

Annex 1

Description of the livelihood zones used in the report

The livelihood zones presented in this report are primarily based on the farming system zones described in FAO and World Bank (2001), which are, in turn, closely correlated with the main agro-climatic zones of the region.

This annex provides a description of the prevailing conditions and main farming activities that sustain rural livelihoods in 13 main zones, plus two locally relevant livelihood zones. In the text below, the term “region” refers to sub-Saharan Africa (SSA).

Arid zone

This zone is the largest (21 percent of the region) and corresponds to the deserts of the Sahara and southwestern Africa. It has marginal importance in terms of agriculture and population. The area under cultivation covers only 0.3 percent of the land area of the livelihood zones (mostly oases), while the rural population (8 million) represents only 2 percent of the regional total. In view of the high level of aridity, irrigated areas represent almost half the cultivated land. Rangeland and livestock are confined to marginal areas. Living conditions are extremely hard, and the rural population consists mainly of nomads, and a few sedentary people at the oases.

Pastoral zone

This zone is located mostly in the semi-arid zones extending across the Sahel from Mauritania to

the northern parts of Mali, Niger, Chad, Sudan, Ethiopia and Eritrea. Some parts are also found in northern Kenya and Uganda, and in part of Namibia, Botswana and southern Angola. It occupies almost 2.7 million km², or 11 percent of the area of the region. The rural population is 27 million (7 percent), with 24 million head of livestock. Pastoral land is abundant (more than 190 million ha). This zone is characterized by nomadic pastoralists, who move to other zones during the driest period of the year, and exclusive pastoralists. The latter are livestock producers who grow no crops and simply depend on the sale or exchange of animals and their products to obtain foodstuffs. Such producers are most likely to be nomads, i.e. their movements are opportunistic and follow pasture resources in a pattern that varies from year to year. This type of nomadism reflects, almost directly, the availability of forage resources – the patchier these are, the more likely an individual herder is to move in an irregular pattern.

Pastoralists are highly vulnerable to climate variability and droughts. In particular, they are highly dependent on the availability of water points for their animals. Fragile balances exist between the availability of water and feed for animals. In periods of drought, excessive concentration of animals around watering points may lead to catastrophic losses of herds. Some of Africa’s largest irrigated areas are located in the pastoral zones of the Nile and Niger Rivers, such as Gezira Scheme in the Sudan, where integration of irrigated agriculture and livestock

play an important role in overall agricultural production.

Agropastoral zone

This zone covers 2.15 million km², or 9 percent of the land of the region. It is characterized by a semi-arid climate, with an average growing period of 95–100 days. It extends from Senegal to Niger in West Africa, and covers substantial areas of East and Southern Africa from Somalia and Ethiopia to South Africa. The rural population represents 9 percent of the region accounting for more than 38 million people, with a density of 18 inhabitants/km². Although the population density is limited, pressure on fragile land is high. Field crops and livestock are equally relevant in the household livelihoods of this zone. Cultivated land and livestock account for 40 million ha and 35 million head, respectively, i.e. 18 and 19 percent of the regional total. Pastoral areas are abundant (more than 148 million ha) and represent 14 percent of the regional total and 70 percent of the area of the zone. Rainfed sorghum and millet are the main sources of food, which are rarely sold on local markets, while sesame and pulses are sometimes marketed. Cultivation is frequent along riverbanks, particularly alongside the Niger and Nile Rivers. Livestock is used for subsistence, marketing (milk and milk products), offspring, transportation, land preparation, sale or exchange, savings, bridewealth, and insurance against crop failure. The region is characterized by extremely low soil fertility and chronic limitations in terms of organic matter.

Irrigation plays a relatively important role in this zone, with more than 900 000 ha of recorded irrigated areas, putting substantial pressure on the region's water resources (20 percent of total water resources of the zone are diverted for irrigation). Rainfed cultivation is often accompanied by water conservation practices in an attempt to enhance soil moisture retention (zai, half-moons,

stone ridges, etc.). Nonetheless, vulnerability to drought remains high, with frequent crop failures and deprived livestock.

Cereal-based zone

This livelihood zone covers large parts of the region (2.45 million km²) and it is the most important food production zone in East and Southern Africa. It extends mainly along the Rift Valley, across plateau and highland areas at altitudes of 800–1 500 m, from Kenya and the United Republic of Tanzania to Zambia, Malawi, Zimbabwe, South Africa, Swaziland and Lesotho. The climate ranges from dry subhumid to moist subhumid. The cultivated area covers 36 million ha and accounts for 15 percent of the regional total. The rural population is almost 66 million, 16 percent of the regional total. Most of the zone has monomodal rainfall, but some areas experience bimodal rainfall. Farmers are typically traditional or emerging smallholders, with farms of less than 2 ha. The main crops are maize (staple and cash crop), tobacco, coffee and cotton. Yields have fallen in recent decades owing to the shortages and high cost of inputs such as seeds, fertilizers and agrochemicals. Soil fertility has been declining, prompting smallholders to revert to more extensive production practices. About 24.5 million ruminants are kept both for food and farm manure and ploughing, and savings. In spite of scattered settlement patterns, community institutions and market linkages in the maize belt are relatively more developed than in other livelihood zones.

Small-scale irrigation schemes and supplementary irrigation are scattered within the zone, and cover 620 000 ha, or 9 percent of the regional total, although the potential is much higher. In this zone, a combination of soil fertility restoration and supplementary irrigation has the potential to boost agricultural productivity substantially, in response to rapidly decreasing farm size.

Cereal–root crop zone

This livelihood zone extends from Guinea through northern Côte d'Ivoire to Ghana, Togo, Benin and the mid-belt states of Nigeria to northern Cameroon, and on to Central and Southern Africa. It covers 3.17 million km² (13 percent of the land area of the region) – mainly in the moist semi-arid zone with an average growing period of about 130 days. Some 51 million ha (22 percent of the regional total) are cultivated, sustaining a rural population of almost 68 million (16 percent of the regional total). Livestock (mostly ruminants) are abundant (42 million head). Pasture, with almost 195 million ha, accounts for 18 percent of the regional area. Compared with the cereal-based zone, this zone is characterized by lower altitude, higher temperatures, lower population density, abundant cultivated land, and higher livestock numbers per household. It also has poorer transport and communications infrastructure. Cereals such as maize, sorghum and millet are common in the area, rotated or intercropped with root crops such as yams, cassava and sweet potatoes. Although a range of agricultural products are marketed, most of the products are consumed within households, given the prevalence of subsistence agriculture and traditional farmers.

Irrigation is limited, it accounts for 6 percent of the regional total, with fewer than 422 000 ha, despite a relatively high potential, estimated at 7.7 million ha. A range of water intervention options have potential for poverty reduction, in particular soil moisture management practices, supplementary irrigation and community-level small-scale irrigation.

Root-crop-based zone

This livelihood zone corresponds mainly to a sub-humid climate. It covers 2.8 million km² (about 11 percent of the land area of the region), has a cultivated area of 28 million ha, and is home to 48 million rural people. Precipitation patterns show

a good seasonal distribution, and the risks of crop failure are limited. The zone contains about 16 million head of livestock. Farmers are mainly traditional smallholders, typically oriented towards staple crops and self-consumption, and root crops are indeed the main staple. Market prospects exist in places, in particular for export of oil-palm products, urban demand for root crops is growing, and linkages between agriculture and off-farm activities are relatively better than elsewhere.

Irrigation is marginal in the zone, owing mainly to the favourable climate conditions for rainfed and market opportunities. Water resources are abundant in most places. Therefore, possibilities for water-based interventions are relatively marginal.

Highland temperate zone

This zone covers 440 000 km² (2 percent of the area of the region). Ten million ha of cultivated land (4 percent of the regional total) support a rural population of 30 million (7 percent of the regional total). This zone is located mainly in the Ethiopian and Eritrean highlands at an altitude of 1 800–3 000 m, and the climate is predominantly subhumid or humid. Given the high altitude, this zone is typically monomodal, and presents one single and long growing season. Temperate cereals, such as wheat, teff (in Ethiopia) and barley, are the most common sources of livelihood, complemented with pulses and potatoes. Livestock are relatively abundant and an important source of cash. Some households have access to soldiers' salaries (Ethiopia and Eritrea) or remittances (Lesotho), but these mountain areas offer few local opportunities for off-farm employment.

The particular agroclimatic conditions of the zone have a twofold effect on its rural livelihood conditions. On the one hand, the population is highly vulnerable owing to the early and late frosts at high altitudes that can severely reduce yields,

and crop failures are not uncommon in cold and wet years. On the other hand, there is a considerable potential for diversification into higher-value temperate crops. The potential exists for substantial increases in agricultural productivity through a combination of water and soil-fertility-related interventions, in particular through better soil moisture management and small-scale irrigation.

Highland perennial zone

This relatively small livelihood zone is located mainly in the highlands of East African, covering an area of about 320 000 km² (1 percent of the regional total). The climate is mostly subhumid or humid, with an average growing period of more than 250 days. The rural population is 32 million (8 percent of the regional total). This zone has the highest population density in the region (more than 1 inhabitant/ha). Therefore, the pressure on land is intense, and about 7 million ha of land are cultivated, mainly by smallholders. The average cultivated area per household is slightly less than 1 ha, but more than 50 percent of holdings are smaller than 0.5 ha. The livelihood base of this zone is characterized by perennial crops such as banana, plantain, enset, coffee and cassava, complemented by annual root crops, such as sweet potato and yam as well as pulses and cereals. Given the limited availability of pastures, livestock are a minor resource, amounting to about 6.2 million head. The main trends are diminishing farm size, declining soil fertility, and increasing poverty and hunger. People cope by working the land more intensively, but returns to labour are low.

Given the favourable conditions for rainfed agriculture, irrigation is a minor practice and accounts for only 52 000 ha (1 percent of the regional total). However, in conditions of heavy pressure on land resources, there is some scope for intensification through improved water control.

Tree crop zone

This zone is located in the Gulf of Guinea, with smaller pockets in the Democratic Republic of the Congo and Angola, largely in the humid zone. The zone occupies about 730 000 km² (3 percent of the regional total), accounts for 14 million ha of cultivated land (6 percent of the regional total), and is home to a rural population of almost 30 million (7 percent of the regional total). The production base of the zone is industrial tree crops, particularly cocoa, coffee, oil palm and rubber. Food crops are intercropped with tree crops and are grown mainly for self-consumption. Livestock are marginal (2 percent of the regional total). There are also commercial tree crop estates (particularly for oil palm and rubber), providing some employment opportunities for smallholder tree crop farmers through nucleus estate and outgrower schemes. As neither tree crop nor food crop failure is common, price fluctuations for industrial crops constitute the main source of vulnerability.

Given the favourable climate, irrigation is marginal in the region, and prospects for livelihood enhancement through water intervention are minor.

Forest-based zone

This zone occupies 2.6 million km² (11 percent of the total land in the region), accounts for 11 million ha of cultivated area (5 percent of the regional total), and is home to a rural population of 29 million (7 percent of the regional total). Most of the land lies in the humid forest zone of the Democratic Republic of the Congo. Farmers practise shifting cultivation, clearing new fields from the forest every year, cropping it for 2–5 years (cereals or groundnuts, followed by cassava) and then abandoning it to bush fallow for 7–20 years. Cassava is the main staple, complemented by maize, sorghum, beans and cocoyams. Sources of food and cash, in limited part, are also forest products and wild game. The livestock population is 3.2

million head (2 percent of the regional total), as pastoral land is limited, given the prevalence of forest vegetation. Rural infrastructures are poorly developed and access to markets is restricted. This implies agriculture of a largely subsistence nature.

While the irrigation potential (6.7 million ha) and the internal renewable water resources (1 460 km³/year) are the highest in the region, irrigation is marginal (87 000 ha) and represents 1 percent of the regional total. This zone offers little prospect for water-based interventions in support of poverty reduction in rural areas.

Large commercial and smallholder zone

This zone covers almost the whole of South Africa and the southern part of Namibia, Zambia and Zimbabwe. The climate is mostly semi-arid. The zone covers 1.23 million km² (5 percent of the regional total), with 15 million ha of cultivated land (7 percent of the regional total). It is home to 20 million rural people (5 percent of the regional total). It comprises two distinct types of farms: scattered smallholder farming in the homelands; and large-scale commercial farms. Both types are largely mixed cereal–livestock zones, with maize dominating in the north and east, and sorghum and millet in the west. Ruminants are abundant in this zone, but the level of crop–livestock integration is limited.

Irrigation is extensively used and has reached its full potential in many places, leading to competition for water between farmers and between sectors. Together with highly intense farming, irrigation is depriving soils, and the zone is becoming more drought-prone. In this zone, water-related interventions should concentrate on water productivity increases through improved management of agricultural water, and the development of water harvesting to support supplementary

irrigation. Institutional issues, including issues of water rights, conflict resolution and river basin management, deserve particular attention.

Rice–tree crop zone

This zone is located exclusively in Madagascar – and benefits from a moist subhumid climate. It is the smallest zone of the region, accounting for less than 310 000 km² (1 percent of the regional total), of which 2.7 million ha are cultivated (1 percent of the regional total). The rural population is 8 million (2 percent of the regional total). Banana and coffee cultivation is complemented by rice, maize, cassava and legumes. Livestock are almost insignificant (about 1 million head).

Farms are small, and there is a significant amount of basin flood irrigation – equivalent to 10 percent of the total irrigated area of the region – used almost exclusively for paddy rice production, the main staple food in Madagascar. As irrigation is reaching its full potential in places, there is ample scope for increased productivity of irrigated agriculture through better water management.

Coastal artisanal fishing zone

This zone stretches all around the coastal areas of SSA. The zone covers 380 000 km² (2 percent of the regional total). It is home to accounts for 15.5 million rural people (4 percent of the regional total); most of the population of this zone live in urban areas (73 percent). People's livelihoods are based on artisanal fishing supplemented by crop production, sometimes in multistoried tree crop gardens with root crops under coconuts, fruit trees and cashews, plus some animal production. The cultivated land area of 3.6 million ha is only 2 percent of the regional total. Livestock numbers are small (fewer than 2 million head, or 1 percent of the regional total).

Irrigation is not very developed – 300 000 ha (4 percent of the regional total). However, as the coastal area has a high concentration of urban population, good prospects exist for the development of peri-urban agriculture, in which water control plays an important role. Therefore, in places, and according to market conditions, this zone offers prospects for further irrigation development.

Other relevant local zones

Peri-urban zone

Urban centres usually offer opportunities for rural people in terms of markets for farm products and labour. Agriculture areas around cities are characteristically focused on horticultural, livestock production, and off-farm work. Within the estimated total urban population of more than 200 million in the region, there is a significant number of farmers in cities and large towns. In some cities, it is estimated that 10 percent or more of the population are engaged in peri-urban agriculture. Overall, there are about 11 million agricultural producers in peri-urban areas. This livelihood zone is very heterogeneous, ranging from small-scale, capital-intensive, market-oriented vegetable-growing, dairy farming and livestock fattening, to part-time farming by the urban poor to cover part of their subsistence requirements. The level of crop-livestock integration is often low, and there are typically environmental and food quality concerns asso-

ciated with peri-urban farming. The potential for poverty reduction is relatively low, mainly because the absolute number of poor is low. Agricultural growth is likely to take place spontaneously, in response to urban market demand for fresh produce, even in the absence of public-sector support. Unless curbed by concerns over negative environmental effects, rapid adoption of improved technologies can be expected. Overall, this is a dynamic livelihood zone with considerable growth potential.

Irrigated zone

Irrigated areas are scattered across the region, and they provide a broad range of food and cash crops, including rice, vegetables, cotton, and sugar cane. Irrigation constitutes a special case in relation to the heterogeneity of livelihood zones. Where irrigation-based production is the principal source of livelihood in an area, as in the case of large-scale irrigation schemes, the entire area can be considered an irrigation-based livelihood zone. Water control may be full or partial. Irrigated holdings vary considerably in size. Water shortages, deterioration of infrastructure, and reduced margins for main irrigated products are among the main problems facing farmers in irrigated areas. Many state-run schemes are currently in financial crisis, but if institutional and market problems can be solved, prospects for future agricultural growth are good. The incidence of poverty is lower than in other livelihood zones, and the absolute numbers of poor are small.