Population

and

Agricultural

Production

Plan of Action
6/13/06

Topic: Population, Food & Agriculture

(1) Food Production

(2) Water

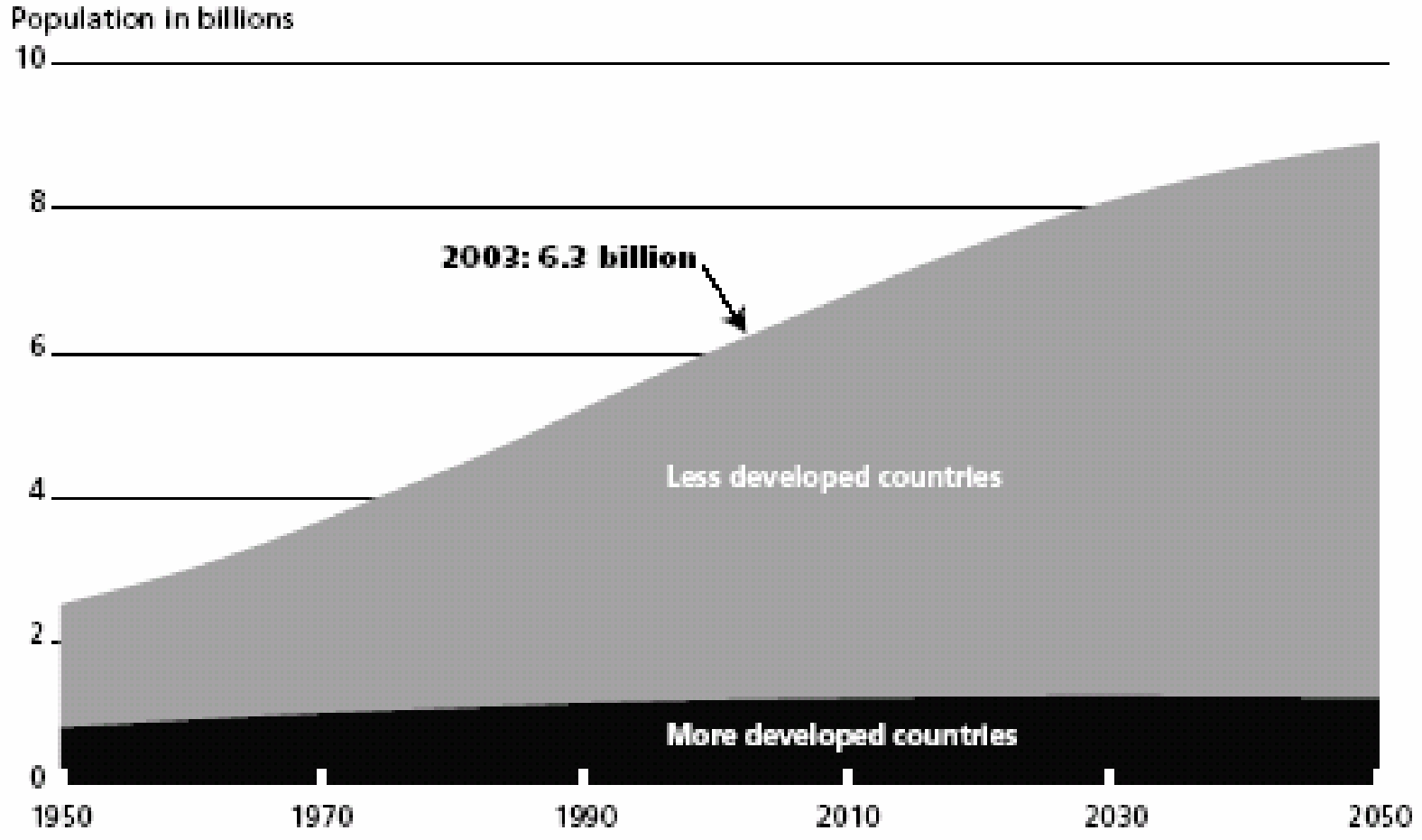
(3) Development

"Population Growing Fastest Where Needs Are Greatest"

"World population will grow by 50 percent, from 6.1 billion in mid-2001 to 9.3 billion by 2050 … All of the projected growth will take place in today's developing countries, which by 2050 will account for over 85 percent of world population. Total population in developed countries will remain at about 1.2 billion."

-UNFPA 2001, p. 3

World Population, 1950 to 2050: 'Medium' Projection



Source: UN Population Division, *World Population Prospects: The 2002 Revision.*

Table 1. Annual changes in world and regional food production (crop and livestock)

Total food production	1991	1992	1993	1994	1995	1996	1997	1998	Average 1994-98
	%								
World	0.1	2.8	0.8	3.1	1.9	4.1	1.8	0.5	2.3
Developed countries	-2.9	1.5	-4.1	1.2	-1.7	3.2	1.1	-1.0	0.5
North America	-0.9	8.6	-8.1	14.9	-4.2	3.7	2.9	1.6	3.8
Oceania	0.4	7.8	4.0	-5.3	9.7	8.6	0.5	2.3	3.2
Western Europe	0.7	1.1	-3.1	-1.1	-0.2	4.3	0.1	-0.4	0.5
Eastern Europe [1]	-1.7	-13.0	1.4	-8.6	4.7	0.3	-0.2	-0.2	-0.8
CIS	...	...	-4.2	-13.6	-5.6	-1.1	0.8	-12.1	-6.3
Developing countries	2.6	3.8	4.8	4.5	4.7	4.4	2.5	1.8	3.6
Africa South of Sahara	5.8	1.3	3.4	3.5	2.9	4.9	-1.7	1.3	2.2
Far East and Oceania	2.2	5.1	6.6	4.9	5.5	4.3	3.9	1.4	4.0
Latin America & the Caribbean	3.0	1.7	1.1	5.1	5.0	2.1	2.8	1.6	3.3
Near East and North Africa	2.7	2.6	1.7	1.7	0.3	10.9	-4.8	5.8	2.8
Low-income food deficit countries	2.5	4.0	5.8	4.8	4.9	4.7	3.2	0.7	3.6

1. From 1993 including Estonia, Latvia and Lithuania.
Source: FAOSTAT

Table 2. **Annual changes in per caput food production (crop and livestock)**

Per caput food production	1991	1992	1993	1994	1995	1996	1997	1998	Average 1994-98
	%								
World	-1.4	1.2	-0.6	1.6	0.5	2.6	0.4	-0.9	0.9
Developed countries	-3.5	1.0	-4.6	0.6	-2.1	2.9	0.7	-1.5	0.1
Developing countries	0.7	2.0	3.0	2.6	2.9	2.7	0.8	0.1	1.8
Africa South of Sahara	2.9	-1.5	0.7	0.8	0.3	2.3	-4.1	-1.2	-0.4
Far East and Oceania	0.6	3.5	5.0	3.4	4.0	2.8	2.4	0.0	2.5
Latin America & the Caribbean	1.1	0.0	-0.7	3.3	3.3	0.5	1.2	0.0	1.7
Near East & North Africa	-0.1	-0.1	-0.9	-0.9	-2.2	8.1	-7.2	3.1	0.2
Low-income food deficit countries	0.6	0.4	4.0	3.0	3.2	2.9	1.5	-0.9	1.9

Source: FAOSTAT

Figure 1. **Average annual rate of change of food production (crops and livestock) in relation to population growth for developing countries 1994-98**

	Average population growth, 1994-97 (%)					
Average rate of change of food output, 1994-1998 (%)	**Below 1.0**	**1.0 to 1.5**	**1.5 to 2.0**	**2.0 to 2.5**	**2.5 to 3.0**	**Above 3.0**
Above 5.0	Kuwait, Uruguay China, Mainland [1]	Guyana [1]	Bahamas, Morocco Tunisia, Peru [1]	United Arab Emirates Belize, Sudan Ecuador, Bolivia Costa Rica [1]	Syrian Arab Republic Benin, Cambodia Ghana, Chad [1]	Mozambique Jordan Angola Laos [1]
4.0 to 5.0		Argentina [1]	Egypt, Qatar Viet Nam [1]	Algeria Bahrain [1]	Pakistan Lebanon [1]	Niger [1]
3.0 to 4.0	Korea, Republic of [1]	Brazil [1]	Fiji Islands Chile [1]	Zimbabwe Central African Rep. [1]	Nicaragua, Guatemala Kenya Côte d'Ivoire Togo [1]	Eritrea [2]
2.5 to 3.0					Paraguay [2]	Guinea Ethiopia [3]
2.0 to 2.5		Mauritius [1]	Mexico India [1]	Iran Islamic Rep. of Philippines Mongolia [2]	Congo, Republic of Lesotho Gambia Cameroon [3]	Comoros [3]
1.5 to 2.0	Cuba China, Taiwan Prov. of Thailand [1]	Malawi [1]	Colombia Myanmar Turkey Bangladesh [2]	Sierra Leone El Salvador South Africa Guinea-Bissau [3]	Nigeria, Nepal Mauritania Tanzania, United Rep of [3]	Yemen Mali [3]
1.0 to 1.5	Jamaica Trinidad and Tobago [1]	Réunion [2]	Indonesia [3]	Malaysia [3]	Gabon Namibia [3]	Solomon Islands [3]
0.5 to 1.0	Sri Lanka [2]			Venezuela Sao Tome & Principe [3]	Vanuatu Honduras [3]	Maldives Oman [3]
0.0 to 0.5		Rwanda [3]	Cyprus, Haiti Dominican Republic [3]			Madagascar [3]
-0.5 to 0.0				Iraq [3]	Burkina Faso Swaziland [3]	Libyan Arab Jamahiriya [3]
-1.0 to -0.5				Burundi Brunei Darussalam [3]	Cape Verde Senegal [3]	Uganda [3]
Below -1.0	Puerto Rico [3]	Suriname [3]	Panama New Caledonia Singapore [3]	Botswana Zambia Papua New Guinea [3]	Equatorial Guinea Saudi Arabia [3]	Congo, Dem Rep of [3]
	1 | Production > population	2 | Production = Population	3 | Production < Population			

Note: The table includes developing countries for which up-to-date estimates are available for both overall food production and population up to at least 1997. For some countries, for which up-to-date statistics are not yet available for 1998 food production, the average refers to 1994-97 (rather than 1994-98). *Source:* FAO.

Water

"Water may be the resource that defines the limits of sustainable development. It has no substitute, and the balance between humanity's demands and the quantity available is already precarious."

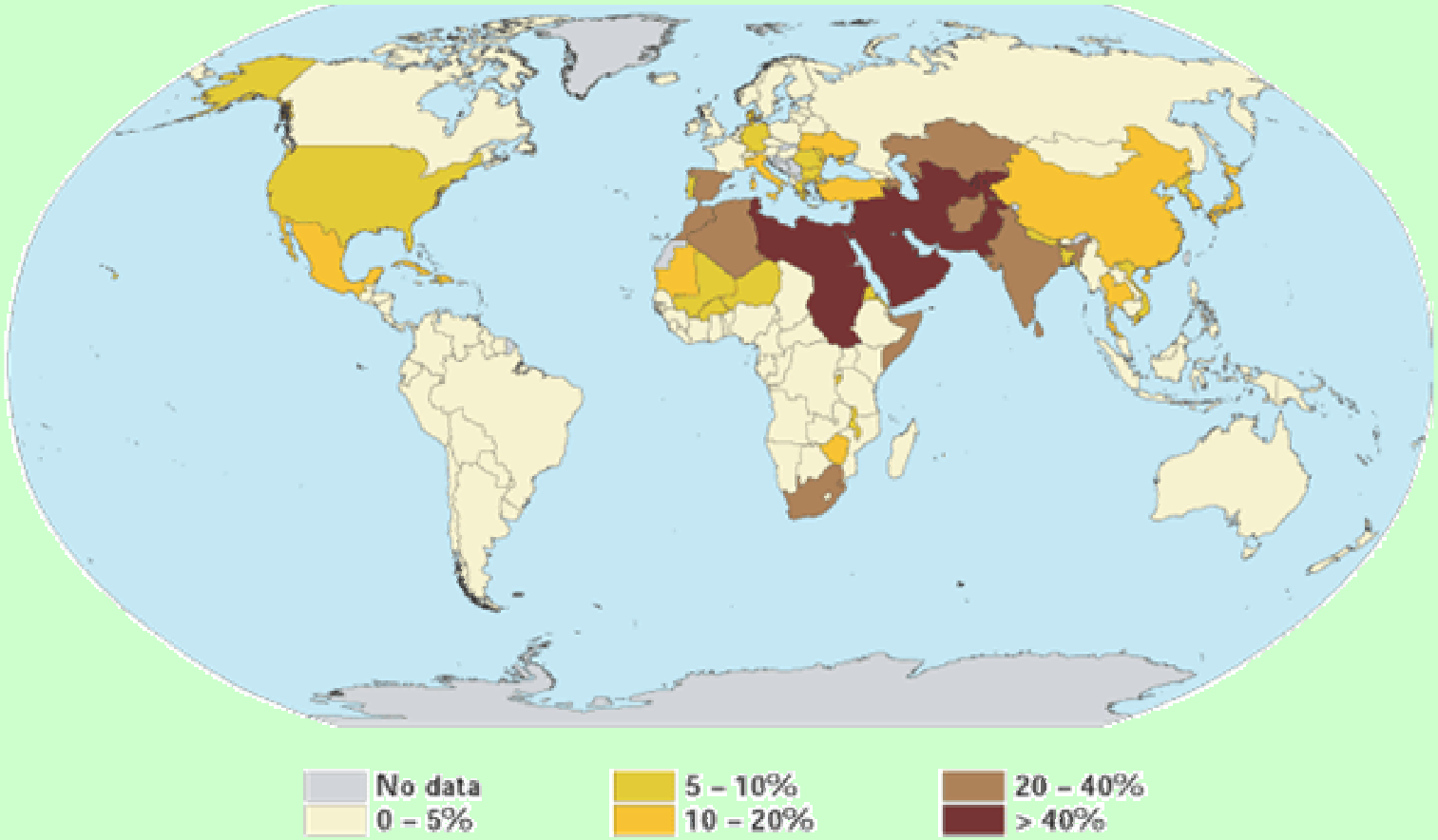
~UNFPA, 2001, p. 11

Water:
Malthus or Engels?

"Worldwide, 54 per cent of the annual available fresh water is being used. If consumption per capita remains steady, by 2025 we could be using 70 per cent of the total because of population growth alone. If per capita consumption everywhere reached the level of more developed countries we could be using 90 per cent of the available water by 2025."

~UNFPA, 2001, p. 11

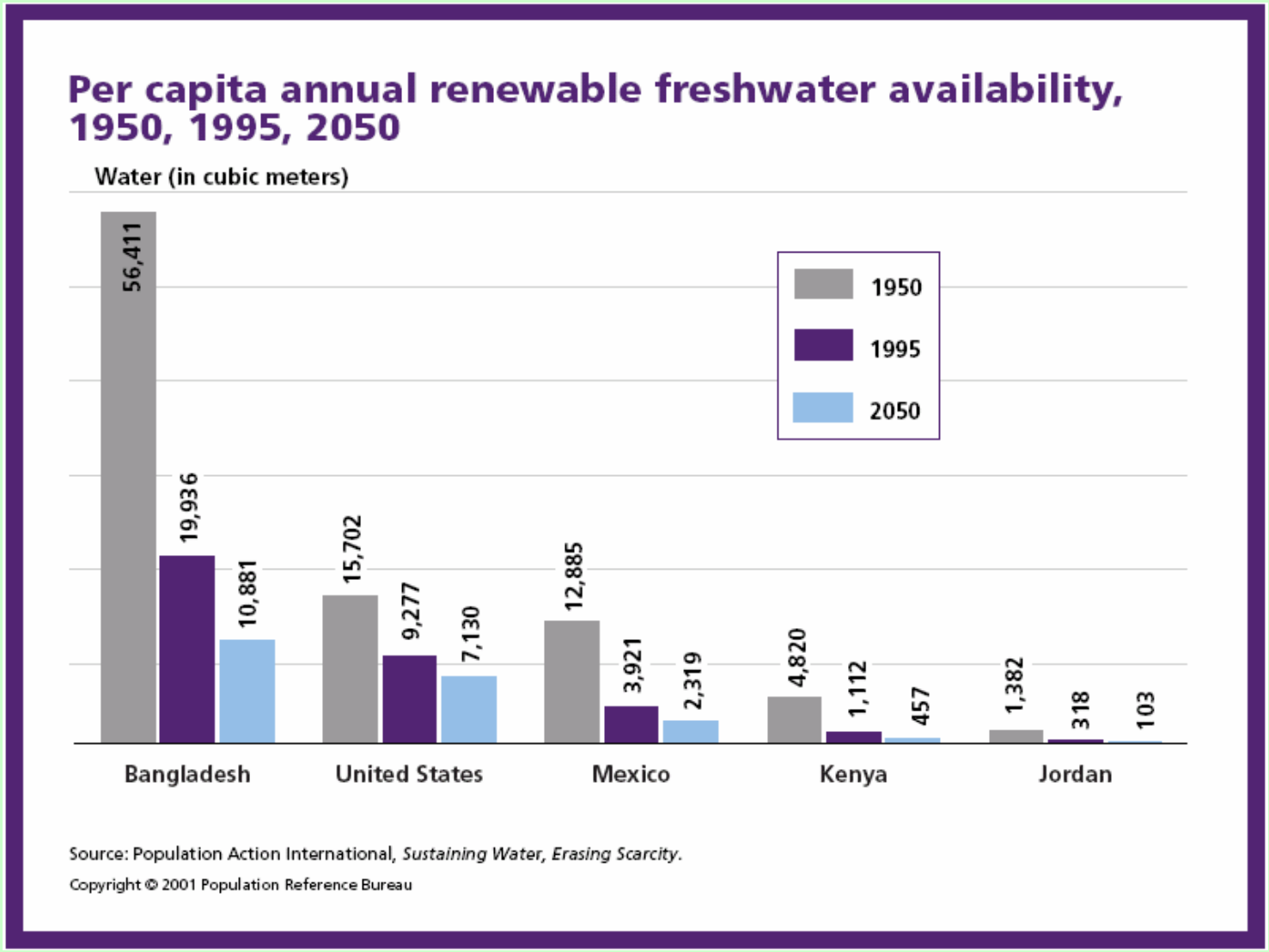
Agricultural Water Withdrawals as Percentage of Renewable Water Resources (1998)



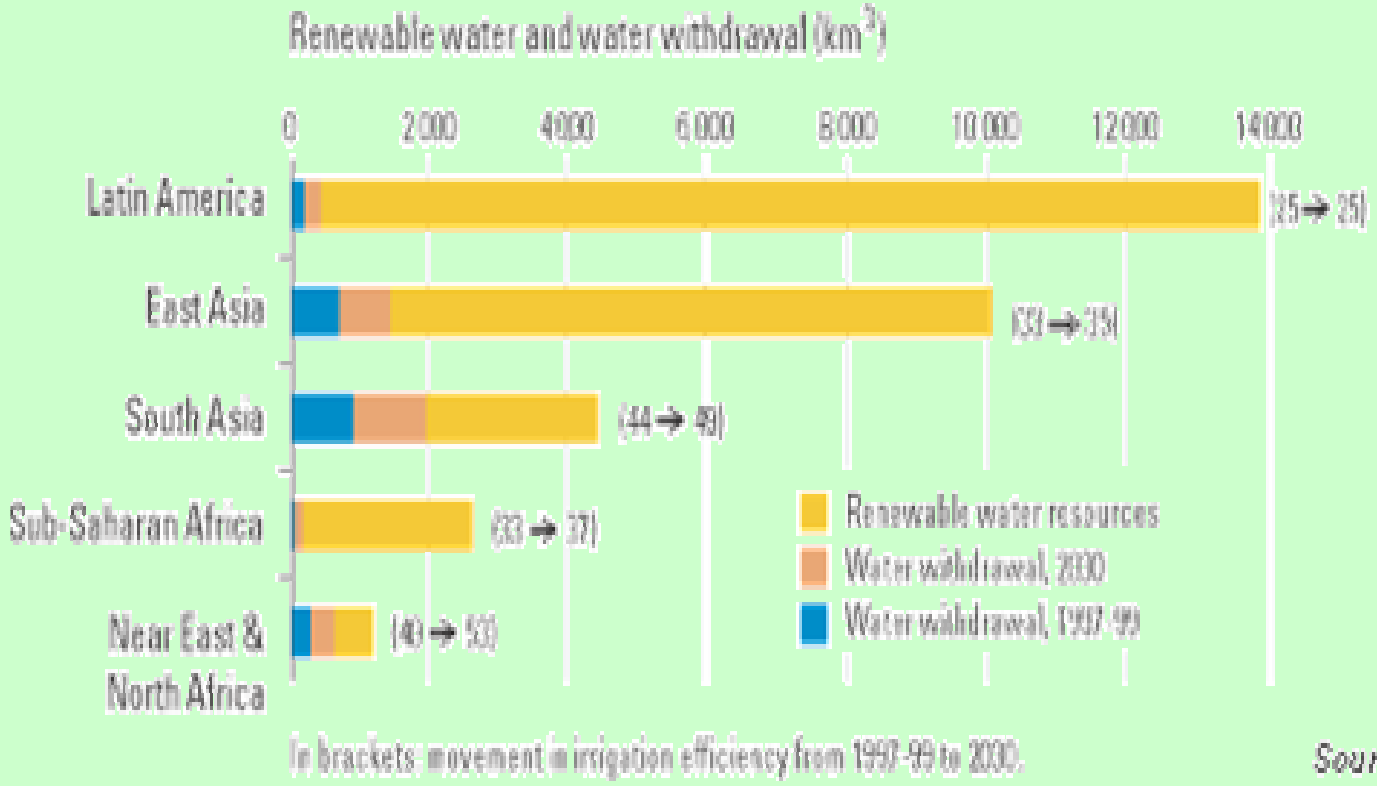
The importance of agriculture in countries' water balance is shown here. Whereas agricultural water withdrawals account for little of the total renewable water resources in the majority of countries, certain regions, such as north-east Africa and western Asia, are notable in that their agricultural withdrawals add up to more than 40 percent of their total water resources. In parts of the Near and Middle East, agriculture water withdrawal represents more than total resources.

Source: AQUASTAT, 2002.

Per Capita Annual Renewable Freshwater Availability for Selected Countries, 1950 ~ 2050



Irrigation and Water Resources: Current (1999) & Predicted (2030) Withdrawals



This figure shows the expected growth in water abstraction for irrigation for the period 1999 to 2030. There is a potential increase in all regions, most notably in south Asia, whereas the sub-Saharan Africa region is predicted to maintain its very low level of irrigation water withdrawals.

Source: FAO data and projections.

POTENTIAL FOR IMPROVEMENTS IN AGRICULTURAL WATER USE EFFICIENCY

Global water strategies tend to focus on the need to increase agricultural water use efficiency, reduce wastage and free large amounts of water for other, more productive uses as well as sustaining the environmental services of rivers and lakes. While there is scope for improved use of water in agriculture, these improvements can only be made slowly and are limited by several considerations. First, there are large areas of irrigated agriculture located in humid tropics where water is not scarce and where improved efficiency would not result in any gain in water productivity. Second, water use efficiency is usually computed at the level of the farm or irrigation scheme, but most of the water that is not used by the crops returns to the hydrological system and can be used further downstream. In these conditions, any improvement in water use efficiency at field level translates into limited improvement in overall efficiency at the level of the river basin. Finally, different cropping systems have different potential for improvement in water use efficiency. Typically, tree crops and vegetables are well adapted to the use of localized, highly efficient irrigation technologies, while such equipments are not adapted to cereal or other crops.

-Source: FAO, 2003, *Agriculture, Food and Water*

Questions for Discussion

(1) What is meant by *development*?

(2) In what ways might varying levels of development affect environmental conditions and food production?

(3) In what ways do varying rates of population growth affect rural areas?

(4) What is the relationship between urbanization and changing rural conditions?