARMING SYSTEMS CHARACTERISTICS AND CONSTRAINTS

2.3.1 Farming Systems Characteristics

Farming Systems and Agroecological Conditions

In the WANA region, most of the agricultural production is undertaken under a Mediterranean climate with dry summers and winter rainfall[3] which rarely exceeds 500 mm per year and highly fluctuates both within and between years. Agricultural production exhibits different features according to the major agroecological and farming systems: irrigated lands, favorable rainfed areas, marginal rainfed areas, and rangelands (see Table 8, first columns).

Irrigated lands, which cover around 27 million hectares (22% of the total 119 million ha arable lands), play an essential role as they probably produce more than 50% of the agricultural production of the WANA region[4]. Egypt and the small oil-exporting countries of the Arabian Peninsula are almost fully dependent on irrigation for their production. In Jordan, irrigated lands represent 60% of the arable lands and may contribute more than 90% of the output. In Iran, Iraq, Libya, Saudi Arabia, Sudan, Syria, Turkey, and Yemen, irrigated lands represent between 15 to 38% of the arable lands and are responsible for more than 60% of the AGDP. In most of those countries with relatively large irrigated schemes (Egypt, Iran, Iraq, Sudan, Syria, Turkey), irrigated farming systems are generally highly intensive and diversified, and include cereals, vegetables, fruit trees, and other crops (food legumes, tubers, oilseed crops, sugar crops, cotton, fodder, etc.), with associated livestock raised permanently on farms in an intensive way and/or livestock partly raised in surrounding marginal lands. In Saudi Arabia, irrigated cropping systems give large emphasis to cereal (wheat) production.

In small and medium-size countries which rely mainly on rainfed agriculture (Algeria, Eritrea, Ethiopia, Lebanon, Morocco, Tunisia) and in small countries relying largely on irrigation (Jordan and the small oil-exporting countries of the Arabian Peninsula), irrigated lands are mainly used for vegetables, fruits, date palm, fodder, and ornamentals. In the countries relying largely on irrigation, animal production (modern poultry husbandry, traditional small ruminants) is often a relatively important and separate activity.

In irrigated areas, productivity of land and labor is generally rather high, owing especially to the use of high-yielding varieties and industrial inputs (fertilizers, pesticides). The potential for productivity increases is still considerable through better management of irrigation structures and water use, and higher cropping intensity. Nevertheless, in many countries, excessive irrigation has led to the depletion of aquifers and the salinization of irrigated areas; water and wind erosion has induced loss of agricultural land and sedimentation of dams and reservoirs; and the competition in water use with other sectors is more and more acute. These problems of sustainability of natural resources (see below) are all the more urgent since prospects for increasing irrigated areas are very limited and expensive in most of the countries.

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[1] The rate of agricultural self-sufficiency in Eritrea as estimated in Table 4 (7%) seems exaggeratedly low (probably due to unreliable statistics); however, according to FAO and IFAD, Eritrea was dependent on food aid for 75% of its food in 1993/94.

[2] During this period, the food diet decreased from 3,290 to 3,130 calories in Libya (reduced consumption of vegetables, fruit, meat, milk), from 2,310 to 2,250 calories in Iraq (mainly lower consumption of cereals and milk), and from 2,780 to 2680 calories in Jordan (much lower consumption of milk). In the three countries, the reduction of milk consumption must certainly have had the strongest effect on children and the aged.

[3] Exceptions are the desert countries (especially in the Arabian Peninsula), Eritrea, Ethiopia, Sudan, and Yemen, which have summer rainfall.

[4] Estimate based on the fact that agricultural output of irrigated land is, on average, almost five times higher than that of rainfed land (Janssen, 1993).

The more favorable rainfed areas are estimated to provide around 40% of the agricultural production of the WANA region. Farming systems generally include wheat as the principal crop, with few other crops (food legumes, oilseeds, fodder) associated with relatively extensive small ruminant production. The potential for higher and sustainable productivity in these areas is large (but less than in irrigated areas), especially through wide replacement of fallow with food and feed legumes or oilseeds, more extensive use of supplementary irrigation, and higher integration of animal production and cropping systems. Susceptibility to degradation in these areas is less than in irrigated lands and marginal rainfed areas and rangelands.

Marginal rainfed areas and rangelands provide less than 10% of the agricultural production of the WANA region. Barley is the main crop. Small ruminants use rangelands and consume fodder and crop residues of the surrounding more favored areas. The potential for increasing crop and animal performance is rather low. These areas suffer from accelerated degradation owing to their still relatively high populations, their crop/livestock practices (degradation of rangelands subjected to intensive barley cropping and animal raising), and rapid changes in tenure systems. Pressure on these areas could be reduced mainly by developing the productive potential of irrigated and favored rainfed areas.

Main Commodities

To date, there has been limited recent information related to the relative economic importance of agricultural commodities produced in the WANA region, whether through international organizations[1] or individual countries[2]. Based on the available data on physical production and international prices, it has been possible to design Table 7 (see also Tables 7a to 7c in Annex 2.1), which gives for the period 1991–1995 the relative values of the main commodities of the WANA countries[3], and thus an approximate overview of the breakdown of the AGDP per main commodities and per country and for the entire WANA region[4].

Cereals (mainly wheat, then barley, and lagging behind are sorghum, rice, maize, etc.) represent around 22% of the total value of the main commodities of the region. This percentage is higher in Ethiopia, Saudi Arabia, and Syria, but much lower in the smaller countries (8.2% in Libya and much less in Cyprus, Jordan, Lebanon, and the oil-exporting countries of the Arabian Peninsula).

Both vegetable and fruit production represent together almost 45% of the regional AGDP. Their relative high importance relies on the comparative advantage for countries with high labor-to-land ratio to undertake labor-intensive agriculture. In some countries, these commodities constitute the bulk of the agricultural added value (Iran: 50%; Iraq: 65%; Lebanon: 76%; Oman: 68%; United Arab Emirates: 74%). Eritrea, Ethiopia, and Sudan pay little attention to these crops because of their poor food diet and probably because of their traditional food habits.

Other crops (food legumes, roots, tubers, oil crops, fiber crops, sugar crops) are relatively marginal (around 13% of the AGDP), except in Eritrea and Ethiopia.

Animal production (meat and milk) is rather limited in the WANA region (around 20% of the regional AGDP), except in countries where pastoralism is still highly practiced (Eritrea and Sudan and, to a lesser extent, Algeria and Ethiopia), and in the small oil-exporting countries of the Arabian Peninsula which have developed "industrial" chicken production.

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[1] FAO and Medagri (CIHEAM, Allaya) yearbooks concentrate on production data and do not take into account their value. Gryssels (1992) gives a brief view of the main groups of commodities, focusing on those having a value of production that is over US$ 2 billion (wheat, barley, tomatoes, potatoes, oranges, grapes, milk, sheep and goat meat, beef). Rodriguez (1997) provides data on the annual value of agricultural production of "ICARDA commodities" (wheat, barley, food legumes) in the dry areas (including some non-WANA countries).

[2] In the WANA countries (as well as in most of the other developing countries), national statistics focus generally on production data (cultivated crop area, yield, production; animal numbers and production). Until present, it seems that no country has published agricultural national accounts, even in those countries which have recently designed strategic plans for agricultural research.

[3] The use of international prices instead of national prices (which are not easily available) has another advantage: comparisons between ADGP at national and international prices (see annex, Table 7b) may help to globally appreciate the relative level of national prices and to understand some "incoherencies" observed in the AGDP estimates for some countries. Examples of this are: despite significantly higher production than Algeria for almost all commodities, Morocco has a lower AGDP because of its much lower internal prices; the same is true between Iraq and Syria (larger physical production, lower AGDP); AGDP in Egypt, and much more so in Ethiopia, is underestimated when considering international prices.

[4] Other commodities than those considered in Table 7 are globally marginal; however, it is worth mentioning fish which is relatively important only in Morocco (600,000 tons, valued at around US$ 560 million, i.e., a little more than 10% of the AGDP at national prices) and Oman (30% of its AGDP at national prices), and coffee grown mainly in Ethiopia (7% of its AGDP at national prices).

Table 7 - The WANA Region: Relative Value of the Main Commodities (1991–1995)
% (rounded numbers) of the value of these main commodities

Italics: Approximate data. …: Data not available. –: Marginal commodities.
Other crops: Food legumes, roots and tubers, oil crops, fiber crops, sugar crops.

	Country/ Sub-Region	Cereals	Vege-tables	Fruits	Other Crops	Meat	Milk	Total
1	Algeria	14.7	28.2	15.7	11.8	23.2	6.9	100
2	Libya	8.2	35.6	17.8	6.9	27.4	4.1	100
3	Morocco	21.6	23.4	22.6	12.9	14.7	4.8	100
4	Tunisia	17.4	34.2	19	10.3	12.5	6.5	100
A	**North Africa**	**17.9**	**27.6**	**19.6**	**11.5**	**17.8**	**5.6**	**100**
5	Egypt	23.2	28.9	18.8	13.6	10.7	4.8	100
6	Eritrea	*20*	*6.7*	…	*33.3*	*33.3*	*6.7*	100
7	Ethiopia	*36.8*	*5.3*	*3.3*	*26.2*	*22.7*	*5.7*	100
8	Sudan	22.7	9.8	10	14.8	19.5	23.2	100
B	**Nile Valley/Red Sea**	**25.8**	**20.5**	**14**	**16.5**	**14.9**	**8.3**	**100**
9	Cyprus	6.7	11.1	33.3	13.3	26.7	8.9	100
10	Iraq	20.4	38.4	26.2	5.7	5.7	3.6	100
11	Jordan	2.7	45.9	20.3	4.1	21.6	5.4	100
12	Lebanon	1.6	28.4	47.2	9.7	9.8	3.3	100
13	Syria	26.5	18.7	18.9	17.6	9.7	8.6	100
C	**West Asia**	**18.2**	**28**	**25.9**	**11.5**	**10.3**	**6.1**	**100**
14	Iran	*21.3*	*21.6*	*28.1*	*11.3*	*11.8*	*5.9*	100
15	Turkey	22.3	29	17	15.5	6.7	9.5	100
D	**Highlands**	**21.9**	**26.3**	**21.1**	**14**	**8.5**	**8.2**	**100**
16	Bahrain	–	11.1	22.2		55.6	11.1	100
17	Kuwait	–	23.5	–		70.6	5.9	100
18	Oman	–	27.3	40.9	2.3	20.5	9.1	100
19	Qatar	–	27.3	9.1		54.5	9.1	100
20	Saudi Arabia	31	25.9	14.2	2.1	22.6	4.2	100
21	United Arab Emirates	–	45.7	28.3		23.9	2.2	100
22	Yemen	18.1	22.9	20.5	10.2	22.9	5.4	100
E	**Arabian Peninsula**	**23.2**	**27.2**	**17.7**	**3.2**	**24.1**	**4.6**	**100**
F	**Total WANA**	**22.1**	**25.3**	**19.5**	**13.4**	**12.2**	**7.5**	**100**

Source: See Annex 2.1, Tables 7a, 7b and 7c.

2.3.2 Limited Natural Resources: Major Constraints to Agricultural Development

Agricultural development in the WANA region is constrained by many factors relating to farming systems and their physical and socioeconomic environment. Most of these factors, such as those in poorly endowed farms (limited natural resources, little capital, low education of farmers), and such as limited infrastructures (communication, marketing), not easily available inputs (seeds, fertilizers, etc.) and credit, lack of farmers' unions or organizations, inefficient extension and research services or centers (see Chapter 9), etc., exist also in other developing regions.

Nevertheless, in all the WANA region (except Sudan and Turkey), the major constraints specific to agriculture are the strong pressure imposed by the very limited natural resources: land and water[1].

Limited Land Resources (Table 8)

In the WANA region, arable land represents only 7.5% of the total land resources, ranging from less than 2% in the Arabian Peninsula to 33 and 35% in Lebanon and Turkey, respectively. Arable land is very limited compared with the population; the region currently has an average of 0.25 ha of arable land per capita. Some countries such as Eritrea, Jordan, and most of the Arabian Peninsula countries are already in a particularly critical situation, with less than 0.1 ha of low-production-potential arable land per capita (semi-arid climate, poor irrigation potentiality). Egypt and Lebanon also have very limited arable land (0.08 and 0.11 ha per capita, respectively), but fully irrigated in the former and under a favorable climate in the latter.

In the long term, the situation will worsen with the fast growth of the population; arable land per capita will fall to only 0.15 ha, and all the WANA countries, except Sudan and Turkey (and, to a lesser extent, Iran), will face very high pressure on their arable lands.

Irrigated lands (currently 22% of the arable lands) will probably remain at the same level as the development of new schemes will certainly compensate for the loss or degradation of cultivated lands in the present schemes (see further).

Permanent pastures and rangelands, which cover around 30% of the total area of the WANA region and provide around one-third of the diet of livestock, are severely degraded by unrestricted grazing and climate deterioration.

All these land problems will be more acute with the continuous degradation of soils due to erosion (water runoff, wind erosion), loss of nutrients through inappropriate management, and salinization. The excessively growing land fragmentation (1.7 ha of arable land per agricultural laborer at present, against 2.4 in 1980, for all the region, and probably less than 0.6 ha in 2025) will also hinder productivity.

Scarce Water Resources (Tables 9 and 10)

Because of its climate, WANA is the region showing the lowest figures worldwide of water resources and uses in absolute terms and per capita, even considering the contribution of rivers flowing from more humid regions of tropical Africa (the Nile River) or from Turkey.

The distribution of renewable water resources (RWR) is very heterogeneous among the countries (and within each country), with contrasted situations according to land relief, location from the sea, latitude and resulting hydro-climatic conditions, hydrographic networks and geological structures, and trans-boundary rivers. Twelve countries (Algeria, Cyprus, Jordan, Libya, Tunisia, and all the Arabian Peninsula countries) suffer severe water scarcity with a total (internal and external) RWR below the absolute "poverty threshold" of 500 m^3/capita/year. The situation is slightly better in Egypt because of its external RWR. The other countries enjoy a more or less favorable situation (total RWR exceeding 1000 m^3/capita/year); among these Eritrea, Iraq, and Syria are highly dependent on external RWR through trans-boundary rivers, with increasing tensions between neighboring countries over the use of international rivers and aquifers.

Renewable water resources are currently widely exploited. In all countries there has been an intensification of water development and withdrawals through building of dams/reservoirs and capturing or pumping renewable or fossil groundwater. The annual quantity of water used varies from country to country, from hardly 150 m^3/capita/year (Algeria, Jordan) to more than 1,100 m^3/capita/year (Egypt, Libya). The exploitation index (annual withdrawals to annual average RWR, expressed as a percentage) already exceeds 50% in some countries (Egypt, Syria, Tunisia), or even 100% in Jordan (in which wastewater reuse has rapidly increased) and Libya (where over 90% of the water demand is covered by exploitation of fossil water).

[1] The following presentation on land and water resources in the WANA region is based on several references, especially the 1997 FAO report on *Irrigation in the Near East Region* (in fact, in the WANA region); Hamdy and Lacirignola (1998); and Furtado, Schoonhoven, and El-Deen (ICARDA, 1992).

Table 8 - The WANA Region: Land Resources

Italics: Approximate data. …: Data not available.

	Country/ Sub-Region	Land Resources (1996) (million ha)				Population (TP)			Arable Area per Capita (AA/TP in ha)			Agricult. Labor Force (ALF)		Arable Area per Ag. Lab. (AA/ALF, ha)	
		Total	Arable (AA)	Irrig.	Perm. Pastur.	1980	2000	2025	1980	2000	2025	1980	1996	1980	1996
1	Algeria	238	8.0	0.56	32	18.7	33.4	52	0.43	0.24	0.15	1.35	2.3	5.9	3.5
2	Libya	176	2.1	0.47	13	3.1	6.4	13	0.68	0.33	0.16	0.14	0.12	15	18
3	Morocco	70	9.7	1.26	21	19.4	31.8	48	0.50	0.30	0.20	2.6	4.1	3.7	2.4
4	Tunisia	16	4.9	0.39	3	6.4	10.2	13	0.77	0.48	0.38	0.7	0.9	7	5.4
A	**North Africa**	**500**	**24.7**	**2.7**	**69**	**47.6**	**81.8**	**126**	**0.52**	**0.30**	**0.20**	**4.8**	**7.4**	**5.1**	**3.3**
5	Egypt	100	3.3	3.3	0	40.9	66	94	0.08	0.05	0.04	5.1	8.4	0.65	0.4
6	Eritrea	12	0.5	0.03	…	38.7	3.8	10	0.37	0.13	0.05	14.1	1.3	1	0.4
7	Ethiopia	122	14	0.19	20		66	125		0.21	0.11		21.8		0.6
8	Sudan	250	13	1.95	110	18.7	33	61	0.70	0.39	0.21	4.3	6.8	3	1.9
B	**Nile Val./Red Sea**	**484**	**30.8**	**5.5**	***130***	**98.3**	**168.3**	**280**	**0.31**	**0.18**	**0.11**	**24.7**	**38.5**	**1.2**	**0.8**
9	Cyprus	0.9	0.14	0.04		0.61	0.8	0.9	0.23	0.18	0.16	0.16	0.04	0.9	3.5
10	Iraq	43	5.8	3.5	4	13.0	26.2	46	0.45	0.22	0.13	1.1	0.7	5.3	8.3
11	Jordan	8.9	0.4	0.08	0.8	2.9	6	11	0.14	0.07	0.04	*0.7*	0.16	0.6	2.5
12	Lebanon	1.0	0.3	0.1	0	2.7	3.3	4.5	0.11	0.09	0.07	0.1	*0.05*	3	*6*
13	Syria	18.5	5.2	1.1	9.3	8.7	17.9	35	0.60	0.29	0.15	0.8	1.3	6.5	4
C	**West Asia**	**72.3**	**11.8**	**4.8**	**14**	**27.9**	**54.2**	**97**	**0.42**	**0.22**	**0.12**	**2.9**	**2.3**	**4.1**	**5.4**
14	Iran	163	19.4	7.3	…	37.2	66.7	*100*	0.49	0.29	*0.19*	4	6	4.9	3.2
15	Turkey	77	26.9	4.2	12	44.5	65.8	91	0.60	0.41	0.30	11	14	2.4	1.9
D	**Highlands**	**240**	**46.3**	**11.5**	**…**	**81.7**	**122.5**	**191**	**0.55**	**0.38**	**0.24**	**15**	**20**	**3.1**	**2.3**
16	Bahrain	0.07	0.004	0.003	0.004	0.29	0.64	1.0	0.1	0.06	0.04	…	0.004	…	1
17	Kuwait	1.8	0.005	0.004	0.1	1.37	2.7	*2.8*	0.003	0.01	0.01	…	0.007	…	0.7
18	Oman	21	0.06	0.06	1	0.99	2.3	4.7	0.06	0.03	0.01	0.14	0.25	0.42	0.24
19	Qatar	1	0.02	0.01	0.05	0.21	0.6	*0.7*	0.1	0.03	0.02	…	0.006	…	3.3
20	Saudi Arabia	215	3.8	1.5	120	9.4	20.1	40	0.40	0.19	0.10	1.3	0.8	2.9	4.8
21	UA Emirates	8	0.07	0.07	0.2	0.75	2.0	2.8	0.09	0.04	0.03	…	0.07	…	1
22	Yemen	53	1.5	0.49	16	8.2	16.4	43	0.18	0.09	0.03	1.2	2.7	1.3	0.7
E	**Arabian Peninsula**	**299.9**	**5.4**	**2.1**	**120**	**21.2**	**44.7**	**95**	**0.25**	**0.12**	**0.06**	***2.7***	**3.8**	*2*	***1.4***
F	**Total WANA**	**1596**	**119**	**26.6**	**…**	**277**	**472**	**789**	**0.43**	**0.25**	**0.15**	**5.4**	**3**	**2.4**	**1.7**

Source: FAO Production Yearbook (1997).

Note: In Sudan, the "potential arable land" is estimated at 74 million ha (most of it currently included in permanent pastures) (data from: El Taher F.H., Hamdoun A.M. - *The Role of Universities in the National Agricultural Research Systems of Egypt, Jordan, Morocco, the Sudan and Tunisia. Case Study no. 4: The Sudan*.- Rome, FAO, Research and Technology Development Service, 1996, pp. 67–83).

Table 9 - The WANA Region: Renewable Water Resources (RWR)

Italics: Approximate data. …: Data not available. °: Rounded numbers. 0.–: Minimal (almost zero).

	Country/ Sub-Region	Total RWR (km^3)				Fossil WR (km^3)	Population (million)			RWR per Capita (m^3/year)		
		Internal RWR a	External RWR b	Total RWR c = a + b	Depen-dency ratio b/c		1980	2000	2025	1980	2000	2025
1	Algeria	13.9	0.4	14.3	2.8	6.7	18.7	33.4	52	760	430	280
2	Libya	0.6	0	0.6	0	4.3	3.1	6.4	13	190	90	50
3	Morocco	30	0	30	0	10	19.4	31.8	48	1550	940	630
4	Tunisia	3.5	0.6	4.1	15	1.7	6.4	10.2	13	640	400	310
A	**North Africa**	**48**	**1**	**49**	**2**	**22.7**	**47.6**	**81.8**	**126**	**1030**	**600**	**390**
5	Egypt	1.8	55.5	57.3	97	3.4	40.9	66	94	1400	870	610
6	Eritrea	2.8	6	8.8	68	…	38.7	3.8	10	3070	2320	880
7	Ethiopia	110	0	110	0	…		66	125		1670	880
8	Sudan	35	53.5	88.5	77	1.3	18.7	33	61	4730	2700	1460
B	**Nile Val./Red Sea**	**149.6**	**115**	**264.6**	**43**	**…**	**98.3**	**168.3**	**280**	**2690**	**1570**	**950**
9	Cyprus	0.9	0	0.9	0	…	0.61	0.8	0.9	150	110	100
10	Iraq	35.2	40.2	75.4	53	2	13.0	26.2	46	5800	2880	1630
11	Jordan	0.7	0.2	0.9	23	0.3	2.9	6	11	310	150	80
12	Lebanon	4.8	0	4.8	0	3	2.7	3.3	4.5	1780	1460	1070
13	Syria	7	19.2	26.2	80	5.6	8.7	17.9	35	3010	1220	740
C	**West Asia**	**48.6**	**59.6**	**108.2**	**55**	**…**	**27.9**	**54.2**	**97**	**3880**	**2000**	**1120**
14	Iran	129	9	138	7	…	37.2	66.7	*100*	3710	2070	*1380*
15	Turkey	196	–12	184	0	…	44.5	65.8	91	4130	2800	2020
D	**Highlands**	**325**	**–3**	**322**	**0**	**…**	**81.7**	**122.5**	**191**	**3940**	**2630**	**1690**
16	Bahrain	0.004	0.1	0.1	97	0.01	0.29	0.64	1.0	340	160	100
17	Kuwait	0	0.02	0.02	100	0.16	1.37	2.7	*2.8*	150	75	*70*
18	Oman	1	0	1	0	1	0.99	2.3	4.7	1010	430	210
19	Qatar	0.05	0.–	0.05	4	0.06	0.21	0.6	*0.7*	240	85	*70*
20	Saudi Arabia	2.4	0	2.4	0	0.02	9.4	20.1	40	260	120	60
21	UA Emirates	0.15	0	0.15	0	0.1	0.75	2.0	2.8	200	75	55
22	Yemen	4.1	0	4.1	0	1.4	8.2	16.4	43	500	250	95
E	**Arab. Peninsula**	**7.7**	**0.1**	**7.8**	**1**	**2.8**	**21.2**	**44.7**	**95**	**370**	**175**	**80**
F	**Total WANA°**	**579**	**173**	**2752**	**6**	**…**	**277**	**472**	**789**	**990**	**580**	**350**

a. Internal RWR: Average annual flows of rivers and recharge of groundwater generated from indigenous precipitation = internal surface water + internal groundwater – overlap (part of the WR which is common to both surface water and groundwater). b. External RWR: Actual external RWR = actual external surface water + actual external groundwater.

Source: FAO Water Reports (1997) for the Near East Region and for Africa. Population: FAO and World Population Prospects, UN (1995).

Table 10 - The WANA Region: Annual Water Withdrawals (AWW)

Italics: Approximate data. °: Rounded numbers.

	Country/ Sub-Region Year of reference	AWW						AWW as % of	
		Agricultural km^3	- %	Domestic km^3	Industrial km^3	Total km^3	m^3 per capita*	Internal RWR*	Total RWR*
1	Algeria 1990	2.7	*60*	1.1	0.7	4.5	160	30	30
2	Libya 1994	4	*87*	0.5	0.1	4.6	820	770	770
3	Morocco 1991	10.2	*92*	0.5	0.3	11	410	40	40
4	Tunisia 1990	2.7	*89*	0.3	0.1	3.1	340	90	75
A	**North Africa**	**19.6**	***84***	**2.4**	**1.2**	**23.2**	**330**	**48**	**47**
5	Egypt 1993	47.4	*86*	3.1	4.6	55.1	910	3080	95
6	Eritrea 1987	1.9	*86*	0.2	0.1	2.2	35	2	2
7	Ethiopia								
8	Sudan 1995	16.8	*94*	0.8	0.2	17.8	650	50	20
B	**Nile Valley/Red Sea**	**66.1**	***88***	**4.1**	**4.9**	**75.1**	**490**	**50**	**28**
9	Cyprus 1993	0.16	*74*	0.05	0.005	0.2	260	23	23
10	Iraq 1990	39.4	*92*	1.3	2.1	42.8	2080	120	60
11	Jordan 1993	0.8	*75*	0.2	0.03	1°	230	145	110
12	Lebanon 1994	0.9	*68*	0.4	0.05	1.3	420	30	30
13	Syria 1993	13.6	*94*	0.5	0.3	14.4	990	210	55
C	**West Asia**	**54.8°**	***93***	**2.5°**	**2.4°**	**59.7**	**1370**	**120**	**55**
14	Iran 1993	64.1	*92*	4.4	1.5	70	1090	55	50
15	Turkey 1992	22.9	*72*	5.2	3.5	31.6	510	15	20
D	**Highlands**	**87**	***86***	**9.6**	**5**	**101.6**	**770**	**31**	**32**
16	Bahrain 1991	0.13	*56*	0.01	0.001	0.2	350	5980	210
17	Kuwait 1994	0.3	*60*	0.2	0.01	0.5	290	0	2690
18	Oman 1991	1.1	*94*	0.06	0.02	1.2	520	120	120
19	Qatar 1994	0.2	*74*	0.07	0.01	0.3	540	560	540
20	Saudi Arabia 1992	15.3	*90*	1.5	0.2	17	900	710	710
21	UA Emirates 1995	1.4	*67*	0.5	0.2	2.1	930	1410	1410
22	Yemen 1990	2.7	*92*	0.2	0.03	2.9	180	70	70
E	**Arabian Peninsula**	**21.1**	***87***	**2.6**	**0.5°**	**24.2**	**580**	**314**	**310**
F	**Total WANA°**	**248.6**	***88***	**21.2**	**14**	**283.8**	**650**	**49**	**10**

*: AWW per capita refers (for more convenience) to the populations in 1993 for all the countries (actual figures referring to previous years and to lower populations are generally slightly higher). RWR: Renewable Water Resources (see Table 9).

Source: FAO Water Reports (1997) for the Near East Region and for Africa.

Waste in water use is generally very important in quantity and quality. Many countries have poor water-use efficiency. Agriculture, which is by far the most important water user (around 80% of the water withdrawals in the WANA region), is probably the least efficient sector, with water losses of more than 60% in irrigation originating from physical and economic mismanagement (poor maintenance/performance of the irrigation/drainage systems, poor distribution and on-farm application, water prices much below the real costs, private open access to aquifers, etc.). In the urban/domestic withdrawals, which now absorb only 15% of the total water withdrawals, losses may also be important for similar reasons. Water degradation and pollution (pathogen and organic matter, nitrates, salt, heavy metals, etc.) originating from agricultural, domestic, and industrial activities have been increasing over the years.

Over the next decades, an imbalance between the constantly increasing demand for water and RWR will affect most of the WANA region, and the situation will worsen in the long term with:

- the steady increase in water withdrawals originating from the total population growth (see Table 9), the explosive urban and industrial growth, and, in some countries (Egypt, Jordan, Morocco, Tunisia), the extensive development of tourism;
- the higher unit costs of actual water availability in the future as all the easily available sources of water (rivers, dams and reservoirs, underground water) have been developed or are in the process of development, and as refining of polluted/contaminated water and use of non-conventional sources of water (desalination, wastewater reuse) are very expensive; thus, the cost per cubic meter of domestic water for the next generation will dramatically increase in the region (two- to threefold the cost for the present generation according to the World Bank, 1994).

In any case, sustainable management of water resources is vital for the future. It is now largely acknowledged that managing water, as a rare economic commodity, is an essential way for achieving its efficient and equitable use and encouraging its conservation and protection. Water use for agriculture will be under strong pressure as it will be more and more affected by the increasing competition and conflict among alternative uses, particularly domestic, urban and tourist consumption.

2.4 CONCLUSION: THE CHALLENGING ROLE OF AGRICULTURAL RESEARCH

In the coming decades, agricultural development in the WANA region should provide food and employment for the inevitably increasing population. However, this task will be impossible to fully achieve, and a realistic challenge would be to improve, or at least preserve, the current rate of agricultural self-sufficiency.

Being able to face this challenge will depend on further intensification of farming systems and resource use: cropping frequency (through fallow replacement) should be increased; marginal land may be made more productive; and animal performance should be improved. Intensification may be aimed at without jeopardizing the sustainability of agriculture as in the past decades; all gains should be obtained through improving land and water use. Promoting competitive and sustainable agricultural and food sectors will not be sufficient; social equity should be also considered, especially through development of small farms and marginal rainfed and rangeland areas.

Such prospects will not be possible without appropriate agricultural and economic policies which would help to improve input/credit delivery, marketing of agricultural output, and institutional changes (agrarian reform). Agricultural research (AR) would be a major component of such policies in order to provide technological alternatives that would simultaneously allow for intensified and sustainable production and stabilized or increased agricultural labor.

As in the past, AR should contemplate crop and animal improvement and natural resource management through traditional specialized or separate approaches (genetics, agronomy and nutrition, integrated pest management, etc.). However, integrated research on cereals, other crops, and animal production should receive higher attention and even the first priority as it is now well known that farming systems, with higher integration of crop and animal production, are essential for long-term productivity and sustainability of each commodity and the whole farming systems[1]. Instead of looking for specialized technological innovations, research should propose models of more efficient and sustainable farming systems adapted to each dominant type of farming, taking into account: (i) their agroecological conditions; and (ii) their current characteristics as well as their possibilities for future evolution which may depend on possible changes in their socioeconomic environments. Such approach necessitates that AR in each country develops and extends research on farming systems that aims to: (i) design national typologies of farms, (ii) analyze the constraints affecting each dominant type of farms and the reasons for the limited adoption of available research results, and (iii) elaborate and test models of sustainable intensification in close collaboration with specialized researchers (biologists and rural socioeconomists). This task should be the responsibility of permanent

[1] On this issue, see research done by ICARDA (at Aleppo and within some of its collaborative programs), INRA/Morocco, INRAT/Tunisia, etc.

multidisciplinary teams[1] which would undertake applied and action-oriented research at the farm level with farmers and extension agents, as well as sophisticated research (including the use of mathematical models) and long-term research in research stations.

All these issues related with AR will be further discussed in Chapter 9, Section 9.4.1.

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[1] Those teams should include one or several researchers on cropping systems, livestock systems, and natural resource management, and agroeconomists specialized in farm socioeconomics and modeling. On the precise role of these farming systems teams, see FAO (Casas and Beye, 1998).

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[1] Scientific Editor's note: This publication, as well as the previous one, refers not only to the Near East but also to the Middle East and North Africa region.

Annex 2.1 - Tables Related to the Economic Importance of the Main Agricultural Commodities in the WANA Region

Table 7a - The WANA Region: Annual Production of Main Agricultural Commodities (1991–1995)
1000 tons (rounded numbers).

Italics: Approximate data. –: Less than 10,000 tons (less than 5,000 tons for countries 16, 17, 18, 19 and 21). …: Data not available.

	Country/ Sub-Region	Cereals	Vege-tables	Fruits	Other crops					Meat	Milk	Fish*
					Food legumes	Roots & tubers	Oil crops	Fiber crops	Sugar			
1	Algeria	2340	2320	1060	50	1040	70	–	–	480	900	80
2	Libya	310	670	270	10	140	20		–	130	130	10
3	Morocco	5180	2890	2310	230	950	170	–	480	460	950	600
4	Tunisia	1590	1610	740	80	220	180	–	20	150	520	90
A	**North Africa**	**9420**	**7490**	**4380**	**370**	**2350**	**440**	**10**	**500**	**1220**	**2500**	**780**
5	Egypt	14930	9510	5130	480	2040	180	330	1130	890	2590	300
6	Eritrea	*170*	*30*	…	*40*	*110*	...	…	…	*30*	*40*	…
7	Ethiopia	*7700*	*570*	*300*	*850*	*2080*	*150*	…	*140*	*610*	*1010*	
8	Sudan	4320	950	800	110	160	340	90	480	480	3660	30
B	**Nile Val./Red Sea**	**27120**	**11060**	**6230**	**1480**	**4390**	**670**	**420**	**1750**	**2010**	**7300**	**330**
9	Cyprus	150	130	320	–	190	–	–		80	160	–
10	Iraq	2850	2750	1560	40	330	40	10	–	100	400	10
11	Jordan	120	870	320	10	80	10			100	150	–
12	Lebanon	80	910	1240	40	290	20		20	80	180	–
13	Syria	4900	1780	1480	190	410	190	210	100	230	1320	10
C	**West Asia**	**8100**	**6440**	**4920**	**280**	**1300**	**260**	**220**	**120**	**590**	**2210**	**20**
14	Iran	*16140*	*8370*	*9050*	*610*	*2870*	*190*	*150*	*900*	*1150*	*3730*	*260*
15	Turkey	29440	19670	9570	1850	4590	730	650	1900	1140	10420	370
D	**Highlands**	**45580**	**28040**	**18620**	**2460**	**7460**	**920**	**800**	**2800**	**2290**	**14150**	**630**
16	Bahrain	–	10	25	–	–				15	20	…
17	Kuwait	–	55	–		–				40	20	–
18	Oman	5	160	200		10				25	80	120
19	Qatar	5	40	10		–				20	25	…
20	Saudi Arabia	4810	2050	940	10	200				450	540	50
21	UA Emirates	10	530	280		–				70	50	…
22	Yemen	740	490	360	70	180	10	–		120	190	90
E	**Arab. Peninsula**	**5570**	**3335**	**1815**	**80**	**390**	**10**	**0**	**0**	**740**	**925**	**260**
F	**Total WANA**	**95790**	**56365**	**35966**	**4670**	**15890**	**2300**	**1450**	**5170**	**6850**	**27085**	**2020**

Source: FAO Production Yearbooks and Country Tables; Medagri 1999 (CIHEAM, Allaya).
Fish: Data for 1991.

Table 7b - The WANA Region: Annual Value of the Main Agricultural Commodities (1991–1995)
Million US$ (rounded numbers)

Italics: Approximate data. …: Data not available. –: Less than US$ 10 million (except for countries 16, 17, 18, 19 and 21).

Country/ Sub-Region	Cereals	Vege-tables	Fruits	Other crops					Meat	Milk	**Total**	**AGDP**
				Food legumes	Roots & tubers	Oil crops	Fiber crops	Sugar				
1 Algeria	470	900	500	20	300	40	–	–	740	220	3190	5400
2 Libya	60	260	130	–	40	10		–	200	30	730	2000
3 Morocco	1040	1130	1090	100	280	90	–	150	710	230	4820	5300
4 Tunisia	320	630	350	30	60	90	–	10	230	120	1840	2400
A North Africa	**1890**	**2920**	**2070**	**150**	**680**	**230**	**–**	**160**	**1880**	**600**	**10580**	**15100**
5 Egypt	2990	3710	2410	210	590	100	490	360	1380	620	13860	12100
6 Eritrea	*30*	*10*	…	*20*	*30*	…	…	…	…	…	*90*	110
7 Ethiopia	*1540*	*220*	*140*	*370*	*600*	*80*	...	*40*	*950*	*240*	*4180*	*3400*
8 Sudan	860	370	380	50	50	180	130	150	740	880	3790	3100
B Nile V./Red Sea	**5420**	**4310**	**2930**	**650**	**1270**	**360**	**620**	**550**	**3070**	**1740**	**20920**	**18500**
9 Cyprus	30	50	150	–	60	–	–		120	40	450	1000
10 Iraq	570	1070	730	20	100	20	20	–	160	100	2790	7900
11 Jordan	20	340	150	–	20	10			160	40	740	600
12 Lebanon	20	350	580	20	80	10		10	120	40	1230	1600
13 Syria	980	690	700	80	120	100	320	30	360	320	3700	4900
C West Asia	**1620**	**2500**	**2310**	**120**	**380**	**140**	**340**	**40**	**920**	**540**	**8910**	**16000**
14 Iran	*3230*	*3260*	*4250*	*260*	*830*	*100*	*230*	*290*	*1780*	*900*	15130	20000
15 Turkey	5890	7670	4500	800	1330	390	980	610	1770	2500	26440	28000
D Highlands	**9120**	**10930**	**8750**	**1060**	**2160**	**490**	**1210**	**900**	**3550**	**3400**	**41570**	**48000**
16 Bahrain	–	5	10	–	–	–			15	5	30	50
17 Kuwait	–	20	–	–	–				60	5	85	*400*
18 Oman	–	60	90	–	5	–			45	20	220	400
19 Qatar	–	15	5	–	–				30	5	55	70
20 Saudi Arabia	960	800	440	5	60	–			700	130	3095	9700
21 UA Emirates	–	210	130	–	–				110	10	460	700
22 Yemen	150	190	170	30	50	5	–		190	45	830	900
E Arab. Peninsula	**1110**	**1300**	**845**	**35**	**115**	**5**	**0**	**0**	**1150**	**220**	**4780**	**12200**
F Total WANA	**19160**	**21960**	**16905**	**2015**	**4605**	**1225**	**2170**	**1650**	**10570**	**6500**	**86760**	**110000**

Source: Values estimated from production (Table 7a) and average international prices calculated from 1993 FAO Production Yearbook (years 1991–1993) and from figures (prices for 1992–1994) presented by Mona (1997): US$/ton 200 for cereals, 430 for food legumes, 290 for roots and tubers (mainly potatoes), 540 for oil crops, 390 for vegetables, 470 for fruits, 150 for fiber crops (cotton), 320 for sugar, 155 for meat, and 24 for milk.

Note: Other main commodities for some countries:

- Fishing is an important activity only in Morocco (600,000 tons, valued at around US$ 560 million, i.e. a little more than 10% of the AGDP at national prices) and Oman (30% of its AGDP at national prices).
- Coffee is grown mainly in Ethiopia (in 1991–1995: annual production was 180,000 tons, worth around US$ 240 million: 7% of its AGDP at national prices).

Table 7c - The WANA Region: Relative Value of the Main Agricultural Commodities (1991–1995)
% (rounded numbers) of the total value of these main commodities

Italics: Approximate data. …: Data not available. –: Marginal commodities.

	Country/ Sub-Region	Cereals	Vege-tables	Fruits	Other crops					Meat	Milk	Total
					Food legumes	Roots & tubers	Oil crops	Fiber crops	Sugar			
1	Algeria	14.7	28.2	15.7	0.6	9.4	1.3	–	–	23.2	6.9	100
2	Libya	8.2	35.6	17.8	–	5.5	1.4		–	27.4	4.1	100
3	Morocco	21.6	23.4	22.6	2.1	5.8	1.9	–	3.1	14.7	4.8	100
4	Tunisia	17.4	34.2	19	1.6	3.3	4.9	–	0.5	12.5	6.5	100
A	**North Africa**	**17.9**	**27.6**	**19.6**	**1.4**	**6.4**	**2.2**	**–**	**1.5**	**17.8**	**5.6**	**100**
5	Egypt	23.2	28.9	18.8	1.6	4.6	0.8	3.8	2.8	10.7	4.8	100
6	Eritrea	*20*	*6.7*	…	*13.3*	*20*	…	…	…	*33.3*	*6.7*	100
7	Ethiopia	*36.8*	*5.3*	*3.3*	*8.9*	*14.4*	*1.9*	...	*1.0*	*22.7*	*5.7*	100
8	Sudan	22.7	9.8	10	1.3	1.3	4.7	3.4	4.0	19.5	23.2	100
B	**Nile Val./Red Sea**	**25.8**	**20.5**	**14**	**3.1**	**6.1**	**1.7**	**3.0**	**2.6**	**14.9**	**8.3**	**100**
9	Cyprus	6.7	11.1	33.3	–	13.3	–	–		26.7	8.9	100
10	Iraq	20.4	38.4	26.2	0.7	3.6	0.7	0.7	–	5.7	3.6	100
11	Jordan	2.7	45.9	20.3	–	2.7	1.4			21.6	5.4	100
12	Lebanon	1.6	28.4	47.2	1.6	6.5	0.8		0.8	9.8	3.3	100
13	Syria	26.5	18.7	18.9	2.2	3.2	2.7	8.7	0.8	9.7	8.6	100
C	**West Asia**	**18.2**	**28**	**25.9**	**1.4**	**4.3**	**1.6**	**3.8**	**0.4**	**10.3**	**6.1**	**100**
14	Iran	*21.3*	*21.6*	*28.1*	*1.7*	*5.5*	*0.7*	*1.5*	*1.9*	*11.8*	*5.9*	100
15	Turkey	22.3	29	17	3.0	5.0	1.5	3.7	2.3	6.7	9.5	100
D	**Highlands**	**21.9**	**26.3**	**21.1**	**2.5**	**5.2**	**1.2**	**2.9**	**2.2**	**8.5**	**8.2**	**100**
16	Bahrain	–	11.1	22.2	–	–	–			55.6	11.1	100
17	Kuwait	–	23.5	–	–	–				70.6	5.9	100
18	Oman	–	27.3	40.9	–	2.3	–			20.5	9.1	100
19	Qatar	–	27.3	9.1	–	–				54.5	9.1	100
20	Saudi Arabia	31	25.9	14.2	0.2	1.9	–			22.6	4.2	100
21	UA Emirates	–	45.7	28.3	–	–				23.9	2.2	100
22	Yemen	18.1	22.9	20.5	3.6	6.0	0.6	–		22.9	5.4	100
E	**Arab. Peninsula**	**23.2**	**27.2**	**17.7**	**0.7**	**2.4**	**0.1**	**0**	**0**	**24.1**	**4.6**	**100**
F	**Total WANA**	**22.1**	**25.3**	**19.5**	**2.3**	**5.3**	**1.4**	**2.5**	**1.9**	**12.2**	**7.5**	**100**

Source: Table 7b.