SOUND THE TOCSIN: THE THIRD HORSEMAN MOUNTS TO RIDE

Drought In Southern And South Africa 1991–1993

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The harvest is gathered,
And we are not filled.

- Jeremiah

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But rage, rage against the dying of the light.

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I.

PRELUDE TO CATASTROPHE

Over a great arc from the Cape of Good Hope to Central Tanzania and Madagascar to Southeast Angola the 1991-92 rains have failed - wholly or dominantly. The 1992 harvests will be small fractions of normal and in many districts there will be no grain harvest.

The additional import requirements for grain could be over 11,000,000 tonnes and can hardly be less than 8,000,000. Because entitlements (household self-provisioning, agricultural sales, agricultural and small town wages) have been devastated, of the order of 25 million persons need 4,000,000 to 5,000,000 tonnes of grain either as food for work (whether literally or via cash payments) or grant survival assistance.

This appalling prospect of mass famine on a scale not seen since the 1920s, and the burdens averting it will require to be shouldered, falls on already debilitated economies and states. The 1990-91 weather was patchy with some disaster areas (e.g. Manica Province in Mozambique) with resultant low

harvests running down grain reserves from the 1986-1990 run of normal to good harvests. With the exception of Botswana, the external balance position of the eleven states ranges from precarious to disastrous - $1.5 billion of additional grain imports cannot be sustained out of present foreign exchange earnings and transfer receipts. Budgetary positions are little better - the domestic financing of food aid to 20 million souls is fiscally unfeasible. A decade of limited economic success in most of the economies (Botswana excluded) has eroded infrastructural and institutional capacity. A decade of war has nearly destroyed civil governance as well as infrastructure in much of rural Angola and Mozambique.

The Four Horsemen Wait

The appropriate imagery is from the medieval representations of the Four Horsemen of the Apocalypse. Famine mounts to ride. And if it does, pestilence will certainly ride after. Nor can one suppose the peace processes in Angola and Mozambique, the transition in South Africa or levels of violence and disorder in several other states would escape unscathed. Where one of the four horsemen rides the others find the way open to follow.

A more regional image would be from the subtle, complex, grim cosmology of the Makonde people of Tanzania and Mozambique - the vultures no longer wheel high and wide looking for prey. They have gathered in a nearby tree to wait for their dying dinner to be ready.

That terrible image of brooding vultures in a tree was misunderstood and domesticated by some European art critics who termed it the "Partridge in the Pear Tree" theme. So too is the stark horror confronting South and Southern Africa domesticated in most reports to date.

There is no disagreement that there is a drought; that it is worse than the early 1980s droughts (in which over 300,000 persons perished in Mozambique and Angola); that millions of tonnes of additional grain imports are needed to avert scores of thousands of deaths from famine. There are uncertainties as to numbers but neither as to existence nor magnitude.

Nor is there disagreement that much of the grain must be aid - for states without import and households without food entitlements; that the logistical problems will be immense nor that time is running out if grain

is to begin reaching consumers in September when such reserves as exist, 1992 harvests such as they are, and existing import pipelines will have been consumed.

But Where Is The Loud Alarm?

But the studies and reports (dating back to late 1991 when the danger first became visible) are very low key. So are the build-up of national data and analysis. Indeed many of the reports after setting out the road to catastrophe go on to say that donors are not in a mood to spend, are otherwise occupied (middle and east Europe, Cambodia) and that the logistic problems are hopeless - so the scores or hundreds of thousands will die. That, however intended, amounts to a paper game of "Pass the Corpses - you were warned, our hands are clean of the blood of these just people, see ye to it".

The early warning systems have warned. The first blinking amber but now flashing red lights have been monitored and read aright. The prospect of windrows of corpses has (rather antiseptically and in odourless semi-statistics) been posed as have the magnitudes of effort needed to avert that prospect. But where is the loud call to action? Where the forceful presentation to convince politicians and bureaucrats while there is yet time? Where the simple, clear releases to the press to arouse public concern before TV teams can beam back pictures of the dying too late to save many of them?

To revert to the medieval image this is the time for ringing the Tocsin, the wild, sustained, clamour of bells to warn of a pressing danger and to call out all decent persons to meet it. Unless the tocsin is sounded and sustained now, in much of Southern and South Africa by 1992's end, the Christmas bells will be tolling for the dead - the needlessly dead of mass famine.

II.

REQUIREMENTS: COUNTRY AND REGIONAL SKETCHES

To sound the loud alarm of the tocsin is necessary. It is not sufficient. Data must be available to demonstrate the parameters of need and the strategic actions and orders of magnitude required to meet it. Because there is a four to six month bureaucratic and logistic gap between

recognition of an impending famine and effective delivery of food to the hungry one cannot wait for that data to be exact.

Plus or minus 10 per cent (with good reporting and good luck) or even 20 per cent margins of error (in cases of severe economic and civil government debilitation and strife) are virtually inevitable. This is particularly true because late rains (or their absence) can still affect harvests (or their absence) in some cases and few, if any, of the yield estimates are based on systematic sample surveys. The point of the exercise is to provide approximately correct data in time to avert famine not to emphasise uncertainty nor to provide precise data on those at risk too late for food to be mobilised and transported to save them. The unanimous view of experienced observers of disastrous crop damage backed by the meteorological record and, in several cases, detailed observation and estimation, forms an adequate basis to begin action now.

For the South and Southern African regions and for almost all of the eleven countries in them that much data already exists. The quality of the data and of its analysis varies as do the chances of late weather shifts improving - or worsening - crop prospects in Tanzania and perhaps Zambia plus Northern Mozambique and Malawi. Further data checking and analysis, however, is not needed primarily to assess need nor to identify key elements in meeting it but to articulate operational programmes. Therefore, they should proceed as a matter of urgency but parallel to mobilising external resources and internal logistic and delivery capacity. Donor's past scepticism of requests based on preliminary data has, understandably, encouraged data checking and analysis prior to presentation but in some cases - notably Mozambique - this concentration on order and method is in danger of loosing sight of the urgency to take steps to initiate action.

The key data relate to:

a. magnitude of food shortfalls (at least at this stage in terms of grain equivalent);

b. numbers of persons whose entitlements (from household self provisioning, cash sales or waged employment) have been terminated or reduced far below the absolute poverty line by the drought and who

require either relief distribution or food for work (in cash or kind) programmes;

c. the port, rail and truck transport logistical capacity for getting food imports to affected countries;

d. the internal logistical capacity for moving food from ports (or arrival points in landlocked states) to afflicted secondary towns and rural areas;

e. the institutional capacity for delivering that food to the persons at risk of starvation;

f. the foreign exchange and fiscal requirements which cannot be met by the affected states' economies/Treasuries (and thus the volume of food aid - as opposed to commercial imports) needed.

Normally data on regional surplus countries and intra regional sourcing (from South Africa, Zimbabwe and - in some years - Malawi and Tanzania) would also be needed. In 1992-93 the sweep of the drought makes that input appallingly simple - no country in the South or Southern African regions has surpluses to export; all have deficits to cover by imports. The regional aspect is crucial but is one of logistics particularly in respect of matching port, rail and highway capacity with landlocked state requirements not of redeploying surplus grain to meet deficits.

In 1992-93 the South and Southern African regions are largely separable logistically and operationally, even if united in a common drought disaster. South Africa's drought and resultant import requirements means it has no grain to sell to and no port capacity to handle for Southern African countries other than Lesotho and - partially - Botswana, Swaziland and Namibia. The concept of using Durban as the hub for Southern African imports is inherently unsound - it will be clogged with South African imports. Further, the nature of the present South African regime precludes the normal external government/international agency relationships with the afflicted state's government which typify most emergency food aid programmes and are both appropriate and possible in Southern Africa.

The balance of this section provides sketches of the data on the eleven South and Southern African states on the heads set out above and a regional summary. Emphasis is on physical quantity orders of magnitude because mid

1992-mid 1993 grain prices are uncertain and the accounting prices used for aid often bear little relation to commercial cif or to each other. A tonne of commercial Thai rice feeds as many people as a tonne of EEC, USA or Japanese aid rice even if the cif accounting prices of the latter are in the range of 1.25 to 3 times as high.

Madagascar is not covered because it is not usually seen as Southern African. However, it is subject to the same weather system and lowland areas (especially in the South) is experiencing its worst drought in decades. A comparable programme is needed, presumptively from the same sources and by the same seas routes as for South and Southern Africa.

Country Review

1. South Africa

South Africa is experiencing its worst drought since the 1920's. Near total grain crop failures are virtually certain in most of the Orange Free State and the Southern, Western and Northern Transvaal. Eastern Transvaal, Cape and Natal losses are estimated at 30 per cent to 75 per cent. It is now too late for rain to affect the outlook much - the harvest, such as it is, has already begun.

Import requirement estimates of the order of 6,000,000 tonnes at first sight appear implausible. Normal South African consumption including household self provisioning, livestock, industrial uses and commercial food marketing can hardly exceed 12,500,000 tonnes for maize and wheat combined. Exports are usually in the 2,500,000-5,000,000 tonne range implying a total crop of 15,000,000 to 17,500,000 tonnes. A 6,000,000 tonne import level would imply a 6,000,000 to 7,000,000 tonne domestic crop or under 40 per cent of normal. However, looking again at the provincial crop estimates brings home the fact that there may well be a 60 per cent national crop loss. Record lows in rainfall have combined with record highs in temperature.

The entitlements destruction is equalling appalling. 1,000,000 farm worker household members are believed to have become indigent through farmer firings and non hirings. An equal number are probably affected by firings in small dorps already strained by the sickness of their white farming market base over the past half decade and now convulsed

by the drought. Adding black farming families who have lost their crops and drought/economic malaise increases in black unemployment suggests that 4,000,000 to 7,000,000 souls are at risk of famine whether food is physically available or not. Charities and churches working closely with these people share that perspective and speak of starvation as soon as June and of over 1,000,000 in rural or dorp food relief programmes already with others not accommodatable and an ever rising demand.

The logistical problems posed by 6,000,000 tonnes of grain imports are immense. South Africa's ports have recently had surplus capacity but largely because a decade of economic stagnation (under 1 per cent annual growth) and, more recently, falling grain exports have reduced throughout (excluding bulk coal and mineral cargos) while modest debottlenecking and capacity expansion have gone unused. 6,000,000 tonnes additional imports would totally alter that position. Durban would again be clogged, Cape Town and Grahamstown at capacity and even the white elephant of East London near capacity for the first time in perhaps two decades. Certainly Durban would have no capacity to handle a significant volume of grain imports for transit to the Southern African region beyond Lesotho and, partially, Swaziland and Botswana.

Domestically SATs and road hauliers probably could move the grain to towns and most rural areas. There would, however, be little safety margin. Institutionally there is clearly inadequate state capacity (direct or via NGOs) to handle the 800,000 to 1,400,000 tonnes grain relief needed by disentitled households. (That assumes the government would give priority to allocating $240 to $450 million - R625 to R1,150 million - for that purpose, which is not self evident.) Of R400 million voted for relief of non-drought absolute poverty via NGOs in the last quarter of 1991 only R17 million has been disbursed despite NGO applications probably approaching the full amount.

Even were state capacity higher, providing a R625 to R1,150 million slush fund for the present government to distribute if it could would hardly be a prudent way of furthering the Codesa led transformation to a legitimate government and would clearly violate much national and international sanctions legislation. Equally, however, mass starvation would be a disastrous - perhaps fatal - context for the Codesa process

and, one might suppose, inconsistent with providing effective humanitarian relief to the victims of apartheid.

Institutional capacity for identification and distribution does exist. Community based organisations, churches and trade unions do - at local level - have the ability to handle at least 1,000,000 tonnes locally. But they number (at that level) several thousand, many with no or sketchy provincial and national coordinating structures. This gap is exacerbated because the nature of the apartheid regime and the struggle against it has meant that the chief international coordinators of the struggle against famine - WFP, UNDP, FAO, UNICEF - are notably absent or engaged only in pre planning for post transition programmes.

The only practicable solution would appear to be for WFP, UNDP, WHO and UNICEF (together with USAID and EEC) to catalyse a national logistical and coordination forum to pump food aid to community level organisations. Time is very short if famine is to be averted but no other realistic option appears to exist. In the present context it is very unlikely that President de Klerk would block or seriously obstruct such an initiative and it would appear consistent with the latest United Nations resolutions on relations with and aid to South Africans.

2. **Zimbabwe**

Zimbabwe has experienced disastrously bad rainfall over virtually the whole country. The present stocks, committed imports and 1992 harvest are not expected to meet commercial demand beyond August. End of year stocks are low because the 1990-91 harvest was patchy (though not disastrous) and reacting against previous overcaution too much was exported.

Imported requirements are estimated at up to 2,000,000 tonnes. This appears to be an overestimate - normal self provisioning, livestock feeding, industrial and commercial food demand is probably of the order of 2,500,000 tonnes (maize and wheat) and normal production 2,750,000 to 3,250,000 tonnes at present relative grain/alternative crop prices. A harvest of 500,000 tonnes would imply an over 80 per cent loss which seems unlikely. 60 per cent - parallel to South Africa - would imply a 1,250,000 tonne order of magnitude for required imports.

The loss of entitlements in rural Zimbabwe is severe. Perhaps 3,000,000 persons are in households who have lost most or all or their food supply and/or cash income. That would imply 600,000 tonnes of basic survival grain (as rations and/or via work for food programmes. To this however must be added the losses of households with mixed wage and agricultural (cash and/or self provisioning incomes) who will need partial assistance of perhaps another 300,000 tonnes.

Logistically serious problem exist. There is unlikely to be any capacity available at Durban (nor 1,250,000 tonnes on SATs rail routes from Durban to Zimbabwe). Maputo port could handle 1,250,000 tonnes (plus Mozambican and Swati requirements) but the Limpopo Valley lines available added capacity is not over 500,000 and may still be as low as 250,000. The balance would need to go via Resano Garcia transiting South Africa and/or via Beira and its corridor. In the latter case available additional port capacity is of the order of 1,000,000 tonnes (or more) but additional rail capacity available is probably of the order of 500,000 and road haulage uncertain albeit not necessarily negligible. Once in Zimbabwe the logistics for distribution are adequate except for two to three isolated districts.

Institutional capacity is less certain. Over 1982-85 very substantial capability in assessing needs and operating work for food and straight relief capacity was built up. On paper the structures still exist and the political priority for using them certainly remains high. However, drought stricken areas in 1990 and 1991 were not served promptly because the reporting and coordination system seems to have atrophied. Unless it has been revived in response to 1990-91 weaknesses this will be a serious weakness.

Zimbabwe's attempted transition from a 4.5 per cent growth trend, low capital/grant inflow, comprehensive import licensing economy to a 6.5 per cent growth trend, high capital/grant inflow, import liberalised economy has had a very troubled first year. Import liberalisation/ devaluation/inflation have interacted in a non-virtuous spiral, inflation has risen despite reduced government borrowing which has not been paralleled by any major increase in enterprise investment. Therefore $400 to $500 million additional grain import cost (ex Harare/Bulawayo) and up to $400 million drought relief/labour intensive

works cannot be financed either on forex or fiscal account. Mass starvation (the first since the 1930's) would make the transition economic strategy much harder to sustain. Therefore, food aid requirements can be estimated at 750,000 tonnes beyond 1991-92 (largely wheat) levels.

As in the case of South Africa, Zimbabwe's grain deficit has a regional knock on effect. Zimbabwe's post 1984 surpluses have been the main source for imports into two landlocked Mozambican Provinces (Manica and Tete) as well as a major one for Mozambican refugees in Malawi, for Zambia and - to a lesser degree - for Botswana. Resourcing these imports (of the order of 250,000 tonnes) will pose major logistical problems.

3. Mozambique

Mozambique is suffering massive crop failure in three of its four Southern provinces and near total harvest wipeout in the fourth (Manica, which also had devastating drought losses in 1990-91). Tete and Sofala in the centre are also seriously affected with near total crop losses in some districts probable. Zambesia and Nampula have experienced severe drought especially along the coast but the position may be less severe in the interior of Nampula and in respect of cassava. The Northern provinces of Niasa and Cabo Delgado are believed to be less severely affected although the poor conditions in neighbouring Malawi and Southern Tanzania suggest caution in assessing harvest outcome. February rains may have reduced damage somewhat from Zambesia northward but are too late to have had any crop saving value in Tete or the Southern provinces. The end of 1991 stock and 1991 committed food aid pipeline positions are also unsatisfactory. The 1990-91 Tete drought's impact was far from fully offset by additional food aid commitments. Only a third of 1991-April 1992 commitments had arrived in January 1992 and much of the balance had not even been scheduled by donors. Food aid agreements (unlike IMF agreements) have no trigger clauses for late or non attainment of targets.

The estimated grain equivalent crop loss is between 750,000 and 1,000,000 tonnes. An additional loss of quasi legal imports from South Africa of perhaps 50,000-75,000 tonnes is likely. This is on top of an estimated 25 per cent national food supply deficit (after food aid) of

1,125,000 tonnes in a normal year. Persons directly affected by major or total entitlement losses are of the order of 4,000,000 to 5,000,000 (including war affected displaced and pauperised households who cannot be supplied at present levels of food aid and are virtually all absolutely poor). In the absence of massive additional food aid the rise in food prices would severely affect 2,000,000 to 3,000,000 more persons - notably the 30 per cent of urban households (900,000 souls) already below the absolute poverty (and adequate diets) line. The position in distinctly worse than in 1982 when inadequate food aid (more than inability to deliver) resulted in over 200,000 famine deaths.

The logistical problems of landing grain at Maputo, Beira and Nacala are negligible if Mozambique is seen in isolation. Nacala can handle the needs of Nampula, Malawi and transhipment to smaller ports (Pemba, Quelimane and coaster/lighter tertiary ports.) However, because of Swaziland, Zimbabwe and Zambia requirements there may be effective port capacity constraints at Beira and Maputo which could be eased marginally by routing Inhambane and perhaps Xai Xai transhipment cargo via Nacala.

Internal transport logistics pose massive problems even at the much smaller present food aid and commercial levels. These relate only in part to security prevent constraints. Deteriorated, damaged and destroyed road and secondary rail links and an inadequate road haulage pool (private and public) are significant constraints. However, in general rural transport capacity has improved markedly over the past three years so that - perhaps with provision of vehicles (whether for the public or - on hire purchase terms - the private sector) 90 per cent of the afflicted persons could be reached.

Distribution capacity at institutional level is fairly well articulated but fragile and none too well coordinated between the central government instrumentality (DPCCN) and some of the field level local governmental and external non-governmental agencies. However in a drought context virtually all households in the severely affected district become eligible so that in one importance sense (absence of need for tight selection and identification criteria) distribution becomes easier. That, however, assumes adequate food aid is delivered

to meet demand. In its absence selection among households all of whom are severely affected by hunger will pose virtually insurmountable problems.

Further the present food supply system to 1,500,000 war dislocated persons in small camps now supplied from food aid would become unsustainable. It is not practicable to feed camp residents alone when the surrounding population is severely malnourished and no alternative supply of food exists. This reality has already led to high 'leakage' and episodic disorder in the hungriest districts - notably in Zambesia. Under famine conditions total disorder would be inevitable.

Perhaps 10 per cent of the afflicted people cannot be reached (or can be reached only by plane) because they are in areas controlled by or cut off from surface transport by the bandidos armados of Renamo. Further, Renamo is following a high publicity profile military strategy with scattered attacks on visible, soft targets and - even before the drought - over half of the 20,000 bandidos were very short of food and carrying out murderous raids in Mozambique and Eastern Zambia to avoid starvation. Taken together, these conditions ensure that food lorries and food distribution points would attract attacks even in accessible areas, as, indeed, has been the case from 1981.

This situation raises the question of seeking to have survival food transport and distribution recognised by the Government and Renamo as "islands of peace". In addition to expanding the present Government and NGO programmes this would presumably require international agency supervised food distribution to women (who after all do the food storage and preparation) in Renamo controlled areas. Despite the certainty of leakage to Renamo's bandidos, if that brought safe movement of all survival food throughout Mozambique the high priority given by the Government to combating absolute poverty and restoring food security suggest it might well agree. The ongoing programme for provision of immunisation and vaccination supplies (despite levels of tetanus toxoid relative to other items suggesting diversion) is a precedent. Whether Renamo would agree is less clear but the proposal (prematurely floated in 1990) is worth re-examination.

Mozambique's external account and fiscal situations are disastrous. About 80 per cent of imports and 50 per cent of the recurrent budget

(and 90 per cent of the emergency survival budget) are financed by external assistance. All 875,000 tonnes of additional grain requirements are for food aid which would need to be complemented with support for domestic distribution costs.

Famine would have a devastating impact on Mozambique's economic and social policy. Rural livelihood rehabilitation can hardly be built on the mass graveyards into which a major famine would turn rural Mozambique. Nor would starvation and disorder further either the peace negotiations with Renamo nor the now unfolding multi party political process toward 1993 elections.

4. **Malawi**

All reports indicate very severe crop damage. This appears to hold both for the densely populated South and the normal grain surplus Northern area. Entitlements loss will include both household self-provisioning/cash sales for affected farmers and loss of seasonal agricultural employment for poor (especially female headed households). The number of persons requiring at least partial food support may be of the order of 3,000,000 largely in female headed and other small farm rural households.

Excluding refugees (750,000 plus - official figure is of the order of 900,000 but may be a cumulation of registrations with less accurate subtraction of returnees) Malawi normally has a maize surplus and imports (largely of wheat) of about 50,000 tonnes.

1992-93 maize import requirements may be, 400,000 to 500,000 tonnes plus 'normal' refugee ration imports (100,000?). Spare capacity at the Port of Nacala is over 1,000,000 tonnes. The railway to about halfway from Nampula to the Malawi border has surplus capacity with the probable limit (set by locomotive capacity) in the 400,000 to 500,000 tonne range. The problem is organising road transport from the end of the rehabilitated line to the border at Intralagos where it could be reloaded on Malawi Railways. Internal distribution capacity in Malawi appears adequate - institutional capacity for either food for work or drought relief distribution in kind more problematic.

The "normal" 100,000 tonnes food for refugees as in the past come largely from Zimbabwe's surplus via the Tete Corridor this will need to be resourced. Given the road traffic constraint on the Nacala Corridor, it may need to be routed via Dar es Salaam or Mtwara both of which have surplus port capacity. However, the mobilisation of adequate lorries from Mtwara or the transhipment point on the Tazara line may pose problems.

Malawi's fiscal and external balance positions are precarious - especially as drought is likely to cripple tobacco, cotton, sugar and tea exports. Therefore substantial food aid (up to 400,000 tonnes) is needed.

5. **Zambia**

Zambia almost certainly has a large grain deficit for 1992-93 after very poor rains in the South, Centre and East in 1991-92. How large is still unclear because of less than fully confirmed reports of above average crops in the Southwest and West (which have indeed had relatively normal precipitation levels). The North is more a cassava than a grain zone and judging by reports from adjacent areas in Tanzania and Malawi is facing severe drought conditions.

Under these conditions the prudent rough estimate of maize import requirements is 500,000 tonnes. However, if the Western reports are wrong that total could be as high as 750,000 (beyond normal - largely wheat and rice - requirements of over 100,000 tonnes). The most seriously affected direct loosers will be primarily farming households on self provisioning and, secondarily, cash sales. The numbers requiring survival food relief could be 2,500,000. Even were Western surpluses to offset a significant portion of other area deficits the domestic need to provide food relief would remain because the drought stricken households could not afford to buy grain.

Thus normal (and speedy delivery) sources of imports - South Africa and Zimbabwe - have none to supply this year so the entire requirement will have to transit Indian Ocean ports. The two plausible ports of entry are Dar es Salaam and Beira. Both have substantial surplus port and, to a lesser extent, railway effective capacity. The split between the two should largely turn on meeting the Zimbabwean and the Zambian

requirements with the first having priority at Maputo and Beira and the balance of the Zambian going via Dar es Salaam. The full 750,000 tonnes would strain Dar es Salaam and probably exceed Tazara effective surplus capacity when taken together with Tanzanian and potential Malawian drought grain requirements.

Zambia's internal logistical and institutional capacity for handling rural grain movements (whether collecting surplus or distributing drought relief) is low and debilitated. In the past it has also not engaged the high priority to make it work given in - e.g. Mozambique, Tanzania and Zimbabwe. How much improvement is possible in 1992 is unclear.

Famine in Zambia would be politically and economically disastrous. There has been no large scale famine since well before independence so that the new government and its economic adjustment/transformation policies would inevitably be blamed. Zambia's price, fiscal and external balance positions are worse than precarious. Therefore, additional food aid of the order of 500,000 tonnes is likely to be needed to maintain stability and a dynamic of economic change.

6. Tanzania

Tanzania has had very mixed weather in 1991-92 following a poor 1990-91 harvest. In the Northern and Lake Regions reports suggest adequate rainfall and average to above average grain harvests. However, this could still go wrong if the March-May period is rainless.

Central Tanzania is drought hit (apparently including the Iringa Highland and Kilambero valley which in normal years are major grain surplus areas). Southern Tanzania had very poor rains through January and will have below average crops. How much below average will depend on the quality of the February and potential March/April rains.

Estimation of grain import needs is complicated by the substitutability of cassava which is a standby famine averting crop in some areas. The lowest prudent estimate of the drought related additional grain (maize) deficit is 250,000 tonnes (versus a normal year balance or small surplus in maize and 50,000 to 100,000 tonnes of wheat and rice

imports). Late rain failure in the North and Lake Zones and petering out of February rains in the South could raise that to 500,000 tonnes.

At least half the physical food requirement will be to replace rural grain in cities - especially Dar es Salaam but also Morogoro, Mbeya and Mtwara. The balance will be needed as drought relief in the worst affected rural districts for between 500,000 and 2,000,000 persons.

Both Dar es Salaam and Mtwara have substantial usable surplus capacity as do the Tazara rail and the Dar es Salaam and Mtwara access highways to the Centre and South. Past drought (and flood experience) demonstrates an adequate institutional system for delivering survival food aid at village or sub-district level and a high political priority to making sure it works. Food for work (in kind or cash) capacity is more limited and the potential for raising it sharply on short notice highly problematic.

Tanzania's fiscal and external balance positions are precarious. Further over a quarter of the recurrent budget and three fifths of imports are aid financed. Therefore food aid of at least 250,000 tonnes above normal levels is required.

7. Lesotho

Lesotho has had disastrous weather. Its main grain growing areas adjoin Orange Free State districts reporting complete crop wipe out. The normal grain import requirement is of the order of 200,000 tonnes including wheat and rice. The additional 1992-93 requirement is likely to be of the order of 100,000 tonnes. Normal non-food aid purchases from South Africa are likely to continue to be available (out of re-exports) and are largely paid for out of mining and other labour remittances both at national and household levels. The number of persons requiring food relief or enrollment in food for work programmes may rise by 250,000.

Because Lesotho is an enclave imports must transit South Africa. The logical port - Durban - may well be clogged with South African grain imports forcing use of the more distant Grahamstown and/or East London. SATs rail and road capacity for port - Lesotho movement is probably

adequate. Lesotho has substantial rations and food for work experience which is effective in averting famine if not, perhaps, very leak proof.

Lesotho has a precarious budgetary and external balance position and will need on the order of 100,000 tonnes additional food aid.

8. **Swaziland**

Swaziland grain crops are poor - though not completely wiped out at least in the Middle and High Veldt zones. In good years Swaziland has an approximate balance in maize production and use and in normal a deficit of up to 100,000 tonnes. The 1992-93 additional requirement may be of the order of 100,000 tonnes and the additional non-South African (normal supplier) requirement 150,000 tonnes. At least partial food aid or food for work may be needed by up to 100,000 persons.

The Port of Maputo has a very large surplus effective capacity so that 150,000 tonnes could be landed. The Manzini-Maputo rail line could carry that tonnage subject to security conditions. The logical South African port - Richard's Bay - is bulk cargo oriented but for coal and mineral exports not grain imports. Durban is likely to be clogged by South Africa's own grain imports while East London, Grahamstown and Capetown are uneconomically far away. Internal distribution logistics in Swaziland should pose few problems - relief or food for work institutional capacity is more problematic.

Swaziland's fiscal and external balance positions are precarious and the drought will worsen both. Therefore, substantial food aid will be required.

9. **Botswana**

Botswana has entered another of its biblical drought cycles. This will increase its normal grain import needs of 200,000-250,000 tonnes to 300,000-400,000. The normal source - South Africa - cannot be counted on to maintain, let along raise, exports because it has a huge maize deficit of its own. However, on past performance it will seek to preserve its Botswana market by re-exporting. A minimum of 100,000 and a maximum of 250,000 tonnes will need to be brought in other than from/via South Africa.

The evident route is via Walvis Bay/Namibia. Port capacity and rail capacity to Windhoek (and perhaps Gobabis) is adequate. Road haulage has built up rapidly since Namibia's independence, though portions of the Windhoek-Gaborone 'highway' are of very poor quality. Botswana is seeking to reopen its use of Maputo and might wish (and be able) to handle a portion of the imports via the Maputo - Resano Garcia line and the SATs net. Internal delivery systems both logistically and institutionally (work for food plus school and health centre based supplementary food provision) are fully adequate. In practice the latter serve virtually all rural households and the former all self selected, low wage seeking households.

Botswana doubtless will seek and receive some food aid. However, $25 million to $40 million of import and distribution costs can, in fact, be covered by its own budgetary and foreign exchange resources if necessary.

10. **Namibia**

Namibia's weather has been uneven. The main grain growing (and African household farm) area in the Northcentral zone has had reasonable rains and water flows from the Angolan plateau. The Northeastern Caprivi zone seems likely to have had a bad year as both Southern Zambia and Southeastern Angola report crop failures. Central and Southern Namibia have had very poor rains which will have affected commercial, mechanised maize production.

The additional food import requirement is somewhat problematic - perhaps 50,000 tonnes (half for livestock consumption). In addition up to 100,000 tonnes of normal commercial imports from South Africa may need to be resourced. Most of this will be for urban sale. Persons loosing entitlements may be as low as 15,000 (Caprivians) unless commercial farms/ranches radically reduce employment. No evident logistical difficulties exist - this magnitude of swing in import levels is normal and of the affected areas only Caprivi is hard to reach.

Namibia will need additional food aid of at least 25,000 tonnes. The fiscal and external account positions are barely satisfactory at levels which are barely consistent with acceptable (4 per cent or above)

output and public service provision growth and 1992 export prospects for some key minerals (especially uranium oxide) and for meat (drought impact) are poor to problematic.

11. **Angola**

Most of Angola is not drought affected. However the Southeast quadrant (UNITA controlled) is. Further the legacy of war means that there is an underlying pre-drought import requirement (even if one not fully met in past years) of at least 750,000 to 1,000,000 tonnes. The drought uplift is perhaps 100,000 to 150,000 tonnes.

Logistical problems are very severe. Even with peace, rail, road, bridge and vehicle fleet capacity is very limited. While the grain can be landed at Luanda, Lubito and Mocamedes movement upcountry is problematic. This problem is exacerbated by a de facto patchwork quilt layout of Government and UNITA controlled areas. In the case of the Southeast this may posit continuation/augmentation of shipments landed at Walvis Bay and carried across Namibia by lorry. On past experience that route could be expanded to up to 200,000 tonnes.

Angola could perhaps cover 500,000-750,000 tonnes of commercial imports ($75-125 million) financed from oil export and tax revenues freed by the advent of peace. It could not cover 900,000 to 1,150,000 except at the price of severe cutbacks on infrastructural and public service restoration needed to heal the civil and political as well as the economic wounds of war. Further at least 200,000 to 250,000 tonnes of the deficit is in UNITA controlled areas and UNITA has very limited civil import capacity. Therefore a 1992-93 food aid level of 400,000 to 500,000 tonnes would be appropriate, especially from states setting high priority on a continued transition to peace and reconciliation in Angola.

Regional Summary

The total additional food import requirements are of the order of 10,000,000 to 11,000,000 tonnes. Between 20,000,000 and 26,000,000 additional persons have suffered major or total entitlements loss from drought and require either relief rations or food for work programmes. Realistically, in the time available, such programmes cannot be expanded to

include the majority of recipients except in Botswana and possibly Zimbabwe and Lesotho which have substantial past and/or present programmes.

The landed cost of the grain (at say $175 cif per tonne - aid agency accounting prices) would be over $1,750 million and that of transport to landlocked states, domestic transport and distribution of the order of $500 million plus non-food costs of food for work programmes for the entitlement restoration component. The bulk of this expenditure in Southern Africa needs to be met by donors (with the possible exception of Botswana and, partially, Angola). In the case of South Africa special constraints mandating complete reliance on non-government channels apply and the bulk of the requirement is for purchase by still entitled consumers and for livestock.

Logistically problems are severe but largely manageable if port and main road/rail link capacity is deployed on a coordinated regional basis and additional road vehicles/spares provided to countries with particularly inadequate lorry pools and import capacity (e.g. Mozambique and, probably, Zambia).

The institutional capacity for distribution is uneven but substantial. In South Africa where the assistance cannot be channelled through the state, base level civil society NGOs exist but national coordinating and delivery capacity is, at present, totally inadequate. Elsewhere unevenly strong state, domestic NGO and external NGO structures with not insignificant capacity built up over a bitter decade of experience exist. The political priority given to maintaining food security and averting famine is significant everywhere (with one possible exception) and is particularly high in Mozambique, Botswana, Tanzania and Zimbabwe.

Food aid requirements to avert famine - albeit not to prevent an increase in hunger - total 4,000,000 to 5,000,000 tonnes. At $175 aid agency cif plus $100 tonne transport from ports plus distribution the cost is of the order of $1,100 to $1,375 million. Together with possible additional commercial imports of 5,000,000 tonnes (of which over 4,000,000 to South Africa) this would reduce the grain equivalent deficit to the order of 1,000,000 tonnes. The reduction may appear large but it is against the background of poor nutrition levels for several countries and for the bottom 40 per cent of the population in all except, perhaps, Zimbabwe and Botswana. At the bottom extreme in Mozambique and Angola pre drought food

availability was of the order of 75 per cent of basic requirements overall and probably under 70 per cent in all rural areas taken together. Levels below 70 per cent are usually interpreted as indicating famine or near famine conditions so that any further significant reduction in these two countries is perilously likely to cause mass starvation. The Swahili proverb "Give a fat man less food and he will grow thin; give a thin man less food and he will die" is only too literally apposite to these countries.

Peace, Politics, Macroeconomics and Famine

The very real probability that failure to meet the food supply disaster can lead to over 500,000 human beings dying in widely spread famine zones, including peri urban "shanty towns" and "squatter settlements" should be enough reason to focus attention on meeting the basic requirements. Allowing avoidable deaths on that scale diminishes the whole world community.

But beyond that imperative there are narrower cogent reasons for not standing by. When Nassav Senior argued that the only problem with 19th Century Irish potato blight famines were that they did not kill enough people to restore viability to the Irish economy, not only the hardness of his heart but the softness of his head could be challenged.

Famine will endanger peace processes in Angola, Mozambique and South Africa. Starving men with guns - whether rebels or soldiers - are virtually certain to ensure that food for them flows from the barrels of their guns. The price is unlikely to be limited to murdered farmers, destroyed food lorries and sacked warehouses. It is likely to rekindle Civil War (not necessarily on the former cleavage lines) in Angola and to plunge much of rural Mozambique into a truly Hobbesian war of all against all. In South Africa - with its massive and massively visible inequality - the enemies of the Codesa process (including the poor white supporters of the far right) would almost certainly gain the power to destroy it. True, people who are actually starving are rarely able to wage war or massively destabilising violence - even civil war - but those who fear their turn to die will come next and have access to weapons do have that power.

If the advent of or transition to open, pluralist, democratic politics is paralleled by the advent of famine levels unknown for fifty years, the

consequences are not predictable in detail but none of the plausible scenarios are pretty. Any new government is in danger of being swept away; any old is likely to feel forced (whatever its own inclinations) to 'tighten up' in the face of very real threats to social and political order as well as to itself. Capacity building will be off the agenda and the maintenance of even minimal civil governance capacity the topical issue.

The macroeconomic results will also be convulsive. In the South and Southern African contexts, food scarcity will lead to food price fuelled inflation and thence to the collapse of semi floated approaches to foreign exchange. Either the rates will fall like rocks, the discrepancy between first and second window rates will broaden rapidly and/or there will be a reversion to administrative allocation. Further the fiscal consequences on both revenue and expenditure (assuming some attempt to provide relief to the drought relief without external backing) will almost certainly reduce progress toward balanced recurrent and both longer and more suitably financed capital budgets. Further the political context will be one highly propitious, not for rational political economic discourse (right, centre or left; structural adjustment, transformation and/or rehabilitation) but for cargo cult populist sloganeering against all existing policies and programmes.

Table 1
Summary Regional Data

	Drought Deficit[1] (tonnes)	Loss of Regional Sources[7] (tonnes)	Additional Extra Regional Import Need (tonnes)	Entitlement Loosers[9] (persons)	Basic Food Aid Need[13] (tonnes)
South Africa	6,000,000	-	6,000,000	4,000,000-7,000,000[10]	800,000-1,400,000[14]
Zimbabwe	1,250,000-2,000,000[2]	-	1,250,000-2,000,000	4,000,000-5,000,000	750,000
Mozambique	875,000[3]	150,000[8]	1,025,000	4,500,000[11]	875,000[3]
Malawi	400,000	-	400,000	3,000,000	400,000
Zambia	500,000-750,000[4]	100,000-150,000	600,000-900,000	2,000,000-3,000,000[4]	500,000
Tanzania	250,000-500,000[5]	-	250,000-500,000	500,000-2,000,000[5]	250,000-500,000
Lesotho	100,000	-	100,000	250,000	100,000
Swaziland	100,000	50,000	150,000	100,000	75,000-100,000
Botswana	100,000-150,000	25,000-100,000	125,000-250,000	300,000	50,000
Namibia	50,000	50,000-100,000	100,000-150,000	15,000-50,000[12]	25,000
Angola	100,000-150,000[6]	-	100,000-150,000	1,500,000[6]	200,000-250,000[15]
Total	9,725,000 - 11,175,000	375,000 - 550,000	10,100,000 - 11,725,000	20,165,000 - 26,700,000	4,025,000 - 4,950,000

Notes

Table derived from text based on mosaic of WFP, UNICEF, SADCC, National Government and press reports.

1. Additional imports required for pre drought importers and total imports required for pre drought exporters. Tonnages are grain equivalent of estimated national food deficits caused by drought.

2. See text. 1,250,000 appears more likely.

3. Midpoint of range. See Annex.

4. Uncertainty as to Western Zambia affects estimate.

5. Possible late rain impact significant.

6. Very tentative. Assumes limited drought losses outside Southeast quadrant.

7. Previous South African or Zimbabwe sourced imports unlikely to be available in 1992-93.

8. Includes 75,000-100,000 triangular food aid from Zimbabwe; 50,000-75,000 parallel market imports from South Africa and Zimbabwe.

9. Loss of household self provisioning food, agricultural cash sales, agricultural cash ('casual' or wage) employment plus loss of wage and self employment income from commercial and other urban sectors affected by drought damage to rural purchasing power. Estimate is of households whose entitlements are severely reduced and pushed well below absolute poverty line. Largely excludes second round effects of higher food prices.

10. Rural component 2,000,000-3,000,000; dorp (small town) 750,000-1,250,000; urban and peri-urban 1,250,000-2,750,000. Last figure highly approximate because urban drift and general economic stagnation trend effects almost impossible to separate fully from drought impact.

11. Includes affectados (war displaced persons not receiving food relief) and other severely war affected rural sector familial households whose limited output will be severely drought damaged as well as more stable sector familial farming households and commercial agriculture employee households.

12. Caprivian farming households plus commercial farm/ranch and related commercial sector employees and households only.

13. Excludes import requirement other than for human consumption and - where plausible - financeable additional commercial imports.

14. Capacity constraint problem severe given unsuitability of Government channels. See text.

15. Higher than strict drought relief estimate because Angola has in the past received disproportionately low food aid and because additional flows to a UNITA controlled area without parallel expansion of flows through Government channels would appear politically impracticable (as well as undesirable).

III.

TOWARD REGIONAL LOGISTICAL PROGRAMMING

For logistics review purposes, South Africa and Southern Africa can - with one potential exception - be treated as two regions. South Africa is most unlikely to have port or rail capacity for substantial transit grain traffic to its neighbours. The exception - which will be explored below - is that for the Northern and Eastern Transvaal the logical port is Maputo and not merely transport costs but congestion at Durban could be reduced substantially by its use.

The logical port for Natal, the Orange Free State and the Southern and Western Transvaal is Durban which probably has the capacity to handle their additional requirements efficiently. Grahamstown and East London can handle the Eastern Cape requirements relatively easily as can Cape Town for the balance of the Cape.

The problem is the Northern and Eastern Transvaal requirements (up to 2,000,000 tonnes if one includes much of the Vaal Triangle around Johannesburg). Durban does not have the capacity to handle them effectively while the other three ports are unsatisfactorily far away. The logical entrance route is via Maputo which up to the mid-1970s handled up to the order of 10,000,000 tonnes of South African cargo a year versus at most a tenth of that level today.

The Port of Maputo could handle up to 1,5000,000 tonnes of grain for South Africa in addition to portions of Mozambican, Zimbabwean, Swati and Botswanan requirements. In principle so could the short Resano Garcia rail line to South Africa. However, that line is a prime target for attacks by the bandidos armados of Renamo which radically reduce its effective capacity. If it could be declared an "island of peace" by the Government and Renamo and SATs cooperated in emergency rehabilitation the grain could be moved. The Government of Mozambique and SATs would probably welcome such a solution, Renamo might agree to it if South Africa exerted its full influence on them.

Crosswords and Corridors

The Southern African import requirements are apparently handleable at port and main rail and highway link levels (Table 2). However, for that adequacy in principle to become adequacy in practice will require:

a. reviewing the initial estimated capacity levels especially in respect to highway routes;

b. identifying additional lorry, lorry spare and railway traction power constraints which could be met by deliveries prior to the end of 1992;

c. coordinating use of routes at governmental, national emergency/relief institution, transport enterprise and donor levels. SATCC (Southern African Transport and Communications Council) and its committee of railways and the Food Security Sector of SADCC (Southern African Development Coordination Conference) should be in a position to provide forums for and play a catalytic role in regional coordination;

d. once aid levels and sources are negotiated then negotiate a firm coordinated recipient/source schedule of deliveries which is held to because the capacity levels assume full time operation on schedule not a slow build-up followed by surges and troughs.

The key elements to be fitted together are seven ports: Maputo, Beira, Nacala in Mozambique, Dar es Salaam and Mtwara in Tanzania, Walvis Bay in Namibia (under transitional joint management with South Africa) and Lobito in Angola taken together with ten rail and/or road corridors, plus one coastal transhipment operation, fanning out from them.

Two other ports - Tanga in Tanzania and Luanda in Angola - are not directly relevant to drought related additional imports. In principle, some normal Dar es Salaam imports could be switched to Mtwara to free capacity for grain but this appears unlikely to be necessary. Luanda should be handling more grain imports for Central and Northern Angola but these relate to the heritage of destruction of the independence and civil wars not to drought.

Table 2
Regional Logistical Allocation

Corridor Capacity[1] Available (Port)	(Links)		Allocation[2]				
Maputo	3,500,000[3]		Moz.	Zim.[2]	Swa.	Bot.	SA
Limpopo[4]		250,000		250,000			
Resano Garcia[5]		1,000,000/2,000,000[6]	50,000	750,000		50,000	(1,000,000)[5]
Swaziland		250,000			150,000		
Domestic[7]		400,000	400,000				
Beira	1,500,000		Moz.	Zim.[2]	Zam.		
Chimoio[8]		750,000	200,000	250,000	250,000		
Domestic[9]		150,000	150,000				
Nacala	1,500,000[10]		Moz.	Malawi			
Nampula[11]		500,000	100,000	350,000			
Domestic[12]		100,000	100,000	-			
T'ship[13]		500,000	150,000	-			
Dar es Salaam	1,500,000		Tan.	Zam.	Malawi		
Tazara[14]		75,000	150,000	500,000	25,000[16]		
Domestic[15]		250,000	250,000	-	-		
Mtwara	500,000						
Road[17]		150,000	100,000	-	25,000[16]		
Walvis Bay[18]	750,000		Nam.	Bot.	Ang.		
East		300,000	50,000	200,000	-		
North		150,000	-	-	100,000[19]		
Lobito[20]	500,000		Ang.				
Road[21]		100,000	50,000				

Notes

1. Capacity is estimated present effective unused capacity. For ports dry cargo excluding ore and coal facilities. For railway road-bed, rolling stock, traction power. For roads road-bed, surface, bridges only, not including lorry fleet.

2. Country of destination. Except for Zimbabwe and Mozambique computed on maximum requirement from Table 1. For Zimbabwe 1,250,000 tonnes used because 2,000,000 tonne estimate appears too high (see Section II Text). For Mozambique top of range estimate of 1,000,000 tonnes crop loss (see Annex) used, not 875,000 of Table 1.

3. Very cautious estimate. However, as with other ports, most grain would need to be bagged or unloaded by grab and bagged in the port.

4. Rail corridor to Zimbabwe.

5. Rail corridor to South Africa.

6. The 2,000,000 tonne figure (and 1,000,000 tonne allocation to shipments to South Africa) is relevant if Renamo (with South African pressure) halts attacks on this line by the bandidos armados. If SATs also carries out emergency rehabilitation an extra 500,000 tonnes of South African imports could perhaps be handled.

7. Domestic road, rail link capacity - rough estimate. May require additional lorries.

8. Rail Corridor to Manica and - by road connection - Tete Provinces and to Zimbabwe and Zambia. Assumes security situation consistent with night train operation. Can be augmented by highway use up to perhaps 100,000 tonnes if Zimbabwe and Zambia lorries available including those previously transporting Zimbabwean grain exports to Mozambique and Malawi.

9. Domestic road, rail link capacity. Rough estimate. May require additional lorries.

10. Includes transhipment (via quay or direct) capacity.

11. Rail line to Nampula and Niasa provinces and rail/road line to Malawi via Intralagos. May be tighter traction power constraint at present.

12. Road capacity. Relates to Eastern Nampula and Northern Zambesia provinces. Does require additional lorries.

13. Transhipment to secondary (Quelimane, Pemba, perhaps Inhambane) and tertiary (e.g. Mocimba, Xai Xai, Angoche) Mozambican ports.

14. Rail line to Zambia with road link to Malawi.

15. Domestic road and rail routes. Rough estimate. Probably requires additional lorries.

16. Assumes Malawi wishes to use Tanzania ports as well as Nacala or faces a highway connecting link capacity constraint on the latter.

17. To Southern Tanzania and Malawi. Probably requires additional lorries.

18. Under interim arrangements between Namibia and South Africa. Very rough additional usable capacity estimated based on facilities plus past peak use.

19. Assumes most shipment to Southeast quadrant of Angola transit Namibia for ease of transport and political pluralism reasons.

20. Luanda also has surplus capacity but the drought appears to be localised in the South. If peace reallocation of oil export proceeds and additional food aid permit up to 400,000 tonnes additional grain imports beyond the drought related ones would be highly desirable - perhaps 200,000 tonnes each Luanda and Lobito.

21. May include rail to Huambo if rehabilitated/operational as of late 1992. Both rail and road require additional equipment.

Mozambique Range – Maputo, Beira, Nacala

Maputo can move 1,600,000 tonnes of additional grain imports - preferably bagged - for Mozambique (400,000), Zimbabwe (1,000,000), Swaziland (150,000) and Botswana (50,000). The key constraints are the low effective capacity of the largely unrehabilitated Limpopo Valley rail line to Zimbabwe, attacks by the bandidos armados of Renamo on the lines to South Africa (linking on to the Zimbabwe system) and to Swaziland the limited lorry fleet on domestic road routes which are also subject to attack.

As discussed above, if South Africa cooperates in using its influence to halt Renamo attacks on the Resano Garcia line to South Africa then 1,000,000 tonnes of grain destined for South Africa could transit Maputo. With South African Transport Services (SATs), emergency assistance on repairs on that line this could be pushed to 1,500,000 tonnes before the Maputo Port capacity became binding assuming reliably scheduled and relatively evenly spaced arrivals of vessels.

Beira could handle 850,000 tonnes – again preferably bagged – additional grain for Mozambique (350,000), Zimbabwe (250,000) and Zambia (250,000). While cargo for Malawi could use the route via Zimbabwe, the easier access to Nacala, Dar es Salaam and Mtwara and - especially - the probably 750,000 tonne additional haulage limit on the Beira-Zimbabwe (Chimoio) rail line point to its use of those ports rather than Biera.

The rail haulage expansion posited assumes that the improved security conditions in the Beira Corridor will allow night trains and that to the extent Mozambican Railways traction power is inadequate National Railways of Zimbabwe can fill the gap. The domestic road haulage capacity available depends heavily on expansion of the lorry fleet and on security conditions (food lorries, especially when not in armed convoys, are soft targets and convoy movement reduces capacity).

Nacala could move 800,000 tonnes to Mozambique (350,000) and Malawi (350,000). In fact the port could probably handle rather more but would then have no means to forward it to additional drought afflicted areas. The level of throughput posited assumes 250,000 tonnes of cargo for secondary and tertiary Mozambican ports is transhipped from large ocean going vessels to smaller ones, coasters and self-docking craft at Nacala which is equipped for and has experience in such transhipment.

The major constraint on use of Nacala at this level is likely to be the unrehabilitated gap in the rail line to Malawi for about 200 km before the Mozambique/Malawi border. Traffic is moving rail-road-rail but a substantial build-up will be needed. There may also be a traction power constraint. Niasa province - previously supplied to a significant extent from Malawi and/or Zimbabwe via Malawi can be reached by rail using the Lichinga extension.

As discussed earlier an "islands of peace" agreement for food carrying vehicles, the infrastructure they use and warehouses/distribution points between the Government and Renamo would significantly increase transit and - especially - domestic forwarding and distribution capacity. If this can be achieved the drought - or more accurately the drought relief - could have a positive impact on the peace process both at the Santa Egida talks in Rome and - even more - on the ground in Mozambique.

Tanzania Range - Dar es Salaam, Mtwara

Dar es Salaam can readily handle 9250,000 tonnes additional grain imports for Tanzania (400,000), Zambia (500,000) and Malawi (25,000) - again with the caveat that most of it will be needed to be bagged or off-loaded with grabs and bagged in the port area. Tazara railway has adequate capacity for the Southbound grain (it tends to have an imbalance of Northbound cargo) through to Mbeya for distribution in Southern Tanzania and transfer to highway transport to Malawi and on by rail to Katima Molilo and the Zambian Railway system. (The latter's capacity to move most of the grain on to the Copperbelt, Lusaka and Livingstone is more problematic.) The domestic rail and road capacity to Central and Southwestern Tanzania is more problematic with additional lorries probably required.

Mtwara (like Nacala a deep water natural port with substantial, but substantially unused, facilities) can handle 125,000 tonnes of grain to Tanzania (100,000) and Malawi (25,000). In this case the main highway to the interior has more capacity, the constraint on moving grain to Southern Tanzania by that route is lorries.

The Atlantic Range - Walvis Bay, Lobito

Walvis Bay - in transition to becoming Namibian - can readily cope with 350,000 tonnes of additional grain for Namibia (50,000), Angola (100,000)

and Botswana (200,000). It may have relatively more spare bulk unloading and storage capacity than the other ports. So far as Windhoek the main rail line can carry the cargo. The Botswana traffic could - in part - continue by rail to Gobabis but would need to be transferred to lorries there and/or at Windhoek. While many parts of the Trans Kalahari 'highway' are very poor, they are passable for lorries and both Botswana and Namibia have relatively adequate lorry fleets.

For Angola transfer to lorries would need to take place at Windhoek for transport on the highway to Otjihase and Rundu. This route has been used for earlier food relief traffic and is adequate at least to the Angolan border. The Caprivi Strip in Namibia lies at the end of another highway link. While in principle it could better be served from Livingstone in Zambia or Bulawayo in Zimbabwe (via Fraincistown, Botswana) that is probably impracticable in the 1992-93 drought context.

Lobito is the logical major port for Southwestern and Southcentral Angola. It should be able to handle 50,000 tonnes of drought related (and perhaps up to 250,000 tonnes pre-existing hunger related) additional grain. Onward transport capacity depends largely on the pace of rail and lorry stock rehabilitation since the end of the Civil War.

General

This sketch suggests that - especially in respect to port capacity - Southern Africa can receive its own food shipments directly. Low demand growth, rehabilitation and modest expansion since the early 1980s have created a substantial effective unused capacity. However, bulk handling and in-port bagging capacity are limited so that, if large shipments of grain are to be made in bulk, assistance in respect to grab off-loading and port area bagging capacity (both of which involve relatively off-the-shelf, swiftly installable plant and machinery) would be needed.

The rail route position is somewhat less uniformly positive. In Mozambique rehabilitation needs severely limit capacity of the direct line from Maputo to Zimbabwe and force transhipment on the Nacala-Malawi line. Security problems limit effective capacity of the lines from Maputo to South Africa and to Swaziland. In Tanzania, Zambia and Angola effective domestic railway capacity (except for Tazara which is basically an international

route) is low relative both to past actual and present nominal levels and shows little sign of sustained recovery.

In the case of road transport, the highway position is uneven and unsatisfactory but - at least at interstate level - a less serious constraint than lorry shortages. These are endemic in Mozambique, Tanzania, Zambia and Angola suggesting that additional vehicles should accompany additional food aid. The South African drought may put pressure on the lorry fleet there causing withdrawal of some South African owned vehicles from services to/in Lesotho, Swaziland, Botswana and Namibia. The key factor is speed of delivery and of bringing into operation. This is consistent with private sector operation if - and only if - rapid enterprise indentification and hire-purchase agreement negotiation is practicable or if the relevant private operators are NGOs.

The tonnages allocated in Table 2 are the maximum additional needs from outside the region listed in Table 1 with two exceptions. For Zimbabwe 1,250,000 tonnes has been used because, as discussed above, a 2,000,000 tonne estimate appears somewhat unlikely. In the absence of rapid progress on Limpopo Valley line rehabilitation or a Government-Renamo truce on the Resano Garcia line the maximum regional capacity to Zimbabwe is 1,500,000 tonnes. Even that would be problematic if Zambia's requirements are at the top end of the 500,000-750,000 tonne range because while the port of Dar es Salaam could handle the 250,000 tonnes of Zambian grain tentatively listed as via Beira Tazara and/or Zambian Railways probably could not. While road haulage would be possible so far as the highway links are concerned, very substantial lorry fleet additions would be required.

For Mozambique a 1,000,000 tonne top of range drought loss estimate and a 250,000 tonne shift from neighbouring country to extra-regional sources has been used. The 250,000 tonne figure is used because of very considerable uncertainty as to border traffic in grain.

This exercise is preliminary or prolegomenonic. It does however demonstrate the possibility of a Southern African logistical solution and provide a basis for a more detailed logistical planning exercise.

IV.

THE REGIONAL ASPECT: SADCC, SATCC POTENTIAL ROLES

Southern Africa's ten states coordinate selected sectoral policies, operations and projects through their regional organisation - SADCC. Two of its strongest sectoral units are in Transport (SATCC) and Food Security. In the early 1980s drought cycle - and particularly in 1984 - SADCC played a significant role in respect to presenting country and regional data and national proposals to mobilise support both for short term survival relief and longer term vulnerability reduction. Since that date the coordinated national/regional early warning system has been completed and has played a role in the provision of the data demonstrating the scope and severity of the 1991-92 drought.

The SADCC Food Security Unit (located in Harare, while SATCC is based in Maputo and SADCC Headquarters in Gaborone) has been collecting and analysing data. By February it had and publicised a regional overview which made plain the disastrous crop situation, the impending famine and the need for prompt action. There is reason to believe action by SADCC, SADCC-FS and SATCC could play several useful roles in mobilising and coordination to secure grain, get it to the afflicted countries and avert mass famine.

A triangular approach by the Headquarters, Food Security and SATCC coordinated with the actions of SADCC's Member States might prove most effective:

a. Food Security to complete first revise of regional preliminary drought and food deficit study and secure data from countries on needed phasing of food arrivals between April 1992 and March 1993 based on opening stocks, pipeline, estimated harvest and requirements;

b. In parallel SATCC to secure data from Member State Ministries of transport and their rail and port enterprises on effective additional port, rail and highway capacity available by route, more tentative data on road haulage fleet capacity and specific citation of any bottlenecks which can realistically be broken before the end of 1992;

c. SADCC-SATCC-Food Security hold meeting of Member States and transport enterprises to agree on tentative route capacity allocation pattern for

the region in respect to drought impact reduction additional food imports to be worked out in more detail by a subsequent working meeting of national food security units, main importing enterprises and key transporters (including major inter-state road hauliers as well as port and railway corporations);

d. In parallel Food Security would update its information on requirements and forward it to the SATCC groups;

e. While SADCC would undertake such profile presenting and resource mobilisation exercises as its Member States desired possibly including a high level team to visit donor capitals and/or a regional workshop presentation to donor representatives either in Southern Africa or in Europe and almost certainly including a SATCC-Transport Enterprise-National Food Security unit regional workshop to agree a destination and timing schedule for food aid arrivals consistent with using available transport capacity effectively to avert famine.

This sketch of possible action is quite consistent with SADCC's goals to act in cases of mutual interest mutually agreed on by its members and to do so in sectors and on topics in which coordinated action was likely to be more effective than separate, uncoordinated national initiatives. It would make use of SADCC's information collection, analytical, contact and negotiating skills while leaving actual goal setting and operations in national hands. In respect to the interstate logistical issues, it would appear that a SATCC catalytic role is a necessary condition for effective allocation of capacity over the Indian Ocean port and corridor range to ensure that all basic national landing and onward dispatch requirements can be met.

V.

WHAT NEEDS TO BE DONE? WHEN?

To warn that no tocsin has been sounded and no sense of urgency and priority created in the bilateral donor community (or even in some of the affected countries) is not to assert nothing has been done. Indeed were that true the situation would indeed be hopeless.

Most of the eleven countries have substantial data and some analysis in hand. In some cases there are several independent (and not always

compatible) sources. For most there are national, WFP and FAO preliminary assessments and presumably UNDP ones for countries in which it has had a substantial food aid coordinating role. However:

a. it is not clear that the national Food Security institutions and UNDP-WFP-FAO have formally met together to reconcile and synthesize their findings at country level;

b. country analysis is - at least in some cases - proceeding on a "business as usual" basis seeking to collect more data from districts and provinces and to have a final result before going public. Thatmay be admirable in a normal year but it is less appropriate to an impending disaster whose reality and parameters are in little doubt even if details are either unknown or - at this point in time - unknowable;

c. central economic ministries (finance and planning) do not seem to have been made uniformly aware of the magnitude of the fiscal and foreign exchange costs of averting disaster nor of how fast time to forestall - rather than merely to alleviate - famine is running out;

d. outside WFP, UNICEF and - perhaps less uniformly - UNDP and the World Bank, international and bilateral potential funders appear effectively unaware of the sheer scope of the physical and financial challenge and of the need for urgent action. They may well have been informed, but neither the tenor nor the content of the communications has been adequate to focus their attention;

e. more general publicity has been very uneven and scattered. The most considered and broadest in coverage appears to have been that of the SADCC Food Security Unit while the most urgently worded national statements have been by Zimbabwe. Unfortunately neither scattered articles nor conflicting statements from different sources (or the same source at brief intervals) are effective in creating a climate of public, overall governmental or donor community concerned opinion adequate to tackle the challenge of averting famine;

f. no coordinated logistical planning to utilise the ports and transport corridors of the SADCC region appears to have been begun and statements

that the appropriate route is Durban may lead logistical planning by donors down a dead end desert canyon.

The recurring weakness of international drought relief and famine avoidance efforts in the past two decades - not only in Southern Africa - has been underestimation of the scope of the problem long after data were available followed by delay in putting responses together until only a bureaucratic and logistic miracle and air-lifting hundreds of thousands of tonnes of grain from the North literally to camps and villages could have prevented famine. Unfortunately evidence on poor crops even together flow charts on when stocks plus reduced harvests plus pipeline flows will run out do not have the same impact either on the general public, or on food aid officials and the politicians to whom they are responsible, as do TV images of starving children. By the time those are on screen the battle to avert famine is lost and only partial amelioration of its deadly impact is possible. There is still time to use to build on the data and analysis already undertaken in the sobering prism of past efforts to yield more satisfactory results for the millions of human beings at risk in South and Southern Africa. Just enough time to use but none to waste.

A critical path for Southern Africa might include:

1. national quick review of own data/analysis with country UNDP-WFP-FAO-UNICEF offices leading to an immediate, forceful alert to potential donors and the international press by the beginning of April;

2. collection-checking-analyis of basic data on crop losses and food balance shortfalls (nationally and by province) leading to a report of physical food aid and immediately suppliable logistic inputs plus finances for domestic distribution requirements which cannot be met domestically to go to donors, SADCC, SATCC by mid-April;

3. a meeting of Member States (including central economic, transport and food security units) with SADCC/SATCC leading to agreement on SADCC's information and mobilisation roles and on SATCC's responsibility to develop a coordinated logistical plan by the end of April;

4. continued data collection and analysis review to correct, articulate and update;

5. on the basis of all available data, Southern African States to negotiate with Donors bilaterally, but preferably on a coordinated basis - ideally at a joint meeting of States and Major Donors either in the Southern African region or in Europe perhaps with SADCC serving as a joint secretariat to its ten members in May;

6. agreement on the levels and timing of assistance followed by immediate technical logistical meetings of Donor, State and SATCC officials to agree on an operational routing and timing programme by early June;

7. procurement and dispatch of initial shipments during June and July;

8. arrival in Southern Africa and forwarding to main cities of destination and thence to rural areas over August/September;

9. review of progress and of new developments on an ongoing basis - primarily at operational level beginning in September;

10. continuation of the programme through the 1992-93 harvest over the period February-July (depending on country) and

11. preliminary assessment of 1992-93 probable harvest and food balance position involving the ten countries, WFP-FAO-UNDP-UNICEF, SADCC and bilateral donors in January 1993 to determine whether a further 1993-94 programme will be necessary.

The date on which stocks, 1992 harvest intake and pipeline shipments of grain will run out is a key one. It is likely to range from August/September 1992 in Lesotho, Swaziland, Botswana, Angola and Zimbabwe through September/October in Mozambique (though possibly August in Southern Mozambique), Malawi, Zambia and Namibia to October/November in Tanzania. That date is the one by which additional aid (or commercial) grain needs to reach urban areas (to substitute for absent national stocks) and to rural drought afflicted households - a date at least two months after shipment from Europe, North America or the Far East except in the case of main port cities.

The cutoff date in 1993 (assuming no 1993-94 emergency programme is needed) depends on the harvest date in the country - February/March at the Southern end of the range through June/July in northern Tanzania.

Because since the mid-1970s the weather pattern of the region has shifted to several successive good or bad years in succession, it is important that the 1993-94 outlook receive a preliminary review in January 1993. 1986-90 was a run of good weather years in most districts of most of the 10 Southern African countries; 1990-91 was mixed, but a balance below average; 1991-92 is a relatively uniform disaster year except for the two Atlantic countries. If 1990-91 marked the entry of a new poor agricultural weather cycle, then on the recent past record 1992-93 is likely to be a bad harvest year requiring a 1993-94 emergency programme. Evidently this is an assumption one hopes will be falsified, but an early review of forecasts and crop progress linked to a pre-planning meeting in January 1993 is a low cost to pay for two to three extra months to plan responses if the weather is indeed bad.

- Reginald Herbold Green
Maputo-New York-Falmer
February/March 1992

Annex

DROUGHT AND MOZAMBIQUE FOOD 'BALANCE'

Introduction

Mozambique in 'normal' years suffers from a post food aid deficit of 25 per cent odd below standard requirements for adequate nutrition. The pre-import deficit is of the order of 35 per cent. 'Normal' in this sense means moderate to favourable crop weather and the 1990 security situation. 25 per cent average food shortfall is a very serious level while 35 per cent (65 per average availability) is clear famine.

1990-91 was a mixed year in respect to weather - from good in Cabo Delgado to a disastrous drought loss of up to 50 per cent in Manica. 1991-92 is uniformly bad to disastrous in the South and Centre and poor to bad in the North. Probable output loss is of the order of 750,000 to 1,000,000 tonnes. That - at unchanged import levels - would increase the shortfall to 40 per cent to over 47 per cent (53 per cent to 60 per cent average availability of adequate nutrition). Either is a severe famine level and would lead to mass starvation. The projected position is worse than in 1982 when over 200,000 persons perished from famine.

The only practicable means to augmenting supplies is food aid. Commercial imports cannot be raised. Indeed the significant - over 125,000 tonnes and conceivably up to 250,000 - quasi legal/informal border imports from South Africa, Zimbabwe, Malawi and Zambia are likely to fall sharply since the first two countries suffer from crop losses at least as severe as Mozambique's and the last two are also in food deficit positions as a result of drought.

The Regional situation has further major implications:

a. food aid cannot be sourced from Zimbabwe or Malawi seriously increasing the logistical problems of supplying Manica, Tete and Niasa provinces;

b. heavy use of Mozambique's main port and trunk rail facilities will be required to meet Zimbabwean and a portion of Zambian, Malawian, Swati and - perhaps - Batswanan import requirements;

c. SADCC (especially Food Security) and SATCC should be used to help mobilise external support (as they did in the mid-1980s drought cycle) and to coordinate use of Regional port capacity and access routes to allow additional import requirements to be off-loaded and forwarded expeditiously.

A much higher profile presentation of the impending catastrophe needs to be projected and preliminary discussions begun with prospective donors at once if the negotiating, routing, scheduling and shipping processes are to be completed in time for deliveries over September 1992-March 1993 after present stockpile, pipeline and domestic harvest sources have run out. The negotiating, scheduling and shipping delays are largely physical and bureaucratic and take at least 4 to 6 months before flows eventuate. To expect much speedier results is to put faith in achieving a bureaucratic miracle - the rarest form of miracle known (or unknown) to humanity.

The security situation poses three special problems in the context of drought and expanded survival distribution's of food:

1. about 10 per cent of the people are in zones isolated from the rest of the country or controlled by the bandidos armados of Renamo and cannot at present be served;

2. the bandidos' present strategy of high profile random attacks on scattered soft targets will evidently target relief food lorries and convoys reducing ability to reach afflicted persons, raising vehicle attrition rates and forcing armed escort convoying which increases time required per trip and thus the carrying capacity of the vehicle fleet;

3. given the incomplete rehabilitation of the Limpopo Valley line, food aid for Zimbabwe would need to transit the Resano Garcia line which (with the Maputo-Swaziland line) is, at present, a preferred target of the bandidos.

The only evident way of overcoming these barriers to saving life would be an "islands of peace" agreement between the Government and Renamo to cover survival food shipments, the vehicles and trains in which they moved and the railway and highway infrastructure over which they moved plus warehouses, depots and distribution points. This would presumably need to include shipments to and through areas controlled by the bandidos armados

of Renamo with internationally monitored distribution to women (who do store, process and prepare food) in Renamo controlled areas. For this the certainty of some leakage to the bandidos would need to be seen to be counterbalanced by the ability to save the lives of more civilians faced with famine in Mozambique and in its neighbours.

Basic Food Imbalance

Mozambique probably has a resident population of 12,500,000 odd. The projection total of 16,000,000 is reduced by 1,500,000 refugees, 1,000,000 plus dead as a result of the war and a lower birth rate resulting from dislocation. Full nutritional requirements (converted to grain equivalent) for that population would be about 4,500,000 tonnes.

Food imports (aid, border informal and quasi legal total of the order of 625,000 tonnes or 14 per cent requirements (say 30 per cent of grain and 40 per cent of urban nutritional needs). Domestic production can be estimated very roughly at 2,750,000 tonnes in a year of normal weather and 1990-91 security conditions. That leaves a deficit of 1,125,000 tonnes or - on average - 25 per cent. That gap appears to be 12½ per cent urban and 29 per cent rural. Arguably the true rural gap is 25 per cent implying unrecorded imports from Zimbabwe, Zambia, Malawi and South Africa of 100,000 to 125,000 tonnes. The high incidences of absolute poverty (30 per cent urban and 65 per cent rural) and of moderate and severe child malnutrition (over 20 per cent urban and up to 70 per cent in some rural districts) corroborate the evidence of a severe national food deficit.

Two points require underlining:

First, Mozambique goes into the 1992-93 famine crisis with serious food deficits to the point it is already not far above famine levels (over 30 per cent shortfalls) so that few belt holes for belt tightening remain;

Second, over 80 per cent of 'normal' food consumption (and over 90 per cent in rural areas) comes from domestic sources so that the margin for drought losses is greater than would be assumed from images of total present reliance on imported grain.

Table 1

'Normal' Food 'Balance' Position
(tonnes grain equivalent)

Basic Requirement[1]	4,500,000	(100%)
Domestic Production	2,750,000	(62%)
Urban (Zonas Verdes)	150,000	(3%)
Household Consumed	(50,000)	(1%)
Commercialised	(100,000)	(2%)
Rural	2,600,000	(59%)
Household Consumed	(2,200,000)	(48%)
Commercialised - Formal and Informal	(500,000)	(11%)
Imports	625,000[2]	(13%)
Food Aid	(500,000)	(11%)
Commercial/Parallel	(125,000)	(2%)
Food Deficit	1.125,000	(25%)

Urban/Rural Breakdown

	Urban		Rural	
Basic Requirement[3]	1,080,000		4,420,000	
Domestic Production	550,000		2,200,000	
Urban	(150,000)		(-)	
Rural	(400,000)			
Household Consumed	(50,000)		(2,100,000)	
Commercialised	(500,000)		(100,000)	
Imports[2]	400,000		225,000	
Food Deficit	(130,000)	(12%)	995,000	(29%)[4]

[1] Based on 12,500,000 population estimate.

[2] Probably understates total imports. May be 125,000 tonnes additional border imports from South Africa, Zimbabwe, Zambia and Malawi consumed in adjoining rural districts or nearby towns. Transborder exports to Malawi and Tanzania - not estimated - may be up to 50,000 tonnes. These are from areas - e.g. Angonia, Northern Mueda Plateau with poor transport links with the rest of Mozambique.

[3] Based on 3,000,000 urban and 9,500,000 rural

[4] Intuitively 29% - borderline famine level - appears slightly too high (61% of basic nutritional need average availability too low). 125,000 tonnes of underestimated border area imports consumed in rural areas or reducing the actual Mozambican sources sales to towns would lower it to the 26% level which seems plausible.

1992-93 Prospect (Portents)

The 1991-92 crop prospects for Mozambique range from poor through disastrous to total wipe out. This is fairly clearly the most severe drought since independence and quite possibly since the years immediately following the First World War.

In three Southern provinces - Maputo, Gaza and Inhambane losses of over 33 per cent appear certain. Low and erratic rains, higher than average temperatures and no appreciable rain in February have made that certain. With the harvest actually or virtually in progress future rain would only exacerbate losses.

The fourth Southern province - Manica - had a severe drought in 1990-91 and has an even worse one in 1991-92. Overall crop losses probably exceed 50 per cent and may approach 67 per cent with some districts approaching 100 per cent losses for grain.

Tete province is also suffering from severe drought, albeit possibly unevenly and probably less than in 1988. In Sofala, below average and erratic rains have at times taken the form of cloud-bursts adding washout to drought losses. The overall crop loss is likely to approach 40 per cent, higher for grain and lower for root staples. Here too any further rains will be too late.

Zambesia and Nampula provinces have been afflicted by drought especially in coastal districts. The interior district position is less clear and may be less severe. The widespread growing/consumption of cassava provides some protection as it is far less drought vulnerable than maize. The possible (but by no means certain) damage reduction effects of February (and March) showers have yet to be factored into projections but are unlikely to reduce losses below 25 per cent. Because of security problems and a historic pattern of endemic food shortages in Eastern Nampula, the starting point in many districts is so low that any serious reduction in supply threatens famine.

Cabo Delgado and Niasa provinces may have had a less disastrous weather/agricultural year. The effective word is may because adjacent areas of Malawi and Tanzania have been projecting severe drought related losses. Further, the value (or otherwise) of February (and March) rain showers remains unclear. Because of recent past year grain surpluses and

inadequate (credit and transport constrained) commercial procurement Cabo Delgado probably goes into the 1992-93 harvest season with more stocks relative to annual requirements than any other province.

On a low estimate the grain equivalent of drought losses nationally is of the order of 750,000 tonnes (about 27.5 per cent of 'normal' output and 150 per cent of 'normal' food aid deliveries). A high estimate of loss is of the order of 1,000,000 tonnes (about 36 per cent of 'normal' output and 200 per cent of 'normal' food aid).

The end March 1992 stock and import pipeline position also gives cause for concern. 1991-92 initial food aid pledges and upward revisions after the Manica drought crisis were insufficient to meet needs because of being tailored primarily to what "donors would wear" and secondarily to distributional bottlenecks. As of December under 40 per cent of the April-March pledges had arrived and over 25 per cent had no scheduled arrival date at all. Unfortunately - unlike IMF Agreements - food aid agreements have no "trigger clauses" for lateness or nonfulfillment of delivery commitments.

On a moderately optimistic view of March stocks, 1992 domestic output and April-September pipeline arrivals, September 1992 will see unmeetable food requirements (at the famine avoidance levels) in the Southern provinces and major increases in urban malnutrition. In the Central and Northern Provinces the point of total depletion of stocks might come one to two months later while the Mueda Plateau and adjoining districts of Cabo Delgado and - conceivably - Angonia district of Tete may have later and limited needs.

Given the external balance and fiscal positions the only plausible source of additional grain (and lorries to move it) is food aid. In respect to additional lorries the key issue is not whether DPCCN, AGRICON or the private sector are to receive and to operate them but prompt approval, shipment and allocation/delivery to allow them to be in use before the end of the year. The snag with allocation to private hauliers is that they will need hire purchase finance and processing this for 500 or more lorries will be excessively time consuming if normal banking channels (even Standard Totta albeit they would be speedier than BPD) are used.

Table 2

1991-92 Drought Losses/1992-93 Added Aid Requirements

a. Low Estimate

Urban Production[1]		40,000
Household Consumed	10,000 (20%)	
Commercialised	30,000 (40%)	
Rural Production[1]		725,000
Household Consumed	525,000 (25%)	
Commercialised	200,000 (40%)	
Total Output Loss		765,000

b. High Estimate

Urban Production[1]		52,500
Household Consumed	12,500 (25%)	
Commercialised	40,000 (40%)	
Rural Production[1]		955,000
Household Consumed	630,000 (30%)	
Commercialised	325,000 (65%)	
Total Output Loss		1,007,500

Notes

[1] Division between household consumed and commercialised speculative. In some districts there will be small surpluses; in Zonas Verdes commercialised vegetables are more attractive than self-consumed grain; even in deficit zones non-food basic needs (e.g. clothes, fuel and light, medical fees) will lead to some food crop sales.