10 Some other geographical aspects of welfare

The main purpose of the preceding maps is to provide perspectives on how welfare and indices of poverty vary across Namibia. A secondary purpose is to identify places where large numbers of poor people live to which programmes seriously interested in alleviating the plight of the poorest Namibians can be directed.

Comments have also been offered to draw attention to some factors that contribute to poverty. Several of these factors and other geographical features associated with welfare are presented below.

Communal land tenure is an inherited consequence of traditional or customary practice and the homeland policy of the South African administration. The tenure system is thus a product of social and political circumstances, but its continuation has a major impact on the welfare of Namibians because all communal land has no capital asset value. Residents in communal areas are therefore unable to use capital based on property to develop, assign, transfer or move their assets. These are benefits that everyone in freehold areas takes for granted.

The spatial and demographic aspects of communal tenure are relevant to the geography of poverty since over one third or some 38% of the country’s surface area is under communal tenure (Figure 51). The approximately 50% of all Namibians that live on rural communal land therefore do not have access to values associated with capital assets in land. The same is true for another 15-20% of the total population that live in informal urban settlements where they lack legal tenure and the capital values that go with titled land ownership.

Figure 51. Land tenure.
It is often said that Namibia suffers from low rainfall. This is true, but high evaporation rates – caused by very low humidity, high temperatures and wind – are an equally important reason for the country’s aridity. And so it is a combination of low rainfall and the loss of water to evaporation that limits crop growth and pasture production for livestock and wildlife. Conditions for farming are thus hard, and this is one reason why it is virtually impossible for rural families to make a decent living from agriculture unless they have very large areas of rangeland or the resources and opportunity to irrigate their crops. As a result it is not surprising that most rural households in communal areas obtain most of their income from off-farm sources.

Aridity as a result of low rainfall and high evaporation is one constraint on rural production. Another is the low fertility of soils in most areas.

Much of the country has, indeed, very little soil because only thin layers have been formed from the decomposition of underlying rocks. There is thus little substrate in which soil moisture can accumulate and where plants can root themselves. Elsewhere in the deep sands that cover much of northern and eastern Namibia, the porous sand holds almost no nutrients, and rain water soon percolates away beyond the depths which the roots of grasses and crops can reach.

The only areas where soils are moderately suited to crop growth are in central-northern Namibia and on small patches of lovisols in and around the Otavi-Grootfontein-Tsumber hills. Elsewhere, significant crop production is only possible if the soils are managed intensively with the application of fertilisers and irrigated water. Both fertilisers and irrigation are extremely costly.
A decent living for a farming family requires that it can feed itself and produce a surplus that can be sold to supply cash needed for basic services and all commodities that cannot be harvested or gathered: clothes, telephone costs, school fees, transport costs, sugar, salt and so forth. Even if limits that stem from aridity and soil fertility were to be overcome, obtaining cash from surpluses remains difficult because of poor access to markets.

Thus a third reason that so many rural families are poor is that the costs of transportation are high and need to be added to retail prices which often become uncompetitive. In addition, usually only durable goods can be transported over long distances, and farmers have little control over their goods once they reach and are made available for sale in remote markets.

The map in Figure 54 provides an indication of areas in the country that have greater or lesser access to markets. Windhoek is of course the biggest market, but it is very small compared to the large number of consumers and customers in Luanda, Lubango, Lusaka, Harare, Johannesburg and Pretoria, and Cape Town. To reach those large faraway markets will always be expensive.

**Figure 54.**
Distances to markets in Namibia. The map shows the density of people (also shown in the small map) overlaid with two measures of distance. The first is a buffer area 10 kilometres either side of all the official roads while the second is a circular buffer zone around all the major towns in Namibia. The radius of each circle is proportional to the population of each town.
In summary, conditions over much of Namibia limit agricultural production and income generation. Most families may not develop capital assets over their land, rainfall is low and evaporation high, soils have low fertility and profitable markets are hard to reach. As a result, many of Namibia’s poorest people are to be found in rural areas, trying to eke out a living using resources which cannot improve their livelihoods by any significant margin. They may produce enough to feed themselves, but they are unable to produce cash incomes for basic necessities.

Not surprisingly, rural people try to escape this cash poverty. They use two main strategies. One is to move to urban centres where jobs and formal and informal business opportunities are more available than in rural areas. It is for this reason that urban populations in Namibia are growing at an average rate of 5% per year, compared to rural growth rates of less than 1.5% in most regions.
Another strategy is to attract and depend on cash from sources independent of their farms, such as pensions, remittances, business earnings from local enterprises and wages from local jobs. For example, a rural family that has one member earning N$50,000 as a teacher is in a completely different wealth league from a family that has no dependable cash income.

The absence of family members who can earn incomes is a major reason why small female-headed households are amongst the poorest in Namibia. Figure 18 on page 26 shows where most of these households occur, and serious poverty reduction programmes could use that information to find and alleviate the plight of these people, for example. Other maps in this book can be used to find areas where other needy people live. Finally, policies can be adopted and implemented to promote livelihoods that are not constrained by the geographical factors that contribute to poverty.

Several people from a large household are able to weed (above), but all the weeding is done by one person in the small female-headed household (below).
Appendix 1
Important references concerning poverty in Namibia


Appendix 2
Data preparation and POVMAP analyses

Data Preparation

Two data sets were obtained from the Central Bureau of Statistics: 2001 Population & Housing Census and the 2004 Household Income & Expenditure Survey. These datasets were imported into two separate MS Access databases (due to size and speed limitations) and appropriate relationships were set up between household level data and individual level data. These databases were named Pov_NHIES.mdb and Pov_PHC.mdb. The complete relationship hierarchy followed the pathway:

```
socio-economic zone
   ↓
   cluster
   ↓
enumeration area
   ↓
   household
   ↓
   individual
```

‘PovID’ code made up from the socio-economic group (1 digit), the cluster ID (3 digits) and the household ID (6 digits). For example: PovID 1624113006 = socio-economic zone 1, cluster 624, household 113006.

The dependent (Y) variable used in the Household Income & Expenditure Survey dataset was per capita expenditure. Fields for both unadjusted and logged (logarithmic) per capita expenditure were included in the output query.

Twenty variables (regressors) which were common to both data sets and for which codes were compatible, were identified.

For each categorical regressor, codes were combined wherever possible to reduce the number of categories. For example with toilet type, the four original categories of flush toilet were amalgamated into one. Look-up tables were used to recode each regressor into the more simplified grouping.

For each data set an output query was developed which exported the data into a .csv file in a format compatible with PovMap. The first field in the output contained the 10 digit concatenated

<table>
<thead>
<tr>
<th>Variable</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>House type</td>
<td>Category</td>
</tr>
<tr>
<td>Sex of head of household</td>
<td>1 or 2</td>
</tr>
<tr>
<td>Age of head of household</td>
<td>Number</td>
</tr>
<tr>
<td>Level of education of head of household</td>
<td>Category</td>
</tr>
<tr>
<td>Highest level of education in the household</td>
<td>Category</td>
</tr>
<tr>
<td>Number of working household members 15-64</td>
<td>Number</td>
</tr>
<tr>
<td>Major source of income</td>
<td>Category</td>
</tr>
<tr>
<td>Tenure over house</td>
<td>Category</td>
</tr>
<tr>
<td>Type of walls</td>
<td>Category</td>
</tr>
<tr>
<td>Type of flooring</td>
<td>Category</td>
</tr>
<tr>
<td>Type of roof</td>
<td>Category</td>
</tr>
<tr>
<td>Cooking fuel</td>
<td>Category</td>
</tr>
<tr>
<td>Heating fuel</td>
<td>Category</td>
</tr>
<tr>
<td>Lighting fuel</td>
<td>Category</td>
</tr>
<tr>
<td>Water source</td>
<td>Category</td>
</tr>
<tr>
<td>Toilet type</td>
<td>Category</td>
</tr>
<tr>
<td>Radio access</td>
<td>1 or 2</td>
</tr>
<tr>
<td>TV access</td>
<td>1 or 2</td>
</tr>
<tr>
<td>Phone access</td>
<td>1 or 2</td>
</tr>
<tr>
<td>Computer access</td>
<td>1 or 2</td>
</tr>
</tbody>
</table>
PovMap Analyses

For each of the five socio-economic zones, two .csv files were produced: one from the Household Income & Expenditure Survey and one from the Population & Housing Census. Taking each socio-economic zone in turn, the following procedures were followed to derive predicted per capita expenditure values for all households in the census data set.

The two .csv files (census and survey data) were imported into PovMap and the PovID field was selected as the Hierarchical ID. Once imported each regressor in the survey data set was matched to its counterpart in the census data set (step 1 Checker). In the subsequent step (step 2 Consumption model) the ‘stepwise’ option was selected from the choice of statistical procedures provided and all regressors chosen by PovMap were accepted. In preliminary analyses it became evident at the Cluster effect screen (step 3) that the unadjusted expenditure values produced extremely skewed prediction plots which prevented a successful results output from being produced at the simulation stage.

In order to obtain a more normal plot distribution the log of per capita expenditure was used. This produced a greatly improved plot. 

In step 4 (Idiosyncratic model) which assesses location effects, the stepwise option was again chosen and all selected regressors were accepted. No changes were made to the distribution model at the Household effects screen (step 5).

At the Simulation screen (step 6) the default settings were adopted. Since the focus of the project was to produce maps depicting relative poverty we were not concerned with the choice of indices available which provide a measure of the proportion of households above or below a given poverty line. Therefore, to enable PovMap to proceed with its simulation an arbitrary value of 5 (roughly the lowest of the logged expenditure values) was entered into the poverty line box.

The appropriate field in the data sets for household size i.e. ‘Householdsise’ was selected in the Household size box.

Summary simulation results produced by PovMap include a table which comprises various statistics for each cluster. These include number of households, number of individuals, and maximum, minimum, mean and standard error logged per capita values.

In addition to mapping the mean per capita expenditure of clusters it was desirable to map the median values per cluster and to also derive tercile values of expenditure for households across the country (i.e. the number of households in each cluster falling within the bottom third, middle third and top third of all household per capita expenditure values across the country). In order to obtain these statistics the ‘Saving all estimates of Y’ box was ticked on the simulation screen. This produced an output (ydump) of all predicted Y (Yhat) values for each household.

Each Ydump output for each socio-economic zone was imported into a new database so that the data could be easily manipulated and desired statistics could be derived from the Yhat values.

A Visual Basic for Applications (vba) module was created in the database to calculate deciles from the Yhat values for each cluster. By definition, the 50 % decile corresponded to the median.

In order to calculate terciles across the country the Yhat values were ranked from lowest to highest and the expenditure values for the 1/3 and 2/3 points were extracted. These values were then used to calculate the number of households in each cluster falling into each of the three tercile groups.

All logged per capita expenditure values from simulations were converted back to ‘real’ NS values for mapping purposes.
Notes


3 Although enumeration areas are planned to each have about 100 households, in practice considerably fewer or more homes may be counted during a census. As a result, most enumeration areas have between 50 and 150 households.

4 In such a skewed set of data, the high incomes of the few rich people distort the average or mean so that levels of wealth of the whole population appear higher than they really are for the majority of people.

5 The equivalent threshold figures in dollar values estimated in 2004, the year of the Income & Expenditure Survey, were N$1,475 between the lowest and second tercile, and N$4,983 between the second and third tercile.


9 $r^2$ values for the consumption models in each of the socio-economic zones were: agro-pastoral 0.5489; pastoral communal 0.5714; rural formal 0.7490; urban formal 0.6239; urban informal 0.4895

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An Atlas of Poverty in Namibia presents mapped information from the 2001 Population & Housing Census and 2003-4 Income & Expenditure Survey to provide perspectives on the distribution of poverty in Namibia. The maps should help to direct alleviation and economic development programmes to the poorest areas and people in Namibia.