

CWANA Chapter 2 Figures

Table 2.1 Water withdrawal (ww) and gap in CWANA region. Source: AQUASTAT, 2002.

		Agricultural ww (10 ⁹ m ³ /yr)	Total ww (10 ⁹ m ³ /yr)	Total ww per capita (m ³ /inhab/yr)	Total ww (% of int. renewable water res)
North Africa	Algeria	3.94	6.07	194	52
	Libyan A.J.	3.54	4.27	784	711
	Mauritania	1.5	1.70	606	15
	Morocco	11.01	12.60	419	43
	Tunisia	2.17	2.64	271	57
Nile Valley and Red Sea	Djibouti	0.00	0.02	27	6
	Egypt	59.00	68.30	969	117
	Somalia	3.28	3.29	347	22
	Sudan	36.07	37.32	1135	58
	R.Yemen	6.32	6.63	343	259
Arabian Peninsula	K.Bahrain	0.23	0.44	180	2200
	Kuwait	1.23	1.36	491	138
	S.Oman	0.21	0.29	483	547
	Qatar	15.42	17.32	736	722
	Saudi Arabia	1.57	2.30	783	1533
	U.A. Emirates	6.32	6.63	343	162
South and West Asia	Afghanistan	22.84	23.26	1014	36
	R.I. Iran	66.23	72.88	1071	53
	Iraq	39.38	42.70	1742	57
	Jordan	0.76	1.01	190	115
	Lebanon	0.92	1.38	384	31
	Pakistan	162.65	169.39	1130	76
	Palestine	—	—	—	—
	Syria	18.93	19.95	1148	76
Turkey	27.86	37.53	534	18	
Central Asia and Caucasus	Armenia	1.94	2.95	960	28
	Azerbaijan	11.65	17.25	2079	57
	Kazakhstan	28.63	35.00	2263	32
	R Kyrgyz	9.45	10.08	1989	49
	Tajikistan	10.96	11.96	1931	75
	Turkmenistan	24.04	24.65	5142	100
	Uzbekistan	54.37	58.34	2270	116

Table 2.2 Land degradation: severity of human-induced degradation in CWANA. Source: Terrastat, FAO database, 2006.

	Total area (1000 km ²)	None (%)	Light (%)	Moderate (%)	Severe (%)	Very severe (%)	Cause	Type
North Africa	5552	50.6	12.8	10.5	25.4	4.6	A, O, D	N, W, C
Nile Valley and Red Sea	4581	42.4	16.2	17.5	14.2	2.4	A, O, D	N, W, C
Arabian Peninsula	2374	24.0	34.3	20.2	32.4	6.0	A, O, D	N, W, C
South and West Asia	4551	8.2	4.3	31.6	39.6	17.3	A, O, D, V	N, W, C, P
Central Asia and Caucasus	3998	57.9	11.4	15.8	13.3	2.1	A, O, D	N, W, C, P

Cause: A – agriculture; D – deforestation; O – overgrazing; V – over exploitation of vegetation

Type: C – chemical deterioration; N – water erosion; P – physical deterioration; W – wind erosion

Table 2.3 Major soil constraints in CWANA. Source: Terrastat, FAO database, 2006

	Total area (1000 km ²)	Sodicity (%)	Shallowness (%)	Erosion risk (%)
North Africa	5552	0.2	22.0	8.0
Nile Valley and Red Sea	4581	1.5	21.8	8.6
Arabian peninsula	2374	0.0	22.6	7.4
South and West Asia	4551	0.9	25.8	19.6
Central Asia and Caucasus	3997	28.4	16.3	5.0

Table 2.4 Potential of soil carbon sequestration through desertification and restoration of degraded soils in the CWANA region. Source: Adapted from Lal, 2002

Ecosystem	Land area (10 ⁶ ha)	Rate of soils C sequestration with improved management (Mg C ha ⁻¹ yr ⁻¹)			Total potential over 50 years (Tg C)
		Soil organic C	Soil inorganic C	Total	
Irrigated Cropland	11.3	0.1–0.2	0.2–0.3	0.3–0.5	170–283
Rainfed cropland	50.1	0.05–0.1	0.01–0.1	0.06–0.2	150–500
Rangeland*	583.3	0.05–0.1	0.05–0.1	0.06–0.15	1735–4337

* Rangeland area has been reduced by 250 10⁶ ha allocated for biofuel production

Table 2.5 Potential of the WANA region and global dryland ecosystems to sequester carbon. Source: ^a Lal 2002; ^b Lal 2001

Strategy	WANA region ^a (Tg C y ⁻¹)	Global dryland ecosystem ^b (Tg C y ⁻¹)
Desertification control	40–100	200–300
Reclamation of salt-affected soils	9–18	200–400
Agricultural intensification on undergraded soils	6–12	10–20
Fuel C offset	88–175	300–500
Soils C sequestration under biofuel planting	25–75	NA
Total	168–380	710–1220

Table 2.6 Red List category summary

subregion totals of CWANA plants and animals. Source: IUCN summarized from <http://www.iucnredlist.org/info/stats>.

		North Africa	Nile Valley and Red Sea	Arabian Peninsula	Southwest Asia	Central Asia and Caucasus	Total
Plants	Extinct and Extint in the wild	0	6	0	0	0	6
	Threatened species	6	197	7	7	5	221
	Lower risk	27	222	9	97	43	398
	Total	33	422	18	104	48	625
Animals	Extinct and Extint in the wild	7	4	3	4	0	18
	Threatened species	267	233	197	512	201	1410
	Lower risk	2831	3833	2067	4673	2176	15580
	Total	3105	4070	2267	5189	2377	17008

Table 2.7 Agricultural development strategies. Source: Giger, 2006.

	1950s–1970s	1980s–1990s	2000–
Dominant strategy	Import substitution Industrial development	Structural adjustment, liberalization of markets (Washington consensus)	Market orientation, governance, propoor growth (post Washington consensus)
Agricultural policies	Urban bias Taxation of agriculture Subsidized inputs	Getting prices right, privatization abolishment of marketing boards, export promotion, reduced investments in extension, credit systems	Policies adapted to the diversity of situations, growth in productivity, integration in supply chains, standards and labels
Constraints	Loss of markets, expensive and inefficient government apparatus, budget deficits, debt crisis	Important functions of states not provided, private sector not ready, commodity markets depressed	Unfavorable market for products, persistence subsidies in the North, technological divide, environmental issues

Table 2.8 Traditional vs. newer issues in trade and nontrade negotiations. Source: Zaibet et al., 2003.

Traditional issues	New trade issues	New non-trade issues
Access issues <ul style="list-style-type: none"> • Tariffs • Tariff rate quota • State trading enterprises • Safeguards and special treatment 	<ul style="list-style-type: none"> • Dumping • Food safety and quality • Guaranteed Minimum Prices • GMPs • Geographic indications and labeling • Sanitary, phytosanitary and related financial and technical assistance • Impact of two-price system and price pooling 	<ul style="list-style-type: none"> • Food security • Biotechnology • Species preservation • Resource conservation • Animal welfare • Safeguarding landscape • Biodiversity • Poverty reduction • Preservation of rural culture • Environmental concerns • Rural development
Export competition <ul style="list-style-type: none"> • Export subsidies • Export credits and assistance • Export state trading enterprises 		
Domestic support <ul style="list-style-type: none"> • Aggregate Measurement of Support AMS (direct and indirect) • Green box measures • Amber distorting measures • Blue box 		

Table 2.9 Shallow vs. deep integration measures. Source: Zaibet et al., 2003.

Trade issues (shallow integration)	Non-trade domestic policies (deep integration)	Relevance of non-trade concerns to the region
<ul style="list-style-type: none"> • Market access • Customs procedures • Rules of origin • Standards and technical barriers • Intellectual property rights • Subsidies and antidumping • Sanitary and phytosanitary • Services trade • Investment measures • Government procurement • Dispute settlement • Role of small economies 	Foreign investment Competition policies <ul style="list-style-type: none"> • Limitation of horizontal restraints: price-fixing agreements • Formation of domestic cartels • Prohibition of vertical constraints • Exclusive agreements between producers and distributors Labor and environmental standards Harmonization of standards vs. mutual recognition Institutional changes (long-term objective)	<ul style="list-style-type: none"> • Raise national investment levels • Increase the rate of technology transfer • Increase economic growth Viewed as a form of protectionism Need financial and technical aid

Table 2.10 Relevance to the European Union and to the region. Source: Zaibet et al., 2003.

EU Agenda 2000	Relevance to the region
Trade and competitiveness <ul style="list-style-type: none"> • Reduction in market support prices for cereals, milk and beef • Direct aid payments to offset lower prices 	Higher import prices New access concessions are sought
Rural development <ul style="list-style-type: none"> • Multifunctional nature of agriculture • Regeneration of rural areas and promotion of diversification 	Included in the Barcelona Declaration
Protecting and enhancing the environment <ul style="list-style-type: none"> • Support agricultural methods which protect the environment • Direct payment conditional on compliance with environment targets 	Included in the Barcelona Declaration
Food safety and consumers' protection <ul style="list-style-type: none"> • Quality assurance for hygiene, the environment and animal welfare • Improving traceability • Labeling • Organic farming 	Impact on agricultural exports Needs technical and financial aid
Enlargement of the Union	Potential gains? Or losses?

Table 2.11 Agricultural producer organizations by main types in 2006. Source: Ministry of Agriculture and Rural Affairs; www.tarim.gov.tr)

Producer organizations	Number	Number of members	Number of subassociations	Number of central associations
Agricultural Development Cooperative	6,796	743,547	78	4
Irrigation Cooperative	2,349	276,246	11	1
Fisheries Cooperative	481	24,681	12	1
Sugar beet producers cooperative	31	1,587,324	1	1
Agricultural credit cooperative	1,948	1,500,000	16	1
Agricultural sales cooperative	350	671,928	17	—
Producers unions	133	8,566	—	—

Table 2.12 Composition of agricultural research expenditures in selected CWANA countries, 2002 (%). Sources: Numbers in parentheses are the percentages of researchers; ASTI, 2003a, 2003b, 2003c, 2004, 2005, 2006a, 2006b.

Country	Public agencies		Private enterprises		
	Research institutions	Higher education	Total		
Jordan	45.8 (58.5)	47.7 (38.1)	93.6 (96.6)	6.4 (3.4)	Mainly in high-value crops & fruit trees
Mauritania ^a	91.9 (91.9)	8.1 (8.1)	100 (100)	00 (00)	
Morocco ^a	63.6 (63.6)	36.4 (36.4)	100 (100)	00 (00)	
Sudan	65.3 (70.2)	26.4 (28.4)	91.7 (98.6)	8.1 (1.4)	Mainly in sugar cane
Syria	83.4 (83.6)	15.8 (15.9)	99.3 (99.6)	0.7 (0.4)	
Tunisia ^a	73.6 (73.1)	26.4 (26.9)	100 (100)	00 (00)	

^a Private-sector involvement in agricultural research is nonexistent

Table 2-13. A short history of government-based agricultural research for selected CWANA countries (Sources: Ahmad and Nagy, 2001; ASTI, 2003abc, 2004, 2005, 2006abc).

Country	History of agricultural R&D
Iran	The Razi Institute in 1925 was the first in the agricultural research system in Iran, conducting research and producing vaccines for contagious animal plague disease. In 1926, the first college of agriculture was founded in Karaj. In 1933, the first college of veterinary medicine was founded in Teheran.
Jordan	Formal agricultural R&D began in 1951 with the creation of the first agricultural research station in the Jordan Valley.
Mauritania	Agricultural research activities commenced in 1949 with the exploratory research by the French colonial government focusing on date palms and the production systems of the Senegal River and the country's oases.
Morocco	The first agricultural research activities in Morocco were carried out by the Agricultural Experimentation Service, established in 1919 by the French colonial government.
Pakistan	After the partition in 1947, only one agricultural college and one research station in three or four provinces of Pakistan remained. The research system was built progressively.
Syria	Formal agricultural R&D began in the early 1940s within the establishment of experiment farms at Deir Elhajar and Kharabo, close to Damascus.
Sudan	Agricultural research began under British rule in attempt to launch cotton production for the international market. Experimental research on irrigated cotton began in the northern part of the country in 1902
Tajikistan	The Tajik Agrarian University was opened in 1931 on the base of the Central Asian State University, as the Faculty of Agriculture.
Tunisia	Agricultural research began over a century ago with the creation of the Livestock Laboratory in 1897, the Colonial School of Agriculture in 1898, and the Botanic Service of Tunisia in 1913.
Turkey	Veterinary school in 1842 and agricultural school in 1881; veterinary research centers in Istanbul in 1914 and in Ankara in 1921. After 1930, several specialized research centers were opened.

Table 2.14 Educational attainment of researchers and share of female researchers for selected CWANA countries.
Sources: ASTI, 2003abc, 2004, 2005, 2006ab.

Country	Year of data	Educational attainment (%)			Share of females (%)		
		BSc	MSc	PhD	BSc	MSc	PhD
Jordan	2003	39	28	33	19	17	5
Syria	2003	75	5	20	26	36	5
Sudan	2000	21	46	33	6	26	17
Tunisia	2002	9	21	70	3	6	20
Morocco	2002	11	55	34	28	18	14
Mauritania	2000	36	47	17	3	3	1

Table 2.15 Research intensity in public agricultural R&D in selected CWANA countries. Sources: ASTI, 2003abc, 2004, 2005, 2006ab.

Country	Year of data	Research intensity (%)
Jordan	2003	2.83
Mauritania	2001	0.92
Morocco	2002	0.95
Sudan	2000	0.17
Syria	2003	0.53
Tunisia	2002	1.04
CWANA region	2000	0.66
Developing world	2000	0.53
Developed world	2000	2.36
Global	2000	0.80

Table 2.16 Evolution of the cereals trade balance of CWANA region and other main regions of the world between 1961 and 2004 (1,000 tonnes). Source: FAOSTAT.

Country	1961– 1965	1966– 1970	1971– 1975	1976– 1980	1981– 1985	1986– 1990	1991– 1995	1996– 2000	2001– 2004
Central Asia and Caucasus	—	—	—	—	—	—	-3,456	1,173	2,357
South and West Asia	-1,877	-1,781	-4,221	-4,853	-9,072	-13,095	-9,080	-14,993	-8,303
Arabian Peninsula	-536	-590	-826	-2,383	-6,215	-3,428	-5,171	-8,875	-8,502
Nile Valley and Red Sea	-1,778	-1,956	-2,982	-5,730	-9,484	-10,214	-10,182	-12,225	-11,765
North Africa	-878	-1,700	-3,138	-5,764	-8,468	-10,580	-12,383	-14,310	-16,677
CWANA	-5,136	-6,135	-11,307	-18,789	-33,305	-37,560	-40,272	-49,230	-42,890
North America (developed)	52,500	56,731	82,219	117,290	129,712	116,448	116,031	106,382	97,821
W Europe	-29,446	-27,034	-26,121	-24,889	-1,495	18,462	23,315	16,812	3,880
EU (15)*						20,996	23,279	15,629	4,767
Oceania	6,705	7,060	10,465	13,546	15,889	16,881	12,744	20,905	17,782
E Europe	-5,527	-2,284	-4,703	-9,505	-3,134	-2,421	213	993	1,793
Latin America and Caribbean	2,591	4,602	550	-1,803	-1,280	-10,259	-17,120	-18,442	-17,000
Africa	261	-351	-270	-2,549	-7,122	-4,910	-11,138	-11,717	-17,838
Asia	-21,611	-34,460	-41,486	-52,344	-56,363	-60,637	-61,487	-61,328	-51,570
World	2,449	982	2,222	815	1,548	4,240	3,142	2,810	4,121

North African countries, Djibouti, Egypt, Somalia and Sudan are excluded from the Africa totals. South and West Asia, Central Asia and Caucasus, Arabian Peninsula countries and Yemen are excluded from Asia totals.

* EU 15 exports do not include the intra-EU trade

Table 2.17 Estimated global public and private agricultural R&D investments, circa 2000. Source: Pardey, et al., 2006b.

Region	Expenditures (million 2000 international \$)			Share (%)	
	Public	Private	Total	Public	Private
Asia-Pacific	7,523	663	8,186	91.9	8.1
Latin America and the Caribbean	2,454	124	2,578	95.2	4.8
Sub-Saharan Africa	1,461	26	1,486	98.3	1.7
Middle East and North Africa	1,382	50	1,432	96.5	3.5
Developing-country subtotal	12,819	862	13,682	93.7	6.3
High-income country subtotal	10,191	12,086	22,277	45.7	54.3
Total	23,010	12,948	35,958	64.0	36.0

Figure 2.1 Yield cereal in CWANA. Source: FAOstat database, data for CAC countries are not available for the whole period

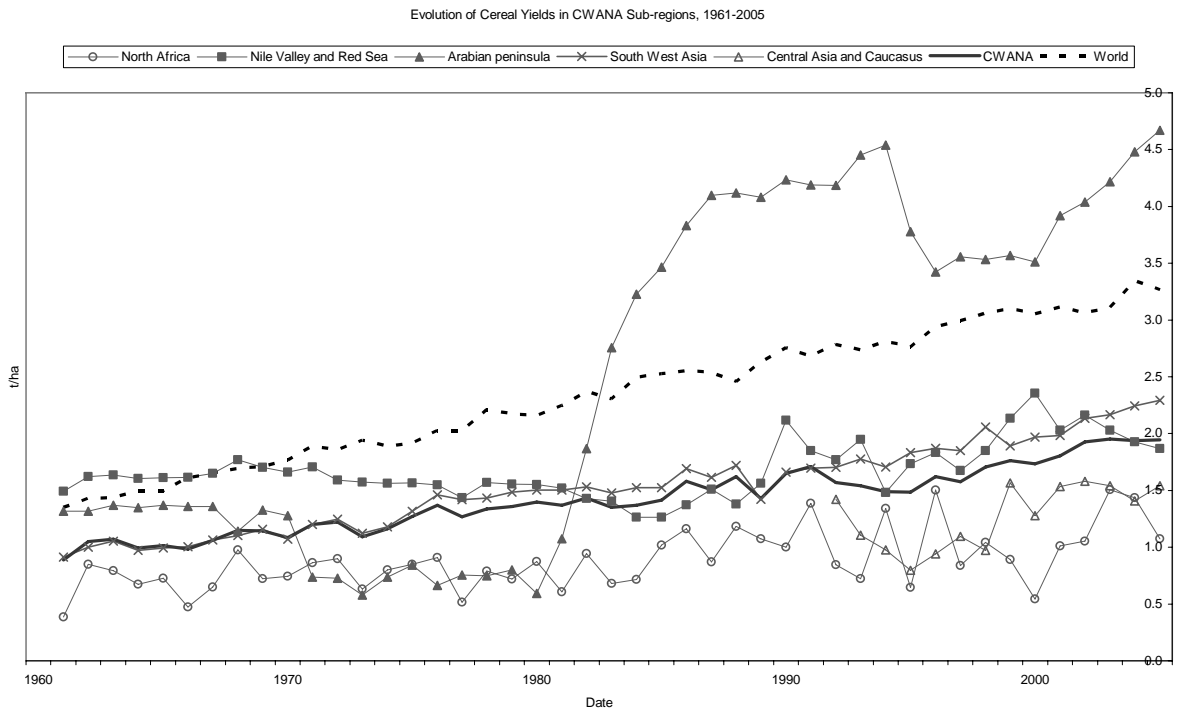


Figure 2.2 Decrease of water resources per inhabitant (m³ per inhabitant per year) in CWANA region. Source: FAO AQUASTAT database

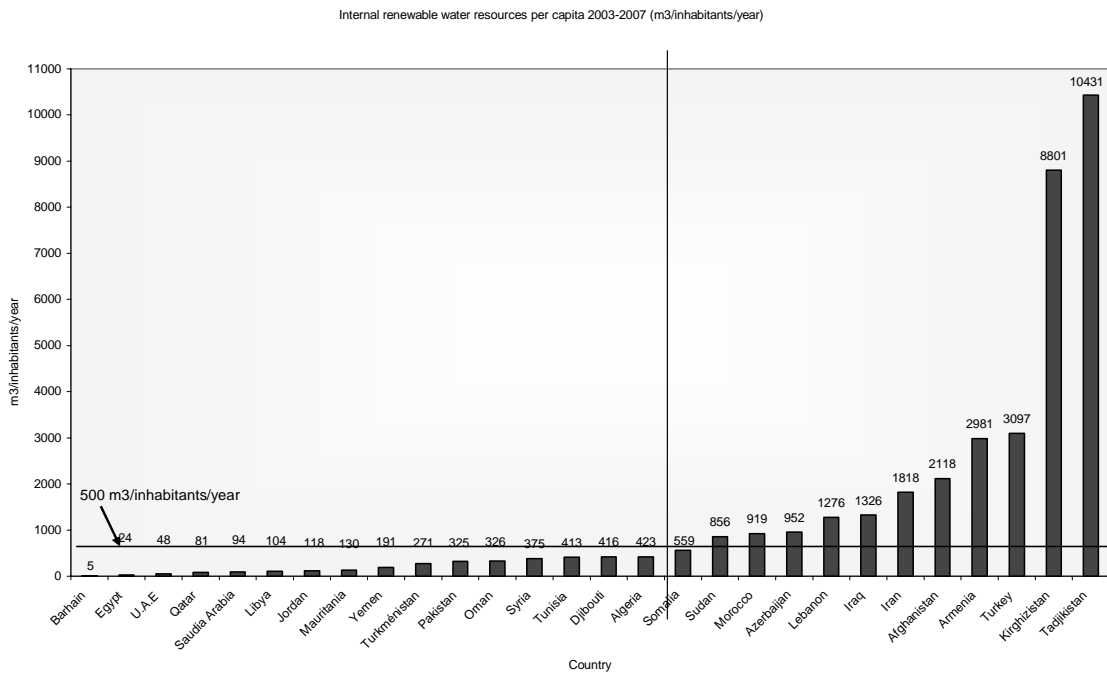


Figure 2.4 Cereal trade balance in CWANA subregions, 1961–2005. Source: FAO database

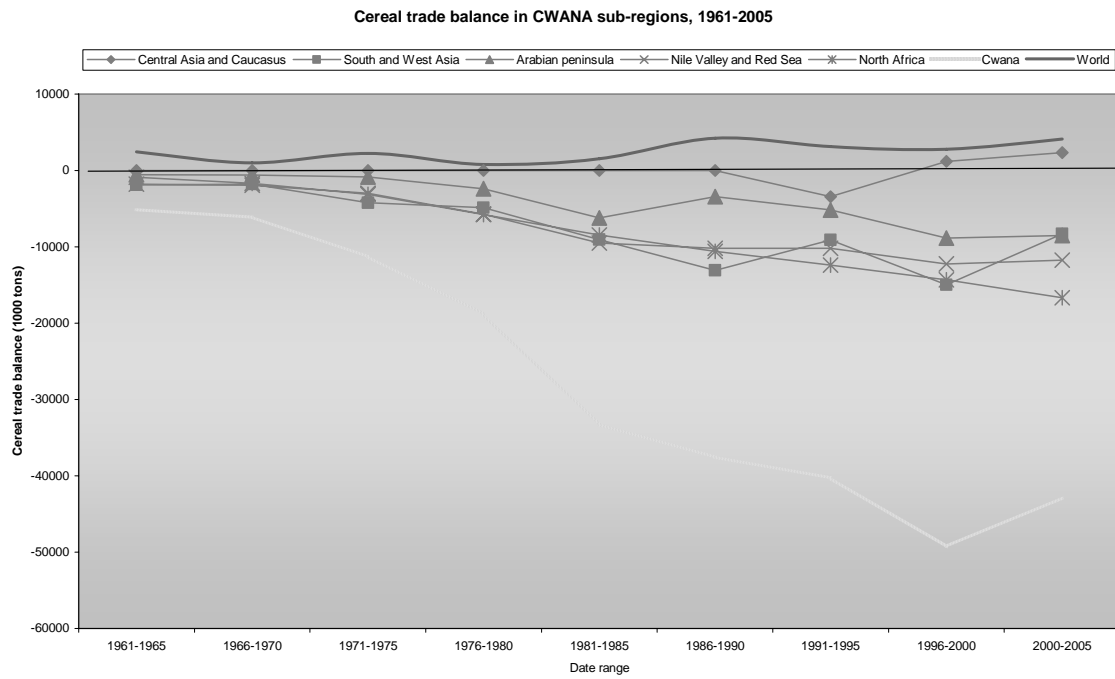


Figure 2.5 Composition of per capita daily food intake (kcalories per capita per day). Source: FAO database

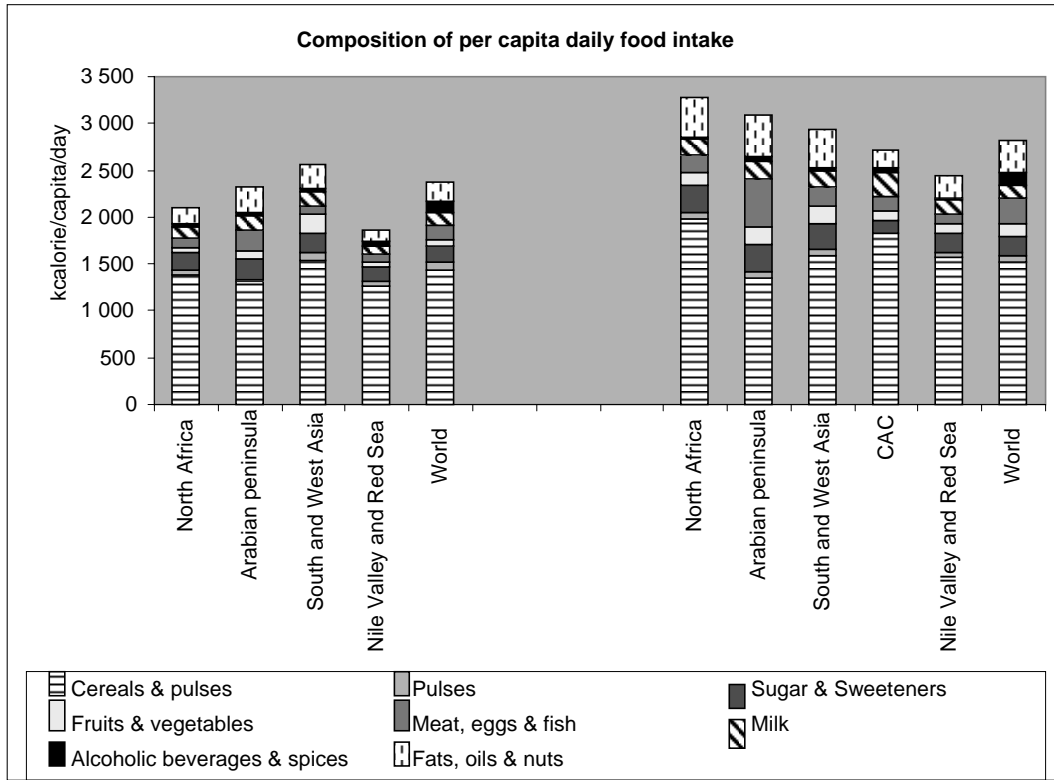


Figure 2.6 Share of economically active population in agriculture in total economically active population. Source: FAO database

