

## Production systems: central regions

### Cattle farming

Extensive farming with cattle for commercial production and export of beef and animals on the hoof. This main source of income is supplemented by goats ( $\pm$  4.8% and sheep (4.0%)

### Geography of the system

The central regions include Otjozondjupa, Omaheke in the east and Khomas. Ovitoto, included in the Otjozondjupa region, is utilized as communal land and extends over an area of 61,111 ha. These regions cover an area of 226,804 Km<sup>2</sup> or 22,680,400 hectares (Table 2.1).

Table 2.1: Total area, number of people and households in Omaheke, Otjozondjupa and Khomas

Census indicator	Omaheke	Otjozondjupa	Khomas
% rural	72	59	7
Area (Km <sup>2</sup> )	84,612	105,185	37,007
Pop density Persons/ Km <sup>2</sup>	0.8	1.3	6.8
Number of HH	12,590	25,338	58,580
Average HH size	5.3	4.6	4.2
Appr No of HH in agriculture	9,064	14,949	4,100
% Commercial land*	48 (4,061,376Ha)	64 (6,731,840Ha)	100
% Communal land	52 (4,399,800Ha)	36 (3,786,660Ha)	0
% State land	0	0	0

\*Rehoboth district falls partly in the Khomas region and all those farms are surveyed and classified as commercial.

A survey carried out by (Kruger et al. 2005) suggests that household size varies considerably. Average household size for all households interviewed is 5.68 persons per household which is in line with the population census of 2001. In 2000 the average size of a household in Omaheke and Otjozondjupa region was given as 4.5 and 4 respectively (RoN 2002: 26).

Extended families continue to be strong in Omaheke Region, making important contributions to livelihoods (Vigne 2000: 6). In the rural areas of Omaheke close to 50% of respondents in a survey conducted in 1993 stated that their households consisted of extended families. The predominance of extended families in the rural areas is a

reflection of the Herero people's cultural emphasis on strong family ties and reliance on the extended family for economic security' (Iken et al 1994: 19).

Table 2.2: Percent distribution of households by main source of income (Namibia Census 2001)

Region	No HH	Percentage of HH with main source of income						
		Farming	Business	Wages + salaries	Pension	Cash remittances	Other	Not stated
Khomas	58,580	1.4	11.0	74.2	3.5	6.5	2.1	1.3
Omaheke	12,590	28.3	6.3	45.0	9.0	7.4	2.7	1.3
Otjozondjupa	25,338	14.6	7.6	55.2	7.2	9.6	3.6	2.2

It is assumed that the proportion classified as rural population and households are those people who are predominantly dependant on agriculture for making a living.

## Climate, topography

### *Rainfall*

#### *Otjozondjupa*

The average annual rainfall in Otjozondjupa region ranges between 300mm - 400mm in the southern and central parts, and up to 600mm in northeastern areas. The rainy season usually lasts from November to April, with 63% of the annual rain in January, February and March. The number of rainy days vary from 40 in the south to more than 65 in the north east.

The overall terrain is relatively flat with a few solitary mountains, sand dunes and inter-dune valleys (600 to 1200 m wide) in the north east. Summers are very hot with mild winters and light frost now and then.

Kalahari sand is the dominant soil type in the central and eastern parts with sandy loam and loamy soils in the western parts (Otjiwarongo and Okahanja districts).

#### *Omaheke*

The mean annual precipitation in northern Omaheke ranges from 350 and 500 mm while in southern Omaheke it varies between 250 and 350 mm. Rainfall can be described as variable and unpredictable. The average number of rainy days is 53 per year.

Once again the area is very flat with a few lone standing hills/mountains. In general the soils can be described as sandy to sandy loam.

#### *Khomas*

The average rainfall for the western part is about 300 mm and increases to 400mm in the east. The average number of rainy days is 43.2 per annum.

The topography varies from hilly to mountainous, More or less half of the surface area has a slope of more than 10%. The western parts constitute the catchment area of the Kuiseb river with its debouchment on the west coast. The eastern parts serve as catchment area for the Black and White Nossob rivers. It is situated high above sea level.

## Tenure, farm structure and size

Two agricultural sub-sectors exist namely subsistence and commercial farming.

### ***Otjozondjupa***

The total freehold farming area of the Otjozondjupa Region is 73,861.5 (67,196) km<sup>2</sup>. This represents of 70.48% (64%) of the region's total area with the communal farm area constituting the rest.

According to Vigne (2005), Otjozondjupa region contains approximately 778 + commercial farms. Of these, the number of privately financed commercial farmers is approximately 506, the number of Affirmative Action Loan Scheme farmers is 130, and the number of resettlement farms is ±12, each aiming to support a varying number of farming households.

The 2001 census classified 14,949 being rural households while 3,700 (14.6%) indicated agriculture as the main source of income. If the title deed farmers are subtracted it is reasonable to say that 3,000 households in communal areas are mainly dependant on agriculture with 63% making a living from business and wages/salaries. The average household size is 4.6.

### ***Omaheke***

In Omaheke region there is an almost even distribution between commercial and communal farm land (48:52%).

Land in the region is communal in terms of the Communal Land Reform Bill of 2002 and therefore fencing of communal land after the commencement of the Act is not allowed, except if approved in the terms of this act. Existing fences must be removed, unless the land board has granted permission for their retention (Kruger et al. 2005).

The fencing of about 65 farms in the vicinity of Okamatapati began (as a government project) in 1979 following a decision that all land in that part of the land in that region be fenced for cattle farmers, after a water supply scheme started. These farms were allocated to wealthy individuals (Mendelsohn and El-Obeid, 2002).

Okamatapati and Rietfontein have large blocks of surveyed and fenced off farms. The sizes of farms in both blocks ranges between 4,000 and 6,000 ha. Together, both blocks cover 8,800 km<sup>2</sup> or 17 % of the area. Although the Rietfontein block was first planned to be occupied by white farmers, the Odendaal Commission recommended they be incorporated in Hereroland and the first settlers arrived in 1966. Some 25-30 farms are presently allocated to individual families and about 50 farms are occupied by groups of farmers (Kruger et al. 2005).

### ***Khomas***

The capitol of Namibia is situated in the Khomas region where much more job opportunities are available which explains the low percentage of rural inhabitants (7% of all households) in this district (See Table 2.1).

About 90 per cent of the Khomas region's projected total population of more than 250,000 live in Windhoek and its immediate surroundings. Rural Khomas consists of large scale commercial farms and farms previously under the Baster Administration in Rehoboth (Vigne 2005).

With only 1.4% of all households making a living out of agriculture (Population and Housing census 2001) it means that there are 820 farmers in this region, making a living on a surveyed farm or part of it. Raw data of the MAWF show that Windhoek district has 387 surveyed farms of more than 1,000 ha, 37 between 101 and 1,000 and 217 smaller than 100 ha – total 641. About 85% of households derive their income from business or wages/salaries.

Almost 60% of the former Rehoboth Gebiet falls in the Khomas region while the rest is included in the Hardap region. Many title deed farms in Rehoboth district have been sub-divided on inheritance and registered as small-undivided shares (Agenbach 2005). De Klerk (1967) reported that the average number of owners per farm were 6.41 with an average of 506.3 ha per owner. The exact situation at present is not known. Since the Act on the Subdivision of Agricultural land (Act, No. 70 of 1970) was not applicable in this area until after Namibia's independence, one can expect that the situation worsened substantially. In practice the entire Rehoboth district could be regarded as communal.

### ***Livestock production and marketing***

The dominant production system in the central/eastern regions is cattle and comprises between 80 and 90% of the livestock in the various regions. Sheep play a more significant role in the commercial part of Omaheke but in the remainder of all these regions small stock are playing a subordinate role. The western part of Khomas is more suitable for small stock farming and therefore herds constitute of a greater percentage small stock in these areas (Table 2.3).

The theoretical carrying capacity (In terms of production potential) in the commercial areas of these regions is 1,430,469 LSU. The present stocking rate is for the commercial and communal areas of these regions is 1LSU: 18.8 and 1 LSU: 16.2 ha respectively. It is a well-known fact that the carrying capacity in the regions under discussion

deteriorated drastically (From 20 to 80%) which means that the land is heavily under pressure.

Agriculturally speaking livestock farming is very important and forms the backbone of the regional political economy. More than half of the populations found in Omaheke region are employed full-time in agriculture; most people are working directly or indirectly with livestock (Vigne 2005).

Windhoek is the major national manufacturing centre and hosts several industries that add value to agricultural produce which include abattoir and meat processing, hide processing and leather manufacturing. These industries have major growth potential for the export market and consideration is being given as to whether to grant them EPZ status to encourage essential capital investment (Vigne 2005).

Table 2.3: Occurrence of various livestock species in commercial and communal areas of Khomas, Otjozondjupa and Omaheke regions expressed as a percentage of the total number of livestock in these regions

Region	%		
	Cattle	Sheep	Goats
Khomas commercial	82.17	12.53	5.31
Otjozondjupa commercial	92.26	4.08	3.66
Otjozondjupa communal	87.86	3.76	8.38
Omaheke commercial	78.76	16.16	5.09
Omaheke communal	88.07	3.66	8.26

[Small stock (SSU) were converted to large stock units (LSU) on the basis of 1LSU = 6 SSU – Ratios therefore determined on the basis of land utilized by each species]

Forty per cent of the Namibian cattle population is found in these three regions while the corresponding figures for sheep and goats are 18.9% and 17.6% respectively.

Table 2.4: Livestock numbers in the commercial and communal farming areas of Khomas , Otjozondjupa and Omaheke (2004 census)

Area	Cattle	Karakul	Dorper	Other	Total sheep	Angora	Boerbok	Other	Total goats
Khomas commercial	122,853	1,402	58,113	69,496	12,911	0	51,955	2,691	54,646
Otjozondjupa commercial	354,916	0	0	94,238	94,238		60,538	23,908	84,446
Otjozondjupa communal	461,286	0	0	27,297	27,297		70,941	74,358	145,299
Omaheke commercial	168,070	4,765	139,623	62,460	206,848	0	61,066	4,054	65,120
Omaheke communal	151,231	1,405	12,880	23,454	37,739	0	53,498	31,638	85,136
<b>Total</b>	<b>1,276,545</b>	<b>7,572</b>	<b>210,616</b>	<b>276,945</b>	<b>495,133</b>	<b>0</b>	<b>297,998</b>	<b>13,664</b>	<b>9</b>

Masdar et al (1993: 74) calculated the average number of large stock units per household in Okakarara to be approximately 29. Based on their investigations they stated that 24% of households did not have any tradable cattle. Devereux and Tapscott (1995: 129) reported that the average herd size in Herero communal areas in January 1992 was 85 head and the median 31. In the latter half of the 1990s a survey conducted for Oxfam revealed that 94% of Herero households in the sample owned between 1 and 213 head of cattle (Vigne 2000: 5).

Local planners regarded a herd of 35 LSUs as the smallest number that can sustain a household dependent on livestock farming. This amount was larger than the average number owned (Masdar et al 1993: 75).<sup>1</sup> (As cited by Kruger et al. 2005)

In Otjozondjupa (See Table 2.6) 89.7% of the households own less than 50 cattle per household.

Table 2.5: Livestock ownership survey in Omaheke (MAWRD. 2003)

TYPE OF LIVESTOCK	Number owned	Percentage of households (n =236)
Total number: cattle	0	1.3 %
	1-10	16,6 %
	11-49	46,0 %
	50-100	20,4 %
	100-150	8,9 %
	> 150	6,8 %
Total number: sheep & goats	0	22,6 %
	1-10	11,9 %
	11-49	45,1 %
	50-100	12,3 %
	100-150	3,8 %
	> 150	4,3 %

<sup>1</sup> Westphal et al (1994: 43) assumed that a herd of 30 LSUs was the minimum to sustain a household dependent on livestock production.

Cited by Vigne

Table 2.6: Livestock ownership survey in Otjozondjupa (MAWRD. 2003)

Type of livestock	Number owned	Otjozondjupa region		Percentage of households (n=157)
		North	South	
Total number of goats and sheep	0	50.7%	16.3%	31.8%
	1-10	22.5%	7.0%	14.0%
	11-49	21.1%	62.8%	43.9%
	50-100	2.8%	1.2%	1.9%
	100-150	2.8%	7.0%	5.1%
	>150		5.8%	3.2%

### Marketing from regions

Khomas, Omaheke and Otjozondjupa proved to be the main stream of the Namibian cattle industry. During 2003 and 2004 these three regions produced 87% of all sales south of the Veterinary Cordon Fence. In terms of small stock (goats and sheep) these areas contributed 5.5% of all exports.

The vast majority of communal farmers are selling their livestock (weaners and culled cows, goats and sheep) at auctions or through so-called permit days or through direct sales while a few make use of the abattoir facilities. In the early 1990s only 3% of cattle owners were reported to have sold their cattle to abattoirs (Iken et al 1994). Local as well as South African speculators are the main buyers.

Prices for livestock sold are broadly determined by prices paid nationally. These prices are determined by South African market forces (Suzman 1995a: 27). Best prices are obtained during the months of April to July, when cattle are in their best condition. 97% of the people market when the need arises and only 3% market at regular intervals according to the household survey.

According to unpublished Meat Board figures the last ten years has seen an overall increase in off-take from the eastern communal areas as farmers have adopted systems of weaner marketing mainly for the South African feedlot market (Vigne 2005).

### Market Infrastructure

Livestock marketing infrastructure is evenly distributed all over the regions. In Communal areas most of it was constructed by government while some are privately owned by farmer associations or farmer co-operatives. The most important infrastructure includes the following: auction pens, holding pens, pavilions, loading ramps, and a platform scale at Pos 13 in the Aminuis area.

A number of local and nearby abattoirs (Table 2.7), which provides adequate capacity, are used for small stock marketing.

Table 2.7: Abattoirs In Otjozondjupa, Omaheke and Khomas Regions

<i>Abattoir</i>	Place	Small Stock Slaughter Capacity		Export
		Per day	Annual	
AA Vleis	Gobabis	200	21,000	
Avro	Okahandja	200	21,000	
NNMP	Aranos	1,000	210,000	210,000
FMM	Mariental	1,200	252,000	252,000
FMM	Rehoboth	400	42,000	
Jacobs	Windhoek	500	52,500	
Meatco	Windhoek	1,200	252,000	252,000
Wesland	Otjiwarongo	200	21,000	

Source: Vigne (2005)

According to speculators from Otjiwarongo they buy each week up to 3,000 small stocks in the northern areas. As most of the goats coming from the northern region go to "half way stations" in the south these exports are reflected in the statistics of Hardap and Karas. Commercial farmers mainly market their small stock through auctions, or privately on the farm or direct to Farmers Meat abattoirs in Mariental and Rehoboth and the Meatco abattoir in Windhoek (Vigne 2005).

In the case of cattle 51.5% were slaughtered at local export abattoirs in 2003 while the rest were exported on the hoof. For 2004 slaughtering at local abattoirs vs live exports were 50:50.

The main livestock marketing facilities used in the region are auction pens, through which farmers sell animals during auctions and permit days. Most of auction pens have been transferred to local communities and are currently managed and maintained by farmers' associations.

### ***Processing and marketing***

Meatco's export abattoirs are located in Okahandja and Windhoek.

Windhoek has several abattoirs and meat processing facilities. These include among others the following:

- Meatco (mainly for exports of beef)
- Just Lamb (slaughtering and exporting mutton and lamb as well as goats)
- Hartlief
- Windhoek Schlachtereie
- And several other butcheries.



**The information highlighted in blue is also reflected in General Overview**

Namibia's slaughtering capacity as provided by the Meat Board of Namibia is reflected in Table 2.8.

Table 2.8: Slaughtering capacity of Namibian abattoirs

ACTIVITY	VOLUME/FIGURES
Cattle population	2,349 700
Namibia slaughtering capacity	210,000 (100%)
Average cattle marketed at RSA formal butcheries from 1995 - 11999	342,086 per annum
Live export 1995 – 1999 / per annum	174, 342
Meatco slaughtering capacity	186,655 per annum
2004 – slaughtering capacity	75%
2005 – slaughtering capacity	76%

Witvlei abattoir is presently not operational.

During the period 2000 to 2004 cattle that were recorded to have been marketed were 288,106 per annum of which 125,396 were exported live to South Africa and 162,710 were locally slaughtered which represents 85.6% of Meatco slaughtering capacity. However, the live exports have decreased by 48,946 cattle during the period between 2000 and 2004.

The average utilization of slaughter capacity was 75 % in 2004 and 76% for 2005 (Table 2.8).

It is recorded that more than 95% of all cattle exported to South Africa fall within the category calves and weaners (Source Meat Board of Namibia 2006). Government however intends to impose a levy on the export of weaners in order to add value to local produce and to utilize existing slaughtering facilities to their maximum capacity (Meat Board of Namibia 2006 unpublished report).

According to the Meat Board of Namibia in the order of 140,000 weaners are annually exported on the hoof to South Africa of which 70% originates from communal areas. This specific marketing channel allows for serious competition and communal farmers are also benefiting from it at large.

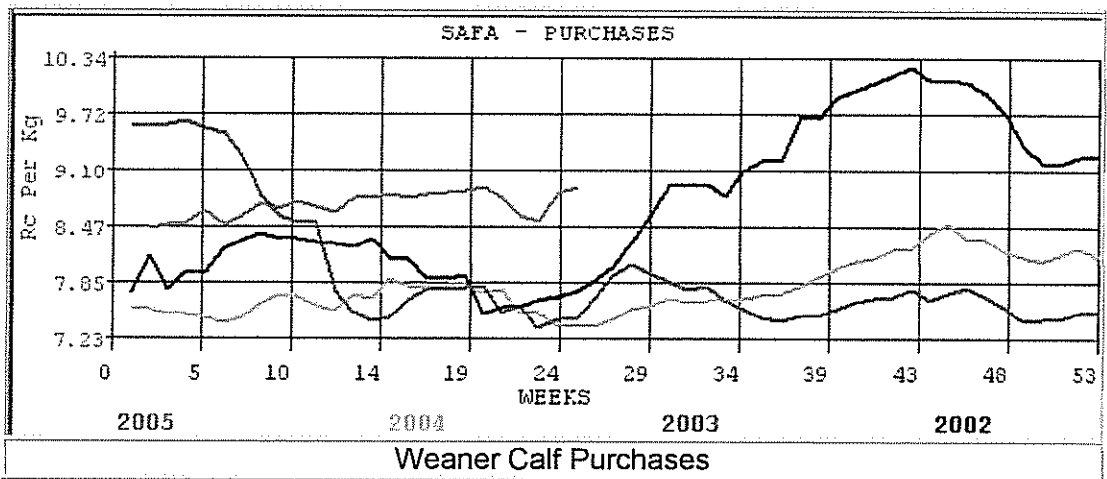


Figure 2.1: Average producers price (South African Feedlot)  
 Source: Meat Board of Namibia

From Figure 2.1 above it can be seen that the average price a farmer could realize varied from NS8.00 to N\$8.30, meaning that against an average body mass of 230kg/weaner the producer could realize a average price N\$1,909.00. While there was still a downward trend in prices during 2003 and 2004 (Fig. 2.2) there was a substantial increase in price to more than ten dollars per kilogram for weaners since October 2005.

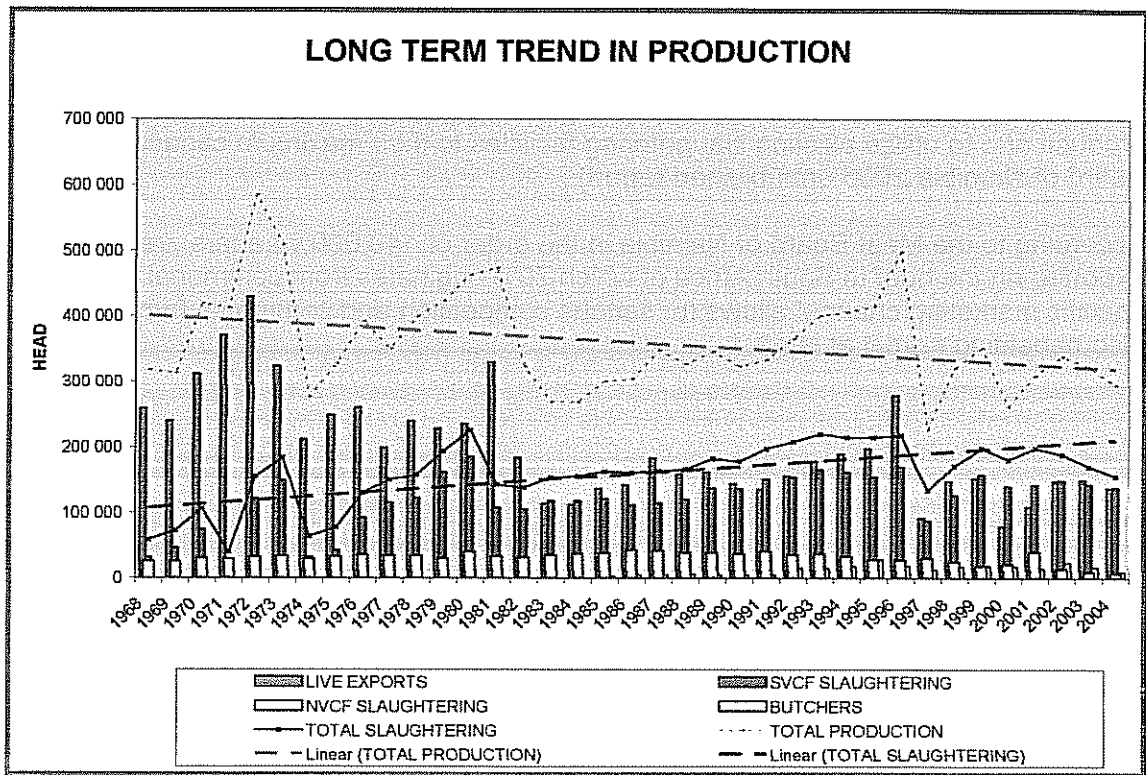


Figure 2.2. Long-term cattle production trends in Namibia  
 Source: Meat Board of Namibia

The Veterinary Cordon Fence (VCF) runs along the 20 degree latitude line to the north of the Gam area westwards to the Ovituuu area where it turns north . Therefore, cattle and small stock in most of the Tsumkwe Constituency cannot be marketed to the south. Distances to the Meatco abattoir in Oshakati make the costs of formal marketing prohibitive. The area from the VCF south to the Eiseb block in Omaheke region is classified as a surveillance zone. Livestock can be marketed to the south from this zone only after they have undergone 21 days quarantine together with sentinel cattle in a quarantine camp to the south of Gam followed by a further 69 days in quarantine on a farm in the disease free zone (Vigne 2005).

### ***Management practices***

#### ***Commercial farmers***

In a pilot study among commercial farmers in the Khomas and Omaheke areas carried out by International Development Consultants (2005) it was found that the majority of farmers (66%) are marketing oxen at the age of  $\pm$  30 months while 12.5% sell weaners (8 months of age) while another 12.5% market their cattle at the age of 18 months. The rest follow a combination of 30 months and weaner marketing.

The data in Table 2.9 represent cattle numbers registered by farmers for 2004 and 2005 with the Meat Board of Namibia.

Table 2.9: Herd composition of cattle farmers in Namibia

Year	Bulls	Cows	Heifers	Calves	Oxen
2004	2.2	30.88	5.88	30	31.06
2005	2.32	30.25	5.76	28.98	32.68

*Source of raw data: Meat Board of Namibia- processed by consultant*

A very sound male: female ratio of 1:26 is applied while the average substitution of cows is at a high rate of 22%. This means that the turnover in the female component is high and that the average age of the female herd is relatively young. The high percentage of calves in Table 2 is an indication of a very good calving percentage

A sound level of animal fertility and health management is maintained. Farmers vaccinate against the most important diseases like botulism, anthrax, blackquarter, pasteurolosis, brucellosis and vibriosis.

Almost 70% follow a rotational grazing system with between 4 and 6 camps per herd. The grazing system is based on the principles of selective grazing and resting of veld. Commercial farms are well developed in terms of infrastructure. In the abovementioned study area the average camp size is 210 hectares with 26 camps per farm and only 535 ha per water point (Pipelines as well as boreholes). Among these farmers no indications of overstocking or mismanagement of veld was found. This is also reflected by the applied stocking rate of 14.8 ha/LSU and a low degree of bush encroachment. Veld condition was rated as good in the pilot area.

Although it can be assumed that commercial farmers in the rest of these regions maintain a satisfactory level of farm management bush encroachment on almost 70% of this area is a serious problem. Subsequently the natural rangelands are showing serious degradation.

### ***Communal farmers***

The management of pastures and allocation of rights falls under the authority of village assemblies. Responsibilities of village assemblies include decisions with regard to the opening of cattle posts or *ohambo* during the dry season as well as the allocation of grazing rights to outsiders in times of drought. (Stahl 2000: 325.).

Village land is divided into different zones, each zone providing specific resources. All households have access to resources in these zones during specific seasons (Homann and Seiffert 1996: 29; 75). It is common for some households to fence off the areas that have been allocated to them for grazing. These enclosures are referred to as *ozokamba* and comprised approximately 10% of the total village land in Otjiwa village in the mid-1990s (Stahl 2000: 328).

The basis of livestock farming in the two Herero speaking regions is based on a cattle breed which is derived from the Sanga. These were crossed extensively with Afrikaner cattle in the past and more recently a move towards using Brahman stock was observed. The interviews indicate that large frame animals such as Afrikaner, Simmentaler and Brahman are mainly found in Rietfontein and Eiseb. In all the other areas the Sanga type animals dominate.

In the early 1990s as much as 63% of bulls in Metzger's sample consisted of Brahman, 11% Otjiherero/Sanga and 10% Simmentaler. Only 2% were Afrikaner (Metzger 1994: 3).

Farmers identified the absence of fences as a major constraint on selective breeding and breeding seasons. In the household survey 78 % indicated that they have no breeding season and that the bulls are always remaining with the cows (Kruger et al. 2005). Breeding bulls ran with the cow herds all year round, and cannot be kept away from females. As Metzger (1994: 8) observed, 'the absence of planned breeding causes inbreeding.

Castration takes place at between six months and one year. At that time, bulls were selected on conformation and weaning weight.

Farmers produce mainly weaners for fattening in feedlots or on commercial farms (Metzger et al 1991: 66). Herds therefore contain a high percentage of females (Metzger 1994: 4).

Although farmers interviewed by Metzger (1994: 9-10) were aware of the importance of supplementary feeding, few were found to do so.

A calf will be weaned when the cow naturally weans it by kicking it away. This happens at the age of 15-18 months'. Herding of livestock does not generally occur. Masdar et al (1993: 74).

From 1990 to 2000 'there has been an overall increase in off take from the eastern communal areas of around 400% as farmers have adopted systems of weaner marketing mainly for the South African feedlot market' (Vigne 2000: 4).

Metzger et al (1991: 66) estimated off-take to be in the region of 20%. Metzger (1994: 26) found that rates of off-take in the SARDEP Test Areas ranged between 12% in Omupanda and 56% in Otumborombonga.

Most cattle are sold at auctions or to commercial farmers. In the early 1990s only 3% of cattle owners were reported to have sold their cattle to abattoirs, while 11% had sold cattle to other communal farmers (Iken et al 1994 cited in Suzman 1995a: 26).

Region	Ratio Cattle:Sheep	Ratio Cattle :goats	Ratio Sheep : goats
Erongo			
Commercial	0.21	0.23	1.11
Communal	0.25	0.57	2.23
Khomas			
Commercial	0.85	0.31	0.36
Communal	1.29	0.89	0.69
Otjozondjupa			
Commercial	0.26	0.24	0.89
Communal	0.26	0.57	2.22
Omaheke			
Commercial	1.23	0.38	0.31
Communal	0.24	0.56	2.25

### Crop production

Cropping in the former "Hereroland East" and "Bushmanland" is mainly for domestic consumption, while north of Otjiwarongo and especially in the area around Grootfontein and Otavi commercial cropping mainly of maize, groundnuts and latterly of cotton are important enterprises. The latter area, with its high rainfall and fertile soils can be considered as one of the best cropping areas in the country (Vigne 2005).

Table 2.10: Area per district in Otjozondjupa and Omaheke regions that were under dryland and irrigation production

Ha cultivated	Grootfontein district		Otavi district		Okahandja district		Gobabis district	
	Dryland	Irrigation	Dryland	Irrigation	Dryland	Irrigation	Dryland	Irrigation
2004	6188	63.5	942	142	120	95	595	79.5

Source raw data: Agronomic Board of Namibia; processed by consultant.

The rainfall where crops are planted vary between 450mm (Summerdown) and 500-550mm in Grootfontein district. Suitable soils are available but the rainfall and its distribution pose a risk for this kind of farming system.

The area under dryland cultivation will vary substantially from year to year (See Figure 2.3) pending the prospects for and distribution of rain. If the precipitation is not adequate by January planting of fields with maize will become a risk farmers will rather consider short duration cultivars of other crops.

Out of a total of 13,492 ha under dryland cultivation in commercial areas during 2004, farmers in Otjozondjupa planted 10700 ha (80%) while another 1600 ha (13%) was planted in Tsumeb district (Oshikoto). According to data obtained from the *Agronomic Board of Namibia* only 380 ha were irrigated in Otjozondjupa and Omaheke out of 2,900 ha in the commercial area in the same year. The exact yields coming from these fields (Dryland and irrigation) is not available. From the statistics bulletin it is clear that poor yield were obtained during 2004. The assumption is made that the regions under discussion produce 80% and more of the dry land maize production over years.

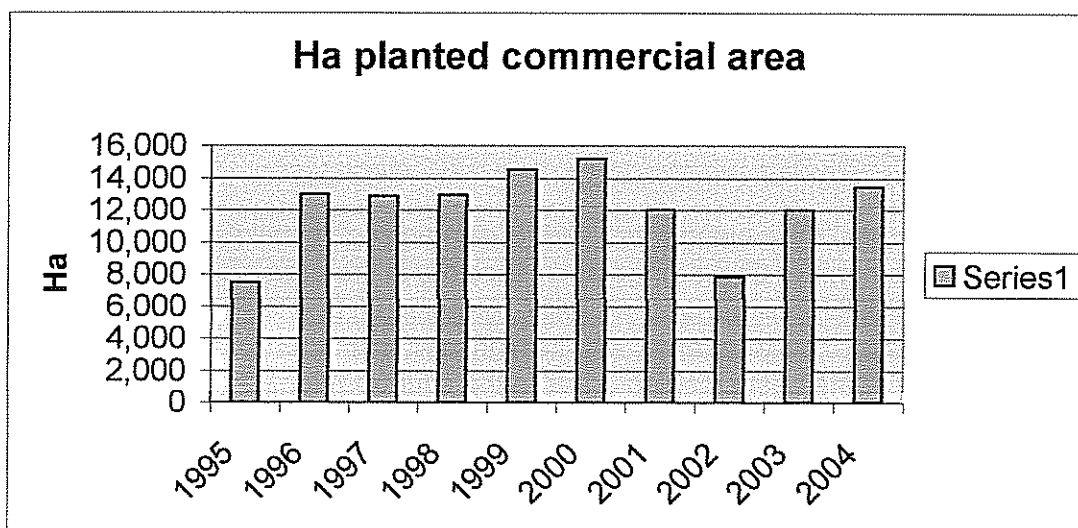


Figure 2.3: Hectares under cultivation in the commercial area (1995-2004)

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