

COPING WITH DROUGHT: THE SUB-SAHARAN EXPERIENCE

Anne M.S. Coles

Australian National University

Paper presented to the African Studies Association of  
Australia and the Pacific, Annual Meeting, Deakin  
University, 30 November - 3 December 1990

Comments on this draft paper are welcome.



This paper examines the mechanisms for coping with drought in Sub-Saharan Africa. Its purpose is to place the food crises of the early 1980s within the context of broader food security issues. It is particularly concerned with early warning systems, the means by which unusual food scarcity can be predicted and timely action taken to prevent the development of more intense, widespread food shortages which ultimately, if unchecked, culminate in famine. Famine avoidance is important, not only for (short-term) humanitarian reasons, but because of the adverse effects that famine has on the (long-term) development process.

In the past two decades, Africa has continued to be famine-prone. This is in contrast to Asia where the threat of famine seems to have receded. In Sub-Saharan Africa, in the early 1970s and 1980s, the immediate cause has been drought but a wide variety of underlying factors have been implicated.

One of the most important factors involved has been the way in which Africa has lagged behind much of the rest of the world in achieving food self-sufficiency. In the last two decades, Sub-Saharan Africa's population has grown at about 3% per annum while per capita food production has declined by up to 1.5% per annum (cited in Huss-Ashmore, 1989). FAO's Fifth World Food Survey, which summarised world food production and consumption for the period 1961-1981, showed that although per capita food supplies had increased by 7% (because of increasing imports) this was the smallest rise for any major region. FAO's figures also identified Africa as the region with the highest proportion of its population under-nourished, 19% or 26%, depending on the estimate of energy requirements used. This was only a little better



than a decade earlier when the figures were 20% and 29% (Dichter, 1987). In 1986 average per capita energy supplies were less than estimated requirements in 49 countries; 31 of these were in Sub-Saharan Africa (Millman, 1990).

A variety of explanations have been put forward to account for the African "food crises". These have included a) external economic factors, b) internal economic policies, c) social and political factors, d) environmental factors and, more specifically, failure to engage in applied research on African food crops. These explanations essentially concentrate on the supply side of the food equation. Recently, following the impact of Sen's theory of entitlement, attention has been given to the demand side (Sen, 1981). It is accepted that even when overall food supplies are sufficient, lack of effective demand for food on the part of the poor can result in chronic under-nutrition and, in adverse circumstances, to famine and starvation.

The 1980s have seen increased concern about the link between poverty and inability to cope with natural hazards such as drought. This can be seen at all levels. A poor government lacks resources in time of disaster to buy and transport food and its public service may be inadequate for the additional tasks imposed on it. At the end of the disaster it lacks funds, not only for rehabilitation but for the investment in buffer food stocks and rural infrastructure that would mitigate the effects of future droughts. Similarly, at the household level it is the poor who are most affected as they have least ability to acquire sufficient food in times of scarcity. Richer families achieve food security through having bigger stores of food, flexible cash reserves, more marketable skills and more capital assets. Thus, just as a bad season tends to make the poor poorer, so drought tends to make them destitute.



### Coping Strategies: Dry Seasons and Droughts

Rainfall in the semi-arid and savannah areas of Sub-Saharan Africa is essentially seasonal. As a result food supplies are also seasonal and food availability, along with seasonal variations in work and illness, results in seasonal fluctuations in nutritional status (Shoffield, 1974). After harvest, food is available, leisure possible, with the dry season infectious diseases subside and body weights rise. As the dry season progresses, food becomes scarcer, water less readily obtained, grain prices rise and a few small animals may be sold to buy staple food. The "soudure" is the hardest time. The peak demand for agricultural labour coincides with minimum food intakes and increased morbidity. Nutritional status deteriorates - adults may lose several kilos and children cease to grow (Phillips et al, 1984). In a bad year, poorer families may have to borrow to obtain sufficient agricultural inputs, pledging part of the next year's crop (Chambers et al, 1979).

Various mechanisms exist to cushion the effects of this seasonality on family food security. During the dry season it is common for active family members to migrate to earn money either in urban areas or on commercial agricultural schemes, where possibly stubble grazing is also available for the household's livestock. Other gainful dry season occupations include gathering and selling wild products (wood, charcoal and in eastern Sudan, gum arabic). This migration relieves pressure on local water supplies and ensures that, when the migrants return at the start of the cultivation season, the household obtains a timely injection of cash or purchased food. Sometimes whole families move to relatives or whole communities to dry season "camps", where conditions are favourable for income-earning or, perhaps, small-scale irrigation.





Rainfall is not only seasonal, it is also variable, both from year to year and, in any one year, in its timing and distribution from place to place. Indigenous farming practices aim at spreading risk and ways of life have a certain flexibility. Most of the dry season strategies mentioned were and are able to adapt to "normal" vagaries in the rainfall. For example, if rains are bad, some young men can migrate to seek work even before the harvest and relatives' hospitality can be sought for longer than usual (Coles, 1974; Glantz, 1989).

There is thus no clear distinction of the point where inadequate rainfall becomes a drought. One of the characteristics of drought is that it is a slow-onset disaster. Often several years of poor rains are necessary before disaster conditions apply (Cutler, 1986). As a result there have been occasions when there were delays in recognising and assessing the extent of the problem. This has led to relief measures reaching the effected population late, after serious famine conditions have developed.

Nutritional emergencies, i.e. famine, arise when the capacity of the indigenous local system to cope with the drought becomes over-stressed. The sequence of events varies somewhat according to the people concerned but the following are likely to occur (Cutler, 1986; Glantz, 1989). Food availability declines or is expected to decline. Cereal prices rise unseasonally and "exceptionally" and family food security is jeopardised. There is an increased demand for work and increased migration for work, since the rural area concerned may be unable to meet the demand. Self-employment activities increase. The price of livestock falls as more animals are sold in order to obtain grain and the grain-livestock exchange ratio rises rapidly (a rise to twenty times the normal ratio is not uncommon). Real wages fall, there is increased demand for credit, which, in turn, becomes increasingly unavailable. Households



sell household goods and, eventually, essential equipment such as farming tools. Food consumption declines, despite the use of grain reserved for use as seed and the increased consumption of wild, occasionally rather toxic "famine foods". Morbidity and malnutrition increase, particularly among young children and eventually there is an increase in mortality. Widespread migration occurs, not only to the usual locations but to urban centres and road-sides, where informal camps form. At this point the social structure breaks down. The recipient areas are unable to cope with the influx of migrants and a major relief effort is needed. Even if adequate food assistance comes, when the famine is over, recovery may be impeded if families are so destitute that they have disposed of the assets that are their means of livelihood. For example, in the 1980s many pastoralists in Sudan lost all their stock and became effectively pauperised.

#### Early Warning Systems

After the drought and associated famine of the 1970s, attempts were made to prevent similar occurrences. The main thrust was the establishment of early warning systems, the most important being FAO's Global Information and Early Warning System of Food and Agriculture. These systems for the most part rely on crop forecasting during the growing season, estimating national shortfalls in food production in relation to national needs and thus enabling imports to be organised for the following year if necessary. The accuracy of the crop forecasting data depends on the resources and ability of the governments concerned, although it has improved with the increased use of agrometeorological data as well as satellite imagery. The systems have been criticised for their macro-scale approach and for concentrating on the supply side. While adequate national supplies of food are clearly a pre-requisite for ensuring adequate food consumption, regional (or ethnic) differences in access to food may be important. Moreover,



the systems, with their "overview" approach, are not able to provide the detailed information on the affected areas, the numbers of people involved or the extent of their need that is required when planning assistance.

Thus, in the 1980s there have developed different kinds of early warning systems. These effectively complement, rather than replace, the GIEWS. They have involved defining areas or population groups that are particularly liable to be affected by a drought, in other words, there have been attempts to provide "risk maps" or "risk profiles". These are then combined with the use of socio-economic (and other) indicators to monitor the household food security situation, particularly in the vulnerable areas and at times when food shortages are anticipated. The rationale behind this approach is that it is possible to detect early signs of food scarcity at the local level and to target prompt relief to those in need. The same system can be used to monitor the effectiveness of any assistance provided and its phasing-out in due course (Borton and Shoham, 1985; Cutler, 1986.2; Autier, 1988; Autier et al, 1989).

Certain difficulties have arisen with these newer early warning systems. These can be grouped as follows:

1. It is not easy to select good indicators, particularly socio-economic ones. Useful socio-economic indicators are likely to be country or area specific. Socio-economic indicators, such as unusual migrations or sales of possessions do not give early warning of food scarcity. Better local crop forecasting (de Waal, 1988) or the use of farmers' opinions (Autier et al, 1989) are more timely. Qualitative indicators, in particular, may require lengthy and sophisticated analysis. Some indicators are not specific, for example, grain prices may rise for reasons other than food scarcity.
2. Countries vary in the capacity and coverage of their field staff, who are the people most likely to collect the additional data needed for early warning.



Most of these early warning systems have been funded initially by the international community. After several good harvests in most Sub-Saharan countries, there may be unwillingness to continue this and unwillingness on the part of governments concerned to take on the additional task of supervising such systems. If the data collection involved could be adapted to also serve developmental purposes this would improve its long-term value (Koenig, 1988).

No early warning system, however precise or however timely, can be of use unless there are effective means of conveying its warnings to those able to take action. Increasing attention is being paid to this aspect and to ensuring that in the countries concerned, there is an effective relief organisation which has sufficient status to commandeer resources (of transport and manpower) in an emergency.

#### Famine Prevention

Droughts cannot be prevented but their effects can be mitigated by a variety of strategies. Early warning systems, with the associated organisational structures for relief, are one aspect of preparedness. Adequate food security stocks at national or, ideally, regional level and the maintenance of all-weather communications with drought-prone areas are others. It has been suggested that some countries may find this model of preparedness inappropriately demanding on government and that, in these circumstances, food security can be assisted by encouraging markets and measures to facilitate freer movement of grains (Eldredge and Rydjeski, 1988). Of major importance is raising purchasing power in vulnerable areas, thus increasing household's resilience in times of stress. This means raising rural incomes, particularly those of the poor, which is seldom easy. Ideally and increasingly, disaster





relief is directed towards this end, using cash-for-work activities, which help maintain rural markets. Such projects may involve improving infrastructure or social services. Alternatively they may be directly targetted at increasing local food production, or at protecting frail resources by combatting soil erosion and desertification. They may aim at reducing vulnerability to drought by conserving water for irrigation or by bunding to concentrate run-off (Critchley, 1990). Such projects are typically small because it is at the local level that they are needed.

To conclude, reducing vulnerability to drought can be achieved by a combination of preparedness and increasing community food security through rural development. The chances of success will depend in large measure on the priority which governments give to realising this end.



## REFERENCES

- Autier, P., 1988: Nutritional assessment through the use of a nutrition scoring system. Disasters 12 (1), 71-79.
- Autier P. et al., 1989: The food and nutrition surveillance systems of Chad and Mali: the SAP after two years. Disasters 13 (1), 9-32.
- Borton, J. & Shoham, J., 1985: Risk mapping and early warning indicators, the Zambia case study. Rome: FAO.
- Borton, J. & York, S., 1987: Experiences of the collection and use of micro-level data in disaster preparedness and managing emergency operations. Disasters 11 (3), 173-182.
- Chambers, R et al., 1979: Seasonal dimensions to rural poverty: analysis and practical implications. Brighton: Institute of Development Studies, University of Sussex.
- Coles, A., 1974: Adapting to water shortage in a year of poor rains. Savannah
- Critchley, W., 1990: Catch the Rain. Ceres 125, 41-45.
- Cutler, P., 1986: The response to drought of the Beja famine refugees in Sudan. Disasters 10 (3), 181-188.
- Cutler, P., 1986, 2: Suggested project priorities in risk mapping; preparedness planning and household food security. Rome: FAO.
- Dichter, C., 1987: The fifth world food survey: an assessment of food supplies and malnutrition. Journal of the American Dietetic Association 87 (12), 1668-1672.
- Eldredge, E. & D. Rydjeski, 1988: Food crises response and emergency preparedness: the Sudan case. Disasters 12 (1), 1-4.
- Glantz, M. ed., 1987: Drought and hunger in Africa: denying famine a future. Cambridge: Cambridge University Press.
- Glantz, M., 1989: Drought, famine and seasonality in Sub-Saharan Africa in African food systems in crisis ed. Huss-Ashmore & S. Katz, New York: Gordon & Breach, 45-73.
- Huss-Ashmore R., 1989: Perspectives on the African food crisis. crisis in African food systems in crisis ed. Huss-Ashmore & S. Katz, New York: Gordon & Breach, 3-44.
- Koenig, D., 1988: National organisations and famine early warning: the case of Mali. Disasters 12 (2), 157-168.
- Millman, S., 1990: Hunger in the 1980s: backdrop for policy in the 1990s Food Policy August 277-298.
- Phillips, P. et al, 1984: Village food systems in West Africa: Gambia. London: International African Institute.



Sen, A., 1981: Poverty and famines: an essay on entitlement and deprivation. Oxford: Clarendon Press.

Shofield, S., 1974: Seasonal factors affecting nutrition in different age-groups and especially of pre-school children. Journal of Development Studies, 11 (1), 22-40.

Shoham, J. & E. Clay, 1989: The role of socio-economic data in food needs assessment monitoring. Disasters 13 (1), 44-60.

de Waal, A., 1988: Famine early warning systems and the use of socio-economic data. Disasters 12 (1), 81-91.



EXAMPLES OF EARLY WARNING INDICATORSBACKGROUND FOR RISK MAPPING

BASICS: POPULATION DISTRIBUTION, MAIN FOOD CROPS  
FOOD AVAILABILITY PER CAP.

AGRO-ENVIRONMENTAL STRESS:  
SOIL EROSION, DEFORESTATION  
RECENT HISTORY OF CROP/STOCK FAILURES  
RECENT HISTORY OF FAMINE

VULNERABLE GROUPS:  
NUTRITIONAL STATUS:  
CHILD MALNUTRITION  
FOOD CONSUMPTION DATA  
INFANT MORTALITY  
MORBIDITY  
FARM SIZE, LANDLESSNESS  
FEMALE-HEADED HOUSEHOLDS

SOCIO-ECONOMIC FACTORS:  
LIVESTOCK OWNERSHIP (RESILIENCE)  
SOURCES ON NON FARM INCOME  
LABOUR MIGRATION  
STOCK MIGRATION  
ACCESS TO LOCAL SERVICES (HEALTH ETC.)  
WATER SUPPLIES

BROADER INFRASTRUCTURE:  
ROADS & RAIL NETWORK  
TRANSPORT FLEET  
STORAGE FOR FOODS

Based on Cutler, 1986.





EXAMPLES OF EARLY WARNING INDICATORSSHORT TERM INDICATORS FOR MONITORING TRENDS

RAIN FAILURE: 10-DAY AGRO-MET. DATA  
LOCAL INFORMANTS' VIEWS

CROP FAILURE: LOCAL QUANTITATIVE & QUALITATIVE ESTIMATES  
SATELLITE IMAGERY OF VEGETATION

GRAIN PRICES: TRENDS IN CEREAL PRICES  
ACROSS AREAS & IN TIME

ASSET SALES: SALES OF LIVESTOCK (ATYPICAL?)  
PAWNING OF VALUABLES/ CREDIT SEEKING  
SALES OF HOUSEHOLD GOODS

ABNORMAL MIGRATION: LABOUR, WAGE RATES  
LIVESTOCK  
UNEMPLOYMENT

NUTRITIONAL STRESS:  
UNDER-NUTRITION LEVELS & SEVERITY  
CHANGES IN DIETARY PATTERNS  
USE OF FAMINE FOODS  
INCREASED ILLNESS

Based on Cutler, 1986.

