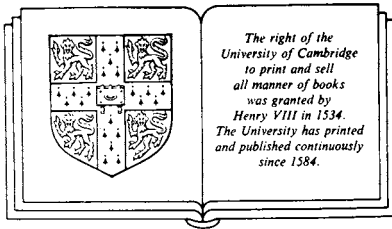


# SALT OF THE DESERT SUN

A History of Salt Production and  
Trade in the Central Sudan

PAUL E. LOVEJOY

Professor of History, York University, Toronto



CAMBRIDGE UNIVERSITY PRESS

CAMBRIDGE

LONDON NEW YORK NEW ROCHELLE

MELBOURNE SYDNEY

PUBLISHED BY THE PRESS SYNDICATE OF THE UNIVERSITY OF CAMBRIDGE  
The Pitt Building, Trumpington Street, Cambridge, United Kingdom

CAMBRIDGE UNIVERSITY PRESS

The Edinburgh Building, Cambridge CB2 2RU, UK  
40 West 20th Street, New York NY 10011-4211, USA  
477 Williamstown Road, Port Melbourne, VIC 3207, Australia  
Ruiz de Alarcón 13, 28014 Madrid, Spain  
Dock House, The Waterfront, Cape Town 8001, South Africa

<http://www.cambridge.org>

© Cambridge University Press 1986

This book is in copyright. Subject to statutory exception  
and to the provisions of relevant collective licensing agreements,  
no reproduction of any part may take place without  
the written permission of Cambridge University Press.

First published 1986

First paperback edition 2002

*A catalogue record for this book is available from the British Library*

*Library of Congress Cataloguing in Publication data*

Lovejoy, Paul E.

Salt of the Desert Sun.

(African studies series; 46)

Bibliography; p.

Includes index.

1. Salt industry and trade – Africa, West – History.

I. Title. II. Series.

HD9213.A56L68 1986 338.2'763'0966 85-12837

ISBN 0 521 30182 3 hardback

ISBN 0 521 52433 4 paperback

# Contents

<i>List of tables</i>	Page	x
<i>List of maps, figures and illustrations</i>		xii
<i>Preface</i>		xiii
<b>1 Salt in the history of the central Sudan</b>		1
The need for salt: an historical overview		1
The salt industry of the central Sudan		5
The limits of the central Sudan salt market		7
The characteristics of the central Sudan salt market		10
<b>2 Consumption of the central Sudan salts</b>		15
Culinary uses		15
Medical uses		20
Tobacco consumption		25
Industrial uses of salt		27
<b>3 The chemistry and geology of the central Sudan salts</b>		33
The chemical composition of the salts		33
The geology of the salt deposits		39
The desert sites		40
The sahel sites		42
The brine springs of the Benue trough		50
Conclusion		51
<b>4 The technology of production</b>		53
Kawar and Fachi		54
Teguidda n'tesemt and the Air Massif		60
The Borno sahel: <i>manda</i> and <i>kige</i>		63
Natron production in the Borno sahel: Mangari, Muniyo and Kanem		74
Salt and natron in the western Dallols		79
Salt from brine in the Benue trough		82
Other salts		86
The low level of technology		88

## Contents

<b>5</b>	<b>The volume of salt production</b>	94
	Kawar and Fachi	95
	The Borno sahel	99
	The western Dallols, Teguidda n'tesemt, Amadoror and Taoudeni	106
	The volume of the Benue brine springs	107
	European salt	110
	Productivity of the salines	112
<b>6</b>	<b>The mobilisation of labour</b>	115
	The seasonal nature of salt production	115
	The migrant workers of Mangari	120
	Migration to Dallol Fogha and Dallol Bosso	129
	Slavery and <i>kige</i> production	133
	Slave labour at the desert sites	139
	Trona production in Foli	146
	Sexual division of labour	148
	Conclusion	151
<b>7</b>	<b>Proprietorship: the rights to salt and natron</b>	153
	Freehold: individual rights to property	153
	Proprietary rights and titles in the Benue Valley	159
	The salt fiefdoms of Borno	163
	Proprietorship of the Dallol salines	170
	Division of salt	171
	Conclusion	176
<b>8</b>	<b>Salt marketing networks</b>	179
	The Tuareg trade	182
	The Lake Chad trade	189
	The Borno trade	191
	Salt depots of the Sokoto Caliphate	200
	The re-export trade in natron	211
	Distribution of the Benue and Dallol salts	216
	Conclusion	219
<b>9</b>	<b>The trade and politics of salt</b>	221
	Desert-side politics before 1800	223
	The decline of Borno	231
	The expansion of Manga industry	234
	Kanem and the salt trade of Lake Chad	238
	The dependence of Borno on the Sokoto Caliphate	242
	The impact of the caliphate at the Benue and Dallol salines	245

The hegemony of the Sokoto Caliphate	247
Conclusion	250
<b>10 The social organisation of trade and production</b>	<b>252</b>
Ethnicity and the relations of production	252
From political economy to class analysis	255
Ethnicity and the salt trade	261
Ethnic fractions and the Hausa diaspora	266
The social basis of production in Borno	269
Slavery and ethnic relations	273
<b>11 Conclusion</b>	<b>279</b>
<i>Notes</i>	285
<i>Glossary</i>	316
<i>Bibliography</i>	318
<i>Archival references</i>	318
<i>Correspondence</i>	324
<i>Field notes</i>	324
<i>Interviews</i>	324
<i>Unpublished theses and papers</i>	328
<i>Published books and articles</i>	330
<i>Films</i>	345
<i>Index</i>	346

## Tables

2.1	Uses and known distribution of central Sudan salts (Hausa terms)	16
3.1	Terms for the different salts of the central Sudan	34
3.2	The desert salts: chemical mixtures of various samples	34
3.3	Composition of salts from the brine springs and other sources of the Benue trough	35
3.4	Chadic salts: chemical composition	36
3.5	The salts of Mangari, Muniyo and Kadzell	37
3.6	Salts of the Dallols and neighbouring areas	39
3.7	Brine concentrations in the Benue basin	50
4.1	Types of <i>manda</i> salt in northern Borno	64
4.2	Sources of Mangari and Muniyo salt and natron	66
4.3	Trona deposits of Foli	77
4.4	Sources of brine for salt-making, Benue-Cross River basins	83
5.1	Estimates of central Sudan salt production	95
5.2	Volume of salt and dates exported from Fachi and Bilma, 1903–14	96
5.3	Volume of salt exports from Fachi, 1907–76	98
5.4	Volume of trona imported into Borno, 1906–12	101
5.5	Trona production in Foli, 1961–67	101
5.6	Trona production by deposit, 1965, 1967	102
5.7	<i>Manda</i> production	103
5.8	Salt production at some Benue Valley locations: 1920, 1941	107
5.9	Salt production at some Benue Valley locations, selected years	108
5.10	Imports of European salt into northern Nigeria, 1903–07	111
5.11	Productivity of the salines, 1915	113
6.1	Work units in the production of <i>manda</i> salt, 1905–06	123
6.2	Work units in the production of <i>manda</i> salt, 1915	124
6.3	Work units in the production of <i>manda</i> salt, Mangari, 1936	126
6.4	Salt <i>tunga</i> in Dallol Fogha, 1924	131
6.5	Social status of workers in <i>kige</i> camps	136
6.6	<i>Kige</i> salt production in Kadzell, cantons of Deoua and Diffa, 1932	137
6.7	Population of <i>kige</i> camps, 1940–41	138
6.8	Population of Kawar, 1906	144
6.9	Population of Kawar and Fachi, 1907	144

*Tables*

7.1	Scale of production, Benue sites, 1941	160
7.2	Size of holdings at brine springs, Awe District, 1941	160
7.3	Proprietors of the Mangari salines, 1905–06	165
7.4	Division of salt, Ari Kombomiram, 1946	174
7.5	Income from salt production, Awe District, 1937	176
8.1	Composition of a Bilma salt caravan, 1905	184
8.2	Value of seaborne natron imports and exports through Lagos, 1870–1901	213

## Maps

1.1 Sources of salt and natron in the western and central Sudan	9
4.1 Salt and natron sources in the Chad basin	62
4.2 The brine springs of the Benue–Cross River region	85
8.1 Commercial centres of the salt trade	180

All maps were drafted by the Cartographic Service, Department of Geography, York University, Ontario, Canada

## Figures

3.1 A trona depression (Bouquet, 1969, 132)	48
4.1 Furnace accessories for the production of <i>manda</i> (Foureau, 1905, 111, 947)	67
4.2 Sketch of oven and filter for <i>kige</i> manufacture at Bitur (Browne's report of 19 May 1906, SNP 7/8/2281/1907, Nigerian National Archives, Kaduna)	73

## Illustrations

4.1 Bilma salt works (reproduced by permission of M. Le Coeur)	56
4.2 Manga filtering devices for <i>manda</i> salt (reproduced from Jean Tilho, <i>Documents scientifiques de la Mission Tilho</i> , 1906–09, Paris, 1910–11)	68
4.3 Manga <i>manda</i> ovens (Tilho, 1910–11)	69
4.4 Loading blocks of trona (reproduced by permission of G. Y. Gac)	79
4.5 Keana salt works (reproduced from Onuora Nzekwu, 'Keana Salt Camp', <i>Nigeria Magazine</i> , 83, 1964)	84



# 1

## Salt in the history of the central Sudan

### THE NEED FOR SALT: AN HISTORICAL OVERVIEW

Salt satisfies a physiological need, and it may well be that salt is also man's earliest addiction.<sup>1</sup> The body requires salt because of its role in regulating osmotic pressure and its part in hormonal and enzymatic processes, but recent studies suggest that the addition of salt to food is usually not necessary. Most foods contain enough salt naturally to meet body requirements, and the body can adapt to salt-free diets. People who consume relatively high proportions of animal products need the smallest amount of salt, since meat and milk are naturally saltier than cereals and vegetables. Diets that are dependent upon grain as a staple food are more apt to be supplemented with additional salt than diets based on animal products. Consequently, nomads have usually consumed less salt than sedentary farming populations. Although the amount of salt needed as a dietary supplement is open to dispute, salt does reduce the danger of dehydration because salt intake encourages people to drink more fluids. In a particularly hot climate, the usual physiological requirements that are largely satisfied through the salt contained naturally in animal and vegetable products have usually been supplemented in order to counteract the effects of the tropical sun. The normal level of salt consumption in temperate zones – 4.5 kg per year – can be satisfied largely through the salt contained in food sources, but in the tropics this level can easily double; at least people have wanted to consume more salt when and where it is available.<sup>2</sup>

Whether or not salt is a necessary additive, people have valued it as a necessity. Salt was always a major item of trade; it could be given as a gift and was a treat on special occasions. The poor usually had to make do with impure substitutes made from local plant ash, while the wealthy compared different salts as a gourmet savours different foods. In addition, salt has been fed to livestock in considerable quantities, and one salt or another has had important medicinal and industrial uses. These other uses, combined with the culinary demand for salt, increased the value of salt as a commodity. Only in recent times, as the result of advances in science and technology, has salt become less important in trade, partly because salt has become cheaper and more plentiful and partly because salt is more often recognised by its chemical constituents than by its generic term.

Robert Multhauf, a leading historian of common salt (sodium chloride), explains contemporary ignorance of the historical role of salt in terms of the

## *Salt in the history of the central Sudan*

major technological and scientific advances that have occurred over the past several centuries. Common salt is a principal source of sodium and chlorine for use in industry; today its culinary usage is far less important than in the past. Moreover, it used to be that salts were impure mixtures, often containing carbonates, sulphates and chlorides of potassium, magnesium and soda. Scientific works and encyclopedias once listed salt as a major item for discussion, but now it is more common to find the chemical ingredients instead. This practice has reflected the increasingly esoteric nature of scientific knowledge and the greater isolation of the general public from their immediate surroundings.<sup>3</sup>

The search for salt to fill culinary requirements and medicinal needs involved considerable technological and scientific experimentation, which were important factors in the development of chemistry and geology as distinct sciences. This process affected large parts of the world; such has been the universal interest in salt. Before the seventeenth century the most advanced production was in China, but thereafter European centres underwent a transformation that led to the major scientific discoveries that have turned salt from a scarce commodity into an extremely common one.<sup>4</sup> A brief review of the advances in salt technology and scientific knowledge demonstrates how variations in geological conditions and the knowledge of salt chemistry have shaped the development of the salt industry in different settings.

Salt is found almost everywhere, although this has been known only as a result of scientific advances in the past two hundred years. The Chinese were the first to discover that salt could be found deep under the earth's surface, at depths of several hundred metres or more.<sup>5</sup> As long ago as 500 AD, the Chinese began to drill for brine, a technique that was only discovered in Europe in the eighteenth century and was not known in Africa until the twentieth century. Drilling led to the discovery that large and easily recoverable deposits were located in many places and could be either mined or turned into brine and pumped to the surface.

Perhaps no other aspect of salt production experienced more experimentation than techniques to concentrate brine.<sup>6</sup> Most devices were elaborations of the arrangement for promoting atmospheric evaporation and included elongated pieces of porous clay in long wooden troughs (Schwabisch Hall), graduation houses in which brine was manually circulated over bundles of straw (Langensalz, Naisheim, Sulz, Sulza, Lombardy), thorns (Wilhelms-gluckbrunn), or ropes. Graduation houses were increased in size; at Sulz manual pumps and siphons were employed to circulate brine in houses that were as long as a kilometre, with two or three walls for greater surface area. These techniques reduced the need for fuel to boil brine dry, but the introduction of furnaces and improvements in furnace design also increased production. Chimneys made it possible to achieve greater temperatures and conserved fuel. Pans were adopted as a replacement for pottery; the pans could be used again; they conveyed heat better and could be pre-heated.

Chemical discoveries also improved production techniques. In the course of the eighteenth century, the various salts in the different European salines were isolated, which allowed the production of purer salt and the development of subsidiary chemical, principally medical, compounds.<sup>7</sup> At Luneburg, blood and beer were introduced to the brine to remove impurities as early as the fourteenth century, but the discovery of Epsom salt (magnesium sulphate), Glauber's salt (sodium sulphate) and soda (sodium carbonate) helped salt-makers isolate sodium chloride in ever purer amounts. These discoveries depended upon experiments with the mother liquor, the residue in the salt pans after total evaporation, and the recognition that salts precipitate out of solution at different concentrations and temperatures.

Salt was once that rare commodity sought after by man in much the same way that petroleum is today. The two are linked historically, in fact. Early petroleum discoveries were frequently associated with the extraction of salt, and petroleum soon became a source of chemicals used in combination with the elements contained in salt. Today, however, the association between salt and petroleum has been reversed. New sources of salt are located as a result of the search for petroleum, and now salt is so common that no one looks specifically for it. Indeed, the availability of salt has changed its attractiveness to man. Where it was once the rare commodity that required intensive labour to secure it, today, thanks to technological breakthroughs in chemistry, physics, engineering, and other fields, the salt industry is no longer labour intensive. Where once it took thousands of man-hours to produce a small quantity of salt, now it requires only a few man-hours to produce vast quantities.

Throughout the sixteenth, seventeenth and eighteenth centuries, salt was an important component of European economic and political history.<sup>8</sup> The European industry was the concern of governments interested in taxing output – salt was an easy target because the sources of salt production were fixed. Salzburg and other places were sometimes associated with small principalities; at other times salines were associated with political struggles on a larger scale. In France and many other countries the salt tax was a political issue.

The virtual unimportance of salt in the politics of contemporary North America and Europe is in sharp contrast to its role in the past. Salt is still discussed; salt-free diets and other popular, quasi-scientific interest in salt or the lack of salt has periodically been a topic of conversation at social gatherings, sometimes having relatively passionate advocates whose political stance – in the great scale of things – only serves to emphasise the relative unimportance of salt. Only when it comes to the use of salt on icy highways – with the destructive impact on automobiles and leather boots – does a passion concerning salt reach epidemic proportions. As is the case with anti-salt faddists, moreover, the use of salt to melt ice raises cries of frustration, not desire. The contemporary age is anti-salt, in part because of a negative public image and in part because salt is so cheap that it cannot be taken seriously in

## *Salt in the history of the central Sudan*

an economic sense. The present attitudes are so remarkably in opposition to the once lofty position of salt in society as to be an accurate testimony of the advances of technology. Once a luxury, now salt is truly common.

The salt trade in Africa has an importance historically that is parallel to its history elsewhere, but unlike its European and Asian counterparts few technological innovations took place that led to other breakthroughs in modern science and industry. Indeed the African industry has remained technologically backward, despite some modest advances developed locally and introduced from outside. The African industry can be said to be dying a slow death, as its counterparts elsewhere in the world have long since experienced. Whether or not modern technology can exploit the geological conditions that account for salt remains to be seen, but the relatively recent decline of salt production in Africa enables scholars to examine this primitive industry in some detail, both to throw light on the industry in its own right and also for comparative purposes in understanding the history of salt production at other times and places.<sup>9</sup> Technological innovation may revolutionise production at some salt deposits – so that various chemicals other than salt are produced. Most sources of salt will probably fall into disuse, as some already have. The most vulnerable are brine springs whose brine content is too low to make them economically attractive when so much salt is available elsewhere. Explorations have failed to reveal large underground salt deposits at most brine sites. The surface deposits of the Sahara and sahel are another matter, however, and some of these are attracting attention and possibly can be developed. Trona deposits near the shores of Lake Chad, for example, are very large, with a possible annual output of 120,000 tonnes, should the need for sodium or carbon ever warrant the development of a modern industry there.<sup>10</sup> It may be that valuable deposits of other minerals are located close to these and similar salt sources. Commercial quantities of uranium are now being mined near Teguidda n'tesemt in Niger, long a source of salt and once a source of copper, too. Perhaps future discoveries of other modern treasures await the salt districts.

Salt deposits in Africa have drawn the attention of outsiders – Arab geographers and European adventurers – for a long time, not because these observers were particularly interested in salt as such but because salt was sometimes associated with the gold trade. Indeed gold and salt were reputedly exchanged measure for measure, which can only be a myth but one that does serve to highlight the importance of salt.<sup>11</sup> The salt of these myths came from rock salt deposits – in Ethiopia and in the western Sahara. At Taoudeni, Toghaza, and Ijil, the salt is relatively pure sodium chloride in tremendous deposits which date back thousands of years into the geological past. In fact salt was not as scarce as these myths would lead us to suppose, but relatively pure sodium chloride was. Deposits of impure salt – mixed with other compounds and dirt – and methods of making salt from ocean water, the ashes of plants and other means have satisfied the demand for sodium chloride when rock salt deposits were lacking or insufficient.

THE SALT INDUSTRY OF THE CENTRAL SUDAN

This book analyses the production and distribution of mineral salts in the central Sudan, a region that encompasses the Lake Chad basin, the south-central Sahara Desert, the Benue River basin, and the Niger Valley from the confluence with the Benue northward to the sahel (the southern border zone of the Sahara). In the nineteenth century, the central Sudan included a loose federation of Tuareg nomads centred on Agades and two major savanna states, the Sokoto Caliphate and Borno. Together they dominated the whole region. Before the middle of the eighteenth century, Borno included most of the Chad basin and parts of the central Sahara northward along the axis of the Kawar oases. In the nineteenth century Borno was reduced to half its former extent but still controlled much of the Chad basin. The Sokoto Caliphate emerged after 1804 through the amalgamation of over thirty emirates that had come into being through the Islamic holy war (*jihad*) of Shehu Usuman dan Fodio (d. 1817). Previously a series of smaller states had dotted much of the territory that was subsequently united under the caliphate. The most important of these were the Hausa states of Katsina, Kano, Zamfara, Zazzau (Zaria), and Gobir – an area which became the heart of the caliphate. Military expansion also extended southward to incorporate Nupe and large parts of Oyo (the major state in the interior of the Bight of Benin during the height of the Atlantic slave trade), south-eastward into the Benue basin and the Cameroon highlands, and westward across the Niger River. The Tuareg federation was centred on the Air Massif and neighbouring parts of the sahel, including Adar, Damergu and Azawaq. The tribes that led a nomadic existence in this area recognised the Sultan of Agades as their titular ruler, but in fact each fraction ran its own affairs, as had been the case for several centuries.

Most of the salt sources under consideration were located in Borno; a few were found in the Sokoto Caliphate, while the Tuareg controlled several important desert salines. The Borno industry can be subdivided according to province; Muniyo, Mangari, Kadzell and Foli. Furthest west was the hilly region of Muniyo, where 23–40 deposits were found; immediately to the east were the depressions of Mangari, with an additional 100 or more deposits; and between Mangari and Lake Chad was the province of Kadzell, located north of the modern boundary between Nigeria and the République du Niger. Kadzell was a source of wells infested with salt. The final salt district in Borno was Foli, a part of Kanem, located on the eastern shores of Lake Chad, which was the location of a number of trona depressions. The major sources in the Sokoto Caliphate included two valleys, Dallol Fogha and Dallol Bosso, that run south into the Niger River immediately to the west of the present boundary between Nigeria and Niger, and a dozen or more brine springs in the Benue River basin. The most important springs were found at Awe, Keana, Azara, Akwana, and Bomanda. The Tuareg-controlled salines included the Kawar oases (especially Bilma), Fachi (located 170 km west of the

## *Salt in the history of the central Sudan*

Kawar oases), and Teguida n'tesemt (located west of the Air Massif).

A regional perspective is adopted here for analytical purposes because the major sources of salt supplied much of the same area; the salt market can be thought of as constituting a series of overlapping distributional systems that radiated outward from each source. Many of the more important salines competed throughout the region, but the smaller ones had more localised networks. The markets for the different salts also depended upon chemical composition and purity, as well as proximity to competing sources, because the use of the salts varied with their chemistry. By focussing on the central Sudan as a region, it is possible to examine the competition between the various salts and thereby assess the relative importance of each. This market-centred approach also allows a study of different methods of salt production, since salt technology depended upon various geological, climatic and demographic settings. As a consequence of a regional perspective, therefore, it is possible to compare differences in production techniques and marketing strategies and how these have changed over the years.

Three major benchmarks can be identified in the history of the central Sudan that had important consequences for the development of the salt trade. The first was the Great Drought of the middle of the eighteenth century (1738–53); the second was the *jihād* (1804–12); and the third was the imposition of British and French colonialism (1897–1903). This study of the salt trade reconstructs the industry in the late nineteenth century, and from this baseline attempts to uncover changes that resulted from the Great Drought and the *jihād*. The colonial conquest destroyed the political structure within which the salt industry had operated, and because much of the documentation for this study is derived from early colonial reports and recently-collected oral data, a major methodological problem has been deciphering the impact of the conquest.

The Great Drought of the eighteenth century upset a balance of power in the central Sudan that had existed since the fifteenth century, when Borno had achieved its ascendancy in the region and the Tuareg confederation at Agades had come into being.<sup>12</sup> Until the Great Drought, Borno virtually dominated the salt market of the central Sudan, since most salt districts, including Kawar and Fachi as well as those in the Borno sahel, were within its political frontiers. The other salines were subdivided into three districts, each independent of the others. The Tuareg of the Agades Confederation controlled Teguida n'tesemt; Dallol Fogha (and probably Dallol Bosso) were part of the Hausa state of Kebbi; and the Benue salines were in the Jukun confederacy of Kwararafa.<sup>13</sup> After the Great Drought, Kawar and Fachi were brought into the orbit of the Tuareg, thereby reflecting a shift in the balance of power between Borno and the Agades Confederation. This change in commercial patterns destroyed the dominant position of the Borno state in the salt trade, an adjustment that presaged the far more serious economic decline after its losses in the *jihād* of 1804–12, when the consolidation of the Sokoto Caliphate to the west resulted in the emergence of a far larger and

### *The limits of the central Sudan salt market*

more prosperous state in the region. The caliphate not only came to dominate the salt trade, in part through a commercial alliance with the Tuareg and in part through the incorporation of a substantial market within its domains, but the caliphate also seized the Benue salines, Dallol Fogha and Dallol Bosso. With the rise of the caliphate, a new division of the salt industry was achieved. Borno continued to control the provinces of Muniyo, Mangari, Kadzell and Foli; the Tuareg dominated the marketing of the desert salts, and the caliphate held the Dallols and the Benue salines. The distributional networks for all the salt sources became centred on the caliphate because of its market. This basic division between Borno, the caliphate and the Tuareg lasted until the European conquest.

#### THE LIMITS OF THE CENTRAL SUDAN SALT MARKET

A regional perspective that concentrates on the central Sudan depends upon a rough correspondence between the market for the various salts and the major salt sources of Borno, the Sokoto Caliphate and the desert immediately to the north of these two states. Such a correspondence is invariably rough because some of the salts produced at the central Sudan locations were exported further afield than Borno and the caliphate, while salt from outside the central Sudan was imported into parts of the region. In order to place the following study in perspective, it is necessary to identify the limits of the market for central Sudan salts.

Broadly speaking, the central Sudan included that territory that was self-sufficient in salts and hence can be distinguished from the northern Sahara and North Africa, the western Sudan, the area east of the Chad basin, and the forest region along the Guinea Coast to the south. While the boundaries separating these different regional markets were never clearly delineated, a number of generalisations are useful in establishing the relative autonomy of the central Sudan from other sources of salt. First, the many salt sources of the northern Sahara supplied North Africa and local Saharan markets, so that very little – if any – salt flowed across the desert in either direction. The only exception to this generalisation was the transport of some salt – perhaps a few hundred tons – from Amador in southern Algeria to the central Sudan. Secondly, the frontier between salt from the Guinea Coast and the savanna to the north was never clearly defined because some types of salt from the central Sudan were needed in the forest zone for medicine, livestock and tobacco, while other types of salt could not compete with sea salt or imported European salt. Locally-made sea salt penetrated the interior all along the coast, from the Niger Delta and the Cross River estuary in the east to the mouth of the Volta River in the west (and indeed continuing along the coast to Mauritania to the north-west and Angola to the south). European salt became a major import by the late eighteenth century and accounted for at least 8,000 tonnes for the Bight of Biafra alone by 1845.<sup>14</sup> European imports gradually undermined local salt production and appear to have penetrated further and further into

## *Salt in the history of the central Sudan*

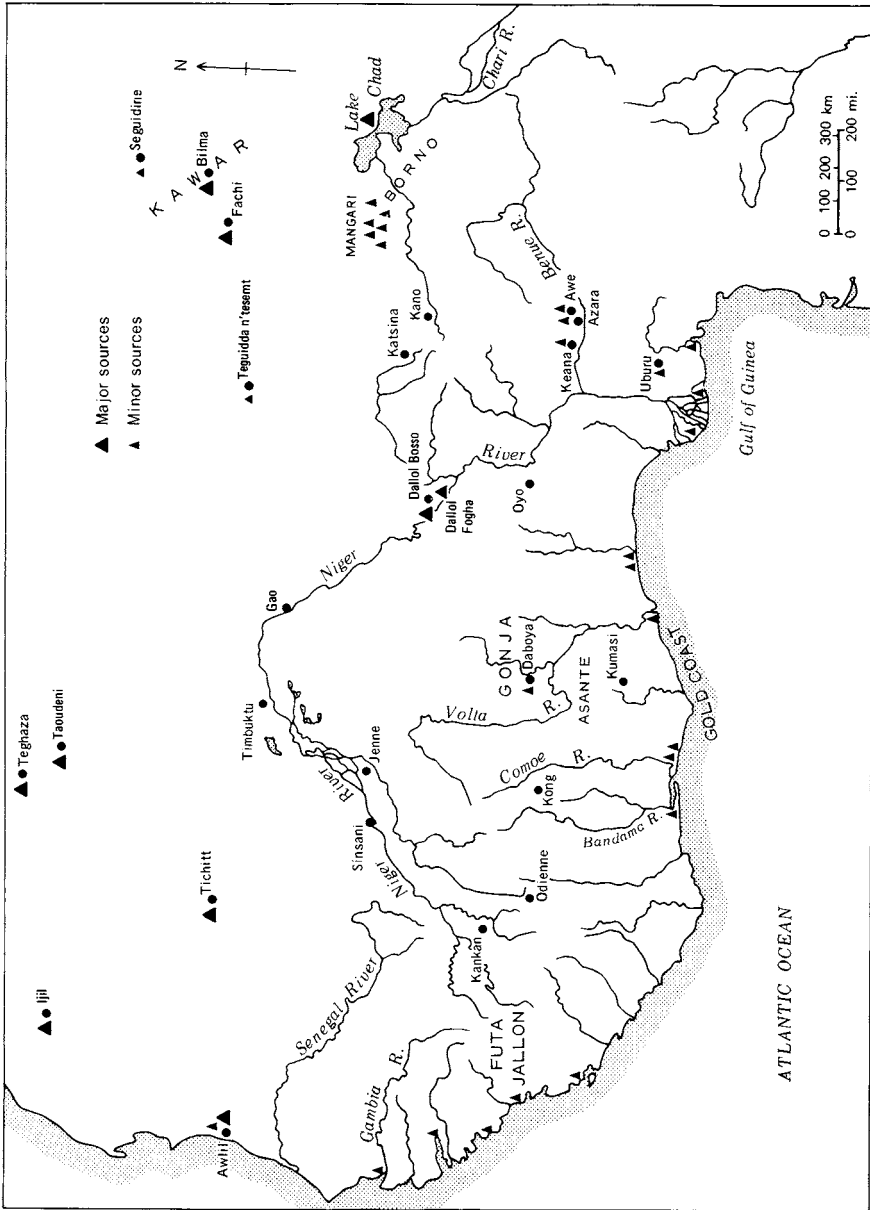
the interior, reaching the central Sudan in appreciable quantities by the last decades of the nineteenth century.

The eastern and western limits of the central Sudan salt market can be established as follows: the eastern boundary passed south through Kanem, east of Lake Chad, to the Chari River valley, while the western boundary was roughly parallel to the Niger River valley, downstream from Timbuktu to the confluence with the Benue. The regions to the east and to the west were similar to the central Sudan in that they straddled the ecological divide between desert and savanna, and consequently similar patterns of desert-side trade prevailed in all three regions.<sup>15</sup> The location of salt sources was an important factor in distinguishing separate desert-side regions; the central Sudan stands out because the various sources (Kawar, Fachi, and Teguidda n'tesemt) satisfied the same geographical area. The western Sudan and the region east of Lake Chad constituted similar regions in which several sources of salt supplied overlapping markets within each region. Invariably there was some overlap between adjacent regions.

To the east of the central Sudan, salt came from a number of deposits in the Borkou–Tibesti–Ennedi region. Demi in Ennedi and Bedo in Borkou were the most important sites, and their output supplied much of the area east of Lake Chad and southward to the upper Ubangi River basin. The Donza, who lived at Bedo and Tigui, worked the Bedo deposits. The salt was formed into moulds that weighed 2–2.5 kg. In 1955, 3,000 camels were used to transport about 400 tonnes of Bedo salt to markets in Kanem and Batha; some salt was sent as far as Marrua in Cameroon. The salines at Demi supplied 80 per cent of the salt for the region east of Kanem. A subgroup of the Bideyat – the Taoua – worked the salines, although at one time the Gaeda also were involved in production. Many different nomadic groups – Teda, Gaeda, Bideyat, Zagawa and others – carried the salt south to Wadai and Batha. The volume of the trade appears to have been of the order of 1,150–2,000 tonnes annually.<sup>16</sup> Soda (sodium carbonate) was available at Ouadi Doum, Ounianga, Mogoro, Teguedei, Mardingai, Sa, Dourab and Toro, which is one reason why trona – a substitute for soda – produced on the east shores of Lake Chad tended to flow west and south. As much as 1,500 tonnes were produced at the Borkou sites (Mardingai, Sa, Dourab and Toro) alone.<sup>17</sup> Salt was also found further east still. The Ethiopian region represented another distinct area of salt production and trade. Salt was found in the Dunahil depression in Eritrea, in the immediate interior of the Red Sea, and was extracted in bars for use as a currency and for consumption. This salt was distributed widely in the interior of Ethiopia as far west as the borderlands with the modern Republic of Sudan.<sup>18</sup>

The principal inland sources of salt for the western Sudan were Ijil, Taoudeni and Tichitt, and there were also important salines along the Atlantic coast as well. The history of these sites is relatively well known, thanks to the research of E. A. McDougall on Ijil and Tichitt and to a variety of scholars who have studied Taoudeni and its predecessor, Teghaza.<sup>19</sup> Ijil rock salt came





Map 1.1 Sources of salt and natron in the western and central Sudan

## *Salt in the history of the central Sudan*

from the basin of what appears to have once been a vast Saharan lake, while Taoudeni rock salt was mined in shafts from the remains of a similar lake. Tichitt salt, known as *amersal*, was less pure than the others; it was a mixture of sodium chloride and probably soda and other salts. Water from the annual rains in the sahel collected in a number of basins near Tichitt, and the salt was left behind as an efflorescence as the water evaporated.<sup>20</sup> These three sources produced much of the salt for the interior regions of the western Sudan; one or the other of the desert salts was found along trade routes to Asante in the south-east and to the kola forests south of Wagadugu further west. Rock salt from Taoudeni was even brought into parts of the central Sudan, so that the dividing line between the market for this salt and a number of the salines of the central Sudan was not as clearly defined as between central Sudan salts and other external sources. Natron (mixtures of soda and other salts) from the central Sudan also flowed west to the Volta basin and the middle Niger Valley. Total volume of trade from the western Sahara sites was of the order of several thousand tonnes annually; in the nineteenth century probably no more than 100 tonnes of Taoudeni salt entered the central Sudan. Camel caravans, involving thousands of animals, transported most of the salt to Timbuktu and the Maraka towns of the middle Niger Valley, from where the salt was carried further afield. Salt also came from the sea coast. In Sierra Leone, Sine-Saluum, the mouth of the Senegal, and elsewhere, elaborate salt works were developed to trap ocean water for solar evaporation.<sup>21</sup> This salt was of two types; from the Gambia south to Sierra Leone, sea salt was in granular form, tightly packaged in mats to preserve it. In the region of Gandiole, at the mouth of the Senegal River, and in the depressions along the Aftouth in Mauritania, sea salt was mined in bars. Finally, salt was imported from Europe – much of it sea salt from near Marseilles – at a relatively early date.<sup>22</sup> The Senegal and Gambia Rivers made access to the interior possible for European ships, and the many overland routes inland from Senegambia and the Upper Guinea Coast enabled merchants to deal in European salt as well as local sea salt.

### THE CHARACTERISTICS OF THE CENTRAL SUDAN SALT MARKET

The central Sudan lacked rock salt deposits which were relatively pure in sodium chloride. Only at Amador, in southern Algeria, were such deposits available, and while some salt from Amador was exported to the central Sudan, at least since the early nineteenth century, Amador salt has never satisfied the demand for salt in the central Sudan.<sup>23</sup> Problems in transport and supply seem to explain this failure; the distance between the major savanna markets and Amador was considerable – over 1,000 km. The salt from Taoudeni came even greater distances, and again there was never the possibility of satisfying the central Sudan market from this source. The deficiency in relatively pure salt was overcome in other ways. Most important, people settled for less pure substitutes – mixtures of sodium chloride and other compounds which were used in the place of pure sodium chloride.