

Land use in Africa

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With high and accelerating population growth and with low and declining efficiency in the use of resources, Africa is currently facing a long-term declining trend. Since agriculture accounted for 41% of the GDP of Africa in 1982, formulation and implementation of efficient land use policies are prerequisites if the long-term adverse trend is to be reversed.

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¹Economic Commission for Africa, *Survey of Economic and Social Conditions in Africa, 1984–1985*, Document E/ECA/CM.12/5 for 21st Session of the Commission and 12th meeting of the Conference of Ministers, Yaounde, Cameroon, 17–21 April 1986, ECA, Addis Ababa, 27 February 1986.

²World Bank, *Financing Adjustment With Growth in Sub-Saharan Africa, 1986–90*, World Bank, Washington, DC, USA, 1986, p 117.

³'Dossier on debt and development', *The Courier*, No 97, May–June 1986, pp 60–96.

⁴A.W. Clausen, 'Poverty in the developing countries – 1985', Address, National Action Symposium on Poverty and World Hunger, Atlanta, Georgia, 11 January 1985, Available from World Bank, Washington, DC, USA.

During the past decade, the various African countries have faced a series of crises, ranging from heavy external debts and falling commodity prices to serious shortages of food and energy. While many aspects of the crises were accentuated by inappropriate government policies, as well as inadequate performances, equally many aspects were beyond the continent's control and it was thus forced to be utterly dependent on external assistance to feed a significant section of its population.¹

Never since some one hundred years ago in 1885, when the colonial powers met in Berlin to decide how to divide Africa into various spheres of influence, had the continent faced such catastrophic effects requiring immediate structural adjustments for long-term sustainable growth. Let us consider some facts which will graphically illustrate the gravity of the problems facing Africa and the difficulties that lie ahead to resolve these problems.

- Population growth in Africa is the highest in the world and is accelerating.
- For sub-Saharan Africa as a whole, GNP per capita in 1984 was \$420, and its annual growth rate during 1965–84 was 1.8%.
- There are 25 countries of low-income Africa which are poorer today than in 1960. According to the World Bank, 'for the first time since World War II, a whole region has suffered retrogression over a generation'.² Per capita income in countries like Chad, Niger, Tanzania and Togo has declined by around 30%, equivalent to the situation in the USA during the Great Depression.
- From 1970 to 1984, sub-Saharan external public and publicly-guaranteed debt increased from \$5.426 billion to \$58.828 billion, and the combined external debts of Africa now exceed \$125 billion.
- Per capita GNP for Mauritania for 1984 was \$450 but the per capita long-term public debt was \$703. Corresponding figures respectively are: Guinea-Bissau, \$180 and \$170; Mali, \$140 and \$130; Sudan, \$340 and \$264; Togo, \$250 and \$225; Zaire, \$140 and \$134; and Zambia, \$470 and \$429.³
- In nearly all African countries, 50–75% of the population subsist in absolute poverty.⁴

- Annual per capita food production declined for the sub-Saharan Africa by 2.3% during 1965–73 and by 1.7% during 1973–84; corresponding figures for total agricultural production were declines of 0.7% and 1.9% respectively.
- The number of severely hungry and malnourished people is estimated to have increased from close to 80 million in the early 1970s to over 100 million in 1984. By 1979–81, on a global basis, the percentage of population undernourished was highest in Africa: a decade earlier it was the highest in Asia.⁵
- Life expectancy at birth in 1983 for sub-Saharan Africa was 49 years compared to 76 years for industrial market economies. Life expectancy at birth in 1983 for Gambia was 36 years, Guinea 37 years, and for Guinea-Bissau and Sierra Leone only 38 years.⁶ These statistics are half or less than half of the industrial market economies.
- Child mortality in sub-Saharan Africa, which was 50% higher than the average of developing countries in 1950, is now almost double the average.⁷
- For Africa, there is one doctor per 21 000 people and one nurse for every 3000. For the USA, there is one doctor for every 520 persons and one nurse for every 140.⁸
- Number of children enrolled in secondary school in 1982 as a percentage of age group in sub-Saharan Africa was 15 compared to 87 for industrial market economies.⁹
- Commercial energy consumption per capita in sub-Saharan Africa in 1983 was 110 kg of oil equivalent: the corresponding figure in industrial market economies was 4733 kg.

Many other similar data can be produced to indicate the extent and magnitude of problems faced by Africa, but in this article the emphasis will be only on those issues which have direct implications in terms of land use policy.

Land use and population

For Africa, land use patterns are primarily dependent on the population. If the 25 low-income economies of sub-Saharan Africa are considered, in 1983, 40% of GDP was accounted for by the agricultural sector in comparison to 17% by the industrial sector.¹⁰ Similarly, the percentage of labour force in agriculture in 1981 in the low-income economies of sub-Saharan Africa was 78% and for the 14 countries of middle-income economies was 60%.¹¹ While the agricultural sector's share in GDP has been falling – 41% for sub-Saharan Africa in 1965 to 29% in 1983 – the sector will continue to remain an important component indefinitely. Agriculture, in turn, is directly dependent on land and how it is farmed.

Population growth in Africa is the highest in the world and is still accelerating. Percentage annual growth of population for sub-Saharan Africa has increased from 2.6 during 1965–73 to 2.9 during 1973–83, and is projected to be 3.2 over the period 1980–2000. Accordingly, the total population of sub-Saharan Africa is expected to increase from 398 million in 1983 to 675 million in 2000.¹² Current population projections indicate that Africa's share of the world population will increase from about 10% at present to nearly 25% by the time the global demographic transition is completed.¹³

⁵Margaret R. Biswas and Asit K. Biswas, 'Food and environmental policies in Africa', *Food Policy*, Vol 11, No 3, pp 190–192.

⁶World Bank, *op cit*, Ref 2.

⁷Biswas and Biswas, *op cit*, Ref 5.

⁸A.W. Clausen, *op cit*, Ref 4.

⁹World Bank, *op cit*, Ref 2.

¹⁰*Ibid.*

¹¹World Bank, *World Development Report 1985*, Oxford University Press, New York, 1985, p 242.

¹²World Bank, *op cit*, Ref 2.

¹³John C. Caldwell and Pat Caldwell, *Cultural Forces Tending to Sustain High Fertility in Tropical Africa*, PHN Technical Note 85–16, World Bank, Washington, DC, USA, 1985.

The hypothetical size of stationary population for sub-Saharan Africa, as estimated by the World Bank, is 2134 million, which is likely to be reached round the middle of the next century. However much the rapid population growth in Africa is anticipated to be, a comparison with tropical Asia is interesting. The average population density of sub-Saharan Africa is around 10% of monsoon Asia (1.64) and 6.5% of India. Even when the hypothetical stationary population is reached in sub-Saharan Africa, it will still be around half of that of monsoon Asia and about one-third that of India at present. It should however be noted that the natural environments of monsoon Asia and India are markedly more favourable than sub-Saharan Africa.¹⁴

Not surprisingly, the number of domestic animals have continued to increase in Africa along with the human population. As the main source of animal protein, their numbers have increased in line with the higher demands for animal products and services due to increasing human population. The rate of growth of livestock has escalated markedly during the past two decades – partly because of better control of animal diseases as well as improved veterinary services. Table 1 shows the increase in the cattle population in various regions of Africa during the 1963–83 period.¹⁵ In a few countries like Cape Verde and Seychelles, the cattle population actually declined.

According to FAO estimates, current livestock populations in Africa are 163.6 million cattle, 158.5 million sheep, 150.7 million goats, 17.7 million equines, 12.5 million camels, 9.6 million pigs and 627 million poultry. Considered in terms of Tropical Livestock Units (TLU), some 30% of the animals are in the Sudano-Sahelian region and another 29% in sub-humid and mountainous East Africa.

With increasing livestock numbers, feed requirements have also increased commensurately. This means that demands for grazing land – rangeland and land under fallow – have increased. Consequently, in and around villages, overgrazing in communal lands has become a serious problem, since feed requirements for the animals have exceeded the supply available from grazing land. The resulting overgrazing has become a serious environmental hazard and soil erosion and desertification has increased.

It is estimated by FAO that the number of livestock units will increase from 172.4 million TLU at present to 207.1 million TLU by the year 2010, which at low input level is projected to require 1611.5 million hectares of land.¹⁶ Land degradation due to overgrazing is already a serious problem in many parts of Africa and is likely to be intensified by further increases in livestock numbers unless new grazing land results from the present attempt to eradicate trypanosomiasis or by developing more extensive and reliable water supply systems.

¹⁴FAO, *Need and Justification of Irrigation Development*, Document AGL: 1A/86/Doc. I-D for Consultation on Irrigation in Africa, Lomé, Togo, 21–25 April 1986, FAO, Rome, March 1986, p 26.

¹⁵FAO, *Crisis of Sustainability: Africa's Land Resource Base*, Document AGD/801/1 for Expert Consultation on the In-Depth Study of Agricultural and Food Problems in Africa, Rome, Italy, 16–19 December 1985, FAO, Rome, p 119.

¹⁶*Ibid.*

Table 1. Cattle population in Africa.

Regions	Cattle (millions)			% increase 1963–83	Country with highest % increase	Country with lowest % increase
	1963	1973	1983			
Mediterranean and arid North Africa	5.8	7.6	7.0	20	Algeria	73 Tunisia 3
Sudano-Sahelian Africa	24.8	34.5	43.2	74	Somalia	206 Cape Verde –33
Humid and sub-humid West Africa	10.6	15.7	17.5	65	Sierra Leone	134 Guinea Bissau –2 Sao Tome/
Humid Central Africa	4.1	3.4	5.9	45	Central African Republic	261 Principe –25
Sub-humid and mountain East Africa	45.5	49.0	54.6	20	Comoros	277 Seychelles –33
Sub-humid and semi-arid southern Africa	20.6	28.7	33.0	61	Angola	136 Namibia –17
Total (Africa)	111.42	138.9	161.2	45		

Source: FAO, see text, *op cit*, Ref 15.

Land use and climate

Climate has always had an impact on land use in Africa. Rainfall and temperature regimes are two important exogenous factors that affect both land use and agricultural practices.

Several recent studies¹⁷ on rainfall patterns in Sudano-Saharan Africa have clearly demonstrated that the decline in rainfall which initiated the present drought has been a continuous phenomenon since the latter half of the 1960s. Existing weaknesses of the meteorological services of the Sudano-Saharan countries have made availability and reliability of climatological data problematical (eg data collection in Chad came to a halt for several years for all practical purposes and many stations have been closed in recent years), but all available evidence indicates an unambiguous trend toward reduced rainfall from the late 1960s to 1984. This can be seen in Figure 1 which shows the annual amount of rainfall, the five-year moving average, and the mean annual rainfall for the 50-year period (1934–83) for the various rainfall zones for Senegal, Mali, Burkina Faso and Niger.¹⁸

The reduction in rainfall has been most significant in Senegal, followed by Mali and Burkina Faso, but is also evident in Niger. A comparison between the earlier isohyets of mean annual rainfall for Senegal with those on the basis of the rainfall of the last 16 years indicate that the earlier isohyets have to be moved southwards by 113 km to reflect the latter rainfall pattern. Similarly, if the rainfall of the past 30 years is considered, the earlier isohyets have to be moved south by some 61 km.¹⁹

From an agricultural land use point of view, it is not only annual rainfall that is an important consideration but also the onset and end of the rainy seasons and distributions of rainfall during the crop-growing period. Present analyses indicate that the rainy season has been shorter during recent years and, on the basis of monthly analyses of rainfall, the most marked decline has been in August, which is an important month in terms of crop-water requirements for rainfed agriculture.²⁰

If irrigated land use is to be considered – for both large – and small-scale irrigation – streamflow conditions are most important. The average annual water yield for all the rivers reaching the Sahel has declined by some 25% between 1968–83. This deficit alone is equivalent to three times the assumed storage of the Manatali Dam in the Upper Senegal River.²¹ In places like Maradi in Niger, no annual total flow during 1965–83 even reached the 1931–60 long-term mean. The flow of the River Oubangui in Central African Republic became so low that navigation was hampered. Water levels in Lake Chad have continued to decline since 1963. By 1973, the surface area was reduced by nearly two-thirds and the volume by three-quarters. Thereafter the lake split into two parts, with the northern part drying up every year.

Similarly, the water level in Lake Volta dropped by more than 10 ft below the minimum required for the Akosombo generating plant to function normally. This in turn drastically reduced the hydropower generating capacity, which seriously curtailed electricity availability in Ghana, Benin and Togo. Cote d'Ivoire also suffered from critical electricity shortages due to low water levels in its hydropower projects. Basic industries and services were forced to operate at their lowest levels. With critical shortages of hydro-generated electricity, the demand for limited liquid fuels available for all purposes increased

¹⁷Sharon E. Nicholson, 'Sub-Saharan rainfall 1981–84', *Journal of Climate and Applied Meteorology*, Vol 24, December 1985, pp 1388–1391; A.V. Todorov, 'Sahel: the changing rainfall regime and the "normals" used for assessment', *Journal of Climate and Applied Meteorology*, Vol 24, No 2, February 1985, pp 97–107; and M.D. Dennett, J. Elston and J.A. Rodgers, 'A reappraisal of rainfall trends in the Sahel', *Journal of Climatology*, 1985, as quoted in FAO, *op cit*, Ref 15.

¹⁸Todorov, *op cit*, Ref 17.

¹⁹*Ibid.*

²⁰*Ibid.*, FAO, *op cit*, Ref 15.

²¹FAO, 1984 *Production Yearbook*, FAO, Rome, 1986.

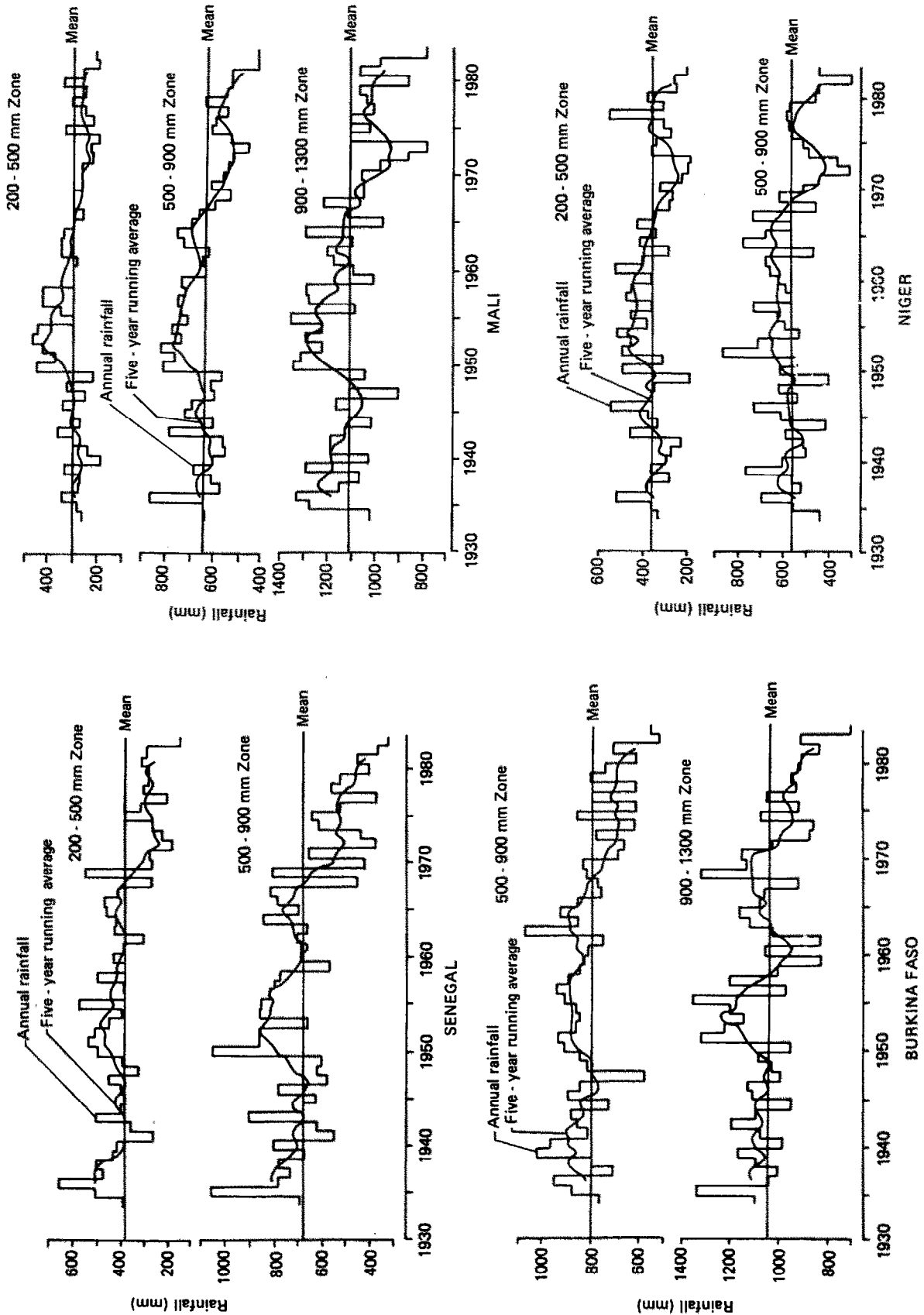


Figure 1. Annual amounts of rainfall, five-year running average and mean annual rainfall for last 50 years (1934-83) in Senegal, Burkina Faso, Mali and Niger.

substantially. This, in turn, meant that the quantity of liquid fuel available for land-related activities was inadequate. Consequently, these activities suffered, resulting in further deterioration in food production, processing and distribution. Thus, a vicious circle originated and thrived.

Land availability, use and desertification

The agricultural land use practices and patterns in Africa are dictated by quality of soil, climatic conditions and management practices. Agriculture is the primary human use of land in the continent. Total land area available in each African nation as well as land available for various agricultural purposes (eg arable land, land under permanent crops, permanent pasture, forest and woodland and other land) are shown in Table 2.

Table 2 also shows the extent of arable land and land under permanent crops available per capita in each country. It should be noted that these are not necessarily fixed estimates: by using better management and technology like irrigation development, more land can be brought under the arable classification. On the basis of FAO and World Bank data,²² estimates indicate that the per capita arable land and land under permanent crop in all the African countries vary from as low as 0.07 ha/capita in Egypt to as high as 1.54 ha/capita in Botswana. For Africa as a whole, the present estimate is 0.36 ha/capita.

According to the latest FAO estimate, the extent of currently cultivated and potentially cultivable land in the six African regions is shown in Table 3.²³ These estimates provide some interesting insights to Africa's land availability:

- 1) Mediterranean and arid North Africa at present has a negative land reserve, which means some lands used for cultivation are unsuitable for such purposes.
- 2) Land reserves are highest in humid Central Africa at 254.6 million ha and is followed by sub-humid and semi-arid Southern Africa at 197.1 million ha. These two regions alone account for nearly 75% of the entire land reserves of Africa.
- 3) Sudan alone accounts for around 75% of the total land reserve for the Sudano-Saharan region (43 out of 65.3 million ha).
- 4) Half of rainfed cultivable land in Africa as a whole and in humid and sub-humid West Africa is marginal in nature. More than half of land in humid Central Africa (63%) and Sudano-Saharan Africa (55%) is also marginal.
- 5) According to FAO estimates, by the year 2010, land reserves will decline to 550.8 million ha from the present 602.5 million ha.²⁴ Maximum reduction is anticipated in humid and sub-humid Africa at 14.2 million ha, which is nearly one-third of the current land reserve in that region.

²²*Ibid*; also World Bank, *op cit*, Ref 11.

²³FAO, *op cit*, Ref 15.

²⁴*Ibid*.

²⁵For a Report on the First African Ministerial Conference on the Environment by Asit K. Biswas, see *Land Use Policy*, Vol 3, No 4, 1986, pp 355-356

²⁶M.K. Tolba, 'Report of the Executive Director of the United Nations Environment Programme', First African Ministerial Conference on the Environment, Cairo, Egypt, 16-18 December 1985, UNEP, Nairobi, September 1985, p 32.

The rate of degradation of land is one of the most alarming features of Africa in recent years. At the first African Ministerial Conference on the Environment held in Cairo in December 1985,²⁵ Dr Mostafa Kamal Tolba, Executive Director of the United Nations Environment Programme, pointed out the enormity of the land degradation crisis now facing Africa, with the following facts:²⁶

- At present only about 35% of the former area of slightly productive

Table 2. Land use in Africa, 1983 (million hectares).

	Land area ^a	Arable land ^b	Under permanent crops ^c	Arable and permanent crops	Permanent pasture ^d	Forest and woodlands ^e	Other land ^f	Per capita arable land and land under permanent crops (ha)
Algeria	238.17	6.86	0.64	7.50	31.0	4.38	195.2	0.36
Angola	124.67	2.95	0.55	3.50	29.0	53.49	38.68	0.91
Benin	11.06	1.35	0.45	1.80	0.44	3.82	4.99	0.47
Botswana	58.53	1.36	—	1.36	44.00	0.96	12.21	1.54
Burkina Faso	27.38	2.62	0.01	2.63	10.00	7.02	7.66	0.40
Burundi	2.56	1.11	0.19	1.30	0.91	0.06	0.28	0.29
Cameroon	46.94	5.91	1.05	6.96	8.30	25.31	6.37	0.73
Cape Verde	0.40	0.038	0.002	0.04	0.02	0.001	0.33	0.12
Central African Republic	62.29	1.89	0.08	1.97	3.00	39.66	17.66	0.79
Chad	125.92	3.145	0.005	3.15	45.00	20.26	57.51	0.66
Comoros	0.21	0.075	0.015	0.092	0.015	0.035	0.075	0.24
Congo	34.15	0.65	0.02	0.67	10.00	21.30	2.177	0.37
Djibouti	2.19	—	—	—	0.2	0.006	1.99	—
Egypt	99.54	2.31	0.16	2.47	—	0.002	97.07	0.07
Equatorial Guinea	2.80	0.13	0.10	0.23	0.10	1.70	0.77	0.59
Ethiopia	110.10	13.20	0.73	13.93	45.25	26.37	24.55	0.34
Gabon	25.67	0.29	0.16	0.45	4.70	20.00	0.61	0.41
Gambia	1.00	0.16	—	0.16	0.09	0.19	0.55	0.25
Ghana	23.00	1.10	1.67	2.77	3.44	8.56	8.23	0.22
Guinea	24.58	1.50	0.07	1.57	3.00	10.36	9.65	0.27
Guinea-Bissau	2.80	0.25	0.03	0.28	1.28	1.07	0.16	0.46
Ivory Coast	31.80	2.80	1.18	3.98	3.00	8.38	16.43	0.42
Kenya	56.92	1.83	0.48	2.31	3.75	2.44	48.42	0.12
Lesotho	3.03	0.29	—	0.29	2.00	—	0.73	0.19
Liberia	9.63	0.13	0.24	0.37	0.24	3.76	5.86	0.18
Libya	175.95	1.77	0.32	2.09	13.30	0.63	159.92	0.61
Madagascar	58.15	2.52	0.49	3.01	34.00	12.99	8.15	0.32
Malawi	9.40	2.32	0.02	2.34	1.84	4.14	1.08	0.35
Mali	122.00	2.050	0.003	2.053	30.00	8.68	81.27	0.28
Mauritania	103.04	0.192	0.003	0.195	39.25	15.13	48.46	0.12
Mauritius	0.18	0.10	0.007	0.107	0.007	0.06	0.01	0.10
Morocco	44.63	7.91	0.48	8.39	12.50	5.19	18.54	0.40
Mozambique	78.40	2.85	0.23	3.08	44.00	15.10	16.22	0.24
Namibia	82.32	0.66	—	0.66	52.90	10.42	18.33	0.60
Niger	126.67	3.56	—	3.56	9.22	2.72	111.17	0.58
Nigeria	91.07	27.90	2.53	30.43	20.94	14.00	25.70	0.32
Reunion	0.25	0.05	—	0.05	0.01	0.09	0.10	0.09
Rwanda	2.49	0.73	0.28	1.01	0.44	0.25	0.78	0.18
Sao Tome Pr.	0.096	0.001	0.035	0.036	0.001	—	0.06	0.41
Senegal	19.20	5.22	—	5.22	5.70	5.94	2.33	0.84
Seychelles	0.027	0.001	0.005	0.006	—	0.005	0.015	0.08
Sierra Leone	7.16	1.62	0.15	1.77	2.20	2.05	1.13	0.49
Somalia	62.73	1.05	0.01	1.06	28.85	8.71	24.10	0.21
South Africa	122.10	12.82	0.80	13.62	79.85	4.60	24.03	0.43
Sudan	237.60	12.39	0.05	12.44	56.00	48.01	121.14	0.60
Swaziland	1.72	0.13	—	0.13	1.15	0.10	0.33	0.21
Tanzania	88.60	4.13	1.06	5.19	35.00	41.78	6.63	0.25
Togo	5.43	1.35	0.07	1.42	0.20	1.55	2.26	0.51
Tunisia	15.53	3.17	1.52	4.69	3.00	0.55	7.28	0.68
Uganda	19.97	4.60	1.70	6.30	5.00	5.91	2.76	0.45
Zaire	226.76	5.90	0.56	6.46	9.22	176.62	34.45	0.22
Zambia	74.07	5.15	—	5.15	35.00	20.15	13.76	0.82
Zimbabwe	38.66	2.60	0.08	2.68	4.85	23.81	7.31	0.34
Total (Africa)	2966.45	164.73	18.32	183.05	778.199	688.366	1316.73	0.36

Notes:

^aLand area = total area – inland rivers and lakes.^bArable land = land under temporary crops + temporary meadows + land temporarily fallow or idle.^cLand under permanent crops = land under crops of long periods like cocoa, coffee, rubber, fruit trees, nut trees but not land under trees for wood and timber.^dPermanent pasture – land used for five years or more for forage crops, cultivated or growing wild.^eLand under natural or planted stands of tree, productive or unproductive, and land soon to be reforested.^fUnused but potentially productive land, built-up areas, wasteland, barren land, and any other land not listed under (a) to (e).

Source: Compiled from World Bank and FAO data.

Table 3. Cultivable land in Africa: potential, present and projection for 2010 (million hectares).

Regions	Total land	Cultivable land potential		Land cultivated		Land reserve	
		Very suitable and suitable	Marginal	Present	2010	Present	2010
Mediterranean and arid North Africa	600.2	10.5	4.0	20.5	20.4	-6.0	-5.9
Sudano-Sahelian Africa	828.2	53.4	65.0	53.1	60.5	65.3	57.9
Humid and sub-humid West Africa	206.6	49.1	49.7	55.4	69.6	43.4	29.2
Humid Central Africa	398.8	102.8	178.8	26.9	35.3	254.6	246.2
Sub-humid and mountain East Africa	251.0	49.1	28.1	29.0	37.3	48.2	39.9
Sub-humid and semi-arid Southern Africa	559.2	141.9	87.9	32.7	46.3	197.1	183.5
Total, Africa	2844.0	406.8	413.4	217.7	269.4	602.5	550.8

Source: FAO, see text, *op cit*, Ref 15.

savannah, where the majority of Africans live, is in existence.²⁷ Some 6500 ha of savannah are being cleared every day. Dr Tolba pointed out that the destruction of the woody plant cover in the savannah has 'serious repercussions for the deforested zones: the effects of fires are increasing, the pyrophytic vegetation that establishes itself afterwards is often unsuitable for animal consumption, soils become sterile, crusts form, drainage basins dry up, regeneration of woody species slows or stops altogether, and the process slowly leads to total degradation'.²⁸

- According to estimates made by the Economic Commission for Africa, the usable extent of pastoral area in the arid and semi-arid regions of Africa has been reduced by 25% since 1968. Much of this destruction has taken place in recent years.²⁹
- Soil fertility has been destroyed along a 150 km wide belt on the southern edge of Sahara during the past 100 years.³⁰
- A shift of ecological zones can be witnessed at present – desertification of the Sahel, sahelization of the savannah and savannization of the forests.³¹

Various aspects of land degradation and their current status are shown in Figures 2–7.

Deforestation in Africa is an accelerating problem due to a variety of reasons, among which are increasing demands for agricultural land and firewood requirements because of rising population growth, overgrazing and commercial logging without reinvestment in afforestation. While nearly every government in Africa has realized the deforestation problem and taken some measures to protect the present forests and encourage afforestation, these have proved to be insufficient because of low priority accorded to this sector. Consequently even the most well-planned policies have suffered from poor implementation. According to FAO estimates, the current annual deforestation in Africa is 3.7 million ha, but afforestation is only about 0.125 million ha – that is slightly over 3% required to maintain the status quo. By the year 2010, a further overall reduction of 20% in forest cover is projected, with about 177 million ha of closed forest remaining.³²

An important consideration of land use policy in Africa is firewood availability. Firewood plays an essential role in countries south of the Sahara where it provides 90–98% of energy needs of rural people. With the combined pressures of high population growth and deforestation there is an increasing disparity between firewood availability and overall demand. Projected demand for firewood and charcoal in Africa indicates that it is likely to more than double by the year 2010.³³ Furthermore, the only part of the continent that is likely to have a positive balance of firewood supply by 2010 is humid Central Africa. The status of firewood situation in Africa is shown in Figure 8.

²⁷Defined as having 1–1.5 m³ of firewood per ha and less than 0.005 m³ of timber per ha, with at least 10% forest cover.

²⁸Tolba, *op cit*, Ref 26.

²⁹Economic Commission for Africa, *Special Memorandum by the ECA Conference of Ministers on Africa's Economic and Social Crisis*, Document E/ECA/CM.10/37/Rev. 1, ECA, Addis Ababa, 1984, p 59.

³⁰Tolba, *op cit*, Ref 26.

³¹*Ibid.*

³²FAO, *op cit*, Ref 15.

³³*Ibid.*

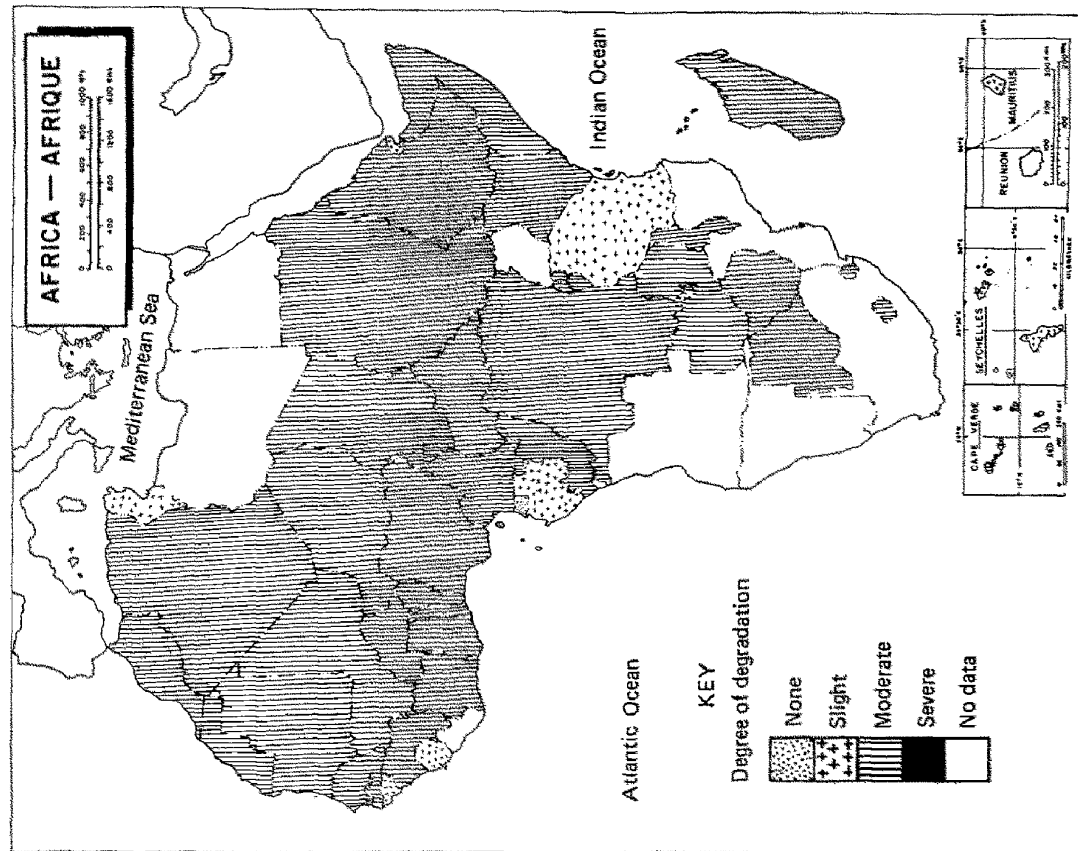


Figure 3. Sheet erosion in Africa.

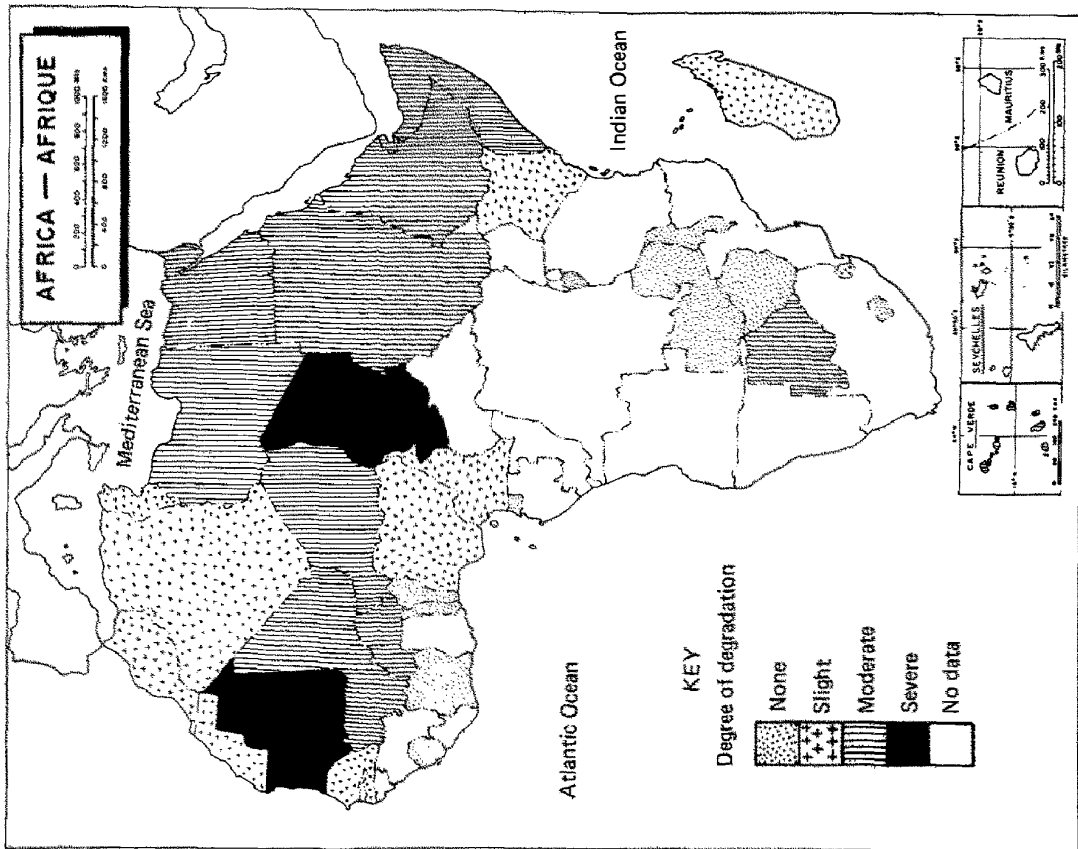


Figure 2. Wind erosion in Africa.

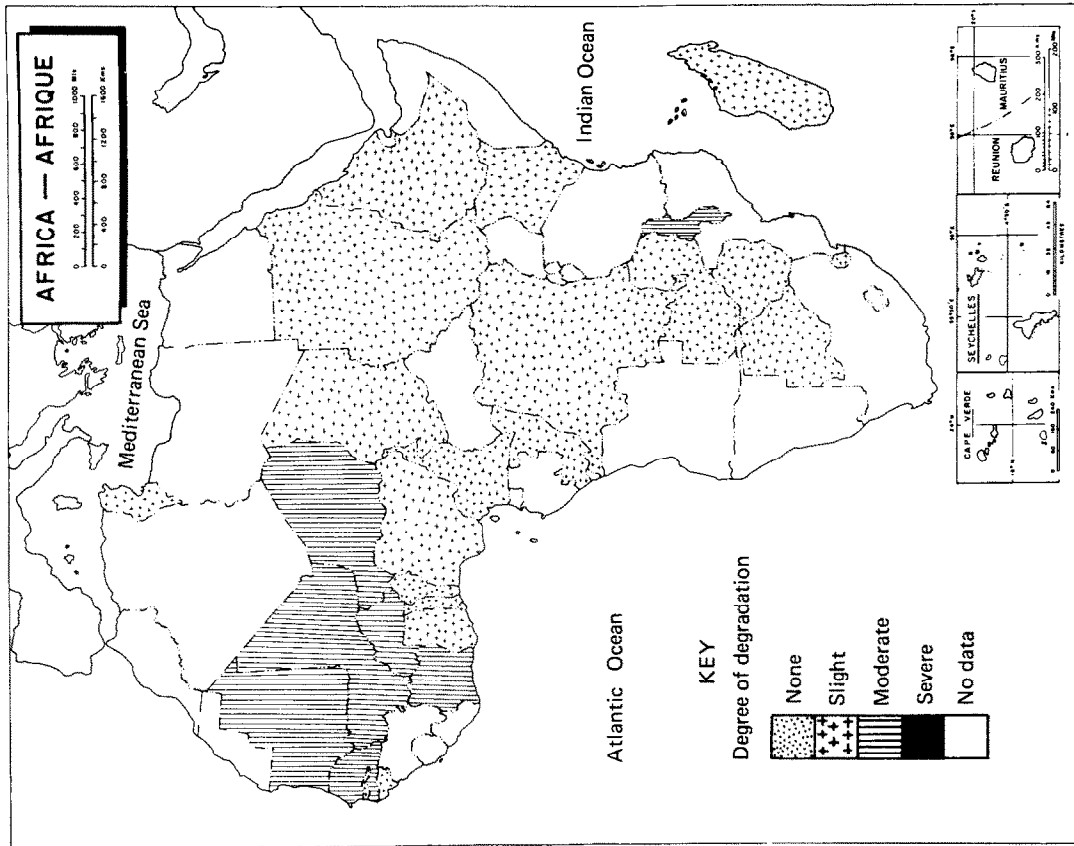


Figure 5. Soil crusting in Africa.

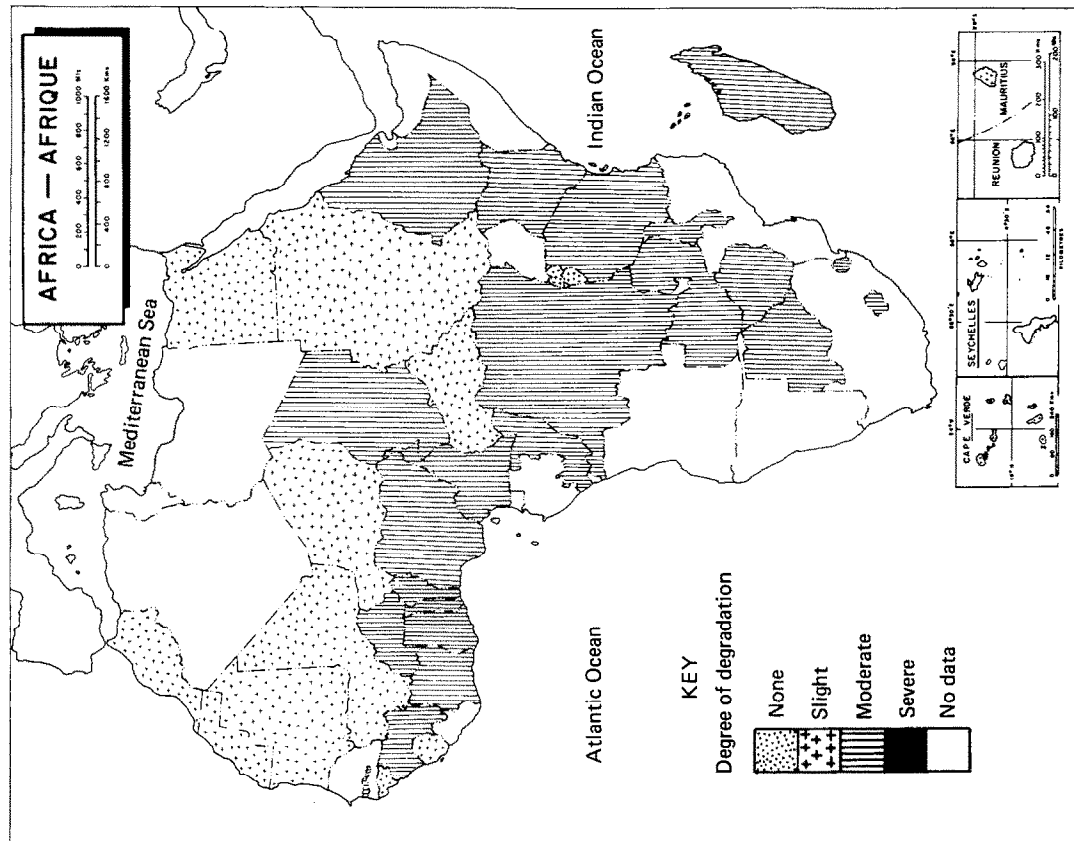


Figure 4. Declining soil fertility in Africa.

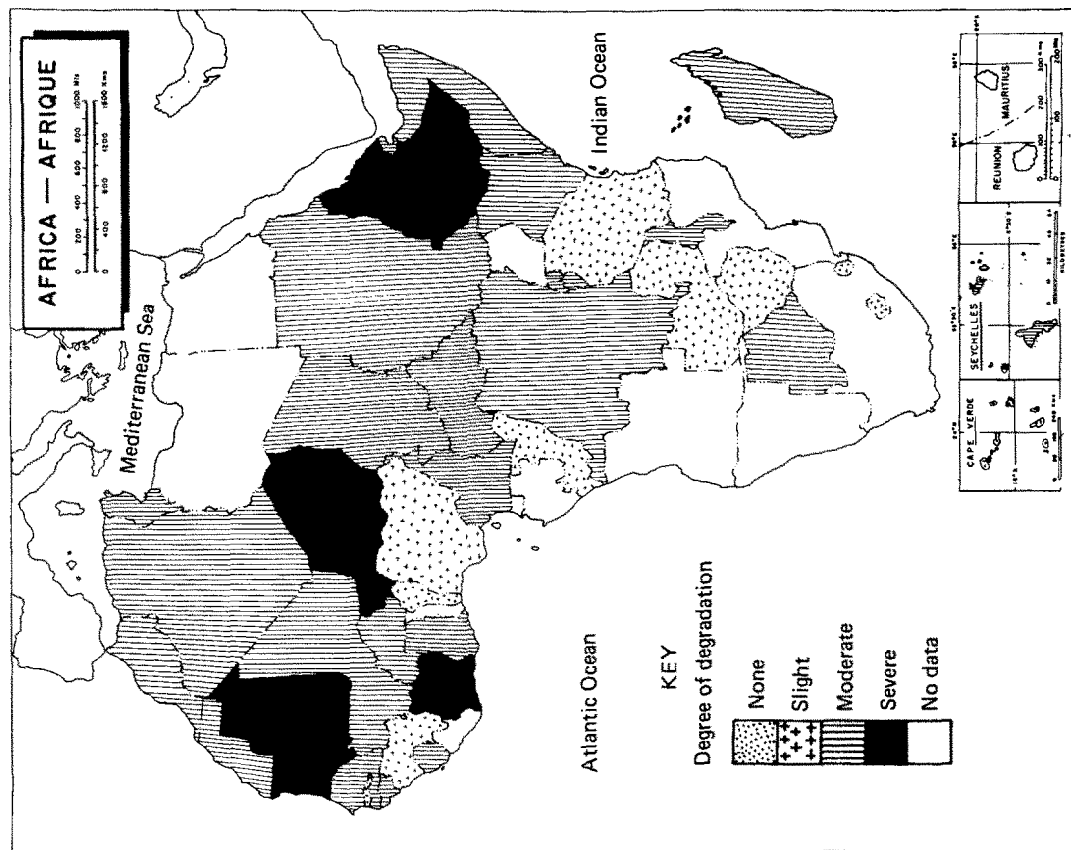


Figure 7. Degraded vegetation in Africa.

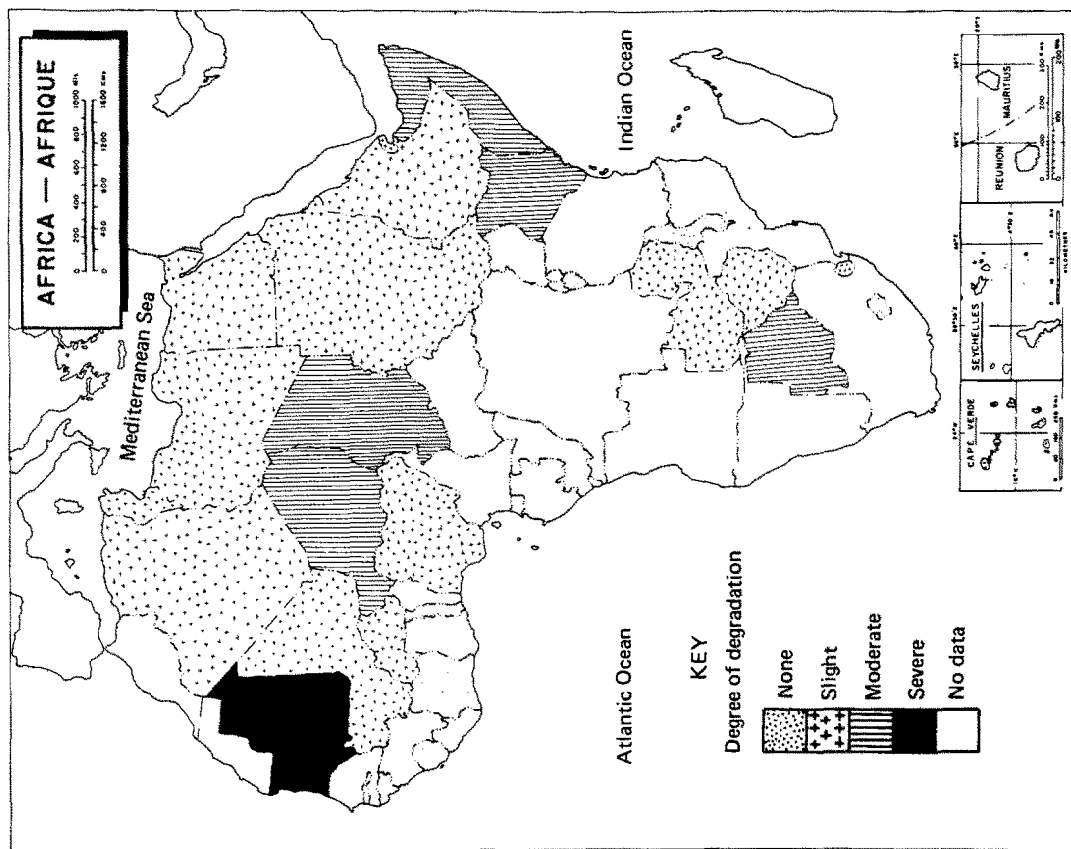


Figure 6. Desert encroachment in Africa.

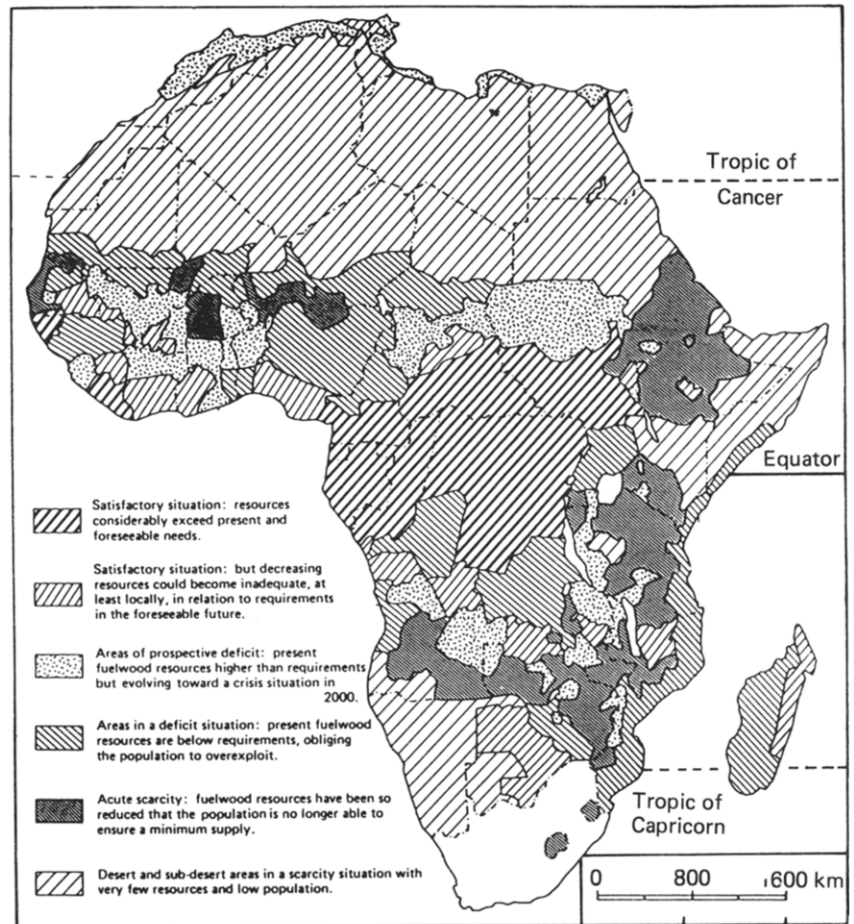


Figure 8. Present and projected fuelwood situation in Africa.

A hypothesis was put forward around the mid-1970s that removal of natural vegetation by overgrazing and the baring of high albedo soil results in thermal depression, reduced precipitation and desertification in regions of low rainfall.³⁴ So far there has been little scientific evidence for such a desertification-inducive mechanism, even though others have suggested that surface changes induced by drought (like reduction in vegetative cover and soil moisture) may have a feedback effect on the atmosphere which could intensify the drought.³⁵

Concluding remarks

Two major problems facing efficient land use planning Africa stem from: the numerous institutions which have jurisdictions on various aspects of land use; and lack of ready availability of usable data. Presence of various institutions makes duplication, interdepartmental rivalry and infighting, and contradictory planning inevitable. For example, during a recent mission to East Africa, I found that for a vast tract of land, one branch of the Ministry of Agriculture was planning afforestation whereas another was proposing rangeland development. Planning by both branches was in fairly advanced stages. Even though the two branches belonged to one ministry, they were unaware of each other's plans. Coordination is often poor within a single ministry, but the problem is further compounded when several ministries are involved.

³⁴J. Otterman, 'Baring high-albedo soils by overgrazing: a hypothesized desertification mechanism', *Science*, Vol 186, 1974, pp 531-533; and J. Charney, P.H. Stone and W.J. Quirk, 'Drought in the Sahara: a biogeophysical feedback mechanism', *Science*, Vol 187, pp 434-435.

³⁵F. Kenneth Hare, *Climate and Desertification: a revised analysis*, WMO, Geneva, 1984, p 149.

Adequate land use data in most African countries are generally not available. They are often seriously incomplete or are nominally complete, but their reliability is unpredictable because of lack of properly trained land use specialists, who can collect, analyse and manage the data. Even when good land use data for a region have been collected and analysed, they are often inaccessible because of inadequate data management facilities. Thus, it is fairly common to find that the data collected on various aspects of land use are more readily available in FAO in Rome rather than in the countries themselves. This does not make national efforts at land use planning any simpler. These types of problems cannot be resolved until and unless there are more land use professionals trained in the various countries who can manage such activities on a long-term basis. Use of expatriates can only provide a short-term solution. Thus, education and training in land use has to be a priority consideration for all African countries.