

Agriculture is also the largest employer in most countries except in the case of South Africa and Botswana. In Tanzania, for example 55 % of the labor force is employed in agriculture, while Botswana and South Africa each had 3 % of the labor force in agriculture.

2.2 Maize in SADC

Maize, in particular white maize, is the dominant food staple throughout southern Africa, with its importance equaling that of rice and wheat in Asia. Although rice and wheat are also consumed, increases in supply are usually from imports while maize is generally a homegrown crop. Most maize is produced on medium to high potential agricultural land and more densely populated areas and areas with better infrastructure. A distinction should, however, be made that maize for human consumption is generally white maize while maize for animal feed is generally of the yellow variety. Currently about 5% of the maize produced is used for animal consumption, with the exception of South Africa where half of all maize is fed to animals.

This study examines 10 of the 14 SADC member countries. Four countries had to be excluded due to the lack of production, consumption, and general economic data. The remaining 10 countries can be grouped as follows: South Africa, Tanzania, and Zimbabwe are net exporters, Botswana, Lesotho, Malawi, Mauritius, Mozambique, Swaziland and Zambia are net maize importers. For modeling purposes, Botswana, Lesotho, Mauritius, and Swaziland are grouped together to form “the rest of SADC” because of their low production and consumption of maize.

South Africa is the regions’ largest producer of maize, producing 43 % of the total maize produced in the SADC region in 1999 (Table 2.2). This is not only due to the fact that it plants the largest area to maize, but also because South Africa’s average yield is consistently higher than that of the other countries.

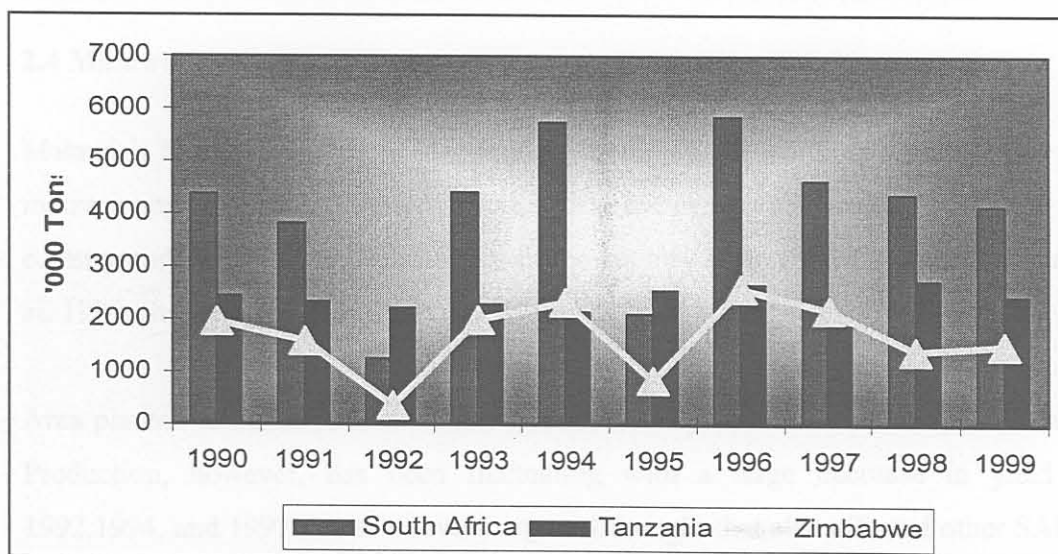
Table 2.2: Area, Yield, Production and Consumption of Maize in SADC: 1999

	Area	Yield	Production	Consumption
	(000 Hectare)	(Ton/Hectare)	(000 T)	(000 T)
Malawi	1400	1.77	2478	2057
Mozambique	1152	1.08	1244	1356
South Africa	3230	2.08	6718	7658
Tanzania	1764	1.39	2452	2643
Zambia	598	1.43	855	1460
Zimbabwe	1446	1.05	1518	2018
Rest of SADC	214	1.14	244	824
SADC	9804	1.42	13922	18016

2.3 Maize Supply

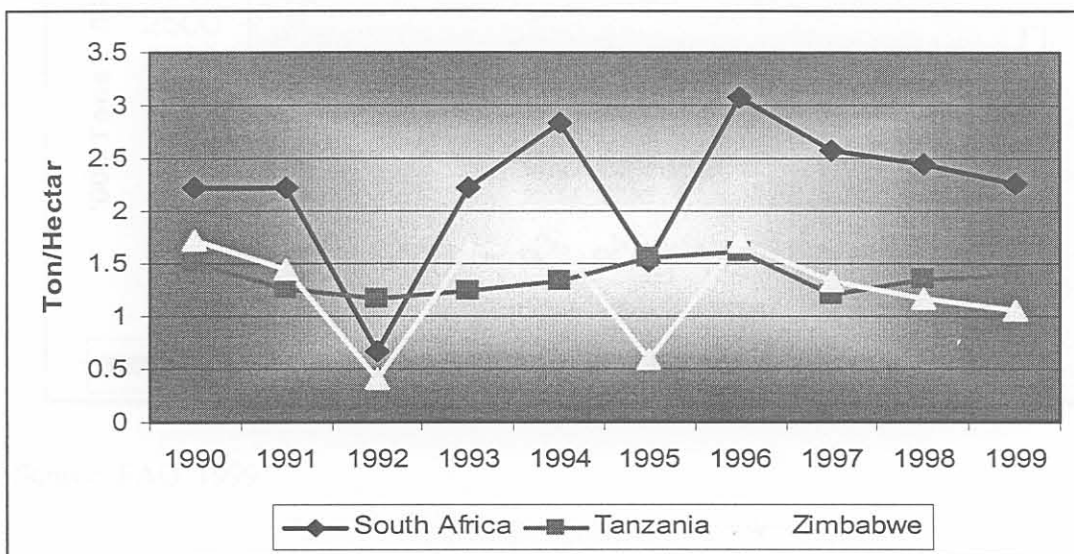
South Africa, Tanzania and Zimbabwe are the main maize producers in the SADC region producing approximately 70 % of the total maize output. Figure 2.1 clearly indicates that of the main white maize producers, South Africa is consistently the largest.

Figure 2.1 White Maize Production In South Africa, Tanzania, And Zimbabwe



On average, between 1990 and 1999 South Africa produces 4 million tons of white maize while Tanzania and Zimbabwe produce 2.3 million tons and 1.6 million tons respectively. The figure also clearly shows that South Africa and Zimbabwe's maize production are affected by similar weather patterns. In fact, they both experienced a severe drought in 1992 and again in 1995. However Tanzania does not seem to have the same weather patterns. This is even more noticeable in figure 2.2, which gives an indication of the changes in maize yields over ten years.

Figure 2.2 White Maize Yields in South Africa, Tanzania, and Zimbabwe



Source: FAO 1999.

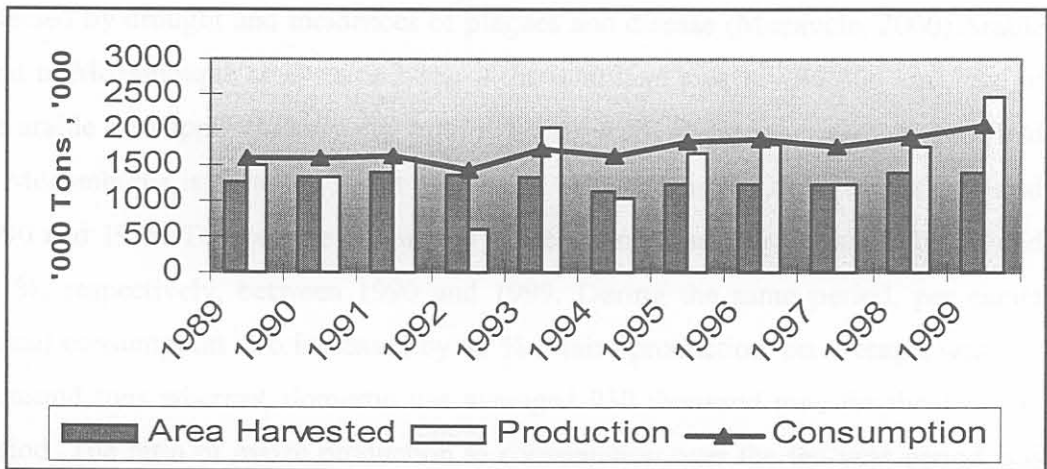
2.4 Malawi

Malawi is blessed with an agro-ecological environment, which is highly suited for maize cropping. Maize is mainly produced in the central and southern parts of the country and about 90% of households in the country cultivate maize (Nakhumwa et al. 1999; Smale and Heisey, 1997).

Area planted to maize in Malawi has remained fairly constant over the past decade. Production, however, has been fluctuating with a large decrease in yield in 1992, 1994, and 1997 due to a severe regional drought that also affected other SADC

countries. Total maize consumption had increased by approximately 22 % in the past decade but per capita consumption has decreased by 26 % over the same period. A crude measure, the ratio of production to consumption, averaged 0.88 indicating that over the last ten-year period Malawi was not self-sufficient in maize except in 1993 and 1999 (Figure 2.3).

Figure 2.3: Malawi Maize Area Harvested, Production And Consumption: 1989-1999



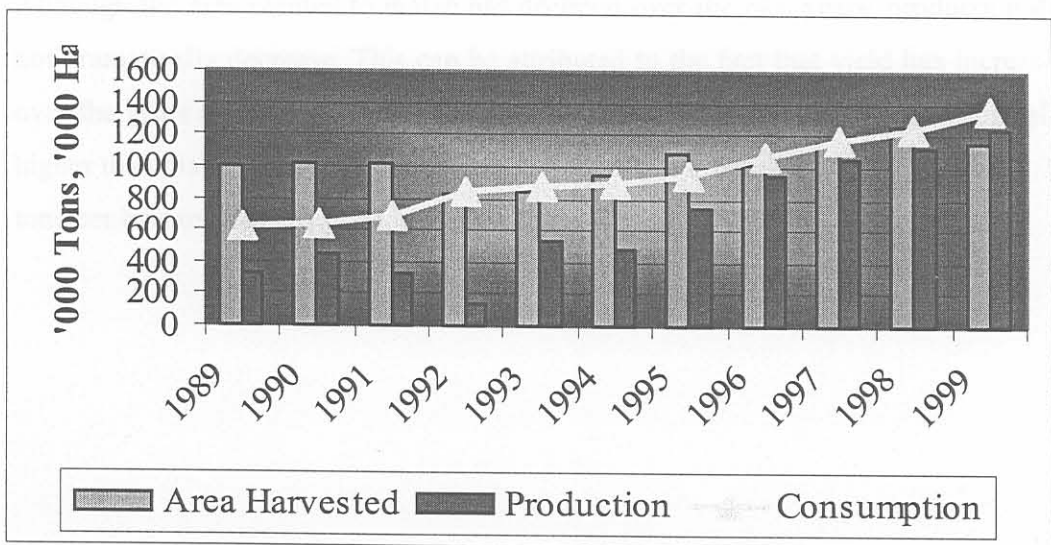
Source: FAO, 1999.

As in other parts of the SADC region, maize is the main food staple in Malawi, supplying about two thirds of the daily food calories' intake. Maize production in Malawi averaged, between 1990 and 1999, 1.3 million tons per annum from 1.2 million hectares of land, whereas domestic consumption averaged 1.4 million tons per annum (Figure 2.3). Malawi was accordingly a net importer of maize. Unimproved local flint varieties are the most commonly used. In 1990, however, higher yielding semi-flint varieties were introduced and widely adopted by small farmers, greatly increasing production. (Smale and Heisey, 1997). It should be noted however that the large decrease in production in 1992 was due to a drought that affected the whole southern African region.

2.5 Mozambique

Mozambique can be divided into three main agro-ecological zones, The Northern, Central, and Southern agro-ecological zones. Although these three zones differ in terms of rainfall and production risk, maize is produced in all of them, with the largest share being produced in the Northern agro-ecological zone. Mozambique's agricultural production for the past two decades has been severely affected by the civil war, and the uncertainty it has created. In addition agriculture was severely affected by drought and incidences of plagues and disease (Mucavele, 2000). Arable land in Mozambique constitutes 3.8% of the total land area of 784 000 km², and of the arable area approximately one million hectares are planted to maize. Maize yield in Mozambique is quite low, with an average of 0.62 tons per hectare for the period 1990 and 1999. Total maize production and consumption have increased by 54 and 53 %, respectively, between 1990 and 1999. During the same period, per capita annual consumption also increased by 43 %. Maize production, on average, was 670 thousand tons whereas, domestic use averaged 930 thousand tons for the 1990/99 period. The ratio of maize production to consumption over the ten-year period was consistently below 1 indicating a constant shortage of maize (Figure 2.4).

Figure 2.4: Mozambique Maize Area Harvested, Production And Consumption: 1989-1999



Source: FAO, 1999.

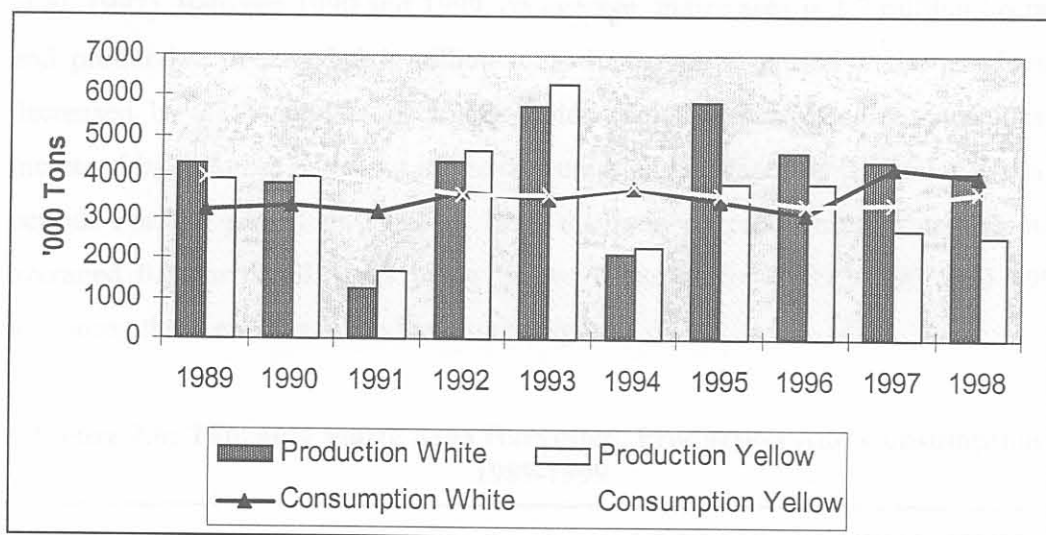
2.6 South Africa

Maize is the most important crop in South Africa, being both the major feed grain and the staple food for the majority of the South African population. Maize is grown in almost all provinces with varying degrees of intensity due to climatic conditions. The Free State is the major maize-producing region, whereas the North West, Gauteng, Mpumalanga and KwaZulu Natal are other important growing regions. Maize accounts for approximately 40% of the cultivated area and generates 15% of the gross value of all agricultural products (World Bank, 1994).

On average, between 1993 and 2000, the Free State produced 34% of total maize production, the North-West province 30%, whereas Mpumalanga and Gauteng supplied 21% and 5%, respectively. The remaining 10% of production scattered in the remaining five provinces. The area planted to maize varied between 5 million to 3.5 million hectares. The annual average maize production for the past decade has been approximately 8 million tons. South Africa has been plagued by a series of droughts, namely in 1982, 1984, 1988, and again in 1992, which seriously affected maize production.

Although the area planted to maize has declined over the past years, production did not dramatically decrease. This can be attributed to the fact that yield has increased over the years as production technologies improved. Yellow maize yield is normally higher than that of white maize in South Africa. Yellow maize's highest yield of 3.35 tons per hectare was achieved in 1993/1994.

Figure 2. 5: South Africa Maize Production And Consumption: 1989-1998



Source: Nation Department of Agriculture, 2000.

Domestic consumption of maize averaged, between 1990 and 1999, 7.5 million tons, 4.4 million tons white and 3.1 million tons of yellow maize. South Africa has been the breadbasket for SADC, exporting maize and maize products to almost all SADC, as well as to non-SADC countries. Over the past five years there has been a marginal increase in the domestic use of maize in South Africa (Figure 2.5).

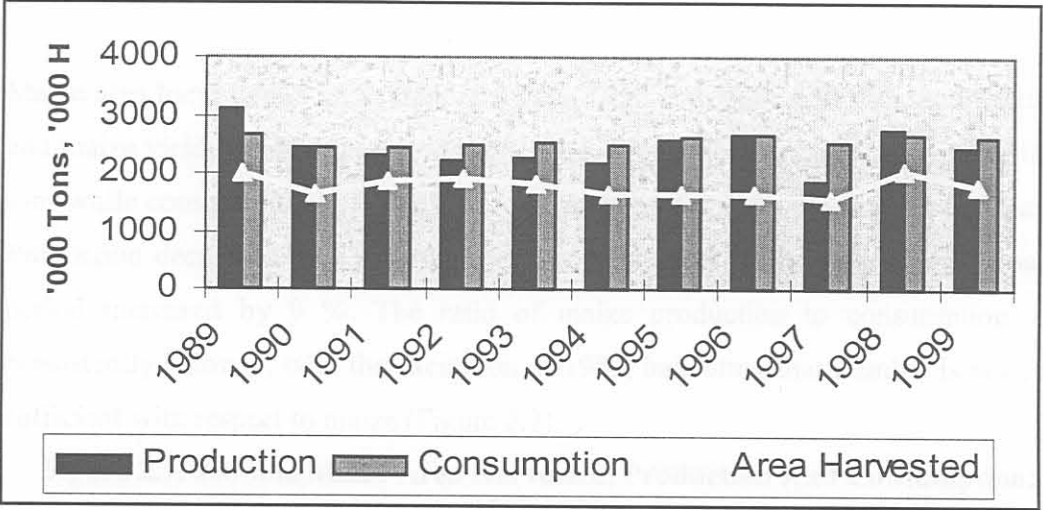
2.7 Tanzania

Agriculture is the backbone of the Tanzanian economy, with more than 80% of the active population is involved in some facet of food production. Agriculture is therefore the country's main source of income, providing 50% of its annual GDP, and 90% of its export earnings. (Lyamachai, *et al*, 1997)

Tanzania has a wide range of agro-ecological climates, and droughts rarely affect the whole country. Maize is cultivated in the western plateau and southwest highlands, mainly in the Iringa, Mbeya, Rukwa and Ruvuma regions. Maize is the most important food staple in Tanzania. Per caput maize consumption is approximately

144 kg and provides 61% of the calorie intake of the average Tanzanian (Lyamachai, *et al*, 1997). Between 1990 and 1999, on average, maize area is 1.7 million hectares and production averaged 2.4 million tons. In the same period maize production decreased by 27 % due to declining yields. Total domestic maize consumption increased by 5 %, but per caput maize consumption decreased by 2.6 % for the same period. For the period of 1989 to 1999 the ratio of production to consumption averaged 0.95 with all years being below 1 except for 1989, 1990, and 1998, indicating that Tanzania is food insecure (Figure 2.6).

Figure 2.6: Tanzania Maize Area Harvested, Production And Consumption: 1989-1999



Source: FAO, 1999.

2.8 Zambia

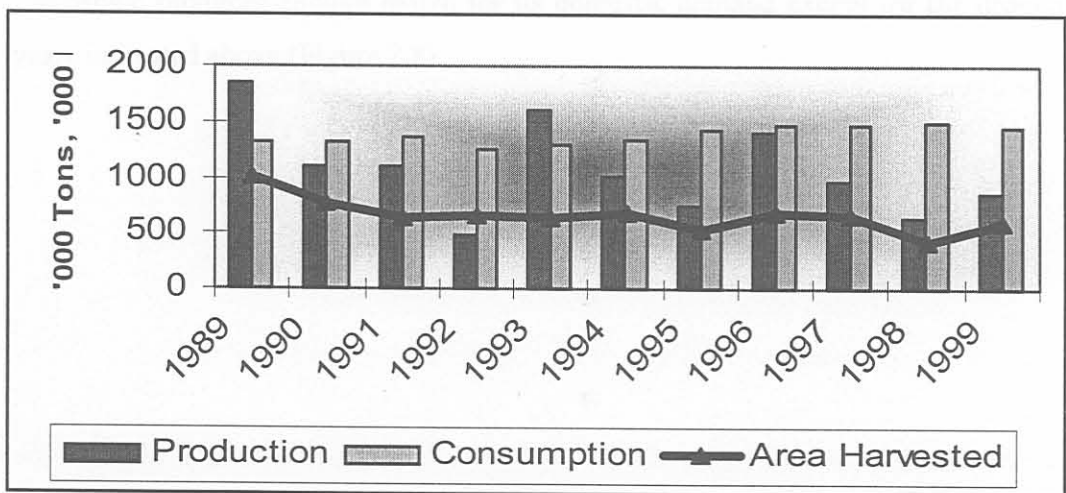
The maize sector used to be highly subsidized in Zambia. The subsidies provided by the government were however, not sustainable as they constituted 17% of the governments annual budget (Howard and Mungoma, 1997). Zambia experienced a “stop-and-go” structural adjustment program (SAP) between 1983 and 1987, as structural adjustment programs were adopted and subsequently the Zambian government abandoned in mid 1987. In 1990/91 the government reintroduced market liberalization under pressure from the international donor community (Howard and

Mungoma, 1997).

Zambia's diverse agro-climates and abundance of natural resources make most of the country suitable for agricultural production. Zambia can be divided into three main agro-ecological zones. Zone I includes the Luangwa and Gwembe valleys in eastern and southern Zambia, respectively, and parts of the Western and Southern provinces. This zone receives less than 800mm of rain. Zone II includes the Central, Eastern, Lusaka, and Southern provinces, and parts of the Western province. Zone III comprises the northern part of the country, which includes, Luapula, Copperbelt, and Northwestern Provinces. Most of the land suitable for agricultural production is found in Zone III (Saasa et al., 1999).

Maize area harvested is on average, between 1990 and 1999, 650 thousand hectares and maize yield is on average 1.6 tons/hectare. Production on average is one million tons while consumption is 1.3 million tons, making Zambia a net importer of maize. Production decreased by 53% from 1989 to 1999. Total consumption for the same period increased by 9 %. The ratio of maize production to consumption was consistently below 1, with the exception of 1989, indicating that Zambia is not self-sufficient with respect to maize (Figure 2.7).

Figure 2.7: Zambia Maize Area Harvested, Production And Consumption: 1989-1999



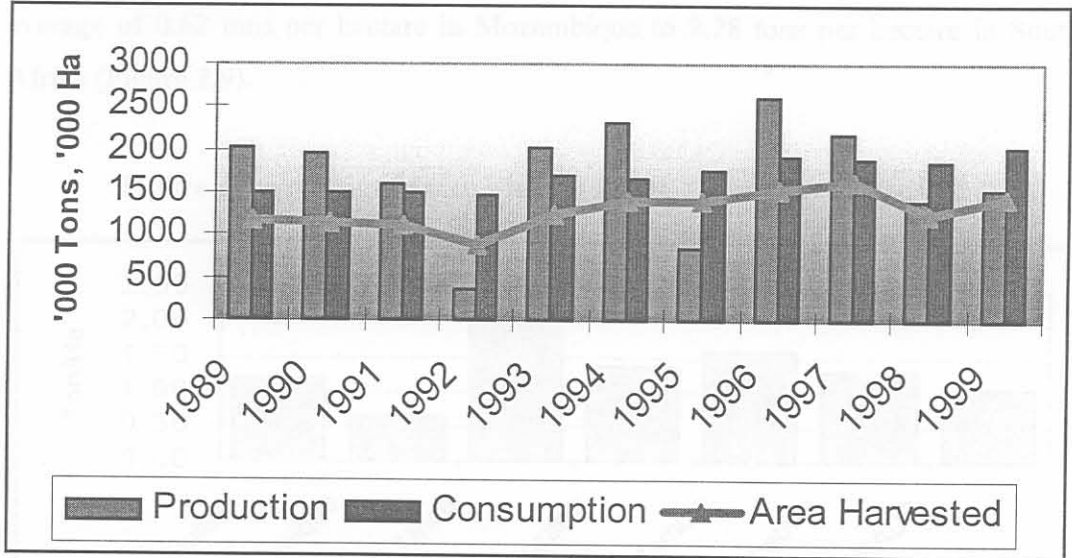
Source: FAO, 1999

2.9 Zimbabwe

Zimbabwe has a dualistic agricultural sector comprising of few commercial farmers, which occupy most of the high potential agricultural regions, and a large smallholder sector, occupying low potential agricultural land where ownership is predominantly communal. Smallholder farmers produce approximately 55% of the total maize (Sukume, 2000). Zimbabwe experienced a first green revolution in the early 1960's when the high yielding maize variety SR52 was released (Eicher and Kupfuma, 1997). Historically maize production was a small-scale farmers' activity. Maize is mainly produced in the southern parts of Mashonaland West, Mashonaland Central, Mashonaland East, and in northern Manicaland.

Between 1989 and 1999, maize area has steadily increased. Maize production however, has not followed the same trend and decreased by 32 % during the same period. For the 1990-99 period, maize production, on average was 1.71 million tons and consumption was, on an average 1.70 million tons. Zimbabwe was a net exporter of maize except for 1992, 1995, 1998 and 1999 due to severe droughts in the region, and again in 1998, and 1999. However, the current political crisis has changed the overall outlook of the country. It is expected that maize production will be the lowest in the history of Zimbabwe in current years. The ratio of production to consumption in Zimbabwe averaged 1.006 between 1989 and 1999, indicating that Zimbabwe produces enough maize for its domestic demand except for the drought years indicated above (Figure 2.8).

Figure 2. 8: Zimbabwe Maize Yield, Production And Consumption: 1989-1999



Source: FAO, 1999

2.10 The Rest Of SADC

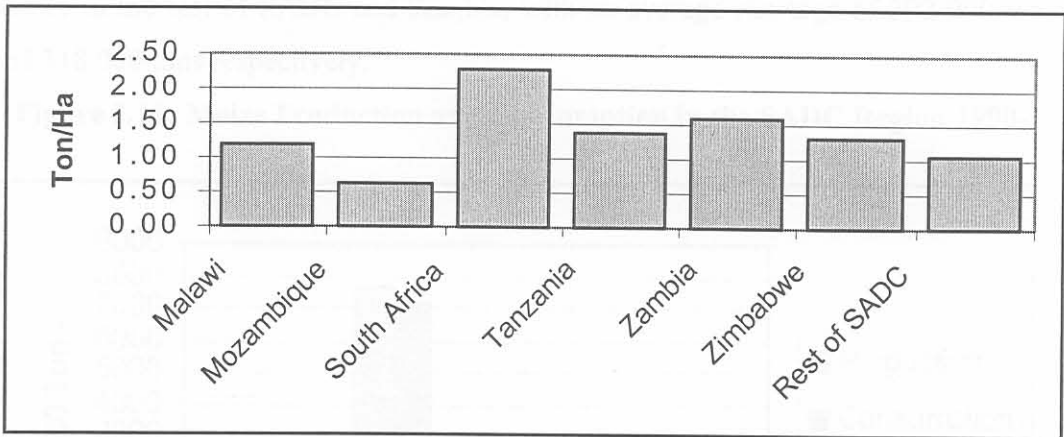
For the purposes of this study the following countries were grouped as the rest of SADC: Botswana, Lesotho, Mauritius and Swaziland. Angola, the Democratic Republic of Congo, Namibia, and the Seychelles were not included due to lack of data for these countries. Over the above ten-year period, the rest of SADC produced on average 234 thousand tons of maize and consumed an average of 666 thousand tons indicating that this group is largely a net importer of maize. The ratio of maize production to consumption was consistently below 1, with an average for the ten-year period of 0.35. This can be explained by the fact that Botswana and Mauritius are not maize producers due to their agro-climatic conditions.

2.11 Summary

From this chapter it is clear that that the countries within the SADC region differ greatly in many aspects, ranging from GDP to their individual food security in terms of maize. Zimbabwe and South Africa are the only countries in the region that consistently have a positive net maize trade. The SADC region as a whole is food secure in terms of maize predominantly due to the surpluses produced in South

Africa and Zimbabwe. Amongst the SADC countries maize yield varies from an average of 0.62 tons per hectare in Mozambique to 2.28 tons per hectare in South Africa (Figure 2.9).

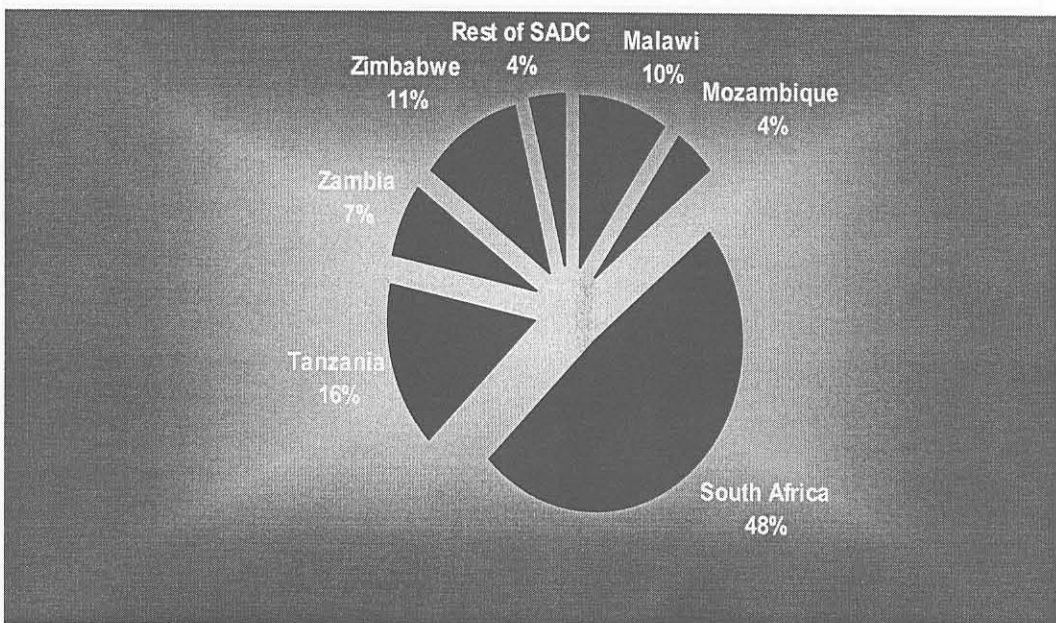
Figure 2.9: Average Maize Yield in SADC Countries 1990-1999



Source: FAO, 1999

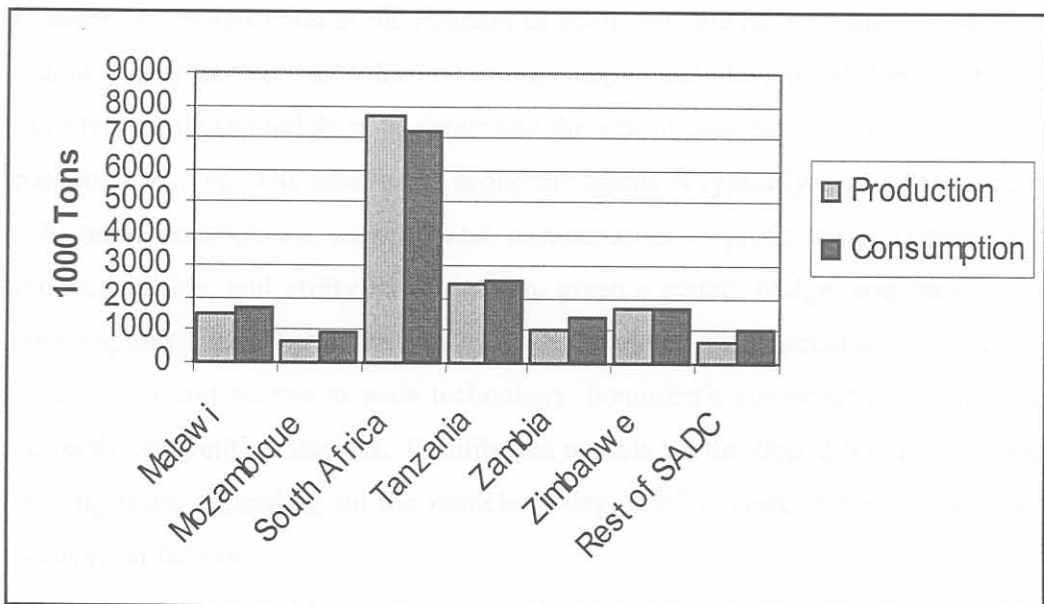
South Africa is the largest producer of maize in the region, producing on average 48 % of the total maize produced in the region, while the rest of SADC and Mozambique produce only 4 % respectively (Figure 2.10).

Figure 2.10: Percentage of Maize Production for the SADC countries 1990-1999



Although the SADC countries produce varying percentages of total production, what is important is how much of that production is consumed. Figure 2.3 represents the average production and consumption of each SADC country between 1989 and 1999. From Figure 2.11 it is clear that, on average, only South Africa and Zimbabwe are food secure in terms of maize. The largest maize deficit on average usually occurs in the rest of SADC and Zambia, with an average shortage of 392 000 tons and 318 000 tons respectively.

Figure 2.11: Maize Production and Consumption in the SADC Region 1990-1999.



One of SADC's main objectives is to promote food security within the region, this however can only be done if policy makers are in a position to make informed decisions. The following chapter discusses the use of commodity modeling as an aid to policy making.