A history of agriculture in Northeastern Nigeria

Roger BLENCH

ABSTRACT

Little is known of the history of agriculture in the North-East of Nigeria, due to an absence of archaeological data or even contemporary descriptions of farming systems. The paper is a preliminary attempt to outline such a history, providing a narrative that links hypotheses about prehistory with documented changes in the present era. Traditional agriculture is often opposed to "modern" farming techniques, but the dynamism of crop repertoires in the pre-colonial era argues that this concept is not very useful.

Keywords : history, agriculture, cultivated plants, North-East of Nigeria

RÉSUMÉ

L'histoire de l'agriculture au nord-est du Nigéria est peu connue. Ceci est dû à l'absence de données archéologiques et même de descriptions contemporaines de systèmes agraires. Le présent article est une première tentative pour tracer les grandes lignes de cette histoire, sous réserve que ce récit rattache les hypothèses sur la préhistoire aux changements documentés des temps actuels. L'agriculture traditionnelle est souvent opposée aux techniques agricoles "modernes", mais le dynamisme des récoltes répertoriées pendant l'ère pré-coloniale incline à penser que ce concept n'est pas d'une grande utilité.

Mots-clés : histoire, agriculture, plantes cultivées, Nigéria du Nord-Est

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1. INTRODUCTION

The title of this paper is a deliberate *hommage* to a well-known paper by Nick David published in the mid-1970s (David 1976). That paper was a striking first attempt to use evidence from crop repertoires to establish the historical pattern of adoption and change of crops in Northern Cameroon.

This paper has much the same goal with respect to Northeastern Nigeria - with some important methodological differences. These relate largely to the sources of evidence. In the first place, apart from the work of Connah (1981 and other references therein) there has been no significant archaeological work in this area. Secondly, there is little secondary literature of any importance relating to crops. By comparison with Northern Cameroon, the general ethnographic literature is extremely impoverished and often relates more to material culture and traditional religion than economic topics. Early travellers are useful for tracking the spread of "new" crops such as the cultigens of South American origin, but listing references to *gussub* in Denham and Clapperton adds relatively little to our knowledge of the history of sorghum in this region.

Another aspect of this type of agrarian history is the integration of the recent past with prehistory. Because of the disciplinary boundaries that separate prehistorians from anthropologists and development specialists, history often takes on a bipartite appearance. Prehistory and the early colonial period being alotted the "academic" slot and recent change the province of developers or professional agriculturalists. However, the development documents of two decades ago, such as the Land Resource Development Reports, are the historical material of today. More importantly, if prehistorians become more aware of the processes of change that can be documented for the immediate present they would perhaps find more flexible ways of interpreting the past. Conversely, if developers were more familiar with agricultural history, their schemes might have a better chance of success.

Although it is often assumed that the nearer the present, the better the documentation for historical change, this is often not the case in Nigeria. The historical archives essentially cover the colonial period and provide documentation of the processes of administration, and more occasionally descriptive ethnography of considerable interest. Since 1960, the volume of printed material has multiplied dramatically and become correspondingly dispersed. Less of it is descriptive and more proscriptive — in other words it is easier to find out what the authorities want farmers to do than what they are actually doing. Similarly, the rise of a professional agronomy establish-

ment has meant an expansion of research papers based on station plots and simulated farm conditions rather than actual farms. Finally, with the exception of the University of Maiduguri, the research concentrations are in the centre of Nigeria, and Borno and Gongola State tend to be under-represented compared with, for example, Hausaland.

Apart from the record of historical change, Northeastern Nigeria also provides a testing ground for theories of the material correlates of political systems. A variety of highly structured hierarchical polities have arisen in this region, most notably the Kanuri kingdoms, but prior to that the less well-documented kingdoms of Wandala and Sukur and later the Lamidate of Yola. In the southwest of the region, Fika and Pabir were also partly centralized state-like systems. To the south and west, these polities confronted a large zone of more diverse and less numerous peoples with whom their relationship was (and is) ambiguous — on the one hand, initial contacts were almost invariably through warfare and raiding — but those who came to raid stayed to trade and the gradual exploitation of the produce of this region, the evolution of caravan routes and the diffusion of cultural and social practices is a narrative whose elicitation has hardly begun.

The paper also has an additional goal — to underwrite the often vague platitudes about the dynamism and flexibility in traditional farming systems with evidence. The historical dimension makes it possible to see that the common opposition between "traditional" and "modern" so beloved of developers and often of anthropologists interested in other aspects of society is not really very useful. Farming systems respond to the rather crude pressures of economics and more complex situations created by innovation, mirroring types of change in the larger society.

2. METHODOLOGY

This type of agrarian history essentially depends on three types of source material; archaeology, historical records and current ethnographic research. However, concealed within descriptive ethnography is the evidence of linguistics. Names of plants, tools and systems can uncover historical stratification of agricultural innovation once correctly interpreted. So little work has been published on crops and farming systems in this region that it is impossible to draw broad conclusions from the distribution of species. However, lists of names for food-crops in a variety of languages do exist and these provide a basis for constructing a historical stratification. A study of the historical stratification of food plants among the Nupe people was published in Blench (1986).

Once the research moves on to a larger canvas, it is possible to establish which crops show a variety of reconstructible roots in the various language families and which cross linguistic boundaries, suggesting more recent diffusion. This technique was first explored by Williamson (1970) in a paper exploring the food-crops of the Niger Delta and more recently for selected plants in Southern Nigeria (Williamson, forthcoming). A similar study of the historical stratification of food plants among the Nupoid-speaking peoples is Blench (1989).

One aspect of this type of reconstruction is the comparison with nearby language families. For example, the Benue-Congo languages of Southern Nigeria represent a large, complex and relatively well-documented group. It is possible to show that a variety of food-plants will reconstruct in Benue-Congo languages — for example, the aerial yam and the cowpea. This makes it virtually certain that these are ancient domesticates in this general region and that to interpret the evidence from neighbouring families we can at least assume a general antiquity for the region. Map 1 shows Nigeria with general indications of regions, place-names and other language families referred to outside the region that is the focus of the paper.

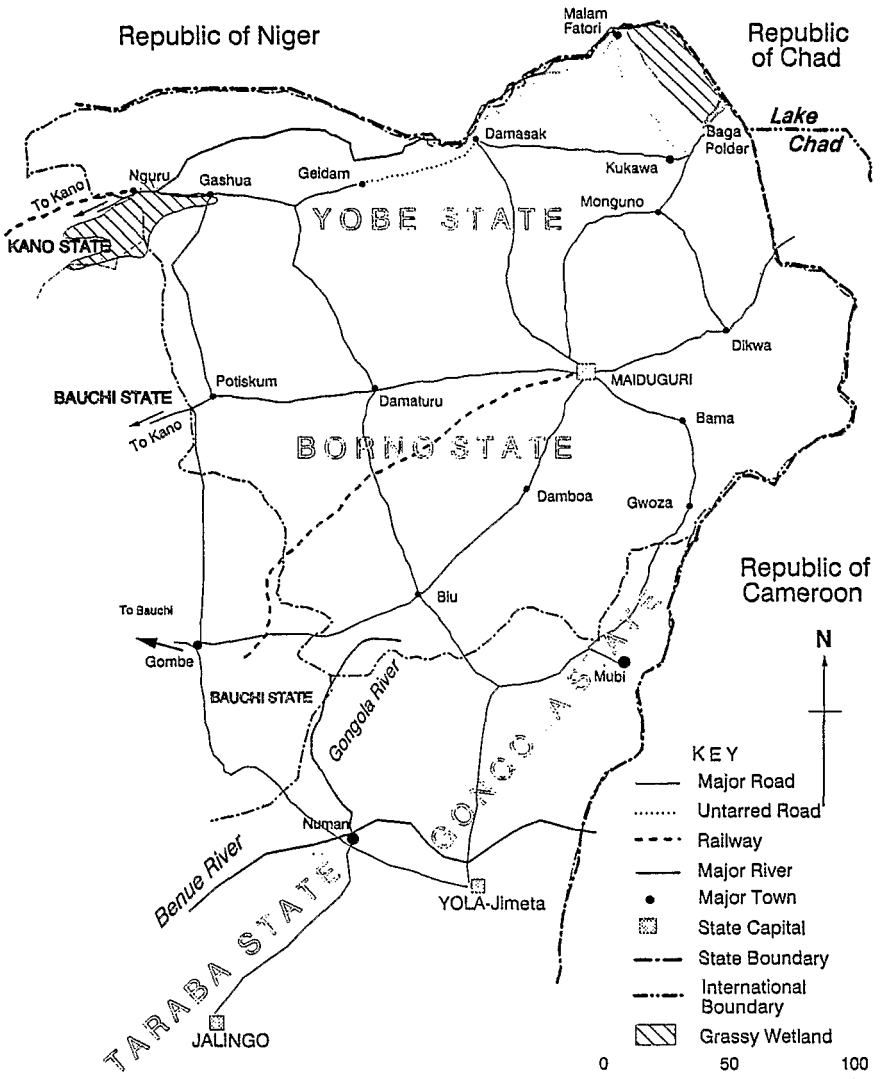
An interesting problem in relation to the comparison of terms for food-plants in various languages is the problem of relexification, *i.e.* the replacement of an older term by a loan-word from a more prestigious language. For example, the rise of Hausa as a prestige language in Northern Nigeria and the retreat of both Fulfulde and Kanuri has sometimes had the effect of replacing indigenous terms with Hausa borrowings. Sometimes this can be detected by using early vocabularies such as Barth's, but where sources are less complete only more detailed ethnobotanical research will uncover the correct history of individual crops.

3. SOURCE MATERIALS

3.1. Archaeological data

Essentially there are two different streams of archaeological data that inform and bedevil any discussion of the prehistory of Northeastern Nigeria. The first is the work of Connah at Daima in northern Borno. Connah (1981) summarizes all previous references and is an attempt to put the excavation findings into a broader environmental context. Connah (1984) reports on a survey of sites in Southern Borno but this has yet to be followed up any extensive excavation. Comparable work in Northern Cameroon is summarized by Marliac (1981) and David (1981).

MAP 1 NORTHEASTERN NIGERIA: ADMINISTRATIVE BOUNDARIES AND INFRASTRUCTURE



[N.B. Two new States, Taraba and Yobe were created in September, 1991. No precise maps of their boundaries have yet been published and so only their general locations are marked]

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The second is the extensive archaeological surveys conducted by Griaule and Lebeuf (references in Lebeuf, 1969) on the region around Lake Chad. These surveys carried an intellectual supercargo -the quest for the mythological Sao people, whose giant pots and clay figurines are found throughout this region. The identity of the Sao -or even the notion that they constituted a discrete ethnic group seem to be irresoluble and no use of this data is made in this paper.

3.2. Historical sources

Historical sources are of a variety of types that partly mirror the evolution of the societies described. The earliest material is contained in the texts of the Arab geographers which go back as far as the 8th century. This material is not always easy to interpret and is most useful for major food-plants - nonetheless there are many valuable pointers embedded in the texts. Lewicki (1974) has filleted the Arabic sources for references to food plants and his compilation is the most comprehensive study for the whole region.

In the post-medieval period, all studies of this region inevitably start with the pioneering work of Heinrich Barth and there are few subjects on which he does not have some illuminating commentary. Apart from the materials in his *Travels and Discoveries* (Barth 1857-1858) the footnotes to his linguistic notes (Barth 1862) are full of additional observations. Benton (1912) also published a selection of Barth's additional vocabularies that did not appear in the first set. Nachtigal (in Borno 1870 but here quoted in the modern annotated English translation, 1980) devoted a chapter of his travels to the food of Borno. Materials on Borno were synthesized by Schultze (1913) although his work adds surprisingly little to earlier authors. Barkindo (1989) has recently synthesised both existing documentary material and oral traditions relating to the Mandara Sultanate.

3.3. Lexicographical sources

The major languages have useful lexicographical sources and I have used Abraham (1949) for Hausa and Hutchinson and Cyffer (1990) for Kanuri. Taylor's (1932) Fulfulde dictionary is the principal source for Nigerian Adamawa but Noye (1989), although concerned with Fulfulde of Northern Cameroon, cites many of the same forms found in Nigerian Adamawa. All the linguistic, ethnographic and botanical data in this paper come from my own fieldwork, 1981-1991, unless otherwise specifically referenced.

The maps and language classification of the Linguistic Atlas of Cameroon (Breton & Dieu, 1983) provide an important cross-border perspective for the Nigerian linguistic and ethnographic data. Berns (1986) surveyed the Adamawa and Chadic-speaking groups in the central region, in particular the

Ga'anda and Yungur, and gives a number of valuable maps showing local migrations as well as a mass of detail on material culture.

No systematic linguistic survey has ever been undertaken in this region and many of its languages remain virtually unknown. The wordlists of Meek (1931) are still a significant resource as are the Chadic wordlists in Kraft (1981) despite their hasty collection. Wolff (1971) has contributed some further survey material. Kanuri citations are taken from Cyffer and Hutchinson (1990).

Much of the geographical, botanical and linguistic material in this paper is based on original fieldwork by the author during the period 1983-1991. In addition, whatever botanically related material exists in herbarium material has been synthesized for the new edition of the Useful Plants of West Tropical Africa (*cf.* Burkill, 1985, for Volume 1). Bokhari and Ahmed (1983) have studied some of the cultivated plants of Borno from a horticultural point of view.

3.4. Ethnographic sources

For the non-Muslim peoples south of Borno, the most significant early ethnography from the Nigerian side is the work of Meek (1931) whose studies of individual groups and their languages remain valuable and in many cases have not been replaced. The only recent synthesis of the ethnography of this region is the study of Wente-Lukas (1977) on the non-Islamic groups south of Lake Chad. Although valuable as a guide to the scattered literature it is not based on new fieldwork in Nigeria.

For Cameroon, the ethnographic sources are both voluminous and are often more directly concerned with plants and their uses. Many of those available up to 1975 were used by David (1976) and are not further discussed here. Only those which bear directly on the soceities further west are analysed here. An important source for both political history and speculations about cultivated plants is Lebeuf (1976) who analysed the sources of the Kotoko crop repertoire.

4. THE REGION UNDER STUDY

4.1. Administrative

Northeastern Nigeria is a large region and I have set limits on it for the purpose of this study. It takes in the east of present-day Borno State and Gongola State, north of the Benue River. In September, 1991, both Borno and Gongola States were divided into two by Government decree. New states, based on Damaturu in northern Borno and a Taraba State, with a capital at Jalingo but including southern Gongola State are presently being set up. I

have given less attention to the extreme west of Borno State -the old Fika Emirate and the flood-plains of the Hadejia-Jama'are up towards Nguru-Gashua. These represent different systems from those I am describing and have recently been dealt with in some detail from an ecological point of view (Mortimore, 1988).

4.2. Physical environment

The most comprehensive picture of the climate, ecology and vegetation of Northeastern Nigeria is the Land Resource Division Study of North-Eastern Nigeria (De Leeuw *et al.*, 1972). Most of Borno consists of semi-arid savannah or sub-desert, with flooded pastures towards Lake Chad and montane regions in the extreme south-east. The soils in the north-central part of Borno are largely aeolian sands, formed by wind-drift from the desert. The basic agriculture of the savannahs is upland rainfed cultivation, based on millet, sorghum and pulses.

Lake Chad no longer exists as a body of open water in Nigeria, and it has been replaced by open plains of swampy grassland or even dry savannah. The former lakeshore is still marked by notable changes in vegetation. The prehistoric extent of Lake Chad can be seen from the distribution of *firki*, a distinctive clay plain of black cotton soil. The *firki* plains are broad flat expanses of heavy clay, virtually without trees. In the wet season, their grass cover consists of annuals such as *Sorghum aethiopicum.* There are relatively few trees, but in places stands of acacias and desert-date interrupt the plain.

The Gwoza hills, along the Cameroon border, are part of the larger granite chain of the Mandara mountains and, in the south-west, the Biu Plateau, a basalt plain, rises to nearly 1,000 m. In the Mandara mountains, elaborate terracing systems prevent soil erosion, and complex rotations of crops prevent soil exhaustion. The river valleys are intensively cropped but the upland regions are usually only planted with cereals, and the site of fields are changed regularly.

4.3. The ethnographic and linguistic pattern

Map 2 shows a synthesis of the ethnic groups of the region with their linguistic affiliations. The distribution of languages represents a useful index of the broad ethnohistory of the region.

MAP 2. LANGUAGES OF NORTHEASTERN NIGERIA

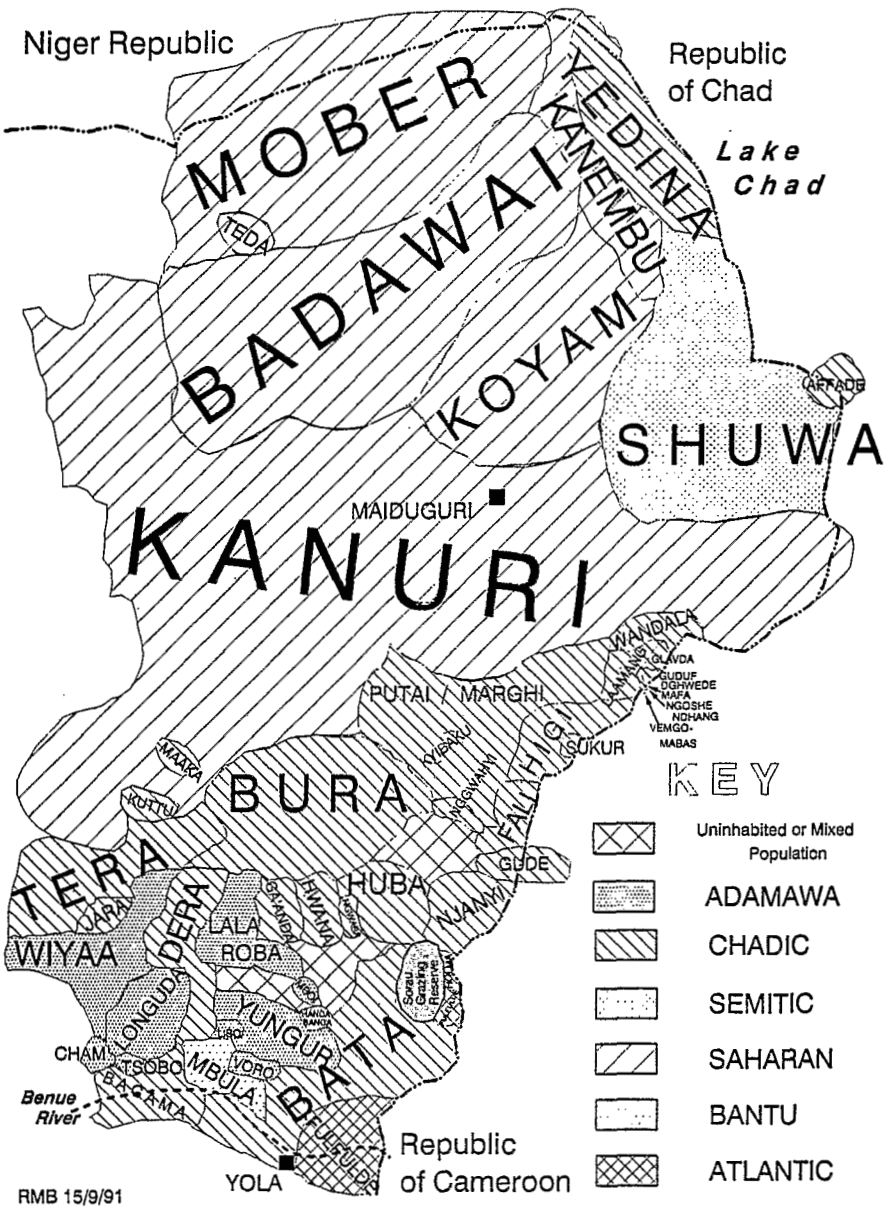

Table 1. Historical strata: groups in Northeastern Nigeria

LINGUISTIC FAMILIES	MAIN GROUPS	COMMENTS
1. Saharan	Kanuri Kanembu	Kanuri were confined to further north until the nineteenth and early twentieth centuries and much of the Maiduguri region was inhabited by Gamergu and Marghi.
2. Adamawa	Yungur group Longuda	
3. Chadic	West Chadic: Dera, Hausa Central Chadic: Bura, Marghi, Fali, Laamang, Bata, Sukur, Kotoko, etc.	The Hausa are either traders or farmers specialising in dry-season cultivation.
4. Bantu	Jarawan: Mbula-Bwazza	
5. Semitic	Shuwa Arabs Uled Suliman	The Uled Suliman are recent migrants to the region (1980s)
6. Atlantic	Fulɓe	

The following sections summarise relevant social and agricultural aspects of these groups.

SAHARAN : Kanuri group

The Kanuri proper were originally one people with the Kanembu, the people of Kanem, which is the region north-east of Lake Chad. However, the two groups separated at unknown time and now speak different, but closely related, languages. Standard Kanuri (the Yerwa dialect) is generally understood throughout Borno although individual groups have their own speech-forms. The Kanuri (and other peoples of Borno) are often known as "Beriberi" outside Borno and the Middle Belt of Nigeria has many "Beriberi" communities, most of which now speak Hausa. Zakari (1985) gives a useful recent synthesis of the complex source-material on the peopling of Borno.

In the main, Kanuri are cultivators, but have substantial holdings of both cattle and small ruminants. Where the environment permits, they manage these animals directly; however, where pasture is inadequate or there are water shortages, they have developed entrustment arrangements with the Shuwa and the Fulɓe. The Kanuri are well-known for their elaborate and ancient kingship systems, and their complex hierarchical social structure

(Cohen 1967). The administrative hierarchy of *bulamas* was imposed on many of the peoples in southern Borno and Kanuri became an effective lingua franca for the region.

The Kanuri live interleaved with more pastoral groups, speaking closely related speech-forms. In the north, these are represented by the Mober and Manga and in the central region by the Badawai and Koyam. The Koyam fall into two main groups; one which migrates east-west between Damboa and Biu, south of the main Bauchi-Maiduguri road, the other between Gajiram and Gudumbali.. They are opportunistic cultivators who sow upland millet when the rains are adequate. The dry years in the 1980s have compelled many to become exclusive pastoralists.

ADAMAWA

The main group of Adamawa languages in northeast Nigeria are the Yungur languages. the Yungur were described by Meek (1931) and Berns (1986) although much of the distributional and ethnonymic information they give is inaccurate. In addition, there are the little-known Longuda languages in the southwest of the region. All these peoples are dispersed subsistence cultivators depending generally on rain-fed agriculture.

CHADIC

The region is by and large the domain of Central Chadic languages, and of West Chadic, only Dera [Kanakuru] "naturally" falls within the region between the Yungur languages and Wiyaa [Waja]. However, Hausa, although spoken only by recent migrants and as a second language, has exercised a powerful influence on the region, witnessed by the extensive loan-words found in all the languages of the region. Like the Adamawa-speakers almost all Chadic groups are dispersed with no central authority. Since the late 1960s, the peoples of the Gwoza hills (the foothills of the Mandara proper) have been subjected to substantial political pressure to move to the plains through the Gwoza Resettlement Scheme.

West of this region, the kingdoms of the Pabir and Bole at Fika represent the growth of larger political units. In the northeast, the Wandala kingdom represented an important influence on the region in the period preceding the Kanuri expansion. The political influence of the Wandala throughout this region in the period immediately before the Fulɓe incursions is manifest in many references to them in oral traditions, for example, the Ga'anda origin myth of the rolling pot that came from Wandala (Berns, 1986).

North of the Wandala are the chiefdoms of the Kotoko, described in some detail by Lebeuf (1969). The Kotoko control the region between the two rivers marking the Nigerian and Chadian borders — "a Mesopotamia" as

Barth called it. Although Islamized, they have preserved a highly individualistic sacralised kingship system with historic traditions apparently marking a considerable time-depth. If any group has links with the mythological Sao it is undoubtedly the Kotoko, but this issue will be conveniently sidestepped here.

BANTU

The Bantu languages are represented by a single group, the Mbula Bwazza, who speak a Jarawan Bantu language. Despite linguistic demonstrations of the unity of the group (e.g. Maddieson & Williamson 1975 or Gerhardt 1983), the historical process that led to the Jarawan Bantu being distributed across Central Nigeria remains unknown.

SEMITIC

Shuwa Arabs

Shuwa Arabs are mobile pastoralists whose links are with the related Arabic-speaking groups in northern Cameroon and Chad. They appear to have first penetrated this region in the fourteenth century (Zeltner 1970). Although they are essentially pastoralists, their systems for cropping the *firki* are highly developed and relate to those further east. The Shuwa have permanent settlements where they practice both rainfed and flood-retreat agriculture, but at least part of the family is semi-permanently on the move with its herds. White (1941a) has summarised the farming systems of the Shuwa.

Uled Suliman

The Uled Suliman are a group of Libyan Arabs who have only begun to come into Nigeria since about 1980. Originally from the Fezzan, they migrated first into Chad in the 1930s, and thence into the Republic of Niger in the wake of the Chadian Civil War. Their earlier history is narrated by Le Rouvreur (1989: 436-441). They are camel pastoralists who sell *cuku*, dried camel-cheese, or occasionally the camels themselves, to buy grain.

ATLANTIC: Fulɓe

Atlantic languages are represented by a single group, the Fulɓe. The Fulɓe in Northeastern Nigeria are sharply divided into the urban and pastoral groups; the establishment of the Lamiɓe of Fombina in Yola (Abubakar 1977) and the adjacent lamidates in present-day Northern Cameroon have a history that is only tenuously connected with the gradual infiltration of pastoral Fulɓe into the region.

It is not known when the Fulɓe first entered Borno, although some sources suggest that it was during the seventeenth century. The most important

pastoral groups in Borno are the Anagamba, Bokolooji, Uda'en, and Wodaaße, who come from the Republic of Niger, whence they return in the wet season to tend their farms. The main agro-pastoral group in this region is the Fulße Maare, who live among the Kanuri and the Shuwa and have often adopted their farming systems. Further south, a scatter of different clans, originally from the Bauchi area, such as the Rahaji, live among the cultivators. Broadly speaking, all the pastoral Fulße also cultivate, usually only small areas of cereals.

5. FARMING SYSTEMS AND INDIVIDUAL CROPS

5.1. Systems of cultivation

Northeastern Nigeria exhibits a wide range of subsistence systems generally incorporating both pastoral and agricultural elements. Broad descriptive work on systems of cultivation is more generally available than detailed discussions of cropping systems. The Land Resources Report on Land Use in Northeastern Nigeria (De Leeuw *et al.*, 1972) includes a useful map of farming systems (op cit, Map 7) and a rather less useful map of "major crops" (op cit, Map 11) that is really a map of cotton and groundnut sales points. These maps are of historical interest because they were created before the drying up of the Komadugu Yobe, the retreat of Lake Chad and the development of the major irrigation schemes on the *firki*.

Dry-season farming is practised in the valley of the Komadugu Yobe along the Republic of Niger border and on the swampy areas of Lake Chad. The Komadugu was originally the basis for an elaborate irrigation scheme established in the late 1950s to produce wheat and residues for livestock feed. The swampy grasslands between Hadejia and Gashua have traditionally been a significant resource for *fadama* cropping, fishing and livestock feed (Adams and Hollis 1987). However, the construction of the Tiga Dam in the mid-1980s has drawn off water into the Hadejia-Jama'are River Basin in Kano State, reducing the flooded area west of Gashua and leaving the Komadugu Yobe virtually dry in its upper reaches for most of the year.

The traditional farming systems have not, by and large, undergone the transformation to the intensive systems common in other parts of northern Nigeria. Bush- or forest-fallow cultivation is still predominant in the southern parts of the region. Irrigation is only in scattered patches along the main river systems, although rice is cultivated in seasonally flooded swamps west of Lau. Along the Benue River near Yola, some flood-retreat cultivation is practised, both to supply the town with vegetables and to grow *masakwa* sorghum.

Shaduf systems were evidently common on the dry-zone garden plots at the edge of Lake Chad and along the Yobe valley. On the Nigerian side these have been almost entirely replaced from the mid-1970s onwards by small motor-pumps, although the shaduf is still in use on the opposite side of the Lake (Bouquet 1990). Table 2 summarizes these.

Table 2. Farming systems and their distribution in Northeastern Nigeria

SYSTEM	FEATURES	MAIN ETHNIC GROUPS	DISTRIBUTION
Firki/ flood retreat	Residual moisture	Shuwa, Kanuri	West and south of Lake Chad
Montane	Terraces, continuous cultivation	Chadic speakers esp. Laamang, Sukur	Mandara
Agro-pastoral	Opportunistic cereal-cropping, large cattle herds	Koyam, Shuwa, Fulɓe	Central Borno
Savannah	Rain-fed agriculture	All groups	Gongola, Southern Borno
Swamp	Riverine, based on natural flooding	Hausa, Fulɓe, Chadic and Adamawa speakers	Gongola
Dry-season gardens	Riverine, using irrigation and shaduf/pumps	Hausa, Fulɓe, Jukun and sporadic among other groups	Gongola

In the *firki*, a distinctive early dry season cropping pattern has emerged based on the cultivation of dwarf sorghum, *masakwa*. The seeds are planted on the flat in early October and depend on moisture retained at the edges of fields by mud bunds (White, 1941a). As De Leeuw *et al.* (1972: 13) point out the heavy soils were not traditionally cultivated in the rainy season but that the lure of profits from cotton has increased the incidence of farming.

Terraces in the montagne regions vary from simple lines of stones ("check-bunds") to extremely elaborate stone-walls. Hallaire (1988, 1991) has begun the mapping of the terrace systems of the Mandara mountains with a view to creating a sort of chronology of agrarian systems for the upland areas. Migeod (1924: 73) discusses the movement of urban Fulɓe north from Yola to settle new towns and start the cultivation of dry season gardens growing onions.

Broadly speaking the first four systems can be regarded as "ancient" while both swamp and irrigation systems seem only to have begun to spread recently.

5.2. Individual crops

The history of individual crops is evidently speculative and without more detailed ethnography of particular groups it is impractical to sketch more than the broadest outlines. Beyond the identification of wild progenitors provided by botanists, linguistics offers the most productive means of establishing the direction and epoch of the spread of individual plants. The following section summarizes the evidence for the major food-plants in Northeastern Nigeria.

5.2.1. Tubers

✧ *Dioscorea bulbifera,* Aerial yam

The aerial yam, *Dioscorea bulbifera,* is an ancient food-crop in many parts of West Africa and is recorded in the southern parts of the region. Blench (1989) proposed a reconstruction for Proto-Benue-Congo, ***-dun**. Although it has generally assumed to be part of the natural flora the similarity with Indian varieties make it possible that it was an ancient introduction.

In some cases, aerial yams may be transplanted from the bush to the compound. It is rarely recorded in published sources and no firm conclusions can be drawn from the variety of terms gathered so far.

✧ *Dioscorea rotundata,* Guinea yam

The true guinea yam, *Dioscorea rotundata,* seems not have been known in this region until comparatively recently. Most people see it only as a trade item, although it is extensively cultivated by the Mumuye near Jalingo, and seed yams have dispersed northwards from this area.

✧ *Dioscorea praehensilis*, Bush yam

The taxonomy of cultivated yams is sufficiently complex for the identification of this yam to be uncertain. The main cultivated yam in northwestern Adamawa was a thorny bush yam, presumably *Dioscorea praehensilis*, that was transplanted into the compound and allowed to twine up a stick. This practice has also been reported among the Masa (David, 1976: 251) although the transplanted yams in Cameroon are identified as *Dioscorea abyssinica*. The Guinea-yam, *Dioscorea rotundata*, has only been cultivated in this region recently and the main agents of its diffusion appear to be the Mumuye people, around Jalingo, for whom it is a staple. Among the Yungur, *D. rotundata* is often known as the "Mumuye yam" as opposed to *D. praehensilis*, which is called the "compound" or "Yungur" yam. The common Chadic root **bulum** that occurs on both sides of the border seems to refer

indiscriminately to almost any type of yam and has been borrowed into Fulfulde **bulumji**.

✧ *Colocasia esculenta*, Taro, old cocoyam and *Xanthosoma mafaffa*, New cocoyam

Both the original place of domestication and the routes by which the cocoyam reached West Africa are controversial. According to Plucknett (1976) wild *Colocasia* is found both in India and the Malay peninsula, taro may have been domesticated in either area. Plucknett (op cit) and subsequently Watson (1983) have suggested that the cocoyam spread down the Nile valley and thence to West Africa. The basis of this appears to be the presence in West Africa of roots such as **koko** which are held to derive from the Arabic **qulqas**. This seems inherently problematic for many reasons not the least of which is the failure of this root to appear in key languages such as Hausa or Kanuri. Even in the regions of greatest cultivar diversity, such as in Southern Nigeria, the **-koko** root appears only sporadically.

Whatever the truth of this, cocoyams are clearly well-established in the humic and subhumid regions of West Africa and are also cultivated in uplands within the semi-arid zone. From Cameroon there is evidence for the ancient cultivation of cocoyams in the hill regions (Seignobos, 1988) but no evidence is available for this in Nigeria. However, an older stratum of cocoyam cultivation is certainly present in Southern Zaria which suggests a possible extension in the Gwoza region. The "natural" extension of cocoyams is in more humid regions, although with the extension of swamp and dry season cultivation both types of cocoyam have become well-known. Kanuri have borrowed the Hausa **gwaza** rather than the Shuwa Arabic **kolokas** (Arabic **-qulqas**) arguing against a Nile valley introduction. Cocoyams are most commonly known by their Fulfulde names, **tandawje** and **bontoje**, which in principle apply to the "old" and "new" types. However, in some languages, terms related to **makabo** are recorded, suggesting a secondary spread of the new cocoyam up into the area from southern Cameroon. Seignobos (1988) has recently described the spread of a new cultivar of *C. esculenta* in Chad and Cameroun which is effectively acting to displace the former low-yielding "archaic" taros.

✧ *Ipomoea batatas*, Sweet potato

The sweet potato seems to have been introduced on the coast by the Portuguese some time in the seventeenth century. David (1976: 251), in comparing Barth and Nachtigal, argues that it must have been brought to Borno between 1850 and 1880. There are two key lexemes, **kudaku** (Fulfulde) and **dankali** (Hausa) that track the introduction of the sweet potato. Broadly speaking, the Fulfulde names are found in languages along

the border with Cameroon and in the Yola area. Versions of both terms are found in Kanuri (**kúnduwú** and **dangáli**). However, the Yungur and many other groups use the Hausa term, suggesting that Hausa traders were the main agent of its spread. White (1941b) refers to the cultivation of sweet potatoes in the Gwoza hills. Van Beek (1981: 117) suggests that the introduction of sweet potatoes among the Kapsiki was before 1900 and that the original plants came from the west in present-day Nigeria.

✧ *Manihot esculenta*, Cassava, manioc

Cassava is of South American origin and was introduced into Nigeria by the Portuguese as a cheap food to feed slaves on the Atlantic crossing. In Northern Nigeria, it is known as much as a starch plant as for food. Both the sweet and toxic varieties are cultivated throughout the north. Tardits (1981, I: 329) refers to the claim by Portères that the sweet cassavas were introduced on the coast by the Portuguese and diffused northwards into Adamawa while the bitter cassavas were transported across the desert. As the bitter cassavas can be stored for greater periods this is certainly possible, although no additional evidence is adduced.

Barth (1857, 2: 505) records the Fulɓe growing cassava in Yola in the 1850s and it was on sale in the market in Kukawa in 1903 (Lenfant 1905: 190). Northwestern Adamawa represents an interface between the Hausa and Fulɓe diffusion of crops. Most Adamawa and Chadic speakers west of the region use a form of the Hausa **rogo**, but loanwords from Fulfulde **mbay** are common in the border area. The etymology of the Kanuri **garisa** is unclear but may be borrowed from Yoruba/Hausa **gari** for the processed form. The sweet cassavas which can be eaten without preparation are known as **ngadalá** in Kanuri. The absence of this name as a loan-word in other languages suggests that the Kanuri did not disseminate cassava. Van Beek (1981: 117) dates the introduction of cassava among the Kapsiki to the 1930s. His informant stated that the technique of cultivation was learnt at Mubi in Nigeria.

✧ *Solenostemon rotundifolius*, Hausa potato

Although an ancient West African cultigen, this plant is hardly known in this region. It is cultivated by some of the Yungur-speaking peoples near Song. The Fulfulde term **bulumji** has been adapted from the common Chadic term for yam, **bulum**.

✧ *Solanum tuberosum*, Irish potato

The Irish potato is an Andean domesticate but it was carried to Europe and only introduced into Nigeria in the colonial period. It is still unknown in many parts of Northeastern Nigeria except as a trade item. Where cultivated it is generally perceived as a variety of the sweet potato. In Kanuri, the Irish

potato is the "European's sweet potato", borrowing sweet potato from Hausa. The potato must also have spread from Cameroon, because in some border languages it is called **kompeter**, evidently borrowing from French *pomme-de-terre*.

5.2.2. Cereals

✧ *Digitaria exilis*, Fonio

Examples of the cultivation of fonio in Northeastern Nigeria are conspicuous by their absence, although Portères (1976) shows the region of *D. exilis* spreading as far as Lake Chad. It is likely that this is a cartographic exaggeration and fonio is only known in the extreme west of Borno. The Kanuri term, **kashâ**, is suspiciously similar to the Hausa **accaa**, and the loss of a **k-** prefix is attested in other loan-words. However, Denham and Clapperton (1828, I: 198, II: 159) refers to a grass with edible seeds that is surely cram-cram, *Cenchrus biflorus*, called **kashcia** or **kasheia** and from this name a confusion may have arisen with the true fonio. Although David (1976: 246) records three apparent cases of fonio cultivation in northern Cameroon these are now known to be erroneous identifications[1]. In the early colonial literature "fonio" may be used to refer to small gathered grains such *Panicum laetum*, also known as "fonio sauvage".

✧ *Eleusine coracana*, Finger-millet

The precise origin of finger-millet remains disputed as experts presently disagree on an African or Indian wild progenitor (Portères 1976: 417 and editorial footnote). David (1976: 249) makes reference to the importance of finger-millet among a number of Cameroonian and Chadian peoples, such as the Mukhtele and the Masa, and it is evidently important in the agriculture of the Mandara. Finger-millet is not a common crop on the Nigerian side, but White (1941b) noted it in the crop rotations in the Mandara terrace agriculture, sown together with beans. Finger-millet takes on greater importance in Central Nigeria, especially on the Jos Plateau and in the southern Zaria region. The Fulfulde term, **cargari**, is likely to have been borrowed from the Kanuri **sarga**. The Arabic term, **telbun**, may be connected with the Hausa **tamba.** although the direction in which such a loan has travelled is uncertain.

✧ *Hordeum vulgare*, Barley

Leo Africanus mentions the cultivation of barley in Katsina in the sixteenth century and it is a well-established crop among the Teda in the Tibesti (Chapelle 1957: 69) and in the Fezzan (Lyon 1821: 273). It was

[1] I am grateful to Christian Seignobos for this information.

presumably brought to Borno in the medieval period, although there is no direct evidence for this. Barley seems to have been cultivated in small quantities as a luxury crop in Borno, but never to have spread further south. Clapperton and Denham (1828, 1: 216) were sent presents of barley paste in Kuka and Nachtigal (1980: 190) mentions barley as a luxury food in Kuka. It was presumably introduced from North Africa in the Middle Ages. The Kanuri, Fulfulde and Hausa names are all borrowed from Arabic.

Barley is more salt-resistant than wheat and can be cultivated with success on halomorphic soils. De Leeuw *et al.* (1972: 16) mention that in the Yo irrigation scheme, wheat plots used to be surrounded by a ring of barley to make more effective use of the salt accumulations along the edges of feeder canals.

✧ *Oryza glaberrima*, African rice

Strabo the Geographer (ca A.D. 12) mentions the cultivation of rice at Aujila in Cyrenaica and it is now assumed that this must have been *Oryza glaberrima* (Lewicki, 1974: 34). Indigenous African rice may not have been cultivated in historic times in this region, although the wild rice of Lake Chad (*Oryza barthii*) was regularly gathered in the nineteenth century. Al Omari (mid-14th c.) says that (gathered?) rice was an important staple in Kanem (Lewicki, 1974: 22). The origin of the rice mentioned in many places by Denham *et al.* (1828, II: 159) is said to be "Soudan" though he mentions the cultivation of rice in Muffatai (Mafatai on his map but perhaps modern Makari south of Lake Chad). David (1976: 249) mentions African rice cultivated by the Afae [Kotoko] and the Duru (both in Cameroon). Domesticated floating rices seem to have been unknown in this region but as De Leeuw *et al.* (1972: 17) note, they have been brought in by Hausa migrants from the Sokoto region.

✧ *Oryza sativa*, Asian rice

The introduction and spread of Asian rice in Africa is controversial. Asiatic rice was first introduced on the coast by the Portuguese and names for it in Southern Nigeria reflect this origin. However, it has been argued that Asian rice, which was known in the circum-Mediterranean region by the Islamic period, was independently carried across the desert (Nayar, 1973 and Watson, 1983). There is, however, no evidence for this view except grounds of likelihood and there is no clear example of adapted *sativa* cultivars existing in the Lake Chad region in pre-colonial times.

Today, Asian rice is widely cultivated throughout this region, both by Hausa migrants and by indigenous farmers. The development of rice research in Nigeria has led to the distribution of research station varieties which may be carried to farmers directly through projects or indirectly through migrant

cultivators. De Leeuw *et al.* (1972: 17) mention the variety BG.79 was widespread in Borno in the 1960s.

There is a strong association with the Hausa, and many groups first learnt rice cultivation from Hausa dry-season farmers. As a result, rice is known as **shinkafa** in many languages even in Cameroon. Fewer languages have **maroori** or some variant, indicating an origin with the Fulɓe .

✧ *Pennisetum typhoides*, Bulrush millet

The pennisetum millets are indigenous to West Africa and are generally thought to have been domesticated on the southern margins of the desert. There are two broad types of millet in the region, often known by their Hausa names, **gero** and **maiwa**. **Gero** is a short-season millet, maturing in 4 and a half months, while **maiwa** may take as long as six months. Although both are cultivated widely in Borno and given separate names in Kanuri [**nzáimó** for short-season millet], there is some evidence that further south it is **gero** that is more widely known and that the **maiwa** types have recently been distributed by the Fulɓe. The Arabic **dukn** appears to be unrelated to any local terms.

✧ *Sorghum bicolor*, Sorghum

The most detailed study of the history and evolution of the African sorghums is Harlan and Stemler (1976). The history of the sorghums in this region are complex and can only be treated in summary. Sorghums can be divided into long and short season types and also those that are grown in residual moisture or in irrigated dry season gardens. The long-season sorghums, known by the generic **dawa** in Hausa are the base staple throughout the area and there is a corresponding elaboration of terminology. The short-season sorghums, known as **jigaari** in Fulfulde, seem to be well established in the region and have a series of quite distinct roots in Adamawa languages. Apart from durra, the sorghums have traditionally been tall-stemmed and the stems play an important role in both animal feed and house construction. However, the research station sorghums with short stems and markedly higher yields have made some progress through the region since the 1950s.

The individual sections below consider the different races of sorghum as defined by Harlan and Stemler (op. cit.).

✧ *Sorghum bicolor* race *bicolor*

The Bicolor sorghums are the most primitive type of domesticated sorghum and they are regarded by Harlan *et al.* (1976: 472) as having evolved in the region between northeast Nigeria and Uganda although Doggett (1988: 34 ff) has more recently made a case for Southwest Ethiopia.

✧ *Sorghum bicolor* race *caudatum*

The Caudatum sorghums are regarded by Harlan *et al.* (1976: 475) as having evolved in the region between northeast Nigeria and Southwest Ethiopia and they are a "relatively new" race. Nonetheless their evolution is still in prehistoric times. A rather spurious correlation between "Chari-Nile" [a now discarded language grouping] and caudatum sorghums was advanced by Stemler *et al.* (1975) but this is not now recognised by most scholars. Carbonized caudatum sorghum grains were recorded at Daima III which is assigned a date of 800 A.D. (Connah, 1981: 188) but Connah speculates that the inhabitants of Daima I (550 B.C. onwards) already had a mixed economy including sorghum. The grain sorghum was apparently new to Fulfulde-speakers as there is no distinct term in Fulfulde.

The red-barked sorghums known as **karan dafi** in Hausa and cultivated for the red dye that can be extracted from the stem sheath are a variety of caudatum. As Hausa and Kanuri have distinct terms which are separate both from each other and from the ordinary caudatum sorghums it is likely that this is a cultivar as ancient as the grain sorghum.

LANGUAGE	DYE SORGHUM	GRAIN SORGHUM
Arabic (Shuwa)	kuludu	ndara
Hausa	karan dafi	damungeri
Kanuri	mají	ngawúli, masogo
Fulfulde	yambe	ndammungeri

✧ *Sorghum bicolor* race *durra*

The origin of the durra sorghums, **muskwari** or **masakwa**, is disputed. Harlan and Stemler (1976:475) argue that they were developed in India and have spread back into Nigeria via the Nile valley. Doggett (1988:49) claims that they evolved in Southwest Ethiopia and were carried to India from the Horn of Africa. However, the linguistic and cultural evidence suggests that Harlan and his colleagues are correct in respect of the West African durras - that they were brought into North Africa from India via the Middle East and were carried to the Lake Chad region. Today, the durra sorghums are distributed all along the southern fringes of the Sahara (Harlan and Stemler, Map 3) and are correlated with the presence of flood-retreat cultivation. They have essentially the same name in Kanuri (**mosuwá**), Fulfulde and Hausa, although this is not a loanword from Arabic **berbere**. Recent ethnobotanical work on collections of sorghums from Lake Chad has drawn the rather

surprising conclusion that many of the durra sorghums are not of a common cultivar type by are united by their method of cultivation (Neumann, p.c.).

If this is true, then it may that it was rather that cultivation practices that spread as opposed to a specific cultivar. This is likely to have occurred during the medieval period in parallel with other Islamic imports such as wheat and onions. Durra sorghums were rarely cultivated by other groups until recently and even now are known to most peoples via the market rather than as a cultivated crop. They are cultivated extensively as a cash-crop to sell in urban centres in Adamawa, especially along the Benue near Yola. The spread of dry-season cultivation has recently given them a boost in many areas.

✧ *Triticum aestivum*, Bread wheat

The wheat grown in Northeastern Nigeria resembles a hard wheat, *Triticum durum*, but cytological investigations showed that it was actually a hexaploid bread wheat (Zeven, 1974). Wheat is an ancient crop in Borno and may have crossed the desert in the medieval period, although Barth believed its appearance was as late as 1750. Terms in Northeastern Nigeria are all derived from the Arabic **qam.** Lewicki (1974: 40) has collected various medieval references to its cultivation under irrigation on a small-scale as a luxury crop across the Sahel. These sources suggest that wheat may have reached the environs of Lake Chad from Ouargla in modern-day Algeria, as early as the twelfth century.

However, it made little impact in the region until the colonial period when its cultivation was encouraged in irrigation schemes. The irrigation channels along the Komadugu Yobe, on the Nigeria/Niger border were intended to grow wheat and wheat production was part of the scheme for the large-scale irrigation projects begun in the 1970s to draw off water from Lake Chad, such as the Lake Chad Development Authority Scheme at New Marte and the South Chad Irrigation Project, south of Dikwa. The extent to which research station varieties have replaced the traditional Saharan wheats is unknown but the collapse of organized distribution of seed and chemicals may have led to some of the older varieties regaining ground.

✧ *Zea mays*, Maize

Maize is a South American domesticate that reached Europe in post-Columbian times. There are two important types of maize in West Africa, the hard, white, flint maizes most suitable for meal, and softer races that can be roasted or boiled and are generally deeper yellow. Maize was introduced on the West African coast by the Portuguese but was probably also brought across the Sahara from Egypt. It has been suggested that the flint maizes were brought across the desert and diffused outwards from the region Lake

Chad. This is supported by the Hausa name, **masara** ["Egypt"], which may derive from the Kanuri **másar**.

Denham (1828, II: 159) refers to maize in his summary of Borno but does not make clear where it was sold and in what quantities. Nachtigal (1879-89, II, 374) noted that it was the second most important crop after sorghum grown on the islands of Lake Chad. It had certainly reached Kukawa market by 1903 (Lenfant, 1905: 190). It is present throughout the region but is nowhere a staple; other forms compare it directly to guinea-corn; among the Yungur, for example, it is known as "Hausa sorghum". These forms suggest that the crop spread indirectly, i.e from farmer to farmer rather than directly.

Van Beek (1981: 117) reports that the Kapsiki consider maize as one of the plants cultivated by their ancestors to protect them from the ravages of grasshopers. Among the Kotoko, the two types of maize are distinguished - the soft maizes are cultivated on Lake Chad and the hard maizes are treated as field crops. In local Arabic, the soft maizes are known as "European maize", **masara nasara** (Lebeuf, 1976: 26).

5.2.3. Pulses

The history of pulses in Northeastern Nigeria is complicated by the lack of specificity in most sources; for many writers "beans" is description enough. Denham (1828,II: 59) refers to four types of beans **mussaqua, marya, kleeny** and **kimmay**. **Mussaqua** must surely be an error for **masakwa**, the flood-retreat sorghum. The general Kanuri term for beans is **ngálo** but the white beans called **ngalongudí** remain unidentified.

✧ *Arachis hypogaea*, Groundnut, peanut

The groundnut was introduced from South America by the Portuguese in the seventeenth century. In most parts of Nigeria, groundnuts seem to have spread rapidly from farmer to farmer and they were generally perceived as a relative of the Bambara nut. As a result, the same term was applied, and the Bambara nut was qualified as "local" or "indigenous". Thus among the Yungur, the former name for Bambara nut, ***shnara** is now applied to *Arachis*, while the term for Bambara nut is ***shnara enara**, i.e. "Yungur groundnut". The Kanuri name, **kólji**, resembles some northwest Adamawa names, such as Sukur **kolakochi**, but the direction of transmission remains unknown. It may be borrowed from the term for Bambara nut in some Chadic languages of northern Cameroon. Denham refers to "ground nuts" in the market at Kukawa (Denham *et al.*, 1: 217). Barth (1857,5: 334) notes that groundnuts had reached Bagirmi by the 1850s and Lenfant (1905: 190) recorded them in the market in Kukawa in 1903. Barkindo (1989: 177) observes that the Mandara call American groundnuts **yina Mbana,** "Masa

groundnut", which points to a second stream of introduction from further east.

Groundnuts were promoted by colonial governments as cash-crops in both Nigeria and Cameroon. Hogendorn (1978) describes the origins and growth of the commercial groundnut operations for which Northern Nigeria later became famous. In Northeastern Nigeria, Maiduguri was a major collecting point and the location of oil-mills for both oil and cake for export. The Cameroon Government began to encourage groundnut production from 1939 onwards in conjunction with cotton. Research station varieties have replaced local types in many areas.

✧ *Cajanus cajan*, Pigeon pea

There are no records of the cultivation of the pigeon-pea in the region although both the Hausa and Kanuri know it by the same name, **aduwa**, borrowed from the name for the desert date.

✧ *Macrotyloma geocarpa*, Kersting's groundnut

Kersting's groundnut is apparently subspontaneous in Northeastern Nigeria and Northern Cameroon but there is no direct evidence for its cultivation. The nearest cultivation records come from Central Nigeria.

✧ *Vigna subterranea*, Bambara groundnut

The Bambara nut is said to have been domesticated in the region of the Benue near the present-day Nigeria/Cameroon border (Harlan 1971: 471). It is cultivated throughout the region, and Nachtigal (1980: 192) notes that it plays a significant role in the cuisine of Borno. Barkindo (1989: 189) mentions that Bambara nuts were an item of trade from the Mandara to the Fulɓe settled in the lowlands. Nonetheless, its varietal diversification and cultural significance is relatively minor compared with further down the Benue, for example among the Idoma. Pasquet and Fotso (1991: 353) include a useful map of lexical roots for Bambara nut in Cameroon. The Kanuri name **ngáŋgála** does not seem to be related to other nearby forms. Because wild forms of the Bambara nut still exist in the region the linguistic picture is somewhat difficult to interpret.

✧ *Vigna unguiculata*, Cowpea

The cowpea[2] is now generally agreed to have been domesticated in West Africa, although it has undergone significant varietal diversification in India. Some of the varieties developed outside Africa have been re-introduced, thus

[2] This section has been corrected following the recommendations of Dr. Rémy Pasquet, who kindly sent me a xerox of the relevant section of his thesis (Pasquet, 1994) for which I am most grateful.

further complicating the picture. Steele (1972) has discussed some of the types of cowpea collected in Nigeria and Pasquet and Fotso (1994) have published a detailed analysis of the cultivated types in Cameroon. Within Nigeria, there is a wide diversity of terms, although it seems possible to reconstruct cowpea back to Proto-Benue-Congo (Blench, in press, a).

Pasquet and Fotso (op. cit.) distinguish five major races:

Indigenous	Introduced
textilis	*unguiculata*
biflora	*sesquipedalis*
melanophthalma	

Of these, var. *textilis* is usually considered the oldest and is still cultivated for its fibres rather than the beans in some remote areas. *Biflora* is the most widespread of the 'traditional' races with some types in the Mandara showing forms extremely close to wild types. *Melanophthalma* is not an introduced race, but nonetheless appears to be regarded as more recent than *biflora* or *textilis* in the region. It was only grown on the plains until recently, but new cultivars, such as Ife Brown, coming from Nigerian research stations, have begun to stimulate its adoption in the hill regions. *Unguiculata* and *sesquipedalis* (the "yard-long bean") were only introduced in or immediately prior to the colonial period and seem to have spread from Southern Cameroon. The spiral cowpea, **kànánnádò** in Hausa, is common in this region.

A strange footnote to the history of cowpeas in this region are the reputedly aphrodisiac races of the *unguiculata* group. These are described by Pasquet and Fotso (1994:123) as "d'origine certainement asiatique" and are reserved for chiefs and sorcerers. These appear to have spread to this region in the pre-colonial era, although the mechanism remains uncertain.

5.2.4. Vegetables and oil-seeds

✧ *Abelmoschus esculentus*, Okra

Okra is an ancient West African domesticate although it was apparently taken early to Asia. There are a wide number of roots for okra in south-central Nigeria, although a root ***ku**CV appears to reconstruct to Proto-Benue-Congo. The Hausa (**kubeewa**), Fulfulde and Kanuri (**guwalto**) terms appear to be unrelated, although the Fulfulde Adamawa dialect term for okra, **baskoje**, is probably borrowed from Kanuri.

✧ *Allium cepa*, Onion

The onion was apparently brought across the Sahara from north Africa by trade caravans in the Middle ages and almost all languages have some form of the Arabic name, The Kanuri name, **luwásar**, looks like a direct Arabic loanword, not filtered through Hausa, which has borrowed the article "al" with the stem. The Fulfulde name, **tingyeere**, is borrowed from the name for the "wild" onion, i.e. the roots of lilies, highly valued throughout this region for their medical virtues. Yungur has also applied the term for lily-root to the cultivated onion, disguising its recent introduction.

White (1941b) refers to the cultivation of onions in stream-side plots in the 1930s in the Mandara, but generally, onions were hardly known south of there except as trade-items until the spread of Hausa dry-season cultivation.

✧ *Allium sativum*, Garlic

Garlic is an Asian domesticate of unknown antiquity that presumably spread across the Sahara alongside the onion, although the absence of references in medieval sources makes this hard to verify. It is used as much in magical recipes as in food flavouring and is generally sold in the displays of Islamic medicine traders. It does not seem to be cultivated in the non-Muslim regions. The Kanuri name for garlic, **kaalmu**, resembles neither Arabic nor Hausa and indeed Hausa is likely to have borrowed its word, **tafarnuwa**, from Twareg **takhfar** for onion.

✧ *Amaranthus* spp., Edible amaranths, "bush greens".

The taxonomy of the cultivated amaranths remains disputed, and it is clear that escaped forms recross with those in domestication to produce a diversity of phenotypes. The two principle edible forms are *A. hybridus* ssp *incurvatus* and *A. viridis*. The edible amaranths were almost certainly introduced from Asia, although whether they all spread up from the coast is unclear. Although Hausa and Fulfulde have quite separate terms, Kanuri has **alélo**, apparently borrowed from Hausa. The Hausa people have clearly been the major agent of secondary dispersal, since variants of **allayaho** are found in most of the minority languages of Northeastern Nigeria.

✧ *Capsicum annuum*, Chili and *Capsicum frutescens*, Pepper

The chili peppers were introduced from South America by the Portuguese and seem to have spread northwards from the coast. Denham *et al.* (1828, 1: 268, 276) refers to "red peppers" in Borno by the 1820s. Lyon (1821: 156) notes that red peppers "of two kinds" were brought from West Africa to the Fezzan in the 1810s. By 1870, Nachtigal (1980: 193) says they are "cultivated in large quantities everywhere". This suggests the possibility that,

like maize, they were brought across the desert from North Africa at the same period as their spread northwards from the coast.

The two *Capsicum* species are generally known in minority languages by a misapplied Hausa name, **kimba**, which correctly applies to the pepper-tree, *Xylopia aethiopica*. The generic Arabic term for spices is **shitta** and this seems to have come into Hausa as **citta**, which is the name for the Melegueta pepper, *Aframomum* sp. This has then been borrowed into Kanuri to apply to *Capsicum*. The large varieties, known as **tattase** or **barkono** in Hausa, seem to have spread subsequently to Ful6e and Kanuri, as both languages use this term almost unchanged.

✧ *Ceratotheca sesamoides*, False Sesame

This herb grows almost like a weed in sesame fields. Its cultivation is almost coterminous with sesame and the leaves are used in soup in the same way. The Kanuri name is **kawulubúl**.

✧ *Citrullus lanatus*, Egusi melon/water melon

Citrullus lanatus is indigenous to the West African region. Although it is the progenitor of the water-melon it was domesticated only for its seeds in West Africa and the breeding of sweet melons with edible flesh appears to have taken place in North Africa. The water-melon has been brought back in twentieth century and is now widely cultivated under irrigation in Northern Nigeria. It is cultivated throughout this region and the diversity of terms with very little cross-language loaning attest to its antiquity. In the post-colonial period, the large-seeded "egusi" types from the south have been brought to the north to supply southern residents. The Kanuri name **bambúsa** appears to be connected with the Shuwa Arab forms. Another cultivar, **gunogunó**, grown in the Lake Chad region has apprently given its name to the Hausa **guna**. Kanuri has a separate name for the true watermelon, **fálí.**

✧ *Corchorus olitorius*, Jew's mallow, jute with other *Corchorus* spp.

Lewicki (1974) states that *C. olitorius* was domesticated in Asia, but it is now considered more likely that the wild progenitors of this plant came from sub-Saharan Africa and were carried to Asia, where an ennobled type developed. In Africa, *Corchorus* is generally cultivated as a potherb and its leaves used to make a mucilagineous soup. A variety of other *Corchorus* spp. such as *C. acutangulus*, *C. tridens* and *C. trilocularis* are cultivated in West Africa and generally have the same vernacular names as *C. olitorius*.

The Hausa have a name for the wild form, **tungurnuwa**, and the cultivated form **laaloo**. This has been borrowed into Fulfulde as **lalo**. Another Hausa name, **malafiya** is likely to be a borrowing from the Arabic **mulukhiya.** The Kanuri names, **gamzáino** and **daraba** do not seem to show any links with these. It is likely, therefore, that there was an ancient

cultivation of *Corchorus* but that North African cultivars were re-introduced into West Africa by Arab traders.

✧ *Cucumis melo*, Sweet melon

The sweet melon has a complex history both in botanical and linguistic terms. The original wild progenitor of *Cucumis melo*, a ground trailer, can still be still be seen at the edge of the desert and some of the non-sweet cultivated forms were probably domesticated directly from this form. However, the melon was also carried across the desert and developed into the more well-known sweet Mediterranean forms.

Non-Sweet forms

The cultivation of non-sweet melons is apparently ancient along the edge of the desert and there are varieties cultivated for the flesh and some where only the seeds are extracted. Although some vernacular names are recorded in the subhumid regions (Burkill, 1985) it is quite likely that these are misidentifications and that *Citrullus lanatus* is intended.

Sweet forms

The sweet melon has the same name in Arabic and Hausa, **shammam** and is likely to be a relatively recent introduction. It was carried back across the desert from North Africa and has become re-established in Northern Nigeria, although its cultivation is still very small-scale.

✧ *Cucumis sativus*, Cucumber

Although the cucumber is an ancient cultivated plant in some parts of Africa it is likely to be recent in Borno. the Kanuri name, **ngurli**, seems to closely resemble some of the names for other *Cucumis* species, such as **gurji**, and it is most likely that cucumbers were brought across the desert with the trans-Saharan trade. They have never become a major plant in dry-season gardens.

✧ *Cucurbita maxima*, Squash

The squash is a native of Peru and must have been carried at an early period to the West African coast, as it is cultivated throughout the region. The linguistic evidence does not suggest that it is a Portuguese introduction. It reconstructs neatly to proto-Yungur and apparently to proto-Benue-Congo [!]. There are two possible explanations; either the plant came to West Africa in the pre-Portuguese era, perhaps through the drift of seeds on the ocean currents, or the name has shifted from another plant giving a misleading reconstruction. The origin of the Kanuri name **saáda** is unclear.

✧ *Cucurbita pepo*, Pumpkin

The true pumpkin, *Cucurbita pepo*, was originally domesticated in Mexico and is widespread in West Africa. Because of its highly polymorphic nature it is easily confused with *C. maxima* and in every case the vernacular names are identical. The same observations as for *C. maxima* thus apply.

✧ *Daucus carota*, Carrot

Carrots were introduced during the colonial period and they have been widely adopted as a dry-season garden crop. De Leeuw *et al.* (1972: 19) noted that carrots were a feature of the gardens around Fika but they are certainly grown on the periphery of all the major urban centres, mostly by Hausa market-gardeners.

✧ *Hibiscus sabdariffa*, Roselle, sorrel

Roselle is indigenous to the West African region. The are two major types of cultivated sorrel in Nigeria -the green types, cultivated for the edible calyxes that are put in soup and those with red calyxes that are boiled to make a drink. The "green" type is the common cultivated type and can probably be reconstructed back to proto-Benue-Congo. The "red" types, known as **karkade** in Arabic were probably brought across the desert to Borno in the medieval period. The green sorrels are called **karasá** and their seeds **mashá** in Kanuri.

✧ *Lepidium sativum*, Cress

Cress is apparently a trans-Saharan introduction since it is known by variants of the Arabic name **lafsur.**

✧ *Lycopersicum esculentum*, Tomato

David (1976: 247) refers to sources for the cultivation of the tomato before 1900 in Cameroon. There is no evidence for the spread of the tomato so early on the Nigerian side and it is possible that the sources may refer to the "native" tomato, i.e. one of the eggplants. Denham *et al.* (1828,1: 217) refer to "bastard tomatoes" in the market at Kukawa. Another possibility is the small cherry tomatoes which were brought from Egypt in the eighteenth and nineteenth centuries and still exist in semi-wild forms in Cameroon. Lyon (1821: 257) notes that "tomata" were being grown in the Fezzan in the early 19th century. This may be the source of the reference to the tomatoes bought by Migeod (1924: 153,156) near Mongonu west of Lake Chad.

In Nigeria, the word for tomato is universally **tomatur** from English via Hausa. The type originally introduced in the colonial era were the round salad tomatoes. However, these were largely displaced by plum tomatoes, originally distributed from Zaria in the disappointed hope that they would be sold to the canning factory for tomato paste. Tomato cultivation was rapidly adopted by

dry-season farmers and constitutes a major element in the internal trade in horticultural products. Nonethless, tomato paste has come to be important in traditional cooking and both imported and locally processed cans are widely available. Indeed, some people claim to have seen tomato paste in tins before fresh tomatoes. There is now a major canning plant in Borno, Vegfru, making tomato paste for sale throughout Nigeria.

✧ *Sesamum indicum*, Sesame and *Sesamum radiatum*, Black sesame

The origin of sesame remains disputed; although long thought to be of West African origin, this has been called into question because of the presence of very early archaeological material in India (Harlan). Both types of sesame are cultivated throughout the region for their seeds and leaves and these typically have unrelated names, as in Hausa **riii** and **karkashi**. The Fulfulde term, **malasiri**, and the Yedina **mareshi** appear to be borrowed from the Kanuri **marashi**. These may be connected rather deviously with Hausa **karkashi**. The Arabic **semsem** that gives English sesame has no currency in the region although it is not impossible that North African cultivars were brought across the desert.

✧ *Solanum macrocarpon*, African eggplant

The indigenous eggplant is cultivated throughout the region and is presumably ancient. The Hausa, Fulfulde, Kanuri (**gorwo**) and Arabic terms appear to be unrelated. The eggplant is extremely polymorphous and in some places many colour types are sold on the markets. There are two main types usually recognised, the small, egg-shaped **gauta** which can be eaten raw and is generally multicoloured and the large, spheroidal **yallo** which is generally yellow or cream-coloured. The large Indian brinjals, usually with mauvish skin and reduced bitterness, appear to be recent introductions.

✧ *Vernonia amygdalina (*with *V. colorata)*, Bitterleaf

Although indigenous to the West African region, and generally cultivated by the Hausa, bitterleaf seems not to have penetrated the northeast until recently. It is used both for the edible leaves and as a source of chewsticks. Where it is found in cultivation it is generally known by the Hausa name, **shiwaakaa**, and the Fulfulde **siwakeeje** is directly derived from this.

5.2.5. Fruits etc.

✧ *Anacardium occidentale*, Cashew

The cashew is known throughout this region, although the largest fruits are brought in from further South. Clapperton (1828,II: 213) refers to cashew nuts in Borno which is surprisingly early and may be a misidentification. It is known in every language by versions of the English "cashew" and its diffusion may date only from the colonial period.

✧ *Carica papaya*, Papaya

The pawpaw is a South American domesticate that was introduced on the West African coast by the Portuguese. It had begun to spread inland from the coast by the nineteenth century. It may also have been introduced into Borno from North Africa in the nineteenth century as Barth records the Kanuri name **bambus Massarbe**, i.e. the melon of Egypt and a now disused Hausa term **gonda Masr**, "custard-apple of Egypt". This term survives in the Bole language as a loan, **gonda Masar**. The analogy with the wild custard-apple, *Annona senegalensis* is made in many languages, and the name for the custard-apple is applied to the pawpaw. Thus in Hausa, pawpaw is **gwanda** and the custard-apple, **gwandau daji**, the "pawpaw of the bush". A similar process in Fulfulde makes the pawpaw **dukku** and the custard apple **dukkuhi ladde**. In modern Kanuri, the custard apple is **ngónówu** and the term **kawúsa** is adapted from the Arabic term for pumpkin or **gonda** from Hausa **gwanda**. These local constructions make it difficult to establish either the route or epoch of the introduction of the pawpaw. Benton says "Pawpaws have been introduced into some of the larger towns in British Bornu, but do not flourish" (Schultze, 1913: 77). In minority languages, such as Yungur, pawpaw is associated with Europeans, suggesting that its spread is largely a twentieth century phenomenon.

✧ *Citrus aurantifolia*, Lime and *Citrus sinensis*, Orange

The citrus fruits were brought to the West African coast in the eighteenth century by the Portuguese but may have been carried simultaneously across the desert to Borno by the Arab caravans. Denham *et al.* (1828, 1: 217) mentions being sent a present of limes by the Shehu in Kukawa. They appear to have been spread by the Hausa, as the Hausa name, **leemu**, from English lemon, is universally used throughout the region. However, Migeod (1924: 118) mentions that the garden planted by Rabeh at Dikwa contained lime trees, so there may also have been some spread citrus via the Arabs from further east. Nonetheless, their cultivation in this region has probably only become economically significant since the colonial period, when seedlings were distributed via the forestry departments.

✧ *Cyperus esculentus*, Tiger-nut

Tiger-nuts are indigenous to the Mediterranean but are widely and anciently cultivated throughout the West African region. Local names show no particular relation to each other, although they reconstruct within linguistic subgroups. The inference is thus that they crossed the desert at an early period and have become naturalised in the agriculture of the region.

✧ *Mangifera indica*, Mango

The mango, domesticated in India, was brought to the coast by the Portuguese. Denham *et al.* (1828,1: 299,309) refer to mangoes in the Mandara valleys in the 1820s -although whether this is correct is doubtful. It is given the Kanuri name **comonah** in the text which is not present-day common Kanuri term for mango. Today the form **mángulo** is used suggesting a loan from the Hausa **mangoro**. The major spread inland of the mango in Nigeria came in the colonial era through the policy of planting rows of mangoes along roads and within institutional compounds. The large non-fibrous hybrid mangoes seem to have been introduced in the post-colonial period. In Kanuri they are known as **aúré** a term borrowed directly from Hausa.

✧ *Musa paradisiacum*, Plantain and *Musa sapientium*, Banana

All the domesticated Musaceae in Africa are originally from either India or South-East Asia. The period and route by which they reached Africa remains disputed but while they have become central to the agricultural systems in the forest zone, they remain little-known in the semi-arid region until recently. Bananas and plantains are stilled shipped to the region from southern Nigeria, but increasing numbers are grown locally using irrigation. In Hausa, Kanuri and Fulfulde, plantain and banana are not generally distinguished. Kanuri **ayawa** is almost certainly a loanword from Hausa **ayaba**. The Fulfulde term, **kondong**, is used in most parts of northwestern Adamawa, suggesting that the Yola region may have been a centre of dispersal.

✧ *Punica gratum*, Pomegranate

One of the more well-known fruits associated with North African Islamic culture it is surprising that the pomegranate never became widespread as a result of the trans-Saharan trade. Rohlfs (1874, I: 374) mentions the cultivation of pomegranates in Kukawa before the sack of the town. Migeod (1924: 118) refers to the cultivation of pomegranates in Rabeh's garden at Dikwa.

✧ *Phoenix dactylifera*, Date palm

Date-palms are only found in small numbers in Borno and Adamawa. Bauchi town is a notable centre for the small-scale cultivation of date-palms although the dates are locally regarded as inferior to dates from the desert. There is also a centre of date-palm production in Fika town, although as in Bauchi, the dates are infertile and thus seedless. Schultze (1913: 85) says "The date-palm is to be found dispersed in single examples all over Bornu, and specimens transplanted by man may even be seen in the middle of Adamawa". The cultivation of the date seems to have been taken over from

the Arabs and the terms in Hausa and Fulfulde (**dibino**), and Kanuri **difúno** are loanwords from Arabic.

✧ *Saccharum officinarum*, Sugar-cane

Sugar-cane is of South-East Asian origin and was probably only introduced into this region during the colonial period. Watson (1983) quotes a reference to a ruler of Kanem who attempted to set up a sugar-cane plantation in the medieval period -but this seems to have left no traces in the region. It is frequently known by the Hausa name, **rake**, borrowed into Kanuri as **reké**. One of Nigeria's two major industrial sugar-cane plantations, Savannah Sugar, is located just west of Numan.

5.2.6. Spices

✧ *Coriandrum sativum*, Coriander

Coriander has not featured in most texts on the transmission of crops along the trans-Saharan route. Nonetheless, it plays an integral part in Kanuri cooking and is known by the same name in Kanuri and Hausa, **kusubara**. It is likely to have been brought to the Lake Chad region in the medieval period — although it has never spread widely in West Africa.

✧ *Nigella sativa*, Black cumin

Black cumin is cultivated in Borno under the name **kamun selem** and was presumably spread across the desert in the medieval period. It does not seem to have spread further south.

✧ *Piper guineense*, West African Black pepper

Although West African black pepper is indigenous to the region, it seems to have only recently spread to Northeastern Nigeria, and is still today only a trade item in many markets. Both Kanuri (**mosóró**) and Fulɓe have presumably borrowed from Hausa the term **masoro**.

✧ *Zingiber officinale*, Ginger

Ginger is originally from Asia, but it seems to have been cultivated in Africa for a long period. Purseglove (1975: 534) regarded it as a Portuguese introduction although there is no support for this in the linguistic evidence from names in Central Nigeria. It seems more likely that it spread independently down the Nile corridor and was also cultivated on the coast after the Portuguese arrived. The Hausa know it as **citta Aho,** referring to it as the pepper of the Eloyi people, who live near the Benue river in Plateau State. At present, the most extensive and elaborate cultivation of ginger is found in Central Nigeria, especially in Southern Zaria. Ginger is known to the Shuwa Arabs by the Arabic name, **zinzabil**. The Kanuri name is **taajiwâr** or **kaajiwâr.**

✧ *Guizotia* spp.

De Leeuw *et al.* (1972: 19) refer to "**gwonkhi**" a crop "widely found in small plots" which is identified as *Guizotia* spp.?. This is not confirmed by any other text but a cultivated *Guizotia, G. scabra,* has recently been reported from the Jos Plateau and southern Zaria (Burkill, 1985: 474).

5.2.7. Others

✧ *Nicotiana tabacum*, Tobacco

Tobacco is a South American domesticate whose importation to Europe is surrounded by a variety of fables. Its introduction into Africa is barely documented, but it seems to have rapidly spread into the interior as it was well-established by the time the first European travellers reached Borno. It was cultivated as much as a cosmetic for staining the teeth as for smoking. The custom of using the flower of the tobacco plant seems to have spread from Hausa. The general word for "flower" in Hausa, **fure** is commonly applied to tobacco and this is loaned into Kanuri as **faré.**

Migeod (1924: 97) refers to two types of tobacco -Bornu which "brown and rolled up in sticks" and Mandara "green and has more flavour". Currently the Kanuri import chewing tobacco from the Mandara and call it by that name **mandará**. Ordinary tobacco is **tafâ** in Kanuri.

Tobacco seed is distributed by the major tobacco companies to smallholder outgrowers and an efficient buying system has made it into a significant cash-crop even in a period of recession. "Local" varieties of tobacco have all but disappeared in many places.

✧ *Ricinus communis*, Castor-oil plant

The castor-oil-plant is cultivated on a small-scale throughout this region. It is generally believed to originate somewhere between Uganda and Nigeria and to have been carried to Egypt in prehistoric times.

✧ *Hibiscus cannabinus*, Hemp

Hibiscus cannabinus is grown mainly for the hemp stripped from the outer bark, but the leaves are also widely used for sauces rather like sorrel. The Hausa name, **rama** is widely spread through Central Nigeria, arguing that the Hausa have acted as secondary dispersal agents. However, the Kanuri term **ngawái** is presumably the source of the Fulfulde **ngabay** which is a common loan-word in Chadic languages of the region. Barkindo (1989: 178) suggests that hemp was spread by the Fulɓe in the Mandara region.

6. HISTORICAL STRATIFICATION OF FOOD-CROPS IN NORTHEASTERN NIGERIA

This section makes some very tentative proposals for a chronological stratification of the introduction of crops into Northeastern Nigeria. Except within the most recent period when direct historical evidence is available, the assignment of crops to particular strata is based on evidence from wild progenitors and loan-words or their absence.

Table 6.1 shows crops either indigenous to the West African region or which have apparently been anciently cultivated.

Table 6.1 "Ancient" Food-Crops

SCIENTIFIC NAME	ENGLISH
Solenostemon rotundifolius	Hausa potato
Citrullus lanatus	Egusi melon
Dioscorea bulbifera	Aerial yam
Hibiscus sabdariffa	Roselle, sorrel
Dioscorea praehensilis	Bush yam
Solanum macrocarpon	African eggplant
Pennisetum typhoides	Bulrush millet
Corchorus olitorius	Jew's mallow, jute
Sorghum bicolor	Sorghum
*Cucurbita maxima**	Squash
*Cucurbita pepo**	Pumpkin
Vigna subterranea	Bambara groundnut
Macrotyloma geocarpa	Kersting's groundnut
*Cyperus esculentus**	Tiger-nut
Vigna unguiculata	Cowpea
Sesamum indicum	Sesame
Abelmoschus esculentus	Okra
Sesamum radiatum	Black sesame
Cucumis melo	Melon (non-sweet)

*Controversial - see text

Table 6.2 shows some of the plants that were transmitted across the desert in the medieval period and have been cultivated for a long time in Borno.

Table 6.2 Crops introduced in the medieval period

SCIENTIFIC NAME	ENGLISH
Sorghum durra	Durra Sorghum
Hibiscus sabdariffa	Roselle -red type
Pennisetum typhoides	Bulrush millet
Lepidium sativum	Cress
Triticum vulgare	Common wheat
Punica gratum	Pomegranate
Hordeum vulgare	Barley
Nigella sativa	Black cumin
Allium cepa	Onion
Coriandrum sativum	Coriander
Allium sativum	Garlic
Curcuma domestica	Turmeric
Cucumis melo	Melon (sweet)
Zingiber officinale	Ginger
Cucumis sativus	Cucumber

A striking aspect of most of these plants is that the Kanuri did not transmit them southwards. Some of the spices, such as cumin and coriander, remain unknown among the non-Islamic groups. A complex, hierarchical group such as the Kanuri value spices and diverse plant foods in a way that attributes value to exotic tastes. It is likely that these found no echo among the acephalous groups south of Borno.

Others, however, such as the onion, have Fulfulde names, suggesting that they were spread from Yola, rather than southwards from Borno.

Table 6.3 shows the crops that were spread by the Fulɓe, as is evidenced by the adoption of Fulfulde terms into the languages of the region. There is a certain amount of overlap with table 6.5 showing those disseminated by the Hausa, as it seems there were two competing streams in the late nineteenth and early twentieth centuries; characteristic Fulfulde loan-words in the east become Hausa further west.

Table 6.3. Crops spread by the Fulɓe

SCIENTIFIC	ENGLISH	FULFULDE
Eleusine coracana	Finger-millet	cargari
Sorghum bicolor	Short-season Sorghum	jigaari
Allium cepa	Onion	tingyeere
Allium sativum	Garlic	arngalare
Musa paradisiacum	Plantain	kondong
Musa sapientium	Banana	kondong
Ipomoea batatas	Sweet potato	kudaku
Manihot esculenta	Cassava, manioc	mbay
Colocasia esculenta	Taro, old cocoyam	tandawje
Hibiscus cannabinus	Hemp	ngabay

Table 6.4 shows crops that were only brought across the desert in the eighteenth and nineteenth centuries; generally those from the Americas.

Table 6.4. Crops brought across the desert in the 18th/19th centuries

SCIENTIFIC NAME	ENGLISH
Oryza sativa	Asian rice
Manihot esculenta	Bitter Cassava
?Capsicum spp.	Chili peppers
Lycopersicum esculentum	Tomato (cherry type)
Zea mays	Maize (flint type)
Citrus aurantifolia	Lime

Table 6.5 shows the crops that have been spread by the Hausa, following the evidence of loan-words. The Hausa began to spread crops in the nineteenth century but they have also acted as important secondary crop diffusers in the colonial period.

Table 6.5. Crops spread by the Hausa

SCIENTIFIC NAME	ENGLISH
Oryza sativa	Asian rice
Capsicum frutescens	Pepper
Arachis hypogaea	Groundnut, peanut
Amaranthus spp.	Edible amaranths
Lycopersicum esculentum	Tomato (plum type)
Vernonia amygdalina	Bitterleaf
Saccharum officinarum	Sugar-cane
Citrullus lanatus	Egusi melon/water melon
Zea mays	Maize
Piper guineense	West African pepper
Capsicum annuum	Chili

Table 6.6 shows the crops that diffused to Northeastern Nigeria during the colonial period. Many of these were introduced on the coast long before the colonial period, but had not reached this region "naturally" by 1900.

Table 6.6. Crops spread in the colonial era

SCIENTIFIC NAME	ENGLISH
Dioscorea rotundata	Guinea yam
Xanthosoma mafaffa	New cocoyam
Solanum tuberosum	Irish potato
Vigna unguiculata	Cowpea cvs
Biflorus	
Sesquipedalis	
Mangifera indica	Mango
Carica papaya	Papaya
Citrus aurantifolia	Lime
Citrus sinensis	Orange
Anacardium occidentale	Cashew

An aspect of this stratification which is most striking is the failure of major political entities such as the Wandala and Kanuri kingdoms to have a significant impact on crop repertoires. Although the political influence of these groups is still evident their relations with their political clients seem to

have included little interchange of crops either in the pre-Fulɓe era or even with "new" crops, such as cassava or sweet potato. Barth (1862,II: 175) observes that the Kanuri word for cotton is probably a borrowing from Wandala.

Another notable absence is the failure of many of the oasis crops of the Fezzan to reach Borno. for example, Lyon (1821: 274) lists the following as cultivated in the Fezzan - fruits such as grapes, apricot, peach, apple, water-melon, figs and vegetable such as turnips, carrots, radishes, mustard and cress. If these were ever carried to Borno, then their cultivation failed and left no trace.

7. CONCLUSIONS: FURTHER WORK

Northeastern Nigeria and adjacent parts of Cameroon represent a complex interface between pastoral and arable subsistence systems and between large political structures and highly nucleated village groupings. This is partly reflected in the considerable variety of domesticated food plants cultivated in the region. A diverse ecology has also encouraged a complex pattern of interlocking cropping systems.

One methodological concept that needs clarification is the concept of a "traditional crop". Descriptions of agricultural systems usually list crops and crops as unitary features are brought in and adopted. However, the relationship between farmers and crops is evidently more complex.

Linguistic evidence, especially the tracking of loan-words can help to partly unravel the history of crops in the region, although defective material on many minor crops makes this a patchy exercise. It should be emphasized that very few of the hypotheses put forward in this paper can be cross-checked against other types of evidence; archaeological, botanical and oral historical materials are lacking and even accounts of crop repertoires are at best incomplete. Studies comparable to the detailed work of Pasquet and Fotso (1991) on edible legumes in Cameroon, combining linguistic and botanical evidence have yet to begin within Nigeria.

BIBLIOGRAPHY

ADAMS W.M. and HOLLIS G.E., 1987, "Hadejia-Nguru wetlands conservation project", Unpublished report to the Nigeria Conservation Foundation.

ALEXANDER B., 1908, *From the Niger to the Nile*, London, Edwin Arnold, 2 vols.

ALIS H., 1892, "Voyage dans l'Adamaoua", *Tour du Monde* 64(2), pp. 225-288.

BAIER S., 1980, *An economic history of Central Niger*, Oxford, Clarendon Press.

BAKER R.L. and ZUBEIRO YOLA M., 1955, "The Higis of Bazza clan", *Nigeria Magazine* 47, pp. 213-222.

BARKINDO B.M., 1989, *The Sultanate of Mandara to 1902*, Wiesbaden, Franz Steiner, Studien zur Kulturkunde 91.

BARTH H., 1857-1858, *Travels and discoveries in North and Central Africa: Being a journal of an expedition undertaken under the auspices of HGM's Government in the years 1849-1855*, London, Longmans, 5 vols.

BARTH H., 1862, new ed. 1971, *Collection of vocabularies of Central African languages*, , Gotha, Justus Perthes.

BAUER F., 1904, *Die Deutsche Niger-Benue-Tsadsee-Expedition, 1902-1903*, Berlin.

BAWDEN M.G. and TULEY P., 1966, "The land resources of Southern Sardauna and Southern Adamawa Provinces, Northern Nigeria", Land Resource Study 2, Tolworth, Directorate of Overseas Surveys.

BENTON P.A., 1912, "Notes on some languages of the Western Sudan", London: OUP.

BERNS M.C., 1986, *Art and history in the lower Gongola vally, Northeastern Nigeria*, Ph.D., UCLA.

BLENCH R.M., 1984, "Peoples and languages of southwestern Adamawa", Paper presented to the 14th. African Languages Colloquium, Leiden.

BLENCH R.M., 1986, "The evolution of the Nupe cultigen repertoire", *Festschrift for Professor C. Hoffman*, (F. Rottland ed.), Hamburg: Helmut Buske.

BLENCH R.M., 1989, "The evolution of the cultigen repertoire of the Nupe of West-Central Nigeria", *Azania* 24, pp. 51-63.

BLENCH R.M., in press, "Evidence for the inception of agriculture in the Nigeria-Cameroun borderland", Paper given to the BIEA symposium on the development of agriculture in sub-Saharan Africa (Cambridge, 4-8 July, 1994), To appear in *Azania* in 1996.

BOKHARI M.H. and AHMED Ch.M.S., 1983, *Food plants in Borno State, Nigeria*, Lahore: Ghalam Publishers.

BOUQUET C., 1990, *Insulaires et riverains du lac Tchad*, Paris: L'Harmattan.

BOUTRAIS J. (ed), 1991, *Du politique à l'économique : Études historiques dans le bassin du lac Tchad. Actes du IV^e colloque Méga-Tchad*, Paris : ORSTOM.

BOYLE C.V., 1910, "Historical notes on the Yola Fulanis", *Journal of the African Society* 10, pp. 73-92.

BRETON R. and DIEU M. (eds), 1983, *Atlas Linguistique du Cameroun*, Paris/Yaoundé: ACCT/CERDOTOLA.

BURKILL H.M., 1985, *The useful plants of West Tropical Africa, Families A-D*, Kew: Royal Botanic Gardens.

BUTTNER T., *Die Autochthone bevolkerung Adamauas im XIX. Jahrhundert formen ihrer unterdruckung durch die* Fulbe *-aristokratie.*

COHEN R., 1967, *The Kanuri of Bornu*, New York: Rinehart, Holt and Winston.

CONNAH G., 1981, *Three thousand years in Africa,* Cambridge: CUP.

CONNAH G., 1984, "Archaeological survey of Southern Borno", *African Archaeological Review*, 2.

CYFFER N. and HUTCHINSON J. (eds), 1990, *Dictionary of the Kanuri language*, Dordrecht: Foris.

DALZIEL J.M., 1937, "The useful plants of West Tropical Africa", London: Crown Agents.

DAVID N., 1976, "History of crops and peoples in North Cameroon to A.D. 1900", *Origins of African plant domestication* (Harlan *et al.* eds.), The Hague: Mouton.

DAVID N., 1981, "The archaeological background of Cameroonian history", *Contribution de la recherche ethnologique à l'histoire des civilisations du Cameroun* (C. Tardits ed.), Paris: CNRS, pp 79-100.

DAVIES G.A., 1956, *The Biu book*, Zaria: NORLA.

DE LEEUW P.N., LESSLIE A. and TULEY P., 1972, *The land resources of North East Nigeria*, Volume 4, *Present and potential land use,* Surrey: Tolworth Tower.

DENHAM D., CLAPPERTON H., OUDNEY W., 1828, *Narrative of travels and discoveries in Northern and Central Africa*, 3rd ed. in 2 vols, London: John Murray.

DUISBURG A. von, 1927, "Zur Geschicte der Sultanate Bornu und Wándala (Mándara)", *Anthropos*, 26, pp. 187-196.

DOGGETT H., 1988, *Sorghum*, London: Longmans.

FROBENIUS L., 1913, *Und Afrika Sprach* (Vol. III), Berlin: Vita Deutsches Verlaghaus, Berlin.

DUPIRE M., 1962, *Peuls nomades*, Paris: Institut d'Ethnologie.

DUPIRE M., 1970, *Organization sociale des Peuls,* Paris: Plon.

EAST R.M., 1935, *Stories of old Adamawa,*. Lagos: West African Publicity Ltd.

FLEGEL E., 1883, "Reise nach Adamaua", *Petermanns Mitteilungen* 29, pp. 241-249, Berlin.

HALLAIRE A., 1988, "Systèmes agraires et histoire dans les Monts Mandara", *Le milieu et les hommes: Recherches comparatives et historiques dans le bassin du lac Tchad* (D. Barreteau and H. Tourneux eds.), Paris: ORSTOM, pp. 215-220.

HALLAIRE A., 1991, *Paysans montagnards du Nord-Cameroun: Les Monts Mandara*, Paris: ORSTOM.

HARLAN J.R., DE WET J.M.J., STEMLER A.B.L. (eds.), 1976, *Origins of African plant domestication,* The Hague: Mouton.

HARLAN J.R., STEMLER A.B.L., 1976, "The races of Sorghum in Africa", *Origins of African plant domestication* (Harlan J.R. *et al.* eds), The Hague: Mouton, pp. 465-478.

HOGENDORN J.S., 1978, *Nigerian groundnut exports: Origins and early development*, ABU/OUP, Nigeria.

HOPEN C.E., 1958, *The pastoral* Fulɓe *family in Gwandu*, London: OUP for IAI.

I.L.C.A., 1979, *Trypanotolerant livestock in West and Central Africa* (2 vols.), Addis Ababa: International Livestock Centre for Africa.

KEAY R.W., 1989, *Trees of Nigeria*, Oxford University Press.

KEAY R.W., ONOCHIE C.F.A., STANFIELD D.P., 1964, *Nigerian trees*, (2 vols.), Ibadan: Federal Department of Forest Research.

KIRK-GREENE A.H.M., 1958, *Adamawa past and present*, London: OUP for IAI.

KOLAWOLE A., 1988, "Cultivation of the floor of Lake Chad: a response to environmental hazard in Eastern Borno", *Geographical Journal* 154, pp. 243-250.

KRAFT C., 1981, *Chadic wordlists* (3 vols), Berlin: Reimer.

LACROIX P-F., 1953, "Matériaux pour servir à l'histoire des Peuls de l'Adamawa", *Études camerounaises* 37/8, pp. 3-17, 39/40, pp. 5-40.

LEBEUF A.M.D., 1969, *Les principautés kotoko*, Paris: CNRS.

LEBEUF J-P., 1976, *Études kotoko*, Paris: Mouton.

DE LEEUW P.N., 1976, "Fodder resources and livestock development in North-East Nigeria", *Savanna* 5, pp. 61-74.

LENFANT (Commandant), 1905, *La grande route du Tchad*, Paris: Librairie Hachette.

L.R.D., 1972, *The land resources of North-East Nigeria* (5 vols.), Land Resources Study, No. 9, Surbiton: ODA.

LE ROUVREUR A., re-ed. 1989, *Sahéliens et Sahariens du Tchad*, Paris: L'Harmattan.

LEWICKI T., 1974, *West African food in the Middle Ages*, Cambridge University Press.

LYON G.F., 1821, *A narrative of travels in Northern Africa in the years 1818-1819 and 1820*, John Murray, London.

MADZIGA G.L., 1976, "Bornu-Mandara relations to C. 1900", *Nigeria Magazine* 121, pp. 64-79.

MARLIAC A., 1981, "L'état des connaissances sur le paléolithique et le néolithique du Cameroun", *Contribution de la recherche ethnologique à l'histoire des civilisations du Cameroun* (C. Tardits ed), Paris: CNRS, pp. 27-78.

MEEK C.K., 1931, *Tribal studies in Northern Nigeria*, London: Kegan Paul.

MIGEOD F.W.H., 1924, *Through Nigeria to Lake Chad*, London: Heath Cranton.

MIZON L., 1896, "Itinéraire de la source de la Bénoué au confluent des rivières Kadei et Mambere", *Bull. Soc. Géog.* 7(17), pp. 188-211.

MORTIMORE M., 1988, *Adapting to drought*, Cambridge University Press.

NACHTIGAL G., 1879-1889, *Sahara and Sudan*, Berlin.

NACHTIGAL G. (ed and trans A.G.B. and H.J. Fisher), 1980, *Sahara and Sudan*, vol. II, London: Hurst.

NOYE D., 1989, *Dictionnaire foulfouldé-francais*, Paris: Geuthner.

NUGENT Capt. V., 1913, "The Nigerian frontier with Cameroun", *Geographical journal*, Vol. XLIII.

PALMER H.R., 1929, *Gazetteer of Bornu Province*, London: Waterlow.

PASQUET R., 1994, *Organisation génétique et évolutive des formes spontanées et cultivées du niébé, Vigna unguiculata (L.) Walp. Biosystématique et processus de domestication*, Thèse de Doctorat, Institut National Agronomique, Grignon.

PASQUET R., FOTSO M., 1991, "Les légumineuses alimentaires du Cameroun: premiers résultats", *Du politique à l'économique : Études historiques dans le bassin du lac Tchad. Actes du IV^e colloque Méga-Tchad* (J. Boutrais éd.), Paris: Orstom, pp. 317-360.

PASQUET R. & FOTSO M., 1994, "Répartition des cultivars de niébé *Vigna unguiculata* (L.) Walp. du Cameroun : Influence du milieu et des facteurs humains", *Journal d'Agriculture Traditionelle et de Botanique Appliquée*, XXXV1 (2), pp. 93-143.

PASSARGE S., 1895, *Adamaua, Bericht uber die Expedition des Deutschen Kamerun Komitees in den Jahren 1893/4*, Berlin.

PLUCKNETT D., 1976, "Taro", *Evolution of crop plants* (N.W. Simmonds ed.), London: Longmans.

PORTERES R., 1976, "African cereals: eleusine, fonio, black fonio, teff, *Brachiaria, paspalum, Pennisetum* and African rice", *Origins of African plant domestication* (J.R. Harlan *et al.* eds.), The Hague: Mouton, pp. 409-452.

PURSEGLOVE J.W., 1974, *Tropical crops. Dicotyledons*, London (one vol. ed.).

PURSEGLOVE J.W., 1975, *Tropical crops. Monocotyledons*, London (one vol. ed.).

R.I.M., 1984, *Livestock and land use in Southern Gongola State* (3 vols.), Final report to LPU, Kaduna.

ROHLFS G., 1874, *Quer durch Afrika*, Leipzig.

ROUSSEAU J-A., 1935, "Les migrations foulbé et la linguistique botanique", *Bulletin Soc. Études Camerounaises* 1, pp. 55-64.

SA'AD A., 1977, *The LaamiBe of Fombina*, Zaria, ABU Press.

SCHULTZE A., 1913, transl. Benton, *The Sultanate of Bornu*, OUP.

SEIDENSTICKER W. and ADAMU G., 1986, *A bibliographical guide to Borno studies*, University of Maiduguri Press.

SEIGNOBOS C., 1988, "Chronique d'une culture conquérante: le taro", *Cah. Sci. Hum.* 24(2), Paris: Orstom, pp. 283-302.

SIMMONDS N.W. (ed), 1976, *Evolution of crop plants*, London: Longmans.

STEELE W.M., 1972, *Cowpeas in Nigeria*, Ph. D. thesis, University of Reading.

STENNING D., 1959, *Savannah Nomads*, London: OUP for IAI.

STRÜMPELL K., 1907, "Die Erkundung des Faros", *Deutsches Kolonialblatt* 18, pp. 1088-1092.

STRÜMPELL K., 1912, "Die Geschichte Adamauas nach Mundlichen Uberlieferung", *Mitteilungen Geographischen Gesellschaft Hamburg* 26, pp. 49-107.

TARDITS C. (ed.), 1981, *Contribution de la recherche ethnologique à l'histoire des civilisations du Cameroun* (2 vols.), Paris: CNRS.

TAYLOR F.W., 1932, *A Fulani-English dictionary*, Oxford.

THAMBYAPILLAY G.G.R., 1983, "The palaeo-hydroclimatology of Lake Chad", *Annals of Borno* 1, pp. 105-145.

VAN BEEK W.E.A., 1981, "Les Kapsiki", *Contribution de la recherche ethnologique à l'histoire des civilisations du Cameroun* (C. Tardits ed.), Paris: CNRS, pp 113-120.

VOSSART J., 1952, "Histoire du Sultanat du Mandara Province de l'Empire de Bornou", *Études Camerounaises* 35(6), pp.19-52.

WATSON A.M., 1983, *Agricultural innovation in the early Islamic world*, CUP.

WHITE S.T., 1941a, "Mixed farming as practised by some Shuwa Arabs in Dikwa Emirate", *Farm and Forest* 2, pp. 24-26.

WHITE S.T., 1941b, "The agricultural economy of the hill pagans of Dikwa Emirate, Cameroons (British mandate)", *Empire Journal of Experimental Agriculture* 9, pp. 65-72.

WHITE S.T., 1966, *Dan Bana*, London: Cassell.

WILLIAMSON K., 1970, "Some food plant names in the Niger Delta", *International Journal of American Linguistics*, pp. 156-167.

WILLIAMSON K. (forthcoming), "Plant names in Southern Nigeria", to appear in *Food, metals and cities in Africa* (T. Shaw and P. Ucko eds.).

WOLFF E., 1971, "Die Sprachliche Situation im Gwoza-Distrikt (Nordost Nigeria)", *JAL* 10(1).

ZAKARI M., 1985, "Contribution à l'histoire des populations du sud-est nigérien", *Études nigériennes* 53, Niamey: IRSH.

ZELTNER J.C., 1970, "Histoire des Arabes sur les rives du lac Tchad", *Annales de l'Université d'Abidjan, Ethnosociologie*, F-2,2, pp.112-179.

ZEVEN A.C., 1974, "Indigenous bread wheat varieties from northern Nigeria", *Acta Botanica Neerlandica* 23, pp. 137-144.

ZINTGRAFF E., 1895, *Nord-Kamerun*, Berlin: Paetel Brothers.

ZOHARY D., HOPF M., 1988, *Domestication of plants in the old world*, Oxford: Clarendon Press, 249 p.