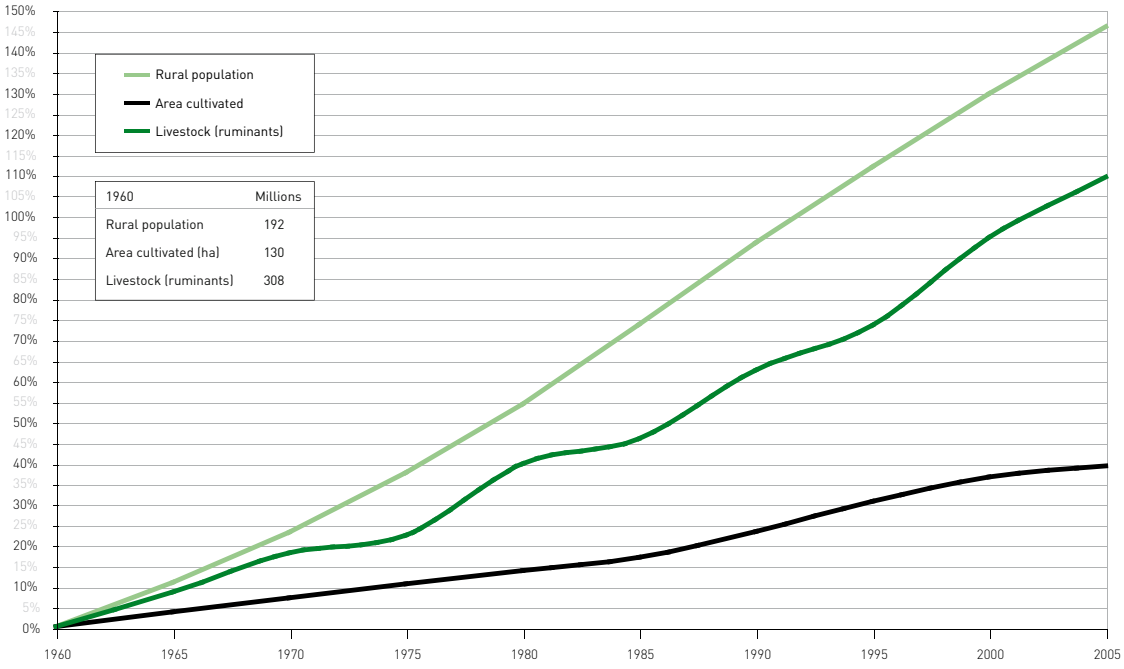
Mapping poverty, water and agriculture in sub-Saharan Africa

Population, natural resources and agriculture

The total area of SSA is 24 million km^2, about 18 percent of the world's landmass. The climate in SSA is influenced by the equator, by the two tropics, and by the two large deserts (the Sahara in the Northern Hemisphere, and the Kalahari in the Southern Hemisphere). Very different climates are in juxtaposition, ranging from very dry to wet equatorial by way of a more moderate climate.

The SSA region contains a total population of about 690 million people (UNDP, 2006), of whom more than 60 percent are classified as rural (Figure 2), higher than the world average (51 percent). In 2000, 300 million Africans, or more than one-quarter of the total population, had no access

Figure 2 **Growth of rural population, cultivated and livestock in sub-Saharan Africa, 1960–2005**



Note: Growth is expressed in percentage change from 1960.
Source: FAOSTAT (2007).

to drinking-water. In the same year, average life expectancy was 41 years in the region.

The region is relatively well endowed with natural resources. Some 234 million ha are cultivated – about one-quarter of the cultivable area. In the region as a whole, the arid and semi-arid agro-ecological zones make up 43 percent of the land area; the dry subhumid zone is equivalent to 13 percent, and the moist subhumid and humid zones jointly account for 38 percent. In West Africa, 70 percent of the total population live in the moist subhumid and humid zones, whereas in East and Southern Africa only about half of the population live in such areas (FAO and World Bank, 2001).

Despite the abundance of natural resources, average GDP per capita in constant prices was lower in 2004 than in 1975, a decrease of 0.6 percent for the period, which is modest but still remarkable for a period when virtually all other regions experienced significant real growth. About two-thirds of SSA countries are ranked among the lowest with respect to the Human Development Index (HDI). Of the 49 poorest countries (least-developed countries – LDCs) in the world, 34 are found in SSA, and income is highly unequally distributed. More than 40 percent of the region's population live on less than US$1 per day, while more than 70 percent have less than US$2/day. In the region as a whole, more than 40 percent of the total population fall below national poverty lines (UNDP, 2006).

Agriculture accounts for 20 percent of the region's GDP, employs 67 percent of the total labour force (FAO and World Bank, 2001), and is still the main source of international exports. Although SSA accounts for barely 1 percent of global GDP and only 2 percent of world trade (down from almost 4 percent in 1970), international trade contributes a relatively large share of regional GDP. Agriculture is the dominant export sector for East Africa (47 percent of total exports), and a significant source of exports in other areas of the region (14 percent of exports in Southern Africa, and 10 percent in West Africa). The region's main agricultural export commodities are cocoa, coffee and cotton. In the region as a whole, agricultural exports make up 16 percent of total exports, while agricultural imports (mainly cereals) account for about 11–15 percent of total imports. In the past three decades, the region has suffered massive losses from the erosion of its share of world trade, aggravated by substantially worsening terms of trade.

Overview of agricultural water management in the region

Annual precipitation in SSA is estimated at an average of 815 mm. Given the wide range of climates in the region, there are consistent disparities between countries, subregions and livelihood zones. Annual precipitation ranges from less than 100 mm in the Sahelian strip (less than 10 mm in northern Niger), eastern Namibia and parts of South Africa, to about 1 000–1 200 mm in the Eastern African highlands (Ethiopia) and in the Lake Victoria basin, and up to more than 2 000 mm in the Gulf of Guinea area (Liberia and Sierra Leone), Central Africa (Gabon and Equatorial Guinea) and Indian Ocean Islands (Mauritius and Seychelles). Central Africa receives almost 40 percent (more than 7 500 km^3/year) of the total precipitation in SSA in an area that accounts for about 23 percent of the total, while the Sudano-Sahelian area receives less than 14 percent of the precipitation in an area that accounts more than 35 percent of the region.

Annual internal renewable water resources for SSA amount to more than 3 880 km^3. Madagascar is the richest country in terms of water resources (5 740 m^3/ha/year). Gulf of Guinea and Central Africa are also well endowed subregions, with 4 490 and 3 520 m^3/ha/year, respectively. They account for 49 and 24 percent of SSA's water

resources, respectively. The Sudano-Sahelian subregion is the most deprived with only 186 m^3/ha/year, with Mauritania having only 0.4 km^3/year (3.9 m^3/ha/year). Considering the availability of resources per capita, at country level, the most disadvantaged countries are Mauritania (130 m^3/inhabitant/year in 2005) and Niger (272 m^3/inhabitant/year in 2005), while Gabon, Congo and Equatorial Guinea enjoyed almost 120 000, 57 000 and 50 000 m^3/inhabitant/year, respectively, in 2005.

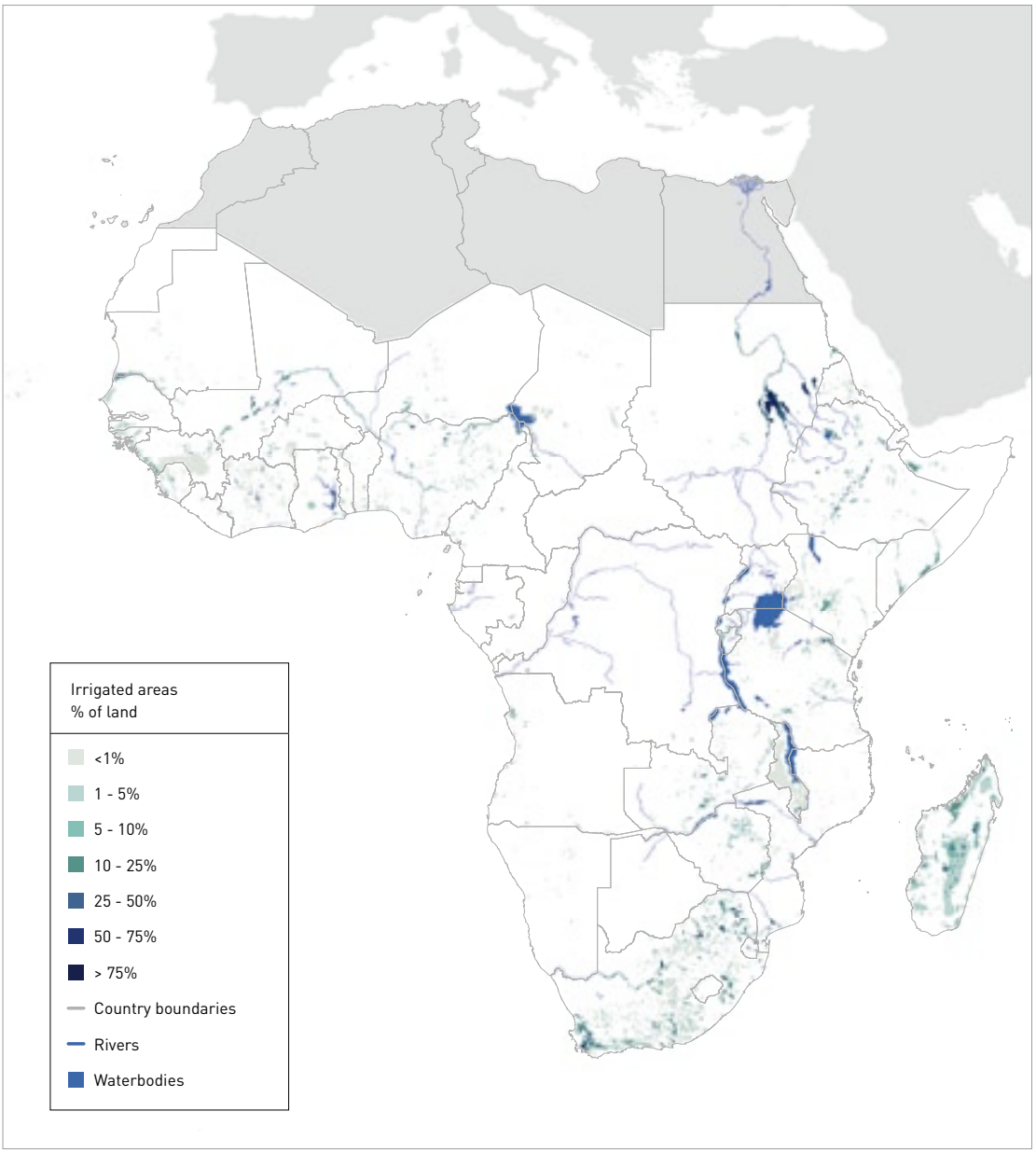
There has been a decrease in internal renewable water resources per inhabitant since 1960. From 1960 to 2005, owing to population growth, the average decreased from more than 16 500 to 5 500 m^3/inhabitant, with an average decrease of

Table 2 Water and agriculture in sub-Saharan Africa

Variable	Unit	Sub-Saharan Africa	World	Sub-Saharan Africa as a % of the World
Total area	1 000 ha	2 428 795	13 442 788	18.1%
Estimated cultivated area 2007*	1 000 ha	234 273	1 865 181	12.6%
in % of total area	%	10%	14%	
per inhabitant	ha	0.34	0.29	
per economic active person engaged in agriculture	ha	1.25	1.15	
Estimated total population 2004**	1 000 inhabitants	689 700	6 389 200	10.8%
Population growth 2003–2004**	%/year	2%	1%	
Population density	inhabitants/km^2	28.4	47.5	
Rural population as % of total population***	%	62%	51%	
Economically active population engaged in agriculture	%	27%	21%	
Precipitation	km^3/year	19 809	110 000	18.0%
	mm/year	816	818	
Internal Renewable water resources	km^3/year	3 880	43 744	9.0%
per inhabitant	m^3/year	5 696	6 847	
Total water withdrawal	km^3/year	120.9	3 818	3.2%
agricultural	km^3/year	104.7	2 661	3.9%
in % of total water withdrawal	%	86.6%	70%	
domestic	km^3/year	12.6	380	3.3%
in % of total water withdrawal	%	10.4%	10%	
industrial	km^3/year	3.6	777	0.5%
in % of total water withdrawal	%	3.0%	20%	
in % of internal renewable water resources	%	3%	9%	
per inhabitant	m^3/year	171	598	
Irrigation	ha	7 076 911	277 285 000	2.6%
in % of cultivated area	%	3%	15%	

* Adapted from IIASA and FAO (2000)
**Adapted from UNDP (2006)
***This study
Source: FAO (2006c).

Figure 3 **Irrigated areas in sub-Saharan Africa**



more than 65 percent. Some countries have been particularly affected, such us Niger, Côte d'Ivoire and Uganda, with decreases of about 75 percent.

In regard to water use, total annual withdrawal of water from rivers, lakes and aquifers was about 121 km^3/year in 2004, about 170 m^3/year per capita. Agriculture is by far the main water user in comparison with domestic and industrial sectors, accounting for 87 percent of the total withdrawal, against 10 and 3 percent, respectively, for the other sectors. The average annual withdrawal

from irrigated areas is about 15 000 m^3 per hectare of irrigation. Out of about 105 km^3/year from the agriculture sector, 48 percent is withdrawn in the Sudano-Sahelian subregion, which accounts for only 15 percent of domestic withdrawals. On the other hand, the Southern area accounts for only 15 percent of agricultural withdrawals but 42 percent of domestic ones. In the last 20 years, water withdrawal has increased considerably in the entire region as population and irrigated agriculture have expanded. Agricultural withdrawals have risen by more than 90 percent on average in the entire region, apart from the Southern subregion (which has almost reached the total irrigation potential and where the increase has been only 9 percent). Table 2 gives the basic agriculture and water-related data for the region and for the world, and Figure 3 shows the distribution of irrigation in SSA.

Mapping rural poverty in sub-Saharan Africa

Context

While substantial progress is being made towards achieving the Millennium Development Goal of eradicating extreme poverty and hunger in most of the developing world, very little progress is occurring in SSA, where poverty, hunger, and food insecurity have increased in recent years (Sanchez and Swaminathan, 2005).

Some 1 200 million people worldwide consume less than a "standard" US$1 a day – they are in dollar poverty. Forty-four percent of them live in South Asia, about 24 percent each in SSA and East Asia, and 6.5 percent in Latin America and the Caribbean. Seventy-five percent of the dollar-poor work and live in rural areas; projections suggest that more than 60 percent will continue to do so in 2025 (IFAD, 2001). In fact, the numbers of the rural poor are underestimated as official data overestimate the shift of the poor from the countryside to cities, further strengthening the case for a greater emphasis on rural poverty. A discussion on the different dimensions of poverty is given in Box 2.

Sixty-two percent of people in SSA live in rural areas. In Eastern and Southern Africa, it is estimated that rural poverty accounts for as much as 90 percent of total poverty, and about 80 percent of the poor still depend on agriculture for their livelihood. Although remote areas with marginal agricultural resources are poorer than other places, they have a low population density and, hence, account for a relatively low proportion of total poor people. Of even more concern, the total number of poor people is increasing (FAO and World Bank, 2001).

In the last three decades, undernourishment in SSA has increased significantly, to an estimated 200 million people in the mid-1990s and to about 400–450 million people today. In 1995–97, the average daily SSA diet contained 2 188 kcal/person/day compared with 2 626 kcal/person/day in developing countries as a whole (FAO and World Bank, 2001), and undernourishment had a higher incidence in rural areas than among urban dwellers.

In view of these data, there are good reasons to emphasize rural poverty reduction, and to redirect attention and expenditure towards agricultural development that generates employment. However, there are arguments to the contrary, i.e. that by promoting urban development and targeting urban poverty it is possible to address the problem of rural poverty as well. This would be true if public action were more cost-effective in reducing urban poverty than in reducing rural poverty; if the rural poor gained far more from urban poverty reduction than vice versa; if rural anti-poverty spending discouraged the poor from migrating; or if rural poverty reduction promoted less economic growth than urban poverty reduction.