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FOOD ECONOMY BASELINE PROFILE: THE LIMPOPO RIVER BASIN COMPLEX, GAZA PROVINCE, MOZAMBIQUE

FEWS NET FAMINE EARLY WARNING SYSTEM NETWORK

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FOOD ECONOMY BASELINE PROFILE

The Limpopo River Basin Complex, Gaza Province, Mozambique

I. Introduction

In November 2000 FEWS NET, through one of its implementing partners, the Food Economy Group (F.E.G.), and with close collaboration from the Ministry of Agriculture, the Ministry of Health, and the World Food Programme, conducted a food economy baseline study in the previously flood-affected area of Gaza Province, Mozambique[1]. The purpose of the study was to investigate how people in this flood prone area normally live - in other words, how they obtain access to food and cash income and how they spend their money in most years.

This baseline work was conducted to provide a richer context against which to understand the effects of any number of potential 'shocks', including renewed flooding in 2001, drought, price fluctuations or loss of access to specific markets. The choice to focus on Gaza Province was related to the fact that, at the time of the study, contingency planning efforts were underway as part of an ongoing effort to prepare for the possibility of new floods in 2001. The devastating effects of the 2000 floods heightened the commitment of national and international agencies to ensure that early warning, preparedness and response mechanisms were in place well before the onset of another hazard. Given that Chokwe district was the epicenter of the 2000 floods, and the focus of much of this year's contingency planning efforts, this baseline work focused on the food economy zone of which Chokwe is a part.

The following profile is provided to review key findings of the baseline assessment, covering specifically:

- food economy zoning;
- distribution of wealth;
- sources of food;
- sources of cash income; and
- patterns of expenditure.

The intention of this baseline profile is to contribute to the growing understanding of rural livelihoods in Mozambique. To the extent that a basic understanding of the rural economy can inform development planning as well as emergency interventions, this information should be relevant for a

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wide range of food security decision-makers[2].

II. Methodology

Household Food Economy Analysis is a method for assessing food security and understanding rural livelihoods. The method is based upon developing an understanding of the various options people employ to secure *access* to food. It goes beyond traditional production-based assessments by exploring, in a systematic fashion, the other food sources people rely upon, and the extent to which these can be expanded in times of crisis.

A feature of the approach is that it is *household-based*, exploring how 'poor', 'middle' and 'rich' households obtain food and income. The concept of vulnerability inherent in the food economy framework is linked to economic circumstances, as opposed to being tied to pre-defined group parameters, such as 'women', 'elderly', 'disabled', etc. The situation of individuals cannot be considered in isolation from their economic circumstances or the economic circumstances of the households in which they live. Thus the objective of food economy work is to define just what it is that makes some households more likely to experience food shortages than others.

In a rural setting, the task is to piece together the relative importance of different food and income options for different types of households ('poor', 'middle' and 'rich'). This estimation is based on an understanding of how much of each source a household may have access to over the year, and, in turn, a knowledge of that food's potential calorific contribution.[3] For instance, if we know that a household of 6 produces three 90 kg sacks of maize most years, we are then able to calculate that maize contributes around 25% to that household's total annual food income in a normal year[4]. The question then becomes, if people in that household are managing to survive, what makes up the other 75%?

[2]In light of the potential value of this information for a wide scope of different users, a number of short targeted pieces were written for specific audiences to help highlight the implications of the baseline work for different decision maker groups in Mozambique. Specific audiences for these briefings included food aid decision-makers, development planners, and early warning & food security monitors.

[3]1900 kcals per person per day, used in this analysis, represents the minimum compatible with long-term subsistence. It is based on an estimate of minimum calories required for different age groups, averaged across an expected age distribution in developing countries.

4The calculation is as follows: 3 x 90 kg = 270 kg. An average adult needs .53 kg per day of maize to meet his/her 1900 kcal minimum requirement if sorghum is all he/she is eating. Thus to find out how many **total days** 270 kg of maize will last, divide 270 by .53. This gives you 509, which divided by the number of people in the family (6) is 84. 84 days is approximately 23% of a year.

The team used a tiered approach to obtaining information, starting at the national level with available secondary data, moving to the district, and finally to 'representative' villages, where the majority of time was spent. A wide range of standard PRA techniques may be used during village interviews, but for the most part, information was derived through rigorous semi-structured interviews.

- At the national and district levels the team acquired information about general differences in general livelihood patterns and reviewed existing secondary information.
- Refinements of food economy zones took place during discussions with agricultural and livestock officers and marketing and planning personnel at the District level. Representative village selection also took place at these meetings.
- At the village level the team spent an intensive period of time interviewing different wealth groups within the population to obtain a detailed account of how specific wealth groups obtain food and income and what their expenditure requirements are. It is from these interviews that most of the critical findings derive.

*Since access to food varies depending on both geographic and wealth determinants, stratification takes place by **food economy zone** (geography) and **wealth group**.*

ZONING: NATIONAL & DISTRICT LEVEL
(to determine 'where')

- *to obtain an overview of key food economy differences in the province.*

WEALTH BREAKDOWNS: VILLAGE LEVEL
(to determine 'who')

- *to obtain an overview of differences in wealth within the zone*
- *and the proportion of the population falling into different wealth groupings*

FOCUS GROUP INTERVIEWS: VILLAGE LEVEL
(to determine 'how')

- *to determine normal year food, cash, and expenditure patterns for specific wealth groups.*

Why Use the Food Economy Approach?

A multi-regional study is particularly challenging in the sense that in order for the results to be useful in a larger context, one needs the **capacity to compare findings from region to region and from sub-region to sub-region**. The tendency in this case would be to lean towards a large statistical survey with questionnaires and enumerators. But experience counsels that a rich understanding of

the economic context, detailing how people obtain their food in most years, and more importantly how the whole economic system fits together with relation to intra- and inter- community exchange, is not possible to derive in a cost-effective and focused way through traditional survey methods.

At the same time Food Economy Analysis counters the problem that most so-called qualitative assessments face - the problem being that they tend to produce information which may be detailed, but not well-suited to comparative analyses. **Because the Food Economy approach is based in large part on quantifying access to food, and in describing the links within and outside a community which determine this access, it allows for comparisons to be made between geographic areas and between economic groups**. It also enables analysts to estimate with an impressive level of confidence the level of 'shock' likely to create a food shortage.

III. Setting/Background

The Limpopo River Basin Complex Food Economy Zone is located in Gaza Province in the southern half of Mozambique. As illustrated in the map below, a majority of the zone is found in Chokwe, Guija, and Chibuto districts. Small parts of Bilene, Xai-Xai, and Madlakaze Districts are also included in the zone[5].

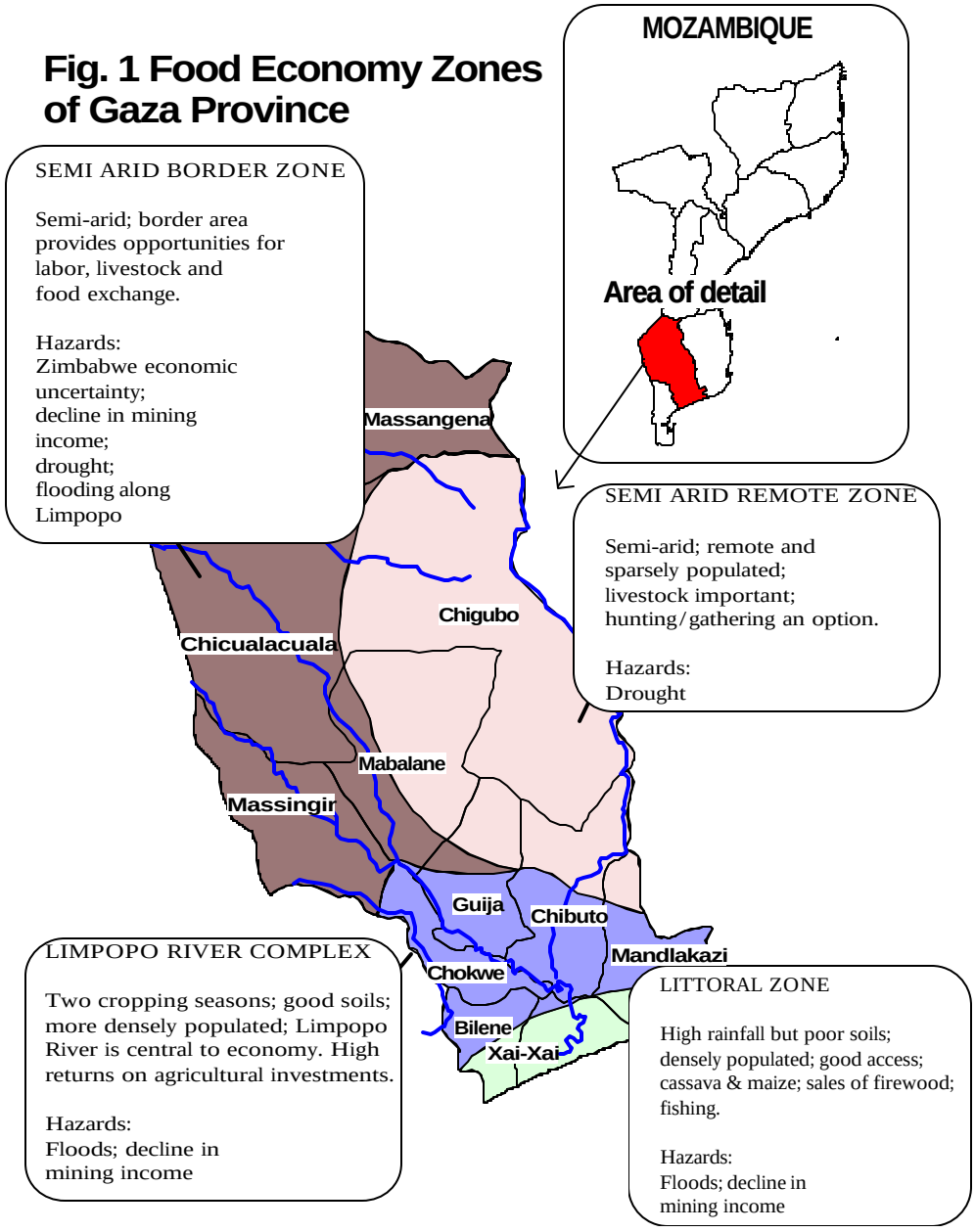
The Limpopo River Basin Complex

What distinguishes the Limpopo River Basin Complex from other Food Economy Zones in the Province is its high production potential combined with a propensity to flooding. With its two (and in some places three) cropping seasons, rich alluvial soils, and relatively low population pressure[6], the Limpopo River Basin Complex is very different from the other, less productive food economy zones in the Province. The northern half of Gaza, for instance, has one season, poor soils, and low rainfall. The southern Littoral Zone, while benefiting from higher rainfall

[5] These boundaries should be considered a starting point subject to further refinement and modification after additional field work.

[6] This applies particularly to the 'alto' areas in the zone; even the 'baixo' areas have less population pressure than many parts of Africa (such as parts of highland Kenya and Ethiopia) where the majority of households have less than 1/8 of a hectare.

Fig. 1 Food Economy Zones of Gaza Province



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because of the coastal influence, has poor soils and far more limited productivity than the Limpopo River Basin Complex.

Within the Limpopo River Basin Complex there are (at least) two sub-zones determined by proximity to the river: lower (*baixo*) areas close to the river, and slightly higher up (*alto*) areas farther away from the river. According to local informants at the district level in Chokwe, Chibuto and Guija, approximately 80% of households live in the *alto* areas and 20% live in the *baixo* areas. The population estimate, based on census figures for the relevant parts of the districts included in the Limpopo River Complex is approximately 345,154 people. In general, the *baixo* areas tend to have a higher population density, better soils, and they face a higher likelihood of flooding. *Baixo* plots are located within or near extensive irrigation schemes; while these schemes deteriorated during the war and were severely damaged in the 2000 flood, they are currently being resuscitated. Local informants claim that despite the increased challenge posed by not having access to the irrigation schemes, they can, with the help of individually owned pumps, plant three seasons of crops most years. A particular emphasis is placed on growing tomatoes for sale in the *baixo* areas; other vegetables, such as cabbage, onions and lettuce, are also commonly grown for sale. Thus, although the *baixo* areas constitute a high flood risk area, the risk tends to be offset by the high returns generated on agricultural production.

The *alto* areas are characterized by sandier soils, lower population densities, and a lower risk of flooding. Most households in these higher up areas rely on two seasons of production; they often have plots in both the *baixo* and *alto* areas, helping them to reduce the risks involved in reliance on rain-fed agriculture alone. The areas cultivated by *alto* households tend to be larger in sum than those of *baixo* households, simply because more land is available.

The influence of government resettlement schemes adds a layer of complexity to zoning in the Limpopo River Basin Complex. While normal patterns of wealth accumulation are found in areas untouched by government resettlement, the land redistribution schemes instituted in 1978 after the flood of 1977 limited the land any one household owned and cultivated to 1 hectare. In certain villages, therefore, the wealth distribution reflects this intervention, whereas in others, it does not[7]. For the sake of simplicity, stratification in this study was limited to two sub-zones (*alto* and *baixo*).

IV. The reference year

Fluctuations in annual rainfall lead to substantial differences in crop production and livestock

[7] In this baseline profile, the wealth distributions reflect areas that were not resettled; one can assume that the food and cash profiles for most households in the resettled villages are typified somewhere in between ½ hectare and 2 hectare households that are presented in this report.

production year to year. This variability creates a requirement to specify the type of year one is referring to when describing how people survive. In typical food economy studies the standard practice is to choose the reference year in consultation with rural informants on the basis of frequency; so, a typical reference year is the type of year that occurs most frequently. In the case of Mozambique, with a civil war on one end of the decade and a devastating flood on the other, this approach was not appropriate. Recent years have been recovery years. Since the war ended in 1992, households have been re-building capital and labor stocks, and each year things have become a little more 'normal'. Therefore, field informants agreed almost unanimously that the reference year closest to 'normal' was the 1998/1999 cropping year. The 1999 harvest year was, therefore, used as the basis for building up a detailed picture of how people in the Limpopo River Basin Complex obtain food and cash income and to detail the typical patterns of expenditure. [8]

V. Distribution of Wealth

The figure below illustrates the approximate distribution of wealth, as determined by amount of land cultivated[9], in the Limpopo River Basin Complex[10].

Some key points indicated by the wealth breakdowns are as follows:

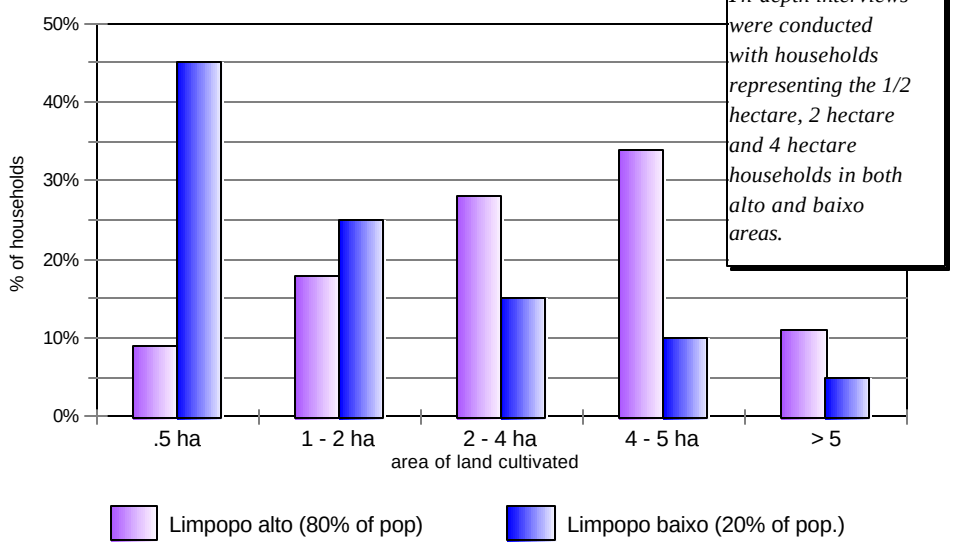
- Population pressure and competition for land is higher in the *baixo* areas, although no household cultivates less than ½ hectare anywhere in the Limpopo River Basin Complex;
- The highest proportion of households in the *baixo* area cultivates less than 2 hectares whereas the highest proportion of households in the *alto* areas cultivates more than 3 hectares.

[8] As we found in doing the scenario analysis later, there is an advantage to having the reference year be the year before the 2000 flood because it allows for a clean analysis of the probably effects of the flood on food and cash income. In other words, there was no need to do a stacked year on year analysis.

[9] Note: In addition to land, oxen ownership was repeatedly cited as a key generator and indicator of wealth. Rural informants claimed that households with oxen tend to correlate with those who cultivate more land. However, it was not possible, given the indiscriminate way in which the war stripped people of their cattle and recent increases in livestock numbers since the war, to establish a consistent picture of livestock ownership patterns.

[10] These distributions represent the average values taken from a range of focus group interviews with village leaders in a number of different localities within the *alto* and *baixo* areas of the Limpopo River Basin Complex. They were cross-checked with various focus groups representing different wealth groups and key informants at the district level.

Fig. 2 Wealth Breakdown: Limpopo River Basin Complex



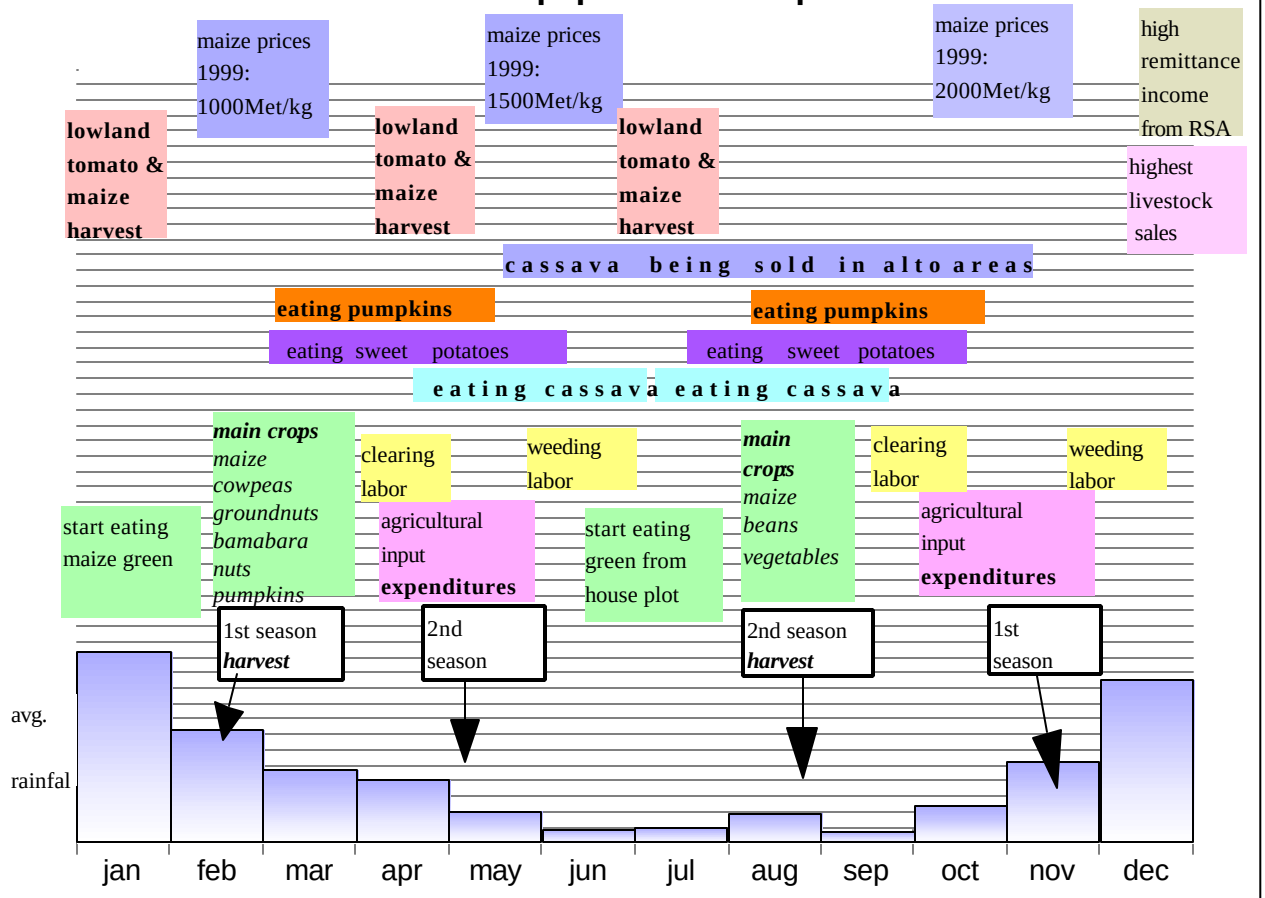
- Because households in the alto sub-zone cultivate relatively large areas, they require significant labor inputs at key times of the year.

For the purposes of this profile, members from households with ½ hectare, 2 hectares, and 4 hectares were interviewed more intensively. It is from these interviews and discussions with key informants in the Limpopo River Basin Complex that the following detailed descriptions of food, cash and expenditure patterns were derived.

VI. Seasonal Calendar

The figure below depicts various activities that household members in the Limpopo River Basin engage in throughout a typical year. It is clear from the illustration that agricultural activities in the Limpopo River Basin Complex are spread across the year. In most years the first season planting starts in October/November at the beginning of the main rains and ends with the harvest in February/March; the second, less important season starts in April/May and ends in August/September.

Fig. 3 Seasonal Calendar: Limpopo Basin Complex



**source for rainfall data: 10 year average (1990 - 1999) derived from INM data, Maputo; source for other information: field informants in Chokwe, Chibuto & G*

A concentrated demand for agricultural labor occurs during four critical times of the year: first season clearing in September; first season weeding in November or December; second season clearing in March or April; and second season weeding in May or June. Harvest labor tends to be supplied by the household, except in the *baixo* areas during the peak vegetable harvest times.

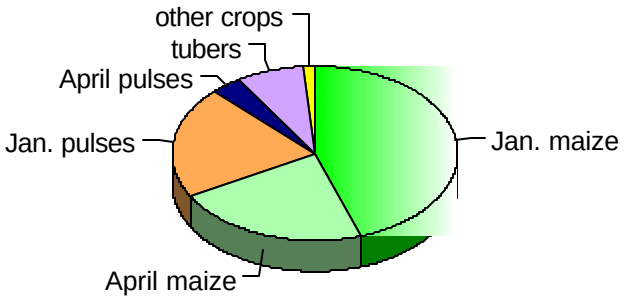
Three seasons are the norm for many households in the ba*i*xo areas who rely on locally owned pumps or portions of the irrigation scheme to supply water to their fields. In this way *baixo* households benefit financially from three selling seasons, making a good proportion of their money from the January tomato harvest (when tomato production and prices are high). These households

are busy throughout the whole year with agricultural activities, unable to count on the post-harvest period common in many agricultural areas in Africa.

VII. Sources of food

Agricultural production is the only source of food for rural households in the Limpopo River Basin Complex in a typical year (or a year like 1998/1999). That is not to say that other sources of food (in particular purchased food) are not available, but most households do not have to resort to purchasing food in 'typical years'. Figure 4, representing the relative importance of different crops that make up annual food requirements for typical poor households,[11] illustrates this point. This representation is for both alto and baixo areas, as the pattern does not differ significantly from one area to the other.

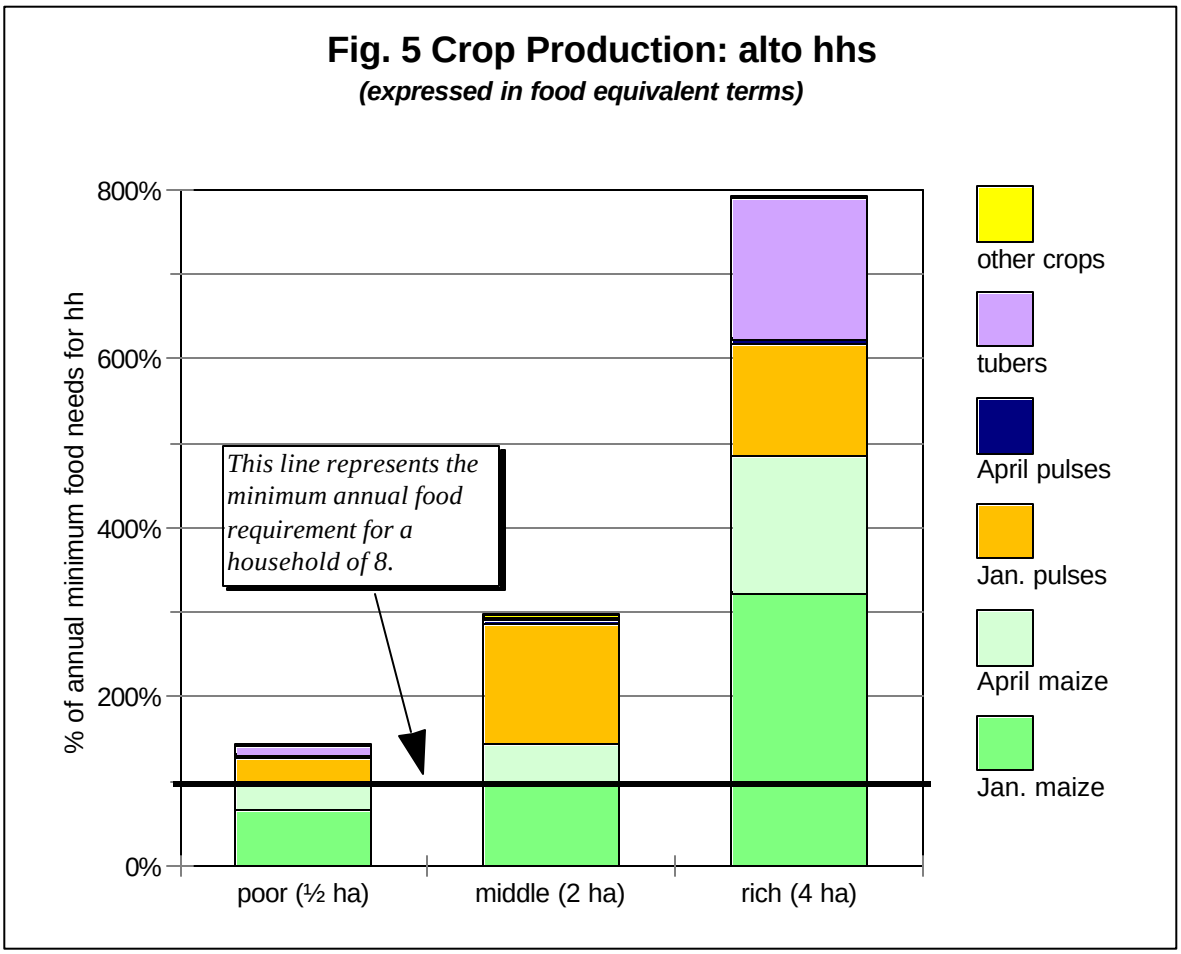
Fig. 4 Sources of Food: Limpopo Basin
1/2 hecatare ('poor') households



Woman picking cassava leaves in November, 2000

In addition, food patterns do not differ very much from wealth group to wealth group. What *does* differ is the total amount of food produced, and therefore the amount of 'surplus' that is stored or sold by households in different wealth groups, as illustrated in Figure 5 below.

[11] The 'household' size used in this zone was 8, on the basis that rural informants claimed consistently that most households consist of at least 2 wives, 5 children and 1 man.

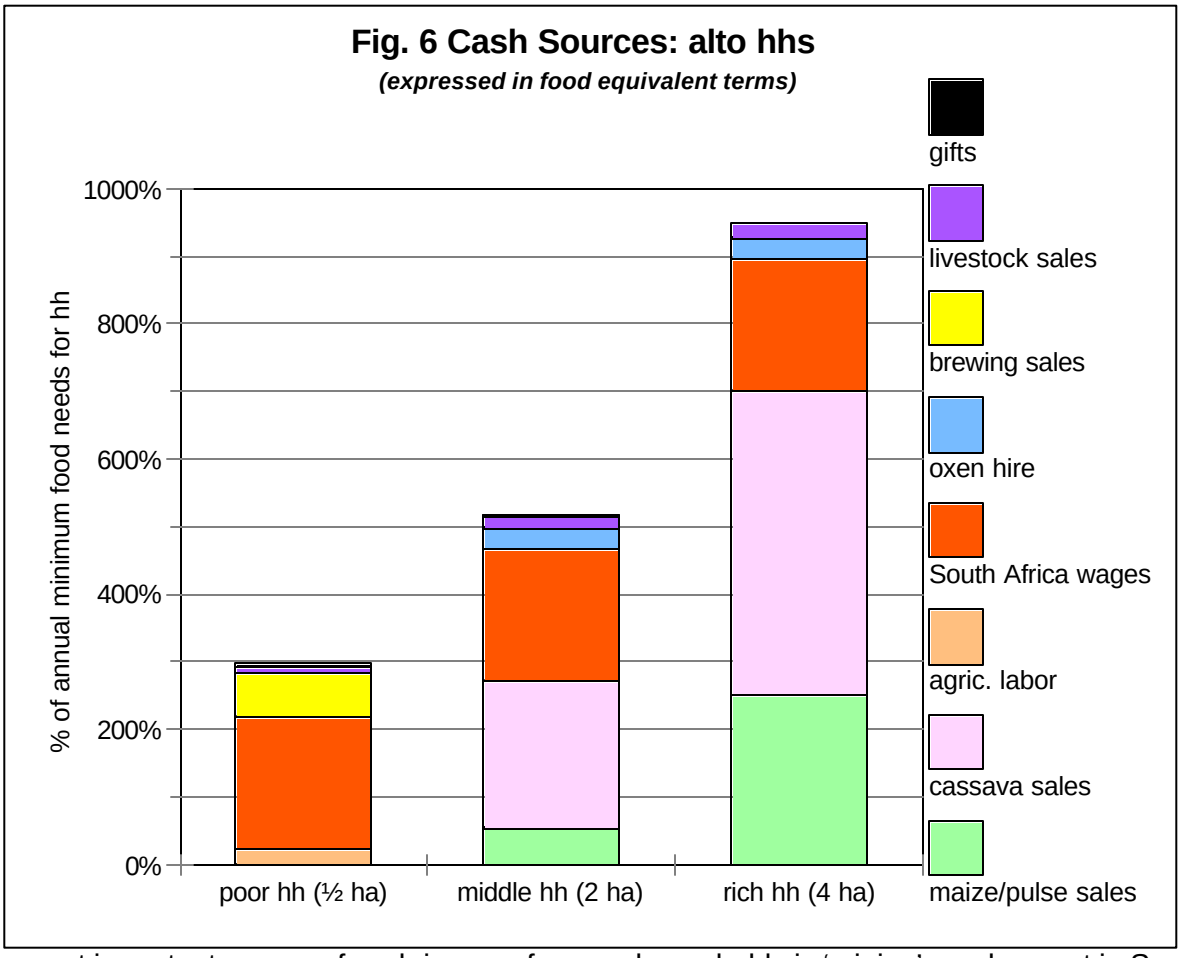


The representation above was derived from interviews with *alto* area households. The same general pattern applies in *baixo* areas, although the absolute values on the y axis are higher in *baixo* areas because of higher yields and an additional harvest. Poor households eat almost all they produce. If they sell anything it is minimal and infrequent.

Middle and rich households, on the other hand, produce significantly more than they need to eat in a typical year, and end up either storing or selling a lot more than they keep for the year's consumption. Whether they store the surplus or sell it depends on how well the next season appears to be shaping up: if the next season looks good, they sell most of the surplus; if it looks bad, most of the surplus is kept in store to help the household make it through the next year.

VIII. Sources of cash income

The figure below outlines the relative importance of the main sources of cash income for households in the Limpopo River Basin Complex. Again, the representation is drawn from interviews with *alto* households, but the same general pattern applies in *baixo* areas, with the following qualification: cassava sales are replaced by tomato & vegetable sales in the *baixo* areas.



The most important source of cash income for poor households is 'mining' employment in South Africa. The Limpopo area is the traditional supplier of labor to the South African mines. People from every wealth category are involved in South African labor, although some of the bigger farmers cultivating five or more hectares in the *baixo* areas tend not to seek this kind of employment because they get higher returns from putting the labor into their fields at home. The practice of

Traditional hut

House built with money from South Africa

sending one or two men from the household to work in either the mines or on large-scale commercial farms is entrenched in local seasonal patterns and a family's hopes and expectations. Young boys assume that their financial start will come from a few years in South Africa and households increase their standard of living (e.g. build a nicer house, buy better clothing, pay for a better education for their children) through this standard means of exchange. There are visible indicators of South African remittances everywhere in the Limpopo Basin. It is easy to tell which houses were built with cash from South Africa, and which houses were not. It is not uncommon to see stereos, bikes, furniture or kitchen equipment from South Africa in or around these rural villages, and cash from this employment undoubtedly assisted families to feed themselves and rebuild their lives after the devastating flood of 2000.

Other sources of income include crop sales, oxen hire, and livestock sales for better off households and brewing sales, local agricultural labor, and gifts for poorer households.

Selling cassava along the roadside

Cash crops include surplus maize & pulses, and cassava or tomatoes, in *alto* and *baixo* areas respectively. Cassava sales make up

Tomatoes from the baixo areas

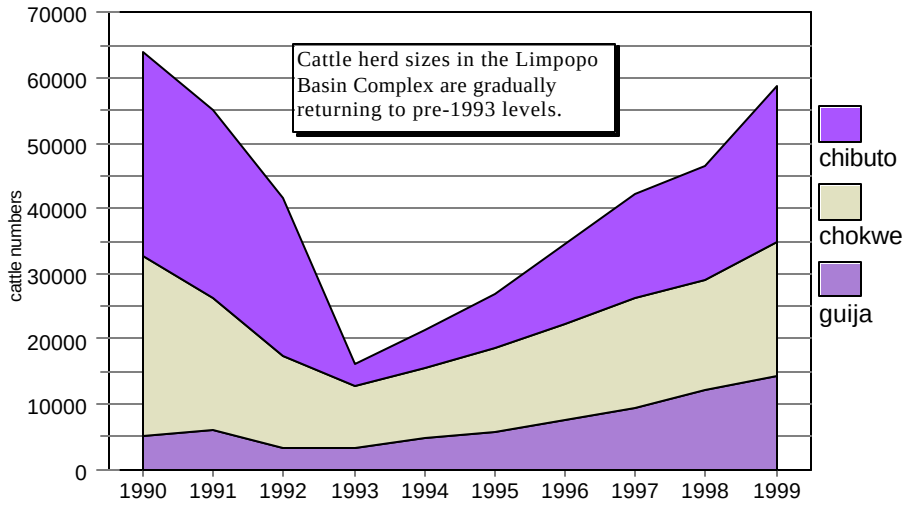
between 40% - 60% of cash income for middle and rich *alto* households respectively. Tomato sales in the *baixo* areas make up 40 – 80% of total cash income for middle and rich households respectively, clearly representing a very lucrative source of income for better off households.

Local labor is a cash generating activity for some poorer households, although not as significant as one would expect given the fact that labor, and not land, is the major constraint to agricultural production in this zone. It may be that most households simply do not have enough excess labor on hand after sending their strongest members to South Africa to make good on the local opportunities; or it may be that local demand has yet to peak since households are still recovering from the war. Whatever the reason, reported income from local labor pales in comparison to cash that can be earned in South Africa. This is somewhat worrying given that most informants expect that the demand in South Africa will fizzle out over the coming year due to the drop in world gold prices and the contraction of a number of key mines. If local opportunities do not step up to fill in the gap, it is difficult to see what will.

One option might be a revival of local livestock herds, hit hard by the civil war. Figure 7 depicts the trend in livestock numbers since 1990 in Chokwe, Chibuto and Guija Districts. It is an encouraging trend, suggesting that herds are returning to pre-war levels, and that soon households will be able to rely on this as an additional source of steady income. Rural informants agreed that it will take another four years before they feel they can start selling cattle at the same rates they used to. At the moment they are still reluctant to sell any until they have reached a crucial viability point where they have enough of a herd to ensure a set of core tilling oxen, two or three female cows, new calves every year, and a bull for breeding.

Cattle grazing near the Limpopo River

Fig. 7 Cattle numbers: 1990 - 1999
The Limpopo Basin Complex



Another important source of cash, for poor households in particular, is local beer. Poor household women are typically take charge of this activity, brewing around 100 liters a month which is sold for 2,000 *Meticais*[12]/litre on average. After accounting for inputs (limited for the most part to sugar since households use maize shells and husks as the grain element) these households net approximately 120,000 *Meticais* a month on brewing, or the equivalent of around 60 kg of maize.[13] This activity provides an important source of extra income while poor households await the arrival of remittances from South Africa and can be especially crucial for poor female-headed households.

[12] In November of 2000 a Meticais was equivalent to approximately 1/15th of a dollar.
[13] This cash is rarely used to purchase maize, but maize is a useful standard for measuring the value of different commodities particularly when the value of the local currency tends to fluctuate.

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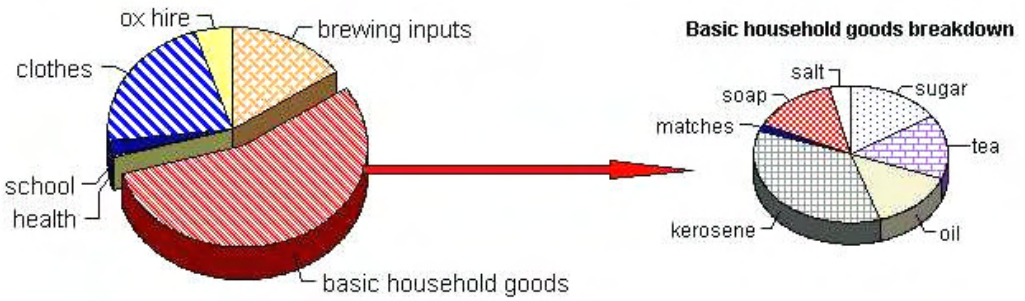
IX. Expenditure patterns

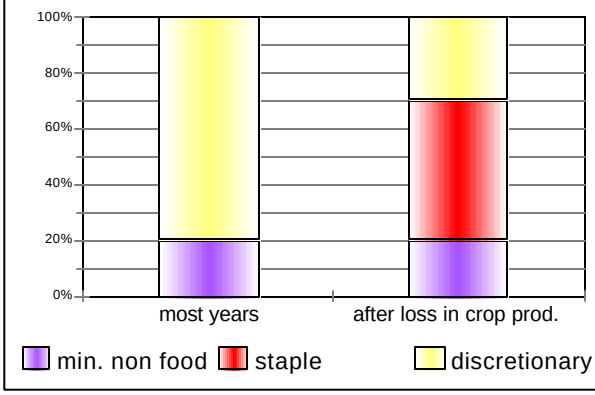
The typical annual expenditure pattern for poor households[14] in the Limpopo River Basin Complex is presented in the figure below. This pattern represents both *alto* and *baixo* areas.

Fig. 8 Typical poor hh expenditure



What is striking about this pattern is the absence of expenditure on staple food (an unusual pattern for poor households discussed in detail in the 'sources of food' section above) and the relatively high expenditure on basic household goods. When added up over the year, small weekly outlays on things like salt, soap and matches consume over half of a poor household's income. School and health expenditures are relatively low, in part because these services are subsidized by the government and UNICEF. Most better off households have a fairly large discretionary expenditure category that allows households to offset production declines by increasing their purchase of staple foods in bad years.

Fig. 9 Illustrative household response to a decline in crop production



[14] The expenditure pattern for middle and richer households is similar, although a much higher proportion of income is spent on agricultural inputs in the richer *baixo* households than in other categories.

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X. Conclusions

The surprising resilience of most households in the Limpopo River Basin Complex after the worst flood of the century is a testament to the fact that the risk of food shortage in this area is actually quite low. This is due in part to the fact that while the likelihood of a hazard such as flooding is high, the corresponding vulnerability of the population (given their high capacity to recover from such a hazard) is actually quite low. The reasons for this assertion are outlined below.

Children playing in a small village in the alto area of the zone

First, the Limpopo River Basin Complex is historically connected through labor exchange with an area outside of the zone. Households obtain regular income regardless of circumstances within the zone. In other words, even if there is a 'shock' that affects the Limpopo River area (such as the flood of 2000), links to South Africa help households recover from the effects of the shock by affording them access to a reliable source of income and food.

Second, but related, cash from South Africa allows even poor households the 'luxury' of keeping their harvest for consumption. These households have an advantage over poor households in many other parts of Africa that get caught in a cash flow shortage, selling part of their harvest every year at the lowest price (to re-pay debts) and purchasing food during the 'hunger gap' when prices are highest. South Africa income is sufficient to cover minimum expenditure on basic household goods, clothing, school and health costs which means that households can keep for consumption, rather than sell, their own crop production.

Third, multiple seasons and a variety of plot placement options (in both *baixo* and *alto* areas) lower the typical risks associated with rain-fed agriculture. If crop production in one season is less than ideal, there is always a possibility of replanting more intensively in the next season. This is particularly so on the heels of a flood when soils are often more fertile.

While contingency planning efforts this year focused heavily on the area that was most **flooded** last year (specifically the Chokwe area), the findings of this baseline profile suggest that more

attention should be directed instead to areas that are most vulnerable (in the sense of being least able to recover) to the coming year's foreseeable hazards. In Gaza Province, this logic should lead one to look more carefully at the Chicualacuala area or the northern Semi-arid Border Zone (see Figure 1), where a combination of flooding, limited agricultural potential, and diminished access to cross-border (Zimbabwe) and intra-provincial trade in 2000 likely made it far more difficult to obtain access to normal sources of food. Additional shocks this year would push households even closer to the edge and be likely to cause serious food shortages amongst certain segments of the population. A basic understanding of the household food economy in this area and others will help the government and contributing agencies develop more appropriate plans for the future.

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