

Farming

There are several good reasons why much of this chapter is devoted to farming. First, a great proportion of people depend on farm produce for much of their food intake. About 96% of all households are reported as having some kind of farming activity, and 71 % of rural households depend upon farming as their main source of income. Second, a fair number of people derive cash incomes by selling farm products. Third, farming provides opportunities for people who have substantial cash incomes from wages or other sources to invest surplus cash, perhaps by acquiring additional cattle and larger fields. Fourth, of all human activities in the region, farming has a much greater impact on the natural environment than any other. Finally, because agricultural activities and methods have been practiced over many generations, an understanding of farming provides a useful view of how people have adapted to the environmental conditions that surround them. Likewise, an appreciation of the established values that people attach to farming provides perspectives on how people may face changing circumstances in the future.

The section is divided into two parts covering crop and livestock farming, respectively. However, it is important to remember that most households both grow crops and keep livestock.

Crops

The great majority of crops are grown on dryland fields, which means that they are not irrigated. This also means that crop production is entirely dependent upon rainfall. Fields are often cleared before the first rains, but all other events during the crop calendar (Figure 34) follow the onset of the rains, generally

in November and December. Batches of crops are often planted at different times, each planting session following a period of good rainfall. This improves the chances of at least some of the crop being successful if some plants do not survive periods of hot, dry weather. Planting at different times also means that the harvest can be done gradually over a longer time so less labour is needed than if the whole crop had to be harvested in a short period. The chances of the whole crop being eaten by birds are also reduced.

Mahangu is the dominant crop in the region, and about 75% of the cultivated area is used for its production. Smaller areas are used to grow maize and sorghum. Most of the mahangu and maize harvest is consumed domestically, while sorghum is used to produce beer. Groundnuts, beans, melons

and pumpkins are also grown in small quantities, generally by intercropping with mahangu.

Proportions of households growing different crops vary slightly between the river zones and the three inland zones of the region (Figure 35). Thus, almost all households in the inland areas grow both mahangu and maize whereas about 15% of riverine households do not grow these crops. These homes may lack access to fields with suitable soils, a constraint that is more severe along the densely populated river than elsewhere. In addition, alternative incomes are more available along the river, for example from retail trade and jobs with wages. Five percent of households along the river have neither crops nor livestock, and 1% cultivate only vegetables and fruits.

Figure 34 The crop farming calendar in Kavango, showing the usual periods when different activities are undertaken, and average rainfalls per month at Rundu.

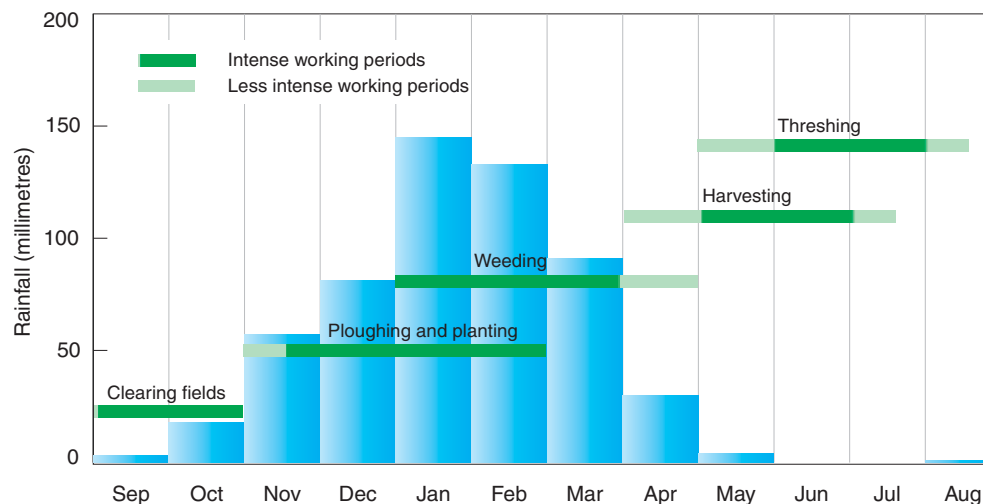
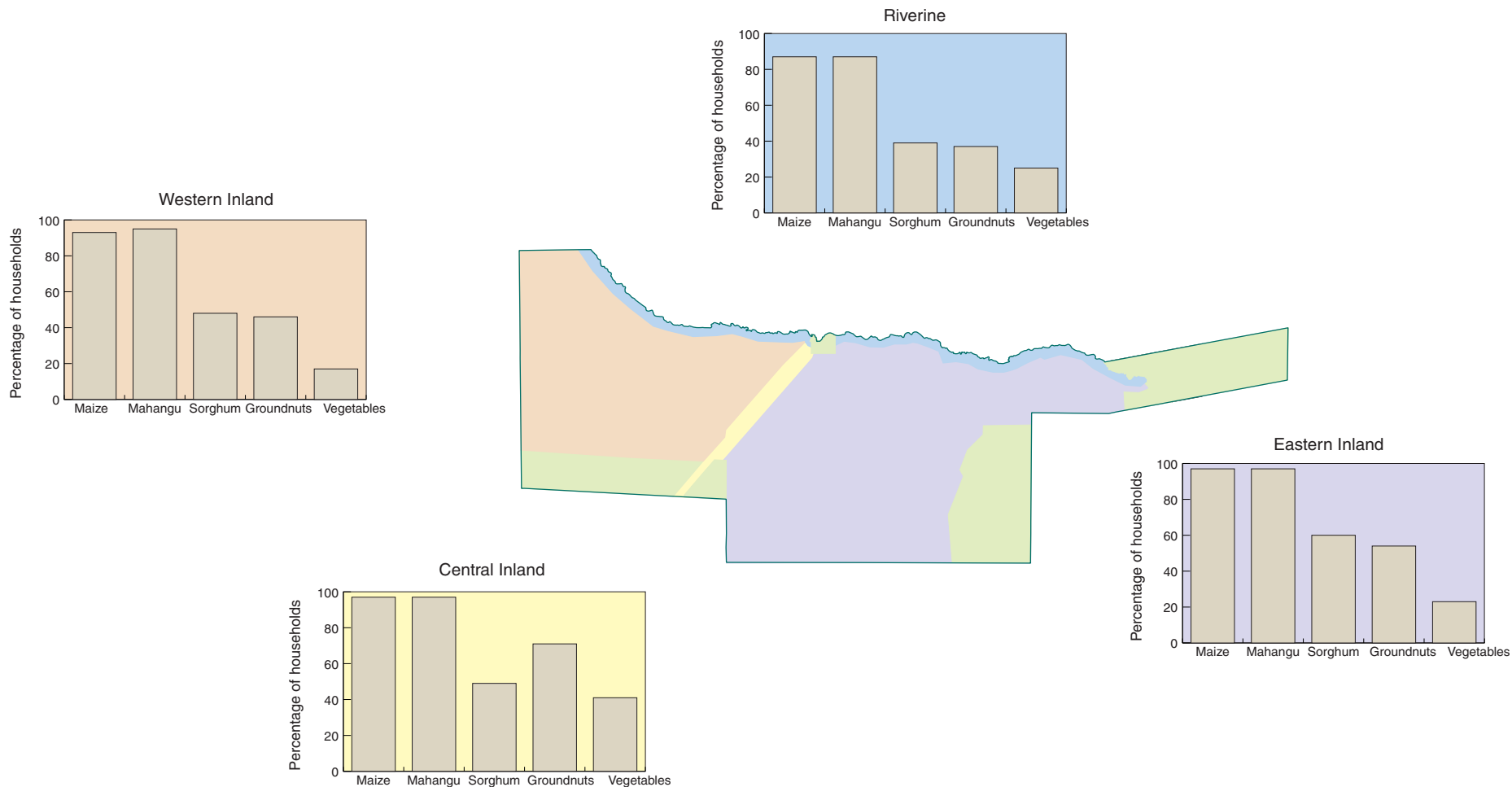


Figure 35

Percentages of households planting different crops in four zones. Areas coloured green are those in which there are few or no crops⁷.



Fields are concentrated along the river, in inter-dunes valleys and in the dry omuramba valleys (see Figure 48 on page 42). Each household is allocated land to cultivate by the local headman in consultation with the village inhabitants. New fields are cleared on an on-going basis, both by new households and as a result of shifting cultivation. A survey in 1992/93 showed that 48% of all households had cleared new land within five years, and 33% of households had given up fields and started new ones within the past five years¹⁴.

Different surveys have produced quite different average areas cultivated by each household, with the highest estimate of 6.7 hectares being more than four times bigger than the lowest of 1.4 hectares¹⁵. Nevertheless, it is clear that sizes of cultivated areas vary in relation to several factors. First, they are related to rainfall, and the survey in 1992/93 (a bad rainy season) showed that while 70% of households intended to cultivate more than one plot, only 44% ended up using more than one plot¹⁴. Second, inland households cultivate about 30% more than those along the river. Third, male-headed households cultivate 25% more than female-headed households. Fourth, cultivated areas vary in relation to a household's assets and wealth. Thus, homes with cash incomes cultivate areas 25% bigger than those lacking any cash income, and families having their own oxen or plough cultivate double the area of those having no draft power and equipment. Similarly, cultivated areas vary in relation to the number of livestock as shown in the table below.

Table 8: Average numbers of cattle per household compared with areas cultivated by the same households¹⁶.

<i>Area cultivated (hectares)</i>	<i>Average number of cattle</i>
Less than 1	5
1-3	10
3-5	16
5-7	22
7-9	25
More than 9	25

Labour is the most valuable input to crop growing, and most labour is provided by members of the family. However, it is common practice to hire labourers or to exchange labour between households, especially during busy periods of weeding. Women provide most of the work (about 62% of worked days), while men provide 33% and children under 15 years old and older people above sixty years old contribute 5% of worked days¹⁴. Women are generally more engaged in cultivation and men are more involved in the clearing and preparation of land. Hired labour consists either of groups of workers or individuals, and hired labour is usually paid in-kind, for example with mahangu, meat or beer. Most hired labour is provided by women.

Weeding, as the most time consuming component of crop production, is done two or three times during the season. Harvesting starts around April and is done manually. Threshing is done by groups of women.

Draft power is used to prepare most fields, and almost all other work to produce crops is done manually. Although only half of all households have their own ploughs, 85% of households have their fields ploughed using ploughs drawn by oxen or donkeys. Ploughs are thus frequently borrowed or hired, and 30-40% of all households report hiring ploughs. Households that do not use ploughs with draft power either use hoes or tractors for ploughing.

The ownership of oxen and ploughs varies in relation to a number of factors (Table 9), so that more households in inland areas have ploughs and oxen than those along the river. More male headed households have ploughs and oxen than female headed-ones. Households with wage incomes are more likely to have oxen and ploughs than those with smaller or no cash incomes.

Table 9: Percentages of households having oxen and ploughs¹⁶.

<i>Zone:</i>	<i>Own plough</i>	<i>Own oxen</i>
Inland	61	58
Riverine	45	40
<i>Head of household:</i>		
Male	51	47
Female	41	38
<i>Cash incomes:</i>		
No income	40	38
Remittances	49	43
Pensions	53	48
Wages	60	56

The use of chemical fertilizers and compost is very limited. Along the river, only 2% and 8% of households apply fertilizers and compost, respectively. The use of fertilizers on inland fields is non-existent, while 8% of all households report using compost¹⁶.

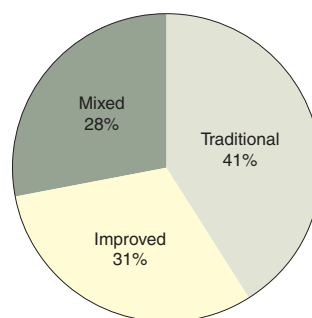
Seeds for planting mahangu are generally selected from the harvest of the previous year. This is particularly true for families living at the riverside where 45% of all households use traditional seeds. About one third of all households also plant improved seeds (Okashana-1) and 28% use a mixture of both traditional and improved seeds (Figure 36). Okashana-1 seeds are usually planted late in the season as they have a shorter growing period.

Mahangu, maize and sorghum grain are stored in different types of containers. Threshed grain is stored in 50-70 kilogram bags, traditional *shiietes* or in 200 litre sealed drums. About 20% of households store mahangu without threshing and the heads are gathered in bundles of stems to be stored inside or outside the house. Households do not mix the harvest of the previous year with the current one. Mahangu is stored for an average of two years, and most households report no losses during storage.

Crop production in the region is evidently a risky activity. While some farmers may sell surpluses in some years (see page 37), it seems likely that domestic production is often too low to meet all the cereal needs of households. The greatest factor affecting yields is rainfall. Good years are those during which rainfall is both sufficient in quantity and well-timed, such that there are regular falls of productive rain throughout the growing period (see page 12). But the unpredictable nature of rainfall means that productive rains often only start

relatively late in the season, and in many years there are good chances of long periods of hot and dry weather occurring during the growing period. Many crops, especially of younger plants, then wither and die. Little good information is available on yields, but average figures of 100 to 300 kilograms of mahangu per hectare are probably harvested regularly. Other than a lack of rain, attacks by pest insects and birds are the main threat to cereal harvests.

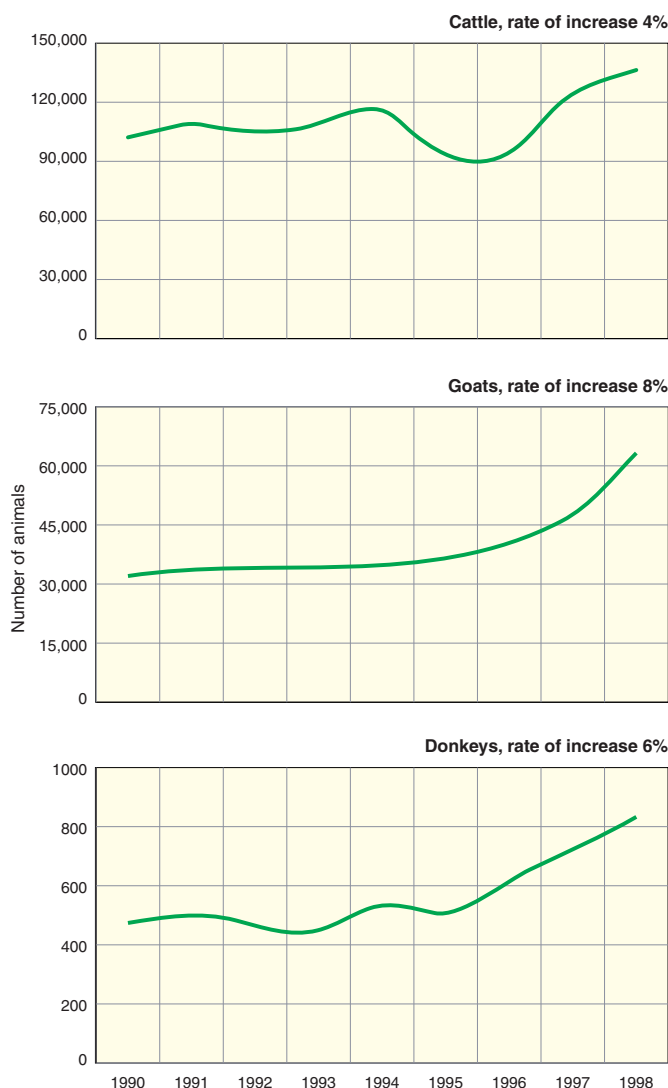
Figure 36 Percentages of households planting different types of mahangu seed¹⁶.



Livestock

Even though some households own donkeys, pigs and sheep, livestock farming is really dominated by cattle and goats. In 1998 a total of about 125 000 cattle was estimated to be in the region, and by 2000 the number would probably have risen to at least 135 000. This is based on an annual rate of increase of 4%, being the rate at which cattle numbers increased over the past nine years (Figure 37). Earlier figures are hard to find and probably often unreliable, but a total of 26 400 cattle was reported in 1938.

Figure 37 Changes in total numbers of cattle, goats and donkeys over the past nine years¹⁷.



The number of goats in the region was estimated to be about 64 000 in 1998, having doubled and increased at an annual rate of growth of 8% over the past nine years. A total population of less than 1 000 donkeys was reported in 1998. Taking cattle and donkeys as single large stock units and eight goats as equivalent to one such unit, cattle represent 93% of all large stock units in the region, goats 6% and donkeys less than 1%.

The average number of cattle and goats per household is 15 and 11, respectively⁷. These averages include the 40% of households that have no cattle and the 48% that do not have goats. That almost half of all households have no cattle or goats is indicative of the considerable variation in livestock ownership (Table 10).

Table 10: Percentages of households in the whole region owning different numbers of livestock⁷.

Herd size	Percentage of households	
	Cattle	Goats
None	40	48
1-5	12	13
6-10	11	10
11-15	8	8
16-20	6	4
21-25	5	3
26-30	6	3
More than 30	12	11

That variation relates to a number of factors. Firstly, patterns of ownership vary in the different zones in the region, with only about 23% of households in the western inland not having cattle compared with about 50% of those along the river (Figure 40). Average herd sizes along the river are 9 cattle and 9 goats, compared with 26 cattle and 16 goats in the western inland. Many farmers in the western inland also have large herds of more than 30

cattle, and there are quite a number of farmers with herds of 100 and more cattle. For the region as a whole, 12% of all households have 30 or more cattle and these farmers jointly own about 65% of all cattle.

Secondly, livestock ownership is related to the main source of income of the head of the household. Thus, those with wages have about double the number of livestock compared to those that have no income, as shown in Table 11.

Table 11: Average numbers of cattle and goats in relation to the head of the household's main source of cash income¹⁶.

Income source	Cattle	Goats
No income	7	4
Pensions	7	5
Remittances	10	6
Wages	14	8

(Note, these figures come from the three agricultural surveys¹⁶. The averages are lower than those reported above (perhaps because of a smaller sample, or different method of requesting information), but the trend in ownership pattern is clear)

Thirdly, large households are more likely to be cattle owners than those with fewer family members (Figure 38). In addition, bigger households also have larger herds (Figure 39). Finally, ownership varies in relation to the gender of the head of the household, male-headed homes having about 30% more cattle and goats on average than those headed by females. Surprisingly, there is little difference in herd sizes between male and female-headed households that own livestock, so the 30% difference is largely due to the fact that more female-headed households do not own livestock.

Figure 38

Relationships between household size and cattle ownership. Greater percentages of bigger households have cattle, while smaller households are less likely to be cattle owners⁷.

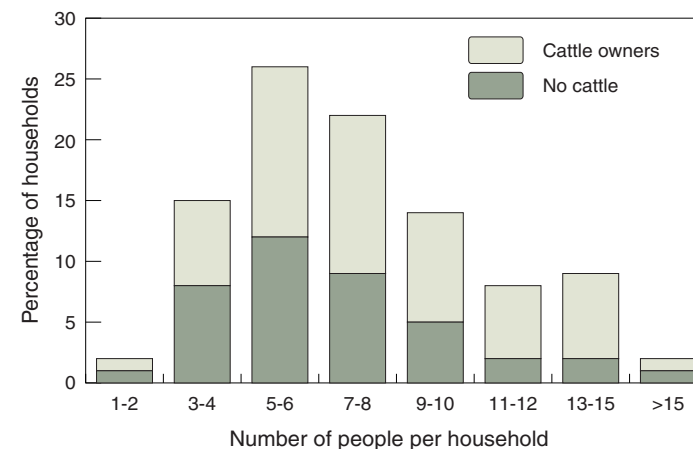


Figure 39

Average herd sizes of cattle and goats in households of different sizes⁷.

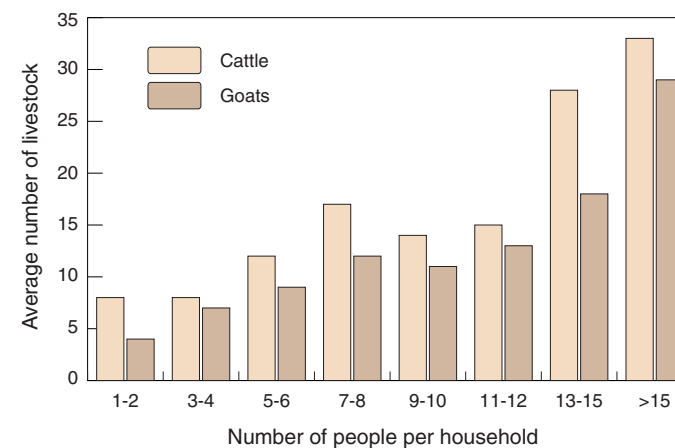
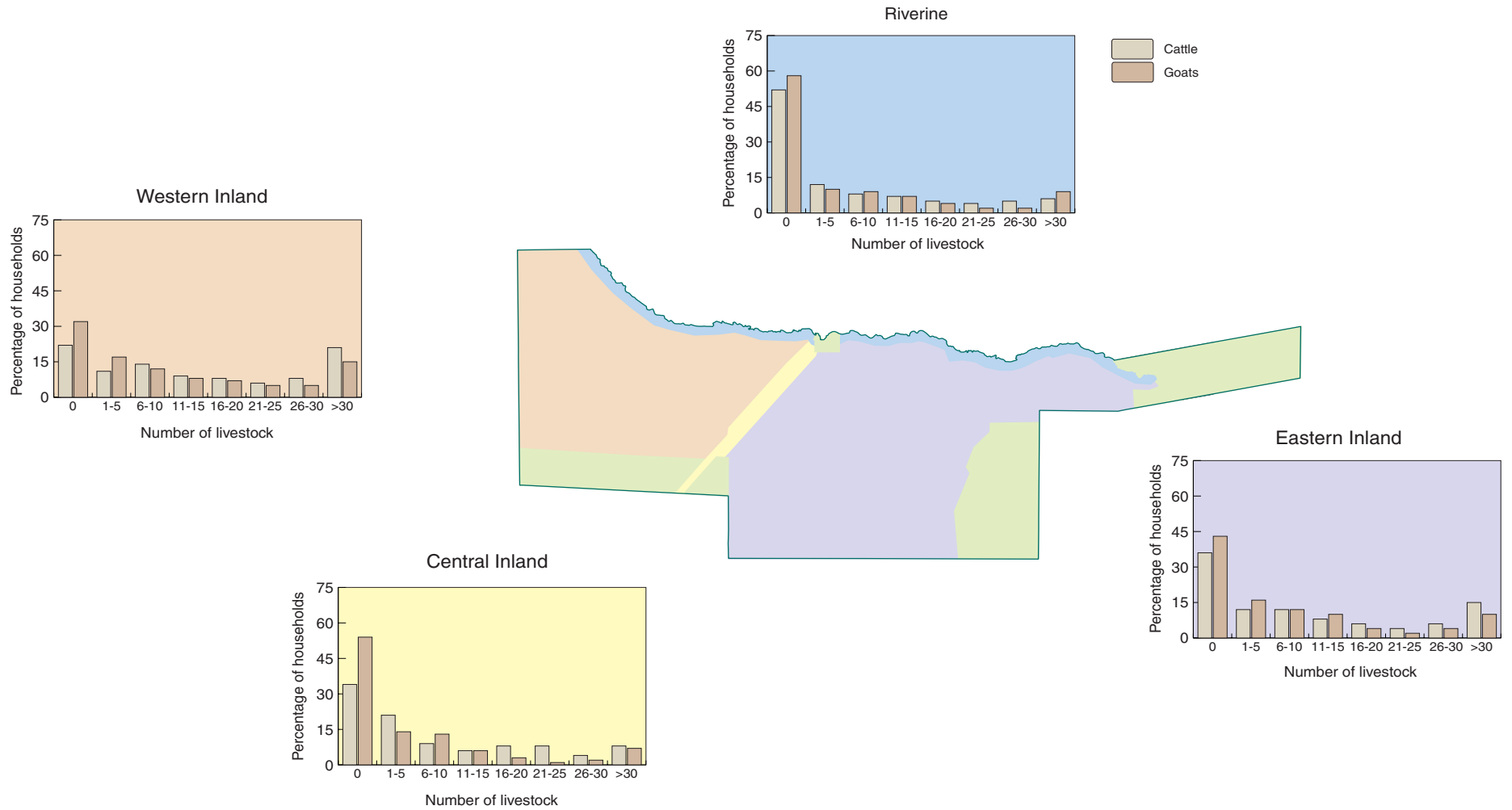


Figure 40

Percentages of households in the four zones that own different numbers of cattle and goats. Areas shaded green are those in which there are few or no livestock⁷.



Figures 41 and 42 provide perspectives on the density of cattle and goats, respectively. These maps largely reflect the distribution of people (see Figure 21 on page 18), with the great majority of goats concentrated along the river. Cattle are perhaps more widely distributed than the map suggests, and densities may be slightly greater in inland areas.

This is because cattle are moved quite widely, often going out some distance from households and then returning in the evening to drink at the river. Nevertheless, concentrations of animals along the river, in western Kavango, along the Mururani-Rundu road, and along the omurambas are noteworthy. It is generally accepted that densities of more than 10

cattle per square kilometre often lead to overgrazing and damage to pastures, especially if these stocking rates continue throughout the year. Measurements of areas with 10 or more cattle in Figure 41 indicate that about 7 900 square kilometres or 16% of the region has such high stocking rates.

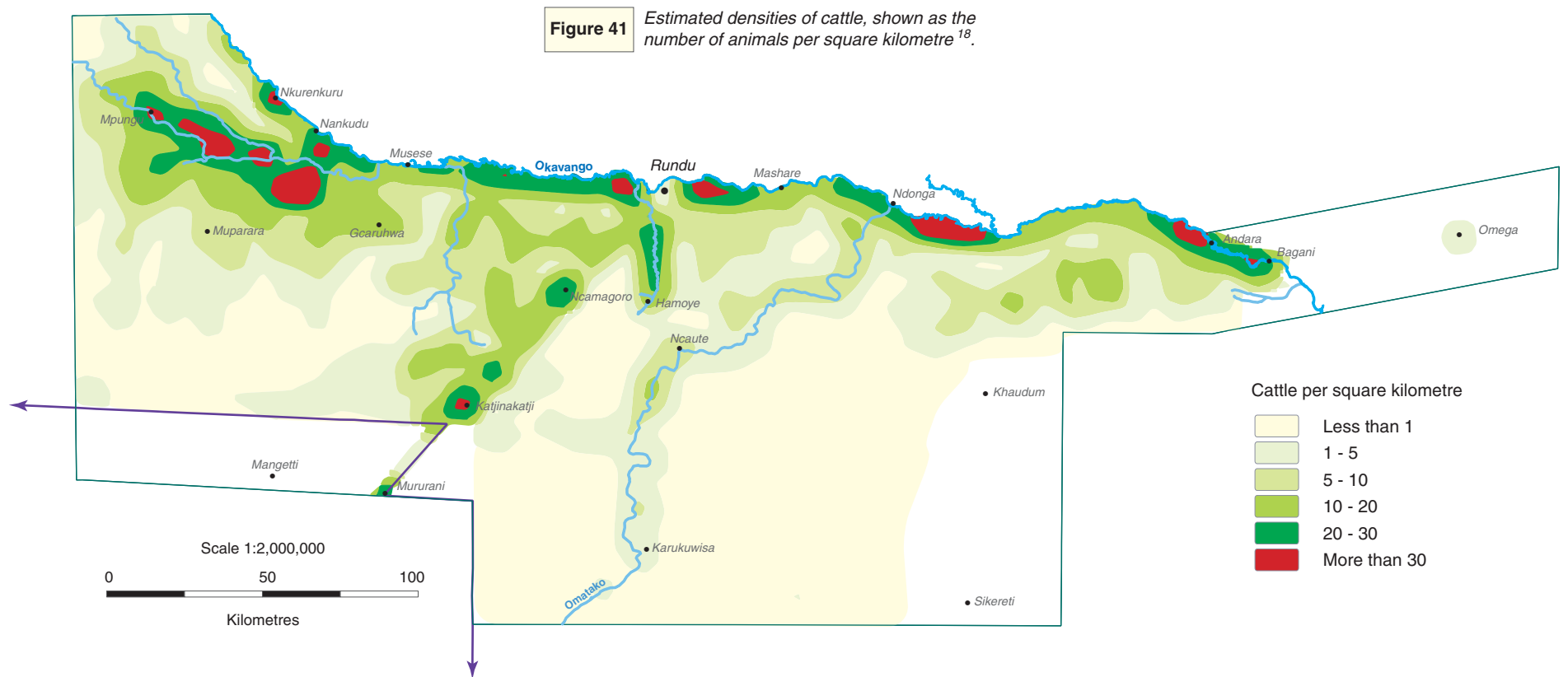


Figure 42 Estimated densities of goats, shown as the number of animals per square kilometre. The figures are in groups of eight because eight goats are taken as equivalent to one large stock unit or one cow¹⁸.

