

## Using food prices to predict harmful effects of drought: Northern Nigeria as a case study

*John Simister and Ranabir Chanda*

### Introduction

The connection between water and food security is well known. 95% of agriculture in sub-Saharan Africa is rain fed, rather than irrigated. In the past two decades, per capita production of cereals has not risen, and remains far below population requirements (FAO, 2005a). In 1998, the only issue that the UN General Assembly agreed on was the looming water crisis. In many countries, limited water supplies combined with population growth exacerbated by drought, is eliminating the option of food availability, let alone self-sufficiency: the Niger famine in 2005 being a case in point.

### Hunger in Northern Nigeria

Northern Nigeria is facing problems related to those in Niger. We commissioned RMS Ltd, Nigeria to carry out two surveys: they interviewed 5,048 households in November 2003, and 5,011 households in February 2005. In northern Nigeria, there has been a big increase in the number of households who can't afford food. Of the 37 states in Nigeria, this paper focuses on just 5 states, in northern Nigeria. The following table shows the change between 2003 and 2005, for these five Nigerian states.

*Fraction of the people surveyed who had been unable to afford food 'almost every month' in the 12 months before the interview.*

	2003	2005
Katsina	7%	18%
Bauchi	3%	10%
Jigawa	0%	11%
Adamawa	2%	8%
Yobe	0%	23%

*Source: RMS Ltd, Nigeria*

For all five parts of Nigeria, the fraction of people unable to afford food increased between 2003 and 2005. Part of the problem is rising food prices. In all five states we studied, the prices of basic foods rose dramatically – for example, millet prices rose from about 20 Naira per Kg in November 2003, to about 40 Naira per Kg in February 2005 (Government of Nigeria, 2005). Prices of other staple foods such as rice and maize also grew alarmingly. FAO (2005b) suggests this is because of food being exported from Nigeria to Niger and other drought-affected countries. RMS survey data suggests spending did not keep pace with prices: in these five northern states, average spending per household rose from 12,787 month in 2003, to 14,069 Naira per month (a slight increase, but not enough to cope with the big price rises). In the short term, some families seem to have survived by selling or eating cattle.

*Fraction of the people surveyed who owned cattle at the time of the interview  
(rural respondents only).*

	2003	2005
Katsina	24%	23%
Bauchi	53%	18%
Jigawa	42%	22%
Adamawa	26%	13%
Yobe	58%	12%

*Source: RMS Ltd, Nigeria*

A sudden drop in cattle ownership may be a sign of hardship (McPeak, 2004). Hardship in Nigeria appears to be partly due to unemployment. Using the RMS survey data, we calculated average unemployment in the five states shown in Table 1, and found unemployment rose from 2003 to 2005: from 1.7% to 2.9% for men; and from 3.8% to 5.1% for women.

### **Desiccation and Desertification**

We report (above) data on five states, to explain the crisis: but other Nigerian states are also affected. Some of these problems are indirect effects of crises in Niger; but they are also a sign of the breakdown of conventional farming in the northern Nigeria, and suggest the Sahara desert is spreading south. It is unrealistic to expect Nigerian farmers to be able to halt the steady growth of the Sahara desert: most farmers struggle to survive. This may be the last chance for northern Nigeria: if the Sahara absorbs Niger, then changing rainfall patterns will make farming less profitable in northern Nigeria. If farmers (and other people) migrate from northern Nigeria, in the next few years, there will be nothing to stop desertification. The Nigerian government, and various NGOs, deserve credit for helping some parts of Northern Nigeria (such as Sokoto). But current work is not enough to prevent Northern Nigeria from becoming desert – a much more ambitious project is needed. Farming is hardly mentioned in Nigerian government plans for water (UNEP, 2005a). UNEP (2005b) claim that “Central Africa rarely experiences problems of water availability, because rainfall is high and generally predictable”, and imply Nigeria can rely on Lake Chad – but the same document admits “Satellite images show that the lake has shrunk considerably over the past 30 years, and is now 5 per cent of its former size, due to persistent low rainfall in the region”.

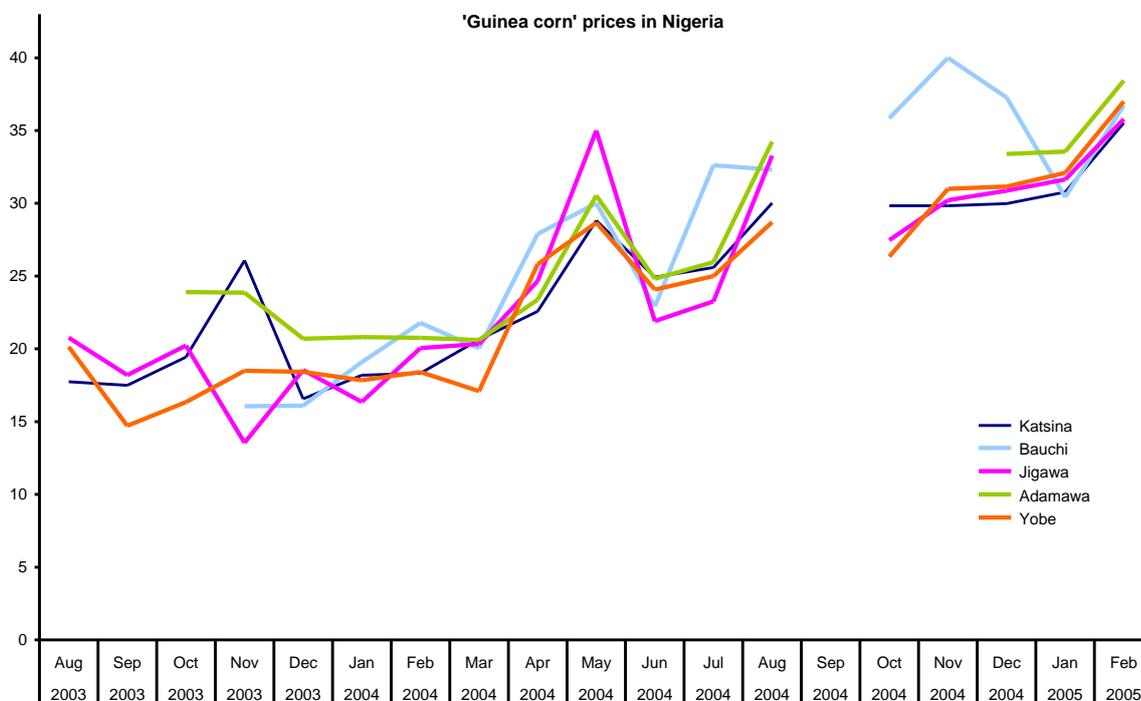
Diminishing rainfall in the Sahel region is a cause for concern: average rainfall across the Sahel reduced by about 30% since the 1970s (Eskonheimo, 2005). Using data on Niger’s rain from CRU (2005), average rainfall for 1941-1960 was 181mm; the average for 1961-1980 fell to 161mm; and the average for 1981–2000 was only 148mm (we don’t have more recent data, but obviously they now have a drought). A similar long-term drop in rainfall may also be happening in northern Nigeria. The Government of South Africa (2004) claimed that 500mm of rain per year is “usually regarded as the absolute minimum for successful dry-land farming”, which suggests farmers in Northern Nigeria have an impossible task to survive. Lack of water cannot be ignored: water, sanitation and hygiene related account for almost 70% of the child mortality and morbidity in Nigeria (Water Aid, 2005).

We think food prices could be useful in warning of crises, if used in conjunction with other systems such as GIEWS (FAO, 2005c). It appears that in a crisis, many farmers sell their animals to buy grain; hence there tends to be a low price for meat, and a high price for cereals – which causes problems for pastoralists, who have low purchasing power (FAO, 2005c).

## Price trends in northern Nigeria

We now consider food prices trends, using price data collected by the Nigerian government, as part of the 'Nigerian Living Standards Survey'. All prices are in Naira. We focus on the same five states in northern Nigeria as our tables above.

**CHART 1:**



The above Chart shows a very clear upward trend in the price of Guinea Corn, in these five states. Similar trends can be seen in prices of other cereal crops, such as millet and rice, in the same five states. Moderate price rises are common in most countries, and we would not be concerned by moderate inflation. However, the price of Guinea corn seems to have almost doubled between November 2003 and February 2005, which may put severe financial strain on poor families. The reason for this trend of rising prices is not clear: it could be that cereal production in these five states was reduced by the same drought that affected Niger; or perhaps Nigerians were less able to import food from Niger than usual, because Niger's harvest was reduced by drought. A third possibility is that some food grown in Nigeria was diverted to Niger: in May 2005, FAO (2005b) wrote "The hike in staple food prices is caused probably by increased cross-border trade to neighbouring countries, including Niger, Chad and Cameroon, whose agricultural sector has been hit by desert locusts and poor rainfall last year."

Much of the cattle farming in northern Nigeria pastoral farmers uses transhumance, i.e. moving the cattle hundreds of kilometres to central Nigeria each year to forage on grass, and then moving back to northern Nigeria for the winter. This lifestyle (associated with ethnic groups such as Fulani and Hausa) has developed partly in response to diseases associated with Tsetse fly (Blench & Dendo, 2003). But not all cattle are herded: some farmers are settled, and provide cereals to feed cattle. If cereals are expensive, this may make it difficult for farmers to feed cattle, and hence they may be forced to sell cattle if faced with high cereal prices. Chart 1 above suggests that the period from about November 2003 and February 2005 could be a time when settled farmers faced financial problems. The following chart explores this issue, by examining beef prices over the same period.

**CHART 2:**

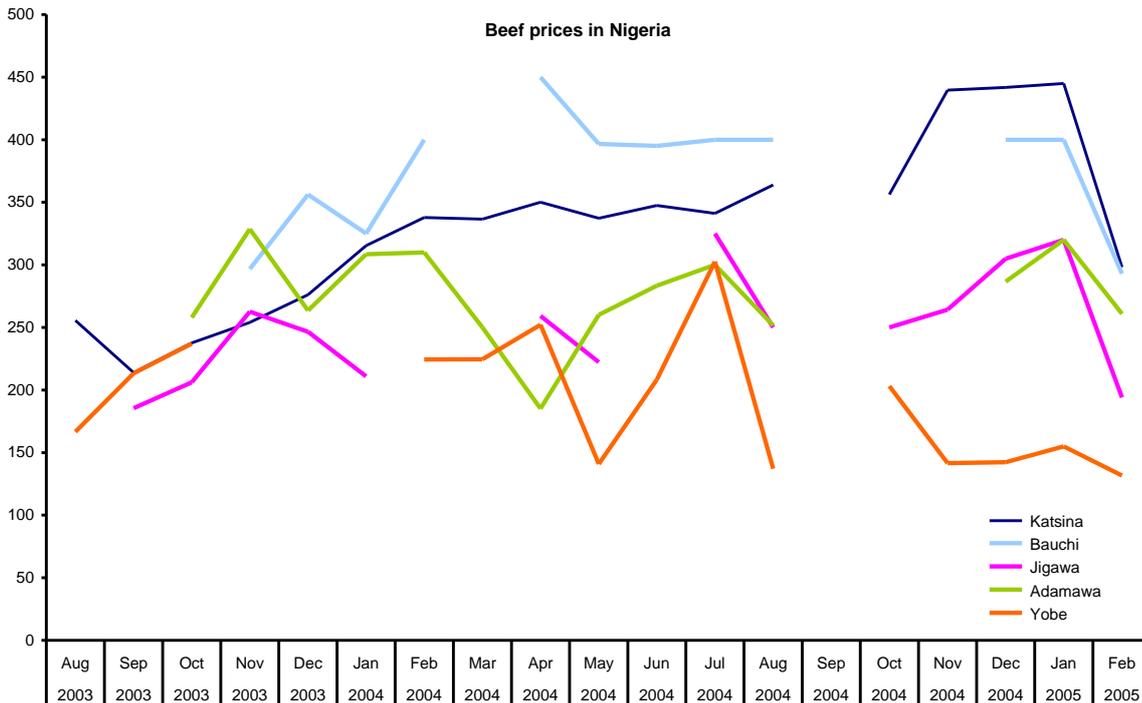


Chart 2 is not as clear as Chart 1, but is still informative. The first point is that beef prices do not rise steadily as we go from left to right: hence Chart 1 is not simply showing general price inflation. The next issue is that there may be a tendency for beef prices to fall in some states – Yobe is perhaps the clearest example of this, falling from 303 Naira per Kilogram in July 2004, to 132 Naira in February 2005 – hence the beef price fell to less than half of its July 2004 value. We consider this a useful insight, more data should be made available to academics (for many countries) if we are to investigate this issue further. Note that we are using the retail price of beef, representing typical prices paid by Nigerian consumers; we assume that the falling price in Yobe indicates that more cattle than usual was being slaughtered around February 2005, and that this produced a (presumably short-term) increased supply of beef.

### **Conclusion**

It is essential that agencies (such as FAO, and other branches of the United Nations) continue to monitor food availability, to observe short-term crises. But, if sufficient data are available, academics can give insights into long-term processes: for example, falling prices of cattle may indicate bad news (for farmers), as well as good news (for consumers). We encourage more agencies (such as the Nigerian government) to make monthly data available, preferably on websites, to enable further research.

We consider that evidence in this paper confirms the claim by FAO (2005c) that falling cattle prices can provide an early warning of famine. But we also claim that retail prices of meat (such as beef, in our Chart 2) can serve as an indicator. However, more research is needed before we can be confident in interpreting retail meat prices in this way.

## **Bibliography**

Blench R. & DendoM. (2003), 'Natural resource conflicts in north-central Nigeria', [rogerblench.info/Conflict/Conflict%20Book.pdf](http://rogerblench.info/Conflict/Conflict%20Book.pdf) downloaded 30<sup>th</sup> September 2006.

CRU (2005), 'Monthly, seasonal, and annual climate observations averaged for political units': Political unit: Niger, downloaded on 16<sup>th</sup> August 2005 from [www.cru.uea.ac.uk/~timm/cty/obs/data/obs.wei.1901-2000.Niger.pre.per](http://www.cru.uea.ac.uk/~timm/cty/obs/data/obs.wei.1901-2000.Niger.pre.per)

Eskonheimo, Anu (2005), 'Rehabilitation of degraded lands in Sub-Saharan Africa - Discussion summary: Causes/Drivers of Degradation of Land and Forests Drylands of Sub-Saharan Africa', European Tropical Forest Research Network. Downloaded on 16<sup>th</sup> August 2005, from [www.etfrn.org/etfrn/workshop/degradedlands/themesdrylands23sum.htm](http://www.etfrn.org/etfrn/workshop/degradedlands/themesdrylands23sum.htm)

FAO (2005a), 'Nutrition data' database, downloaded on 16<sup>th</sup> August 2005 from [faostat.fao.org/faostat/collections?version=ext&hasbulk=0&subset=nutrition](http://faostat.fao.org/faostat/collections?version=ext&hasbulk=0&subset=nutrition)

FAO (2005b), 'Country reports: Western Africa', downloaded on 23<sup>rd</sup> July 2005 from [www.fao.org/docrep/008/J5649e/j5649e04.htm#AFO](http://www.fao.org/docrep/008/J5649e/j5649e04.htm#AFO)

FAO (2005c), 'Endogenous and regional factors underlying Niger's Food crisis', downloaded 10<sup>th</sup> November 2005 from [www.fao.org/giews/english/shortnews/niger050805.htm](http://www.fao.org/giews/english/shortnews/niger050805.htm)

Government of Nigeria (2005), 'Nigeria Living Standards Survey' (NLSS): for details, see [www4.worldbank.org/afr/poverty/pdf/docnav/03611.pdf](http://www4.worldbank.org/afr/poverty/pdf/docnav/03611.pdf)

Government of South Africa (2005), 'Basic facts: a rainbow nation', downloaded on 16<sup>th</sup> August 2005 from [www.sa-embassy.hu/basicfacts/basicmenu2.php](http://www.sa-embassy.hu/basicfacts/basicmenu2.php)

ITDG (2005), 'Rainwater harvesting', downloaded on 16<sup>th</sup> August 2005 from Intermediate Technology Development Group, [www.itdg.org/docs/technical\\_information\\_service/rainwater\\_harvesting.pdf](http://www.itdg.org/docs/technical_information_service/rainwater_harvesting.pdf)

McPeak, John (2004), 'Contrasting income shocks with asset shocks: livestock sales in northern Kenya', *Oxford Economic Papers* 56, 263-284.

UNEP (2005a), 'Innovative practices for consideration at the ministerial level consultations of the twenty-third session of the UNEP governing council / global ministerial environment forum, Nairobi, Kenya, 21-25 February 2005', downloaded on 16<sup>th</sup> August from [www.unep.org/gc/gc23/documents/Nigeria.pdf](http://www.unep.org/gc/gc23/documents/Nigeria.pdf).

UNEP (2005b), 'Africa environment outlook: past, present and future perspectives', United Nations Environment Programme, downloaded on 16<sup>th</sup> August 2005 from [www.unep.org/dewa/Africa/publications/AEO-1/164.htm](http://www.unep.org/dewa/Africa/publications/AEO-1/164.htm)

Water Aid (2005), 'Shagari sets July date for National Sanitation Policy', downloaded 16<sup>th</sup> August 2005 from [www.wateraid.org.uk/in\\_depth/country\\_programmes/nigeria/current\\_news/5702.asp](http://www.wateraid.org.uk/in_depth/country_programmes/nigeria/current_news/5702.asp)