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**THE WORLD MARKET FOR PEARL MILLET
AND THE POTENTIAL FOR IMPORTS
INTO NAMIBIA**

FINAL REPORT

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Executive Summary

The objective of the study is to determine the possibility of Namibia obtaining imports of pearl millet to facilitate the establishment of a substantive processing industry.

From the onset, it must be stressed that there is a worldwide dearth of information on commercial pricing, cost of production, processing costs and general trade information on all types of millet.

The main millet producing countries are India (10.7 million tonnes), Nigeria (4.6 million tonnes) and China (3.7 million tonnes). Total world production is 28.4 million tonnes. This compares with 50 000 tonnes produced by Namibia. Average world yields are 0.74 tonne/ha compared with Namibia's 0.20 tonne/ha.

The global trade of millet is very small at about 255 000 tonnes, ie less than 1% of total production. The main exporting countries are India (59 000 tonnes), USA (46 000 tonnes), Argentina (43,000 tonnes) and China (22 000 tonnes). All of the USA and Argentina's exports are proso millet which is sold into the high priced birdseed trade. The main regular source of Pearl millet on the international market is India. On average, Namibia imports 110 000 of cereals other than millet.

Virtually all of the world's production of Pearl millet is by subsistence farmers for own-consumption; it is rarely commercially traded.

Countries bordering Namibia are not regarded as suitable for securing millet when Namibia is short. These countries experience a similar climate and, if Namibia experienced a deficit, they will too. Also, most of the production in neighbouring countries is by subsistence farmers and not for commercial marketing.

West Africa is a significant producer of Pearl millet. However, it is all grown well inland in areas bordering the Sahara desert, about 1 000 to 1 500 miles from the sea on very poor roads. The high cost of road transport to a sea port as well as the cost of sea freight and import duties would make West African Pearl millet prohibitively expensive. In addition, the unreliability of their yields, and hence unreliability of a marketable surplus, would make it extremely risky to develop a business strategy based on sourcing from West Africa.

Millet producers in North and South America grow almost entirely Proso millet for birdseed. Even if it was suitable for Namibian processors, it sells at a price much too high to allow the production of millet flour competitive with maize meal. If farmers in Argentina and the USA could be persuaded to grow Pearl millet instead of Proso, they would require even higher prices to compensate them for the lower yields.

The only country that could supply Namibia with Pearl millet in most years is India. Price models have indicated that Indian Pearl millet can be landed in Oshakati for prices of between US\$ 336 to 408/tonne (N\$ 1 613 to 1 958/tonne). However, at these factory gate prices, millet flour would be retailed at N\$ 3.00 to 3.50/kg which is over twice the price of maize meal.

If import tariffs were removed, the factory gate price of Indian Pearl millet could be reduced to between US\$ 277 to 335/tonne (N\$ 1 330 to 1 608/tonne). Even at these prices, the cost of millet flour in the shops would be about N\$ 3.00 to 3.40/kg which is still about twice the price of maize meal. These figures are elaborated in Appendix 3.

It has been reported that Indian millet has been traded at N\$ 750/tonne in Oshakati. The only way this could have been achieved is if someone in the marketing chain made a very substantial loss, or if an "improper transaction" took place before it arrived in Namibia.

Therefore, it must be concluded that it is impossible to import Pearl millet on a regular basis and process it into flour in Namibia at a price which is competitive with maize meal. There may be occasions when certain countries have a surplus and Pearl millet might be sold sufficiently cheaply to make it attractive. However, the high cost of transport will make importation from most countries prohibitive.

CHAPTER ONE

INTRODUCTION

1.1 Background

In September 1997, Namibia Resource Consultants (NRC) were asked to review the operations of the Mahangu Marketing Intelligence Unit (MMIU) and a strategy for its future development. As part of this assignment, the constraints to commercialising the mahangu were identified and discussed. One of the main conclusions was that if it going to commercialised, the target market would be the urban population in the main towns such as Windhoek. In order to develop a product acceptable to this market, it would have to be processed into a flour. In other words, investments would have to be made to de-hull and mill mahangu. A viable processing industry could only be established if it was possible to import mahangu in years when Namibia was in deficit. This document was commissioned to review the world trade in millet and establish the potential for imports into Namibia.

The world production and trade is reviewed in Chapter Two. Chapter Three discusses the potential for imports. The data for this study were collected in mid-October during a visit to Namibia, in early November during a visit to FAO (Food and Agriculture Organisation) and World Food Programme (WFP) in Rome. In addition, a considerable number of phone conversations were held with international grain traders, processors, organisations such as ICRISAT (International Crops Research Institute for the Semi-Arid Tropics) as well as consultants specialising in millet. All of these provided background information. In addition, the FAO publication, "The world sorghum and millet economies" was an invaluable source of information.

It must be stated at the outset that despite being the seventh most important cereal crop in the world, there is remarkably little information, trade statistics or economic analyses of millet. Whether it is ICRISAT, FAO or WFP, they all acknowledge they know very little about the crop, despite the fact that it is a staple food for a considerable, and often disadvantaged, people. One of the reasons for this dearth of information is that it is very rarely traded. Most of the internationally traded millet is sold for birdseed or cattle food and not for human consumption. Basically, in most countries, millet is grown as a "crop of last resort" in areas of poor soils with an inhospitable climate. It is grown mainly for own-consumption and not for commercial gain.

1.2 Objectives of the Study

The objective of this study is to:-

Evaluate the potential for Namibia to develop regular and reliable Pearl millet imports into Namibia. This will include identifying traders, sources of grain, the potential for supplying Namibia and future price projections.

The full terms of reference are presented in Appendix I. The world trade in millet is much smaller than originally anticipated and much of the trade is for birdseed and not the preferred type in Namibia. It had been hoped to visit European based millet traders to discuss pricing, availability and obtain samples. The large European grade traders do not deal with millet, the smaller ones only sell it for birdseed. The most likely source of mahangu for Namibia is India, so no visits to traders took place.

1.3 Exchange Rates

The exchange rate assumed in this study were:-

4.8 Namibian dollar (N\$) to the US\$ and
8.0 N\$ to £ sterling.

1.4 Acknowledgements

The author of this report, Andrew Sergeant, gratefully acknowledges the support to many people who gave their time so willingly. In particular, the author is grateful to Jurgen Hoffman and his staff at Namibian Agronomic Board (NAB) for their encouragement and advice, Messrs Ipinge and Shatona of the MMIU for all their hard work, staff and advisors of the Directorate of Planning at the Ministry of Agriculture for their help and stimulating advice, various staff members at FAO, WFP and ICRISAT for searching their data bases and "memories" for millet information. The author gratefully acknowledges support and help from Jonathan Coulter and Paul Hindmarsh of Natural Resource Institute (NRI). Agrisystems (UK) and Landell Mills Ltd allowed the author to "browse" their computer data base for specialist millet consultants. The Indian High Commission provided a list of "possible" millet exporters

A list of the main people met or spoken to is given in Appendix Two. This list is not exhaustive and the author apologises for any omissions.

Finally, the author would like to take this opportunity to express his thanks to Rod Davis of NRC for his indefatigable efforts, cheerful support and encouragement.

CHAPTER TWO

THE WORLD TRADE IN MILLET

2.1 Background

Much of the data in this Chapter are extracted from the FAO publication entitled "The World Sorghum and Millet Economies".

It is important to differentiate between the different types of millet grown in the world. Most of the millets are grown for their grain, although there is increasing interest in utilising it as a forage crop. All the millets have different taste characteristics and therefore cannot substituted for each other for human consumption. In fact, different varieties within the same species have different taste characteristics.

Pearl Millet (*Pennisetum glaucum*, *P typhoides*, *P thypidum*, *P americanum*) is the most widely grown type of millet; it accounts for almost half the world's millet. The "mahangu" grown in Namibia is, in fact, Pearl Millet. Besides Namibia, it is the staple food crop of a number of West African countries and certain parts of India and Pakistan. It can be grown on poor sandy soils in dry areas which are unsuitable for maize or other cereals. Some breeding work has been done on Pearl millet. There has been some success at producing hybrids which are mainly grown in India.

Finger millet (*Eleusine coracana*) has a slightly higher rainfall requirement than Pearl millet and is often grown at higher elevations. It is grown in certain parts of East Africa as well as India and Nepal.

Proso or common millet (*Panicum miliaceum*) is grown in temperate climates such as the Ukraine, Kazhakastan, USA, Argentina and Australia. This is the most widely traded form of millet. Proso is often produced in developed countries and is sold almost exclusively for birdseed. It is higher yielding than Pearl millet and, therefore, is cheaper per tonne to produce.

Foxtail millet (*Setaria italica*) is also adapted to more temperate climates. It is mainly grown in China as well as India, Indonesia, the Korean peninsula as well as some parts of Europe.

Teff (*Eragrostis tef*) is very important in the Ethiopian highlands, but hardly cultivated elsewhere and rarely traded internationally.

White fonio (*Digitaria exilis*), **Black fonio** (*Digitaria iburua*) and **Guinea millet** (*Brachiaria deflexa*) are grown in dry areas. Some of them are important in

localised areas of West Africa, but are hardly ever traded.

There are a few other millets which have been identified, but are not very important and are insignificant in terms of the world millet trade.

2.2 World Production

World production of millet is about 28 million tonnes. Average yields are 0.74 tonne/ha. About 94% of total production is grown in developing countries, mainly in Asia and Africa (Table 2.1). World production has increased from about 26 million tonnes in the last 13 years, an increase of 0.7% per year. This increase is less than the expansion of the population in the countries where it is grown, which means the per capita consumption is declining. The small increase in total output is due mainly to yield increases because the total plantings have remained reasonably constant at about 38 million ha.

Table 2.1 Annual millet production and yields in different countries (average 1992/94)

	Production (million tonnes)	Average yield (tonne/ha)
World	28.38	0.74
of which		
Developing countries	26.60	0.75
Developed countries	1.79	0.72
Africa	11.36	0.61
of which		
Nigeria	4.62	0.89
Niger	1.86	0.38
Burkina Faso	0.79	0.64
Mali	0.73	0.61
Uganda	0.63	1.57
Senegal	0.55	0.64
Sudan	0.55	0.28
Namibia	0.05	0.20
Asia	15.17	0.79
India	10.70	0.77
China	3.67	1.93
CIS (former USSR)	1.54	0.74

Source:- FAO

The main producer of millet is India with over 10.5 million tonnes/annum; Nigeria is the next biggest with over 4.5 million tonnes and then comes China at over 3.5 million tonnes. There is only one other country that produces more than 1 million tonnes, ie Niger. Table 2.1 lists all the countries that produce more than 0.5 million tonnes. Zimbabwe produces 70 000 tonnes. According to FAO statistics, Southern Africa, which probably includes Namibia and Botswana but not RSA, produces on average 40 000 tonnes.

As in Namibia, considerable efforts are being made to promote millet production for own-consumption. Again like Namibia, very little is traded, a small portion is used for stock feed and seed, but the vast majority is used for own-consumption. According to ICRISAT and FAO data, production in Zimbabwe is declining by 4%/year. This is a per capita decline of 7%/year. It should be noted that ICRISAT in Bulawayo believe that at least part of the decline in millet production is due a change in the method of recording information. Again according to ICRISAT/FAO data, 70% of the Zimbabwe millet is pearl and 30% finger millet.

The biggest producer of Pearl millet is India. Approximately two thirds of its millet production is Pearl millet, ie over 7 million tonnes. It is interesting to note that most of the Chinese production is Foxtail millet. The Sahelian countries produce mainly Pearl millet while the East African production is mainly Finger millet. Virtually all the millet grown in the developed countries is Proso millet.

Average yields are low, about 0.75 tonne/ha. Uganda and China have much higher yields at almost 2.0 tonne/ha. This is probably due to the higher yielding types of millet more suited to temperate climates. Average millet yields in Southern Africa are 0.18 tonne/ha. This reflects the exceptionally bad sample years, 1992/94. However, the average yields for Southern Africa are the second lowest in the FAO data for 1992/94, only Sudan produces lower yields.

It should be noted that, on average, millet yields about 75% of sorghum; but production costs of both crops are similar.

To put the total millet production into perspective. It represents 5% of the world's cereal area, but only 1.5% of total production. This reflects the fact that it is grown in areas which are too dry and too hot and with too poor soils for other cereals.

It is interesting to note what has happened recently in the two millet major producing countries. Since 1979/81, yields have increased by over 50% in India, but the area planted has declined by almost 25%. Thus, as better technology is introduced resulting in higher yields, farmers plant a smaller area. Because it is regarded as a subsistence not a commercial crop, farmers only aim to produce their requirements and not a surplus. This observation was confirmed by officials at ICRISAT. In China, yields increased by about 35%, but plantings declined by over 50%. The reduction in area planted in China reflects government policy. The

agricultural economy was liberalised in the late 1980s and farmers shifted away from millet to more remunerative crops. Again the inference is that it is not a preferred crop for commercial production. Thus, trends in two of the main millet producing countries, China and India, indicate that it is not grown commercially.

The only continent in the world where millet production is increasing is Africa. Most of the expansion has been into areas with poorer soils and climate. Thus average African yields have stagnated or fallen despite the efforts to distribute improved varieties and spread improved technology.

2.3 Millet Utilisation

Millet is a very important staple food in the areas where it is grown. It is estimated that about 80% of the world's millet (over 95% in Africa and Asia) is used for human consumption. The remainder is used as stock or birdseed (7%) and other uses such as seed, brewing and wastage (Table 2.2).

Table 2.2 Millet utilisation, average of 1992/94 ('000 tonnes)

	Human food	Stock feed	Other uses	Total
World total	22 289	1 936	4 090	28 314
of which				
Developing countries	21 776	966	3 767	26 509
Developed countries	513	970	323	1 806
Asia	13 103	748	1 433	15 284
India	9 216	283	1 100	10 599
China	3 277	327	257	3 861
Africa				
Nigeria	3 315	100	1 155	4 570
Niger	1 440	17	259	1 716
Burkina Faso	683	2	126	811
Mali	658	3	119	780
Uganda	517	20	95	632
Senegal	505	5	83	593
Sudan	364	20	76	460
Namibia	50			50
CIS	504	736	31	1 271
North America	0	180	1	181

Source:- FAO

Per capita millet consumption varies greatly. It is highest in Africa. For example, it represents over 75% of cereal intake in Niger and over 30% in most of the other Sahel countries. It is much less important in East and Southern Africa where maize is much more dominant. Outside of Africa, it is only important in certain regions within some countries.

Just under 2 million tonnes are used as animal feed. To put this usage in perspective, 30 million tonnes of sorghum are used world-wide as animal feed. Over 700,000 tonnes of millet are consumed as animal feed in Asia and a similar amount in the CIS (former USSR countries). Western Europe, North America and Japan together consume slightly over 200,000 tonnes, virtually all of it for birdseed. Proso millet is imported into South Africa and used as birdseed. One source estimates RSA imports of Proso millet at 1,500 tonnes.

2.4 Namibian Production

It is worth putting the world statistics in perspective with Namibia. In world terms, Namibia is a very minor producer with well below average yields (Table 2.3). To put Namibia's production into perspective, it accounts for 0.18% of the world's total millet production and 0.65% of the world's cultivated millet area. The data is not strictly comparable because the world averages are for 1992/94 whilst the Namibian data are for 1992/96.

Table 2.3 Comparison of Namibian and world millet production

	Output (tonnes)	Yield (tonnes/ha)	Area (ha)	% of World Production
World	28,314,000	0.740	38,100,000	
Namibia	50,250	0.202	248,762	0.18%

Source:- FAO statistics and the Namibian Early Warning & Food Information System

In terms of world output, Namibian production may be small, but it forms a significant portion of its cereal requirements. Between the 1991/92 and 1995/96 seasons, mahangu production and usage was estimated to average 38,800 tonnes compared with a total cereal usage of 186,000 tonnes. Thus, mahangu supplied 21% of its cereal needs. Namibia has to import grain each year. According to the NAB published figures on imports of white and yellow maize and wheat, based on permits issued, a total of 878 000 tonnes was imported between the 1990/91 and 1995/96 seasons inclusive. This gives an annual average importation of 146 333 tonnes over a six year period. Some of these imports could be replaced by either

locally grown or imported millet. If millet was more widely available in Namibia at a price comparable with imported maize and maize meal, then its usage may increase.

2.5 International Trade

The FAO estimates that the annual global trade in millet is 255 000 tonnes (Table 2.4). This is about 1.0% of the millet produced or 0.1% of the international cereal trade. Within the 255 000 tonnes of global millet trade is 28 300 tonnes of intra-Europe trade. Thus the true figure for exports from producing countries will be nearer 227 000 tonnes. The major exporters are India, USA, Argentina and China. These four countries account for 75% of global exports. Virtually all of the exports from the USA and Argentina are Proso millet while China's exports are Foxtail millet. The only significant and regular Pearl millet exporter is India.

Table 2.4 International millet exports - average of 1992/94 ('000 tonnes)

	Exports ('000 tonnes)
World	255.0
of which	
Developing countries	147.4
Developed countries	107.6
Africa	20.2
Mali	18.0
Asia	84.6
India	58.5
China	21.6
USA	45.5
Argentina	42.9
Australia	16.3
EU	28.3

Source:- FAO

In the period covered by the data in Table 2.4, Mali was the main African exporter. Statistics for earlier years show that both Niger and Sudan have exported millet. Most of this African trade will be to neighbouring countries, especially in the West African countries. For example, most of Mali's exports in

1992/94 will almost certainly be to Senegal. There is much more informal intra-African trade which is not recorded. Some of this unrecorded informal trade will be between Angola and Namibia.

Average global annual millet imports between 1992/94 are recorded as 264 300 tonnes. This is higher than exports due to discrepancies and differences in record keeping in different countries. The main importers are the EU countries (145 200 tonnes) which account for over a half the world's imports (Table 2.5). Other regular importers are Japan, Canada, Switzerland and Brazil. Imports into African countries are erratic. In 1992/94, Angola was the main importer with 21,700 tonnes, but in the previous years the FAO give data for, it did not import anything. The next major African importer was Senegal, which probably sourced from Mali.

Table 2.5 International millet imports - average of 1992/94 ('000 tonnes)

	Imports ('000 tonnes)
World	264.3
of which	
Developing countries	75.4
Developed countries	188.8
Africa	40.9
Angola	21.7
Senegal	15.0
Ivory Coast	1.2
Asia	44.3
Japan	20.3
Saudi Arabia	2.8
Malaysia	2.4
Thailand	1.8
EU (12 countries)	155.4
Canada	8.2
Switzerland	8.2
Brazil	5.8
Oceania	5.8

Source:- FAO

It is interesting to note that Angola imported an average of 21,700 tonnes of millet between 1992 and 1994 and yet it did not import in the previous 10 years. The FAO did not know which country supplied Angola with millet. Almost certainly it was part of a food aid package. The WFP do not recall any millet shipments to Angola, but there are other agencies which donate food to countries in difficulties. Assuming that the FAO data of millet imports into Angola are correct, it is unlikely they came from another African country because the main African exporter during this period was Mali (Table 2.4) and most of its exports almost certainly went to Senegal. Therefore, the most likely source of Angola's imports will have been India.

Namibia does not appear as a millet importing country. According to investigations by the MMIU, customs do not have any records of official millet imports, but it is known that when there is a price incentive, millet does move from Angola into Namibia on an informal basis.

FAO claim that international millet trade is controlled by a few specialised companies. However, all the companies FOA thought traded millet, when contacted during the course of this study actually did not! There are a few small and medium sized companies involved with trade in Europe and North America. Most of these companies import and supply to birdseed users and even smaller volumes to health food shops. Trade from the largest exporting country, India, is controlled by their government who issue export licenses for coarse grain (millet and sorghum). Each year, the government estimates cereal production and project requirements and then advertise for tenders. As noted earlier, FAO data suggests that India exports almost 60,000 tonnes each year although APEDA (Agricultural and Processed Food Products Export Development Authority) claim exports are normally between 35 000 and 40 000 tonnes.

The 35 000 to 60 000 tonnes exported each year is a very small proportion of the 10.7 million tonnes of millet that India produces each year (much less than 1%). Therefore, adverse growing conditions in some main producing areas could have a significant effect on the amount of millet available for export. Nevertheless, it does appear that India does export every year.

In summary, most farmers who rely on this crop are subsistence and frequently experience shortfalls. Little of the millet production enters the commercial market yet alone be part of any international trade; most of it never leaves the farm it is grown on. Instead, many millet farmers are more likely to be buyers of cereals rather than sellers.

2.6 International Prices

The FAO present a series of export price data for Argentina, USA and Australia (Table 2.6). These data are presented in constant terms. Prices vary considerably from year to year, especially from Argentina. Export prices from the USA are more stable. International prices of millet are higher than most other cereals. This will be a reflection of their lower yields. It should be stressed that prices in Table 2.6 are export prices and do not take into account sea freight, offloading costs or any import tariffs. The price data in Table 2.6 are not really relevant for Namibia, because 100% of the millet grown in the USA and Australia and 98% in Argentina is Proso millet which is sold for birdseed! However, the data are an import guide to the level of prices farmers in developed countries expect to grow millet. It is likely that if they were growing the lower yielding Pearl millet, they would expect even higher prices.

More recent price data for USA millet on the international market are presented in the Public Ledger. Two prices are quoted for USA millet ex-UK stores. The price in November 1997 was US\$ 600/tonne and US\$ 550/tonne (excluding the EU levy). The prices in the Public Ledger have changed by only US\$ 10/tonne between November 1995 to November 1997. Again, these prices are for Proso millet which is traded for birdseed.

Table 2.6 Average annual millet export price data (US\$/tonne - constant terms)

	Argentina	USA	Australia
1985	107	171	210
1986	139	151	195
1987	108	154	162
1988	123	173	110
1989	190	177	249
1990	143	188	318
1991	107	156	249
1992	114	170	249
1993	156	223	245
1994	228	254	325

Source:- FAO

The most relevant international price data for Namibia will be Indian Pearl millet. APEDA has been requested to supply time series of prices and tonnage. They have agreed to the request but not yet responded at the time of writing this report. However, conversations with the one of the executive officers within APEDA confirm that exports of Pearl millet are normally between 35,000 and 40,000

tonnes annually and the average export price over the last 10 years is US\$ 180/tonne FOB Bombay. Over the last 10 years export prices have varied between US\$ 160 and 220/tonne. The average export price of the 1997 crop is expected to be between US\$ 210 and 230/tonne. Interviews with Indian based traders confirm this average price. Most of India's millet exports are sold within the Pacific rim and Middle East for animal feed and industrial uses.

Attempts were made to understand the trends in millet prices. The birdseed market for Proso millet is relatively static, the UK quoted price has hardly moved for two years. Indian Pearl millet export prices are higher than world maize prices. It would seem logical that Indian export Pearl millet price trends would follow maize. The World Bank predicts that maize prices will decline by about 20% over the next 10 years. If Pearl millet prices decline by a similar amount, then it would be cheaper to import into Namibia. However, cheaper world maize prices would mean maize meal prices would also decline maintaining a similar differential with millet flour.

CHAPTER THREE

OPPORTUNITIES FOR IMPORTING PEARL MILLET INTO NAMIBIA

3.1 Background

There are a number of countries where Namibia could secure imports. In order to discuss opportunities for Namibian imports, these potential sources are segmented and discussed individually. These sources are differentiated as follows:-

1. Angola and Zimbabwe
2. Botswana and South Africa
3. West Africa
4. India and other Asian countries
5. Argentina and South America
6. USA

In NRC document entitled "Constraints to the Commercialisation of the Pearl Millet Industry in Namibia", a factory gate price of mahangu was calculated which allowed millet flour to be produced at a price competitive with maize meal. This calculation showed that if the average delivered price for mahangu did not exceed N\$ 700/tonne (US\$ 146/tonne), then the flour could be sold on supermarket shelves at a price within 10% of maize meal. It is recognised that this 10% is rather arbitrary, but it proves a useful starting point. The NRI report on "Grain storage in the Northern Communal areas of Namibia" suggests that with a mark-up of 50% over maize flour, there could still be significant sales. Even with a mark-up of 50%, the buying in price for mahangu could not be much more than N\$ 1 000/tonne (US\$ 208/tonne).

The NRC report on constraints to commercialisation of the Pearl millet industry noted that the cost of producing mahangu was much higher than processors could afford to pay farmers. However, there were occasions when farmers may be persuaded to sell at a price to allow commercial processing. If a substantial processing sector is going to be established, then it is essential that processors are able to import Pearl millet in deficit years to keep the factory operational and ensure that the product is always available to consumers. In other words, processors must be able to obtain mahangu at a delivered factory price of N\$ 700/tonne (US\$ 146/tonne), whether it is grown within Namibia or imported. An effective industry will only be established if processors are certain they can regularly obtain competitively priced Pearl millet, whenever there is a deficit in Namibia.

3.2 Import Duties

Pearl millet imported into SACU (Southern African Customs Union), of which Namibia is a part, is subjected to import levies. Currently, the import duty into SACU is 25% on the FOB value from outside of SACU countries will have to be levied with a 25% duty, whilst it can be imported duty free from South Africa and Botswana. It should be noted that the import duty on millet into SACU is currently being disputed.

3.3 Angola

Being the country nearest to Northern Namibia and a grower of Pearl millet, Angola has the potential to supply Namibian processors. Already there are informal millet exports to Namibia. Angola is not part of SACU and therefore imports are, in theory, subject to 25% duty. As all imports have been "informal", no duties have been paid.

Southern Angola is in the same climatic region as Namibia. Therefore, when Namibia is in deficit it is likely that Angola will also be in deficit. It is reported that higher yields can be achieved in Angola which could offset the transport costs of marketing to Namibian processors. However, it is unlikely that Angolan farmers will be able to grow millet commercially to supply Namibian processors. It is interesting to speculate that if the prices offered by Namibian processors were set at a level to stimulate local production (perhaps by subsidies), then there would be much more informal cross-border trade with Angola.

It is also reported that there are "a number of stores filled with mahangu in Angola". If there were real commercial trading opportunities with Namibia, the mahangu would be sold rather than kept in-store waiting for high prices in possible future drought years.

As mentioned earlier, Zimbabwe grows more millet than Namibia (67,000 tonnes), but in per capita terms, its production is considerably smaller. Zimbabwean millet is grown almost entirely for own-consumption. There is some localised trade, which according to ICRISAT specialists such as Dr Rohrbach, is rarely outside a radius of 5 miles from the point of production. The Zimbabwean Grain Marketing Board reportedly buys "about 200 tonnes" of millet each year which it sells for stock feed.

The constraints affecting Namibian producers are similar for Zimbabwean growers. These include the fact that, in most years, they are barely self sufficient and in surplus years they are unable to sell the crop at a price farmers would consider attractive. There have been considerable efforts to improve millet processing in Zimbabwe, and there are now many village level processors, but there is still very little millet flour commercially traded in the urban centres.

It is reported that in years of surplus production, an active buying programme could obtain "up to 10,000 tonnes" of millet for export. Almost certainly the cost of transport and transaction costs would start to make it unattractive to Namibian processors. Perhaps the main problem with targeting imports from Zimbabwe is that they would probably only have a surplus in years when Namibia has one.

3.4 Botswana and South Africa

Botswana and South Africa both grow Pearl millet in the dryer, hotter areas of their countries. The advantage of trading with countries within SACU is that imports are not subjected to tariffs.

Like Namibia, the vast majority of Botswana and South African millet production is by subsistence farmers, very little of the grain is traded. One of the larger grain trading companies in South Africa was interviewed. It noted that there was a millet surplus in the 1996/1997 season, and that this was unusual. However, the surplus is small. Prices quoted were SAR 1 300/tonne ex-farm. When transport and other marketing costs to a Namibian mill, the factory gate cost would rise to at least N\$ 1 900/tonne. At these prices it would not be possible to produce commercially mahangu flour in Namibia.

Like Angola, Botswana and South Africa are in the same climatic region as Namibia and cannot be relied upon to have surpluses in years when Namibia is in deficit although, it must be admitted, South Africa had a good harvest in 1995/96 whilst Namibia was in serious deficit. It is therefore unlikely that either South Africa or Botswana could be relied on to supply mahangu at a price to facilitate a competitive mahangu processing industry. Therefore, the quote obtained for millet exports in 1997 reflects the good 1996/97 rainy season in Southern Africa. It must be expected that in poor rainy seasons, prices will be higher.

South African grain traders state that in most years it is deficient in millet. It may be possible to export a few containers in good years, but they would be unable to keep a vibrant processing industry going. In fact, South Africa is an importer of millet. It imports Proso millet from Argentina for birdseed.

3.5 West Africa

The Sahel countries are major producers of Pearl millet. However most of the production occurs 1,000 - 1,500 km from a sea port. Transport costs are high because of the very poor roads. This inhibits international trade except to neighbouring countries. Hence, there is some cross border trade, but as the data in Section 2.5 shows, it is very small. Imports into Namibia would be subjected to SACU import tariffs.

Requests were made to a number of organisations to supply production cost data for West Africa; but there was no response. FAO staff members who have worked cereal production and marketing in West Africa believe that their costs of production will be broadly similar to those in Namibia. Yields in West Africa are generally higher which should make it cheaper per tonne to grow millet. Considerable efforts were made to locate costs of production and selling prices of millet in West Africa but none of the people asked had either calculated them or knew of anyone who had.

In order to calculate the transport costs of cereals, estimates for road freight were obtained from WFP. These work out at about US\$ 0.10/tonne/km. If this rate were applied to moving millet from countries such as Mali or Niger to a major port, transport costs would be US\$ 100 to 150/tonne. Sea freight from West Africa to Walvis Bay would be about US\$ 45 to 50/tonne. With loading and off loading at the ports, freight costs from West Africa to Oshakati would be about US\$ 150 to 200/tonne. Thus, when the purchase price, transaction costs and transport from Walvis Bay to Oshakati, the cost of millet from West Africa will be at least double and possibly treble the price of maize. Therefore, Namibia could not rely on any West African country which grows millet being able to supply a processing industry.

Virtually all the trade in West African millet is at village level. It is very rarely exported. Mali has exported an average of 18,000 tonnes/year between 1992 and 1994 (2.5% of its total production). Most of this went to the neighbouring Senegal where the transport costs are not prohibitive in the years of surplus production in Mali. Therefore it would be very risky to rely on a country in West Africa to supply millet for the Namibian processing industry on a regular basis.

Considerable efforts were made to identify average selling prices of millet in West Africa so as to calculate a price delivered to Namibia. However, no reliable prices were found. Transport costs of between US\$ 150 to 200/tonne (N\$ 720 to 960/tonne) on their own would mean that sourcing from West Africa would not be a viable option.

3.6 India and other Asian countries

There are only two significant millet exporting countries in Asia, India and China. China's millet exports are mainly Foxtail millet which is not suitable for Namibia. However, India does export mainly Pearl millet. Therefore India is a potential source of supply to Namibia. In fact it is reported that one processor based in Oshakati has obtained and successfully processed Indian Pearl millet.

No official export price data have been supplied from India. However, discussions with APEDA confirm that the average export price over the last few years were US\$ 180/tonne. It is expected that the average export price for the 1997 crop will

be US\$ 220/tonne FOB Bombay. Sea freight costs to Walvis Bay are estimated at US\$ 30-35/tonne for full cargoes of 10 000 to 15 000 tonne. Sea freight rates will be higher for smaller consignments; the charge for a part-vessel of 3 000 tonnes would be US\$ 50-60/tonne. Millet from India would have to pay the SACU import duty of 25%.

In section 2.5, it was noted that Angola was a significant importer of millet between 1992-94. These imports were almost certainly food aid which probably originated from India. Therefore, it is possible that some of this food aid may have been "misappropriated" and traded into Namibia. It is reported that Indian millet from Angola was sold in Namibia for N\$ 750/tonne (US\$ 146/tonne). If this was misappropriated food aid, then its value to a processor on the open market in northern Namibia would be similar to maize. It is not possible to confirm this hypothesis, but it might explain why Indian millet was traded at a price much lower than the FOB Bombay price.

3.7 Argentina and South America

Argentina is the largest millet producer out of Asia, Africa and the CIS. It has developed international trade based on Proso millet to supply the birdseed market in Europe. In fact, 98% of the millet grown in Argentina is Proso millet. In recent years, export prices of Proso millet from Argentina have been more than US\$ 200/tonne and imports into Namibia would be subjected to SACU import levies.

Proso millet is higher yielding than Pearl millet (average Argentinean yields are over 1.5 tonne/ha). Costs of production were not available from Argentina. However, it must be assumed that if it grew the lower yielding Pearl millet, it would be more costly to produce per tonne than Proso millet. Therefore, even if Argentina started to grow Pearl millet, it would command a price well above US\$ 200/tonne FOB an Argentinean port.

The current landed price of Argentinean Proso millet for birdseed in the UK is between US\$ 400 to 450/tonne, C&F.

3.8 North America

There is interest in USA in growing millet in areas where rainfall is becoming more unreliable. Currently, all of the USA's millet production is Proso, which, like Argentina, is targeted at the high priced birdseed market. Given the cost of mechanisation in USA and the low yields from Pearl millet, producers in the USA would expect prices to be higher than those for Proso millet. Therefore, export prices FOB an American port would be more than US\$ 200/tonne. It should be noted that the ex-UK store price of American millet for birdseed is between

US\$ 550 and 600/tonne (Public Ledger quote). Again, these price data imply that growing Pearl millet in the USA would simply not be attractive to farmers there.

The only possibility to supply Namibia would be if very high yielding Pearl millet varieties adapted to American conditions could be identified. However, given the size of demand from Namibia, it is not worth anyone investing in a research programme to breed and select such varieties.

3.9 Summary of Potential Sources of Imports for Namibia

The world millet trade is very small. Currently, most of the trade is high priced Proso millet for birdseed. Obtaining millet from countries within SACU has a competitive advantage because it is not subjected to import duties. However, neighbouring countries to Namibia do not normally have a surplus, except in good rainfall seasons. When South Africa and Botswana enjoy good rains, Namibia will most likely be in the same position.

Transport costs make importing millet from West Africa totally non-competitive whilst South America and the USA only grow and export Proso millet for birdseed. Even if Proso millet was acceptable for processing in Namibia, it is traded at much higher prices than processors could afford to pay.

The only country where relatively large quantities of Pearl millet are commercially available is India. Even then exports are controlled by Government who issue licences after they have calculated their own cereal requirements, but it exports Pearl millet virtually every year. Therefore, India is likely to be the best place to secure imports of millet for processing in Namibia.

3.10 Costs of Imports from India

It is noted, therefore, that perhaps the only country which could supply Namibia is India. A simple model has been developed for costing Indian Pearl millet delivered to a Namibian processor in Oshakati. Some assumptions have been made. These assumptions include that the 25% import duty payable on the FOB value - currently being disputed - is not levied. Port charges at Walvis Bay have been calculated at N\$ 65.54/tonne (US\$ 14/tonne), transport to Oshakati is N\$ 200/tonne (US\$ 42/tonne). It is assumed that there will be some procurement costs incurred. Normally, importers would have to pay 1 to 2% for an agent (exporter) to negotiate the purchase, prepare the paperwork and organise the sea freight.

Two scenarios for importing from India have been described (Table 3.1). The first is the based on the average price for the last few years, ie US\$ 180/tonne, and assumes that at least 10,000 tonnes are imported which will allow cheap sea

freight. The second is based on the expected export price for the 1997 crop, ie US\$ 220/tonne, and assumes that smaller loads are imported and a part vessel has to be chartered. The first scenario probably represents the best case for Namibia, the second is a more likely case where smaller amounts are bought because of the limited demand due to the high price.

Table 3.1 Projected cost of imported mahangu delivered to Oshakati (US\$/tonne)

	Average price in recent years	1997 price
Price FOB Bombay	180	220
Procurement costs (2%)	4	4
Sea freight	37	55
Off loading at Walvis Bay	14	14
Subtotal C&F Walvis Bay	235	293
Transport to Oshakati	42	42
Factory gate price	277	335

Thus, imported Pearl millet from India would cost between US\$ 277 to 335/tonne (N\$ 1,330 to 1,608/tonne) delivered to Oshakati. At these prices, it will be impossible for processors to import and produce mahangu flour at a price competitive with maize meal. Using the model described in the earlier NRC document, it is estimated that if millet is imported from India and processed in Namibia, the flour would have to retail at between N\$ 3.01 to 3.46/kg to cover costs and make an acceptable margin for the processor and retailer (as covered in Appendix 3). These projected millet prices compare with maize meal retail prices of N\$ 1.7 to 2.2/kg depending on location and quality. Therefore, using imported Pearl millet from India, would mean that the flour would have to sell at about twice the price of maize meal.

The scenarios in Table 3.1 can be re-calculated assuming that no import tariffs are paid. This would result in the factory gate price being between US\$ 277 to 335/tonne (N\$ 1 330 to 1 608/tonne). At these factory gate prices, the cost of millet flour in the shops would be about N\$ 3.00 to 3.40/kg. This compares with prevailing maize meal prices in Oshakati ranging from;

ELUWA	12.5 Kg at 1.30/Kg
TOP SCORE	12.5 Kg at 1.90 - 2.10/Kg

Therefore, even without import duty, processed millet flour would still be almost twice as expensive as maize meal.

It should be noted that if 10 000 tonnes or more consignments of millet are imported, then almost certainly storage would become an issue and cost. Bulk stores would have to be built away from the damp air at Walvis Bay. The cost of bulk storage has not been included in the above calculations of factory gate pricing.

3.11 Organising Imports from India

Exports of millet from India are controlled by the government through the issue of licences. The issuing of licences occurs about three times per year. If Namibian processors wanted to import millet, it would be essential to have an agent or exporter in India who would organise the purchase, transportation and paperwork associated with each shipment. The agent would also organise samples to be sent to Namibia.

A number of agents were spoken to during the research for this study, but it was impossible to determine which would be the best one to use. If a processor wanted to import millet, the best approach would be to contact APEDA, based in New Delhi, who would recommend a suitable agent to represent the processor.

However, it must be stressed that it is unlikely that any processor from Namibia would want to organise the import of millet considering that the final price of the flour would be so much more expensive than maize meal.

CHAPTER FOUR

SUMMARY AND CONCLUSIONS

The objective of this study is to determine the possibility of Namibia obtaining imports of Pearl millet to facilitate the establishment of a substantive processing industry.

Data on the economics of growing and trading millet are in very short supply. Most of the millet traded internationally is Proso millet which is used mainly for birdseed. Virtually all of the world's production of Pearl millet is by subsistence farmers for own-consumption; it is rarely commercially traded.

Countries bordering Namibia are not regarded as suitable for securing millet when Namibia is short. The countries experience a similar climate and more than likely would also be in deficit. Also, most of the production in neighbouring countries is for subsistence and not for commercial marketing.

West Africa is a significant producer of Pearl millet. However, it is all grown well in-land in areas bordering the Sahara desert, about 1 000 to 1 500 miles from the sea on very poor roads. The high cost of road transport to a sea port as well as sea freight and import duties would make West African Pearl millet prohibitively expensive. In addition, the unreliability of their yields, and hence unreliability of a marketable surplus, would make it extremely risky to develop a business strategy based on sourcing from West Africa.

Millet producers in North and South America grow almost entirely Proso millet for birdseed. Even if it was suitable for Namibian processors, it sells at a price much too high to allow the production of millet flour competitive with maize meal. If farmers in Argentina and the USA could be persuaded to grow Pearl millet instead of Proso, they would require even higher prices to compensate them for the lower yields.

The only country that could supply Namibia with Pearl millet in most years is India. Price models were indicated that Indian Pearl millet could be landed in Oshakati for prices of between US\$ 277 to 335/tonne (N\$ 1,330 to 1,608/tonne). However, even at these factory gate prices, millet flour could be retailed at N\$ 3.10 to 3.40/kg which is over twice as much as maize meal.

It has been reported that Indian millet has been traded at N\$ 750/tonne in Oshakati. The only way this could have been achieved is if someone in the marketing chain made a very substantial loss, or if an "improper transaction" took place before it arrived in Namibia.

Therefore, it must be concluded that it is impossible to import Pearl millet and process it into flour in Namibia at a price which is competitive with maize meal.

There are a number of reasons why importing mahangu is very expensive. These include:

- It is a "crop of last resort" which is only grown when the soils are too bad and the climate too hostile for other cereals. Therefore, yields are very low. In Namibia, average yields are in the order of 200 to 400 kg/ha. In other countries yields are slightly higher, but are still much lower than maize and other cereals. With such low yields, it is only worth a farmer growing it commercially if a high price is offered. Therefore, it is hardly ever grown commercially.
- There is some commercial production of Proso millet in developed countries to supply the birdseed trade. Proso millet gives higher yields than Pearl millet and the birdseed industry is prepared to pay delivered prices in excess of US\$ 450/tonne. Farmers in the USA and Argentina would want even higher prices to switch to the lower yielding Pearl millet.
- Because it is a crop mainly grown by subsistence farmers, there has been relatively little research and development to improve yields and little breeding to generate improved varieties.
- In most countries, it is grown at considerable distance from ports, consequently transport costs are very high for a low value product.
- Millet has to compete with maize which is grown world-wide on a massive scale, often a short distance from ports. It is transported in large bulk ships which hold 50 000 to 60 000 tonnes so that the cost of sea freight becomes very cheap. (Maize can be transported across the Atlantic Ocean for US\$ 10/tonne). Maize is widely available, easy to locate supplies and importantly, it is cheap and easy to process.
- Millet is a more difficult and more expensive crop to process than maize. In addition, its processing losses are higher. Therefore, it is more expensive to produce millet flour

All the above issues explain why there is very little commercial processing of Pearl millet into flour. It also explains why the price of imported Pearl millet is prohibitively high for Namibia.

The issues facing the commercialisation of the Namibian millet industry are the same as in other African countries and India. As stated above, it is grown as a crop of last resort by subsistence growers and not by commercial farmers. It is normally only traded in years of surplus. All the efforts to promote processing have been at village level to reduce the labour associated with dehulling and milling. The larger commercial processing in all developing countries has not been successful at expanding the market size through significant urban sales. In virtually all the regions where millet is an important part of the diet, continuity of supply is a serious problem and it is accepted that in a significant number of years production will not meet demand. The shortfall is met either through imports of other cereals or by storage from surplus years. It is interesting to note that in both India and West Africa, projects which have been established to improve the technology of production and have successfully led to increased yields have seen the total area of production decline. In other words as it is a subsistence crop, farmers only grow their anticipated requirement and do not normally aim to plant a surplus.

APPENDIX I

TERMS OF REFERENCE

TERMS OF REFERENCE

- a) Review the world market for millet using statistics on the market from the FAO, the Public Ledger, commodity brokers and other sources. Visit FAO to interview the authors of "The World Sorghum and Millet Economies" to obtain more information. In particular, the data will concentrate on the factors that affect international trade. Price projections for future imports into Namibia will be included.
- b) Develop an understanding of the international millet market.
- c) Network with consultants who have a good understanding of the international market.
- d) Visit at least one of the main European based international trading companies. Obtain samples of millet from the main exporting countries and send them to the Namibian Agronomic Board (NAB) for appraisal of quality.
- e) Gain an appreciation of the minimum order sizes, transaction costs and transport costs (including port handling costs).
- f) Present a report on the findings to enable the Steering Committee to recommend to Government a policy for the future of the commercial millet market in the Namibian market.

APPENDIX II

LIST OF PEOPLE CONSULTED

In Namibia

Jurgen Hoffman	Manager, NAB, Windhoek
Paully Ipinge	Manager, MMIU, Oshakati
Kalifeni Shatona	Deputy Manager, MMIU, Oshakati
Thierry Duplois	Economist, Ministry of Agriculture, Development (MAWRD)
Christof Brock	Cooperative Division, Directorate of MAWRD
Dr M Westlake	Advisor, DoP, MAWRD
Martin Fowler	Advisor, DoP, MAWRD
Michel Mallet	Executive Director, CRIAA
Selma El Obeid	Consultant, CRIAA
C J Brink	General Manager, TransNamib Carrier
S C Bhatia	First Secretary, Commerce, India High
P B van Schalkwyk	Managing Director, Namib Mills
Frans Meyer	Operations Manager, Namib Mills
Wessie Wessels	Manager, Walvis Bay Port Authority
David Ledderly	Consultant, Windhoek
Johan Silver	Consultant, Sesfontein

In Rome

C Joly	Senior Country Projects Officer, FAO
Ed Seidler	Senior Officer (Marketing) FAO
Andrew Sheppard	Marketing Specialist, FAO
Laurent Thomas	Operations Officer, FAO
Doyle Baker	Chief, Farm Management and Produ Service, FAO
Lawrence Clarke	Chief, Agricultural Engineering Branch
W A Lamande	Chief, Basic Foodstuffs Division, FAO
Abby Abbassian	Commodity Specialist (Grains), FAO
Myles Mielke	Senior Commodity Specialist, FAO

Mr Menkveld	WFP
Francois Gerex	WFP
Mr Frisch	WFP
Mr Marchetti	WFP
Mr Garafello	WFP

By telephone

Christian Emerich	Lead author of ICRISAT/FAO report on sorghum and millet economies", Laos
Mr Raja	ICRISAT, India
Timothy Kelley	Senior Economist, ICRISAT, India
David Rohrbach	ICRISAT, Bulawayo, Zimbabwe
Richard Woodham	International Grains Council, London
Charlie	Senior Grains Trader, Cargill, Geneva

Mr Karbib	Finagrain, Geneva
Frederick Dupoix	Finagrain, Geneva
Aga Venkat	Tradigrain, Geneva
Stefan Tallman	Andre, Geneva
Sarah Nightingale	Grain and Feed Traders Association
Paul Hindmarsh	NRI, UK
Jonathan Coulter	NRI, UK
Peter Robbins	Senior Consultant, Public Ledger
David Buttery	Trader, Kimptons, London
Kelly Carey	Trader, A Portman, London
Peter Innes	Trader, Surdam Produce, UK
Cor Harge	Managing Director, Umgeni Products,
Mr Stanger	Trader, Umgeni Products
Sqr Ldr Sabharwall	APEDA, India
H K Raval	Senior Manager, Agricultural Commod Exports, India
Anon	African Trading Company, India
Anon	Agrani International, India
Anon	Banzal Exports, India
Anon	Eximlink, India
Anon	Mahaan Foods, India
G K Sood	CEO, Vanaspati, Manufacturers Assoc
Limji Nanabouy	Director, Agri-Sciences, India
David Dendy	Consultant, Grains After Harvest, UK
Ron Watkins	ex-Chairman, High Value Horticulture
Denzil Phillips	Consultant, UK
Hector McKilligan	Consultant, UK
Jan Driessen	Consultant, Belgium
Robert Clancy	Consultant, Ireland
Mark Kippax	Agrisystems UK
Various	South African Agricultural Union
Various	South African Customs
Various	Botswana Ministry of Agriculture

APPENDIX III

CALCULATION OF THE RETAIL PRICE OF MAHANGU FLOUR USING MILLET IMPORTED FROM INDIA.

CALCULATION OF THE RETAIL PRICE OF MAHANGU FLOUR USING MILLET IMPORTED FROM INDIA (N\$/Kg)

	Average price in recent years	1997 price
Factory gate price factory gate - N\$/kg	US\$ 0.277 N\$ 1.33	US\$ 0.335 N\$ 1.61
Processing losses (21%)	0.28	0.34
Add back value of bran	(0.05)	(0.05)
Processing costs	0.50	0.50
Processors margin (15%)	0.31	0.36
Transport to Windhoek	0.25	0.25
Retailers margin (15%)	0.39	0.45
Retail price	3.01	3.46

This calculation assumes that the millet is processed in Oshakati and sold in Windhoek.