

# **MEASURING DROUGHT AND DROUGHT IMPACTS IN RED SEA PROVINCE**

Edited by Roy Cole

**MEASURING DROUGHT AND DROUGHT  
IMPACTS IN RED SEA PROVINCE**

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## **Acknowledgements**

Working in the Sudan during the two years of my tenure as Research Officer for Oxfam Port Sudan has been a challenge. There were many times, particularly during the latter part of my tour, when we could not find food in the market for our field trips not to mention for our daily subsistence. I owe a debt of gratitude to my staff for their willingness to continue to work in such conditions and to subsist on so little. Without their hard work and daily sacrifices none of this work would have been possible.

It has been a rare privilege to work for Oxfam. There are few other organisations in the world like it in terms of its responsible, hardworking staff and its unique relationship with the poorest of the poor. The cooperation and important contributions to the papers in this collection by the Sudanese government is much appreciated. A particular word of thanks is due the National Water Corporation, the Gash Board, the Tokar Delta Board, the Meteorological Department, and the Sudan Survey Department.

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I hope that our contribution will be of use in understanding drought, food stress, culture, and economy in Red Sea Province and will contribute circumventing future emergencies.

## A Note on Orthography and Other Conventions

The editor has endeavoured to follow the orthography adopted by modern Arabists throughout this collection of papers. However, some commonly used words in English, for example, "Arabian", have been spelled without the 'ayn marker, "'". Other Arabic words that are commonly spelled a certain way in English are spelled according to that spelling. For example, "suudaan" has been spelled "Sudan", al-khartuum has been spelled Khartoum. The spelling of proper names was done on a case by case basis according to preferred spelling by the person in question. For example, if an author cited spells his name Osman instead of 'uthmaan, the accepted spelling by Arabists, I have used the spelling preferred by the person cited. For all other words I have used the Arabists' spelling. I have followed, incidentally, the Arabic system of alphabetising authors, first name, father's name, grandfather's name, rather than attempt to adopt the western family name system.

I have preserved the definite article, "al" throughout, even before the haruuf ash-shamsiya in order to avoid confusion. For example, al-Sa'ud is used instead of as-Sa'ud. It should be noted that Sudanese pronunciation differs from Modern Standard Arabic pronunciation in the following sounds:

gaaf for qaaf  
qaaf for ghayn  
siin for thaa° or daal for thaa°  
zaay for thaal and thaa°  
zhaa° for dhaadh

The list below represents the symbols used throughout the present collection of papers. Shadda, or gemination, is represented by a doubling of the consonants as in, for example, the word shadda itself. The long vowels, alif, waaw, and yaa° when acting as a seat for hamza have been transcribed in the short vowel form with °, hamza, immediately following as in qabaai°l, "tribes". Admittedly, this method presents some awkwardness in such words as lu°lu°, "pearls". These short vowels are: fatha, dhamma, and kasra respectively. Sukuun has not been transliterated nor has wasla.

- ' the consonant 'ayn.
- ° the glottal stop, hamza.
- aa the long vowel alif.
- a the short vowel fatha, madd alif, alif maqsuura, and taa° marbuuta.
- aw the diphthong fatha waaw.
- ay the diphthong fatha yaa°
- d the short vowel dhamma.
- dh the consonant dhaadh.
- g the consonant qaaf (except for administrative terminology or where the Modern Standard Arabic "q" is more appropriate).
- gh the letter ghayn.
- h the consonants haa° (aspirated) and haa° (unaspirated).
- i the short vowel kasra.

- iin** the third person plural suffix.
- iw** the diphthong kasra waaw.
- kh** the letter khaaf.
- s** the consonants siin and saadh, and, depending on the word, thaa°.
- sh** the letter shiin.
- th** the letters thaal and thaa°.
- uu** the long vowel waaw between two consonants.
- uw** the diphthong dhamma waaw.
- uy** the diphthong dhamma yaa°.
- w** the long vowel waaw in initial position or after a long vowel or the short vowels fatha or kasra.
- y** the long vowel yaa° and the nisba suffix.
- z** the consonants thal and zaay.
- zh** the consonant zhaa°.

Spelling of words in Tu Bedaawi has followed the Arabic pattern. With sounds that have no equivalent in Arabic the nearest equivalent in English was used.

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## Executive Summary of the Research

When I was appointed Research Officer for Red Sea Province in January 1988, I was given a wide brief: to develop a research programme to measure drought and recovery for Red Sea Province. A related and very important part of my brief was to make Oxfam's relief food allocation system accountable. To accomplish these tasks I chose key areas and key variables to obtain reliable information on vegetation, the market, rainfall and flooding, agriculture, livestock, malnutrition, and the regional economy. I adopted a historical approach to address these topics in order to understand the past and present environmental and economic trends, to provide the necessary historical contrasts to interpret the present, and to contribute some depth to the work of researchers to come who may not have the time or opportunity to investigate difficult sources.

The papers which follow are a product of two years of research done by the Research Section of Oxfam Port Sudan from early 1988 to the end of 1989 and four years of research done by the Oxfam Port Sudan Nutrition Research Teams. Each of the eight papers is intended to address one element which singly, or in conjunction with other factors, affects food security in Red Sea Province. In the conclusion common themes are brought together in a brief discussion of the findings of all the papers.

The first paper is a general introduction to Red Sea Province: its physical geography, rainfall, political organisation, infrastructure etc; the activities and way of life of the people who live there, how they cope with drought and organise their society, plus an overview of famine relief in the province.

Paper two, "Measuring drought impacts and food insecurity in Red Sea Province in 1987 and 1988: a technique for the rapid assessment of large areas", is an examination of drought and socioeconomy in Red Sea province in 1987 and 1988 through a spatial framework. The structure used in the assessments and the assessments themselves form the basis of Oxfam's relief food allocation system in Red Sea Province. The study motivated by a desire to make relief food allocations accountable, to obtain more information about the province, and to investigate methods. Watson's (1976) ecozones were used as the basis for an assessment of each zone on six variables: two representing drought impacts and four representing food insecurity. Results, not surprisingly, indicate that 1988 was much better than 1987 but not in all places. There is still high food insecurity in places where refugees have concentrated (although areas infested by locusts had bad scores as well).

The third paper, "Drought, food stress, and the flood and rainfall record for Red Sea Province", examines the rainfall record for 19 gauging stations and the flood record for 9 flood gauging stations. The purpose of this paper is to document the periods and patterns of drought in the past, define what constitutes drought in terms of the historical record, and examine this record in conjunction with the human historical perception of drought. The results indicate that some famines commonly held to have been caused by drought were caused by other factors that weakened the economic strength of people in Red Sea Province such that normal environmental variation became deadly.

Paper four, "Drought, inflation and the impact of food aid in Red Sea Province, 1980 to 1989", examines the changes in market prices for cereals and livestock from

1980 to 1989. Results of the study show that the terms of trade of cereals to goats, the common currency of trade in Red Sea Province, turned against goats in 1984 in the markets studied but that in 1985 cereal prices declined dramatically and the terms of trade turned in favour of goats. The results of the study suggest that free, province-wide relief food deliveries in early 1985 were responsible for the 56 percent drop in the market value of cereals in 1985 and its continued depression until 1988 when other forces contributed to extreme cereal (and all other commodities) price inflation. The paper also discusses the continued usefulness of free, province-wide relief food deliveries and the impact of new policy associated with the change in government in July 1989 on the cereals and livestock markets.

Paper five, "Nutritional status of children in Red Sea Province, November 1985 to November 1987", examines the data collected by Oxfam since 1985 throughout Red Sea Province on the nutritional status of children under five years of age. Once in 1985 and three times a year in 1986 and 1987 two teams of nutritional researchers surveyed the entire province. Findings of the analysis suggest that the nutritional status of children in Red Sea Province improved significantly with some important exceptions. Rural Port Sudan and North Tokar Districts had children of better than average nutritional status did not improve between 1986 and 1987. More disturbingly, children in Haya District, who had poor nutritional status did not improve between 1986 and 1987. The highest risk of malnutrition was in babies and weaning children. This extends our concern about nutritional status to pregnant and lactating women. Clear seasonal trends in malnutrition rates were seen in the south of the province and not in the north, where there is less rainfall variability. There was no correlation between the World Food Programme relief ration and the nutritional status of children. The effect of the individual settlement explained a large proportion of the variation of the percent weight for height in children in Red Sea Province. The researchers recommend that pregnant and lactating women and babies and children of weaning age are in need of targeted nutritional interventions. Improving the health and welfare of these groups should become largely a gender issue.

Paper six, "Nutritional status of children in Red Sea Province, 1989", is an update to 1989 of paper number four. Delays in fieldwork prevented the analysis of these data with the 1986-87 data. Results indicate that nutritional status in Red Sea Province has improved significantly since 1987, however, the same groups identified as at risk in the 1986-87 study were found to be still at risk. Gender differences became more apparent in 1989 and deserve further investigation.

Paper seven, "Land tenure, agricultural labour, drought and food stress in the Gash, Gash Dai and Tokar agricultural areas", presents the regional economy of southern and central Red Sea Province, focusing on the Tokar and Gash Deltas. Land tenure and agricultural labour and the role of the two agricultural schemes in food security strategies of the people of Red Sea Province is examined in the paper. Results of the study show that sharecropping is a rational risk-minimising economic strategy that assures a food entitlement even in a highly variable environment such as that represented by the Tokar Delta and the Gash Dai. Where the environment is less variable, such as the Gash Delta, wage labour arrangements predominate. Both agricultural schemes were found to contribute significantly to the regional economy and to strengthen rather than weaken the

ability of pastoralists to cope with drought through the provision of thousands of feddans of grazing, vast quantities of crop residues, cereals, and employment.

Paper eight, "Changes in tree density on five sites, Red Sea Province, 1960s to 1989", is a study of change in tree density from the early 1960s to 1989 on five study sites located around the province. The results of the study indicate that dramatic negative changes in tree density have taken place on the study sites in the last 25 years. The findings suggest that the changes are attributable to human rather than environmental impacts. The implications for development work in the province, particularly restocking, are serious.

