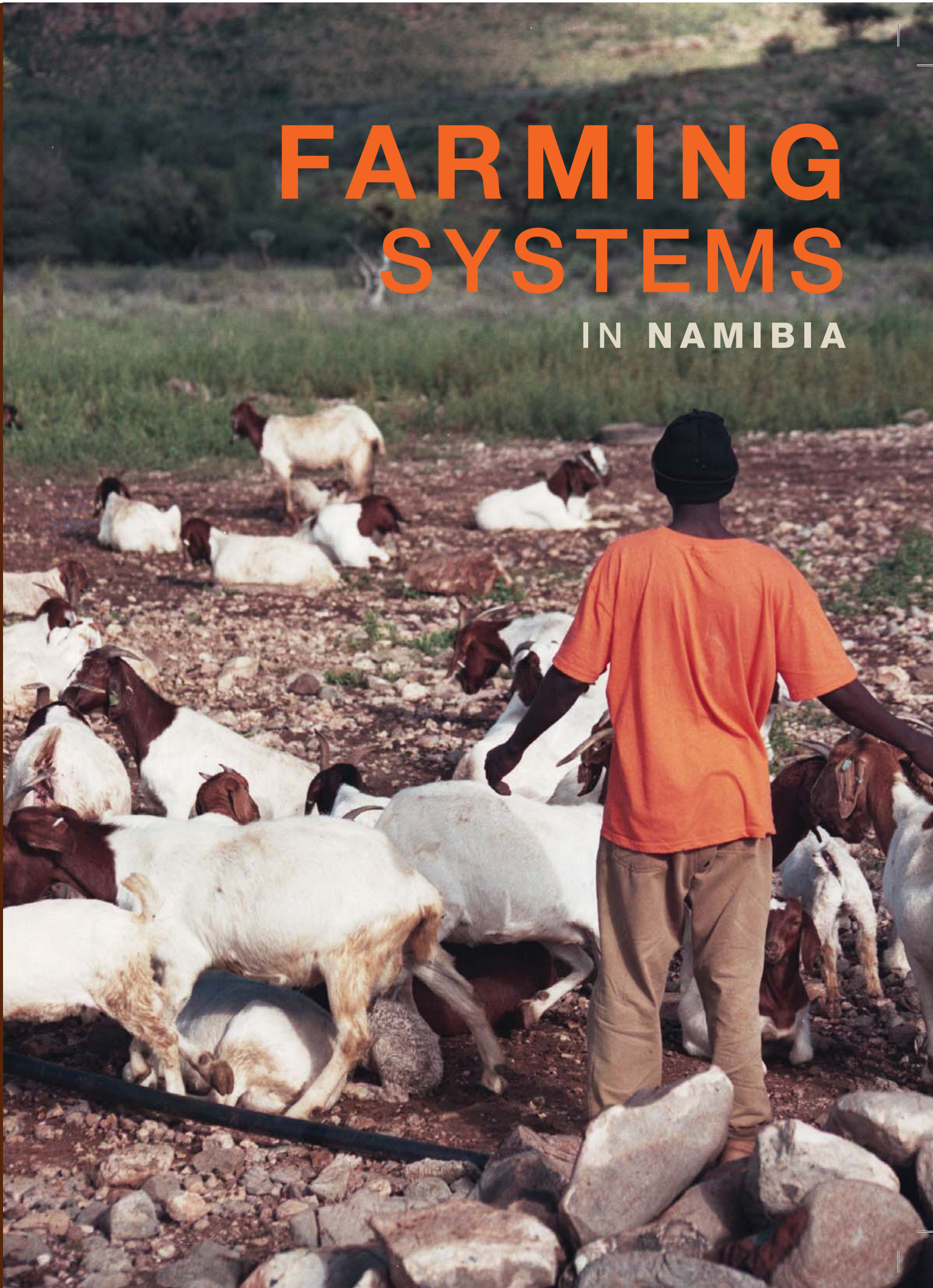


FARMING SYSTEMS

IN NAMIBIA



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RAISON

FARMING SYSTEMS

IN NAMIBIA



JOHN MENDELSON

With major contributions by
Selma el Obeid, Nico de Klerk and Piers Vigne

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Farming Systems in Namibia

A publication for the Namibia National Farmers Union (NNFU)



Funded by the Service for Co-operation and Cultural Affairs of the French Embassy in Namibia



First published in 2006

Published by **RAISON** (Research & Information Services of Namibia)

PO Box 1405, Windhoek, Namibia

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Copyright © photographs with individual photographers

Designed by: **PETALDESIGN**, Cape Town

Printed by: ABC Press, South Africa

ISBN 99916-780-4-2

ACKNOWLEDGEMENTS

This book benefitted from the assistance of many people.

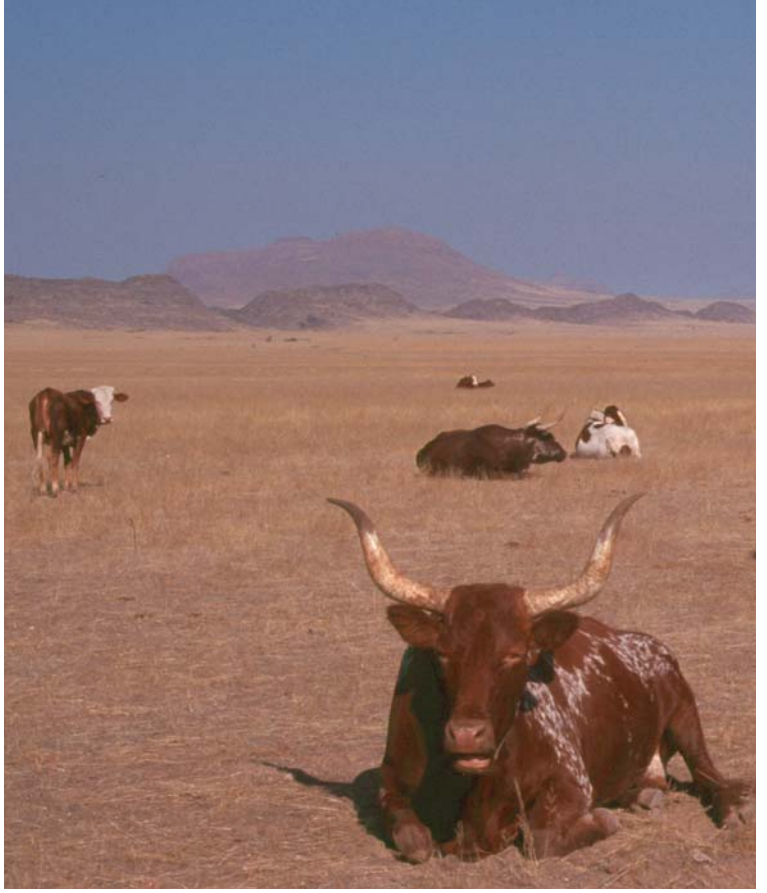
Vehaka Tjimune and Eddie Mukuahima of the NNFU, and Marcel Jouve of French Service for Co-operation and Cultural Affairs in Windhoek gave particular support. Celia Mendelsohn edited the text, while Helge Denker provided many of the photographs. The following people willingly offered information and ideas: Yanka Agenbach, Jon Barnes, Christof Brock, Caroline and Jan Buhmann, Marina Coetzee, Joerg Diekmann, Pierre du Plessis, Peter Erb, Jurgen Hoffmann, Oliver Horsthempke, Pieter Hugo, Paul Isaaks, Sam Kapiye, Johannes Kohlman, Piet Liebenberg, Anton Losper, Annemie Louwrens, Harold Marggraff, Dirk Prinsloo, Christophe Rigourd, Willie Schutz, Alfred Sikopo, Sophia Swiegers, Marietjie van Staden and Antoinette Venter.

Institutional support was kindly given by the Meat Board of Namibia, Meatco, Ministry of Agriculture, Water & Forestry, Ministry of Lands & Resettlement, Namibia Agriculture Union, Namibia Agronomy Board and Namibia Stud Breeders' Association.

PHOTOGRAPHS

Agra: 50 (top left); Agriforum: page 48, 49 (top and middle two, bottom right); Eddie Parker: back cover; Helge Denker: 4 (top two), 6, 7, 12 (top right), 22, 27 (both), 32 (top), 39, 46, 58 (top left), 64 (bottom), 70 (both), 74; NNFU: 12 (bottom right), 13, 73; Peter Reiner: 12 (top left); Peter Tarr: 18, 58 (bottom), 59, 64 (top left); Piers Vigne: 1, 4 (bottom left), 49 (bottom left), 51; RAISON: front cover, 2, 4 (bottom right), 12 (bottom left), 21, 23, 28, 30, 32 (bottom), 33, 40, 41, 50 (top right, bottom), 57, 58 (top right), 64 (top right), 65, 69, 71, 75.





FOREWORD

More Namibians depend – directly or indirectly – on farming than on any other economic activity or land use. However, rather little information on agriculture reaches the grassroots people in the country. As a result, most people are unaware of the variety of farming activities. Some people would say that farming is dominated by cattle ranching; others would consider that sheep farming in southern Namibia to be the main form of agriculture, for example. There is also little appreciation of the diversity of farming methods used in the northern communal areas, or that freehold farms are increasingly being used for a variety of economic purposes. One consequence of a lack of information on farming is that development programmes may be designed for particular farming systems but are then inappropriately targeted at others.

The Namibia National Farmers Union (NNFU) has commissioned the production of this book with several aims in mind. First is the need to describe and emphasize the variety of farming systems: their main features, strategies, practitioners, distribution, challenges and dynamics. A second and resulting goal is to better inform decision-makers, development specialists, agriculturalists, and resource managers about the diversity of farming practices. Third, is to improve awareness of environmental, historical and economic features that affect farming, and provide baseline information for other purposes, including research, management, coordination and planning. Fourth, this book will be useful for education and training, and will be of interest to the general Namibian public.

Finally, I hope that the book will help improve existing and future development projects. These include programmes that focus on rural and economic development, decentralization and natural resource management. Government ministries and agencies, trade unions, community and political leaders, and development agencies must be challenged to do a better job of managing our resources and agriculture. This has to be: for the sake of present Namibians and for those who follow in our footsteps.



Dr Nickey Iyambo
Minister of Agriculture, Water and Forestry





1

INTRODUCING NAMIBIAN FARMING SYSTEMS

Farming is mainly about the production of food, and other commodities such as medicines, cotton and fuel. It is an enterprise that developed only as recently as about 11,000 years ago when the first grasses and animals began to be domesticated as wheat, rice, cattle and sheep, for example. Our world has been very different ever since because of four fundamental changes caused by farming. First, the availability of surplus food enabled some members of society to do things other than hunting and gathering. By eating food produced by farmers, they no longer had to use all their time in pursuit of their own fare. From the ranks of the non-farmers emerged scholars, craftsmen, and a host of other innovators who took the first steps towards developments that we now take for granted: writing, metalwork, science and technology. Much of what characterizes modern civilization would not have developed without agriculture. Everyone would still be foraging for wild animals and plants.

A second major change was the formation of urban centres when non-farming members of the population congregated in large villages, towns and cities. This is now where the vast majority of people in the most developed societies live, all their food being delivered by a handful of farmers. For example, farmers make up less than 5% of all people in Western Europe and the United States of America.¹

Third, populations grew rapidly because people were nutritionally healthier and survived longer. The growing number

of consumers, in turn, led to farmers improving their skills to supply more food. Other plants and animals were domesticated, and the most productive of them were bred selectively. The process of specialization continues, and modern equipment and fertilizers now contribute to yields many times higher than those without these new inputs. Agriculture evolves, and it does so quickly.

Fourth, farming societies became powerful, using new technology to expand and dominate other societies. That power gave rise to differences in development between one society and another, between the haves and the have-nots. In short, the most powerful, numerous and innovative societies developed because of agriculture.²

Farming has thus forcefully shaped human history over the past 11,000 years. But what of Namibia, where agriculture has only been practiced during the last thousand years or so? How has farming changed, and what sections of Namibian society are hunter-gatherers, pastoralists, crop producers or the beneficiaries of surpluses produced by others? What kinds of agriculture may help us escape poverty? Can we produce surpluses that are simply edible, or can they be sold to generate money to buy food grown by other people, perhaps in other countries? And setting ourselves higher goals: how can Namibia secure enough surplus food to have time and energy for technological and economic development? These are big questions. This book focuses on more modest questions, such as: How do Namibians farm and what factors influence agriculture? But without addressing the smaller questions, it may take much longer to get at the bigger challenges.

Farming is often characterized by a mix of traditional and modern practices.

Farming systems in Namibia was also compiled to illustrate the variety of agriculture. Many of us assume that the kind of farming we see near our homes to be typical of agriculture throughout the country. Likewise, we may think that the farming systems of today are those of the past, and they will be the ones that feed us in future. This is not so. If this book has been written in 1950, it would have contained two chapters not included here, one on dairy farming and another on Karakul farming. A digression on this.

The recent history of Namibian agriculture can be sketched in three periods, starting with the phase of German administration from 1892 to 1915.³ Policy and practice focused on attracting and establishing German settlers who would be productive and develop the country into being as self-sufficient for its food needs as possible. Much effort was placed on the production of diverse foods, on experimentation, and support for farmers. Most farms produced enough vegetables, fruit, butter, milk and meat to meet their own needs. In short, farming practices aimed to produce a variety of products, as did the country as a whole. Butter was exported on a large scale; an average of over 4,000 tons was exported each year between 1935 and 1958.

South African influences from 1920 to 1990 changed the complexion of Namibian agriculture. The country became something of a fifth province, its agricultural policies often tailored to the needs of South Africa. Farmland was used for the resettlement of landless whites from South Africa. Diversity of production was replaced by monoculture. The vibrant dairy industry was replaced with beef production. Most importantly, Namibian farmers could not compete with cheaper imports from South Africa because of the huge growth of production by South African agriculture. Other than beef and mutton, Namibian had little to sell in South Africa, and access to markets elsewhere in the world was limited.

The third period is that of sovereign Namibia, from 1990 onwards. Much has been done to rekindle the self-sufficiency encouraged by the Germans, and to protect Namibian farmers and associated industries from competition. Namibian export produce has been promoted, particularly to markets beyond South Africa. There has been a resurgence in the production of a variety of crops (Chapter 7) and major efforts have been made to bring new commodities of indigenous plants and animals into production (Chapter 8).

Two messages should be clear from this short history. First, that farming systems can change rapidly, and second that they can change in response to internal policies and external forces.

WHAT IS A FARMING SYSTEM?

The Food and Agriculture Organization (FAO) suggests the following:

“A farming system is defined as a population of individual farms that have broadly similar resource bases, enterprise patterns, household livelihoods and constraints, and for which similar development strategies and interventions would be appropriate.”⁴

The definition seems applicable, both to conditions in Namibia and the aims of the book, which are to describe the diversity of farming and be able to target measures that improve agriculture. The idea of a system implies two conditions. First, that activities are inter-connected to form an enterprise of integrated components. The system becomes greater than the sum of its parts. A second condition is that people, farms and their practices fit clearly into distinct categories; in other words, into one farming system or another.

There are slight problems with both conditions. Namibia is both a developing and rather arid country, which creates a substantial degree of vitality and diversity. Most people living on farms have a variety of incomes and relatively few farmers or farms focus on one commodity. Only some incomes are derived from agriculture, and farmers frequently add new economic activities to their income base. All this makes it hard to see how different activities are integrated. It also makes it harder to fit people and farms into the pigeonholes required of the farming system approach.

But there are obvious differences in how people farm, and many activities are indeed integrated. The concept of systems also gives us useful labels. Four major farming systems have been recognized here (**Figure 1**). Other people might have distinguished more. However, differences between the four are likely to remain fairly constant, whereas differences between what might be called sub-systems are more fluid. Most of the so-called sub-systems are related to land tenure and the consequences of segregation and discrimination, particularly between communal and freehold farms (see page 13). Those old divides are fast being bridged or changed in complexion.

The systems on which the book focuses are more associated with commodities and ecological factors than the socio-economic criteria often used to distinguish farming systems. However, social and economic conditions are extremely variable, even within one local group of farmers, and circumstances change. The book is also aimed at more general readers than people who analyze farming systems in detail.

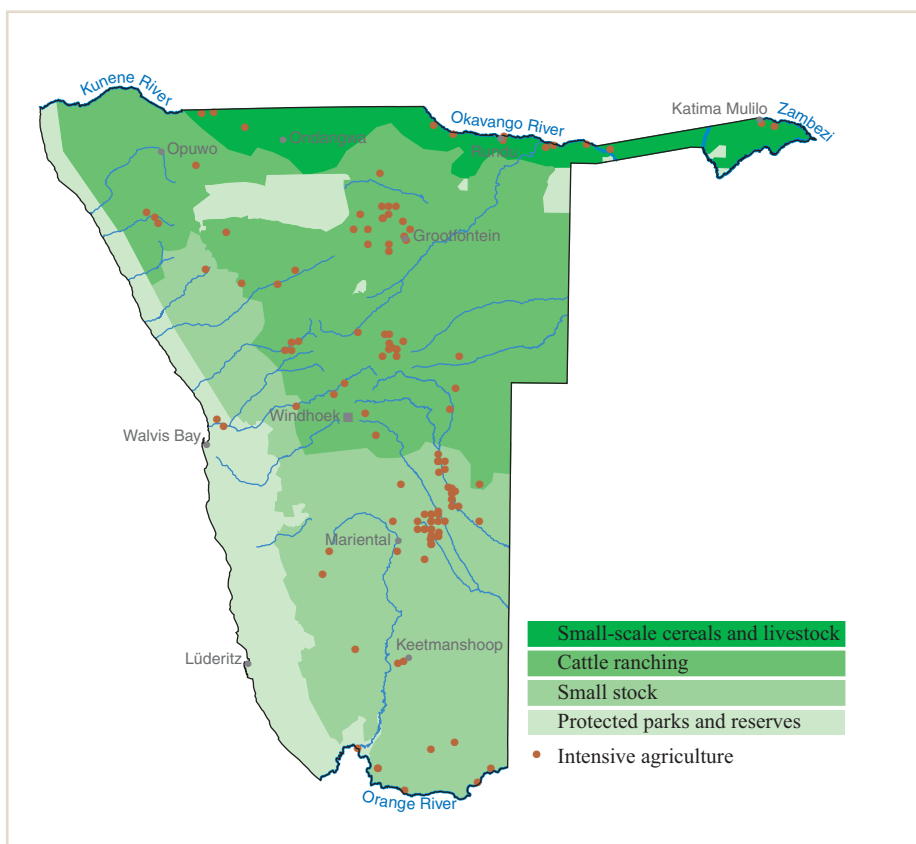


Figure 1. The distribution of farming systems in Namibia.

THE FOUR MAJOR FARMING SYSTEMS ARE AS FOLLOWS:

Farming system	Main commodities	Land area	Use of production
Small-scale cereals and livestock (Chapter 4)	Mahangu, sorghum, maize, goats and cattle	Small exclusive farms and open grazing in communal land in the northern regions	Domestic consumption supplementing incomes from non-farming activities
Cattle ranching (Chapter 5)	Cattle	Large freehold farms, exclusive farms in communal land, and in open grazing in northern Kunene	Beef, mainly for commercial sale to South Africa, Europe and Namibian consumers
Small stock (Chapter 6)	Sheep and goats	Large freehold farms and open grazing in communal land in the southern and western regions	Mutton and goats for commercial sale to South Africa and Namibian consumers
Intensive agriculture (Chapter 7)	Maize, wheat, grapes, ostriches, olives, dates, pigs, dairy products, vegetables and fruit	Small farms, mostly irrigated, throughout the country	Commercial sale to export markets and Namibian consumers
Natural resource production (Chapter 8)	Indigenous fauna and flora, and landscapes	Mainly in conservancies, game farms, community forests, parks and reserves.	Commercial sale to Namibian consumers and for export through tourism

The fifth is not farming, but mainly a production system. Its inclusion in a book on agriculture may be surprising. However, *Natural resource production* amounts to a way of obtaining economic benefits using methods that have many similarities to farming. Moreover, these new incomes often complement or exceed those from farming, and a good deal

of farmland is now being used for game and trophy hunting and tourism. The resources are also increasingly managed and harvested, and the first steps are being taken towards selection and a measure of domestication of some indigenous plants and animals.

ESTIMATES OF THE NUMBER OF PEOPLE, GOATS, SHEEP AND CATTLE, AND AREA IN EACH FARMING SYSTEM

Farming system	People	Goats	Sheep	Cattle	Area (hectares)
Small-scale cereals and livestock	960,000	950,000	44,000	600,000	5,500,000
Cattle ranching	106,000	800,000	300,000	1,400,000	31,500,000
Small stock	67,000	650,000	2,100,000	180,000	27,000,000
Intensive agriculture	40,000	-	-	5,000	40,000
Total	1,170,000	2,400,000	2,444,000	2,185,000	64,040,000

EXTENT OF AGRICULTURE IN NAMIBIA

Farming is a big enterprise in Namibia. More land is used for agriculture than any other activity; thus about 64 million hectares or 78% of the country is used for farming while the remaining 22% consists of national parks, game farms, urban areas, mineral concessions and areas too dry or remote to be used for agriculture. Almost 1.2 million people in about 206,000 households live on farmland, which is many more than in any other economic unit. Most of them also derive *some* income from agriculture, but only about 95,000 households obtain incomes *largely* from farming. They make up 27% of all households in the country.⁵

Despite the high proportions of farmland and households living on farms, agriculture contributes a comparatively low percentage of Namibia’s Gross Domestic Product (GDP). The whole agriculture sector, which includes processing, made up 5% of GDP in 2004, ranking sixth after government services; mining; finance, real estate and services, wholesale and retail trade; and manufacturing. The proportionately low contribution of farming is due to several factors: the country’s

fairly well diversified economy and high production by other sectors, such as government services and mining; the low agricultural capacity as a result of aridity and poor soils; small market demands within Namibia and elsewhere for Namibian products; the lack of market development in most communal areas; and the relatively low value added through local processing. For example, the processing of meat contributes only 0.5% to GDP, whereas fish processing provides 2.4%.

The value of exports has also dropped as a consequence of the stronger South African Rand, to which the N\$ is tied. Thus, the total value of Gross Agricultural Production in 2002 was N\$2,275 million, N\$2,054 million in 2003 and N\$1,878 million in 2004. Of the total production in 2004, 76% came from the freehold sector and 24% from communal areas. Meat products (59%), cereals (14%), grapes (5%) and dairy products (3%) contributed most to Gross Agricultural Production (**Figure 2**).

About 3.8 million Karakul were farmed in 1975. Numbers began to drop in the 1980s as a result of reduced demands and prices for pelts (see page 18). The decline continued over the past 15 years, dropping from about 1 million in 1990 to some 183,500 in 2005. The numbers of other livestock have not changed dramatically, although populations in the middle 1990s were some 10% lower than at the beginning and end of the decade. That slump was due to a succession of years of low rainfall, which culminated in a severe drought during the summer of 1995/1996. Over the past 15 years, cattle numbers have varied between about 2.1 and 2.5 million, sheep between 1.9 and 2.7 million, while the total population of goats has varied between 2.0 and 2.6 million (**Figure 3**).

Figure 4 provides perspectives on levels and changes in the production of beef, small stock (mutton and goats) and cereals. Small stock is the only product to have changed significantly during the past 15 years, having risen from about 1 million carcasses sold in the early 1990s to approximately 1.4 million in the last few years. The number of cattle sold each year has varied between about 200,000 and 400,000. The lowest

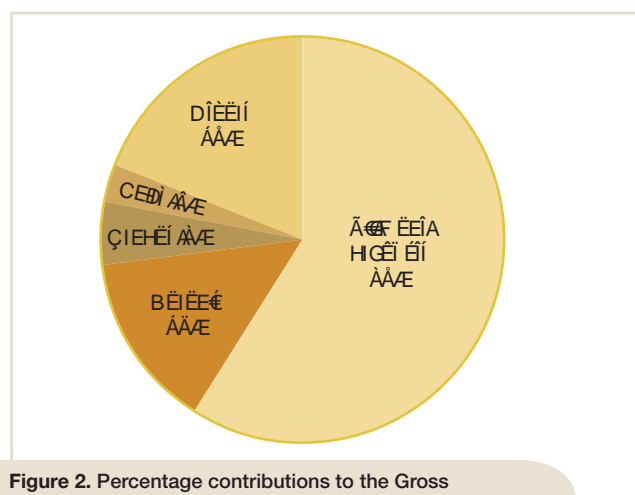


Figure 2. Percentage contributions to the Gross Agricultural Production of N\$1,878 million in 2004.⁶

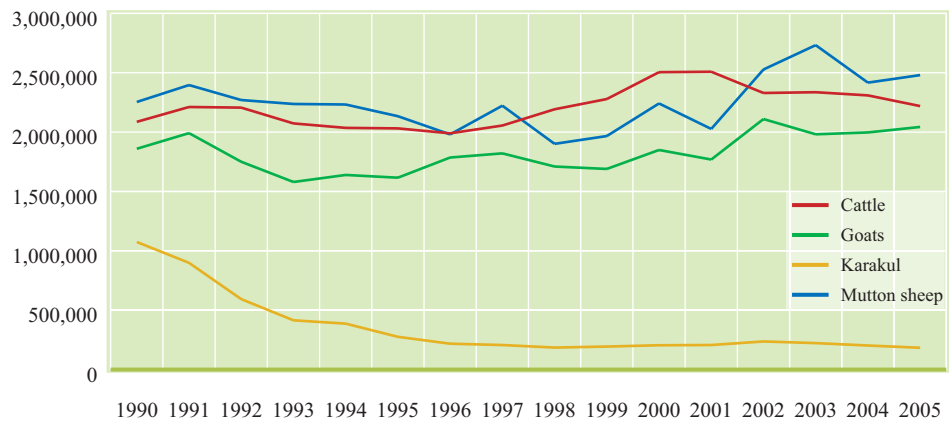


Figure 3. The total number of cattle, mutton sheep, goats and Karakul in Namibia since 1990. These are figures reported in the annual census of livestock. However, the census methods do not allow for the full inclusion of goats kept by the small-scale farmers in the northern communal areas.⁷ The number of goats thus excluded is substantial (see page 38), to the extent that there are likely to be 25% more goats than are shown in this graph.

production figures for both cattle and small stock were recorded in 1997 when farmers built up their stocks following losses during the preceding years of low rainfall. These figures are for so-called ‘formal sales’, the great majority of which take place south of the veterinary cordon fence (see page 20). The formal sales are of animals that are reported to, and recorded by the Meat Board as slaughtered or exported live to South Africa. Livestock sold to informal butcheries in the communal areas are thus not reported or included in these production figures. Cereals consist largely of mahangu (64% of total production)

and white maize (28%), with smaller volumes of wheat (6%) and yellow maize (3%), all harvested from cultivated land covering 305,000 hectares on average. The total annual production of these cereals has averaged 98,800 tons over the past 15 years, while an additional average of 174,000 tons has been imported each year to meet Namibia’s requirements for cereals. White maize has made up 45% of imports, wheat 28%, and yellow maize 26%. Small quantities of mahangu have also been imported in recent years, but these made up less than 1% of imported cereals.

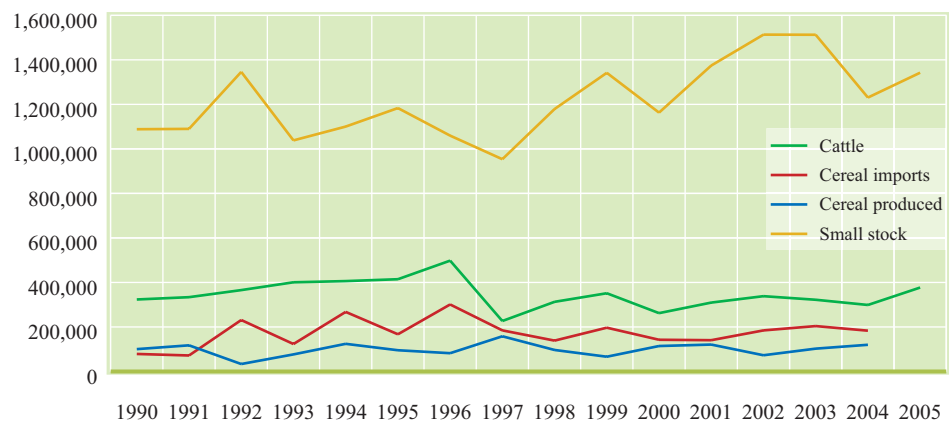


Figure 4 . Numbers of cattle and small stock (sheep and goats) produced for the formal market, and tons of cereals produced and imported over the past 15 years.





2

THE HUMAN ENVIRONMENT

While agricultural practices are moulded by constraints and opportunities offered by the physical and biological environment (see Chapter 3), farming systems are shaped most strongly by a range of factors associated with people. Farming is, after all, largely a human endeavour that depends on the know-how of people as farmers, and on the demands and tastes of consumers of agricultural products. These are immediate effects, but there are also broader historical, social and economic factors that have substantial impacts on farming. Some influences play stronger roles than others, depending on the farming practice, area of the country, prevailing government policies, market forces and international trade linkages. Some factors are direct; others are more subtle or indirect. And yet other influences are rooted in the past, and it is with aspects of history that the chapter begins.

RIGHTS AND RESPONSIBILITIES OVER LAND

Much of Namibian society consists of two halves: urban and rural, traditional and modern, and the poor and well-to-do. Another split that has profound historical origins is between communal and freehold tenure land. From the earliest days of colonial government and control, Namibia was divided into areas reserved for different indigenous ethnic groups and those allocated for the exclusive use of settlers; Germans at first, then South Africans and other whites. A variety of laws enforced

A good deal of Namibian farming depends on hard, time-consuming manual labour, much of which is supplied by women.

the ethnic separations over the years, and generally expanded areas reserved for freehold settlers.

Although all land in tribal areas was formally owned by the state, little was done to develop or to manage these so-called homelands. Education, health, water, roads, veterinary and other services were supplied to a minimal degree. Local control of the land was largely left to traditional leaders who allocated residential, cultivation, grazing and gathering rights to people. By independence in 1990, approximately 36% of Namibia consisted of what had been ethnic homelands and 43% was freehold land for commercial farmers. The remaining 21% was state land, mainly reserved for conservation or mining concessions.

The homelands were immediately designated as communal land at independence (**Figure 5**), with the specific purpose of ensuring that those areas – with their pastures, soils and other natural resources – would be available to those in need, particularly to poorer people unable to acquire farmland elsewhere. However, much of the freedom of access to land is now gone, as described below.

Use and ownership	Area (square kilometres)	Percent of Namibia
Freehold farming and tourism	356,533	43%
Communal open access farming	263,832	32%
State protected areas	137,212	17%
Communal exclusive farming	35,602	4%
Other government or parastatal	15,827	2%
Resettlement farms	7,731	1%
Urban areas	7,275	1%
Total	824,011	100%

Areas of the country allocated for freehold farms were first systematically surveyed before each farm and its title was sold to a farmer. By 1964, most of the farms had been established.¹ Owners of the freehold farms enjoyed considerable support from the government, both through direct assistance – such as subsidies, extension and veterinary services – and indirectly as a result of the development of transport, marketing and other services.

By contrast, people in the homelands faced several major constraints that influenced farming practices and systems before independence. Many of the difficulties now remain in the communal areas, the following being most limiting:

1. Given the high density of people historically forced to live in many of these areas, most farm enterprises are confined to pieces of land too small to make a decent living, or to ever make a profit that might be used to improve living standards. Most families therefore go to great lengths to obtain other, non-farming incomes, which causes a drain on farm labour (see page 34).
2. Areas outside the small enclosures of fields are known as the commons, offering resources to be used by everyone, but managed by no one!² This had led to a classic example of the ‘tragedy of the commons’, where wealthier farmers use and/or enclose increasing areas of the commons. This leaves poorer farmers with little, in effect gradually squeezed into greater reliance on the meagre resources inside their own tiny enclosures. The poor get poorer, while other people exploit natural resources maximally and destructively.
3. Farmers have no permanent or legal tenure over land allocated to them. As a consequence, they have little access to credit such as bank loans. In the absence of legal ownership, farmers also have limited incentive to develop their farms.

Exactly opposite conditions held, and continue to hold on freehold farms. The owners have secure tenure, and do not share or compete for natural resources outside their farms. They can borrow money to invest in their farms and their livestock can be exported as disease-free produce. Most importantly, their farms are large enough to generate sufficient produce to make most of their enterprises economically viable.

For most people, communal tenure has been constraining. However, for others it has offered opportunities, especially in

making possible the demarcation and establishment of about 1,000 large farms.³ Most are at least several thousand hectares in size, and all the farms have essentially been acquired for free. The process of establishing them began when several hundred farms were allocated to selected individuals during the 1960s, 1970s and 1980s. This was part of an effort by the pre-independence administration to encourage commercial farming in communal areas. The acquisition of new farms has since skyrocketed, especially over the past 10 years, when many large farms were acquired through allocations made by traditional leaders or councils, or by claiming land informally. These are sometimes called ‘illegally fenced’ farms in the north-central regions, but such connotations are not applied to similar farms in other communal areas. Cattle and goats are kept on most of the farms, some of which farmed actively and commercially, while others serve more as personal investments.

The focus here has been on how farming has been influenced by different tenure systems, which developed partly as a result of past discrimination. That bias had many other impacts on farmers and, again, many continue to influence farming practices. For example, most farmers in communal areas have had limited or no education, and little access to information and technology to benefit their enterprises. Their marketing opportunities remain constrained by poor infrastructure and access to markets. By contrast, the majority of freehold farmers are relatively well educated, often have access to efficient marketing channels, and benefit from services and infrastructure developed years ago. Perhaps the most valuable of these is the extensive network of gravel roads, which give farmers quick access to facilities in towns and allow their livestock to be trucked to markets within a short time. Communal farmers had, and still have, limited access to good transportation.

OFF-FARM INCOMES

Ideally farms should be independent, standing alone as economically viable enterprises free of external support or other means. However, most Namibian farms are not that fortunate, for example because they are too small, shortages of rain result in poor yields, the soils have few nutrients or market prices are low. These constraints are most severe in communal areas, where the majority of farmers and their dependants need to turn to off-farm sources for additional income and valuable safety nets. For instance, the average value of food produced by

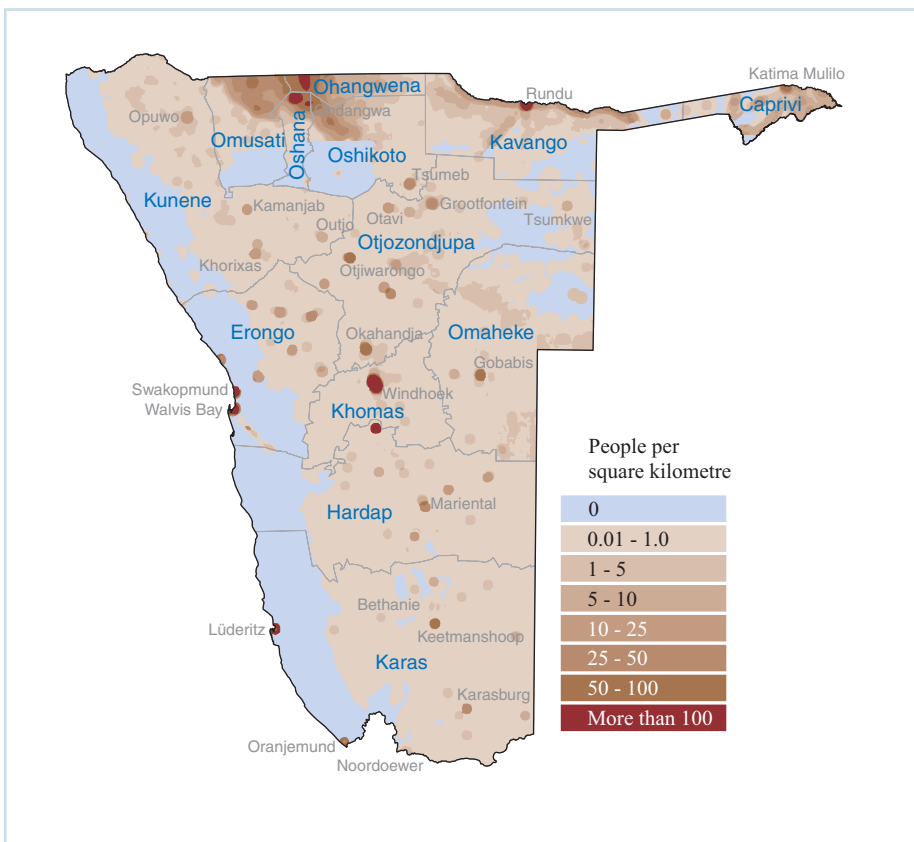
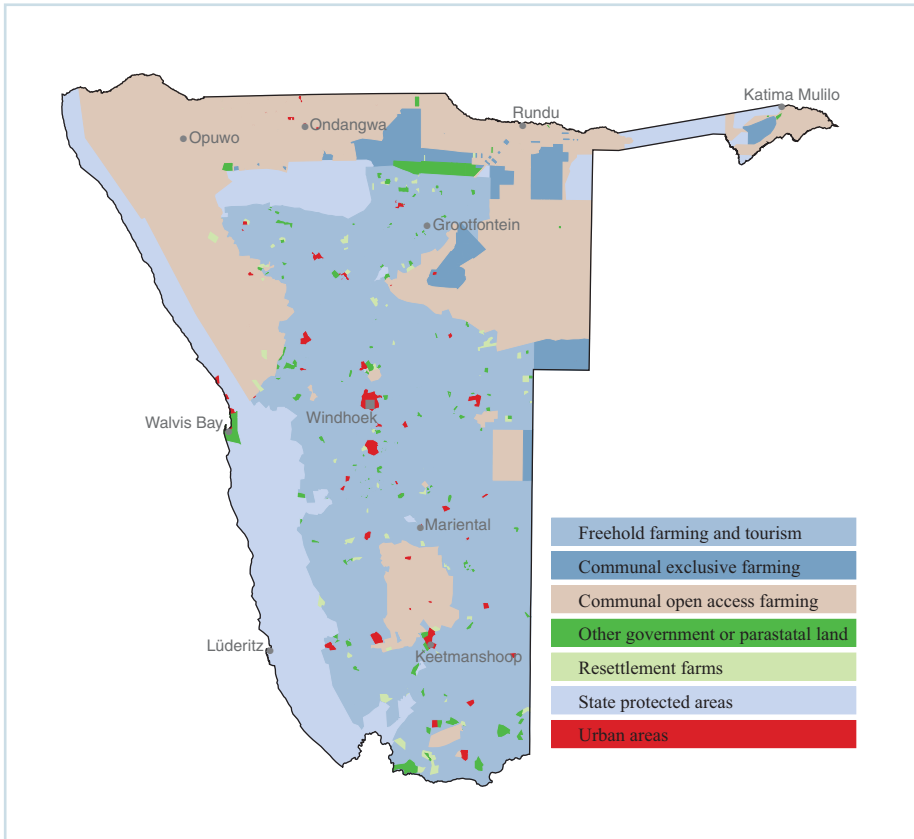


Figure 5. Namibia is a patchwork of different land tenure and usages (above).⁴ Administratively, the country is divided into 13 regions (below). Rural areas in the southern regions are much more sparsely populated than in the north.

most farmers in the *Small-scale cereals and livestock* farming system amounts to less than N\$5,000 per year. By comparison and on average, over three-quarters of all their cash and income in-kind is derived from sources unrelated to their farms (see page 39). Salaries, business earnings, pensions and remittances are the most important incomes. A family member who is a teacher might have an annual income of between N\$40,000 and N\$60,000, and social pensions (now at N\$4,440 per year) often exceed the value of produce on the smallest farms.

Many freehold farmers likewise depend on non-farming incomes to a greater or lesser extent, especially those now earned increasingly from tourism, trophy hunting and game meat sales on many farms (see Chapter 8). Depending on their level of development, these enterprises may add substantial amounts to a farm's annual income.⁵ For example, the value of each oryx, hartebeest, kudu, wildebeest and warthog as a trophy animal ranges between N\$1,000 and N\$4,000, figures that are comparable to the unit sale values of cattle sold as weaners and oxen.⁶

Major developments on farms belonging to wealthy owners of both freehold and communal farms are usually funded from external sources. Many of these people are colloquially known as 'weekend farmers' who use savings from other business enterprises to build up their herds or buy expensive stud bulls, for example (about one quarter of all freehold farms are owned by weekend farmers). Freehold farmers also enjoy access to loans. While these external loans might be repaid from farm profits over a number of years, the key point is that off-farm financing is usually required for any substantial development on a farm. Profits from farming are usually too low to save enough for capital improvements.

A consequence of all this is that the size of a farming enterprise is usually directly related to the size of its off-farm incomes, especially so in communal areas. The greater the total income of a household, the larger the household, the more labour is available, the bigger the fields or livestock holdings, and the more protected households are against losses caused by drought, pests and dips in market prices. More capital is also available for improvements or development.

With many farmers increasingly obtaining other incomes, it is tempting to argue that farming is becoming more of a subsidiary economic activity, perhaps as part of the social and economic movement of people away from farming and rural areas towards wages and business in urban areas. This may often be true, but it also suggests the potential for greater integration between farming and non-farming activities.

For example, farmers might become more involved in agribusiness, adding more local value to their primary products. And it points at opportunities for farms to be used in more diverse and profitable ways.

MARKETS

If this book had been written in 1975 it would have included coverage of another farming system. This would have been for the roughly 3.8 million Karakul sheep which supplied a lucrative export market with pelts. Production peaked with the sale of 4.3 million pelts in 1975 when Karakul pelts were in high demand by the fashion industry. But as demands and prices dropped, the number of Karakul sheep declined rapidly, reaching a low point of some 183,500 sheep in 2005.⁷ However, recent years have seen prices increase, and the industry looks as if it will begin to regain ground.

This is the most dramatic Namibian example of how markets can affect farming systems, but the prices of all commodities are seldom stable for long. For example, the spot price for a ton of white maize was N\$1,319 in February 2004, a year later in February 2005 it was down more than half to N\$535, and then up again to N\$981 in February 2006.⁸ Each farmer thus continually has to assess local and international markets that are complex and dynamic, responding by selling or – where possible – holding back stock as demands change, prices of competitive goods rise or fall, and transaction costs and exchange rates fluctuate. Livestock farmers have to assess the condition of their grazing: is it good enough to maintain the animals until prices rise, or are the pastures so poor that the animals will lose condition and market value? The production of maize under irrigation is now marginally profitable, one reason being that about 10% of production costs are paid for electricity to pump water (see page 61). Any profits may disappear if electricity costs escalate substantially, as is widely predicted.

One lesson to be learnt from the Karakul industry's misfortunes is that the sale values of fashionable products are less secure than those of staple foods. As human populations grow, so do demands for basic meats and cereals. For instance, the global consumption of meat rose steadily from about 135 million tons in 1960 to about 230 million tones in 2000.⁹ Fashions are fickle; staples are stable!

Without doubt, however, the greatest need is for markets to be available or accessible in the first place. The most severe marketing difficulties faced by Namibian farmers are the following:

1. Most farms are located far from markets within Namibia or export destinations in South Africa and elsewhere. The effect of this is that the prices of farm produce have to be high to cover the transport costs of both inputs and outputs over these distances. Similarly, perishable goods can only be moved if costly cooling or other special storage facilities are available. Of course, consumers are reluctant to pay such high prices and competitive farmers closer to the market can offer their produce more cheaply.
2. The Namibian market is tiny because of the country's low population of about 2.1 million people in 2006. The only possibly lucrative markets are in urban areas, most of which are small. Windhoek was the only city with more than 200,000 residents in the year 2000. Only Rundu, Oshakati and Walvis Bay had more than 40,000 people, while all other urban areas had fewer than 30,000 residents.¹⁰ By contrast, most major cities elsewhere in southern Africa have more customers than the whole of Namibia.
3. The majority of Namibians are relatively poor. The local purchasing power of the average consumer of farm products is thus limited, and it is mainly aimed at staple foods.
4. Many markets are closed to Namibian farmers because of import tariffs or restrictions imposed by other countries, subsidies that prevent competitive trading, or limits on exports imposed by the Namibian government. These are discussed in the following section, but the most severe barrier within the country is the veterinary cordon fence spanning the breadth of Namibia (see Figure 7 on page 20). While livestock products south of the fence may be exported because they come from a zone free of contagious diseases, the products of about 1 million cattle and 1.4 million goats north of the fence may only be exported under strict conditions. These are so cumbersome and costly that very little produce leaves the northern zone. The risk of foot-and-mouth disease and lung sickness spreading to other countries is the major reason for these conditions. The Directorate of Veterinary Services is now exploring ways of moving the cordon fence northwards to include more northern farmers in the 'disease-free' zone.
5. Prior to independence, relatively little effort was made to develop markets for Namibian produce. There was also a particular lack of market-related investment in the communal areas. Indeed, it can be said that policies were

often driven by motives to integrate Namibia's economy into that of South Africa. A major challenge has thus been to disentangle the agricultural economy from that of South Africa.

6. While farming in Namibia is not easy, it is also expensive and farmers demand high prices for their goods. Unfortunately for Namibians, many other farmers in other countries work under easier conditions and have their produce subsidized by their governments. Imported food is thus often cheaper, of better quality, and can be delivered more reliably than that grown locally. As a result, international competition can be a major constraint to the marketing of local agricultural produce.

INTERNATIONAL TRADE

Imports serve to provide agricultural products that the country cannot produce, while exports earn revenue from sales to foreign markets. Most cross-border sales are organised by private traders, but all governments exercise controls and enter into agreements to protect or enhance the value of farm produce in three principal ways:

- By promoting exports, and therefore local production.
- Through restrictions on imports to protect and support local production against foreign competition.
- By limiting the export of raw products to encourage local processing.

Exports are mainly promoted through trade agreements that aim to give exporters free, cheaper or preferential access to markets in countries with which Namibia has links. Namibia is party to many southern African and international trade agreements and communities: the Southern African Development Community (SADC) Free Trade Agreement, the Common Market for Eastern and Southern Africa (COMESA), the European Union - African, Caribbean and Pacific countries (or Cotonou) agreement, the Common Monetary Area and the World Trade Organisation. As a member of the Southern African Customs Union (SACU), Namibia also benefits from participation in the SACU/Mercosur agreement with Argentina, Paraguay, Uruguay and Brazil, the SACU/European Free Trade Association (EFTA) agreements, and negotiations to establish free or preferential trade agreements with China, the USA and India. Namibia has a free trade agreement with Zimbabwe and is negotiating a preferential trade agreement with Angola.



Many jobs are created by secondary agricultural industries that process and package foodstuffs, such as these dates.

Although free trade agreements are designed to encourage the free flow of goods and services, the interests of each member country have to be safeguarded. This is why it normally takes so long to reach trade agreements. As a small country, Namibia has to protect itself from dominance by economically powerful trading parties who often are in stronger positions to promote their interests. This is the case with South Africa, by far Namibia's biggest trading partner. Namibian exports of agricultural goods to South Africa amounted in value to about N\$2,379 million in 2005, while Namibia imported agricultural products worth N\$2,222 million from South Africa.¹¹ Beef, mutton and goats are the main food exports to South Africa, whereas Namibia imports most of its high value, processed agricultural products, sugar and staple foods in the form of maize, wheat and rice. The other major market destination for Namibian farm produce is the European Union, the main exports being beef, mutton, table grapes and dates. The current value of food exports to the European Union amounts to about N\$1.1 billion annually.

The second way of supporting local interests is to impose import tariffs or quotas.¹² Imported goods are then more

expensive or at least competitive with prices demanded by Namibian producers, thus protecting local investments and encouraging production. For example, as a partial result of tariffs placed on imports of horticultural foods in 2003, Namibian farmers now produce more than 20% of the fruit and vegetables consumed in Namibia. Previously, the figure was less than 7%, the remaining 93% being imported.

The Namibian government has also limited the import of maize and wheat flour to sustain farming and milling industries in Namibia. For similar reasons, there is an intention to restrict mahangu imports and to fix producer prices at levels that are higher than international prices. These kinds of controls may seem justified in promoting Namibian produce. But there is an equal need to encourage Namibian farmers to be competitive and efficient, and not to depend on protective measures. Since cheaper products can often be imported, Namibian consumers may pay unnecessarily high prices, especially if local processors monopolize the market.

Thirdly, the government may limit exports of raw products with the aim of promoting local processing, thus creating Namibian industries, jobs, and adding greater value to the original produce. For example, current regulations dictate that only 15% of all mutton may be exported live to South Africa. The remaining 85% must be slaughtered and processed in

Namibia before being sold elsewhere as packaged or processed meat. Another benefit is that skins of these animals become available for local tanning and sale.

GOVERNMENT SUPPORT

Governments throughout the world often provide considerable support to farming. Namibia is no exception. As described previously, the greatest assistance was given to the more formal, commercial or freehold sector before independence. Since then much support has shifted to farmers in communal areas where the stated aim of government is to reduce poverty. Other important policy goals pursued in the past 16 years are to promote rural development, and to boost food security, which aims to ensure that each household can meet its nutritional requirements. It is the Ministry of Agriculture, Water & Forestry that provides most direct support to farmers, while other assistance comes from the Ministry of Trade & Industries and several statutory organisations: the Meat Board, Agronomy Board, Karakul Board, Meatco and the Agricultural Bank of Namibia (known as Agribank). Finally, the government is redistributing freehold farms to previously disadvantaged Namibians, this policy being implemented by the Ministry of Lands & Resettlement.

Funding and subsidies

In 2004, Namibian farmers owed an estimated N\$1.4 billion that had been loaned by a variety of banks. Approximately 35% had been loaned by commercial banks and the remaining 65% by Agribank. The government established this parastatal to provide affordable loans through several financing systems. Figures in the table below reflect Agribank lending as it stood in 2004:¹³

Type of lending	Number of clients	Amount owed
Long term loans to freehold farmers, largely to buy farms, livestock and capital equipment and make fixed improvements	1,193	N\$209.8 million
Medium term loans to freehold farmers to buy livestock, implements and vehicles	1,116	N\$363.3 million
Short-term loans for crop production	160	N\$49.5 million
Affirmative Action Loan Scheme and North-South Incentive Scheme for previously disadvantaged Namibians to buy freehold farms and livestock	570	N\$488.6 million
Loans to build housing for farm workers	180	N\$13.9 million
National Agricultural Credit Programme for smallholder farmers on communal land to pay for fencing, irrigation, equipment and draught animals	6,866	N\$124.2 million
Loans for the purchase of tractors providing ploughing services for small-scale farmers	235	N\$30.5 million

A variety of other services are subsidised. Livestock are vaccinated in the northern communal areas, and water is supplied to farm animals through pipelines and boreholes, pumps and troughs. However, communities are now starting to manage and pay for water.

As a parastatal, Meatco (the Meat Corporation of Namibia) is run entirely on a commercial basis. Its services in the northern areas operate at significant losses, however. The losses amount to a cross-subsidy because they are recovered from levies on meat bought from farmers to the south. Although government-owned irrigation schemes are now run as commercial operations on a contract basis, the government paid the considerable development costs that went into them. Similarly, the government will pay a major proportion of the development costs of the new Green Scheme irrigation farms. The Ministry of Lands & Resettlement provides resettled farms with considerable subsidy assistance, mainly in the form of implements and housing.

Information: Advisory services, research and training

The Ministry of Agriculture, Water & Forestry delivers a range of advisory and training services to farmers through its extension offices, agricultural development centres and veterinary extension centres.

More formal training for degree and diploma purposes is provided at the University of Namibia, the Ogongo and Neudamm Agricultural Colleges and at five training centres across the country (**Figure 6**). Agricultural research is conducted at 15 research farms stations and by staff at the Windhoek head office.

Figure 6. Services and infrastructure that support agronomy, research and formal training.

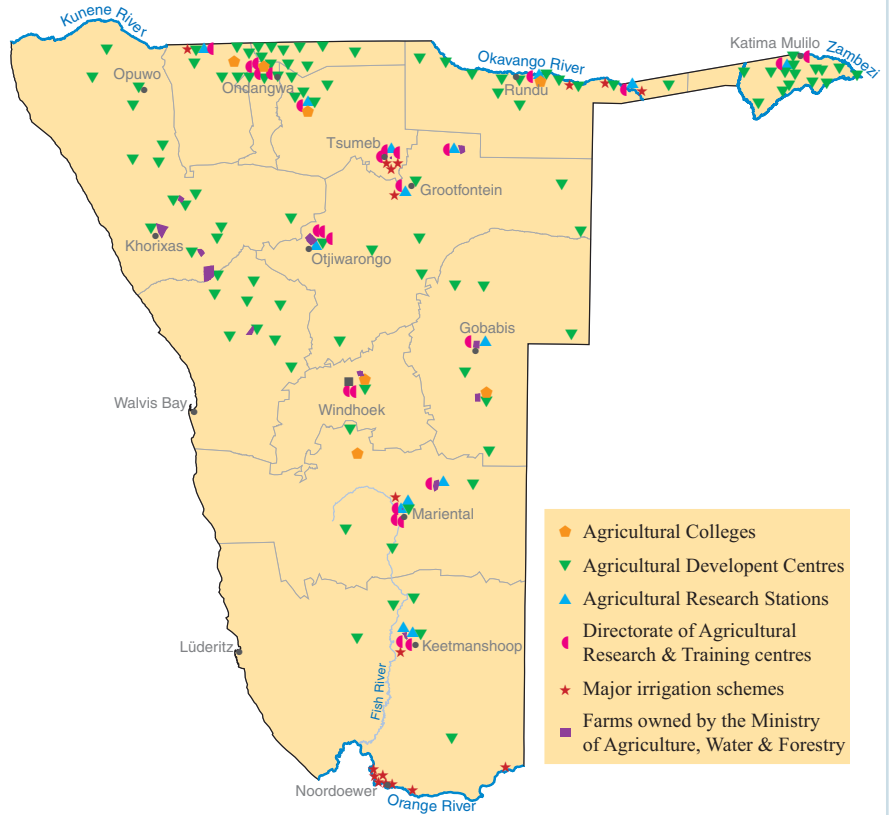
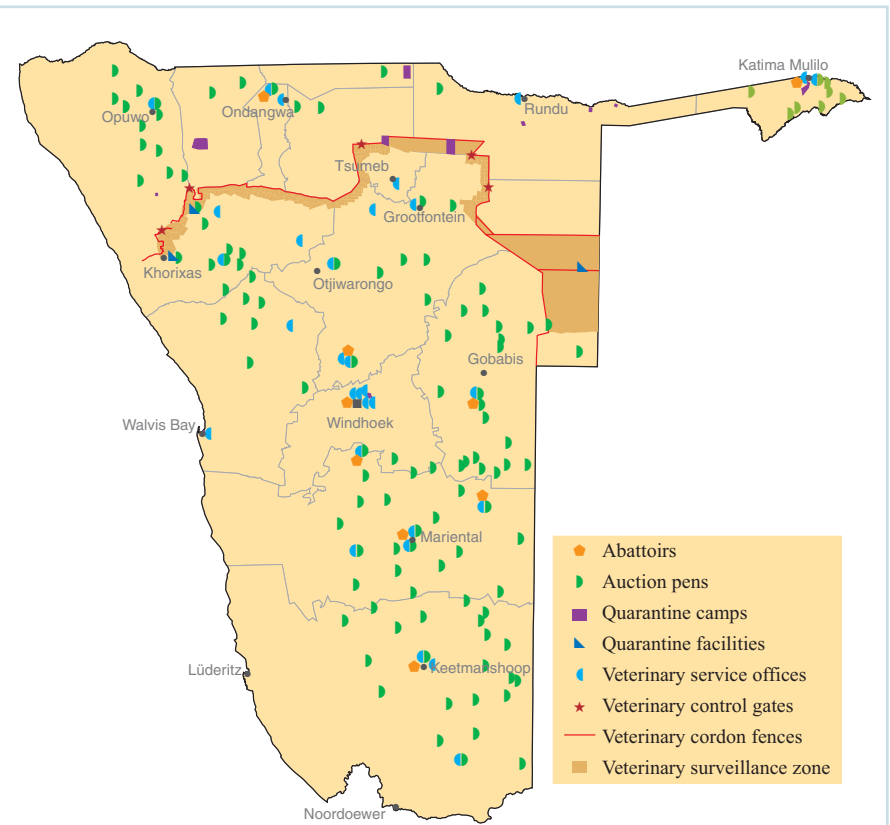


Figure 7. Infrastructure and service points for livestock farming. The Directorate of Veterinary Services concentrates on the control of scheduled diseases that pose a threat to the commercial sector and its export markets. Scheduled diseases include foot-and-mouth disease, lung sickness (contagious bovine pleuropneumonia), anthrax, brucellosis and trypanosomiasis in cattle, sheep scab in sheep, African swine fever in pigs, and Newcastle disease in poultry and ostriches. The veterinary cordon fence separates animals to the south from potential infections of lung sickness and foot-and-mouth disease in the north. No livestock or meat is allowed to cross to the south of the fence unless it has been through quarantine procedures. Regular inspections are done in the surveillance zone to check for diseases.



Marketing and processing

Most government support for marketing and the processing of farm products is provided through its parastatals. The Agronomy Board was established in 1985, and currently focuses largely on horticultural crops, white maize and wheat, promoting their production and processing, and controlling imports. It has also begun promoting mahangu production and milling following the considerable attention given these aspects in recent years by the Ministry of Agriculture, Water & Forestry. Trade in livestock and meat products is mainly promoted by the Meat Board, which was formed in 1935. The Karakul sheep industry is supported in a similar way by the Karakul Board, established by the government in 1982.

Meatco's main role is the processing of meat products, which is done at abattoirs in Katima Mulilo, Oshakati, Okahandja and Windhoek, and at a tannery north of Windhoek. This is a government owned company that should function profitably, but also help develop the livestock industry, particularly in communal areas. Although it has traditionally concentrated on slaughtering and selling beef, Meatco now has 50% local ownership of a South African company – Just Lamb – which slaughters small stock at the Meatco abattoir in Namibia.

Namibia's total slaughtering capacity for beef at the Meatco and other smaller abattoirs amounts to 210,000 animals per year. The average number of cattle slaughtered between 2000 and 2004 was 179,376, representing 85.6% of capacity. The slaughtering capacity for small stock is 1,216,110 animals per year, while the average number slaughtered each year was 473,366, making up 35% of capacity. The biggest small stock abattoirs are those of Farmers Meat Market in Mariental, Namibia National Meat Producers in Aranos, the Ostrich Products Namibia in Keetmanshoop, and Just Lamb/Meatco in Windhoek.

NON-GOVERNMENT SUPPORT

Farmers themselves have established various unions, associations, co-operatives and forums to support their interests. The two farmers unions – the Namibia National Farmers' Union (NNFU) and the Namibia Agriculture Union (NAU) – respectively, represent the interests of communal and freehold farmers. They were also established along obvious colour lines, mainly as a result of Namibia's political circumstances. However, the division between communal and freehold farmers is increasingly blurred and the NNFU now also plays a role in representing large-scale or freehold farmers. Most people hope that the two unions focus more on development, processing

and marketing issues than on their political bases. Many local farmers' associations and other groupings have been formed since independence in several communal and freehold areas. Some of these have been effective while others have stopped functioning. Several multi-purpose co-operatives provide a range of services to their members including the commercial supply of equipment, materials, seed, fodder and fertilizers. Agra is the biggest of the co-operatives.

The Namibia Stud Breeders' Association provides registration, performance and evaluation services to almost all cattle, horse, sheep and goat breeders. A total of 364 registered breeders currently breed about 47,000 registered animals. A Karakul Producers' Association represents the interests of Karakul farmers. Trading is the focus of the Agricultural Trade Forum of Namibia, an umbrella organisation that speaks for the private sector on matters of external trade. More broadly, farming interests are of importance to the Namibia Chamber of Commerce & Industry (which mainly represents the manufacturing, industrial and trade sector), the National Trade Forum of Namibia (which fosters public - private partnership in matters concerned with trade), and the Namibian Manufacturers Association (a private sector grouping which represents certain food processing and packaging companies).



The veterinary control point at Oshivelo, one of five gates used to limit the spread of diseases which would jeopardize the export of Namibian meat.





3

THE NATURAL ENVIRONMENT

Any farming system is broadly a product of interaction between farmers and their environment, which comprises their social and economic circumstances (Chapter 2) and the natural world. The system is therefore a consequence of how farmers use resources and opportunities, and how environmental factors limit what can be produced. And so, what kind of environment is available to Namibian farmers, and how does it mould their practices? How do climatic or geological features make one farm fertile and productive, but another farm less so? This chapter explores answers to these questions, especially by considering the influences of rainfall, soil and natural vegetation.

CLIMATE

Crops and natural grasses and shrubs require sunlight, heat and water, all of which are products of the weather. Sunlight and heat or temperature (actually thermal energy) is needed for photosynthesis and therefore growth. However, plants grow best when temperatures fall within specific limits. Very high temperatures lead to increased rates of water loss through evaporation and transpiration (the loss of water from a plant's leaves). Growth then slows, followed by wilting and possible death of the plant. At the opposite extreme, growth rates drop

the colder it becomes. Many plant species are also sensitive to frost, growing only in places free of frost. Most tropical fruit trees fall in this category.

The role and importance of rainfall dominates all other climatic factors in Namibia, however. Amounts of rain increase in a rather smooth gradient from the Namib Desert in the west to the wettest and most tropical areas in the north-east (**Figure 8**). Annual rainfall in eastern Caprivi averages about 650 millimetres, roughly six times higher than the 100 millimetre isohyet which marks the approximate western limit of all rain-fed farming activity. Namibian farming is thus practised in areas that receive very different rainfall. This is one important reason for the diversity of farming systems in the country. Most farming is limited to sheep and goats between the 100 and 350 millimetre isohyets, while farming activities focus more on cattle and crops in wetter areas further north and east.

The predominant effect of rainfall on farming is simple: rain determines how much water is available for plants to grow. For example, each millimetre of rain results in the production of between 1.2 and 2.3 kilograms of grass per hectare, as measured on several farms in Namibia.¹ Differences between the lowest and highest figures were mainly due to differences in soil fertility and degrees of bush density (see below). But the main point is that more rain leads to more forage, which allows higher stocking rates, faster livestock growth and production, and higher yields of meat for cattle, sheep or goat farmers. Similar benefits accrue to crop growers: more rain falling at the correct time means better plant growth, higher rates of pollination, greater seed production, and increased yields.

Rare flows down the Hoarusib River recharge reserves of water that nurture riparian trees. Farming would be much harder in the absence of the nutritious pods and leaves provided as browse by the riverine trees.

However, too much rain can cause poor growth or death because of water logging and increased fungal attacks. The nutrient value of grasses may also decline. For example, 200 millimetres could be too much for those grass species adapted to an average of 100 millimetres, while 900 millimetres might be excessive in Caprivi.

Evaporation has a counteracting effect on water availability, since the greatest volumes of water generally evaporate in areas of least rainfall where the air is driest. By contrast, evaporation rates are lowest in the most humid, tropical climates. Subtracting evaporation (as loss) from rainfall (as gain) gives us a measure of water deficit. The distribution of water deficit is broadly a mirror image of rainfall, but the highest water deficits are to be found in the south-east of Namibia, rather than the very arid Namib (**Figure 9**). The lower deficits along the coastal belt are due to relatively moist maritime air coming on shore.

Variation in rainfall and drought

The availability of water for plant growth thus varies geographically. Likewise, there is much variation from year to year, with the result that crop, pasture and tree growth is stunted in poor years, but luxuriant in years with bumper falls. What makes life difficult for farmers is that Namibian rainfall is extremely variable and unpredictable from year to year, and from month to month. Making decisions as to when to plant rain-fed crops is thus hard, since the timing and frequency of rain is often more critical than the total amount of rain in a season. Likewise, livestock farmers have to assess how many animals their pastures can support. A succession of wet years may lead farmers to build up their herds and flocks, which they will be reluctant to reduce when conditions become more arid. Indeed, it is often said that the degradation of farms is due to continued over-stocking after farmers had optimistically increased their livestock during good years. The greatest variation in year-to-year rainfall is in the southern and western third of the country, and so farming practices that depend on regular rainfall are most precarious in these areas.

An extreme shortage of rain may be called a drought. This is a term and concept loaded with implications because droughts invoke fears of famine, and possible needs for emergency food aid, subsidies to farmers and emergency grazing, for example. But what is a drought, and how should one agree on appropriate responses to drought? The National Drought Policy and Strategy defines drought conditions to be 'so intense or protracted that they are beyond what can be reasonably dealt with in terms of normal risk management practices, and are

expected to occur once in 14 years.² An analysis of rainfall records collected over many years can be used to determine the cut-off between 'normal rainfall' in 13 of the 14 years, and lower falls expected more rarely. **Figure 10** shows how these drought limits vary across the country. For example, years in which less than 300 millimetres falls in Caprivi would be considered as drought years, as would those with less than 150 millimetres around Windhoek.

Such limits may be helpful in defining a drought in one year, but hardships may be compounded when several dry years follow each other. The effects of low rainfall are then cumulative. This happened in the early 1990s, and livestock numbers dropped as a result (see **Figure 3**, page 11). Responding to the problem of drought is also complex, and requires that the nature of farming systems be taken into account. Poor rainfall may devastate one farming activity but not another. For instance, cattle require more grass than sheep, and so the same low rainfall may amount to a drought for a beef rancher but not for a neighbouring mutton producer. Should everyone get drought relief, or only those whose farming practices are appropriate to the local environment?

SOILS

It is unfortunate that the Namibian climate has generally been arid for millions of years. If conditions had been wetter, our soils would be better developed and would contain more nutrients. Rocks weather more rapidly in wet climates, leading to higher rates of soil formation and the release of more nutrients from rocks. Additional organic matter is available because of more luxuriant plant growth, higher rates of decomposition, and because fewer dead leaves and twigs are blown away or burnt. The absence of good soils has an extremely constraining influence on farming in Namibia, perhaps just as limiting as the low and variable rainfall. This is true both for crops and for the grasses and woody plants on which farm animals graze and browse.

The growth of crops and indigenous plants mainly depends on four qualities of soil: its moisture, depth, structure and nutrient content. These characteristics also have a major influence on what species are present in any one place. In arid Namibia, water-holding capacity is very important, the best soils being able to retain a good deal of moisture without becoming waterlogged. Many different nutrients are required for plant growth, especially appropriate amounts of nitrogen, phosphorus, potassium and, to a lesser extent, calcium, magnesium and sodium. Soil quality is also boosted by the

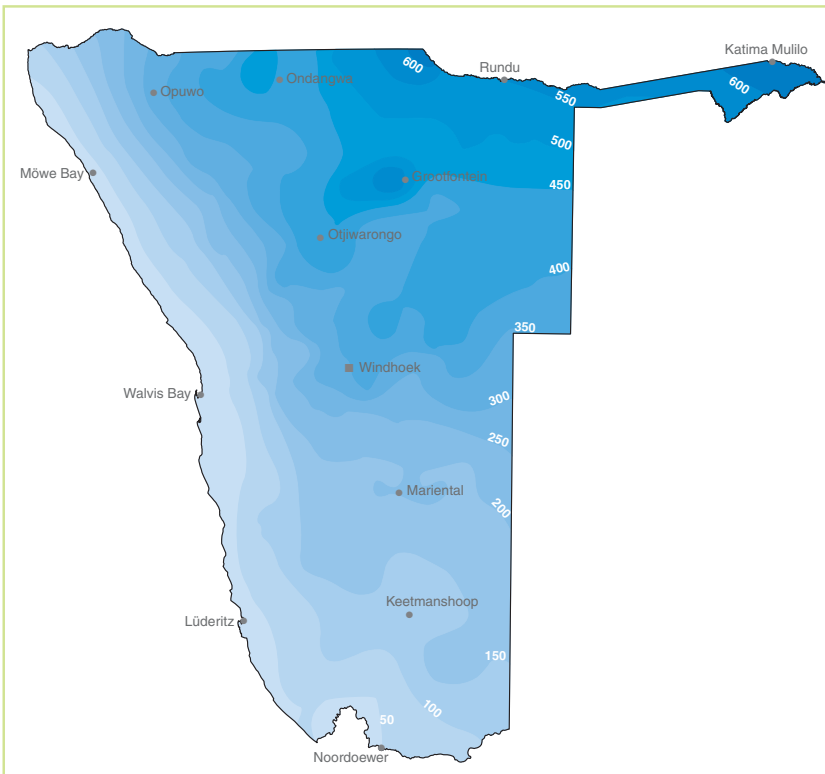


Figure 8. Average annual rainfall varies from about 650 millimetres in Caprivi to less than 50 millimetres along the Atlantic coast. Somewhat higher falls occur around Tsumeb, Grootfontein and Otavi as a result of the highlands in that area.³

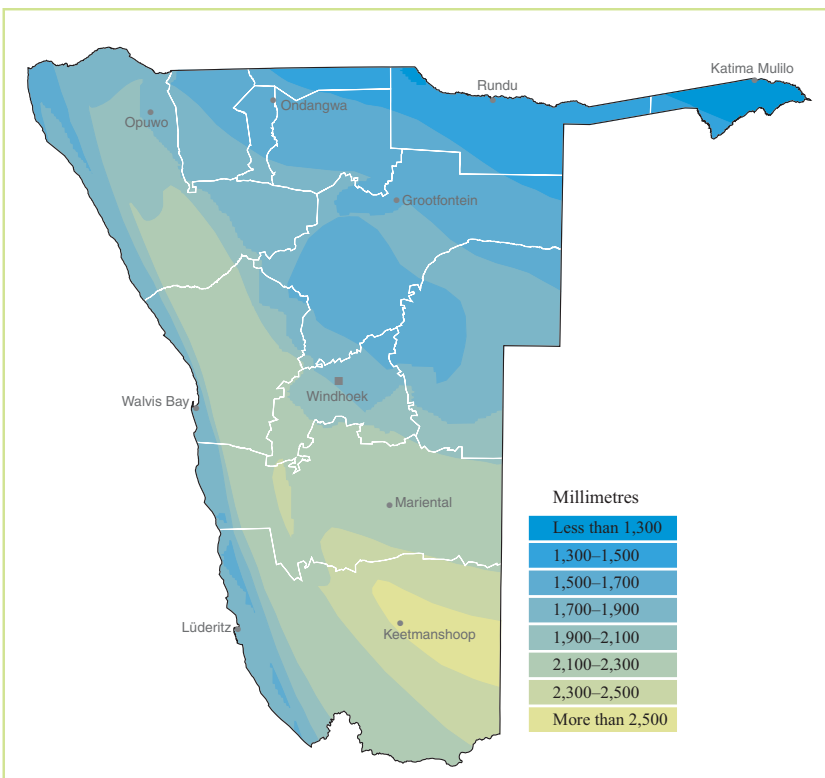


Figure 9. The greatest shortages of water (as reflected by rainfall minus evaporation) are in the south-east of Namibia. By contrast, water deficits are lowest in Caprivi because of high rainfall and low rates of evaporation.⁴

Figure 10. One measure of drought. The map shows rainfalls which occur infrequently enough that drought conditions might be proclaimed if these or lower annual totals are received.⁵

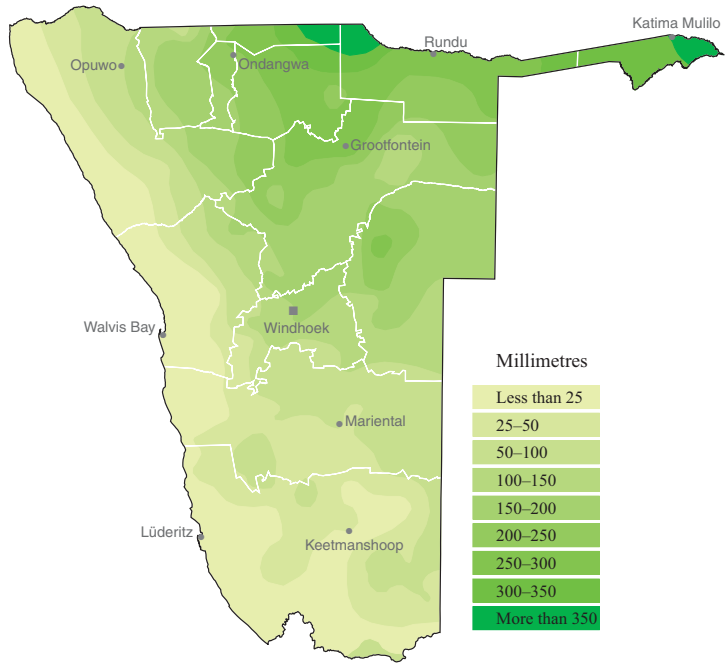
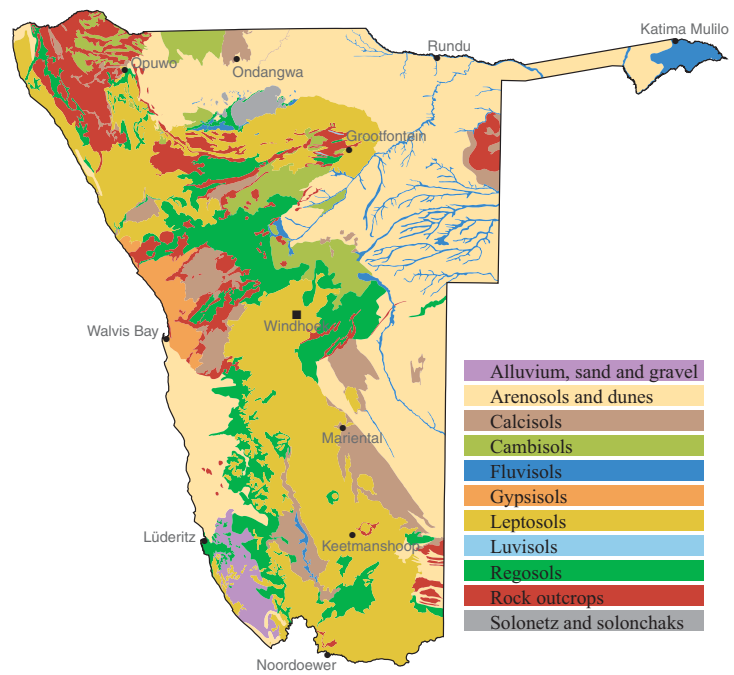
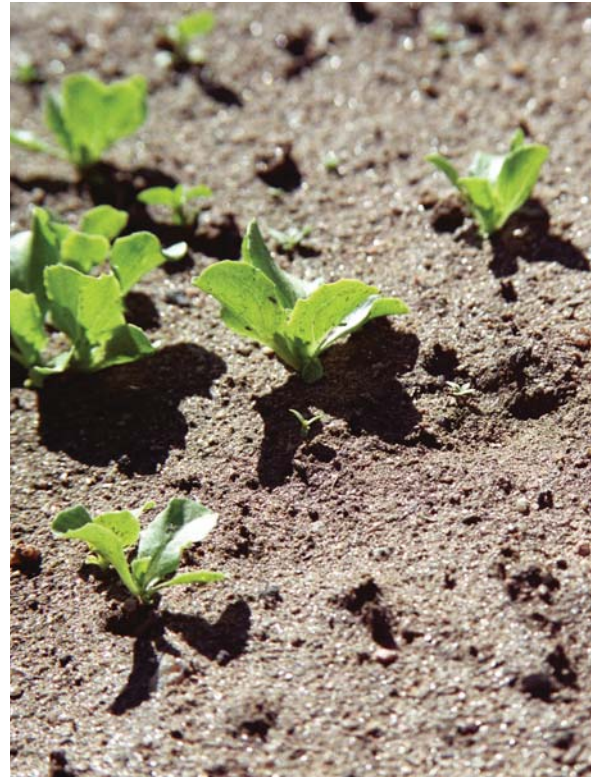


Figure 11. The major types of soils and their distribution in Namibia.⁶





presence of communities of animals (or soil fauna) that break down organic material into the nutrients that roots can absorb.

Based on soils, the country can be divided into two zones: soils derived from rocky areas in the south, central and much of the western regions; and the Kalahari Sands that dominate the eastern and northern regions (**Figure 11**). Sedimentary sands and clays in the Cuvelai Drainage and the sands of the Namib are part of the Kalahari Sand complex.

Most rocky areas are covered by shallow layers of soil formed from the erosion of the underlying rocks. Rainwater is usually lost rapidly as a result of surface flow, seepage into cracks between the base rocks, or evaporation. Plant growth in rocky areas is thus normally sparse, and carrying capacities for livestock and wildlife are consequently low. The predominant soils in these rocky areas are known as leptosols and regosols. Although in most places there is hardly any soil to speak of, some deeper pockets accumulate in crevices and as extensive sediments in valleys. Certain of these valleys offer good soils for crop production, the most valuable being the deep luvisols in valleys of the Tsumeb-Otavi-Grootfontein 'Maize Triangle' (see page 62).

Landscapes across much of Caprivi, Kavango, Ohangwena, Oshikoto, Omaheke and eastern Hardap are flat because they

One consequence of an arid environment is that most Namibian soils contain few nutrients. Soils in many places also retain little water, with the result that seedlings often only survive if they are irrigated or get frequent falls of rain.

are covered in Kalahari Sands deposited here as wind-blown sand dunes during drier periods. The sands are called arenosols, and they are extremely poor in nutrients. Water drains through the sandy texture easily, so little moisture is held in the surface layers where most plants have their roots. There is also little surface run-off or erosion of these porous soils. Sand, or more correctly grains of quartz, makes up the bulk of the soil, which contains limited humus or organic matter, and is intrinsically low in phosphorous. Plant growth is constrained not only by shortages of phosphorous but also by the fact that low levels of phosphorous result in deficiencies of nitrogen.

In and amongst the vast covering of Kalahari Sands are zones of other sedimentary soils, most of which were partly formed from water-borne deposits carried down by rivers long ago. From an agricultural point of view, the best of these are

the cambisols in the Cuvelai Drainage and the fluvisols that line the watercourses traversing the Kalahari Sands. Cambisols have good water-retention capacities, do not become waterlogged and have relatively high fertility. This is one important reason why so many people settled and continue to live around the *oshanas* in north-central Namibia (see Figure 5, page 15). However, soil qualities are very patchy in this landscape, requiring farmers to have a good eye to select those patches most suited to crops. Other nearby soils are too salty, alkaline or clayey, or have hard layers of clay below the surface, which makes the ground hard to plough and waterlogged after heavy rain.

Stipagrostis or bushman grass, known to some farmers as the AK47 of Namibian grasses for its reliability as a source of food for livestock.

Fluvisols along the larger river courses in north-eastern Namibia provide comparatively nutrient-rich soils for crop cultivation, and this is where many crops are grown in Caprivi and Kavango. Some fluvisols are flooded regularly, particularly those along the margins of the Zambezi River and on the eastern Caprivi flood plain. Maize is the predominant crop on *molapo* floodplain fields. Other fluvisols in dry *omurambas* probably last saw floodwater many decades ago.

Figure 12 provides an approximation of the potential of soils for crops. Within each zone, however, there is much fine-scale or local variation, small areas of more fertile soils being surrounded by expanses of poorer ground. Compared to arable soils elsewhere in the world, those rated best in Namibia have rather limited potential. There is, indeed, a critical need for farmers to manage their soils intensively to realize useful yields. The application of suitable fertilizers in appropriate amounts and at correct intervals is of special importance and value. Other less expensive measures include the incorporation



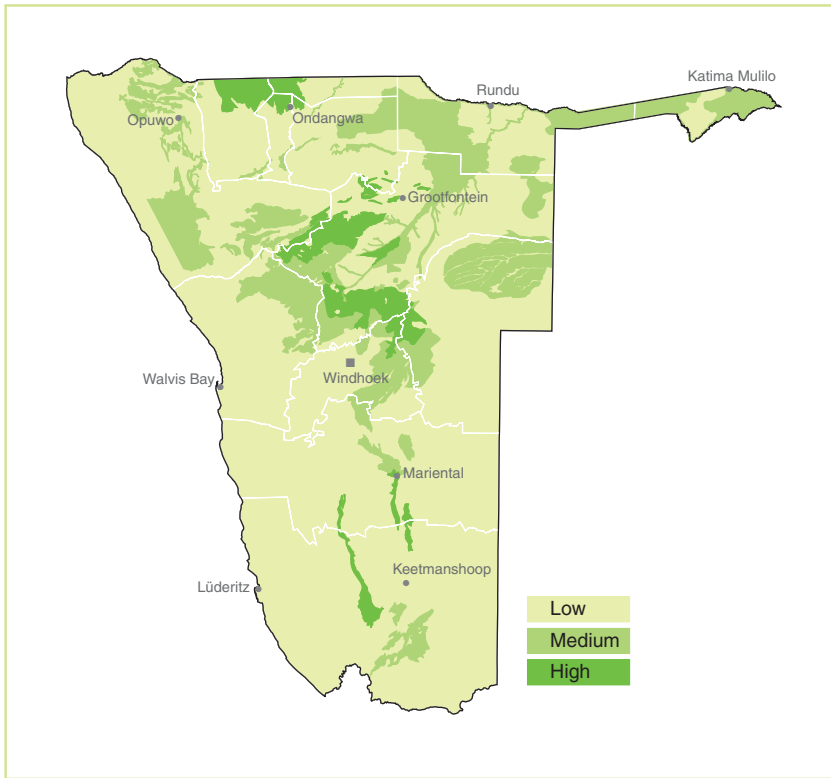


Figure 12. An assessment of the relative suitability for crop cultivation.⁷

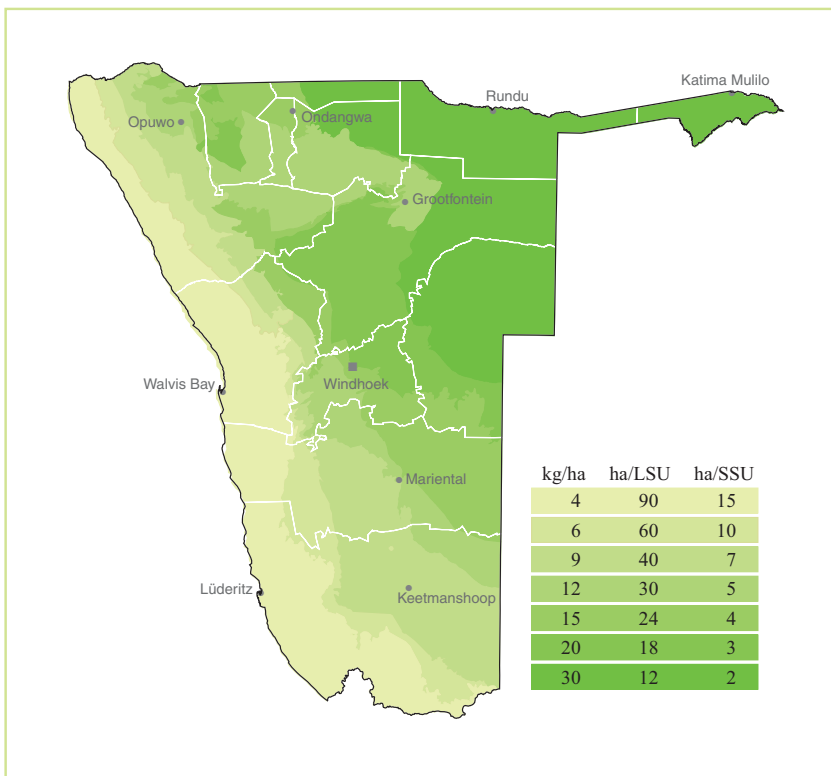


Figure 13. Measures of how many kilograms live mass of livestock can be supported on one hectare (ha), or the number of hectares required for each large stock unit (LSU, each equivalent to cattle of 360 kilograms) or small stock unit (SSU, a sheep or goat weighing an average of 60 kilograms).⁸



Farmers judge the condition of pastures more on the degree to which preferred, indicator grass species have been grazed than on the total amount of grass that has been eaten. These assessments serve to prevent the permanent loss of the most valuable grasses and to spread grazing pressures across their farms.

of the residues of crops into soils rather than allowing them to be grazed, and the use of kraal manure. Some practices should also be avoided. For example, repeated disc harrowing pulverizes the structure of the soil, creating a shallow hardpan layer, and destroying the organic matter and fauna in the soil.

NATURAL VEGETATION

While agricultural conditions are most generally determined by climatic and soil characteristics, natural vegetation also has a major effect on farming systems. The clearest Namibian example is in the distinction between *Small stock* and *Cattle ranching* farming systems. Cattle are predominantly grazers and do best in areas where pastures are most abundant. The southern and western parts of the country offer little in the way of grass fodder, however, and sheep and goats therefore replace cattle

in those more arid areas. The small stock browse substantially on shrubs and can thrive in areas where cattle could only be farmed at very low stocking rates or in years of exceptional rainfall. Moreover, shrubs grow and are available as fodder over long periods. They are thus a more dependable, permanent food, unlike most grasses that are largely absent if rain has not fallen recently. Similar distinctions in the availability of forage hold in areas where grass is the predominant food as a result of differences between annual and perennial grasses. Some grass communities are dominated by annual species, others by perennial grasses. Annuals grow only after rain and then die, whereas perennial species survive and are available throughout the year.

Another example is the enabling effects of trees and other plants growing along ephemeral rivers in western Namibia. The countryside away from the rivers is so arid that almost no forage is available to farm animals, but the perennial trees – through their leaves and pods – provide relatively rich sources of nutrition, especially to goats and some cattle. These rivers are often appropriately called linear oases.

Most importantly, vegetation affects livestock farming through its influence on how many animals can be supported in any one area. Following the earlier estimates of how rainfall

relates directly to plant production (see page 23), equivalent rates can be estimated for the biomass of livestock that an area of pastures can sustain. For example, on the cattle ranches in central Namibia, 300 millimetres of rain should yield enough grass to support 20 kilograms of live weight per hectare. A cow weighing 360 kilograms thus needs about 18 hectares. And at a price of N\$7.50 per kilogram live weight, each hectare could produce beef worth about N\$150. These figures would be lower in more arid areas or in dry years with lower grass production, and greater in wet years and higher rainfall areas of the country.

The figures would also be lower as a result of bush encroachment. Large areas of central and eastern Namibia are now covered with bush which is so abnormally dense that access to grass and stocking capacity is greatly reduced. For instance, stocking rates in heavily encroached paddocks (3,000-4,000 bushes/hectare) at Neudamm Agricultural College averaged 8.3 kilograms of live body mass per hectare. This is four times lower than the 38 kilograms body mass per hectare in camps where bush had been removed, leaving only 500 bushes/hectare.⁹

Less obvious, but often substantial effects on livestock production result from varying qualities of grass and other forage. Different grasses vary in their nutritional value. For example, perennial species in more arid areas (often called sweet grasses) generally have higher value than annual species and those growing in wetter climates (sour grasses). Trees and bushes, likewise, vary in nutritional quality. Camel thorn pods have high protein values, as do the leaves of black thorns and many other indigenous species.

Finally, indigenous plants offer a great variety of values for people who are now reaping commercial benefits from natural plants and wildlife through conservancies, tourism, and non-timber products, as described in the *Natural resources* production system (Chapter 8).

ENVIRONMENTAL FACTORS IN SUMMARY

The cumulative effects of environmental factors can be brought together in two map compilations that reflect potentials for farming conditions. The first is a map of agro-ecological zones, each zone being an area that shares similar climatic, soil and landform features. The map for Namibia has 69 such zones, but it is too detailed to be reproduced in this small book.¹⁰ However, copies can be obtained from the Ministry of Agriculture, Water & Forestry. The second map is one of carrying capacity (**Figure 11**). This is the number of animals that can be kept sustainably

in an area of natural vegetation for optimal production and without over-grazing or otherwise permanently damaging the plant communities. Excluding the extremely arid Namib Desert, carrying capacities vary a massive five-fold from 6 to 30 kilograms per hectare in Namibia.

In addition to the major influences of rainfall, soils and natural plant life, several other factors affect Namibian farming. Underground water is a valuable resource. In a few places it is sufficiently abundant to make irrigated farming possible, (see page 62) but in most areas of the country water reserves are only adequate for livestock. Another major impact is from the pests and diseases of crops and livestock, for instance on restricting the potential marketing of more than two million head of livestock from the northern communal areas (see page 17).

Overall, however, the limiting effects of aridity and poor soils make farming in Namibia a difficult enterprise. Crop yields and livestock production rates are much lower than in most other countries, and it is because of low food production that Namibia has such a small and dispersed human population. The same is true for Botswana. For related reasons, more Namibians live – and farm – in the wetter parts of the country than elsewhere. The small population then has further impacts on the sizes of markets available to farmers, and on the provision of services, such as roads. The low productivity of most areas also means that farms need to be large if they are to produce enough food to make farming viable economically. And to demonstrate that point, the only small farms that have high returns are those on which crops are intensively fertilised and irrigated (Chapter 7).

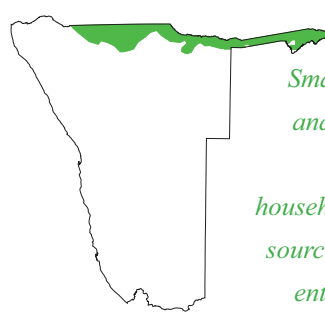
Low and unpredictable falls of rain further restrict the ability of farmers to cultivate crops and supply their products reliably. Major retailers of food therefore prefer to obtain supplies from more dependable sources in South Africa. But the hazards of low rainfall have probably also helped stimulate the production of a greater range of products in Namibia. After all, farmers are often forced to consider other options when hit by droughts or other misfortunes, which might then cause them to produce new commodities. Some farmers engaged in the *Intensive agriculture* farming system (Chapter 7) may not have ventured into producing such crops as olives or flowers if they could have relied on traditional agriculture.





4

SMALL-SCALE CEREALS AND LIVESTOCK



Small fields of cereals and some vegetables, and small numbers of cattle and goats used largely for domestic consumption. Most household income is derived from non-farming sources. The farms are low input – low output enterprises, based mainly on family labour.

GEOGRAPHY OF THE SYSTEM

Many more people are engaged in this farming system than any other in Namibia, and most live in a narrow zone stretching across the north from Omusati in the west to Caprivi in the east. There were about 152,000 farming households in this zone in 2006: Omusati (40,000 households), Ohangwena (35,000), Oshikoto (23,000), Kavango (22,000), Oshana (20,000) and Caprivi (12,000 households).¹ These are the most densely populated rural areas of Namibia, and are home to about 960,000 people. There are probably about 10,000 households using this system elsewhere, mainly in the communal areas of Otjozondjupa and northern Kunene, and on some resettlement farms.

Most households are located several hundred metres from their closest neighbours so that many areas are characterized

by a patchwork of smallholdings. This scattered pattern of homesteads is most prevalent in the Cuvelai drainage system, and along the Okavango River and most main roads. Elsewhere, houses are loosely clustered in small villages surrounded by farmlands and grazing areas.

Rainfall across this narrow swathe of land varies in a gradient from average annual totals of about 650 millimetres in the east to about 300 millimetres in the extreme west. The landscape is a very flat expanse of Kalahari sands across which various drainage lines carve their way. Large perennial rivers follow some of these lines, notably the Okavango, Kwando/Linyanti and Zambezi/Chobe, while others are now permanently dry, for example the Omatako. Yet others are ephemeral, especially so the *oshana* channels of the Cuvelai drainage system in the north-central regions.

The farming system is constrained by poor soil fertility in most areas. Without intense management and fertilizer applications, large areas of the Kalahari sands are not suitable for cultivation. Patches that are more fertile have generally been farmed for decades, with the result that much of their

An ox in northern Kunene (above), perhaps on its way to water, pastures or fields to be ploughed. Fences around farms in Omusati enclose the small fields that are typical of this farming system (below).

original nutrient value has been lost. Other constraints include the presence of saline soils in some areas and the high rate of water and mineral loss in soils with a high sand content.

SOCIAL ENVIRONMENT

The farming system is one of communal land where farmers have exclusive rights to small areas that usually surround their homes. The farm units are often fenced, especially by households that can afford fencing. Traditionally, poles, sticks or branches were used for fencing, but droppers and fencing wire are now used increasingly. Livestock is largely grazed on open access commonage pastures and woodlands, from which people also harvest firewood and other natural plant products. The practice of transhumance – where cattle move seasonally between grazing areas near the home and those in large expanses of unoccupied communal land – has declined in recent years, mainly because many of those open areas have been fenced off into large farms (see page 15).

Each farming unit is centered round a single household consisting of an average of 6 or 7 people. While different family members play greater or lesser roles, farming is largely a household pursuit, and it is usually difficult to pinpoint one person as ‘the farmer’. Women do most of the work on arable land. Additionally, the number of people in a household has a direct bearing on the size of its farming enterprise since labour is hired only sporadically.

Demographically, the homes are skewed in two significant ways. The first is that there is a high dependency ratio, which means that a large proportion of household members are ‘dependants’. These are people either younger than 15 or older than 64 years of age. On average, there is about one dependant

to each person of a working age (15 to 64 years). People of more productive ages thus have to support many children and elderly folk. The high dependency ratios are due to the movement of many young adults into towns, and also to work on mines or farms far away from their homes. Rates of migration have long been higher in Omusati, Oshana, Ohangwena and Oshana than in Kavango and Caprivi.

The second is that the sex ratio is skewed, with more adult women present than men. More households are therefore headed by women than is usual. Again, this is due to migration since men are under greater social pressure to seek employment or start businesses away from their rural homes. However, increasing numbers of younger women now also leave their rural homes. It is perhaps the most entrepreneurial women and men that seek employment elsewhere.

This farming system produces a significant variety of products: three main cereals (mahangu, sorghum and maize), various vegetables, meat and milk. The great majority of farm produce is used for domestic consumption. Very little produce is therefore sold. Indeed, most cereals available in markets or shops in northern Namibia are produced by commercial growers elsewhere in Namibia or in South Africa. Angolan farmers also sell mahangu in markets in north-central Namibia.

FARM HOLDINGS

Most households plant between one and four hectares each year (Figure 14). The average sizes of areas cultivated in the six northern regions were: Caprivi (1.7 hectares), Kavango (1.9), Ohangwena (2.4), Oshikoto (3.6), Oshana (2.7) and Omusati (3.2 hectares) (Figure 15). In all six regions there are also large expanses of fields that have been left fallow, usually because

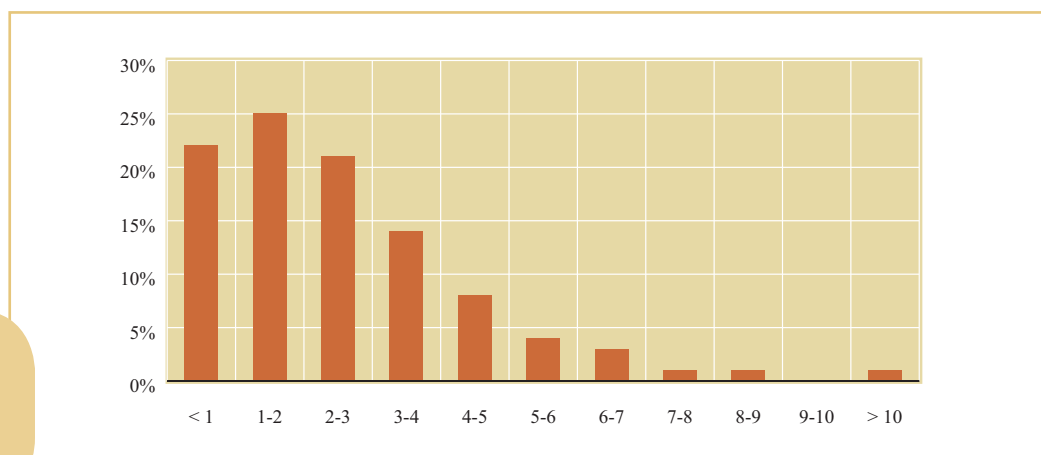


Figure 14. Most (82%) households plant less than four hectares (x axis) each year.²

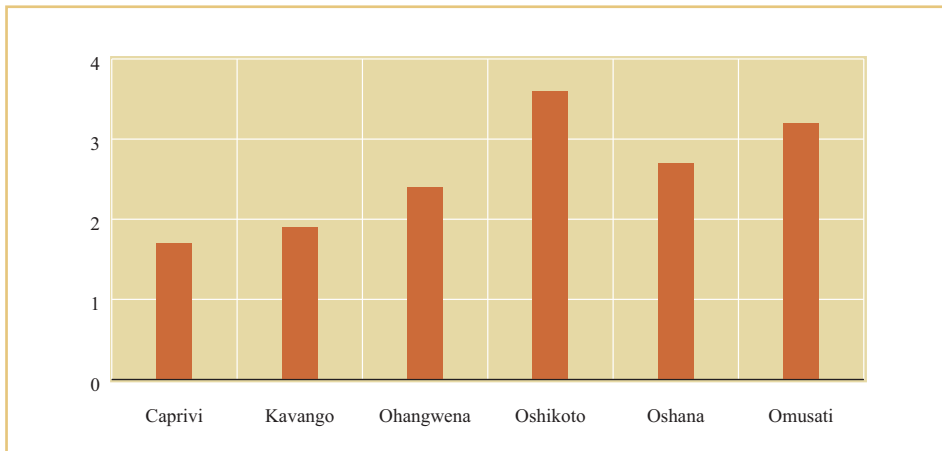


Figure 15. The smallest cultivated area (in hectares) are in the north-eastern regions where they average about half the size those in the four north-central regions.⁵

the soil is no longer fertile after several years of production. For example, for every three hectares of cultivated fields there is an additional nine hectares of old, cleared land in the four north-central regions. In Kavango and Caprivi, about 20% of all cleared land is cultivated while the rest lies fallow or abandoned.³ Some richer households have fenced enclosures of pastures of 5 to 20 hectares around their homes and fields. These are most prevalent in north-central Namibia where they are called *uyyanda*.

Several factors affect the size of cultivated areas:

- Wealthy, influential households plant the biggest fields, which may extend over five to ten hectares, whereas the poorest farmers often plant less than one hectare. In fact, about one-fifth of all households plant less than one hectare each year.⁴
- In the most densely populated areas all better patches of soil have been cultivated and so only tiny pockets of soils not suited to crop cultivation remain available. Anyone wishing to expand their farm significantly or establish a new farm is forced to move to outlying areas. These are generally far from such essential services as water supplies, shops, schools and clinics.
- Field areas are limited by the availability of labour since most work is done manually. Most households have too few family members or cannot afford to hire casual labour to tend larger fields. Similarly, there are limits on how large an area a family can fence off or control for itself.
- Bigger areas are planted in good seasons when the rains start early.
- As shown in **Figure 15**, fields in the west are larger than those in the east, presumably to compensate for the lower rainfall in the west.

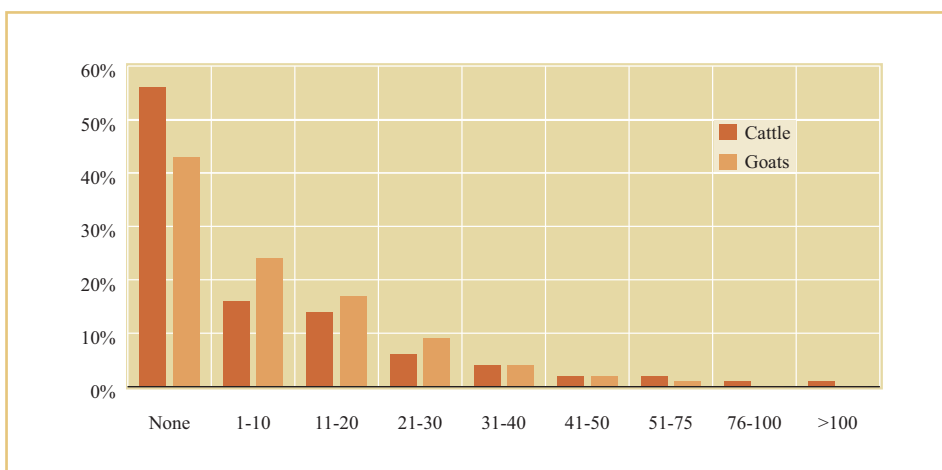


Figure 16. There is a high level of variation in livestock ownership, as shown by the percentages (y axis) of farmers having no cattle or goats, or owning herds and flocks of varying numbers of animals (x axis). A herd or flock of 30 animals would be needed to maintain a regular off-take.

Livestock farming is dominated by goats and cattle, some poultry and then smaller numbers of pigs, donkeys and a very few sheep. It is popularly believed that every farmer has livestock, but a significant number of households have none. For example, more than half of all households have no cattle, pigs, sheep or donkeys, while about two-fifths do not have goats (see the table below). About one-third of households have neither cattle nor goats. Amongst those who are livestock owners, most have fewer than 30 cattle and goats (**Figure 16**). In total, approximately 600,000 cattle and 950,000 goats are owned in this farming system.⁶

Farmers with the biggest herds of cattle are in Caprivi and Kavango. Sheep, donkeys and pigs are not kept in Caprivi, hardly so in Kavango, and then much more so in Ohangwena, Oshikoto, Oshana and Omusati. The great majority of households have less than 10 of these animals, while few people own more than 20 chickens. Again, far fewer farmers in Caprivi and Kavango have small stock and poultry than those to the west. As is true for cultivation, the wealthiest and largest households have the biggest herds and flocks.⁷

FARMING METHODS

The great majority of cultivated land is dryland, which means that crops depend on rainfall for their water requirements. New fields are usually cleared – and established ones are ploughed

afresh – before the first rains. Poorer farmers hoe by hand, while more affluent households make use of ploughs drawn by donkeys, oxen or tractors. Only 4% of all households use fertilizers, while 42% boost soil fertility using limited amounts of manure, often from livestock grazing stubble after the harvest. Manure applications are much more prevalent in the north-central regions than in Kavango and Caprivi.⁸ Overall, soil fertility has probably declined due to a decrease in plant biomass in these farming areas and the withdrawal of subsidies for fertilisers. Several varieties of mahangu and sorghum seed have been bred to improve production under Namibian conditions. The best known of these is Okashana-1, a mahangu cultivar that grows more rapidly than traditional varieties. Approximately equal numbers of farmers plant one of these cultivars or a mix of traditional and improved seeds (**Figure 17**).

Planting is done by hand, several seeds being planted in the same hole. The seedlings are later thinned and fields are weeded once, twice and often three times during the growing season (weeding is more frequent in the north-central regions than in Caprivi and Kavango). Labour for weeding is much the most time-consuming and important input in achieving reasonable yields. Its value becomes clear by summarising the typical labour requirements for one hectare: 13 days for manual hoeing, or 4 days using draught animal power, or 2–3 hours using a tractor; 8 days for planting; 27 days for weeding;

PERCENTAGES OF SMALL-SCALE FARMERS WITH OR WITHOUT LIVESTOCK IN THE SIX NORTHERN REGIONS.⁹

% households with:	Caprivi	Kavango	Ohangwena	Oshikoto	Oshana	Omusati	Total
No cattle	42	49	59	57	66	52	56
1-30 cattle	43	39	34	34	30	41	36
More than 30 cattle	15	12	7	9	4	7	8
No goats	84	59	34	37	37	27	43
1-30 goats	15	38	59	50	56	62	49
More than 30 goats	1	3	7	13	7	11	8
No pigs	100	86	66	57	56	43	65
Some pigs	0	14	34	43	44	57	35
No sheep	100	99	99	99	93	83	95
Some sheep	0	1	1	1	7	17	5
No donkeys	100	97	76	72	80	55	78
Some donkeys	0	3	24	28	20	45	22
No poultry	47	35	8	8	8	7	16
Some poultry	53	65	92	92	92	93	84

7 days for the harvest, and another 7 days for threshing.¹⁰ These tasks add up to about 62 days for one person per hectare if ploughing and weeding is done manually, and a minimum of 49 days if a tractor is used for ploughing. An average field of three hectares would require 147–186 days of work. Small homes, with perhaps just one or two productive family members, are unable to provide that kind of labour and therefore only cultivate smaller fields. Of course, labour requirements are not spread evenly over the growing period, which means that large and wealthy households are better placed because more family members are available and casual labour can be hired at critical times.

Mahangu, maize and sorghum – as the dominant rain fed cereals – are generally harvested four to five months after planting, usually between April and July. Harvesting is done as rapidly as possible to prevent losses to pests, especially red-billed queleas in some seasons. Flocks of tens of thousands of these birds may settle in a field and destroy a crop in a day. The harvested seed heads are threshed at home. Some households that can afford it have their grain milled at local mills, while others prefer home pounded meal.

Most households also grow small quantities of vegetables or field crops such as beans, cowpeas, bambara nuts, groundnuts, pumpkins, melons, tomatoes and spinaches and cabbages. The gardens are usually within their cereal crop fields and close to their homes where the soils benefit from household waste and more frequent weeding and watering. However, there are also many gardens along the banks of the permanent rivers in Kavango and Caprivi. Maize is also commonly grown in Caprivi in *molapo* fields along the margins of seasonally flooded river channels.

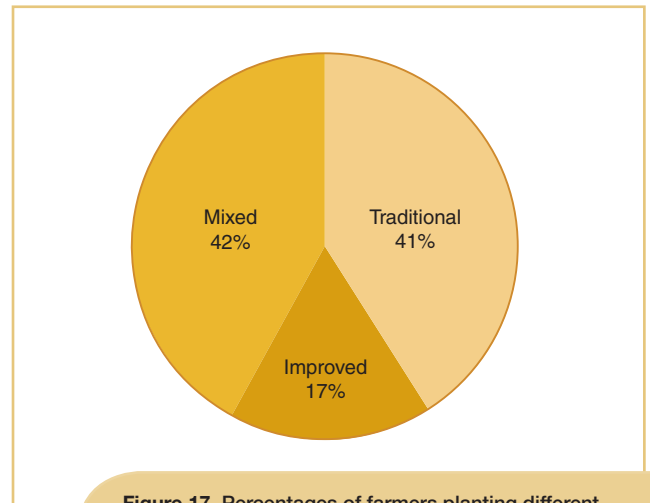


Figure 17. Percentages of farmers planting different types of mahangu seed. Improved seed types grow more rapidly than traditional ones.

The relative importance of mahangu, maize and sorghum changes across the country. Virtually every farmer plants mahangu in Omusati, Oshana, Ohangwena and Oshikoto. From there, the dominance of mahangu drops off to the east, as increasing amounts of maize are grown in Kavango and especially in Caprivi. Sorghum is also less frequently planted in Caprivi and Kavango, whereas about 80% of farmers in the four north-central regions grow sorghum, which is used mainly for beer production.

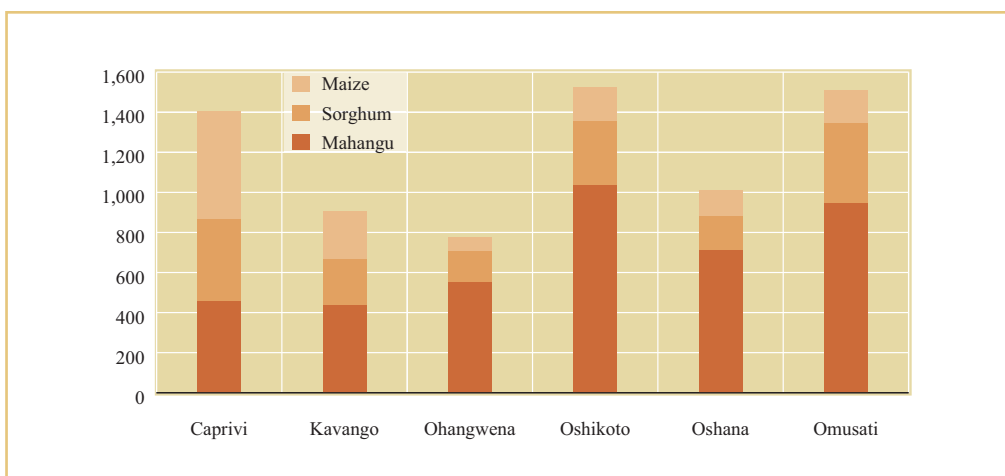


Figure 18. The average weight of maize, mahangu and sorghum (in kilograms) produced by a household each year.¹¹

Maize, sorghum and mahangu contribute about equally to the average total production of cereals by each farmer in Caprivi, whereas mahangu dominates production elsewhere (**Figure 18**). Differences in total production between the regions are due to the combined effects of varying yields and the size of fields. Thus, the high rate of production in Caprivi (where fields are smallest) is largely due to good yields, whereas larger fields are probably the main reason for the higher production in Oshikoto and Omusati. The average total production in these three regions is almost double that in Kavango and Ohangwena.

Livestock generally graze and browse on their own, although young men or boys herd them if there is a chance of the animals damaging crops, or if the pastures are far from their homes. The animals return to kraals each evening, usually after being watered at a river or drinking trough at a borehole or piped watering point. Breeding is not controlled and calving rates are usually below 50%. Compared to those elsewhere in Namibia, livestock in this farming system generally suffer from high morbidity and mortality, as a result of food shortages and disease. Only cattle are vaccinated on a regular basis by veterinary officials, primarily to curb the spread of foot-and-mouth disease and lung sickness.¹²

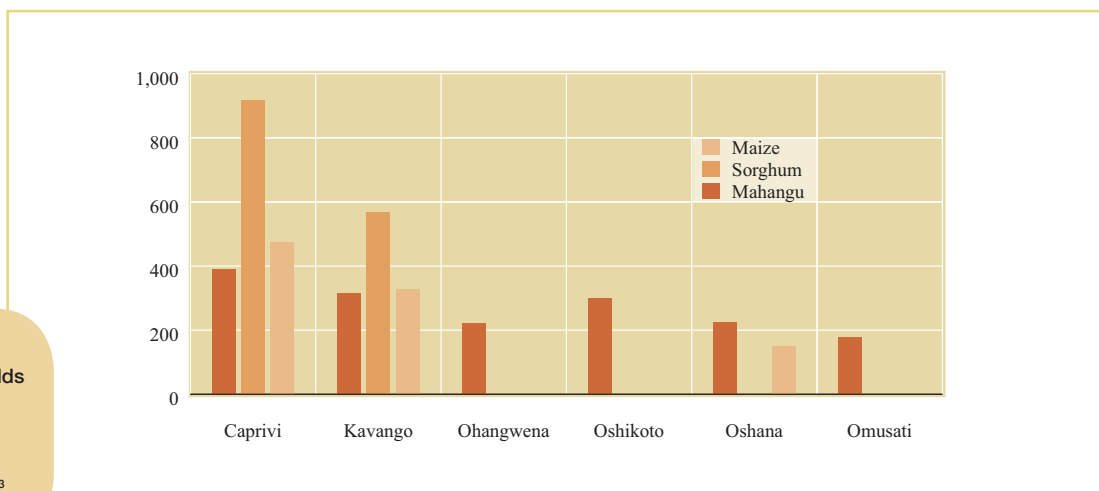
Crop yields are low as a result of two main factors. The first is the much poorer growing conditions than in wetter climates where the soils are usually more fertile. This is probably why yields in the more tropical Caprivi are higher than those in more arid areas to the west (**Figure 19**). Rainfall is higher and maize planted in the more clayey and richer soils along floodplains does much better than in the comparatively infertile sandy soils which dominate most areas of this farming system.

The second reason is that inputs to crop production are low, a conclusion based on the fact that yields are several times lower than those on commercial farms where the soils are intensively fertilized and sometimes irrigated, and pests and weed growth are controlled (see page 61). As averages, the yields in **Figure 19** mask the fact that some small-scale farmers indeed achieve good harvests. This is obvious to anyone travelling through northern Namibia and who observes that many fields consist of scattered, stunted crops while other, nearby fields have a dense, even cover of well-tended, healthy plants, each bearing good heads of seed.

Overall off-take rates of goats and cattle are about 10%. Most animals that are slaughtered are consumed at home, and comparatively few animals are therefore sold to the Meatco abattoirs or to local bush markets.¹⁴ Indeed, the majority of cattle and goats sold in the north-central regions come from or Kunene. A variety of factors limit marketing: the small herds and flocks, the importance of retaining livestock as capital assets, the moderate prices offered by formal markets and the difficulties in selling a few animals at a time.

Grain surpluses are kept in various storage containers, the most elaborate of which are the *omashiha* or *iigandhi* granaries of Ohangwena, Oshikoto, Oshana and Omusati. These tightly, neatly woven baskets have capacities ranging from 0.7 to 2.0 tons, and can store mahangu for up to three years. Having such long-term storage facilities is of considerable importance in an environment where the risk of crop failure is high due to inadequate rain and pest damage. Severe famines experienced over the past 150 years in these regions contributed to the development of strategies to store food for long periods.¹⁵

Figure 19. Average yields of mahangu, maize and sorghum measured in kilograms per hectare.¹³





VALUES OF FARMING

A typical farming household of six people plants three hectares of mahangu and has 30 goats and five cattle. They would harvest an average of 900 kilograms of mahangu in a year, which has a market-related value of about N\$2,000. A minimum of 147 days of labour would have been spent in realising the N\$2,000 of mahangu, giving a maximum daily rate of return on labour of N\$13.60. Annual sales or in-kind values from slaughtering five goats and one cow would amount to no more than N\$3,000. While a few hundred dollars could be added from vegetables and legumes, it is clear that the total production of such farm is extremely low, and that returns from inputs are small.

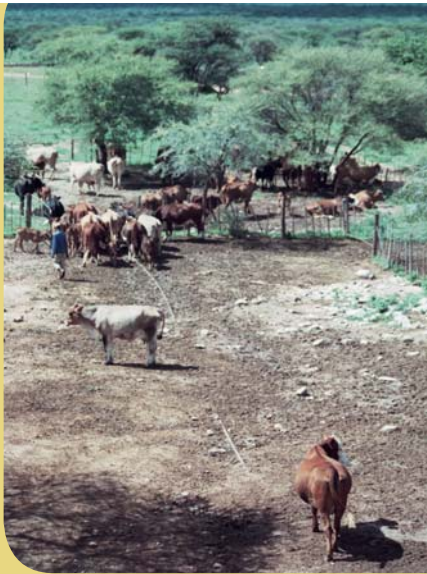
Most people would consider this farming system to be a subsistence economy, implying (a) that the majority of households have small incomes and (b) that most income is derived from farming activities. The idea that incomes are generally low is correct for many homes, but there is a high degree of variation from one house to the next. Many of the poorest Namibians are to be found here, but there is also a considerable number of very wealthy families. How many households are really poor is hard to say. One way of assessing this is to assume that homes that plant less than one hectare and/or have no livestock are at a level of severe poverty. From figures given above, that would mean that there are 40 to 50 thousand poor families. Farm produce probably represents

In the absence of other forage, goats make the most of fallen leaves and pods from a tree, its lower canopy already cropped by browsing.

a significant part of the total income of a poor family, but it would amount to less than N\$2,000 per year. This is less than half the value of an annual social pension of N\$4,440. For the remaining majority of about 110,000 homes, however, much more of their income is derived from non-farming activities, in particular from the wages and pensions of family members, and from remittances sent by family members working elsewhere. For example, an average of 73% of total household income came from non-farming activities in north-central Namibia, while 82% of income in Kavango was not from farming.¹⁶

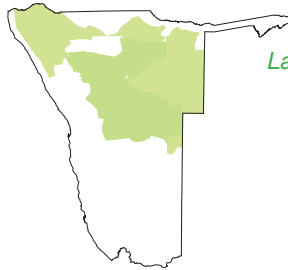
Perhaps the most important point is that although the rural households engage in a variety of farming activities, most families rely largely on cash incomes. As a result, the majority of household commodities are obtained through cash purchases and not from harvested products. Other important points are that most households have several incomes, and those with the largest families have the greatest diversity of incomes and the highest total off-farm earnings. The predominant value of non-farming incomes raises the question of whether these should be viewed as farming households or not.





5

CATTLE RANCHING



Large-scale commercial cattle farming for beef production on big farms in freehold and communal land, and on open access communal land. Most beef is exported or sold to local markets.

GEOGRAPHICAL FEATURES

The main purpose of this farming system is the commercial production of beef. The system covers all of Otjozondjupa, much of Kunene, Omaheke and Khomas, the southern parts of Omusati, Oshana, Oshikoto and Kavango, and eastern areas of Erongo. About 315,000 square kilometres, or 38% of Namibia, is used for cattle ranching. Much of the area in eastern Namibia is on Kalahari Sands where the trees are predominantly broad-leafed species forming a flat landscape of savanna grasslands. Among the commonest trees are burkea and silver-leaf terminalia. Vegetation to the west is savanna-like as well, but acacias and mopane dominate the tree cover. Pastures below the trees provide grazing while the trees give cattle important shade. The most arid areas in the far west have few trees away from dry rivers and streambeds. The drainage

courses are lined with moderately dense ribbons of trees that supply valuable pods and leaves to livestock. However, a variety of grass species form the mainstay grazing resource for cattle throughout the area of this farming system.

Annual average rainfall varies from about 550 millimetres in the north-east to 300 millimetres in the south and 150 millimetres in the far north-west. The most arid north-western areas are grazed by cattle only intermittently, herds being moved in a roving fashion into areas where occasional falls of rain have produced grazing. Since rainfall is the main determinant of grass biomass (see page 23) and both rainfall and pasture production are moderate in most years, cattle production requires large areas of grazing. Cattle ranchers therefore either have big, fenced farms or graze their animals over large expanses of open, communal grazing.

Water is a critical resource. The great majority of cattle obtain their water from underground sources pumped into reservoirs and drinking troughs, or from thousands of small dams constructed on ephemeral rivers and streams. Because only intermittent or widely scattered surface waters were

Beef production has been an important commercial farming activity over the past 50 years. The farming system is now practiced over more than one-third of the country, and it supports the livelihoods of more than 100,000 people.

previously available, the creation of permanent sources of water was a key step in making cattle ranching possible.

Pastures in the north-eastern areas burn frequently. This happens almost every year in many places where most fires are set by people to stimulate new grass growth. Others are fires that accidentally run away after being lit to clear water holes or fields of old growth, for example. The fires result in the loss of substantial areas of grazing, and possibly cause changes in the composition of grass communities. A major difference between freehold and communal farming areas is in the frequency of fires.¹ While communal pastures in the north-east burn often, fires on freehold farms are very infrequent because they are regarded as a threat to pastures. Any fire is thus extinguished as quickly as possible. There is also often insufficient grass to burn because of intense grazing on freehold farms.

Many of the farms are also characterized by severe bush encroachment, the highest bush densities in Namibia being found on freehold farms in northern Otjozondjupa where rainfall is higher than to the south.² An association between heavy grazing pressure, cattle ranching and bush encroachment seems obvious, since bush cover is much thicker on the freehold farms of this farming system than in any others. Pastures that are badly encroached have lost several times their previous productivity because of reduced grass biomass (see page 31) and cattle being unable to reach grass beneath and between impenetrable bush. Losses in beef production have been estimated to cost Namibia hundreds of millions of Namibian dollars. Black thorn, purple-pod terminalia, sickle bush and mopane are the most invasive bushes.

A range of factors and ideas have been suggested to explain how overgrazing leads to bush encroachment. However, it is the absence of fire that is probably the critical cause. Hot fires kill most young bushes, and so the continued absence of fire on freehold farms allows young bushes and shrubs to grow and multiply into thick cover. Moreover, the occasional fires that do occur are too cool to kill much of the bush because

heavy grazing has removed the dense cover of grass needed to fuel hot fires. It is this last point that probably links bush encroachment most clearly to cattle ranching.

Social environment

Cattle are farmed for beef on a substantial scale in three distinct areas of land tenure. The first and most widely recognized is the extensive, freehold, titled cattle ranches that cover much of central Namibia. There are about 2,400 of these farm units. Those in areas formerly allocated to white owners have an average size of about 7,300 hectares, while farm units average less than 1,000 hectares in the former Rehoboth district. Approximately 11,000 households and 47,000 people live on, and are largely supported, by all these farms. The farm units are bigger than the registered farms. For example, among 53 owners of registered farms between Windhoek and Gobabis, 16 of them leased other farms or sections of farms, thereby enlarging their farming units from an average of 5,248 to 8,459 hectares.⁴

A second category comprises the farms that have been fenced off into exclusive ranches in communal areas, each of which ranges between approximately 1,000 and 8,000 hectares.⁵ Some were demarcated by the previous government and allocated to farmers between the 1960s and 1980s to encourage commercial agriculture in communal areas. There are about 300 farms of those original farms in the Mangetti Block of Oshikoto and Kavango, and the Okamatapati and Rietfontein areas. At least 700 new farms have been established since independence in Caprivi, Kavango, Oshikoto, Omusati, Otjozondjupa and Omaheke (see page 14). There are an estimated 5,500 households and 35,000 people associated with these farms.

The third group is made up of farmers using open access grazing on communal land, most of which is in northern Kunene, eastern and northern Otjozondjupa, northern Omaheke and the Aminuis Block. Here an estimated 3,600 households and

AREAS USED FOR THE CATTLE RANCHING FARMING SYSTEM AND THE ESTIMATED NUMBER OF HOUSEHOLDS AND PEOPLE IN EACH LAND TENURE TYPE.³

Tenure type	Hectares	Households	People
Freehold farms	14,500,000	11,200	47,000
Exclusive communal farms	3,000,000	5,500	35,000
Open access communal	14,000,000	3,600	24,000
Total	31,500,000	20,300	106,000

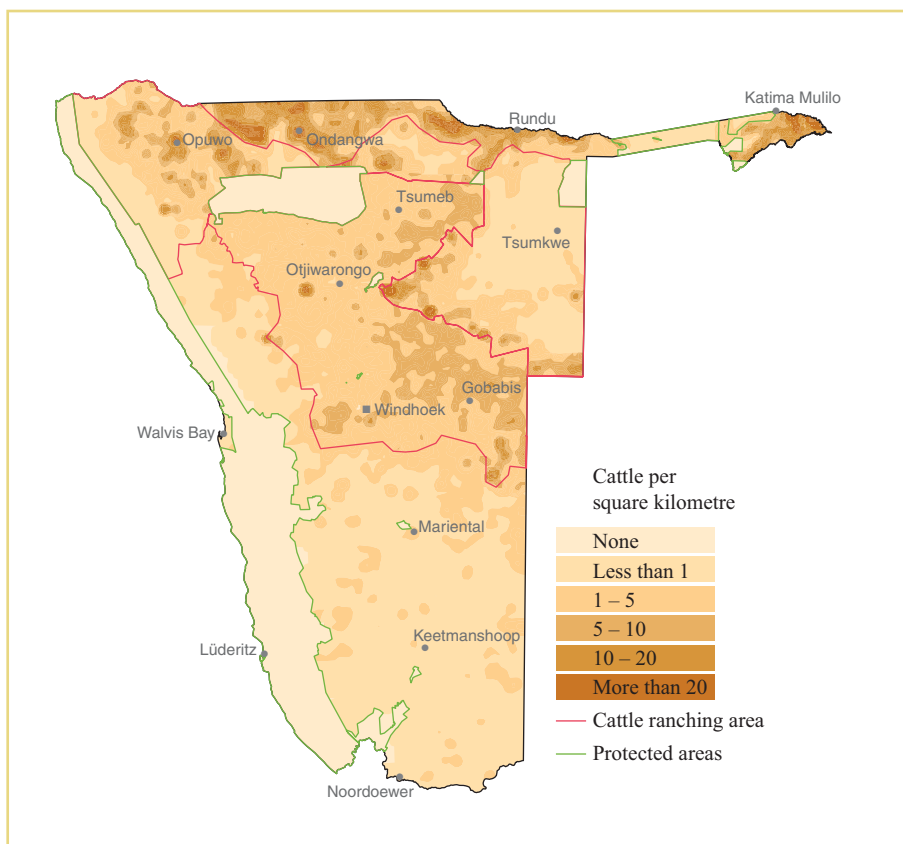


Figure 20. Approximately 1.4 million or 58% of the roughly 2.4 million Namibian cattle are within the *Cattle farming system area*. Most others are in the *Small-scale cereal and livestock farming system* (Chapter 4).

24,000 people are probably directly involved in commercial beef production. Another 8,000 households in these same open communal areas are not beef producers, and thus fit within the *Small-scale cereal and livestock farming system* (Chapter 4).

Little infrastructure is available for cattle farming in these open access communal areas. Water is supplied from boreholes, most of which are found at widely separated points close to villages. All people and all livestock share the water points, causing a concentration of overgrazing and trampling close to the water. Conditions on the exclusive ranches in communal areas are better. The originally demarcated farms were fenced and each was supplied with a borehole and reservoir. Likewise, some owners of the newer ranches have established water sources, housing for labourers and fenced off camps to manage grazing on a rotational basis. But their infrastructure does not compare with that of freehold farms. Good roads provide easy access to most of these farms, which have telephones and electrical power from the national grid or generators. Each freehold farm has a relatively dense network of water sources. For example, there were 536 water points in one area covering

286,000 hectares of freehold farms. Each water point therefore served an average of 535 hectares. Water was further available from 62 dams built across river beds. The farms were divided into grazing camps of an average size of 218 hectares.⁶

It might have been logical to distinguish three farming systems for cattle in this book: open access communal land, exclusive ranches in communal areas, and freehold farms. However, differences are fading as more farmers in communal areas fence off big ranches, farming more as commercial producers than cattle owners in open access rangelands. Well-developed marketing systems of auction pens, traders and farmers' associations now serve many of their needs, the best examples being found around the Okamatapati farms. Farmers in northern Kunene also market cattle and goats on a substantial scale.

Increasing numbers of communal farmers are thus turning to the kind of beef production traditionally expected on freehold farms. Distinctions between the categories are also being blurred in the opposite direction on freehold farms used to resettle people from communal areas. The farming

units allocated to each family are generally too small to produce beef on a substantial or economically viable scale. In this sense, therefore, many former freehold farms now function as subsistence rather than commercial units. There are approximately 90 resettlement farms within this farming system area.

FARMING PRACTICES

Open access communal land

While farmers on communal land have been herding cattle for generations, practices to produce beef commercially have started to develop only recently. The developments are occurring rapidly, a feature that contributes to the variety of ways in which cattle are farmed in these areas. Even greater diversity stems from the fact that the farmers are extremely heterogeneous, particularly in terms of household wealth, herd sizes and assets of value in farming cattle (**Figure 21**). Some people are therefore more involved in cattle farming, and produce much more beef than others. The focus in this chapter is on those commercial beef producers who mostly own more than 50 cattle. More traditional small-scale approaches to cattle farming for domestic consumption are described in Chapter 4 on the *Small-scale cereals and livestock* farming system.

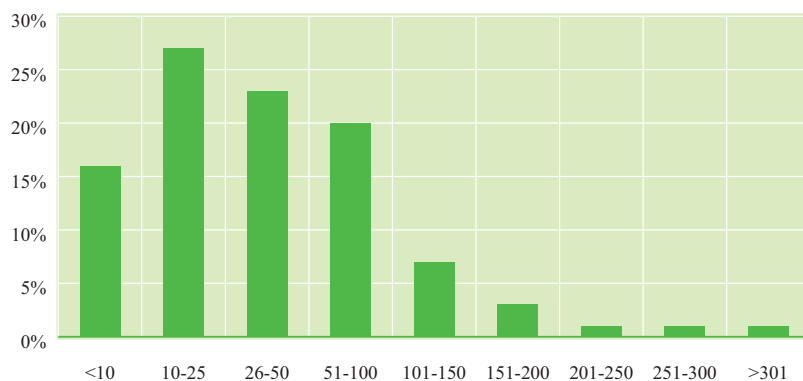
Cattle are principally grazed wherever suitable pastures and water sources are available, often on an itinerant or nomadic basis. While the grazing areas are not fenced, the herds of different farmers are usually separated by mutual agreement or by allocations and rights accorded by traditional leaders, especially in northern Kunene. However, those farmers with large herds have access to the biggest and best grazing areas

as a result of the size of their herds, their social standing and their capacity – as wealthy farmers – to employ herders and transport water. They also have substantial flocks of goats, and sometimes sheep, thus farming with a diverse assemblage of livestock, unlike freehold farmers who largely specialise in either cattle or sheep (see below and Chapter 6).

Herd boys are often family members, and the size of the farming enterprise is generally related to the number of people in a household. The number of cattle may further depend on the extent of off-farm incomes and number of extended family members who contribute remittances. Cattle are often exchanged, borrowed or pooled between members of a family. For example, relatives who live elsewhere may have their animals herded with others belonging to a resident, rural family. The lending of cattle in northern Kunene is one way of maintaining kinship ties and enabling young family members to start their own herds or build them up in the event of loss due to disease or drought.

Cattle herds are managed using a variety of approaches. On the one hand, they are run rather informally, at least compared with the herds of conventional commercial beef producers. Limited efforts are made to monitor pregnancy, calving, growth rates, or the fertility of bulls and cows. Herds expand when grazing is good, but then crash when grass or water is in short supply. Locally, stocking rates are often high, causing severe overgrazing and cattle to be in poor condition. For example, the stocking rate of 4.3 hectares per large stock unit in the Ovitoto communal area near Okahandja was three times greater than on adjoining freehold farms.⁸ Calving rates are seldom above 50%, and mortality rates range from 10 to 20% per year.⁹

Figure 21. An example of how cattle ownership varies in communal areas. These are percentages (y axis) of farmers owning different numbers of cattle (x axis) in 2001 in eastern Otjozondjupa.⁷



Most losses are caused by disease and insufficient food, which leads to starvation and greater susceptibility to infections, particularly botulism, anaplasmosis, pasteurellosis, and black quarter. A significant number of cattle are stolen as well. The biggest cause of death in much of eastern Otjozondjupa results from cattle feeding on gifblaar (*Dichapetalum cymosum*).

However, many farmers are increasingly adopting animal husbandry practices that were rare or absent in communal areas 10 or 20 years ago. These include castrations, dehorning, vaccinations against disease and the treatment of sick animals using veterinary medicines. The composition of herds is more controlled, so that cows make up 40 to 50% of animals, oxen 20 to 40%, calves 30 to 40%, and bulls between 1 and 2% of an average herd. Supplementary licks may be provided. Local associations have been formed to support farmers. Most importantly, farmers are pursuing active methods of marketing, especially in supplying distant markets. For example, the majority of weaners exported live to South Africa are sold in the communal areas of eastern Otjozondjupa, and most cattle slaughtered at the Meatco abattoir in Oshakati come from northern Kunene. Off-take rates of cattle sold to formal and informal markets in northern Kunene amount to about 11% annually. This may not seem high, but another 10-20% of herds are lost to mortality, and unknown percentages are consumed domestically or withheld from sale for reasons of being sacred cattle.¹⁰

Freehold farming

Practices to produce beef in communal areas are thus changing rapidly. Those on freehold farms, by contrast, are more established as a result of decades of experimentation, the availability of findings from research and the provision of advisory services. Farmers thus have – or can get – good information on how to manage pastures and water supplies, optimise reproduction, treat diseases and market their beef, for example. Although an estimated 25% are so-called ‘weekend farmers’, they and the majority who farm full-time have generally been farming for many years. Furthermore, many come from farming backgrounds, having been raised as the sons and daughters of commercial beef producers. Most current farmers have had some tertiary education, often in agriculture. While labourers on freehold farms have generally had little formal education, the majority have gained much practical expertise over years of employment. Each farm employs an average of five to six labourers who live there with their families, usually consisting of four or five dependants.¹¹

Freehold farms used for beef production are typically stocked with several hundred head of cattle. For example, each of the 53 farm units mentioned above had an average of 567 cattle, 42 sheep and 47 goats. Counting all the cattle and treating six head of small stock as equivalent to one large stock unit (LSU), gave an average stocking rate of 14.8 hectares per LSU. Stocking rates may be greater to the north where rainfall is higher, and lower in the more arid south and west (see page 31).

The average composition of cattle on a freehold farm would be about 33% cows, 27% calves, 32% oxen, 6% heifers, and 2% bulls. The animals are typically divided into separate herds of about 50 to 100 head, each herd being managed as a unit and shifted together from camp to camp. The frequency of rotation depends on the condition of the grazing, especially that of grass species that indicate the degree of pressure on the pastures (both within any single camp and elsewhere on the farm). To maximize conception and fertility, each ranch would have enough bulls in a ratio of one bull per 20-30 cows, of which 75-90% would produce calves in a year. Between 10 and 15% of the older or less productive cows are replaced each year to maximize calving rates. Ideally, bulls should be placed with cows in January, February and March so that most calves are born at the roughly the same time, nine months later. The calves and their mothers can then benefit from fresh summer pastures. The performance of cows in producing calves and the growth of their calves is easier to monitor if most of the herd follows the same cycle of reproduction. The quality of a herd is increased by the addition of good genetic material from stud animals. Namibia has 198 stud breeders who have some 28,000 registered animals, mainly of Brahman, Bonsmara, Sanga (N’guni), Simmentaler and Simbra breeds.

Calf production is further improved by the provision of licks containing phosphorus, maize meal, molasses and urea or protein concentrates. Cattle are commonly vaccinated against brucellosis, vibriosis, black quarter, anthrax and botulism. The vaccinations – together with treatments for internal and external parasites – contribute to high survival, generally over 97% per year.¹² Other than licks, most cattle obtain all their nutritional requirements from natural grazing. Some farmers, however, have planted pastures of blue buffalo grass, a nutritious grass that grows on a range of types of soils. Blue buffalo grass may carry one LSU per 2-4 hectares in the higher rainfall areas of north-eastern Namibia. Beef cattle from freehold farms are largely sold either at auctions or directly to Meatco (see page 21). Approximately two thirds of farmers between Windhoek and Gobabis sell oxen



While cattle add value to Namibia's economy, their diverse shapes, sizes and colours also contribute to the beauty of open, rugged landscapes.

at an age of about 30 months, while others prefer to market weaners at 8 months, or so-called stores or tollies when they reach about 15 months. Decisions on what to sell, and when to do so, are complex. Current prices, anticipated demands, the condition of grazing, and the costs of raising animals to heavier weights all have to be considered.

Exclusive communal farms

Beef is not produced on a substantial scale on most of the approximately 1,000 large, fenced farms on communal land (see page 14). Many are now being developed, and it will take several years before cattle herds, water points and other infrastructure are established. Other farms, particularly those in Oshikoto and Omusati, serve more as capital investments than as productive farms. In due course, however, all these farms should become important contributors to Namibia's beef industry, especially once the shifting of the veterinary cordon fence opens up local and export markets for their beef. The farms should then become similar to those around Okamatapati and Rietfontein in eastern Otjozondjupa, and Omaheke where about 100 or more ranches produce beef on a substantial scale.

The owners of all the exclusive farms are typically wealthy people with significant local status. Many are civil servants, political figures or self-made businessmen who derive most of their income from non-farming activities. They seldom live on their farms and few have received any training in agriculture. In short, these are new farms owned by a new generation of entrepreneurs pursuing business enterprises new to communal land.

As might be imagined, rather little information is available on these enterprises, but some insight is to be gained from the 65 Okamatapati farms established in 1979. Most of the farms range in size between 5,000 and 7,000 hectares. In 2001, each farm supported an average of 384 cattle, 100 sheep and 65 goats.¹³ Eleven farms had herds of more than 600 cattle, the highest being 925. The farmers are served by a number of auction pens, some of which were built by government while others were developed by local farmers' associations.

Other than sales at auctions in the Okamatapati area, cattle are sold on 'permit days' arranged by farmers' groups who advertise the availability of cattle to prospective buyers. Buyers who submit the highest price proposal are then invited to the location of the permit day sale to buy and load the cattle. The majority of cattle are sold as weaners, most being exported for fattening to South Africa. It is estimated that 70% of all live exports of cattle are originally bought in communal areas. The

predominant sale of weaners allows for high rates of off-take. These are currently thought to be in excess of 30%, a figure estimated to have grown from 4% in the 1940s.¹⁴

Cattle production and marketing

The 2004 livestock census reported a total of 2,349,081 cattle in Namibia of which there were roughly similar numbers to the north (1,165,430) and to the south (1,183,651) of the veterinary cordon fence. A total of 298,807 cattle were reported as having been formally marketed for beef production in the same year. (The ‘formal market’ consists of sales reported at abattoirs south of the veterinary cordon fence, at the Oshakati and Katima Mulilo abattoirs, by Namibian butchers and as live sales to South Africa.) Only 9,787 of these animals originated in the northern communal areas, which means that the remaining 289,020 cattle were from south of the cordon fence. Dividing 289,020 by the total number of cattle reported in the south gives an annual off-take for beef production of 24.4%. Equivalent calculations for previous years yield similar figures.

What of the 1,165,430 cattle counted north of the fence? Various studies indicate that the total off-take is about 10% across this broad swathe of the country, which includes an average of 16,000 cattle slaughtered each year at the Meatco abattoirs in Oshakati and Katima Mulilo.¹⁵ The remaining animals (roughly 100,000) are used for domestic consumption or sold at informal meat markets in northern Namibia.

A variety of reasons are offered for the low off-take rates in the northern areas: irregular calving and high losses due to

mortality, the lack of markets, a shortage of labour to improve management, and the value in keeping cattle as capital assets and for draught power, milk, manure, and other products. Most farmers also have very small herds from which it is difficult to produce beef commercially. The sale of one or two animals represents a substantial reduction of the herd, especially if irregular and infrequent calving and high mortality mean that the farmer can not be certain that the animals sold will be replaced easily. Finding a buyer willing to pay a reasonable selling price for such a small purchase may also not be simple. Finally, there may be little incentive to earn a few thousand Namibian dollars from one or two cattle if the perceived profit is small compared to cash earnings from wages and other incomes (see page 39). Notwithstanding these factors, greater beef production will only be achieved if cattle numbers increase or, alternatively, if higher rates of off-take are achieved by increasing calving and lowering mortality rates. The latter option is to be preferred because much of northern Namibia is already very densely stocked with cattle (see **Figure 20** on page 43).

An average of 345,000 cattle have been sold each year for formal beef production since 1990 (**Figure 22**). The great majority (92%) is exported, mainly to South Africa or Europe, while the remaining 8% is for the local Namibian market. Of all exports, 54% of cattle were exported live to South Africa, generally for fattening and subsequent slaughter, 27% were exported as carcasses or processed meat to South Africa, and 19% were sold to European markets. Very small volumes have also been exported to Botswana and Angola. The European

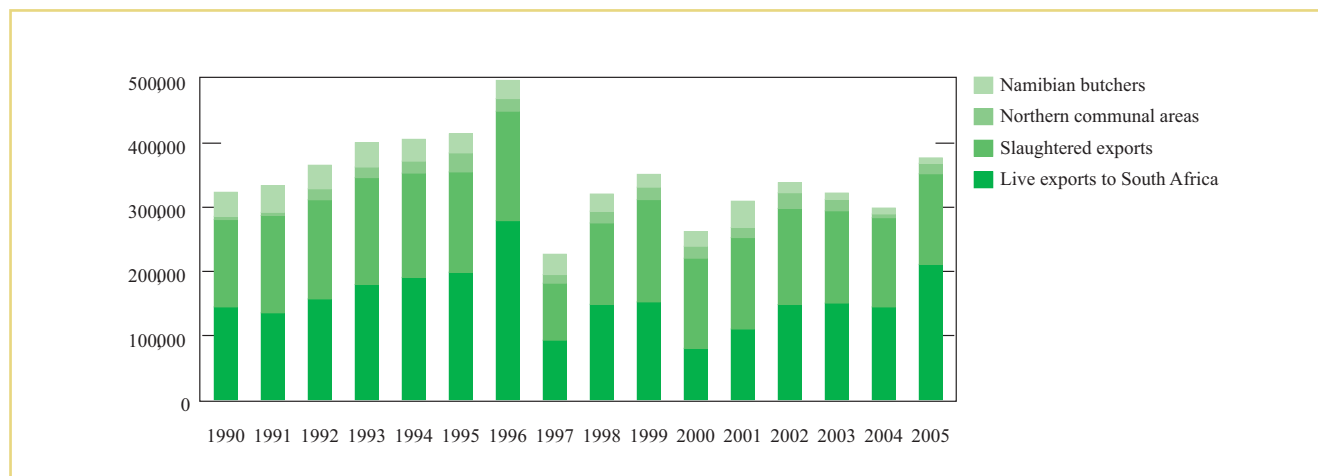


Figure 22. The number of cattle sold for beef production since 1990. The sharp increase in 1996 was due to an absence of grazing as a result of poor rain, while low production in 1997 reflects a reluctance to sell as farmers built up their herds again.



Brahman (photograph above), Afrikander, Simmentaler, Bonsmara and Sanga breeds and crossings between them form the core of Namibia's cattle population. Other breeds which occur in smaller numbers are Brown Swiss, Santa Gertrudis, Beefmaster, Charolais, Hereford, Pingsauer and South Devon. Sanga, as the collective name for cattle indigenous to southern Africa, are gaining popularity as a pure breed, with an increasing demand for their genetic material among freehold farmers south of the veterinary cordon fence. Compared to exotic breeds, Sanga are more tolerant of heat, have higher resistance to ticks and lung sickness, are fertile, and are good mothers. As smaller animals, their food and water requirements are relatively low, which means that they cost less to maintain than other breeds. However, all the exotic breeds also serve Namibia's beef production requirements well. The breeds have been selectively bred over many years under local conditions, with the result that they generally calve regularly and frequently, have good growth rates, and produce meat of high quality.

market is dominated by sales to the United Kingdom (73% of European exports) and Norway (13%).

As is the case of sheep (see page 56), the export of live cattle to South Africa is a concern to the government. Greater value could be added if the carcasses were processed locally, jobs could be generated, and Namibia would obtain value from the hides and other by-products. While intended levies on live exports may boost these local benefits, they would also limit the growth of beef (as weaners) production by farmers in communal areas.

Namibian beef is widely held as being of high quality. Much is done to protect that reputation, not least in ensuring that all

exports are certified as free of disease. The Meat Board has recently introduced the Farm Assured Namibian Meat Scheme (or FAN Meat) as an additional method of guaranteeing quality. In essence, the scheme allows all meat products to be traced from the final market destination back to the farm of origin. One aspect to be pursued in developing beef production in communal areas is the quality of meat. Many of the cattle sold to abattoirs are old and the meat of poor grades. For example, about 30% of carcasses are categorised as A or B grades in the northern communal areas, the other 70% being C grades. By contrast, 76% of carcasses sold by freehold farmers are A and B grades, the remaining 24% being C grade.



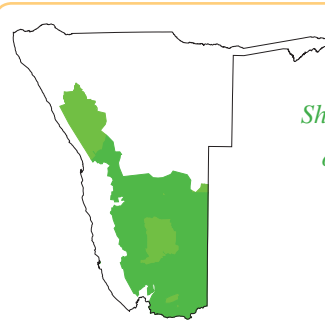
Cattle breeds: Afrikaner (top left), Simbra (top right), Santa Gertrudis (middle left) Simmentaler (middle right), Sanga (bottom left) and Bonsmara (bottom right).





6

SMALL STOCK FARMING



Sheep and goat farming in semi-arid areas on large, exclusive freehold farms and in open access communal land. Most production is sold, both locally and to South African markets.

GEOGRAPHICAL FEATURES

Much of southern and western Namibia is used for small stock farming. This is a semi-arid area lying between true desert to the west and savanna woodlands to the east and north. Average annual rainfall ranges between 100 and 250 millimetres per year, but there is a very high degree of variation in rainfall from year to year (see page 24). The farming system covers about 33% of Namibia, and extends over most of Hardap, Karas, much of Erongo, south-western Kunene, and small parts of southern Khomas and Omaheke. A large part of the chapter is based on a recent comprehensive report on the small stock industry in Namibia.¹

Landscapes in southern Namibia are mainly flat. The south-eastern areas to the east of the Weissrand are covered by long sand dunes and linear inter-dune valleys. Gravels and a thin cover of soils predominate elsewhere in other

areas of this farming system. The western areas of Namibia are topographically much more rugged because of the greater variety of geological formations found there, as well several westerly flowing rivers that have carved valleys through the hills. The rivers are ephemeral linear oases lined with trees and shrubs that are sufficiently dense in some places to form riparian forests. Farm animals depend heavily on browse and fallen pods from this vegetation, as well as on its shade.

The main environmental resource to make small stock farming possible is the presence of relatively abundant shrub vegetation, which forms the mainstay food for sheep and goats. The plants are perennial, unlike most grasses that are only abundant after sporadic good rains. Moreover, in the absence of regular rainfall farmers can never depend on a reliable supply of grass, as would be needed for cattle. Livestock farming in these really arid areas thus has to use the only dependable forage: woody and succulent shrubs.

Farming revolves to a great degree around the availability of water. Homesteads and kraals are sited at water sources, which are generally boreholes using windmills or diesel pumps to supply water to reservoirs and drinking troughs. All

Small stock come in many shapes, sizes and colours, including Damara sheep (top left), various indigenous breeds of goats (top right), and Boer goats and Blackhead Persian sheep (bottom).

farm animals should drink at least once each day and their foraging is thus restricted to feeding areas within walking distance of water points. The concentration of livestock around water results in zones around sources of water being severely overgrazed and trampled. Most other sources of water are seasonal pools of rainwater, particularly in the ephemeral rivers in the west. In places, farmers have dug into the sandy beds of these rivers to give their animals access to water lying close to the surface.

Invasive bush growth – mainly by *driedoring* – has led to a loss of agricultural productivity (see page 31) in large areas of eastern Hardap and Karas. It is commonly believed that this bush encroachment has been caused by overstocking and overgrazing. However, the problem is less severe than in the *Cattle ranching* areas to the north (see page 42)

SOCIAL ENVIRONMENT

Archaeological evidence shows that small stock have been farmed in at least parts of this area of Namibia for at least 1,000 years. Pastoral nomads then moved their livestock and homes between seasonal water sources and grazing.² It is only in the last hundred years that permanent farms have been established as a result of the introduction of boreholes and surveyed, fenced farms.

AREAS USED FOR SMALL STOCK FARMING AND THE ESTIMATED NUMBER OF HOUSEHOLDS AND PEOPLE IN EACH LAND TENURE TYPE.³

Tenure type	Square kilometres	Households	People
Freehold farms	214,000	9,700	40,000
Communal land	61,000	6,300	27,000
Total	275,000	16,000	67,000

A total of approximately 16,000 households and 67,000 people form part of this farming system, which occurs within two land tenure areas. Each of these might be regarded as a farming system in its own right. The first consists of communal land in Erongo, the Aminuis area, the so-called Hoachanas, Bondelswarts and Warmbad reserves, and the former Namaland in Karas and Hardap. All these communal areas support about 6,300 households.

One condition perhaps best describes the majority of households in the communal land of southern Namibia: poverty.⁴ Most of these farmers have but small flocks of goats and sheep, and a few cattle. For example, over half of all households have less than 100 goats, more than two thirds have

less than 50 sheep, and more than three-quarters of households have less than 10 cattle (see **Figure 23**). Women are often the head of the household. The majority of residents are children or pensioners, since most people of a working age have left their rural homes to work in towns. Dependency ratios are therefore very high, and often above 60% (see page 34). The majority of adults have little or no schooling. Alcohol abuse is high, and most household income comes from pensions and remittances. Many homes are rudimentary structures, mainly built from discarded corrugated iron.

These are the general conditions that hold in many households. However, the communal areas are also farmed by a significant number of much wealthier farmers who have hundreds of animals. They make up perhaps 10-15% of all farmers, and many are absentee or weekend farmers. Substantial competition for grazing occurs between them and poorer farmers when the richer farmers graze their large flocks around established water points after rain has fallen and fresh pastures are available nearby. However, once this grazing is depleted their flocks are moved further away to areas that have not been grazed. These are far from permanent water, and the wealthier farmers then use vehicles to cart water to their animals. Poorer farmers do not have these means to transport water, and so their flocks remain close to permanent sources of water. Having little to eat, the growth and production of their animals suffers.

The second land tenure category consists of approximately 2,000 freehold farm units. The 2,000 owners employ approximately 7,600 labourers, at an average of 3.8 workers per farm unit. About 10% of all labourers are employed on a temporary or casual basis.⁵ Most of the farm units are large, ranging from 7,000 to 15,000 hectares. Those farms in the Rehoboth District are an exception, however, having steadily been subdivided into smaller units when family farms were split up among the heirs of previous owners. The majority of the Rehoboth farms now cover between 1,000 and 3,000 hectares.

Farming provides most freehold farmers with their sole or main source of income. On average, the majority of the farmers have high levels of education, most having completed some technical or academic training at a tertiary level. Each farmstead is a substantial complex of a stone or brick-built home, workshops, garages, storerooms, houses for labourers, kraals, reservoirs and pump rooms. Some of the farms earn additional income from tourism, trophy hunting and game sales, but these activities have been developed much less than on *Cattle ranching* farming system areas to the north.

FARMING PRACTICES

In the longer term, farming practices aim largely at the maintenance of flocks, the production of lambs, and maximizing their growth to a marketable size. However, day-to-day practices are mostly geared towards finding grazing and browse, supplying water and protecting livestock against predators. Two costly assets do much to facilitate these needs: water points and fences. Both are relatively well provided and maintained on freehold farms, but poorly developed in communal areas.

Freehold farms are generally divided into camps, each with access to a water point normally fed from a nearby source or using extensive pipelines from boreholes further away. Livestock are similarly divided into flocks, typically of several hundred animals per flock. For example, a farm of 10,000 hectares might support 2,000 sheep in five flocks, and be divided into 25 to 40 camps. The flocks are rotated among the camps to give the animals the best quality, variety and quantity of forage. Each flock may spend several weeks in a camp.

Fences also help protect livestock from theft and predators, the commonest of which are jackals. The fences make it easier for farmers to locate their flocks as well – imagine trying to find sheep scattered across 10,000 hectares. Each flock is usually managed by a shepherd who, for example, ensures that water points are working, fences are intact, stray animals are found, and the flocks are placed in kraals to protect them against occasional very cold weather.

Many farmers provide their livestock with enriched licks (usually containing salt and phosphates) in winter and early summer when the nutritional quality and palatability of pastures is lowest. Vaccinations are provided against botulism, pulpy kidney (enterotoxaemia), *Clostridium septicum* and pasteurella (a major cause of goat deaths), and against scabby mouth and blue tongue in wet years.

Sheep and goats may breed at any time of the year. Dorper ewes mated between February and May produce more twin

lambs than ewes that conceive at other times. This may be desirable from a numerical point of view, but the lambs are then born between June and September when pasture conditions are usually poorer than at other times. That constraint – and the extra demands that two lambs make on a lactating ewe – causes twins to wean at lower weights than single lambs. A more productive approach is to introduce rams to ewes in August and September. Their lambs are then born in December or January when the summer rains should have fallen and pastures are best. Over and above these seasonal variations, lambing percentages vary from year to year according to pasture conditions. Very dry years result in low rates of lambing and poor rates of growth.

Since lambs are the main products of this farming system, the great majority of animals are reproductive ewes. On average, most farmers maintain the following ratios of Dorper sheep: 6% rams, 60% breeding ewes and 15% replacement ewes and rams. Among Karakul the ratios would be 3% rams, 75% ewes and 15% replacements. Farmers who can afford to do so, control and improve the quality of their livestock by

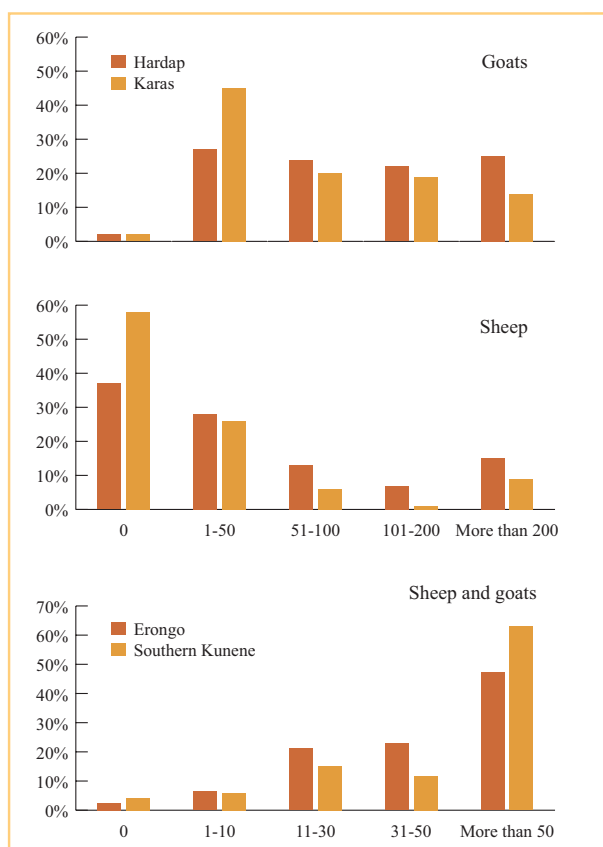
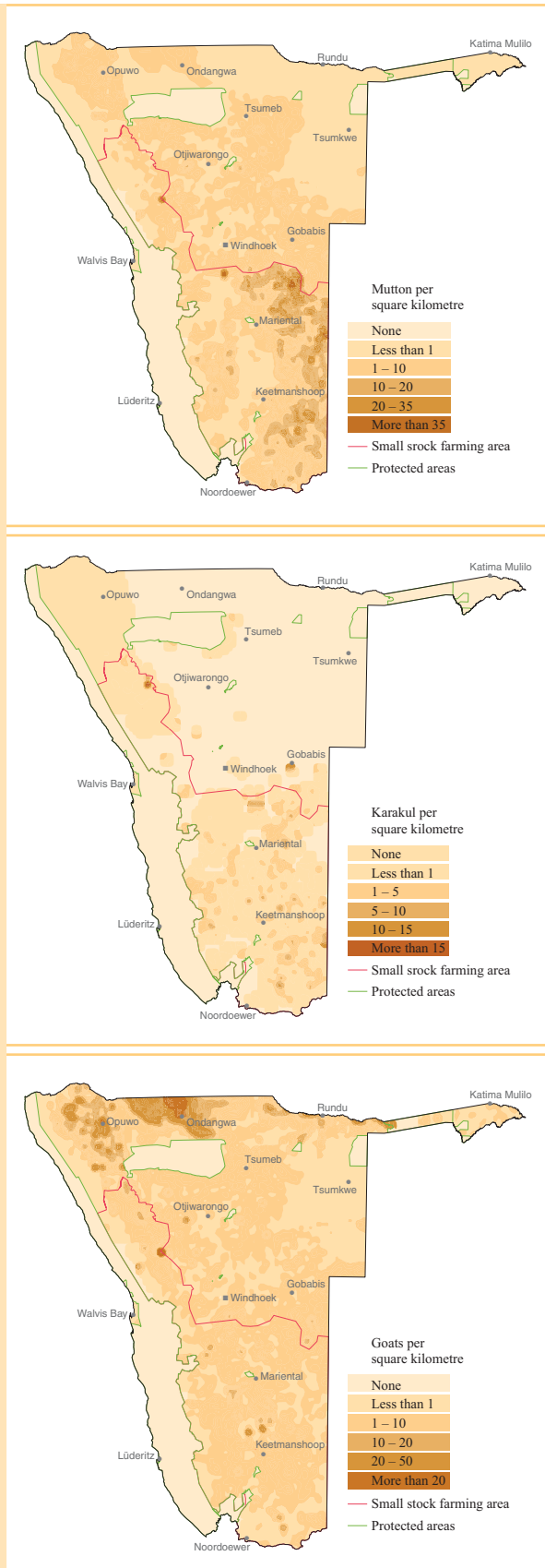


Figure 23. Proportions of households with different numbers of goats (top) and sheep (middle) in the communal areas of Hardap and Karas, and sheep and goats combined in the communal areas of southern Kunene and Erongo (bottom). Note that the scale on the x axes of the top and middle graphs differs from that on the bottom graph.⁶

Figure 24. Densities of mutton sheep, Karakul and goats in Namibia.⁷



introducing stud animals to their flocks. About 20,000 stud animals were registered in 2003 by breeders' associations for various types of small stock. The associations had 246 members who produce stud small stock.

Although densities vary greatly across the country, and from farmer to farmer, the stocking rates on most freehold farms range between 2 hectares in the wettest areas and 10 hectares per small stock animal in the driest areas. All small stock breeds are not the same, however. For example, a Dorper ewe weighing 65-70 kilograms and raising her lamb over four to five months requires as much food as 1.5 Karakul ewes. This is because Karakul ewes weigh 45-50 kilograms and their lambs are slaughtered immediately after birth. Stocking rates of Karakul may thus be 50% higher than those of Dorper. Similarly, Dorper sheep require as much as double the farm area as Blackhead Persian (or Fat-tailed) sheep because they need more, and higher quality food. Farmers with low stocking rates can be more certain of maintaining good pastures, while farmers who stock heavily will produce more lambs and higher incomes in some years, but then risk the of losing much of their stock if little or no rain falls.

SMALL STOCK BREEDS

The *Small-stock* system focuses very largely on sheep (including Karakul) and goats. About 85% of sheep, 90% of Karakul and 26% of all goats in Namibia are within the farming system. The approximate distributions of these animals are shown in **Figure 24**. The only significant, but small numbers of livestock are those of cattle (about 180,000 - mainly in the northern areas), and ostriches, of which there were about 31,000 in 2004 (see page 62).

The percentages of small stock given above are estimates for the whole farming system area. However, there are substantial

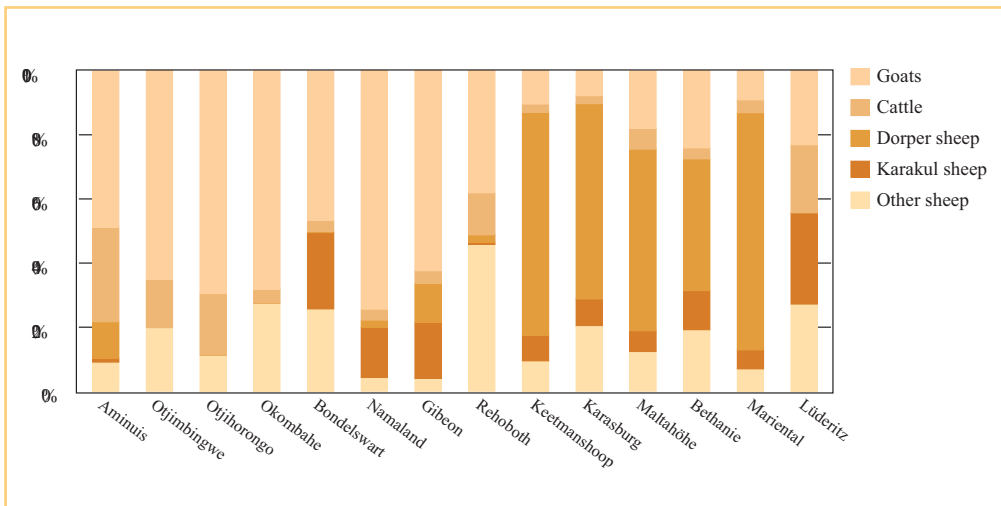


Figure 25. Proportions of livestock held by farmers in different veterinary census districts. Goats predominate in the communal farming districts of Aminuis, Otjimbingwe, Otjihorongo, Okombahe, Bondelswart, Namaland and Gibeon districts, while Dorper sheep make up the highest percentages of livestock on freehold farms in the Keetmanshoop, Karasburg, Maltahöhe, Bethanie, Mariental and Lüderitz districts.⁹

differences in the proportions of livestock between freehold and communal farms. Sheep dominate livestock holdings on freehold farms, whereas communal farmers have higher numbers of goats and cattle, and fewer sheep. Breeds of sheep also differ. Karakul are favoured by communal farmers in the southern regions, Damara sheep predominate in the flocks of communal farmers in Erongo and Kunene, while freehold farmers mainly farm with Dorpers (Figure 25).

Sheep

The biggest change to this farm system in recent decades involved the almost complete replacement of Karakul sheep production with mutton sheep farming. During the 1940s and 1950's, for example, Karakul comprised about 70% of an estimated 4.5 million small stock south of the veterinary cordon fence. The rest were goats and mutton sheep. In 2004, by contrast, only 8% of all sheep and 4% of all small stock in Namibia were Karakul.⁸

Several breeds of mutton sheep and cross-breeds or hybrids are now farmed in Namibia, of which the main ones are Dorper, Damara, Van Rooy and Blackhead Persian. Each has particular characteristics that shape its potential for meat production. Dorper is the breed known best, and it forms the backbone of the country's mutton industry. According to various estimates, between 50 and 65% of all sheep are Dorpers. The breed was developed for farming in arid areas, and is now widely regarded as a source of high quality mutton. Rates of reproduction are high. Of all the lambs born in a year, 80 to 85% may reach weaning and marketable weights of 32 to 36 kilograms at ages of four to five months. Once slaughtered, an animal of that weight would produce a carcass weighing 16 to 18 kilograms.

While Dorpers produce valuable meat, several factors limit their production in Namibia. They require more water and high quality food, and are more vulnerable to parasites than some other breeds. Dorpers also do not flock as well, with the result that they are difficult to shepherd and are unsuited to unfenced communal farmland. Overall, production costs are comparatively high because of the risks of losses and the low stocking rates for the breed.

As a breed indigenous to Namibia, Damara sheep are hardy, being well adapted to conditions of limited water and food supply. Other attractive features include its tasty meat, good resistance against parasites, and a varied diet with up to 64% of its food consisting of browse (this is similar to goats and higher than other sheep that eat more grass). Damara ewes also take exceptional care of their lambs. The breed is well suited to communal areas because it requires relatively little care. There is an increasing demand for its genetic material amongst sheep breeders elsewhere in the world.

Van Rooy sheep have favourable characteristics that include hardiness, high rates of ram fertility, strong flocking behaviour, unlimited mating season and good maternal care. The breed originated in South Africa. By contrast, Blackhead Persian sheep probably have their origins 4,000 years ago in Somaliland and Arabia. These small sheep have lower needs for food and water, and greater heat tolerance and fertility than most other breeds. They may breed in any season, and have high resistance against disease and parasites. The meat is, however, fatty and unsuited to the tastes of most consumers who buy on the formal market.

The majority of Karakul are on scattered freehold farms, particularly in Hardap and Karas. However, the Ministry of

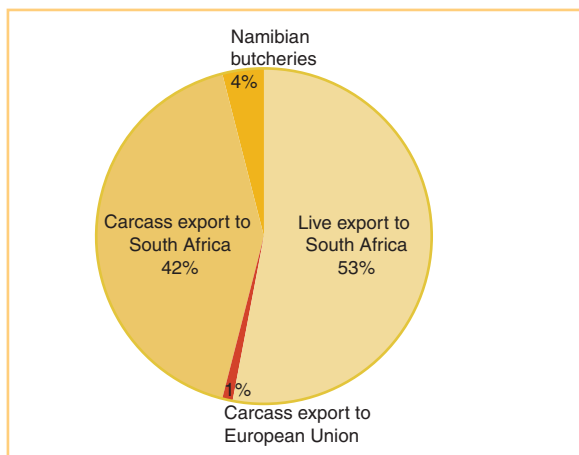


Figure 26. Ninety-six percent of 922,860 sheep were exported in 2004, almost all going to South Africa. Butchers bought the remaining 4% for Namibian consumers.

Agriculture, Water & Forestry is now encouraging communal farmers in Erongo and southern Kunene to farm with Karakul since they do well under arid conditions and because pelt prices are rising. In addition, Karakul provide wool suited for carpets and good mutton (although it is also too fatty for the formal market). Compared to other breeds, Karakul production is usually less risky because they require less maintenance and have high levels of resistance to parasites. During very dry periods, the ewes survive because their lambs are slaughtered and used profitably. Karakul gather in flocks and are thus easy to shepherd. The preparation of pelts and shearing of wool are fairly skilled and labour intensive tasks.

Goats

Of approximately 2.5 million goats in Namibia (**Figure 24**), about 40% are Boer goats and 60% belong to indigenous breeds. In addition, there are a handful of Angora and Dairy goats in Namibia. Mohair production from Angora goats has not been profitable, however, and feasibility assessments of goat milk and cheese production from Dairy goats on communal farms in Omaheke have not yielded clear results.

Boer goats are indigenous to Africa. Their value lies in hardiness, high reproductive rate (lambing percentages of 180% are possible as a result of frequent twins), high resistance against external parasites, and their lean, tender meat which has a low cholesterol content. They also prefer to browse on woody plants, thus consuming little grass and hardly competing with

cattle that depend more on grass. Some constraints to farming with Boer goats include lambs being badly infected by lice and ticks, low resistance to several diseases, and poor consumer demand and a lack of market development for goat meat in Namibia. However, there is a lucrative export market for live goats to South Africa (see below).

Indigenous goats, as a broad category, cover animals locally called by such names as Caprivi, Kavango, North Central and North Western goats. As the labels reflect, most are kept by small-scale farmers in the northern communal areas, where they form an important component of the *Small-scale cereals and livestock* farming system (Chapter 4). Genetically and as productive animals, these indigenous breeds have considerable value due to their fertility, high rates of survival and resistance to disease.

SMALL STOCK PRODUCTION AND MARKETING

Sheep and goats are sold in several ways: at auctions, directly to local buyers, abattoirs and butchers, and on an ad hoc informal basis. Auction sales have evidently declined in recent years, and many farmers now prefer to sell directly from their farms. This saves transport costs to auction pens and commissions charged by middlemen. Local buyers are often called speculators who buy up animals, keeping them until prices are sufficiently attractive to sell to local abattoirs or to export the animals to South Africa.

Most sheep sold for mutton production are exported either live or as whole carcasses after slaughter at export abattoirs (**Figure 26**). To add local value through slaughtering and the processing of meat cuts, the government has been discouraging the export of live animals. As a result, the number of sheep carcasses exported rose from an average of about 85,000 per year during the 1990s to 390,941 in 2004, which then made up 44% of all sheep exports (**Figure 27**). New regulations require that the figure be raised to 85%, so that live exports of sheep are limited to the remaining 15% of production. The average auction price per live sheep was N\$304 during 2004, and so the formal market production of 922,860 head was worth some N\$285 million.

While the export of mutton carcasses and cuts can be promoted, the same is not true for goats. Most of the 262,972 goats exported in 2004 went to KwaZulu-Natal and the Eastern Cape in South Africa mainly for sale to Muslims, Zulus and Xhosas who buy the animals live. The goats are bled for religious and ritual purposes, goats of various colours being required for different occasions. This market has proved

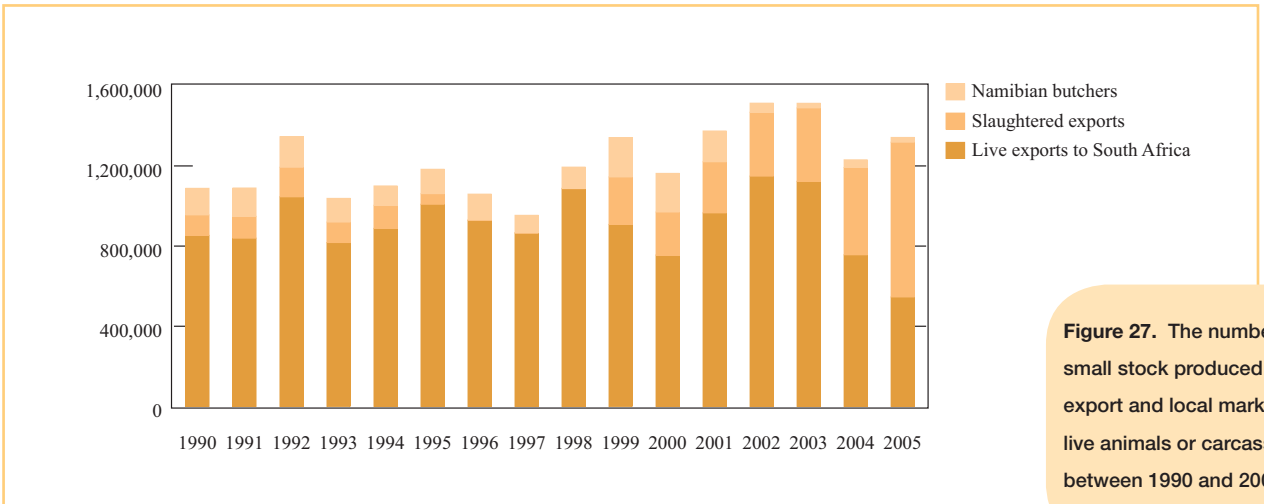


Figure 27. The number of small stock produced for export and local markets as live animals or carcass exports between 1990 and 2005.¹⁰

lucrative to communal farmers in southern Namibia, and prices for goats have been higher than those for sheep over the past several years. Exports of goats in 2004 were worth some N\$40 million to Namibia.

An average of about 75,000 Karakul pelts was produced each year during the mid-1990s when the market was at its lowest. Annual production has risen to an average of 140,000

pelts over the last few years. The value of pelt sales to Namibia in 2005 amounted to some N\$18 million. Fresh pelts are dried by farmers before being sent for sorting and grading to Agra in Windhoek, which then dispatches the pelts for to be auctioned at the Copenhagen Fur Centre in Denmark. Agra also exports Karakul wool, about 95% of a total production of 400,000 kilograms in 2004 being sold in South Africa.



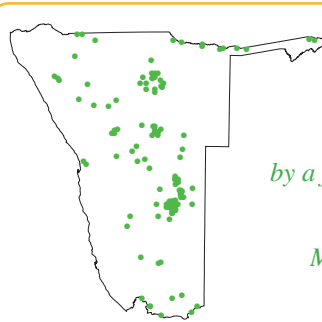
About 60% of all Namibian goats belong to indigenous breeds, variously called North-western, North-central, Caprivi or – as the ones shown here – Kavango breeds. Many of these goats have valuable genetic properties that contribute to high fertility and resistance to disease.





7

INTENSIVE AGRICULTURE



Commercial production, largely of high value commodities on small farms by a few farmers using comparatively intense management and specialist knowledge. Many products are exported or consumed by a fairly select local market.

The other three farming systems described in this book cover large expanses of the country and involve considerable numbers of farms and farmers. Much of the production also occurs over extensive periods of time. By contrast, the farming system of this chapter is one of intense, mostly skilled agriculture, each farmer usually specialising on one kind of crop or livestock: ostriches, dairy products, grapes, olives, dates, flowers, pigs, tobacco, paprika, vegetables, fruit, groundnuts, sunflowers, cotton, lucerne, poultry, maize, wheat, and mahangu as a commercial crop. Most of the farm units are small, although some of the commodities are produced on sections of large cattle or sheep farms.

DEVELOPMENT OF THE SYSTEM

Namibia has a long history of producing a variety of foods, usually in small quantities for domestic use. Bare necessity

This farming system produces a surprising variety of commodities, including various vegetables (top left), yellow maize (top right) and tables grapes, here cultivated at Aussenkehr along the Orange River (bottom).

drove early settler farmers to grow virtually all their own food, and the German administration made considerable efforts to encourage the production of cereals, fruit, vegetables, tobacco and dairy products (see page 8). In those years, it was difficult to transport and market fresh produce over any distance or period of time. Bear in mind that the total Namibian population in 1921 was only 229,000. That had grown to 440,000 by 1951, but most people were still dispersed in rural homes and were not part of the market economy. Providing food for sale to a few, scattered and occasional customers was not tenable. The need for people to be self-reliant was always even greater among households in communal areas. Here, the absence of a cash economy, marketing services and infrastructure led to the development of the small-scale, so-called subsistence farming system that still dominates northern Namibia (Chapter 4).

However, much of the need to produce food for self-sufficiency has disappeared in recent years. This is true for both farmers on freehold and communal land. Incomes from livestock sales or from off-farm incomes are now used to buy flour, milk, fruit and vegetables, most of which are imported from South Africa. Instead, the face of Namibian agriculture

has come to be dominated by commercial beef (Chapter 5) and mutton (Chapter 6) production. The development of this commercial production on freehold farms over the past 50 years was geared largely to the sale of meat to consumers in South African cities.

But things are changing as increasing numbers of farmers have again turned to producing other foods. Why this shift? There are several reasons, the most important of which are a consequence of Namibia's independent status since 1990. New markets for Namibian exports have opened and been promoted, examples being the export of ostriches and table grapes. The government has promoted an overall policy of self-sufficiency to reduce dependency on imports. Programmes funded by donors have promoted new crops, dates being one example. New irrigation schemes have been proposed under the auspices of the Green Scheme, in which small farms are intended to produce cereals, vegetables and fruit, and perhaps even fish. The National Horticultural Initiative targets fruit and vegetable production by developing marketing systems, providing training, credit and new technology.

Other explanations for the resurgence in interest in high value commodities are due to market forces, in particular opportunities created by growing international trade. Local markets have grown, too. For example, Namibia's urban population increased from 261,300 people in 1981 to 676,200 in 2001, thereby

creating concentrations of consumers who buy more select and processed foods, such as bread, olives, fresh fruit and flowers. Finally, many farmers have realised that new crops could indeed be produced under local farming conditions.

DISTRIBUTION, EXTENT AND VALUES

The total number of farmers of *Intensive agriculture* is small, perhaps numbering no more than 500 people. Of roughly 26,000 hectares used by this type of farming, two-thirds are planted with white maize. The remaining areas used for other commodities are small, usually less than 1,000 hectares for each type of crop or livestock.

The majority of farms are clustered in places where there is sufficient water for irrigation: near the Orange, Okavango, Zambezi and Kunene Rivers, below the Naute and Hardap Dams; and above underground aquifers at Stampriet, Hochfeld, the Tsumeb-Otavi-Grootfontein 'Maize Triangle', and along the Swakop, Hoanib and Omaruru Rivers. Most dryland maize, sunflowers and cotton is grown in the Maize Triangle because of the presence of relatively fertile luvisol soils (see page 27) and higher rainfall, a consequence of moist air being cooled as it is lifted by the surrounding hills.

To the producers alone, the total value of produce amounted to at least N\$358 million in 2004. Most of this came from food sold to Namibian consumers, but a sizeable proportion was

AREAS USED FOR PRODUCTION, THE VALUE OF PRODUCTION FOR THE FARMER AND TOTAL VOLUME PRODUCED. MOST FIGURES ARE FOR THE YEAR 2004.¹

Commodity	Area farmed (hectares)	Production value (millions of N\$)	Volume produced
White maize	17,192	61.6	25,344 tons
Yellow maize	1,052	2.2	1,752 tons
Wheat	1,985	15.1	8,262 tons
Sunflowers	114	0.3	105 tons
Groundnuts	226	0.9	242 tons
Cotton	1,056	4.1	1,955 tons
Commercial mahangu	437	0.34	170 tons
Lucerne	360	8.0	8,002 tons
Beans	788	no information	472 tons
Dates	156	34.0	1,800 tons
Grapes	1,292	86.1	8,473 tons
Vegetables	522	28.8	19,475 tons
Fruit	173	4.0	3,445 tons
Dairy products	no information	58.0	20,530,000 litres
Pigs	no information	27.4	1,960 tons
Ostrich meat and leather	no information	12.7	9,512 birds
Olives	63	no information	no information
Chicken eggs	no information	14.3	3,437,000 dozen
Total	about 26,000	358.0	

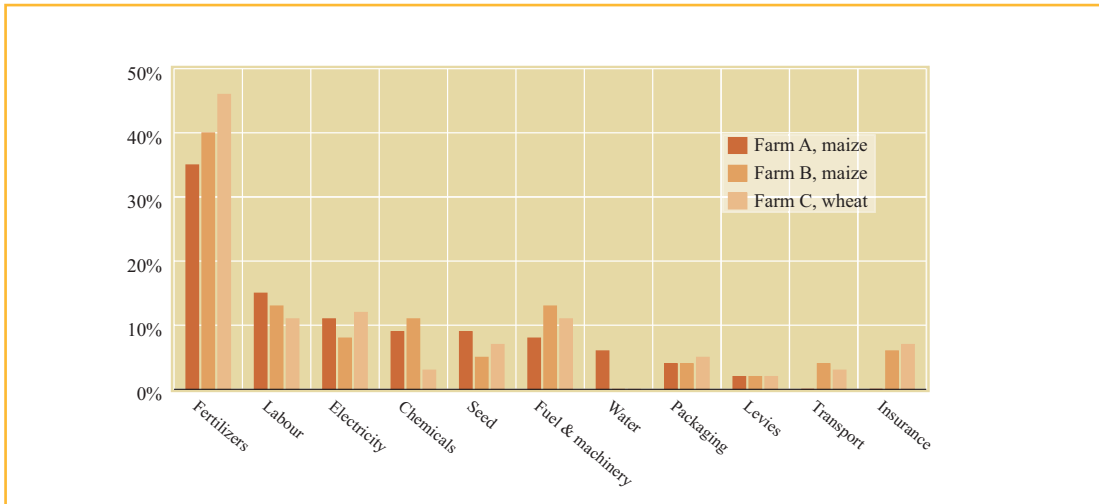


Figure 28. Proportions of total costs in producing white maize and wheat on three irrigation projects in northern Namibia.³ (Because the government developed these farms there are no input costs due to capital expenditure on land and infrastructure.)

also earned in foreign exchange, for example from exports of dates, table grapes and even maize to Angola. About 50% of all fruit and vegetables grown in Namibia are exported to South Africa. Various reports suggest, as an average approximation, that there are two employees per hectare of very intensive production (for examples, grapes, fruit and vegetables) and one employee per 50 hectares of less intensive production (maize and cotton, for example).² Based on those assumptions, about 7,000 people earn their living from this farming system. Using an average household size of 5.7 individuals (as reported in the 2001 Population & Housing Census), the farms support in the region of 40,000 people.

INPUTS

A good supply of water is a necessity for most of the crops and animals within this farming system. Flood irrigation, centre pivot systems or sprinklers are predominantly used to supply water. The majority of irrigation farms are small, usually covering less than 100 hectares. For example, the 34 farm units at the Hardap Irrigation Scheme each cover an average of 67 hectares. In total, some 9,000 hectares are now under irrigation in Namibia, and various estimates suggest that another 40,000 to 50,000 could be irrigated in the country.

Approximately one-third of all irrigated land in Namibia is used for the production of white maize. The irrigated areas made up an average of 13% of all land planted with white maize between 1995 and 2004, but contributed 49% of all white maize production. The difference in percentages was due to annual yields from irrigation (6-8 tons/hectare) being several times higher than those on dryland or rain-fed fields

(1-2 tons/hectare). The effects of irrigation are two-fold: in supplying more water, and in doing so regularly, especially during the most critical stages of growth. The second aspect is the most important because the majority of losses in potential yield are due to extended periods of dry, hot weather. Indeed, yields of all rain-fed crops would be much greater if Namibia's rain were more predictable and reliable.

Together with water and electricity to pump it, other costly inputs are fertilizers, agricultural machinery, fuel, pesticides, seed, packaging and transport to markets. The proportions that these make up of total production costs obviously vary from crop to crop and from one farm to another (**Figure 27**). Labour inputs are likewise substantial; these add to the costs but also provide employment. An important point is that all the costly inputs are vital not only for production, but also in ensuring that the produce is of high quality. Many of the commodities target discerning customers, and often compete with similar foods produced by farmers in other countries.

A rather high level of specialist knowledge concerning production and marketing is often required to be a successful farmer. However, relevant information and experience is not always available, particularly for Namibian conditions and for newly introduced crops. And because there are few farmers, there isn't the same pool of collective expertise that has built up over the years among the many beef and mutton producers.

PRODUCTS

Some of the many crops and livestock are farmed on a very limited scale, while other products contribute significantly to Namibia's food supplies and economy, as described below.

Accounts are also given for a sample of less significant crops to illustrate some of the potentials and difficulties in producing rather specialized commodities.

Dairy produce

At the time of writing, 21 farmers produce milk on a commercial basis. Input costs are high, especially those paid for lucerne and processed feeds that are required for the cows. Net income to the farmer amounts to less than 10% of the retail cost of a litre of milk. Dairies thus need between 100 and 200 lactating cows, each producing 10 to 20 litres per day to be profitable.⁴ In 2004, 47% of all commercially produced milk was sold as fresh milk or milk with an extended shelf life. The rest was processed into UHT milk, cheeses and butter. Current production levels provide for approximately half of Namibia's needs for dairy products.

Dates

Since the government began to support date production at irrigation schemes along the Orange River and at the Naute Dam in 1993, Namibia has become regarded as southern Africa's leading date producer. A total of some 156 hectares of dates has been planted, from which 1,800 tons of fruit were produced in 2004 at a total production value of N\$34 million. Dates can only be grown where their considerable water requirements can be met, which amount to between 22,000 and 25,000 cubic metres per hectare each year. Yields vary between 70 and 150 kilograms per tree, depending on the cultivar. While all dates have thus far been grown on large-scale irrigation schemes, there is potential for the fruit to be produced by smaller scale farmers.

Grapes

The majority of Namibia's grapes are grown on irrigation schemes along the Orange River, particularly at Aussenkehr, and to a lesser degree below the Naute and Hardap Dams. Most production is exported as table grapes to Europe, where they can be sold earlier than those from other exporters to Europe. That comparative advantage has enabled the Namibian grape industry to profit and grow rapidly. For example, the producer value of grapes rose from N\$21.8 million in 1995 to N\$86.1 million in 2004. A new Green Scheme irrigation project, known as Tandjieskoppe near Noordoewer, will increase grape production substantially and add to the almost 1,300 hectares now planted with grapes. At least two vineyards produce wine on a limited scale.

Mahangu

While as many as 150,000 households grow mahangu for domestic use (see page 37), it is only in recent years that it has started to develop into a commercial crop. Considerable efforts have been made to further this development, notably by improving marketing channels, storage and milling facilities, and urging that mahangu be served in government institutions, such as hostels and prisons. Mahangu has also been declared a 'controlled crop' to protect it from competition from imported cereals, and to guarantee producers that they will be paid prices equivalent to those for white maize (the other controlled crops are white maize, wheat, vegetables and fruit). The number of commercial mahangu producers remains small, however, at estimated 50-100 growers. Most of their farms are in south-western Kavango and Oshikoto.

Oriental tobacco

Many areas in Namibia are well suited to this crop since it can be grown in low rainfall areas, has high tolerance to drought conditions, has a short growing season of between 60 and 120 days, and does well in soils with a high sand content. The crop is now grown by eight farmers who obtain yields of 700-950 kilograms per hectare and incomes of N\$7,000-N\$11,000 per hectare. These are several times higher than earnings from maize, and the irrigated water requirements of oriental tobacco are five times lower than those of maize. Oriental tobacco is exported for use as an aromatic additive to other tobaccos. One farm in Caprivi grows small quantities of Virginia tobacco.

Ostriches

There were 11,700 ostriches being farmed in 2005, mainly in Hardap and Karas, a great reduction from over 52,000 birds in 1998.⁵ The decline in production has largely been for reasons of poor economic returns, especially due to the high costs of imported feed and low export prices. The specially built ostrich slaughtering facility at Keetmanshoop has been converted into a mutton abattoir. Namibia also exported large numbers of live ostriches and ostrich eggs during the early 1990s; for example over 60,000 eggs were sold in 1994. This number rapidly dwindled until exports ended in 2000. Foreign farmers eager to establish their own flocks paid up to N\$300 per egg and several thousand N\$ per bird.⁶

Vegetables

A variety of vegetable crops are grown commercially using intense production methods, usually under irrigation. Onions,

cabbage, tomatoes and potatoes predominate, while significant quantities of carrots, butternut, green maize, pumpkins, asparagus and beetroot are also grown. Marketing is the greatest difficulty faced by local farmers, particularly as a result of stiff competition from South African suppliers who are generally better at guaranteeing to retailers that they will regularly deliver the range of high quality vegetables needed. Such requirements of volume, variety and reliability are difficult to meet for Namibian vegetable farmers, each of whom might have just one or two ripe crops at any one time. One goal of the new National Horticultural Initiative is to help local growers meet these requirements by coordinating and streamlining the delivery of vegetables to the bigger retailers. The Namibia Horticulture Market Share Promotion system limits imports by requiring that wholesalers buy at least 12% of their vegetable (and fruit) stocks from Namibian farmers.

Wheat

All Namibian wheat is grown in winter under irrigation. Planting normally takes place between May and July, while harvesting is in November and December. Yields average between 5 and 6 tons per hectare. The crop does best in the cooler southern areas, and so much of the country's production is at the Naute and Hardap Dams, while smaller areas are cultivated at agricultural projects in Kavango (Shadikongoro, Musese, Shitemo and Vungu Vungu). Total annual production over the last 10 years has averaged 5,700 tons, which provided 10% of all the wheat requirements of Namibia. The remaining 90% was imported.

White maize

Areas planted with white maize have almost doubled from 9,000 hectares in 1995 to 17,192 hectares in 2004, when 220 farmers were growing white maize commercially.⁷ Most dryland maize is grown in the Tsumeb-Otavi-Grootfontein 'Maize Triangle', and elsewhere in Otjozondjupa and Omaheke. Dryland maize production is risky. On average, crops fail in three of every eight years as a result of inadequate rain, farmers break even in two years, and make a profit in the other three years.⁸ Irrigated maize is produced along the Orange and Kavango Rivers, at Etunda close to the Kunene River, at the Hardap and Naute Dams, and by using underground water reserves at Stampriet and in the Maize Triangle. Namibian producers are protected by government regulations from competition by cheaper imports. On average, 24,270 tons were marketed commercially over the past 10 years, and another 81,800 tons were imported each year.

The following brief notes describe the many other crops and livestock produced on a limited, but intensive scale:

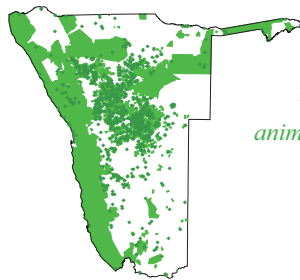
- β **Beans:** several varieties of beans are grown for cattle feed.
- β **Cacti:** many farms have small fields for fodder. There is potential for fruit and fruit products from prickly pears, such as jams, jellies, liquid sweeteners, juices and alcohol.
- β **Cotton:** average annual production over the last 10 years has been 3,076 tons. Yields average 1.5 tons per hectare.
- β **Flowers:** Several growers supply fresh flowers, mainly to buyers in Windhoek and Swakopmund. The flowers are grown in climate-controlled tunnels.
- β **Fruit:** mainly melons, citrus and mangos are produced on irrigated plots across the country. Total production in 2003 was 3,445 tons, and at least another 5,200 tons of fruit was imported for commercial consumption.⁹
- β **Groundnuts:** grown on dryland fields and irrigation, largely for export to South Africa and to supply a peanut butter factory in Grootfontein.
- β **Lucerne:** produced throughout the year for sale to dairy farmers. Only grown under irrigation, between 40 and 50% of production being grown at Hardap.
- β **Olives:** about 17 farmers recently began to produce table olives and olive oil, mainly for the Namibian market.
- β **Paprika:** grown on at least four farms, mostly for export to South Africa where it is used for food colouring.
- β **Pigs:** local production grew from less than 649 animals in 2002 to about 28,000 weaners in 2005, when there were 25 pig farmers in Namibia.
- β **Poultry:** about 41 million eggs worth over N\$14.3 million were produced in 2004. Almost all chickens for consumption are imported.
- β **Sunflowers:** an average of 224 tons was produced annually between 1995 and 2004. The only sunflower oil processor in Namibia has now closed.
- β **Yellow maize:** an average of 1,500 hectares was planted annually between 1995 and 2004 for animal feed.





8

NATURAL RESOURCE PRODUCTION



The use and management of indigenous animals and plant resources for commercial purposes. Most revenue is derived from tourism, trophy hunting and the sale of live game and meat.

Indigenous wildlife and plants have always been valuable resources for Namibians, particularly for rural people living in subsistence economies based on pastoralism and hunting and gathering. Most of the resources are used in the form of material commodities, such as fuel wood, wild fruits and thatching grass, or to obtain indirect benefits, for instance from livestock grazing and browsing. These are traditional uses. What is new – and the focus of this chapter – is the use and management of these resources to gain direct commercial benefits.

Enterprises within the production system differ from farming in several ways, but most notably that wild animals and plants are used rather than domesticated ones. The *Natural resource production* system also does not aim to produce food, which is the function of most Namibian agriculture. Another difference lies in the fact that the value of the wild plants and animals usually depends on them being in their natural habitats, rather

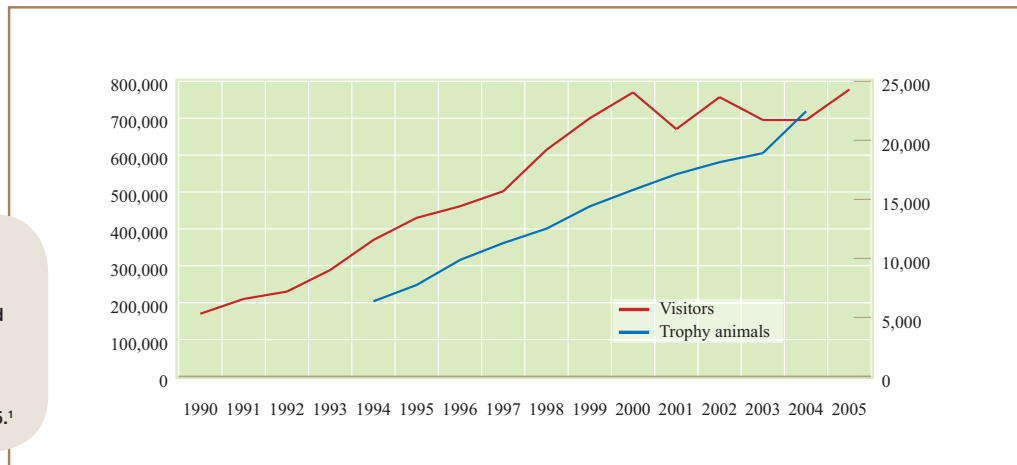
than within a fenced camp or field. This is because tourism is the predominant source of income, and tourists much prefer to see indigenous resources in pristine, scenic environments.

But there are also links to farming. The two activities often occur on the same land and the same people frequently work in both systems. The ways in which the two enterprises manage their resources are often similar. And, as with farming, we can ask the same questions of the *Natural resource production* system: what commodities are produced, how are they produced and sold, who are the producers, who and where are the consumers, and what is the value of the produce? The rest of the chapter attempts to answer those questions. Before doing so, however, some further introductory comments.

A further similarity with agriculture is that farmers have ownership rights over their land and stock. However, it is only recently that rights over wildlife and indigenous plants have been given to private landowners or communities. This is one reason why the production system is so new. Commercial rights over wildlife were first given to freehold farmers in 1967, while communities in communal areas got the same rights much later when policies were adopted to promote

Indigenous animal and plant resources are commercially valuable in many forms, for example as aesthetic attractions (a kudu bull), useful materials (thatching grass) and objects of pursuit (a lion).

Figure 29. The number of foreign visitors to Namibia (left y axis) and trophy animals hunted (right y axis) each year between 1990 and 2005.¹



community-based natural resource management (CBNRM). The legislation to provide commercial rights over natural resources on communal land was passed in 1996 and 2001.² Another effect of these policy changes was to move wildlife and plants into the realm of the private sector, which then drove the production system's rapid growth.

A second reason for this being a new system is that its revenues depend very heavily on the tourism industry, which has recently boomed throughout much of the world. For example, the number of visitors to Namibia increased almost five times between 1990 and 2005 (**Figure 28**). The highest revenues come from the many relatively wealthy visitors, particularly from Europe and South Africa. Although much has been done to develop the supply of attractions for tourists, especially through the development of services, Namibia will need to continually promote demands for tourism if it is to remain competitive.

There is often a conflict of interests between farmers and those who benefit from *Natural resource production*. For example, agriculture destroys indigenous plants and animals through the clearing of land, and wild animals may damage crops and livestock. However, farming and incomes from wildlife and plants often complement each other, particularly in environments where agricultural productivity is low. It is here that the same farmlands are used for livestock and tourism, game meat production or trophy hunting, for instance. Moreover, it is largely farmers who have adopted this production system, which, in turn, has benefited from the use of adapted farm management and marketing practices. As examples, valuable wild animals and plants are now being bred, selected breeding

stock is being traded, and pastures are managed to optimise conditions for wildlife.

COMMODITIES

Namibia is richly endowed with large mammals – generally called wildlife – and they form the backbone of the production system. As shown in the table on the next page, there are at least two million of these animals, a number roughly similar to those for cattle, sheep and goats in the country (see Figure 3 on page 11). It is also noteworthy that almost 90% of wildlife is on freehold farms.

While wildlife dominates the production system, a growing number of plants are being found to have commercial value. Products from the following species are now being marketed: marula, blue sourplum, monkey-orange, devil's claw, Kalahari melon and !Nara. Most of the products are bought by relatively wealthy people interested in alternative or novel medicines, oils and cosmetics. The volumes of some products are significant. For example, about 600 tons of the dried tubers of devil's claw and 15 tons of dried !Nara seeds have been exported annually in recent years.³ The potential production of oils, liquors, fruit and juices, jams, relishes, medicines and cosmetics from at least another 30 species of plants is being investigated. Timber for furniture is no longer harvested because Namibia's stocks of kiaat – the most valuable species – were severely depleted by logging between the 1950s and 1980s.

There is also a sizeable craft industry. Most items are produced in the northern communal areas as carvings from the wood of kiaat trees or baskets woven from palm leaves and grass. About 100,000 cubic metres of firewood is sold each

ESTIMATES OF THE NUMBER OF LARGE MAMMALS IN NAMIBIA⁴

Species	Protected areas	Communal areas	Freehold farms	TOTAL
Springbok	18,932	91,070	621,561	731,563
Oryx	8,265	30,054	350,092	388,411
Kudu	2,497	3,595	345,801	351,893
Warthog	209	40	173,866	174,115
Hartebeest	1,583	700	122,805	125,088
Mountain zebra	3,974	13,242	55,520	72,736
Ostrich	3,787	5,550	36,336	45,673
Eland	2,084	389	34,743	37,216
Burchell's zebra	18,098	20	7,303	25,421
Blue wildebeest	5,199	470	16,623	22,292
Common impala	77	385	14,980	15,442
Giraffe	3,491	1155	5,769	10,415
Elephant	8,993	964	0	9,957
Leopard	2,000	2,000	4,000	8,000
Cheetah	765	765	2,970	4,500
Waterbuck	0	0	4,475	4,475
Blackfaced impala	1,500	0	1,870	3,370
Hippopotamus	1,262	300	0	1,562
Buffalo	1,275	90	0	1,365
Sable antelope	316	15	902	1,233
Roan antelope	560	95	435	1,090
Others	1,536	432	655	2,623
TOTAL	86,403	151,331	1,800,706	2,038,440
<i>Percent</i>	<i>4%</i>	<i>8%</i>	<i>88%</i>	<i>100%</i>

year, mainly to consumers in urban areas, while approximately 48,000 cubic metres of charcoal is sold locally and as exports to South Africa and Europe. Wild silk is produced from the cocoons of a moth that lives off acacia trees. The silk now sells for about N\$1,000 per kilogram.

PRODUCTION

Wildlife is marketed in four main ways: through tourism, trophy hunting and as live game and slaughter products (venison, skins and horns). The first of these – tourism – is the most important in giving value to the production system since so many visitors are obviously attracted by Namibia's abundant wildlife. Many other attractions also draw tourists, such as traditional cultures, historical sites, birds, fish, pristine desert landscapes and other geological features. In addition, tourism is enhanced – indeed made possible – by the fact that visitors feel safe, and can travel on good roads, spend the night in excellent accommodation, and see wildlife against a backdrop of spectacular scenery.

While it is probably impossible to measure the exact degree to which wildlife attracts tourists, it is reasonable to assume

that everyone visiting a national park or game reserve does so to see these animals. A minimum of 210,000 visitors or maximum of 382,000 people were recorded as entering parks and reserves in 2003. The difference between the two estimates is due to the fact that it is not known how many people were counted more than once because they visited more than one park in that year.⁵ The numbers are nevertheless substantial.

Even though national parks are favourite attractions, the great majority of accommodation for tourists is on freehold farms (**Figure 29**). Most of the guest farms offer attractions and activities related to wildlife, such as game drives and walks, and game viewing at waterholes. In addition, some farm owners have purchased game to boost the numbers and diversity of wildlife they have on offer. These include several species that did not originally occur in Namibia or in areas where the farms are located. Examples are blesbok, black wildebeest, sable and roan antelope and waterbuck.

As with tourism, the value of trade in wildlife has increased greatly. Animals are sold live in three ways: in direct sales from game dealers to farmers (39%), at auctions (16%),

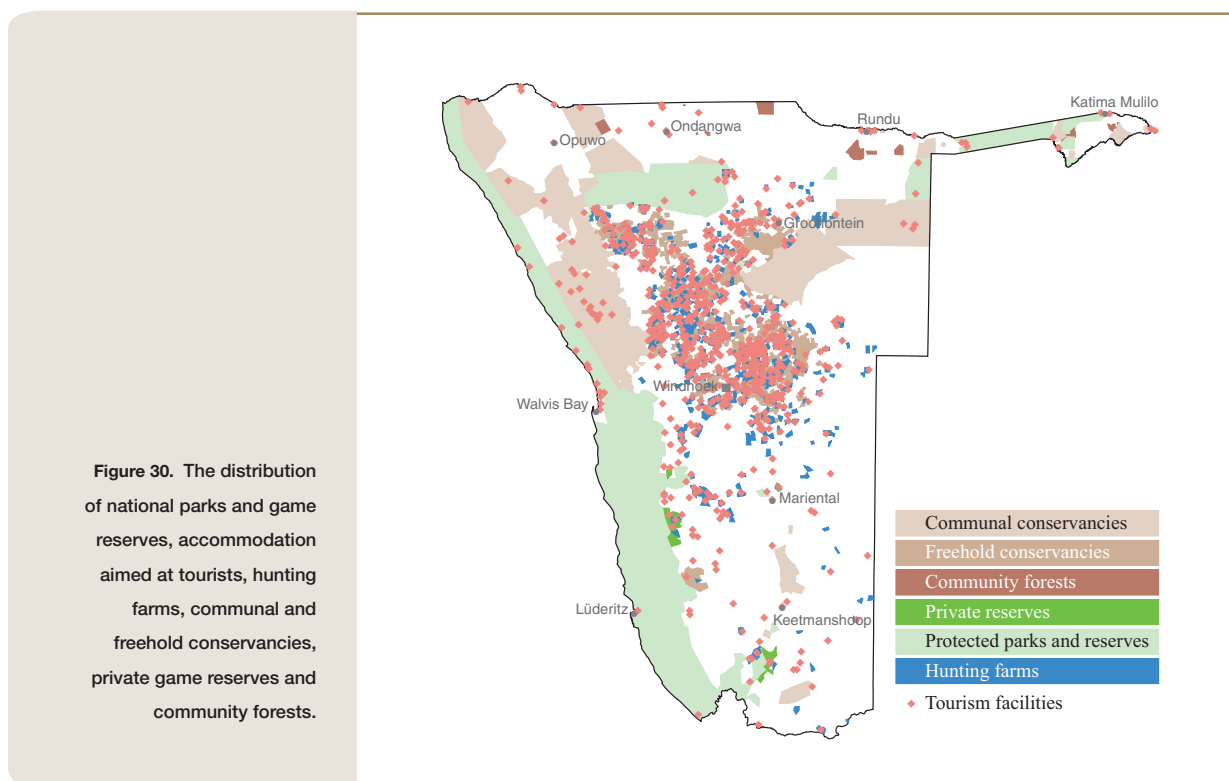
and as exports (46%) which mainly go to South Africa. The percentages are those of 12,376 animals sold in 2001.⁶ Springbok, oryx, hartebeest and giraffe were exported in the greatest numbers.

The number of trophy hunters increased from 1,918 in 1994 to 5,363 in 2004, while the number of animals hunted more than tripled over the same period from 6,365 to 22,462 animals (**Figure 28**). Most of the hunters in 2004 came from Germany (35%), the USA (21%), Austria (8%) and France (7%). Oryx, kudu, warthog, springbok and hartebeest made up 65% of the animals hunted in 2004, most of which were hunted on freehold farms. Other more valuable trophies, such as elephant, lion, buffalo and hippo, were hunted in hunting concessions in communal areas and parks and reserves.

Namibian butchers buy game carcasses from farmers, process the meat and sell it as venison. For example, two studies showed that freehold farmers in the central regions of Namibia annually harvest about 3,500 to 3,600 kilograms of live weight per 10,000 hectares of farm land.⁷ Oryx, kudu, springbok and hartebeest are the most favoured kinds of venison. Springbok are sometimes harvested in bulk during night culls in south-eastern Namibia. A total of 51,081 skins and 16,141 pairs of

horns were sold in 2001. Most kudu hides are exported to producers of horse riding boots in Greece, while oryx hides are sold to Hong Kong where they are made into protective clothing.

Much of the production described above is concentrated in national parks or reserves and on freehold farms. In 2005, a total of 667 farms covering 35,300 square kilometres were registered for trophy hunting, and there were at least 400 lodges on freehold farms. Some farms have also been converted into private game reserves. There are, however, several other land management areas that have increasingly become part of this production system. The most notable of these are conservancies in communal areas. At the end of 2005, 46 such conservancies had been established, covering 105,148 square kilometres, or about 35% of all communal land. Indeed, the promotion of the *Natural resource production* system has been a prime motive for the formation of conservancies, especially in bringing new incomes from wildlife to residents on communal land. For example, there are now 11 agreements between conservancies and tourist and lodges and camps, and 20 joint ventures with professional trophy hunters. The incomes are mainly derived from agreements to share profits generated by tourism and





hunting, from jobs created by the private sector operators, and from the harvesting of game.

Wildlife and tourism has been the main focus in conservancies, whereas emphasis has been placed on benefits from plant resources in community forests. As of the beginning of 2006, 13 community forests had been established, covering almost 3,950 square kilometres in which over 36,000 people live. Some of the community forests and communal conservancies overlap geographically. A total of 1,008 farms are included in 25 freehold conservancies that stretch over 43,259 square kilometres. The main purpose of the freehold conservancies is for farmers to co-operate in managing and protecting their wildlife resources.

Although studies to estimate the total value of this production system have yet to be done, the revenue earned is substantial, as shown in the table. These figures cover only commercial sales, and would be much higher if the consumptive values of domestic uses were included, for example the value of firewood used in rural homes. Figures for the value of craft, thatching grass, game meat, hides and horns are also not available.

Revenues have also grown. The value of trophy hunting grew at an annual rate of 18% between 1980 and 2001, while tourism incomes grew at approximately the rate reflected by

Most lodges and camps for tourists have been established by the owners of freehold farms in central Namibia. Guests at the farms enjoy excellent accommodation, food and wildlife viewing.

the increasing number of visitors shown in **Figure 28**. Income from tourism to community members of communal area conservancies rose from N\$401,700 in 1999 to N\$7,644,000 in 2005, while their income from trophy hunting increased from N\$448,500 to N\$2,663,000 over the same period.⁸

ESTIMATES OF THE GROSS EXPENDITURE ON NATURAL RESOURCES AS COMMERCIAL PRODUCTS.⁹

Commodity or activity (year of estimate)	Annual value
Trophy hunting (2005)	N\$316 million
Live game sales (2002)	N\$14.3 million
Wildlife viewing (2005)	N\$2,700 million
Fuel wood sales (2004)	N\$63 million
Charcoal (2004)	N\$75 - N\$100 million
Select plant products (various years)*	N\$21,585,000
Approximate total	N\$3,200 million

*Marula, blue sourplum, monkey-orange, devil's claw, Kalahari melons, !Nara





9

OPPORTUNITIES AND CHALLENGES

The earlier chapters focused largely on the characteristics of different farming systems and the social and physical environment in which they are practised. That, indeed, was the primary purpose of the book commissioned by the Namibia National Farmers' Union (NNFU). However, the Union also wished to explore prospects for development, particularly in how farmers might improve their production and incomes within a farming system, and how farmers might shift from one system to another farming system. It is easy to ask these questions. But finding answers that can be implemented is much more challenging, especially for an enterprise as big as farming. About 27% of all Namibian households depend largely on incomes from agriculture, and approximately 78% of the land surface can be regarded to a greater or lesser degree as farmland (see page 13). These figures give an idea of the size of the enterprise, but the development of the agricultural sector is further complicated by a range of political, economic and social factors. In offering some ideas on opportunities and challenges, the pages ahead follow the order of the preceding chapters. The broad characteristics of the farming and production systems are summarized as follows:

THE HUMAN ENVIRONMENT

Two rather different approaches characterize agriculture in Namibia. On the one hand, policies and programmes are directed towards making agriculture economically productive. Farmland is to be used to produce surpluses which are sold for revenue that benefits the farmer and country as a whole. The approach is best implemented by *Intensive agriculture* production and by those individual farmers in other systems who profit substantially from their farms and produce. The main point about the strategy is that agriculture generates wealth for the growth and development of society. It thus goes beyond providing for the needs of the individual farmer.

The alternative approach focuses on agriculture as a tool for social policy. Emphasis is often placed more on access to land and food, rather than the productive use of land. Aspects that are implicitly or explicitly seen as important include the right to farm land, traditional farming values, and the idea that every Namibian is a farmer, or at least a potential one. Cattle are deemed to have great value, often for reasons of status or investment. Policies and programmes that build on this approach include efforts to protect local agriculture, and

MAJOR FEATURES OF NAMIBIAN FARMING SYSTEMS

	Small-scale cereals and livestock	Cattle ranching	Small stock	Intensive agriculture	Natural resource production
Land tenure	Usage rights	Mainly exclusive ownership	Mainly exclusive ownership	Exclusive ownership and some land leases	Exclusive ownership or usage rights
Inputs	Low	Moderate	Moderate	High	Moderate
Use of production	Domestic consumption	Commercial sales	Commercial sales	Commercial sales	Commercial sales
Predominant markets	Local	Mainly exports	Mainly exports	Mainly Namibian	Mainly exports

to promote food self-sufficiency, rural development and social harmony through the distribution of farmland.

Which of the two strategies should Namibian agriculture follow, or what balance should be achieved between them? It is beyond the scope of this chapter to explore the many answers to these questions, but several aspects deserve comment. First, decision-makers must recognize the clear dichotomy between the approaches, and be aware of consequences of following one approach or the other. Second, the production of profitable surpluses is a prerequisite for economic development (see page 7). Third, comparative advantages must be sought and exploited if Namibian farmers are to compete with international producers. Fourth, is the need to evaluate how agriculture can most effectively help solve the urgent problem of poverty, both nationally and within individual homes. Domestic food production and self-sufficiency may not always be adequate or most effective in reducing poverty, especially if poor households remain short of land and secure land tenure (see below). Finally, it would be useful to close the gap between the approaches, for example by encouraging closer links between farming and secondary enterprises that add value through processing, packaging and marketing. For example, more farmers could have financial interests in these secondary aspects of food production, and more businesses could invest in primary agriculture.

The emergence of a new group of previously disadvantaged people as large-scale farmers is one of the most striking changes to the complexion of agriculture in Namibia. These include people who have purchased farms (often through the Affirmative Action Loan Scheme – see page 19), and yet others who have been settled on farms acquired by the government, or who have acquired large farms in communal areas (see page 14). In total, there are some 2,000 such ‘emerging farmers’ who effectively own at least 750,000 hectares, or 12% of Namibia’s agricultural land.¹ While much of this area has been made available in the name of land redistribution, the challenge now is to promote the effective use of the farms for production.

The great majority of the farms belonging to the emerging farmers are in areas where livestock farming predominates. Most of the farms are also comparatively large. This is an important asset if the farms are to be economically useful in producing beef, mutton or goats under conditions where extensive grazing is required. Quite simply: the larger the farm, the greater its productivity, viability and profitability. Conversely: the more people given land, the smaller the farm units will have to be, and the lower the economic returns from

agriculture. Decision makers will again have to achieve a balance between the need for access to land and the use of farmland for growth and development. They will have to decide if Namibia needs more farmers, or better farmers.

The development of markets is one of the greatest needs for improving agriculture in communal areas. Two aspects seem most important. The first is to develop markets and give farmers greater access to them, for example, by shifting the veterinary cordon fence so that more livestock products can be exported (see below). A second requirement is to ensure that appropriate incentives for marketing are in place. Too often it is assumed that all rural households in communal areas are poor and eager to sell any surplus. However, the majority of families have non-farm incomes that greatly exceed the value of their farming activities (see page 39). Logically, greater time and effort will be spent in pursuit of more lucrative income sources than on producing surpluses that yield lower returns. As a consequence, really profitable incentives have to be present if these households are to market farm products.

THE NATURAL ENVIRONMENT

Although Namibian pride may not allow it, it has to be admitted that environmental conditions are generally poorly suited to agricultural production, at least compared to other countries. The main constraints are low, variable rainfall and soils that are low in nutrients and the capacity to retain water. This is not an admission of failure, but of the challenging reality, and it is necessary because mistaken optimism often leads to expectations that agriculture will be at the forefront in driving development and getting rid of poverty.

This realism is also not cause for despair, since measures can indeed be taken to enhance production. Two aspects deserve particular mention. The first is for soils to be managed more effectively. It is often said that Namibian soils are being mined because nutrients are removed from the ground faster than they can be replaced, which causes progressive losses of production. Farmers therefore need to pay greater attention to the conservation of soil structure and nutrients, or their replacement with compost, manure, crop residues or inorganic fertilizers. Communities of tiny animals (soil micro-fauna) that break down organic material into nutrients should be preserved, for example by avoiding applications of harmful chemicals. Irrigation practices that cause concentrations of salt in the soil to increase should be avoided.

Bush encroachment is the second environmental problem that needs addressing. Grass biomass has been reduced



several times on the most heavily encroached cattle ranches (see page 31). Since productivity is very largely dependant on the quantity and quality of pasture, it is to be expected that carrying capacity, beef production and economic returns could increase several times if encroachment was eliminated. While all methods of removing bush are now expensive, Namibia should continue to seek policies and practices to rid itself of the problem and to enhance the value of pastures.

SMALL-SCALE CEREALS AND LIVESTOCK

From a development point of view, this farming system deserves high priority. It includes many more households than any other system, and the conditions faced by farmers are extremely difficult. Most farms are tiny, and few areas with reasonably fertile soils remain available. The system of communal tenure means that farmers lack secure rights over farmland. Labour resources are limited as growing numbers of physically and economically active people seek cash incomes elsewhere. Moreover, occasional surpluses of farm products never provide profits that are large enough to increase farm sizes and assets.

What can be done to improve farming under these tough conditions? A first important step is to recognize that household economies vary much more than are suggested by the somewhat uniform rural settings of the farmsteads. These settings further conceal the fact that the majority of households have several incomes, some of which are substantial, at least in relation to the value of farm produce (see page 16). Social conditions vary

Every effort is needed to conserve sparse vegetation in many farming areas in Namibia. This extreme example is the result of concentrated over-grazing around a water point near this home.

too. For example, many households are headed by women, the number of household members differs greatly from family to family, and some families receive much greater support from relatives working elsewhere than others. The admission of all this diversity leads to a second requirement. This is the recognition that needs differ greatly from one family to another. Priorities also vary. Certain development programmes will therefore be appropriate to the concerns of some farmers, but not to others. Similarly, many households are in desperate need of assistance to boost agricultural production, while others require no help.

There are perhaps three broad groups of farming families: (a) those that are very poor and depend largely on farm produce for their livelihoods; (b) households that have significant cash incomes from other sources but for which farm produce makes life easier, and (c) those that are so wealthy that they derive all their needs from sources that have nothing to do with agriculture.

Arguably, most effort should be focused on the first group in which there may be between 40,000 and 50,000 households in the northern communal areas (see page 39). Their production of food should increase and become more reliable, for example



Namibians often pay little attention to soil conservation. Soil erosion is one concern, but a greater problem is that nutrients are lost more rapidly than they are replaced. Both processes lead to a reduction in farm production.

through improving soil fertility, using labour-saving technology and employing measures to improve the health of their livestock. And these are the people that most need to benefit from new or expanded marketing opportunities. Most crucially, they should be given secure tenure over their land. Leasehold rights over 99 years would be a good beginning, although freehold titles would be preferable. These rights – which every Namibian deserves – would allow greater access to credit and would enhance motivation to invest in farm land. They would also be pivotal in allowing the poorest communities to develop capital assets. Currently, if a family living on communal land decided to establish a new farm or home, they would have no capital assets that could be transferred to their new venture. By contrast, it is taken for granted that freehold owners of farms

and – for that matter – urban properties can accumulate and transfer capital assets.

CATTLE RANCHING

As a long established farming system, beef production on freehold farms appears reasonably successful. Production could be increased greatly by reducing bush encroachment (see above), but the greatest challenge for the beef industry lies in finding and maintaining secure markets. Almost all exports now go to only three market destinations: South Africa (81%), United Kingdom (14%) and Norway (2.5% of all exports by volume). Since the international beef trade is highly competitive – and subject to the vagaries of currency exchange rates and strict quality controls – it is important that Namibia develops additional markets. One aspect to be considered is an extension of the concept of Farm Assured Namibian Meat Scheme (FAN Meat, see page 48). For example, beef could be marketed or branded as having higher value because it was produced without feed additives under free-ranging conditions in pristine savannas that are virtually free of pollution.

Compared to freehold beef ranching, beef production by the large group of emerging farmers (see above) is a quite new enterprise. Many of the farmers acquired their ranches only recently and thus lack the experience of older, freehold farmers. Several programmes aim at supporting emerging farmers, including a joint Namibia Agriculture (NAU)/ Namibia National Farmers Union (NNFU) 'Emerging Farmer Support Programme', and extension services provided by the Ministry of Agriculture, Water & Forestry. Support to emerging farmers is also provided more locally by different farmers associations. This signals the valuable building of new multi-racial farming communities where neighbouring farmers help each with information, advice and material support. All these efforts should help promote the need for the new ranches to be run as businesses which will make important contributions to Namibia's beef industry.

The veterinary cordon fence is usually noted as the biggest obstacle to the marketing of cattle in the northern communal areas. The removal of the barrier could open up markets for the sale of perhaps another 100,000 to 150,000 cattle per year (and several hundred thousand goats).² Most of the cattle could initially be sold as weaners until management practices improve to the point that large numbers of good quality carcasses can be produced (see page 48). However, removing the fence is much easier said than done. For a start, it could not be eliminated immediately since cattle throughout Namibia would then be exposed to potentially devastating infections from across the Angolan border. This leaves the option of moving the fence northwards, perhaps to create a barrier between Namibia and Angola. But that would also be difficult in practical terms, especially along the Okavango River. Given these constraints, most people accept that the fence be moved in phases along with the introduction of extensive vaccination programmes in southern Angola. A first phase might entail moving the fence so as to incorporate northern Kunene and parts of Oshikoto (around the Mangetti Block) into the surveillance disease-free southern areas of the country (see page 20). Other parts of the northern communal areas could follow, but each newly-opened area would have to be carefully monitored until risks of infection could be declared as eliminated.

SMALL STOCK FARMING

A farmer needs a dependable market, preferably one offering reliable returns. The price paid to a farmer is fixed once an animal leaves the farm gate or auction pen. It thus matters little to him or her if the animal is later exported live, as a carcass

or as processed cuts. But these different kinds of exports matter much to the Namibian economy. The more an animal is processed locally, the higher the price paid as it leaves the border, and the more Namibian jobs will be available. All this sounds reasonable, but the interests of the farmer and national economy may not always agree. For example, measures to boost local processing may prevent farmers from selling at reliable prices if they are can't export live animals for good prices to South Africa. Worse still, animals may have to be fed for months until local processors have the capacity to buy them at lower, perhaps preset prices.

There is thus a tension between small-stock farmers and the government as it gradually increases the requirement for local processing (see page 56). Finding an ideal balance between the two interests will be difficult. What will be important is that all stakeholders continually evaluate their positions in an effort to find an appropriate balance. And the balance will probably have to change, depending on rainfall, slaughtering capacity, market demands, and foreign exchange rates, for example. The same considerations will apply if, or when, the government begins to limit the export of weaners, goats and any other livestock products.

A good part of Namibia's economy was based on exports of Karakul pelts during the 1950s, 1960s and 1970s. There are indications that demands could again increase significantly. It is therefore important that Namibia help stimulate demand by co-operating with other producers in Uzbekistan, Turkmenistan, Kazakhstan, Tadjikistan, Kyrgyzstan and Afghanistan. Namibia should also be prepared to respond to higher demand, and to penetrate new markets in China and Russia.³ However, there is also a need to remember that this market is subject to the whims of fashions.

Since these hardy sheep do well in the more arid regions of Namibia, there is also scope for promoting Karakul farming in the communal areas of Karas, Hardap, Erongo and Kunene. The great majority of farm income in those communal areas now comes from the sale of goats. This is fine as long as the demand for live goats remains high in South Africa, but the addition of Karakul production could increase earnings. Incomes would be diversified as well, which would be important if demands for goats drop.

It is indeed surprising that Namibia appears to have done rather little to promote goat farming, at least compared to the substantial support offered to beef and mutton production. There are more goats in Namibia than cattle or sheep, and much of the country is well suited to goat farming. This is

true for most communal land and for freehold farms that are badly encroached with invasive bush. While consumer tastes now mean that relatively few people buy goat meat, efforts should be made to change those tastes. For example, aggressive advertising and marketing programmes could emphasize the health value of goat meat as a result of its low content of saturated fat and cholesterol (similar promotions have been run for fish). Goats are also produced under healthy, natural conditions, and their meat – especially that of younger animals – is extremely tasty.

INTENSIVE AGRICULTURE

The previous three farming systems – *Small-scale cereals and livestock*, *Cattle ranching* and *Small stock* – have all been practiced over decades, if not longer. By contrast, *Intensive agriculture* and *Natural resource production* are systems that have developed and grown rapidly since independence in 1990. In addition, these two systems generate high returns (see below), and cause less environmental degradation than the three more traditional farming systems.

There is thus good reason for Namibia to seek and promote more commodities that can be produced intensively on small areas of land. Innovative methods need to be sought for production and marketing. Ways should further be sought of involving small-scale farmers in communal areas in the production of high value crops. These, indeed, are the partial objectives of the Green Scheme and National Horticultural Initiative. However, there are doubtless more ways of encouraging small-scale farmers away from traditional low input–low output farming into high input–high output *Intensive agriculture*.

Maize production is now protected against competition from cheaper cereal imports, largely as a consequence of policies that Namibia should be self-sufficient in its food needs. There

are three reasons for reconsidering those policies, especially as they relate to maize. Firstly, Namibian consumers pay more for maize meal than if cheaper imports were allowed. These higher costs are especially hard on most poor people for whom maize meal is a staple food. Second, if current irrigation schemes were charged the full capital costs of development, their operators would probably switch to producing higher value commodities which could earn export revenues for the country. At least they would save the losses now paid to subsidize capital costs, and more jobs would probably be created. Third, these added benefits would probably raise levels of food security in the country as a whole. (Note, food security aims to ensure that everyone is fed adequately, irrespective of whether the food is grown locally or purchased elsewhere using money generated from non-agricultural sources; by contrast, food self-sufficiency is aimed at the local production of food; the two policies, therefore, can result in contradictory practices).

NATURAL RESOURCE PRODUCTION

The rapid growth of lucrative practices to commercialize wildlife and plant resources has brought about significant changes to land uses in Namibia. Rather than almost all non-state land being perceived as farmland, it is now widely appreciated that natural resource production usefully complements – and in some cases replaces – farming. This is true for both individual farmers and for the country as whole. Freehold and communal farmers can earn incomes from tourism, trophy hunting and the sale of game while continuing to produce livestock. Their livelihoods are now based on a greater variety of incomes. Likewise, the Namibian economy has diversified and grown, encouraging policy makers to contemplate land uses other than conventional farming

Much of the growth in the production system has been driven directly or indirectly by private enterprises run by previously



advantaged Namibians. The same is true for *Intensive agriculture*, and there is now an urgent need to encourage other people to play stronger leadership roles in all these enterprises. Efforts to achieve this would bring several benefits, not least in helping to promote a diversification of vested interests. It is indeed curious that most efforts to encourage previously disadvantaged Namibians to become commercial farmers have narrowly concentrated on cattle ranching.

The minimum annual expenditure on commodities and activities sold by the *Natural resource production* system amounts to at least N\$3,200 million (see page 69). This is the gross output of the system, and it does not include the value of domestic consumption of the same resources. The total gross output of the whole agricultural sector amounted to N\$1,878 million, which, by contrast, does include the value of domestic consumption.⁴ It is thus obvious that this new production system provides substantial value to Namibia. It is also clear that the production system offers extremely profitable ways of using much of Namibia's land. These are trends that hold across the whole country, but some places will be best for farming and others for natural resource production. This means that the most effective uses of land need to be assessed for each area. Those assessments need to be as objective as possible, and they will also have to work out a useful balance between political claims on the use of land, and a vision for the future economic health and development of Namibia.

IN CONCLUSION

The chapter began by exploring two perspectives on agriculture in Namibia, one approach emphasizing the value of farmland, the other focusing on the value of farm production. The book now ends by considering alternative views on two other aspects. First, we need to reflect on the comparative effort placed on developing the *supply* of commodities and that

devoted to creating a *demand* for produce. Arguably, much more time, money and people are allocated to the supply side of the equation, for example in producing heavier, high quality livestock. That is all necessary, but it is based too firmly on the assumption that markets can absorb whatever is produced. This is an assumption that has failed Namibia several times, in the case of Karakul, dairy produce and ostriches, for instance. Accordingly, a much greater focus on developing and sustaining markets is desirable. The challenge to do so should be taken up by the many parastatals and government organizations that represent the interests of Namibian agriculture (see page 21).

Finally, it is useful to consider the degree to which Namibian farmers are promoted or protected. Put differently, are Namibian farmers in business or are they the providers of the nation's food? Are the failings of weak farmers ignored, or are the innovative efforts applauded of those who contribute to economic development? That farming is a risky, difficult enterprise requiring support and some protection seems undeniable, but levels of protection can be counterproductive when consumers pay too much, environmental conditions suffer, and farmers become complacent. Yet again, balance is needed. In striking that balance, however, more should be done to emphasize the economic value of farming. In the words of the President of the Namibia National Farmers Union, 'Farming is a business, and it should be treated as such. If farmers want to make a meaningful contribution to the country's economy, they should treat farming with a business mind and not as a leisure activity'.⁵ In pursuit of economic development, Namibia should be competitive in capitalizing on its comparative advantages. Innovation is necessary to improve current farming practices, and to bring new commodities into production and the market place. These are the steps that enabled societies to develop across the world. Let agriculture help to do the same for Namibia.



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5. The total number of households on farmland is about 205,000. However, at least 70% of households in the Small-scale cereals and livestock farming system (Chapter 4) derive most of their incomes from non-farming sources. Adjusting for those 70% means that a total of about 95,000 households rely fully or very largely on incomes from agriculture.
6. Ministry of Agriculture, Water & Forestry. 2005. *Agricultural Statistics Bulletin*. Windhoek.
7. The annual stock census is conducted by the Directorate of Veterinary Services of the Ministry of Agriculture, Water & Forestry. For an analysis of estimates of goat populations, see: Motinga, D., van Wyk, K., Vigne, P., Kauhika, S. & Visser, W. 2004. *National Small Stock Situation Analysis*. Report for Ministry of Agriculture, Water and Rural Development, the Ministry of Trade and Industry, Meat Board of Namibia, the Namibia Agriculture Union and the Namibia National Farmers' Union.

2: THE HUMAN ENVIRONMENT

1. However, recommendations made in the Odendaal Commission report of 1966 led to about 170 commercial farms being incorporated into what was Damaraland and 110 farms into the then Namaland.
2. In terms of the Communal Land Act of 2002, commonage areas should be administered by traditional authorities. However, this happens to a limited extent, if at all in many areas.
3. The original farms allocated in the 1960's, 1970s and 1980s consisted of 106 farms in the Mangetti block of Oshikoto, 44 in the Kavango Mangetti block, 56 farms near Okamatapati, and 91 farms in the Rietfontein block. The number of new farms established since then consists of about 450 in Kavango, 80 farms in Caprivi, about 150 in Oshikoto

and Omusati, and perhaps another 100 farms in eastern Otjozondjupa and Omaheke.

4. Compiled from data provided by the Ministry of Lands and Resettlement, Ministry of Agriculture, Water and Forestry and from Mendelsohn, J.M., Jarvis, A.M., Roberts, C.S. & Robertson, T. 2002. *Atlas of Namibia*. David Philip, Cape Town.
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8. These are prices in Johannesburg from which prices are set for maize grown in Namibia. The figures were obtained from the Namibia Economic Policy Research Unit (NEPRU) website: www.nepru.org.na
9. Same as Note 7.
10. Population and Housing Census of 2001. Central Bureau of Statistics, National Planning Commission.
11. Figures supplied by Jürgen Hoffmann, Agricultural Trade Forum, Windhoek.
12. Many more developed countries also limit exports on the grounds of health conditions, such as those that prevent meat exports from the northern communal areas. Another example is the difficulty Namibia has in exporting table grapes to the USA. Unsuccessful attempts have been made since 1999 to establish the exact permit conditions required by the USA to allow the grapes to be imported.
13. Agribank. 2004. *Annual Report*. Windhoek, Namibia.

3: THE NATURAL ENVIRONMENT

1. International Development Consultancy. 2005. *Study on land productivity and economic farming units*. Report for the Ministry of Agriculture, Water & Forestry.
2. National Drought Task Force. 1997. *National drought policy and strategy*. Government of Namibia.
3. From Namibia Resource Consultants. 1999. *Rainfall distribution in Namibia: Data analysis and mapping of spatial, temporal, and Southern Oscillation Index aspects*. Windhoek: Ministry of Agriculture, Water and Rural Development

4. From Mendelsohn, J.M., Jarvis, A.M., Roberts, C.S. & Robertson, T. 2002. *Atlas of Namibia*. David Philip, Cape Town.
5. Same as Note 3.
6. Adapted from data provided by the Ministry of Agriculture, Water & Forestry.
7. Same as Note 6.
8. Same as Note 6.
9. Same as Note 1.
10. De Pauw, E. & Coetzee, M.E. 1998/99. Production of an agro-ecological zones map of Namibia (first approximation) - Part I: Condensed Methodology. *Agricola* 10: 27-31; and De Pauw, E, Coetzee, M.E, Calitz, A.I, Beukes, H, & Vits, C. 1998/1999. Production of an agro-ecological zones map of Namibia (first approximation) - Part II: Results. *Agricola* 10: 33-p43.

4: SMALL-SCALE CEREALS AND LIVESTOCK

1. Based on an analysis of the 2001 Population & Housing Census and allowing for an annual growth rate of 2% in rural areas.
2. Analysis of data from Annual Agricultural Censuses conducted by Central Statistics Bureau, National Planning Commission.
3. Based on data collected by the Directorate of Surveys & Mapping map revision surveys in 1996 in Kavango, and on data collected from aerial photographs of Caprivi taken for the Environmental Profiles programme of the Directorate of Environmental Affairs in 1998.
4. Same as Note 2.
5. Same as Note 2.
6. Based on an average of 9.2 cattle and 10.7 goats per household as recorded by Annual Agricultural Censuses.
7. Mendelsohn, J.M., el Obeid, S & Roberts, C.S. 2000. *A profile of north-central Namibia*. Gamsberg Macmillan, Windhoek. 80 pp; and Mendelsohn, J.M. & S. el Obeid. 2003. *Sand and Water: a profile of the Kavango region of Namibia*. Struik, Cape Town.
8. Proportions of farmers using manure: Omusati (63%), Oshana (54%), Oshikoto (54%) and Ohangwena (64%), Caprivi (11%) and Kavango (6%); from data collected in the Annual Agricultural Censuses.
9. Same as Note 2.
10. From Keyler, S. 1995. Economics of the pearl millet subsector in northern Namibia: a summary of baseline data. *International Crops Research Institute for the Semi-Arid Tropics*. Working Paper 95/03; and Motinga, D., van Wyk, K., Vigne, P., Kauhika, S. & Visser, W. 2004. *National Small Stock Situation Analysis*. Report for Ministry of Agriculture, Water and Rural Development, the Ministry of Trade and Industry, Meat Board of Namibia, the Namibia Agriculture Union and the Namibia National Farmers' Union.

11. Same as Note 2.
12. All farmers are obliged to vaccinate their cattle against anthrax. Lung sickness vaccines are administered by the Directorate of Veterinary Services to all cattle throughout the northern communal areas. The Directorate also vaccinates cattle against foot-and-mouth disease in parts of Omusati and Oshana, and throughout Kavango and Caprivi.
13. Same as Note 2.
14. Kirsten, J. 1999. *Livestock marketing study*. Report for Northern Regions Livestock Development Project (NOLIDEP), Windhoek.
15. Mendelsohn, J.M., el Obeid, S & Roberts, C.S. 2000. *A profile of north-central Namibia*. Gamsberg Macmillan, Windhoek.
16. Keyler, S. 1995. Economics of the pearl millet subsector in northern Namibia: a summary of baseline data. *International Crops Research Institute for the Semi-Arid Tropics*. Working Paper 95/03.

5. CATTLE RANCHING

1. Mendelsohn, J.M., Jarvis, A.M., Roberts, C.S. & Robertson, T. 2002. *Atlas of Namibia*. David Philip, Cape Town.
2. De Klerk, N. 2004. *Bush encroachment in Namibia*. Ministry of Environment & Tourism.
3. For freehold farms, estimated from farm sizes and numbers of employees reported in the Wage Survey in 2004 of the Agricultural Employer's Association, Windhoek, and from data collected in the 2001 Population & Housing Census. Estimates for communal areas are based on data in the 2001 Population & Housing Census. It was further estimated that 30% of households in open access communal areas would be involved in cattle farming for beef production, either as farmers or labourers.
4. The total number of farms and their sizes was estimated from data collected by the Wage Survey in 2004 of the Agricultural Employer's Association and from various other sources that suggest that the figures are approximately correct. Data on the sample of 53 farmers was reported by International Development Consultancy. 2005. *Study on land productivity and economic farming units*. Report for the Ministry of Agriculture, Water & Forestry.
5. The original farms in the Oshikoto Mangetti Block averaged about 1,100 hectares, those in the Kavango Mangetti Block 5,000 hectares, and those around Okamatapati and Rietfontein between 5,000 and 7,000 hectares. Most of the newer farms in Kavango and Caprivi cover either 2,500 or 5,000 hectares.
6. International Development Consultancy. 2005. *Study on land productivity and economic farming units*. Report for the Ministry of Agriculture, Water & Forestry.
7. Derived from stock census records kept by Animal Health Inspectors in the Okakarara district and at Gam, as analysed by Mendelsohn, J.M. & S. el Obeid. 2002. *The communal lands of eastern Namibia*. RAISON, Windhoek.
8. Same as Note 6.
9. Vigne, P. 2001. *Cattle marketing in the Epupa, Ruacana and Onesi Constituencies of the Kunene and Omusati Regions*. Report to the Meat Board of Namibia, Windhoek.
10. Same as Note 9.
11. Based on International Development Consultancy. 2005. *Study on land productivity and economic farming units*. Report for the Ministry of Agriculture, Water & Forestry; and Wage Survey in 2004 of the Agricultural Employer's Association, Windhoek.
12. Same as Note 6.
13. Derived from stock census records kept by Animal Health Inspectors in the Okakarara district and at Gam, as analysed by Mendelsohn, J.M. & S. el Obeid. 2002. *The communal lands of eastern Namibia*. RAISON, Windhoek.
14. See for example Baird, J.H. 1995. *Verification of socio-economic data for SARDEP test areas in the southern and eastern communal areas*. Report for Ministry of Agriculture, Water and Rural Development and Deutsche Gesellschaft für Technische Zusammenarbeit, Windhoek.
15. Vigne, P. 2001. *Cattle marketing in the Epupa, Ruacana and Onesi Constituencies of the Kunene and Omusati Regions*. Report to the Meat Board of Namibia, Windhoek; MAWRD. 2000. *Livestock Marketing in the Northern Communal Areas of Namibia (Livestock Producer Marketing Strategies and Informal Trade in Live Animals, Meat, Hides and Skins)*. Northern Regions Livestock Development Project (NOLIDEP); Liagre, L. 2000. *Cattle Marketing in Northern Namibia: A Commodity Chain Approach*. NEPRU Research Report No. 20. May 2000. Windhoek. Annual slaughter figures at Oshakati and Katima Mulilo between 2001 and 2005 were 15,701, 24,499, 17,776, 5,881 and 16,283 cattle, respectively.

6. SMALL STOCK FARMING

1. Motinga, D., van Wyk, K., Vigne, P., Kauhika, S. & Visser, W. 2004. *National Small Stock Situation Analysis*. Report for Ministry of Agriculture, Water and Rural Development, the Ministry of Trade and Industry, Meat Board of Namibia, the Namibia Agriculture Union and the Namibia National Farmers' Union.
2. Kinahan, J. 1991. *Pastoral nomads of the central Namib Desert: the people history forgot*. New Namibia Books, Windhoek.
3. Estimated by overlying the boundaries of the farming systems on data from the 2001

Population & Housing Census, and increasing the rural population at a rate of 1% per year. The following figures were derived. For freehold farms: 9,600 households, of which about 1,600 are in the former Rehoboth district. For open-access communal land: Erongo 1,500, Amunius 300, Hoachanas 100, Warmbad 100, Bondelswartz 350, and Namaland 850 households. For large-scale communal farms: former Damaraland 1,700, former Namaland 1,150, Resettlement farms 260, and the Amunius Corridor 200 households. The total number of people these areas was estimated by multiplying the number of households and average rural household sizes recorded in the 2001 census.

4. Much of the information given here is gleaned from interviews with staff of the Directorate of Extension Services and Engineering in Mariental, Gibeon and Keetmanshoop, and from Ministry of Agriculture, Water & Rural Development. *Karas region: Baseline survey of the impact of agricultural extension services*. Ministry of Agriculture, Water & Rural Development, Keetmanshoop; and Agenbach, Y. 2005. *Gathering baseline information towards assessing the impact of Agricultural Extension Services in the Hardap Region, Namibia*. M.S.A. thesis, University of Free State, Bloemfontein.
 5. Wage Survey in 2004 of the Agricultural Employer's Association, Windhoek.
 6. Agenbach, Y. 2005. *Gathering baseline information towards assessing the impact of Agricultural Extension Services in the Hardap Region, Namibia*. M.S.A. thesis, University of Free State, Bloemfontein; and three reports by the Ministry of Agriculture, Water & Rural Development, published in 2003, entitled *Baseline survey of the impact of Agricultural Extension Services in the Erongo Region*; *Baseline survey of the impact of Agricultural Extension Services in the Southern Kunene sub-region*; and *Karas region: Baseline survey of the impact of agricultural extension services*.
 7. From Mendelsohn, J.M., Jarvis, A.M., Roberts, C.S. & Robertson, T. 2002. *Atlas of Namibia*. David Philip, Cape Town.
 8. From reference in Note 1 and Ministry of Agriculture, Water & Forestry. 2005. *Agricultural Statistics Bulletin*. Windhoek.
 9. From the 2004 Annual Stock Census conducted by the Directorate of Veterinary Services, Ministry of Agriculture, Water and Forestry.
 10. Meat Board statistics for 2004.
- #### 7. INTENSIVE AGRICULTURE
1. Most figures are from the Agricultural Statistics Bulletin of 2005 produced by the Ministry of Agriculture, Water & Forestry, and from the Agronomic Board of Namibia website: www.nab.com.na. Figures on fruit

and vegetables are for 2003 as reported by Price Waterhouse Coopers. 2005. *Irrigation development in Namibia: cost-benefit analysis*. Report for Green Scheme and Horticulture Initiative, Ministry of Agriculture, Water & Forestry.

2. For example, 30 dairy farmers are reported as employing 690 people (NRC. 2001. *State of Environment Report on Agriculture*, Ministry of Environment & Tourism, Windhoek); some 1,500 permanent labourers are employed in the 2,400 hectare Hardap Irrigation Scheme (General Manager of Hardap Co-operative, personal communication); and over 1,000 people (many as seasonal labourers) worked on an area of 150 hectares of grape orchards at Aussenkehr.
3. Figures provided by Green Scheme support project of the Ministry of Agriculture, Water & Forestry.
4. International Development Consultancy. 2005. *Study on land productivity and economic farming units*. Report for the Ministry of Agriculture, Water & Forestry.
5. Livestock census of 2005, Directorate of Veterinary Services, Ministry of Agriculture, Water & Forestry.
6. Ministry of Agriculture, Water & Forestry. 2005. *Agricultural Statistics Bulletin*. Windhoek.
7. In addition, small-scale farmers grow and sell white maize in Caprivi. About 3,900 tons were produced on 9,000 hectares in 2004, according to the Ministry of Agriculture, Water & Forestry. 2005. *Agricultural Statistics Bulletin*. Windhoek.
8. Same as Note 4.
9. Price Waterhouse Coopers. 2005. *Irrigation development in Namibia: cost-benefit analysis*. Report for Green Scheme and Horticulture Initiative, Ministry of Agriculture, Water & Forestry.

8: NATURAL RESOURCE PRODUCTION

1. The number of visitors includes people coming to Namibia on business or to visit friends and family. Most of these 'non-tourists' are from neighbouring countries. However, at least 40% of all visitors are on holiday. The tourism data were provided by the Namibian Tourism Board and Turpie, J., Lange, G-M., Martin, R., Davies, R. & Barnes, J. 2004. *What are the national parks worth? Economic value and financing of Namibia's protected areas*. Report for the

- UNDP/GEF project on 'Strengthening the system of national protected areas'; Trophy hunting data were supplied by Peter Erb of the Ministry of Environment & Tourism, and reported in his work: Erb, K.P. 2004. *Consumptive wildlife utilization as a land-use form in Namibia*. MBA thesis, University of Stellenbosch.
2. Nature Conservation Amendment Act of 1996 and the Forest Act of 2001.
 3. Henschel, J., Dausab, R., Moser, P. & Pallett, J. (eds). 2004. *!Nara: fruit for the development of the !Khuiseb Topnaar*. Namibian Scientific Society, Windhoek.
 4. Barnes, J.I., Lange, G-M., Nhuleipo, O., Muteyauli, P., Katoma, T. & Amupolo, H. 2004. *Preliminary valuation of the wildlife stocks in Namibia: wildlife asset accounts*. Unpublished. Environmental Economics Unit, Directorate Environmental Affairs, Ministry of Environment and Tourism, Namibia. Species grouped as 'Others' are tsessebe, white and black rhinoceros, lechwe and lion.
 5. Turpie, J., Lange, G-M., Martin, R., Davies, R. & Barnes, J. 2004. *What are the national parks worth? Economic value and financing of Namibia's protected areas*. Report for the UNDP/GEF project on 'Strengthening the system of national protected areas' and the Ministry of Environment & Tourism.
 6. Erb, K.P. 2004. *Consumptive wildlife utilization as a land-use form in Namibia*. MBA thesis, University of Stellenbosch.
 7. International Development Consultancy. 2005. *Study on land productivity and economic farming units*. Report for the Ministry of Agriculture, Water & Forestry; and Erb, K.P. 2004. *Consumptive wildlife utilization as a land-use form in Namibia*. MBA thesis, University of Stellenbosch.
 8. MET/NACSO. 2005. *Namibia's communal conserancies: a review of progress and challenges*. NACSO, Windhoek.
 9. Based on: Novelli, M., Barnes, J.I. & Humavindu, M. In press. The other side of the eco-tourism coin: consumptive tourism in southern Africa. *Journal of Ecotourism*; Erb, K.P. 2004. *Consumptive wildlife utilization as a land-use form in Namibia*. MBA thesis, University of Stellenbosch; and Turpie, J., Lange, G-M., Martin, R., Davies, R. & Barnes, J. 2004. *What are the national parks worth? Economic value and financing of Namibia's protected areas*. Report for the UNDP/GEF project on 'Strengthening

the system of national protected areas'; Barnes, J.I., Nhuleipo, O., Macgregor, J. & Muteyauli, P.I. 2005. *Preliminary development of wildlife and woodland asset accounts in Namibia*. Research Discussion Paper, Directorate of Environmental Affairs, Windhoek; and Mendelsohn, J.M. & el Obeid, S. 2005. *Forests and woodlands of Namibia*. RAISON, Windhoek. The sale values of special plant products are estimates based on the most recent year, or several years of sales, as supplied by Pierre du Plessis of CRIAA, Windhoek: Blue souplum - NS\$432,000, devil's claw - NS\$18,000,000, !Nara - NS\$76,800, mangetti - NS\$151,200, marula - NS\$2,025,000 and Kalahari melon - \$900,000.

9: OPPORTUNITIES AND CHALLENGES

1. Based on the following: there are about 1,000 exclusive farms in communal areas with an overall average unit size of 3,500 hectares. As reported in the report of 2004 of the Permanent Technical Team on Land Reform, Ministry of Lands & Resettlement, a total of 625 farmers had used the Affirmative Action Loan Scheme to purchase 3,470,000 hectares, while 300 individual farmers (as opposed to resettled groups) had been allocated 530,477 hectares. These are figures reported in 2004, so the number of farmers will have increased. Additionally, an unknown but significant number of previously disadvantaged farmers have also purchased farms without the assistance of the Affirmative Action Loan Scheme.
2. Cattle off-take north of the fence is now about 10%, or just over 100,000 cattle per year (see page 47). If off-take rates were raised to 20-25%, which are those achieved south of the cordon fence, another 100,000 to 150,000 cattle could be supplied for the formal export.
3. Motinga, D., van Wyk, K., Vigne, P., Kauhika, S. & Visser, W. 2004. *National Small Stock Situation Analysis*. Report for Ministry of Agriculture, Water and Rural Development, the Ministry of Trade and Industry, Meat Board of Namibia, the Namibia Agriculture Union and the Namibia National Farmers' Union.
4. Ministry of Agriculture, Water & Forestry. 2005. *Agricultural Statistics Bulletin*. Windhoek.
5. Newsletter of the Namibia National Farmers Union. April/May 2006.

FARMING SYSTEMS IN NAMIBIA

A combination of environmental, historical, traditional and economic factors shape the range of farming practices and household economies that comprise Namibia's farming systems. The systems are evolving rapidly as new farming methods are introduced, new markets emerge, and new commodities are brought into production. The challenge is to select the most effective elements from this rich landscape of farming systems to further the development of Namibia in a global context.



ISBN 99916-780-4-2



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