Food security or food self-sufficiency for Namibia?
The background and a review of the
economic policy implications

Discussion Paper №1.

Division of Agricultural Planning
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Foreword

The genesis of this paper lies in the interest raised by the subject in the run-up to the World Food Summit which was held in Rome, Italy, in early 1997. A number of contradictory statements were made on the subject by commentators in the country and by the press, with almost no reference being made to any data nor to the costs of the various options being promoted in Namibia.

This is a first attempt to provide a more objective basis for such discussions.

A mass of documents and data sources were consulted in order to obtain much of the data and information contained in the report.

Following on from this, a large number of people - from both within Namibia and from abroad - provided comments on earlier drafts of the paper, for which we are most grateful. Clearly, not all of the opinions expressed could be reflected in the final version of the paper, but we are nevertheless pleased that it generated so many comments and that it resulted in further debate. For the same reason, we would welcome receiving additional comments which readers may have on any aspect of the final version, since the paper is likely to be revised and updated over time as more information becomes available.

The usual disclaimers apply.

B. Rothkegel
Director
Executive summary

This paper considers the real meaning of the much-used and often-misunderstood terms, "food self-sufficiency" and "food security", in the Namibian context. A nation’s population is food secure when all its members are sufficiently well fed for them to be able to lead a healthy and active life. A nation is self-sufficient in food when it produces enough for its entire population and does not need import. Normally, food self-sufficiency refers to self-sufficiency in staple food grains, rather than complete self-sufficiency in all food. No country is self-sufficient in all foods - all of them trade food to a greater or lesser extent.

The findings of the paper include the following:

- There is a strong correlation between poverty and food insecurity;
- Namibia imports between 50 and 80 per cent of its grain requirements each year - principally maize and wheat. It has ready access to the world grain market and borders one of the world’s largest producers of white maize (whose costs of production are significantly lower than in Namibia). There is, therefore, virtually no possibility that Namibia will be unable physically to import food. Moreover, unlike many countries in sub-Saharan Africa, where it must be transported overland through foreign countries on poor-quality roads or unreliable railways, grain can be (and is) acquired quickly;
- South Africa is the major source of Namibia’s food imports and the destination for the bulk of its agricultural exports;
- Unlike many countries in sub-Saharan Africa, Namibia has a strong export sector. Currently, it is able to run a balance of payments surplus while importing not only staple grains, but also a wide range of high-value foods which are not needed for food security to be assured;
- Any moves towards growing all of the staple food requirements would require massive investment in irrigation, since dryland production is subject to the vagaries of the weather. The size of the investment would be in excess of N$ 1,300.00 million, which could not be justified economically;
- Furthermore, experience to date has shown that irrigation schemes in Namibia producing cereal crops (which have a low value) have so far been unable to meet even their operating costs;
- Difficult decisions will need to be taken by the Government concerning its priorities for irrigation development, given the limited irrigable area. If the proposal to grow sugar cane under irrigation in Caprivi region - currently under investigation - comes to fruition, correspondingly fewer hectares will be available for irrigated grain crop production.
- Cereals produced for sale in Namibia are not, on average, competitive with grain produced in neighbouring countries;
- The controls currently in place for the marketing of locally-grown maize result in farmers receiving higher prices and consumers paying more, than would be the case under free-market conditions;
- Inter-year storage of grains if food self-sufficiency were to be realised, would add close to 20 per cent to the cost of the grain. Added to this would be the problems inherent in managing
the storage operations.

- An emphasis on foodgrain production would contribute relatively little to alleviating rural unemployment and poverty: grains generate lower incomes per hectare and per cubic metre of water than other crops, as well as having significantly lower labour requirements;
- The agricultural sector uses nearly three-quarters of all water consumed nationally. The future demand for water for other uses and from our riparian neighbours is likely to limit the quantity available for irrigation and lead to substantial increases in its price;
- Experience from elsewhere has shown that state-run strategic grain reserves are both high-cost operations and an inefficient use of public funds. Moreover, there is already a significant under-utilised grain storage capacity in northern Namibia; and
- The move away from a focus on food self-sufficiency towards the more pragmatic approach of food security at both the national and household level, has been a noticeable feature in the agricultural policies of many countries in the region over the past few years;

The major policy considerations arising from the study are that:

- The problem of food security (and the scope of any strategy to overcome it) is much broader than just agricultural production. Poverty reduction lies at the heart of any strategy to achieve food security and the principal way in which this can be done lies in the creation of employment opportunities. The scope of any intervention must therefore be wider than the agriculture sector alone;
- Attempts to increase food grain output significantly through artificial support for large-scale rainfed or irrigated production, will do little or nothing to improve food security - indeed they could worsen it. The reasons are that it would:
  - involve the substitution of imported inputs (such as seed, fertilisers, farm machinery and fuel) for imports of grain;
  - require either significantly higher domestic staple food prices (as at present in Namibia) or heavy subsidisation by the Government. The former would reduce directly the capacity of households to acquire food. The latter would indirectly hamper this capacity to the extent that it reduced the pace of economic growth;
  - make little or no positive contribution to GDP and economic development; and that
  - this mode of production is capital intensive and employs few people;
- On the other hand, increasing agricultural production by smallholder producers will make a major contribution to both household and national food security, as it will increase the ability of low-income households to acquire food;
- If the overall policy goal of poverty reduction is to be pursued, then achieving cheap food prices, particularly staple grains, should be a key strategy;
- There is no reason whatsoever for Namibia to be concerned with the possibility of not being able to import foodgrain to meet consumption requirements;
- Any food production policy must be viewed against global as well as regional pressures towards trade liberalisation;

In conclusion, then, there is a need for an effective national household food security policy, based on the economics of comparative advantage. It is both more efficient and cheaper for Namibia to import
certain foods using revenues earned from its export (both agricultural and non-agricultural) sector, than for the country to grow all of its food. The Government’s role should be to improve the competitiveness, transparency and performance of food production, processing and marketing enterprises. It should also seek to improve the livelihoods of those most vulnerable to food insecurity. This will require, above all, an expansion of sustainable and productive employment opportunities, particularly in the rural areas.
1. Definition

Food security has been defined as, "Access by all people at all times to enough food for an active, healthy life". Another, slightly broader definition is, "The ability of a country to assure, on a long-term basis, that its food system provides the total population with access to a reliable, timely and nutritionally-adequate supply of food". High levels of undernutrition and malnutrition are an important indicator of food insecurity.

Food security at the level of the family is normally referred to as household food security. The higher the number of households which are food secure, the higher the level of national food security.

On the other hand, food self-sufficiency describes the situation where a country produces enough food from its own resources to meet the demand (backed by an ability and willingness to pay) of its entire population. Normally, the term is used to mean self-sufficiency in basic staples, rather than complete self-sufficiency in all foods, including luxury items. Indeed, no country is self-sufficient in all foods - all trade food to a greater or lesser extent.

Food security and food self-sufficiency are therefore two quite different concepts. Provided a country has the capacity to import, it can be food secure without being self-sufficient in food. Japan is a good example of a country which is far from being self-sufficient in basic foodstuffs and yet has a high degree of national food security.

Conversely, a country can be self-sufficient in its basic staple food crop and yet much of its population remain food insecure, because they do not have the capacity to acquire food. Malawi, for example, is self-sufficient in its principal food staple, maize, and yet its population suffer from high levels of undernutrition.

From this discussion it can be seen that food security involves assuring both an adequate supply of food and access by the population to that supply. Access is usually possible through generating adequate levels of effective demand by means of income growth or transfer payments (such as pensions, in the case of Namibia). From this, it is clear, that insufficient household income is a major source of food insecurity. Development researchers and planners have learned over the past two decades that food security depends upon both supply and demand factors. It is more than just a question of increasing agricultural production. In rural Namibia, for example, malnutrition and undernutrition are common, caused to a large extent by poverty and they will not be ameliorated by an increase in food output alone. To ensure food security in the country, therefore, action is also needed on the demand side.

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2 As one such researcher has written, "Starvation is the characteristic of some people not having enough food to eat. It is not the characteristic of there not being enough food to eat". Sen, A. (1982) Poverty and Famines. Oxford: Clarendon Press.
Demand
From the above definition of food security, it is clear that the inability of people to obtain (or "to be able to afford to buy") food rather than a scarcity of supply per se, is the central food problem. Therefore, in addition to taking action to raise food production levels, public action to improve access to food especially for households with low or fluctuating incomes or purchasing power, is also necessary. Even if supply improves, the distribution of income and wealth and the regional concentration of production may leave large segments of society without the purchasing power to buy enough staple foodstuffs.

With the lack of food security being a reflection of a lack of purchasing power, the ability of households to acquire food is largely dictated by the employment and income opportunities available to their members, and by the price of food on the local market. Poverty is at the root of food insecurity and income from productive employment (including self-employment) is the principal means by which the vast majority of the poor can gain assured access to food. In conclusion, then, the long-run solution to food insecurity is to attack poverty (urban as well as rural) through income- and employment-generating policies, and to ensure that the resulting benefits are equitably distributed.

Supply
This is not to say that expanding food production is unimportant. It should be recognised that the Government is making considerable efforts to increase the production of staple food grains - *Mahangu* (pearl millet), in particular - in the Northern Communal Areas (NCAs). These efforts include: support to expand the capacity and capability of the agricultural extension service at the field level, support for research into improved crop varieties and techniques of production, and the provision of credit to enable farmers to expand the scope of their operations. (At the same time, the Government is implementing a nutrition strategy which includes promoting the consumption, at the right time, of food containing the right kind of nutrients in the right quantities - among all sections of the population).

With an increase in staple food production by smallholder farmers, both national and household food security will be strengthened - all things being equal. This is because widespread access to food is ensured by agricultural growth - the bulk of the poor in Namibia live in the rural areas and depend on agriculture for their employment and for much of their income. Rapid agricultural growth will also tend to increase employment opportunities for the rural poor and improve returns to labour.

From what has been said earlier, however, it should be clear that food security does not necessarily result from a rapid increase in cereal/food production, nor does it involve the pursuit of national food self-sufficiency irrespective of cost considerations. The agricultural sector as a whole provides income and employment and hence "entitlements", or access, to food (including access to imports financed by agricultural, or other, export earnings). Thus, what is needed for the food security of

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3 *Mahangu* accounts for most of the total food grain production in the NCAs - it has averaged 90 per cent of the total during the last six cropping seasons.
rural households to be assured are high (and stable) incomes\(^4\) and/or low (and stable) food prices to prevail in local markets.

At the same time, we should not lose sight of the fact that low food prices for consumers also mean low prices for farmers for the food which they produce and, under normal conditions, low producer prices lead farmers to reduce production for the market. This need not necessarily be the case if lower producer prices are the result of increases in agricultural productivity; such improvements may enable and encourage farmers to maintain production levels even though the overall trend in prices is a declining one. Lower producer prices may also be the outcome of improvements in the efficiency of marketing systems.

2. Cereal production and consumption

Depending on the annual rains, between 50 and 80 per cent of the market demand for cereals needs to be imported: during the last six seasons\(^2\), the figure has averaged 59 per cent (at the two extremes, the figures are 90 per cent for wheat and 0 per cent for Mahangu) - see Table 1. While only insignificant volumes of Mahangu and sorghum are imported - usually on an informal basis across the northern borders of the country (and do not therefore appear in official trade statistics)\(^6\) - approximately 90 per cent of the wheat consumed locally is imported; for maize\(^7\), the self-sufficiency ratio\(^8\) has been around 25 per cent on average in recent years. All of the rice consumed in the country (close to 7,000 tonnes per annum at present\(^9\)) is imported, predominantly from third countries through South Africa. It has been estimated that about 70 per cent of all fruit and vegetables are imported, although other commentators have put the figure significantly higher (see Table 3, for example).

Production of cereals varies from 35,000 to 120,000 tonnes, depending on weather conditions. Because of the high variability of rainfall from one growing season to the next, annual import requirements vary considerably. However, this has not posed the same problems as those faced by many other countries in sub-Saharan Africa because neighbouring South Africa is one of the world’s largest producers of white maize and it has large, relatively cheap and responsive food markets, because of the high standard of the road and rail connections with South Africa and because of the excellent port facilities at Walvis Bay for importing cereals from further afield. Furthermore, funds

\(^{\text{4}}\) Either from agriculture or off-farm employment, or both.

\(^{\text{5}}\) The greater part of which, it should be noted, represents a period of below-average rainfall.

\(^{\text{6}}\) However, some observers have estimated monthly imports from Angola to be as high as 500 tonnes in the months following the harvest - hardly "insignificant volumes".

\(^{\text{7}}\) Only white maize is considered here: yellow maize is used only for livestock feed. An average of approximately 90 per cent of the 22,000 tonnes of yellow maize consumed each year is imported.

\(^{\text{8}}\) Defined as the volume of production as a proportion of total utilisation.

\(^{\text{9}}\) J. Hoffmann (pers. comm.).
have not been a constraint to importing more when it has been required: additional food imports have never been more than a "phone call away". Namibia has had neither the need for, nor the experience of, food security stocks while import requirements are handled effectively by private traders. (It should be noted that the Early Warning & Food Information Unit of the Department of Agriculture and Rural Development makes accurate calculations of grain import requirements on a regular basis).

### Table 1

**Cereal production, imports and utilisation, 1991/92 to 1996/97 a/ b/ (in '000 tonnes)**

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Maize:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>production</td>
<td>52.0</td>
<td>12.8</td>
<td>26.2</td>
<td>43.6</td>
<td>13.1</td>
<td>18.1</td>
<td>27.6</td>
</tr>
<tr>
<td>imports</td>
<td>31.2</td>
<td>137.8</td>
<td>69.8</td>
<td>38.8</td>
<td>89.7</td>
<td>93.7</td>
<td>76.8</td>
</tr>
<tr>
<td>utilisation</td>
<td>77.0</td>
<td>124.6</td>
<td>93.1</td>
<td>82.0</td>
<td>103.9</td>
<td>118.6</td>
<td>99.9</td>
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<tr>
<td>Wheat:</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>production</td>
<td>5.9</td>
<td>3.1</td>
<td>5.7</td>
<td>6.3</td>
<td>2.8</td>
<td>4.1</td>
<td>4.7</td>
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<tr>
<td>imports</td>
<td>27.0</td>
<td>34.5</td>
<td>49.5</td>
<td>37.8</td>
<td>56.8</td>
<td>28.6</td>
<td>39.0</td>
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<tr>
<td>utilisation</td>
<td>34.1</td>
<td>38.6</td>
<td>46.8</td>
<td>47.2</td>
<td>41.4</td>
<td>50.3</td>
<td>43.1</td>
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<td>Mahangu:</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>production</td>
<td>46.0</td>
<td>15.0</td>
<td>36.7</td>
<td>59.1</td>
<td>37.1</td>
<td>56.6</td>
<td>41.8</td>
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<td>0</td>
<td>0</td>
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<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>utilisation</td>
<td>46.0</td>
<td>15.0</td>
<td>36.7</td>
<td>59.1</td>
<td>37.1</td>
<td>56.6</td>
<td>41.8</td>
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<td>Sorghum:</td>
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<td></td>
<td></td>
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<td></td>
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<tr>
<td>production</td>
<td>11.7</td>
<td>2.2</td>
<td>7.0</td>
<td>10.0</td>
<td>4.0</td>
<td>8.0</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>production</td>
<td>115.6</td>
<td>33.1</td>
<td>75.6</td>
<td>119.0</td>
<td>57.0</td>
<td>86.8</td>
<td>81.2</td>
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<td>imports</td>
<td>58.2</td>
<td>172.3</td>
<td>119.3</td>
<td>76.6</td>
<td>146.5</td>
<td>122.3</td>
<td>117.5</td>
</tr>
<tr>
<td>utilisation</td>
<td>168.8</td>
<td>180.4</td>
<td>183.6</td>
<td>198.3</td>
<td>186.4</td>
<td>233.5</td>
<td>191.8</td>
</tr>
</tbody>
</table>

**Notes:**

a/ These dates refer to marketing years; the year runs from May to the following April.

b/ Figures on the supply and demand sides do not balance due movements in the "End of Marketing Year Stocks" and re-exports which are not reflected in the Table. "Utilisation" does not include changes in the amounts of grain held in storage from one marketing year to the next. The figure given in the text, above, of 59 per cent of cereal requirements being imported, is calculated as: [imports ÷ (imports plus production)] x 100.

**Source:** Early Warning & Food Information Unit, Directorate of Planning, MAWRD

### Urbanisation

Average per capita grain consumption levels are close to 115 kg per annum, with maize accounting for more than one-half of the total. It is believed that wheat consumption, which currently accounts for almost one-quarter of grain intake, is growing rapidly as the country's population becomes more urbanised (in 1991 the urban population accounted for 28 per cent of the total and this figure will have increased since then - Windhoek's population has, for example, recently been surveyed and is
expanding at an annual rate of 5.4 per cent per annum\textsuperscript{10}\textsuperscript{11}. We can expect rice consumption to follow a similar trend, but have no data on the volume of imports to substantiate this: the value of rice imports showed an increase of 24 per cent per annum between 1993 and 1995, although much of this can probably be explained by the increase in its unit cost due to the depreciation of the Namibian Dollar against the currencies of the countries from which Namibia's rice imports are sourced. In constant terms\textsuperscript{12}, a better proxy for the change in the quantities imported - the annual rate of increase over the period, was close to 13.8 per cent. However, world prices (in constant terms) of rice over the same period, rose at an annual rate of approximately 12.4 per cent. Thus, we can hypothesise that the local demand for rice over the three-year period increased at a rate of almost 1.5 per cent per annum.

However, local production of both wheat and rice is severely constrained by the country's agro-ecological conditions (which give rise to low and fluctuating yields), meaning that they could only be grown in sufficient quantities to replace imports if production were to be heavily subsidised by the Government and, additionally in the case of rice, if trials were to be undertaken\textsuperscript{13} to determine the most appropriate varieties and agronomic practices to suit the local, Namibian conditions.

The consequence of the rapid urbanisation is that more people are becoming consumers at the same time as the number of producers of grains is declining, relatively speaking. With its rapid growth, Windhoek's population alone will be adding approximately 1,000 tonnes per annum to the national demand for food grains each year\textsuperscript{14}. Since the additional mouths to be fed are not at the same time producers, this rapid increase in staple food requirements will have to be met either by local marketed production, or from imports.

3. Namibia's agricultural trade
During the 1990's, agriculture has, on average, contributed 17 per cent to the total value of

\textsuperscript{10} By contrast, the country's total population is increasing by approximately 3.1 per cent per annum.

\textsuperscript{11} Of relevance here is the finding of the Namibian Millet sub-Sector Project surveys in 1992/93, that 50 per cent of the children interviewed in Kavango and former Ovambo regions indicated a preference for bread over any other staple food, compared to 0 per cent among adults. (Keyler, S. (1995) Economics of the pearl millet subsector in northern Namibia: a summary of baseline data. ICRISAT Southern and Eastern Africa Region Working Paper 95/03. Bulawayo: SADC/ICRISAT SMIP. p.17).


\textsuperscript{13} Admittedly, some work has already been carried out - on appropriate varieties, under the Isiize rice project which was run by the then FNDC in the late-1980's/early-1990's; and on agronomic practices, more recently in North-Central Extension Region by the Agricultural Extension Division.

\textsuperscript{14} This assumes that most of the "new" population of Windhoek is poorer than the average (certainly this applies to the newly-arrived migrants) and, therefore, that they have a slightly lower than average per capita consumption of grain. The population of the capital on which these calculations are based, was enumerated as being 182,000 in July 1995.
merchandise exports. Virtually all of these agricultural exports originate from the livestock sector, while the principal agricultural imports are maize, sugar, fish\(^{13}\), "other meat"\(^{16}\), vegetables, animal foodstuffs, milk and milk products (Table 2) - sugar alone accounted for more than ten per cent of the total value of imported food between 1993 and 1995.

**Table 2**  
Namibia's principal agricultural imports, 1993 to 1995

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Average annual value (in N$ '000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sugar</td>
<td>103,337</td>
</tr>
<tr>
<td>Animal feedstuffs</td>
<td>74,154</td>
</tr>
<tr>
<td>Maize</td>
<td>71,995 (^{17})</td>
</tr>
<tr>
<td>Fish</td>
<td>70,324</td>
</tr>
<tr>
<td>Vegetables</td>
<td>64,336</td>
</tr>
<tr>
<td>Other meat/edible offal</td>
<td>53,682</td>
</tr>
<tr>
<td>Milk &amp; cream</td>
<td>29,571</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>847,722</strong></td>
</tr>
</tbody>
</table>

Source: Central Statistics Bureau data sheets.

Food imports accounted for an average of 16.4 per cent of the total value of Namibia's imports in those years\(^{18}\).

Table 3 provides details of the principal agricultural items exported and the food imported in one year for which detailed data are available. It also provides an estimate of the proportion of the local demand for certain food items which was being met by imports at that time.

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\(^{1}\) However, most of this was fish caught by Namibian and Angolan vessels, processed at the coast and subsequently re-exported.

\(^{16}\) Of which poultry accounts for more than 80 per cent.

\(^{17}\) It is interesting to note that the average value of wheat imports (N\$ 22.50 million) was less than one-third of the value of maize imports, while imports of rice averaged approximately N\$ 6.40 million annually.

\(^{18}\) It showed no discernible trend over the period.
Table 3
Namibia’s agricultural trade, 1987/88

<table>
<thead>
<tr>
<th>Exports</th>
<th>Value (in N$ million)</th>
<th>Imports</th>
<th>Value (in N$ million)</th>
<th>Imports + consumption (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Livestock/meat</td>
<td>222.9</td>
<td>Cereals</td>
<td>34.9</td>
<td>87</td>
</tr>
<tr>
<td>Animal by-products</td>
<td>7.6</td>
<td>White meat</td>
<td>16.5</td>
<td>70</td>
</tr>
<tr>
<td>Pelts</td>
<td>34.6</td>
<td>Eggs</td>
<td>1.2</td>
<td>20</td>
</tr>
<tr>
<td>Wool &amp; mohair</td>
<td>4.3</td>
<td>Fruit &amp; veg.</td>
<td>15.8</td>
<td>90.1/</td>
</tr>
<tr>
<td>Dairy products</td>
<td>14.4</td>
<td>Sunflower seed</td>
<td>6.0</td>
<td>94.2/</td>
</tr>
<tr>
<td>Stock feed</td>
<td>48.1</td>
<td></td>
<td></td>
<td>93</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>269.4</strong></td>
<td></td>
<td></td>
<td><strong>136.2</strong></td>
</tr>
</tbody>
</table>


Notes: 1/ A more recent estimate puts this figure closer to 70 per cent. 2/ The export data do not include the value of exports of fish and fish products - see Page 7. 3/ An estimated 40 per cent of this was used for cake for animal feed (B. Rothkegel, pers. comm.).

Details of agricultural trade in recent years are presented in Table 4. Over 85 per cent of agricultural imports are sourced from South Africa, which is also the major market for Namibia’s livestock exports - taking 86 per cent of them, on average, between 1990 and 1996. The data show that the total cost of food imports was more than covered by export revenues earned by the agricultural sector in 1987 and again in 1995. Agricultural exports were insufficient to meet the cost of food imports in 1993 and 1994, although the value of exports was only approximately 5 per cent less than the cost of imports. Thus, it is possible to state that, at the national level, food self-sufficiency is ensured by the fact that the country is meeting the cost of food imports from the foreign exchange earned from exports of agricultural produce. (Importantly, the calculation of the value of agricultural exports does not take into account the substantial export earnings arising from the export of fish and fish products - in 1995, fish exports alone amounted to N$ 1,368.20 million while, as Table 4 indicates, agricultural exports totaled N$ 998.00 million).

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21 However, see Note 2/ of Table 4.
Table 4
Namibia's agricultural trade, 1987 to 1995 (in N$ '000)

<table>
<thead>
<tr>
<th>Year</th>
<th>Exports</th>
<th>Imports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1987</td>
<td>269,400</td>
<td>136,900</td>
</tr>
<tr>
<td>1988</td>
<td>368,000</td>
<td>n.a.</td>
</tr>
<tr>
<td>1989</td>
<td>420,000</td>
<td>n.a.</td>
</tr>
<tr>
<td>1990</td>
<td>418,000</td>
<td>n.a.</td>
</tr>
<tr>
<td>1991</td>
<td>528,000</td>
<td>n.a.</td>
</tr>
<tr>
<td>1992</td>
<td>605,000</td>
<td>n.a.</td>
</tr>
<tr>
<td>1993</td>
<td>626,000</td>
<td>678,773</td>
</tr>
<tr>
<td>1994</td>
<td>874,000</td>
<td>895,595</td>
</tr>
<tr>
<td>1995 (est)</td>
<td>998,000</td>
<td>968,799</td>
</tr>
</tbody>
</table>


Notes:
1/ The "exports" data include, "live animals, meat and meal products, hides, skins and wool". The export totals do not include "fish, lobster, crabs and other food products".
2/ If fish imports are excluded from the annual total import figures (since the bulk of these imports represent imports for processing and immediate re-export, rather than for consumption in Namibia), the total agricultural imports are reduced to: 1993: N$ 632,223 thousand; 1994: N$ 813,992 thousand; and 1995: N$ 885,969 thousand (virtually the same as, or below, the value of agricultural exports).

4. Enterprise budgets

If guaranteed self-sufficiency in the nation's staple food grain requirements is sought, additional irrigated production will be necessary. This is because the large-scale production of maize under dryland conditions by private-tenure farmers is a risky enterprise, due to the country's climatic conditions, and therefore cannot be relied upon to provide reliable output levels every year\(^2\). The plant is susceptible to periods of drought during the growing season and average yield levels over time are therefore significantly lower than in the neighbouring, better-watered countries. Its large-scale production under dryland conditions would result in highly-variable output from one year to the next. Mahangu, on the other hand, is believed to be a hardier crop\(^3\); it is much better adapted to the climate, as a result of both the waxy coating of the leaf which prevents desiccation in the hot, dry spells between rain storms and its ability to resume growth by further tillering at the onset of additional rainy spells. According to a specialist in grain crop breeding in semi-arid areas, "...no other cereal is as well adapted to the climate and soil conditions (of the northern parts of the country)...."

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\(^2\) The same argument applies to large-scale grain producers in the communal-tenure areas (mainly located in Caprivi region).

\(^3\) Although at least one reviewer has questioned this assumption.
nor will provide the same stability of production as pearl millet.24

As already indicated, if maize is to be grown for food self-sufficiency purposes, irrigation will be necessary. However, given the high costs of irrigation (see Section 7.1), maize can only be grown under irrigation if the capital costs can be spread by, for example, growing a winter crop, and only in areas which have access to the national electricity grid and suitable silos (see Section 6).25

Projected gross margins (the difference between gross output and variable costs) for dryland and irrigated cereal crops being produced by smallholder farmers in the NCAs, were calculated in early 1996 as being:

<table>
<thead>
<tr>
<th>Crop</th>
<th>Gross Margin (NS/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mahangu</td>
<td>331</td>
</tr>
<tr>
<td>Maize (irrigated)</td>
<td>1,840</td>
</tr>
<tr>
<td>Maize (dryland)</td>
<td>437</td>
</tr>
<tr>
<td>Wheat</td>
<td>160</td>
</tr>
<tr>
<td>Rice</td>
<td>384</td>
</tr>
</tbody>
</table>

These gross margins are based on highly-favourable yield assumptions - for example dryland maize is assumed to yield an average of 2.0 tonnes per hectare, whereas actual smallholder yields in Caprivi have averaged approximately 300 kg per hectare during the past five years. (Nevertheless, research on Mahangu has shown that there is significant scope for yield gains through improved crop management practices.27)

Clearly, the variable costs (as well as the fixed/capital costs - discussed later, Section 7.1) associated with irrigated crop production are much higher than those associated with dryland farming - mainly because the farmer will be fertilising to achieve much higher yields. Thus, although yields will be higher (on private tenure farms: 5-6 tonnes per hectare under irrigation compared with only 1 tonne


25 However, to assume that the shortfall in food grains could be made good solely through increased production of maize is perhaps unrealistic since, on average, almost 40 per cent of grain imports are wheat which consumers are unlikely to be willing to substitute by consuming increased amounts of maize.

26 Government of Namibia. (1996) Options for cash crop production in the Northern Communal Areas of Namibia. United Kingdom: AgriSystems (Overseas) Limited. The authors note (p.26), "Since the production of rice is unproven in oshanas and the production cost structure is speculative, there could be a significant margin of error associated with the gross margins".

per ha. under dryland conditions), the total costs per tonne are similar:

<table>
<thead>
<tr>
<th></th>
<th>Variable costs of production (in N$/tonne)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Maize</strong></td>
<td></td>
</tr>
<tr>
<td>(irrigated)</td>
<td>1,400 (flood) - N$ 1,200 (centre-pivots)</td>
</tr>
<tr>
<td>(dryland)</td>
<td>1,360</td>
</tr>
</tbody>
</table>

The current producer price of maize in Namibia is approximately N$ 900 per tonne. In the light of these figures for the costs of dryland production, farmers would therefore need a significant level of subsidy if they were to be encouraged to grow the crop, given existing yield patterns and costs of production. By comparison, it is estimated that South African maize grain can currently be delivered to a mill in Windhoek for N$ 792 per tonne (transport costs mean that the landed price would be correspondingly higher further north - closer to N$ 870 at Otavi).

On the basis of the above data, we can estimate the approximate cost of producing - under irrigation - the additional quantities of maize required to make good the shortfall in production if Namibia is to become self-sufficient in basic food grains. The production shortfall has averaged approximately 115,000 tonnes over the past six years (Table 1). Thus, as a rough approximation, the annual gross cost of meeting this shortfall by expanding irrigated cultivation of maize, would be N$149.50 million (assuming one-half is produced under centre-pivots and the other half under flood irrigation). This refers only to variable costs of production; consideration of the investment needed to expand irrigation to meet consumption requirements, follows.

With an average yield of 5.5 tonnes per hectare under irrigation, the additional area required to grow the crop would be 21,000 ha. It has been estimated that a total of 25,500 ha of land are potentially irrigable in Namibia (although it is not clear if this figure takes account of the international agreements regulating Namibia's drawing rights for water from the perennial rivers which form boundaries with our neighbours), of which approximately 6,000 ha are already under irrigation. Thus, more than the whole of the potentially-irrigable area in the country would need to be planted were Namibia to seek to become self-sufficient in food grains.

However, it is important to bear in mind that Namibia's population is increasing rapidly - at over 3.1 per cent per annum - with more than 50,000 people currently being added to the total every year, each of them needing to be fed. The population will consequently double within the next quarter of

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29 Data obtained from NRC. (1996) Restructuring of certain functions of the Namibian Agronomic Board: Phase 2: the competitiveness of cereal production in Namibia. Windhoek. These costs assume that water charges are at current levels - which are heavily subsidised (see Section 7).

n.b. For the sake of the analysis, we are assuming that this shortfall in all grains is made good by producing only maize, since the yields of Mahangu and sorghum are inherently lower and would therefore require a larger area of land to be planted.

30 ACIL Australia Pty Ltd (1992) op. cit.
a century. Therefore, even if it is technically feasible to expand the irrigated area such that sufficient food could be grown to meet almost the present level of demand, no additional irrigable farm land would be available to meet the staple grain needs of the growing population in future years.

In the light of these figures and Namibia's limited irrigable area, it is clear that some hard decisions will need to be taken by the Government concerning the national priorities for irrigation development. For example, if the proposal to grow sugar cane under irrigation in Caprivi region - currently under investigation - comes to fruition, there would be correspondingly fewer hectares available for irrigated grain crop production.

A recent feasibility study calculated the investment cost of building a dam and a reticulation system on an ephemeral river for the purposes of irrigated crop farming, as being approximately N$ 120,000 per ha (in 1995/96 prices)\(^{31}\). The review of the Etunda Irrigation Scheme\(^{32}\) (see Section 7) which uses water from the Kunene river, calculated the (un-discounted) capital cost of the scheme (to irrigate 600 ha) as being N$ 64,400 per hectare (in 1995/96 prices - approximately N$ 73,400 in 1997/98 prices). Of the total undeveloped irrigable land, nationally, it is estimated\(^{33}\) that 18,600 ha would be irrigated from perennial rivers and the balance from ephemeral streams. Thus, the investment cost alone, of developing the additional 19,500 ha for irrigated grain production would be more than N$1,300 million (in constant 1995/96 prices).

In conclusion, therefore, and based on the data presented above as well as other data collected by the Directorate of Planning, cereal produced (for sale) in Namibia is not, on average, competitive compared with grain produced in neighbouring countries.

5. Implications for international trading arrangements
Namibia has entered into a number of international commitments which have implications for policies affecting the production of staple grains. As a signatory of the World Trade Organisation (WTO), the country is committed to replace quantitative import controls with tariffs. In fact maize has already been "tariffed". The implication of this is that the prices which domestic producers receive for their maize crop will correspond to the c.i.f. price of maize landed at Walvis Bay, plus the tariff, plus transport costs to the mill. At present the Namibian Agronomic Board (NAB) is not complying with Namibia's commitments to the WTO, in that it grants permits for imports only after the domestic crop has been bought up by the Namibian grain mills. Through this mechanism the country's private-tenure grain producers (and those smallholder surplus maize producers in Caprivi) are receiving higher prices.


\(^{33}\) Calculations based on data contained in ACIL Australia Pty Ltd (1992) *op. cit.*
and consumers consequently paying more, than would otherwise be the case. While this situation may be allowed to continue for the time being without challenge in a situation where, on average, little more than one-third of grain requirements are produced domestically, an extension of such quantitative controls in order to move towards food grain self-sufficiency by means of high prices, is likely to run into difficulties with the WTO and/or South Africa.

While the Southern African Custom’s Union’s common external tariff provides a good degree of protection to producers from cheap imports from the world market, competition from the Republic of South Africa provides a greater threat since it is generally a surplus producer - of white maize. Although there is no tariff protection, Namibian producers have some natural protection afforded by the costs of transporting the grain from the areas of surplus production in South Africa. Even so, however, producers as well as other observers consider that transport costs, amounting to some N$200 per tonne, provide insufficient protection given the low maize yields being realised by the bulk of Namibia’s producers.

Namibia has also entered into a commitment for a SADC free trade agreement. One of the provisions of such an agreement is the dismantling of quantitative restrictions and ultimately (within 8 years) zero tariffs. However, there may be a possibility of treating maize as a "sensitive" product and thus for it to be excluded from the agreement (although this could give rise to significant levels of "unofficial" imports from our lower-cost neighbours).

In conclusion, manipulation of producer prices as a means of achieving self-sufficiency is not likely to be successful due to objections from our trading partners. For this reason, instruments which tackle the situation from the supply side are likely to be more successful. These could, for example, take the form of subsidised farm inputs. However, the cost of the subsidies themselves and of the policing efforts which would be required to avoid "leakage" (the subsidised inputs being sold by the beneficiaries to farmers who were not entitled to receive them - both within Namibia and abroad), are likely to be prohibitive.

6. Storage and processing

If it is assumed that the goal of self-sufficiency is to be pursued by increasing maize output to cover the annual shortfall in grain production, then surpluses in grain production at the national level will result from good production years (seasons in which the local production of dryland Mahangu is higher than average) which would be used to meet the shortfall in deficit years.

An examination of the data in Table 1 suggests that an additional 115,000 tonnes of maize would need to be produced annually to ensure that the country is self-sufficient in grains on an ongoing basis.

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4 Although data are scarce, it can be hypothesised that there are significant inter-farm variations in yields. There is, therefore, scope for raising the productivity - and competitiveness - of those farmers with below-average yields. This would bring them closer to the situation of the highest-yielding producers whose grain farming operations, analyses have shown, are likely to remain competitive in the liberalised grain production and trading environment.
(Clearly, the tonnage will increase every year in line with the growth in the country’s population). A review of the data shows that apart from 1992 which was an exceptionally poor production year with imports of 138,000 tonnes of maize, additional production of 115,000 tonnes would satisfy a self-sufficiency scenario. Were this additional tonnage of grain to be produced under such a scenario, it would mean that in a good growing year such as 1993/94, approximately 36,000 tonnes would be produced in excess of consumption requirements. However, that excess would be used up in two consecutive drought years such as those experienced in 1995 and 1996.

In a year of surplus, the Government or its appointed agent, would have to intervene to buy up surplus grain and to release these surpluses in the event of drought. If, however, two good production years followed one another, the surpluses produced would result in considerable difficulties in terms of procurement and storage. This situation has not arisen in recent years, as in only two (1990/91 and 1993/94) of the past six growing seasons\(^{35}\) were reasonable production levels (production more than 50 per cent of "utilisation") realised.

As the cost of purchasing the surplus production would be recovered in selling the grain back to the millers, the principal costs for the Government would be those of storage and the interest charges on the money tied up in the grain thus purchased. The Ministry of Finance would need to make provision of approximately N$ 32.40 million for the purchase of this initial stock of maize. The storage of maize has been estimated as costing approximately N$ 20 per tonne per annum (this figure includes depreciation, maintenance, etc), while handling adds a further N$ 21 per tonne. Thus the annual cost of storing 36,000 tonnes would be approximately N$ 1.48 million. Interest charges, at an estimated rate of 15 per cent, would add a further N$ 4.86 million. The total annual cost would therefore be approximately N$ 6.34 million - representing an additional N$ 176 (or 20 per cent) per tonne to the cost of the stored maize.

On the processing side, sufficient capacity already exists within the country to handle the additional grain harvest were investment in irrigation to result in significant increases in output.

7. Implications of a programme for self-sufficiency in cereals

7.1 Financial and economic implications

Whether or not an increase in cereal output to the point of self-sufficiency is technically feasible, an important economic question needs to be answered: whether rapid growth in cereal output to the point of self-sufficiency promotes the realisation of the Government’s broad macro-economic development goals which are laid down in the First National Development Plan, namely: the creation of employment opportunities, sustained economic growth, a reduction in income inequalities and the alleviation of poverty? Experience from a number of other parts of the world has shown that governments have been tempted to solve the problem of slower-than-desired grain production through an increase in production by means of large, modern enterprises. This is the easy solution

\(^{35}\) This does not include the current season which appears to have been a record. However, provisional data for 1996/97 are only now becoming available.
as these types of enterprises are relatively simple to control. But experience has shown how they are often highly inefficient and lead to a concentration of income distribution - the rural population is provided with few employment opportunities. Although it is more difficult to implement and requires substantial commitment over time, the development of grain production based on increases in smallholder productivity seems to offer better guarantees for egalitarian and stable growth. As outlined in Section 1, the Government has made considerable efforts along these lines in order to increase smallholder food production since Independence.

**Employment creation:** The drive for self-sufficiency in food grains may conflict with the overall national development goal (as detailed in the First National Development Plan) of "employment creation". The reason for this is that cereals have the lowest labour requirement of all crops: under irrigation, maize requires a total input of between 20.5 person-days (using mechanical harvesting) and 44.5 person-days (using hand-harvesting) person-days per hectare, while wheat requires only 17.5. Other crops need far higher labour inputs per hectare - grapes, for example, need an estimated 1,150 person-days, cotton 124 and citrus fruit 340. Cereal production under irrigation, therefore, tends to be intensive of both capital and technology inputs, while generating little employment. Replacing maize or wheat cultivation under irrigation with cotton, for example, would have the advantage of creating more work. (Under dryland conditions, cotton has the added advantage of providing a more stable return than food grains, since it is more resistant to drought).

Furthermore, supporting large-scale food grain production would do little to increase the income of poor households directly, since such production is capital-intensive and consequently employs few people. The opposite argument applies in the case of production by smallholders.

**Income growth:** From the information currently available, any move towards self-sufficiency in cereals cannot be relied upon to produce a sustained growth in farmers' incomes and, consequently, to contribute towards poverty alleviation - cereals are low-value crops and, therefore, generate only low income per unit of land area. For example, it was estimated in 1994 that under irrigation maize would provide a gross margin\(^{36}\) per hectare of approximately N$ 780 and wheat N$ 470 per hectare, while cotton would give a gross margin of N$ 1,460, oranges N$ 17,200 and grapes N$ 36,800\(^{37}\).

As already explained, if the additional grain is produced using irrigation, this will have significant cost implications since irrigation is expensive in Namibia. This may not be apparent to the casual observer since, with many of the existing irrigation schemes, the full financial costs have been hidden - see below. (One of the principal causes of the high cost of irrigation is that the very sandy soils adjacent to most of the perennial rivers have a low soil

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\(^{36}\) To all intents and purposes, the same as "net return".

\(^{37}\) CSE/LCE. (1994) *op. cit*. Appendix D. However, the gross irrigation requirements of horticultural crops are correspondingly higher: maize - 1,200 mm; grapes - 2,103 mm; and citrus - 2,398 mm (using sprinklers).
water-holding capacity. This means that irrigation cycles must be short – often as little as six days – and the design needs to be adapted to take this into account).

The recent evaluation of the Etunda irrigation scheme shows how large the initial investment costs of an irrigation scheme can be - the discounted financial cost of the buildings, irrigation equipment and infrastructure, vehicles and the clearing of the site to irrigate 600 ha at the scheme is estimated to have been approximately N$ 28.6 million, in 1995/96 constant prices. The present value of crop output less operating and variable costs over the 25-year analysis period, is estimated to be N$ 6.2 million. Thus the scheme represents a net cost to the economy of N$ 22.4 million. Indeed, the value of crop output over the 25-year period will not even cover the physical development costs incurred over the first seven years of the project.

This merely serves to confirm the evidence available from other parts of the southern African region (and further afield) which suggests that irrigating low-value crops such as cereals, does not provide an economic return on capital. If irrigation schemes are to be developed, high-valued crops have to be grown and the capital costs of the scheme need to be minimised. Sustained growth in the arable sector and, with it, sustained growth in farm incomes and employment, lies in the production of high-value crops - the transport costs of which make up a smaller share of total costs. There can be little doubt, then, that, all other things being equal, the production of high-value crops would be a more efficient use of Namibia’s scarce irrigation resources than the production of cereals. As noted in Section 5, the price of maize is currently controlled by the Namibian Agronomic Board at an artificially-high price to support the industry. Even with such politically-motivated distortion in the price structure, market-oriented producers of white maize in Namibia are increasingly unable to compete with neighbouring countries. Therefore, if marketed production is to be promoted, it can only be done on the basis of guaranteeing a producer price substantially above world levels (or by paying farmers some form of drought relief to maintain their income levels in years of low rainfall). While this may bring financial benefits to individual producers, it would not be beneficial to the national economy - either the Government (in other words, taxpayers in general) would cover the premium over the world market price being paid to farmers, or the cost would be passed on to consumers who would consequently have to pay more for their maize and maize products - see Section 7.3, below.

Any production venture being sponsored by the Government needs to be economically justified. Given the high capital and operating costs of irrigation in Namibia, any new or existing scheme will therefore need to produce high-value crops. Such crops clearly do not include staple grains, since the returns realised from growing them do not justify the high costs. Recognising this situation, a recent report concludes, "... food self-sufficiency .... will

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38 Albeit at a level which is now substantially below the peak recorded in the 1993/94 season.
prove economically ... ruinous if pursued nationally as an end in itself. Indeed, experience generally in the southern African region is that self-sufficiency strategies without regard to these costs are a recipe for disaster.

In addition, it needs to be borne in mind that the true economic situation of irrigation projects in Namibia may in fact be even worse than that presented in the Etunda analysis. This is because the unit price of water used by the large-scale projects is only a fraction of its actual cost - thus, at Hardap, the total cost of water is estimated to be N$ 0.15 per m³, whereas farmers are currently being charged only N$ 0.015 per cubic metre. At Etunda, the actual cost is N$ 0.38 per m³, whereas farmers are charged only N$ 0.08. Furthermore, the opportunity cost of water from the perennial rivers (the Kavango and Orange, for example) is likely to be greater than the financial cost in the coming years; the value of the water in these rivers will increase significantly in the future as urbanisation and industrialisation in Namibia gather pace and as demand in neighbouring countries rises, leading to increased competition with agriculture for this scarce resource. Under these circumstances, it seems foolhardy to commit resources to irrigation schemes when that water will find a more productive alternative use in Namibia's cities in the medium to long term.

**Government budget:** The NRC (1996 *op. cit.*) study estimates that the cost of the subsidy required to stimulate additional production of maize would be approximately US$ 200 per tonne. Since it is estimated that the average grain production shortfall amounts to 115,000 tonnes, the subsidy requirement would be N$ 103.50 million per annum (in constant 1996 prices). This sum can be compared with the Government's capital development budget for the Department of Agriculture, Water and Rural Development in 1997/98 which amounted to N$ 63.00 million.

**Value added:** The results of a recent study on the value added by the various sectors of the economy from the use of water, show that the agricultural sector lags behind much of the rest of the economy. Thus, in 1993, the value added by agriculture per cubic metre of water used, averaged N$ 4.7 in the private-tenure farming sub-sector and N$ 4.5 in the communal-tenure sub-sector, compared with, for example, N$ 451.00 in fish processing and N$ 113.00 in the tourism sub-sector.

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40 DWA (*pers. comm.* 03/07/96. A. Du Plessis). However, some farmers at Hardap are paying only N$ 252/ha/annum for up to 150,000 cubic metres of water!

41 Although this charge has, in fact, never been collected!

The study shows that the values of output per unit of water input for livestock and crops in the private-tenure farming sub-sector in 1993, were N$ 26.2 and N$ 0.2, respectively. Crop farming used nearly three times as much water as livestock but generated output with a value only 2 per cent that of livestock. The difference would have been even greater if rainfed crops had been excluded from the crop production value figure (but inadequate data precluded this calculation).

**Input supplies:** Any moves towards self-sufficiency in grains will require the application of large quantities of inputs in order for the required yields to be realised. The principal inputs - other than irrigation water and labour - will be seeds, fertilisers and pesticides. Whilst the country has now installed and developed the capacity to produce sufficient Mahangu seed to cover the normal demand in any one year (at the current time), the other grain seeds (maize and wheat) and inputs will have to be imported - the low level of demand precludes the possibility of establishing hybrid seed, fertiliser or pesticide production in the country. Therefore, while grain production may rise towards self-sufficiency levels, this will be at the "cost" of increased imports of inputs required for such production levels to be realised; dependence upon foreign sources for supplies of grain will be replaced by a dependence on outside sources for agricultural inputs (to say nothing of the petroleum products imported to drive the farm machinery being used more intensively, and the irrigation equipment which would need to be imported to water the expanded area). Although data are not available to enable the analysis to be undertaken, the net foreign exchange savings resulting from food self-sufficiency could well be negative. Whilst the grain can be, and is, imported from a number of countries, agricultural inputs brought in by the private sector are sourced almost exclusively from South Africa; with greater food self-sufficiency, therefore, dependence on that one country would increase correspondingly.

**Transport costs:** Most large-scale grain production takes place at points distant from the main consuming centres. In terms of assuring effective distribution within Namibia, increasing domestic large-farm production would have little, if any, advantage over imports.

The situation is different for smallholder production - which is mainly for subsistence but can include small surpluses for sale or barter in the immediate vicinity. This has the clear advantage, in that it minimises use of transport. To the extent that transport cost advantages make smallholder production competitive with imports, policies to increase such production will help improve food security.

7.2 **Environmental implications**

**Fragile resource base:** The vast majority of the arable soils of Namibia are light, sandy loams or sandy clay loams that are highly susceptible to both wind and water erosion once the vegetative cover is removed. They also have low levels of fertility. Unless carefully planned and managed, the clearing and levelling of land for any irrigation development may leave soils exposed to wind for weeks before irrigation/plant growth begins. It may also induce rapid erosion by wind of the upper soil horizons, with a resultant drop in fertility. Such rapid degradation could occur if plans to increase self-sufficiency are translated into the preparation
of large areas of land for irrigated farming. On the other hand, however, experience from elsewhere has shown that the structure of soil can be improved under intensive irrigated farming if good farm management practices are followed, including the planting of windbreaks.

**Water:** The agricultural sector is already a major consumer of water, accounting for approximately 65 per cent of total water use in the country (Lange, G-M (1997) *op. cit.*), and data show that the demand from this sector is increasing rapidly. Of the 146.2 million cubic metres used for agriculture in 1993, 73 per cent went on crop production with the balance being used for livestock farming. The private tenure sub-sector used more than three-quarters of the total ‘consumed’ by the sector, and most of this (80 per cent) was for irrigated crop production. One-third of the water used for crop production was sourced from the perennial rivers, with the crops’ sub-sector using more than 60 per cent of all perennial water consumed in the country.

With the recent pronouncements on the necessity of piping water southwards from the Kavango river (with the attendant significant implications this would have on the unit cost of domestic water) to meet the projected demand of Windhoek - possibly 60 million cubic metres per annum - the Botswanan government (and others) may well raise objections if Namibia decides to abstract additional volumes from the perennial rivers which run along the country’s borders, for irrigated farming. This highlights the trade-offs between alternative users which will become an increasing feature of national and regional water planning in future years.

The result of increased use of perennial rivers for irrigation in the face of greater demands being made for that water from alternative uses, would be increased pressure on groundwater and ephemeral river sources. A possible consequence of this would be a permanent loss of storage capacity and damage to water quality. If this were to happen, it would, in turn, lead to less productive vegetation and, therefore, poorer quality grazing for livestock.

Finally, the tail water from irrigation schemes contains concentrations of fertilisers and agrochemicals leached from the irrigated soils. If the area under irrigation is expanded significantly, there is the possibility that it could lead to an increased volume of contaminated water. This would present an environmental threat to some highly-sensitive ecological areas, both within Namibia and in neighbouring countries.

### 7.3 Welfare implications

Because the market for the basic staple food imports (maize and wheat) is currently regulated (by the Namibian Agronomic Board through its controls on both the import and marketing of the commodities - see Section 5) rather than being left to the free market, it has a significant impact on

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their prices. Thus, white maize is approximately 20 per cent higher in price than it would be if there were no controls, and the price of wheat is between 10 per cent and 23 per cent higher (NRC, 1996, op. cit.).

The price raising effect has significant welfare implications - recent research has shown that among low-income households, food consumption\textsuperscript{44}, especially of staple grains, accounts for over 50 per cent of total consumption: in the northern regions, the purchase of Mahangu, maize and other cereals by "low-income" households accounted for 41 per cent of total food expenditures, while among the "very low income" households the figure is 46 per cent\textsuperscript{45} 46. Thus, changes in the consumer prices of these grains have an immediate impact on the living standards, food security and nutritional status of the poorest sections of the population.

The implication is clear, if the overall goal of poverty reduction is to be pursued, then targeting cheap food prices, particularly staple grains, for consumers should be an important consideration. If the moves towards self-sufficiency resulted in higher food prices (which would inevitably be the case, unless the Government were to subsidise the production of grains directly - and we have seen earlier what a burden such a strategy would place on the Treasury\textsuperscript{47}), then the negative impact on the welfare/food security of the poorest section of society in both the rural and the urban areas, is clear.

If prices offered to grain producers are raised in order to encourage a significant increase in production under a self-sufficiency initiative, it can be expected that cheaper grain and flour from outside the country will be smuggled into Namibia across the highly-porous borders. Furthermore, a high-producer price policy would have the effect of widening income differentials within the regions\textsuperscript{48}, since those farmers producing a small surplus would gain whereas those who do not - the majority of households - would suffer.

\textsuperscript{44} Food consumption comprises both cash expenditure and consumption in kind, which was valued in the survey.

\textsuperscript{45} Compared to 24 per cent amongst the "better off" households.

\textsuperscript{46} According to the same source (National Planning Commission. (1996) Living conditions in Namibia. Windhoek: Central Statistics Bureau), for 38 per cent of the population food consumption accounts for more than 60 per cent of total consumption while, for 9 per cent of Namibians, food consumption makes up more than 80 per cent of total consumption. These are internationally-recognised indicators of poverty and severe poverty, respectively.

\textsuperscript{47} It would also indirectly hamper the capacity of households to acquire food which is physically available, to the extent that such a budgetary burden would reduce the pace of national economic development.

\textsuperscript{48} which are already high - the Gini-coefficients (the measure of the extent to which actual income distribution differs from a hypothetical uniform distribution) for Namibia's grain-producing regions (as enumerated in UNDP, (1996) Namibia: Human development report 1996. Windhoek) are amongst the highest recorded in sub-Saharan Africa (Nicholson, K. pers. comm.).
8. A strategic grain reserve

If yields were predictable from one year to the next, price signals would encourage production up to the level of local demand, but not beyond. However, yields are highly variable between years as they are largely determined by volatile seasonal rainfall (an indication of this variability can be obtained from Table 1). Consequently, at an average level of self-sufficiency, there will be an un-exportable surplus in good years and a market deficit in poor years. To make matters worse, in poor years the rural market demand would rise as farmers would make up for lost production for own-consumption, through market purchases Thus, the market deficit would increase.

Until recently, conventional wisdom suggested that in such a situation, publicly-funded "security stocks" should be used to carry forward grains from surplus years to cover deficits in poor years. However, the costs of such a strategy are now well-recognised - they are high and, in most cases, represent an inefficient use of public funds. They also tend to "crowd out" efforts by the private sector to become involved in grain storage - since private profit is curtailed.

It is now widely recognised that Government efforts should rather ensure that price, trade and credit policy are such that they permit the private sector freely to invest in food storage and to profit (or lose!) from price fluctuations. In addition, Government investment funds should be allocated to develop the infrastructure required for the efficient marketing and distribution of grains, including food aid. When a severe grain shortage arises, it is best handled by importing more food - experience from a number of other African countries has shown that storage of money with which to buy food, is cheaper than storing the food itself. Trade offers a more flexible, sustainable and generally lower-cost means of stabilising the grain market than any buffer stock scheme. Grain reserve programmes tend to use arbitrary floor and price ceilings and incur inordinately-high storage costs. And, when they have collapsed - as they inevitably have done in situations of chronic surplus or deficit - they can be extremely destabilising to national grain trade.

In addition, experience from running strategic reserves elsewhere has shown that the operations have inevitably become politically-determined and also resulted in the destruction of local grain markets. In Kenya, for example, NCPB, the grain marketing parastatal which is responsible for managing the strategic grain reserve, has "become a huge wild monster, despite years of attempts to tame it with performance contracts and donor conditionality". A similar outcome could be projected for Namibia were the country to adopt a grain reserve strategy with, inevitably, movement controls on grain being introduced and attempts made to discredit traders, describing their actions as "exploitative" (whereas, by riding the speculation game, they would be providing an important service to producers and consumers alike).

Unlike many other countries in sub-Saharan Africa, Namibia has an active, well-developed private trading sector which results in supplies of maize and wheat flour being sold in stores and shops in the

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49 A reviewer used the term "decades"!

50 Nicholson, K. (pers. comm.)
most remote locations. The private milling companies organise shipments of grain from South Africa - one of the world's largest producers of white maize - and further afield to meet their milling needs (once local supplies have been exhausted) which are dictated by national market demand. Such shipments can be (and have been) organised rapidly and apparently in a cost-effective manner, to meet any unexpected shortfall in supplies. Grain is always available on the world market, even when world stocks are low, and Namibia has ready access to it. Furthermore, unlike many other developing countries Namibia has a well-developed transport infrastructure which means that food can be distributed quickly and at relatively low cost. All of this serves to diminish even further the case for establishing a strategic grain reserve. This characteristic of the trade in grain in Namibia also has important implications for household food security; it underlines the point made earlier that households need to produce "income" rather than "food".

It is also important to note that there already exists a significant grain storage capacity in the north of the country - in both the rural and the urban areas - owned by traders who deal in millet, in addition to the commodities which they normally handle. Moreover, many of these storage facilities are under-utilised. Thus, Keyler (1995, op. cit.) notes that if storage space is needed by the Government in Kavango and former Ovambo regions, it could probably be rented from the local business community.

9. Lessons from the region
During the last few years there has been a noticeable shift in the agricultural policies and strategies of many of the SADC member states, away from a fixation with achieving food self-sufficiency towards a more pragmatic and economically-rational approach of food security at both the national and household level. (The principal reason for this is, most probably, the fact that civil conflicts and the stance of the "front-line" states against the then apartheid South Africa, are no longer dominant issues in the region. This shift in focus has created an environment in which individual countries are prepared to substitute trade for a self-sufficiency strategy). Nowhere is this shift better exemplified and documented than in the case of Botswana.

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51 Leading one team of researchers to remark that, "The main source of food is no longer the family grain store but the local retailer". (Hay, R., Pell, J. and Tanner, C. (1990) Household food security in Northern Namibia. Oxford, UK: Food Studies Group).

52 "At the moment Namibia is heavily dependent on South African food markets. This source is both cheap and responsive to changes in demand". (Hay, R. et al (1990) op. cit.). Thus, in 1992, following the severe drought, as much as 85 per cent of the total supply of staple grains had to be imported (imports trebled compared with the previous year) and yet total food availability in Namibia was as normal.

53 Keyler, S. (1995) op. cit. p.121

54 G. Eele (pers. comm.).

Ever since its Independence in 1966, Botswana's National Development Plans had promoted food self-sufficiency. However, this goal was never realised due to the unfavourable natural resources endowment of the country. Given the country's comparative disadvantage in growing crops, the policy served to promote production, the cost of which, it has been calculated, was at least twice the import parity price.

However, the seventh National Development Plan, covering the seven-year period from 1991, signalled a fundamental change in direction. The self-sufficiency strategy was dropped in favour of a strategy to raise rural incomes; it was felt, the latter would be, "more likely to fulfil the goal of social justice, to preserve the dignity of families by providing them with the means to produce in order to consume to generate productive employment and to ensure an efficient allocation of resources". The Plan document also recognised the demand side of the food equation, as discussed earlier - namely, that national food self-sufficiency is only an indication of the physical supply of food; it does not guarantee universal access to food, nor the end of hunger and malnutrition. It pointed out that, on the other hand, food security allows for production and income generation which follow the principle of comparative advantage through internal and international trade. Thus, the foreign exchange earnings from activities in which the country is competitive (in Botswana's case, these are livestock, minerals, and some manufactures and services) can be used to import essential food commodities which cannot be produced so advantageously - maize in the case of Botswana.

A similar line of reasoning can be put forward in the case of Namibia.

10. Summary

In conclusion, a realistic assessment of Namibia's natural resource endowments and agricultural prospects must be the cornerstone for any policy directives, as well as for both public and private investment in staple food production. At the same time, the food security mandate must be interpreted as broadly as possible - it is more efficient (and cheaper) for Namibia to import certain foods using revenues earned from its agricultural exports, than for the country to grow all of its own staples. Indeed, as the paper has tried to show, devoting resources to food grain production that could be used more productively elsewhere, will reduce incomes, welfare and, thereby, food security, and yet absorb substantial amounts of public funds. It has also tried to point out that there is nothing intrinsically wrong with importing food. It is not a sign that domestic agriculture has failed. All countries import food, and some of the most successful economically are net importers of their main staple.

The principal role of the Government in the food crop sub-sector should be to improve the competitiveness, transparency and performance of grain production, processing and marketing.

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37 op cit. (p.259)
enterprises. Among other things, this involves ensuring the removal of marketing restrictions, improving the availability of information on crop forecasts and price movements for use by both farmers and traders, and providing legal support, security and improved infrastructure for competitive domestic trade in grains and for the financial transactions that support that trade.

A further vital rôle for the Government is to improve the lives and welfare of those most vulnerable to food insecurity. This requires, above all, an expansion in employment and incomes, in both the rural and urban areas. In this way, livelihoods which are both secure and sustainable, and which lie at the heart of an effective food security strategy, can be guaranteed.

Finally, the Government is attempting to raise the productivity of dryland Mahangu (and other grains) production in the Northern Communal Areas, by providing the agricultural research services with extra resources to investigate improved cultural methods and technologies, and to develop higher-yielding and more drought-tolerant seeds, by strengthening the agricultural extension service to improve its effectiveness in its work with farmers, by supporting the training of smallholders and traders, and by encouraging the private sector to make available the necessary production inputs to the farming community in a timely manner. At the same time, however, it is promoting the diversification of output to include higher-value crops and livestock enterprises.

In summary, then, the strategy which the Government has adopted in order for sustainable food security to be realised in Namibia, focuses on both sides of the equation - access and production. It is also seeking to make the best use of its own resources and of the nation's limited natural resources while, at the same time, addressing nutritional issues.