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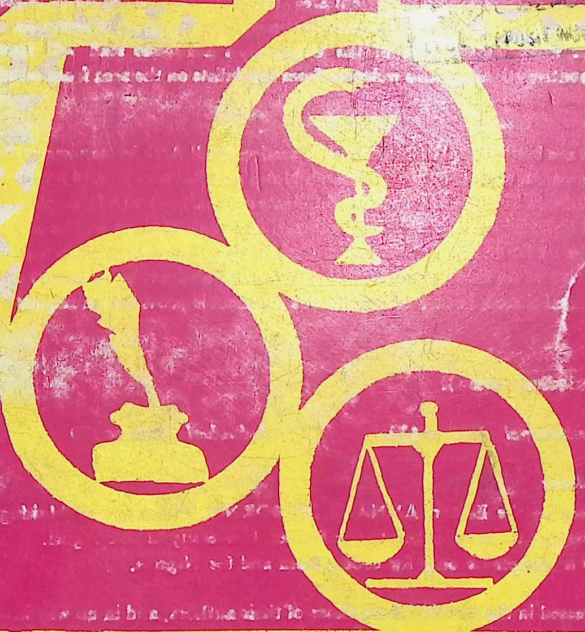
# ANNALS OF BORNO

VOL. III

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UNIVERSITY OF MAIDUGURI

## Annals of Borno

A multi-disciplinary annual periodical of research and documentation in the Human and Natural Sciences from the University of Maiduguri, Nigeria.

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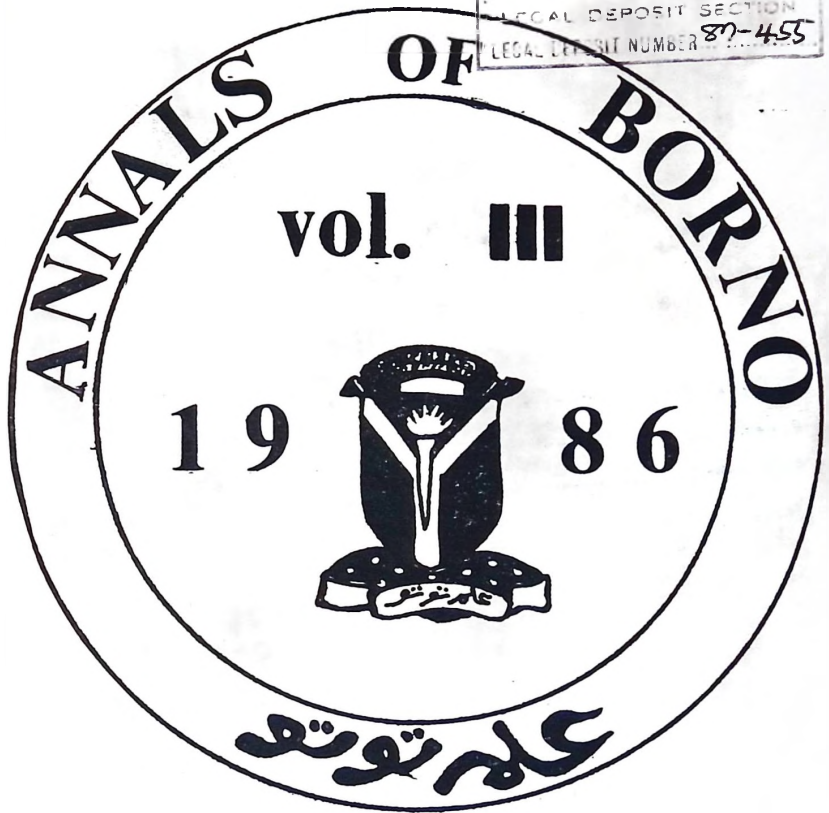
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## EDITORIAL INTRODUCTION

The 3rd volume of the ANNALS of BORNO can come out on time, thanks to the academic contributions of many colleagues and to the financial and moral support of the University Administration. Of the 34 pieces, there is once again a preponderance in the natural sciences, especially Agriculture and Biology—which reflects the University's striving to serve the development of its eco-region. However, the cultural sciences of Anthropology, Human Geography, Economics, Administration, History, Linguistics and Education illuminate happily the conditions, past and present, under which the people of this region have lived, are living and may be living in the future—true to the University's vocation. The lack of reports on medical research promises to be palliated in future volumes, especially in the area of Epidemiology and Community Medicine.

Two features are inaugurated with this issue: a series of *reports* is to acquaint readers interested in the developmental and institutional aspects of the University with plans for new research areas and the evaluation of existing ones, as with the 'Scarborough Report' on the University Hospital. This is in keeping with the University's Tenth Anniversary, which was celebrated at the 1986 Convocation with the publication of the *Tenth Anniversary Commemorative Calendar*—to which these reports are seen as addenda.

The rubric *research in progress* has been long in coming and is herewith making its debut, whilst that of *reviews* is gradually improving. We would, however, appeal to our readers—connoisseurs and amateurs (in the proper sense) of this Region—to contribute more towards the review of the literature, including the setting up of a *Current Bibliography of Borno & Adamawa*.

If we may make bold to forecast for the next issue, it is also intended to offer separate editions of the ANNALS: one complete with the Natural and Cultural Sciences, as before; one separatum for the Natural and another for the Cultural Sciences, so as to enhance the sale and distribution to individual academics.

Another editorial decision for the future is to take account of the University's ecological interests in the Sahel and Sahara by including occasional contributions from similarly interested institutions and scholars in West, Central and Northern Africa in *Arabic, English or French*, with abstracts or summaries in English.

CONRAD MAX BENEDICT BRANN  
May 1986



## PRE-COLONIAL GOVERNMENT AND ADMINISTRATION AMONG THE JUKUN

by

Sa'ad Abubakar

The Jukun-speaking people are located mainly in the middle Benue region, between Djen in the north and Abinsi in the south; and from the lowlands of Plateau State in the west to the piedmont of the Mambilla Plateau in the east. It is difficult to determine their antiquity in this region largely because while available oral traditions do not go far enough into the remote past, the limited archaeological work in the area is yet to be fully analysed and published<sup>1</sup>. It is quite possible that all the modern Jukun groups within this vast region of the Nigerian middle Belt were possibly part of the legendary KWARARAFa—an ancient Kingdom or possibly an empire which is believed to have flourished in the Benue region several centuries before it was succeeded by the Kingdom of Wukari<sup>2</sup>. In view of our obvious handicap, i.e. lack of sufficient information relating to the emergence, growth and internal structural organisation, of the ancient Kwararafa empire this article is more concerned with the Jukun system that had emerged at Wukari and spread to other areas as from about the 18th century.

### The Structure of Jukun Government

Governments of the various pre-colonial Nigerian peoples were remarkably similar in a number of ways. Those of Kanem/Borno and the Hausa for example exhibited strong influence of Islam even before the era of the revolutionary movements in the nineteenth century<sup>3</sup>. The influence of Islam on the nature and functions of government in both Kanem/Borno and Hausaland was much strengthened following the jihad of the Sheikh Uthman Ibn Fudi. While in the western parts of central bilad al-Sudan, emirate type of governments replaced the pre-existing Hausa governments, in the east, the emergence of Muhammed al-Kanemi rejuvenated the influence of Islam on the Borno government. However Islam was not the only faith that had influence on the government of its adherents. Almost all the pre-colonial governments in the Nigerian area were, in one way or the other, influenced by the religious beliefs of the people. As a matter of fact, the governments of the non-Muslim communities; such as Benin, the Alafinate of the Yoruba, and the Igala, to mention just the better known groups, exhibit stronger influence of their traditional religion, far more than those of Borno and the emirates exhibited Islamic influence. This was quite apparent in the case of the Wapan<sup>4</sup>, whose government in Wukari was structurally and functionally influenced by their religious beliefs.

The government of the Jukun has been described by the late C. K. Meek as a theocracy<sup>5</sup>, i.e. a state governed directly by gods or through a sacerdotal class, where the *Aku* (King) served as head of the priestly class. He was not therefore a supreme political authority, but merely a representative of gods as well as their intermediary with the people. But as a divine personage, the *Aku*'s person, it was believed, was

magically charmed to secure the invincibility of the entire country inhabited by the Jukun. He had the power of life and death over all citizens and his decisions were final, because they had divine sanctions. But in actual fact, the Aku being merely part of the decision making process had only very limited powers. He was indeed the most senior person, the most important personality in the state, just like the Oba of Benin, the Alafin of Oyo or the Amayanabo of Elam Kalabari. But in terms of wielding real authority, his position was different from that of the Mais in Borno or the Sarakuna in the old Hausa states. While the latter wielded enormous powers because the ruling elite (*masu sarauta* in the Hausa states, *majlis* in Borno) comprised men selected and appointed by the chief executives, the Aku wielded less power because the power elite around him was composed in a different way. The leading officials in the government were not appointees of the Aku *per se*, and so the extent of his control over them was very much limited. In most cases they decided what actions were to be taken and also exercised direct control over the Aku.

The civil officials in the government were headed by the *Abo*<sup>6</sup> whose position was more or less similar to the *Wazir* in the emirates, or the *Bashorun* among the Oyo Yoruba. Thus, the Abo was the premier adviser of the Aku and part of his function was to report on daily events to the latter. Similarly, while the Aku was the intermediary between the gods and the people, the Abo was also the channel of communication between the people and the Aku. All citizens—including officials of government had no direct access to the Aku except through the Abo. Consequently he had access to the Aku at anytime. Quite clearly therefore the Abo occupied an important position in the Jukun hierarchical system and the Aku's life was virtually secluded. This is because the sacredness of the Aku's personality precludes direct approach by his citizens. The next senior official was the *Abo Zike* (junior Abo) whose duty was to assist the senior Abo in the discharge of his many functions. There was also the *Kinda-Achuwo* assisted by *Kinda-Zike* and a couple of other *kindas* whose duties concerned the daily royal rites.

What was remarkable about the power elite in the old Jukun political set-up was that almost all the senior members were drawn from among members of the royal family. The *Kinda-Achuwo* for example, was usually the *Aku's* official younger brother. The officials of the palace were headed by the *Awei-Achuwo*. They comprised the *Kato*, overseer of royal enclosure and the head of those responsible for the preparation of *Aku's* victuals, the *Aku Nako* and the *Kato Jo*, as well as the six "gentlemen of the bed chamber<sup>7</sup>," the *Kato biene* and the *Kure* whose duty was to repair the *Aku's* bedroom. Other palace or domestic officials include those responsible for accompanying objects during the performance of important rites and also looked after the dishes of the *Aku*. There was also an official, the *Kundushishi*, who supervised the wives of the *Aku*. Ordinarily the domestic officials in Wukari had limited political power and authority, but because of the nature of their work—always so close to the *Aku* and very senior civil and spiritual officials—they certainly had some kind of influence in the state.

The sacerdotal class of officials, because of their positions in Jukun theology, had by far the greatest responsibility in the day to day affairs of the Jukun people. The most senior priestly official was the *Ku Puje Achuwo*, the chief priest of the Jukun's most important holy place at Puje. In matters of religion his position was equivalent

to that of chief Imam in the emirates. The *Ku Puje Achuwu* was assisted by six deputies, known as *Ku*, and about eight *Iche*. Basically, there were two types of cults in Jukun religious beliefs: The universal or public cults and the private or family cults<sup>8</sup>. While the potency of the former was over all Jukuns and jukunland, the latter's was restricted to individuals or families. The priests of the universal cults were also influential members of the government. Such priests as the *Avu Kenjo*, *Avu Yaku*, *Avu Wayu* and the one for *Achu-nyanda* were all hereditary personalities and did not in any way owe their positions to the Aku. Thus, it was this basic independence that gave them tremendous influence in the affairs of the Jukun since historic time.

Other leading officials of the Wukari government were the *Akuke* (war leader, or better still, commander of the armed forces), the *Tsuma* (royal diviner), the *Nene* (spokesman or press secretary) the *Kidadu* (head agriculturalist) whose position was equivalent to the *sarkin noma* of the Hausa states. Others were the *Ku Vi* (leather worker of the Aku) and the one responsible for the Aku's installation; the *Nani* (supervisor of the royal burials) and last but not the least there was the *Kuya* (official representative of the defunct dynasty at Kwararafa).

It would appear from the foregoing that government among the Jukun was a matter only for men. But that was not the case. As a matter of fact nowhere among the pre-colonial Nigerian states were women more politically involved in government than among the Jukun. The leading women officials were the *Angwu Tsi*, *Angwu Kaku*, *Wakuku* and the *Kunsheje*<sup>9</sup>. The *Angwu Tsi* was the female counterpart of the sovereign, not the first lady, but usually a widow of the deceased Aku. The office is held for life and she lived outside the Aku's palace in her own residence with a court and its officials, such as the *Awebwa*, *Kuntami*, *Awe Jo*, *Kinda* and *Kinda Abgugbu*. Thus, the *Angwu Tsi* was the head of all the women in the Kingdom of Wukari and part of her priestly function was to annually plant the royal seeds. The *Angwu Kaku* on the other hand was the official sister of the *Aku*, usually the senior princess of the last *Aku*. The *Wakuku* occupied a position similar to that of *Uwar Soro* of the Hausa sarakuna and the *Gumsu* of Kanem-Borno. On the installation of a new *Aku*, the *Wakuku* had to bring him from his house and keep his company for the first night. Her position was that of the senior wife of the sovereign. Finally, the *Kunsheje*, like the *Magira* in Kanem/Borno, was the mother of the *Aku* and she too had her own residence and a court comprising such officials as the *Kuje*, *Kusho*, *Kuza*, *Kasi* and *Jifida*. Other titles like *Ashu Wune* and *Wundu Kwi* formerly held by daughters of the *Aku* have disappeared from the political system. As we shall see, some of these women officials had vital roles in the administration of the Wukari kingdom.

The government of the Jukun of Wukari was indeed an elaborate and highly complex body. It was hierarchical with the 'gods' at the apex, the *Aku* and the sacerdotal class under them. It was a system that developed over centuries and not just something that had come into being quite recently. Functionally, the *Aku* was simply a '*primus inter pares*' working closely with the highly influential priestly class headed by the '*Avu Kenjo*'. This will be evident as we consider the details of administration of the Jukun state.

### The Administration of the Jukun kingdom

The kingdom of Wukari, established possibly after the collapse of Kwararafa, was described not as a unitary state, but as "a loosely knit confederacy composed of a number of semi-independent chiefdoms<sup>10</sup>." As a matter of fact, the hegemony of Wukari extended over two types of territories. Firstly, over the core area, metropolis or nucleus which comprised areas around Wukari in the middle Benue region, and over which the Aku's government exercised direct control. The second type of territory comprised two categories of dependancies; those inhabited by Jukun under the authority of local chiefs and those inhabited by non-Jukun with their own local rulers. Its structure was therefore more or less similar to the Caliphate system established over the greater part of the present Northern states in the 11th century. But there were clear differences between the two systems. While the Aku was divine and an intermediary between gods and the people, the Sokoto Caliph was neither divine nor an intermediary between the Muslims and their creator. He was simply the leader of the community subject to the same laws of God. Nevertheless, in both systems, religion was the basis of legitimacy; Islam in the case of Sokoto, and the Jukun religion in the case of Wukari. Being the "fountain and highest example of divine kingship<sup>11</sup>", the authority of the Aku was buttressed by his religious position. The person of the Aku was believed to be a magical charm which secured the invincibility of the country. Quite clearly therefore physical force was not and had never been behind the power and authority of the Aku. Indeed, the Jukun of the middle Benue area were "an unwarlike collection of people<sup>12</sup>" and the Aku was not a military potentate, but a spiritual leader whose supremacy within the state rested upon "the maintenance of innumerable cults under his presidency<sup>13</sup>."

The most important function of any government is the maintenance of law and order so that citizens could pursue their legitimate occupations and trades for their livelihood without fear and molestation. In the Jukun kingdom of Wukari that task fell not upon an army or police force, but upon the national or universal cults. In Jukunland each family functioned as a religious unit with its distinct cults. The cults protected the family and rites were performed by them for protection. However the efficacy of such cults was limited only to a family. On the other hand, the efficacy of the universal cults extended over all the land and people in the state. To that extent, therefore, the powers of cults like *Kenjo*, *Yaku*, *Wayu*, and *Achu Nyanda* overrode those of family cults<sup>14</sup>. The *Kenjo* cult was the patron of war and the procurer of victory for the nation during battles and wars. The priest (*Avu Kenjo*) performed the essential rites for the appeasement of the cult so that it could keep vigil over national security and guarantee victory in war. The *Kenjo* was also believed to have control over lightening and rains, and it was believed that once rites were not performed, there would be no rains, thereby jeopardising the life of the people. The Aku being the "high priest par excellence" was responsible for the offerings made by the priest to the cult. The *Yaku* cult was also a rain cult and rites were performed to it by its priest to arrest drought. The *Wayu* and the *Achu Nyanda* on the other hand were part of the judicial arm of the Jukun administration.

All Jukun obeyed the orders of government because they believed doing otherwise meant disobeying the gods. The generality of the people obtained favours of the ancestors and deities through loyalty and obedience to the priest under the leadership

of the Aku. Sufficient rainfall and bountiful harvest were both impossible unless they fully obeyed the orders of the constituted authority. National prosperity was only possible if the Aku and the various priests around him observed their various taboos and carried out their essential rites. It therefore goes without saying that disloyalty to the government might lead to its leading persons not performing their religious duties which in turn meant the on-set of national disaster, such as drought or outbreak of serious epidemics.

In Jukunland, because decisions of government emanating from the Aku were fully supported by religious sanctions they were final and unchallengeable. To that extent therefore it is possible to see the Aku as a despotic ruler. This was, however, far from the reality of the situation. In modern parlance, the Akuship among the Jukun was result-oriented. As head of the executive, it was religiously required of him to consult with all his various advisers - civil, palace and spiritual before any major decision was to be taken. The senior officials led by the Abo formed 'a patrician caste' embodying the tradition of the Jukun; they took all major decisions for the Aku's concurrence or veto. But for a number of reasons the latter was rarely used. The Abo was a priest in his own right and was in charge of the royal rituals upon which the authority of the Aku depended. The maintenance of the aura of secrecy about the royal ritual was essential to the prestige of the Akuship, and all the Abo needed to do to obtain the approval of the Aku for any measure was to threaten the disclosure of the secrets of the royal rites. That was tantamount to undermining the basis of the authority of the Aku. In Jukun theology, the Aku was also identical with the state; its success or failure was therefore a direct reflection of his office so that the society could function normally. Similarly, the leading priest within the government also performed various essential rites which, in Jukun belief, ensured security for the state and prosperity for the people. That the priests occupied key position in government as far as decision-making was concerned, was never in doubt. Whenever the state was faced with any problem, the priests had to diagnose the ills and procure remedies. If for a problem such as serious drought, epidemics and the like, the cause was attributed to the Aku's negligence on observing taboos and prohibitions, he had to go. That meant joining his ancestors or at best, a very serious warning to the Aku. Thus, the smooth operation of the Jukun government required understanding and general accord between the Aku and the priestly class around him. Moreover, the Aku, secluded from the people, was never in the full picture of events and happenings within the Kingdom. The Abo being the main channel of communication decided what should reach the Aku from the people and vice-versa. The Aku was therefore anything but a powerful ruler, real authority was wielded by the sacerdotal class in the capital. A successful Aku was therefore the one who had succeeded in living a life in complete accord with his powerful priests in-charge of the universal cults.

The administration of the metropolis was, in name, under the direct control of the Aku, but members of the royal family and other civil officials played a more active part in local matters. It was the practice to assign specific areas to princes and each was expected to move out to his district to effect better administration with his own court. The royal district rulers were generally treated with respect by all the people. This was possibly, because they refrained from interfering in local matters, confining their activities only to spiritual issues. Some of the districts within the metropolis

had their own chiefs but their positions remained unaltered even with the presence of royal princes from Wukari. In this regard, one may equate this system to that of Old Oyo, where the Alaafin was represented in the outlying regions by the *Ilaris*. It was also similar to the Borno system, where the Mai was represented in the courts of the Hausa *sarakuna* before the establishment of the Sokoto Caliphate. The system of appointing leading princes as district rulers developed among the Jukun as a means of keeping away all powerful claimants to the throne from the capital so as to minimise the possibility of their intriguing with leading officials to undermine or overthrow the authority of the Aku. It was therefore customary that once a new Aku was appointed and installed, his serious rivals had to be appointed to district posts so as to reside outside the capital. The most important district headships included the *Sebe* of Akwana, the *Tsoho* who looked after the country of Zomper, near modern Takum and the *Tsike* who resided at Sinkai to take charge of the ferry across the Benue<sup>15</sup>. Others included the *Shamaki* who resided at Arufu and supervised the extraction of minerals etc, and collected all revenues due to the government. The *Musi Buhu* resided at Ando Musi and was also responsible for the affairs of Gidan Yaku and finally, the *Kuse* who was the representative of the Aku at Donga.

Next to the district representatives were supervisors of leading villages within the metropolis. But this category of officials were drawn from members of the Aku's government resident in the capital. In some aspects this system was similar to that which developed in some emirates of the Sokoto Caliphate, where leading officials had *fiefs* which they depended upon for almost all their regular daily needs<sup>16</sup>. The leading officials of the Aku who had villages assigned to them maintained constant touch with them through intermediaries. The *Abo* and the *Kinda Achuwo* had more villages under them than other officials<sup>17</sup>. The former for example was in charge of Wanufo, Tsufa, Akyekura, and Sinkai; his junior was in charge of Abinsi. The *Kinda Achuwo*, on the other hand, was in charge of Riti, Fiai, Gankwe, Tikaso and Kunyishi. The *Kinda Bi* was responsible for Dampar, the *Kato Banga* for Akwana, the *Angwu Tsi* for Keana and Arufu, the *Awe Achuwo* for Chimankar, and finally the *Tsokwa* for Takum. It is however not clear if the distribution of these villages to officials was similar to what obtained in some of the emirates such as Zaria, where for example no official controlled extensive unbroken territory. What is known is that the various villages lived under local rulers and maintained contacts with senior officials through the latter's emissaries.

It is indeed remarkable that there is virtually no indication of episodes of disloyalty to the central government among the Jukun in the middle Benue region during the pre-colonial period. The main factor that accounted for the dedicated loyalty of the Jukun to the Aku and the government was certainly not military. Districts and villages entertained no fear of punitive military action, if they did not accept the authority of the government at Wukari. Just as in the case of the maintenance of law and order, here too Jukun religion was the big force behind the authority of government. The most powerful and efficacious Jukun cults were all based in the capital which was in fact the cult-distributing centre of all the Jukun-speaking peoples. Thus, the district and village cults were derived from those in Wukari, which had control over rains, security and health. Disobeying the orders of the government by districts and villages, therefore, had very serious repercussion for the people.

In the judicial field, the gods were the source of law and this was communicated to people through the Aku and senior priests of the universal cults. It was also universally held that whoever broke the law would somehow be punished by the gods: there was therefore no need for a law-enforcement body in the state. But the *Kinda Achuwo* was the head of the judicial administration and there were special cults which discharged judicial functions. Such cults as the *Wayu*, *Waggye*, *Achu Nyanda* and the *Kenjo*, which were believed to have control over lightning, were resorted to in cases of thefts and loss of property<sup>18</sup>. After performing certain rites by the priest of any of these cults, it was believed that lightning would strike the culprit or his house. In other cases, civil or criminal, divination and ordeal were employed for the purposes of adjudication.

### Provincial Administration

The Jukun in the Middle Benue Region, like those in the metropolis, acknowledged the religious supremacy of the Aku and this formed the basis of political association with the government in Wukari. There were three types of chiefdoms that comprised the Jukun confederacy. Those that developed independently, such as Kona; those founded by immigrants, either from old Kwararafa or Wukari, such as Pindiga Gwana, Awei among others; and those that emerged and developed as a result of contacts and intercourse with Jukun, such as Goemai, Kam, Hwaye and Kpwate. The last category of chiefdoms were inhabited by non-Jukun, but because of the extent of Jukun cultural and political influence, the Aku of Wukari was seen as the most senior vis-a-vis their own chiefs. Though non-Jukun speaking, the third category of dependant chiefdoms were governed much in the same way as the Jukun of Wukari. Jukun religious institutions had also infiltrated into the neighbouring non-Jukun chiefdoms to such an extent that Wukari was accepted as a source of powerful cults, thereby making the Aku their spiritual cum political overlord.

Among the Jukun-speaking subordinate chiefdoms, Kona was the next in importance to Wukari. Its government was more or less a replica in miniature to that of the Aku. The chief of Kona, addressed as *Kur*, was surrounded by over twenty secular and spiritual officials, headed by the Senega. Like the Aku<sup>19</sup>, the *Kur*, too, led a secluded life leaving the Senega to grapple with the day-to-day affairs of state. Just as Wukari was noted for powerful cults within the Benue region, so was Kona famous as a centre of very efficacious cults whose influence extended over such neighbouring groups as the Yorro, Kunini, Djen, Chomo, Lau Habe and Bandawa. Virtually all the various communities in the environs of Kona looked to the *Kur* for religious guidance and direction. It is even suggested that the Chamba of Sugu had migrated from Kona in the west to establish chieftaincy institutions in the east<sup>20</sup>. There certainly was Kona's influence among its neighbours, as most of them had religious cults derived from Kona with priests who had been specially trained by those in Kona.

Between the Kona chiefdom and Wukari a number of small communities lived as autonomous groups. The Jiru along the Benue and the Wurbo in the region of the Taraba-Benue confluence were probably not Jukun-speaking originally. But by the eighteenth century they had, as a result of constant relationship, come to share certain religious and social customs with the Jukun. Like the Hwaye and Kpwate they

acknowledged the Aku of Wukari as a political leader, more so because they had not developed any form of centralised institutions themselves. There were also the Kam and the Chamba of Donga, along the valleys of the rivers Kam and Donga, respectively. The latter were certainly not part of the Jukun kingdom, but co-habitation of the same environment for a considerable period of time, resulted in their adoption of Jukun political and religious institutions as well as a resident representative of the Aku in the *Gara's* court<sup>21</sup>. The Kam on the other hand, claim that the founders of the Jukun state of Wukari and that of their chiefdom were twins, that of Wukari being the elder. The *Wan* (chief) of Kam, like the Aku of the Jukun in Wukari, was a divine personage subject to similar taboos and prohibitions. His position was however reckoned to be next to the Aku and *Kur* of Kona. To the south of Kam lived another Jukun-speaking people known as the Jibu. Their earliest centre was Kunpien, near modern Gashaka, and it was from there that they spread along the valley of the river Taraba. Their earliest centres included such places as Kungana, Tapare, Bali and Kundi. Unlike the other Jukun groups, the Jibu lived not under a centralised chiefdom but in small communities headed by elders who acknowledged the spiritual authority of the Aku in Wukari.

In the region to the north of the Benue region were a number of Jukun dependant chiefdoms and groups that were highly influenced by Wukari. Of the former, the most important were Pindiga and Gwana<sup>22</sup>. Located in the upper Gongola valley, the Jukun of Pindiga exercised sovereignty on behalf of the Aku over a number of non-Jukun-speaking peoples, such as the Bolewa, Waja, Tera and some groups among the Tangale. The chiefdom of Gwana, located south of Pindiga, also exercised considerable influence in Wurkumland. The earliest community in Bambur traced their descent from the Jukun, possibly from those of Kona to the south of the Benue, or from Pindiga to the north. Similarly, the Kuyu of Karim claim origin from the Jukun of Wukari. Thus, apart from the chiefdom of Gwana, Jukun influence was certainly well spread to Wurkumland by the Kuyu of Karim, the Bambur, and the Djenjo, to mention just a few. Further down the Benue, the communities of Bomanda, Je-Muri and Maltumbi, who exploited the salt deposits in the environs of Muri, were believed to have been under the direct authority of the Aku in Wukari—just like the inhabitants of the lowlands to the east of the Central highlands of Nigeria. There too as elsewhere in the Middle Benue Region, a number of Jukun immigrant settlements, such as Kwande, Ajikamai and Wase Tofa, helped in the dissemination of Jukun political influence. Thus, the Goemai as a result of mutual understanding and association developed a political system that was hardly different from that which operated in Wukari. The *Long Goemai* occupied a position similar to the Aku of Wukari. His officials, headed by the Shamkwel, comprised priests as well as civil functionaries. Finally, the chiefdoms of Doma, Keana and Awei in the Niger Benue confluence area were also dependencies of the Aku of Wukari before the 19th century.

### Relations between Wukari, its Districts and Chiefdoms

The chiefs and other officials in-charge of districts had various types of relations with Wukari and the Aku. All the chiefs of dependencies were autonomous in so far as management of their affairs was concerned. In tune with his political and religious

seniority, the appointment and deposition of all the major chiefs was vested in the Aku. In the event of death of any subordinate chief, it was the duty of the chiefdom concerned to select a successor who subsequently had to visit Wukari for confirmation. Where it was not possible or necessary to visit Wukari, the chiefdom's king makers had to send a message to the effect that a successor to their deceased chief was appointed. Such a notification to the Aku was necessary to legitimise the accession to office. Traditions are clear that all new chiefs appointed at Kona had to pay a visit to Wukari for installation. But in the case of the Mudut Goemia, in the lowlands, message to Wukari was all that was needed on appointment of a new chief. This arose from the situation that it is taboo for their chief to cross the Benue river or see eye to eye with the Aku. The real position in regard to the other chiefdoms is not quite clear: possibly they too merely sent news of the death of their chiefs and the appointment of a new one, or that the new chief had to come to Wukari in person to be appointed. What we do know for sure is that chiefdoms like Kam, Gwana, Pindiga and all those to the south of the Benue river looked to the Aku to approve the appointment of their chiefs and unless this was done their accession would be null and void.

Since it is the Kona Jukun who seem to have surviving traditions on the appointment of their chiefs by Wukari we should examine what was actually involved. The Aku ratified the appointment of chiefs by giving any new chief a virgin girl, either a daughter of his sister or of any leading member of the Wukari government. The significance of this is considerable. The conferment of a Wukari daughter, especially of royal descent, was most likely to strongly oblige the new chief to be steadfast in his loyalty to the Aku. Where the girl was of royal descent, the Aku was usually considered as father-in-law. As a result of this tradition, most of the ruling houses in the various chiefdoms had matrimonial links to the ruling aristocracy in Wukari. However, the most significant gift to any new chief from the Aku was seed corn. This was believed to have magical properties to ensure a bountiful harvest by the community. These were the seeds which, like the Aku, all chiefs had to distribute just a few to their subjects to be used for the first sowing in the rainy season throughout the land. By custom it was after the royal seeds were sown that farmers moved to plant their seeds on their farms. The Aku also used to send gifts of such items as "a burnous, cap, gown, shawl, sandals, spear, arm-knife and fan<sup>24</sup>" to any newly appointed vassal chief. They were also usually strongly admonished by the Aku to continue to maintain the observance of the daily rituals which, as chiefs, was one of their most important functions. When these formalities were completed, the installed chief was escorted back to his chiefdom by acolytes who saw to it that the rituals were instituted before handing over to the new chief "a secret charm which could ensure the safety and prosperity of himself and his people"<sup>25</sup>, so long as he observed the royal taboos.

From the foregoing it is apparent that religion also played an important role in maintaining the primacy of the Aku's position vis-a-vis the chiefs of Wukari's satellite chiefdoms. All the vassal chiefs performed rituals derived from Wukari; they made use of sacred corn-seeds supplied by the Aku and they also obtained other religious charms for the day to day operations of their respective communities. To this extent therefore the Aku's position was certainly above disobedience since to disobey him meant serious set-backs to their communities. In short, the religious supremacy of the

Aku was a strong factor that accounted for the continued loyalty of his subordinate chiefs.

Apart from formalising appointments, the Aku also had the power of deposition of certain chiefs under Wukari. In fact, the Aku, according to tradition, had authority to order the deposition, or even execution, of subordinate chiefs. The ground for the latter was contempt of Jukun religion, and for the former it was usually general misgovernment of the chiefdom. The local electors or king-makers in the various chiefdoms also had the power to depose their chief, but the Aku had to be officially informed. In Kona for example, it was the practice to depose the chief by a fictitious message; that the Aku had requested the *Kur* to visit Wukari, so that as soon as he set out on a journey a new chief would be appointed<sup>26</sup>.

The nature of relationship between the Aku and his chiefdoms was similar to what obtained in other Nigerian polities at the same time, especially Kanem-Borno under the Sayfuwa and the Sokoto Caliphate in the 19th century. Appointments and depositions were major indicators of the extent of the authority of the overlord. But whereas in both Borno and Sokoto there were instances when the sovereigns alone decided whom to appoint over certain states or emirates, thereby dispensing with local wishes, the Aku of Wukari in all cases abided by local recommendations in the exercise of his functions. There is not a single instance of the Aku forcing an individual as chief over any of the dependant chiefdoms. But there are traditions among the Gwana Jukun that several of their chiefs were deposed at the instance of the Aku of Wukari. It is also indicated that the various chiefdoms had specific officials whose duty was to maintain periodic contacts with the government in Wukari. These representatives resided not in the vassal chiefdoms but in the capital, Wukari, under the Aku. Thus, the Wukari system was, in this respect, different from the practice in Borno, the Alafinate of Oyo and the Sokoto Caliphate where representatives of the sovereign were charged with the duty of maintaining contacts with the vassals by residing with them. Even though Kona traditions point out that the conduct of their *Kur* was closely scrutinised by the Aku to ensure good government, it is not indicated that this was done by a resident representative of the Aku or by his official who visited Kona from time to time. In all probability this was done by the priests in Kona who had their own channel of communication with their counterparts in Wukari.

#### Material resources and Revenue

In writing about material resources and revenue in pre-colonial Nigerian polities, C. K. Meek made the interesting remark that the Jukun state was not a "tax collecting sultanate"<sup>27</sup>. The impression here is that the Jukun state was different from the Sokoto Caliphate, Kanem Borno, the Oyo Empire, Benin and other Nigerian polities in the pre-colonial era. While it is true that there did not exist among the Jukun a system of regularised tax payment, the Jukun state of Wukari, like other Nigerian states of the time, had a system which enabled the Aku and other functionaries of government to receive various resources from their communities. Thus, the relations between the Aku, metropolitan districts and chiefdoms were not merely restricted to political matters, there were also important economic considerations. In the metropolis for example, all the villages paid tribute through their supervisor to the central government.

An official, the *Fotso*, was specifically put in-charge of tribute in Wukari<sup>28</sup>. As a matter of fact all villages within the metropolis used to send to Wukari products peculiar to them as tribute<sup>29</sup>. Dampar for example generally sent dried fish and palm oil; Akwana sent salt, Arufu usually salt and antimony, while Sinkai sent cloth. Within the capital itself, it was the custom for each household to give the Aku bundles of corn at the end of each season and the quantity paid by each depended upon the status of the householder. Moreover all fines imposed and paid in the course of any judicial proceeding was retained by him. Similarly, the Aku was entitled to part of game animals killed in the course of hunting expeditions. He was also entitled to free services from his subjects; his palace was usually repaired by the people, the royal farms were worked communally by the citizens of the capital and those near it under the supervision of the Wananku.

The above system which operated around Wukari also obtained in almost all the Jukun chiefdoms. The hegemony of Kona extended over the riverain groups, Lau-Habe and Bandawa, who used to send to the *Kur* gifts of fish (fresh, dried and smoked) and also calabashes; the inhabitants of the Mumuye massifs, who under their *kpantis*, installed by Kona, sent tribute of yams, corn and goats.

The kingdom of Wukari had also a very strong economic base. The Middle Benue Region was blessed with several brine-springs, and it is even suggested that "the desire to control the supplies of salt, one of the most prized commodities among inland people, exercised a considerable influence in the formation and building up of the Jukun state"<sup>30</sup>. The salt producing villages inhabited by Jukun attracted traders from the neighbouring areas, Hausaland and possibly Kanem Borno as well as from the Niger-Benue confluence area. There were also important centres of antimony in the same region, under the control of the Aku of Wukari. Quite obviously therefore the Jukun kingdom derived revenue—levies paid by the traders as well as by the Jukun who exploited the mines—which was vital for the proper functioning of government.

It is apparent from the foregoing that much as the Jukun state was not a tax-collecting sultanate, its system of acquiring material resources was not markedly different from what obtained in other states of that time. Indeed, there were probably no market stalls, occupational levies, tolls on caravans punitive expeditions or slaving sorties, for Jukun traditions are silent on these. Nevertheless occupational products—farm produce, fish, cloth, salt etc, were sent to the Jukun rulers since time immemorial, on more or less regular basis. According to Meek, these were mainly sent for "semi-religious offerings"<sup>31</sup>. It is my opinion that the various products were sent to Wukari, not as mere gifts for the pleasure of doing so, but in recognition and appreciation of the duties performed by the Aku and the priests; duties which they believed were, by and large, responsible for health, fertility, peace and tranquility in Jukunland. To this extent, therefore, the gifts were very necessary. There were also compelling reasons for the collection of taxes and the receiving of tributes by such kingdoms as Borno, Oyo and even the Sokoto Caliphate. First and foremost, tribute was paid to express loyalty by vassals or to escape possible punitive measures. Taxes were paid into public treasuries for various reasons; for up-keep of members of government, for the maintenance of the army and the poor, etc in accordance with the stipulations of the shari'a. Thus, religious considerations, the need for peace and security were

the factors that explained the levy of taxes and collection of tributes among some Nigerian states.

From the foregoing, it is apparent that the margin between the system that operated among the Jukun and elsewhere is quite thin. In case of the former, vassal chiefs were very regular in sending whatever they had to the Aku, not because of his military might, but because of the fear of the consequences emanating from the force of religion. Elsewhere in the Nigerian area, tribute flowed to the sovereign because to do otherwise was to invite the wrath of the overlord, expressed in several ways. The argument that among the Jukun the Aku and his vassals merely exchanged gifts, and therefore 'tribute' was not paid, is not at all convincing. For example the Kona used to send fish, iron currency and calabashes in varying quantities to the Aku every year and in turn, he sent salt and charms to Kona. Again, this practice was not peculiar to the Jukun. In most Nigerian pre-colonial polities sovereigns did, from time to time, send gifts to their subordinates. Thus, it was not uncommon for the Shehu of Borno, the Caliph in Sokoto or the Alafin to send special gifts to their vassals who had been sending tributes. Indeed, while tribute was a necessity to express acceptance of vassalage and continued loyalty, a gift from a sovereign was in most cases to mark an important occasion in the life of the vassal state. The extensive bureaucracy of the Jukun, a large body of cults with numerous priests as servitors, etc certainly depended on what was available within the kingdom for their maintenance and for the needs of government, and this was obtained not through a regularised tax collection, but through gift despatch from villages and dependancies and through the control of its mineral resources in the north Benue Region.

### Conclusion

The kingdom of Wukari, established as a successor to the mythical Kwararafa empire, was undoubtedly the greatest non-muslim polity to have emerged in the northern Nigeria area in pre-colonial times. Its government though quite elaborate, consisting as it did of priestly, civil, military, palace and women officials, was nevertheless very effective in maintaining peace and order, as well as providing security and stability down to the advent of British colonial rule. The traditions of the Jukun do not speak of internal crises and conflicts. These, no doubt, were by and large the exception rather than the rule, right from its foundation down to the end of the 19th century.

Another interesting feature of the Jukun government was its structural arrangement in accordance with the functions performed by each group of officials under its leader, with the Aku at the helm of affairs. In the 19th century the Jukun system was threatened by a number of forces. There were for example the Chamba from the north-east and the Tiv from the south-east, whose encroachment on the fertile middle Benue valley in search of more fertile agricultural lands was effectively curtailed. There were also threats from the jihadist as part of the revolutionary movement of Sheikh Uthman Ibn Fudi in the 19th century. Indeed, quite a proportion of Jukun and Wukari territories were lost to the newly established emirates of Bauchi, Gombe, Muri and their satellites, but Wukari and its environs, for all intents and purposes, remained under the authority of the Aku throughout that century. That the Wukari system survived the Islamic revolutionary movement as well as the encroaching threats of the Chamba

and Tiv is a clear testimony of its effectiveness in checking and curtailing external aggression. In short, the system, inspite of centuries of existence and operation, did not become effete and obsolete even at the time it was superseded by the Lugardian system in the defunct Northern Nigeria.

#### NOTES

1. The only archaeological excavation within Kwararafa so far was undertaken by a Belgian team under the sponsorship of the Federal Antiquities Department, Lagos in 1969/70. The report and findings are still being eagerly awaited.
2. According to traditions in: Fremantle, J. M. *Gazetteer of Muri Province* (London 1920), Wukari was founded in (ca. 1660) the 17th Century within the precinct of old Kwararafa.
3. Islam reached Borno in the 11th Century and the Mais, subsequently Islamised became great Islamic proselytisers. By the 14th Century, Hausaland was also Islamised. Thus Islamic influence on the governments of Kanem-Borno and the Hausa states was of very long standing.
4. *Wapan* or *Apa* was the name of all the different Jukun-speaking peoples, including those claiming common descent from them. These include the Igala, Idoma, Igbira, Arago and the Ud'am of Ogoja; See Abubakar, S. *The Kwararafa factor in the History of Kano* (unpublished paper, 2nd International Seminar on Kano and its Neighbours, BUK, September 1985) p. 3.
5. Meek, C. K. *A Sudanese Kingdom: An Ethnographic study of the Jukun-speaking peoples of Nigeria*. (Reprinted, New York, 1969) p. 332.
6. *ibid.* p. 333.
7. *ibid.* p. 338.
8. For details on Jukun religion see *ibid.* pp. 1 81f.
9. *ibid.* p. 340; 342.
10. *ibid.* p. 342.
11. *ibid.*
12. See S. Abubakar, "Peoples of the Upper Benue Basin and the Bauchi Plateau before 1800" in O. Ikime (ed.) *Groundwork of Nigerian History* (Ibadan) 1980) 171.
14. For further details on Jukun cults, see Meek pp. 265-293.
15. *ibid.* pp. 344.
16. See MG. Smith *Government in Zazzau* (London 1960).
17. *Meek op cit.* p. 344.
18. *ibid.* pp. 349-351
19. See *The Kona* (Muri Archives, Jalingo Local Government, Secretariat).
20. S. Abubakar, *op. cit.* p. 174.
21. *ibid.* p. 175 for details.
22. Low, U. N. *Three Nigerian Emirates* (Evanston; 19) pp. 81-6. See also Abba I. A. "Changing patterns of Local Authority and the Evolution of the District Head system in Gombe emirate, 1801-1960" (Ph.D. thesis, BUK, 1985).
23. Dai, B. F. "Traditional authority among the Geomai speaking Group of Plateau States. A study of the changing role and power of Chiefs from the colonial period to the present" (M.A. thesis University of Maiduguri 1984) pp. 10-19.
24. Meek, *op. cit.* p. 343.
25. *ibid.*
26. *ibid.* p. 343.
27. *ibid.*
28. *ibid.* p. 345
29. *ibid.* p. 332: 343.
30. *ibid.* p. 428.
31. *ibid.* p. 345

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**THE ROLE OF THE CHIEF EXECUTIVE OFFICER IN LOCAL  
GOVERNMENT: A CASE STUDY OF NORTH EASTERN  
NIGERIA—1980-1984**

*by*

**S. O. Okafor**

**Introduction**

In September, 1972, the Public Service Review Commission was set up under the Chairmanship of Chief Jerome Udoji. The Commission was amongst other things requested to examine the organization, structure and management of the Public Service including Local Government and recommend reforms where desirable. In September, 1974, the Commission's report was submitted to the Head of the Federal Military Government.

In its report the Commission briefly described the two systems—local government and local administration—which have been operational in various parts of Nigeria since 1967. In doing this, it highlighted the problems of organisation, structure, functions and management which each of the systems still had to resolve.

One important institution dealt with was that of the executive secretary. The Commission pointed out that in order to 'ensure the efficiency and effectiveness of local government, it is necessary to establish the office of an Executive Secretary who would assume full responsibility for the operation of the local authority and be adequately empowered to discharge these functions<sup>1</sup>'. It assigned to his office 'such matters as planning and co-ordination of the activities of the various departments of the local authority, advising the local councils on all matters relating to management and taking charge of all personnel matters delegated to him<sup>1</sup>'. On the basis of these responsibilities assigned to the executive secretary, the commission held that 'he should relate to the local councils as the Head of Civil Service relates to the State government<sup>1</sup>'.

The Commission felt that the local government council should continue as the policy-making body for the local authority, but should not interfere with administrative matters which should be fully delegated to the executive secretary.

The Federal Military Government, which embarked on a systematic and deliberate reorganisation of local government, incorporated these recommendations in the new local government system. The reorganisation became effective in September 1976, with the promulgation of the various State Local Government Edicts (often referred to as—The Local Government Edict, 1977).

The new system provided for a council to be constituted for each local government. The council should be composed of elected members and where necessary nominated members also<sup>2</sup>. The number of elected and nominated members should normally be prescribed in the instrument relating to the council. But generally the prescribed number should not be less than ten and should not exceed thirty. Members of a

council should be elected either directly or indirectly and in either case, the election should be conducted by secret ballot. The term of office of elected members should be three years.

Each council should, except where there is a provision for an executive president, have a chairman who should be elected from amongst the elected members of the council. Each council should also elect not more than four of its members as supervisory councillors. It is provided by the edict that supervisory councillors should, subject to the overall authority of the council, exercise general political, but not executive direction over departments of the local government, as might be assigned to them.

The edict provided for the establishment of statutory committees like Finance and General Purpose, Education and Police. It also empowered local government to establish standing or ad hoc committees, in addition to the statutory ones mentioned above, for any general or specific purpose which the local government feels would be better managed or regulated by means of such committees. The edict stipulated that when such standing or ad-hoc committees are established, the local government should delegate 'with or without restrictions or conditions any function' which is carried out by the local government. It is also provided that such committees when established should not be more than three. The membership and functions of these committees, apart from the standing/ad-hoc committees, were all set out by the edict.

The edict also provided that where—(i) local government council fails in any year to hold the meetings it is required to hold under the edict, and (ii) the State Executive Council is satisfied that a council is not discharging its functions under the edict in a way conducive to the welfare of the inhabitants of the area of its authority as a whole, or any part thereof, or the State generally, the State Government can order the suspension of the Council for a period not exceeding three months and should immediately appoint a Management Committee in its place. The State Executive Council should within that period arrange for an inquiry to be held into the affairs of the Council.

At the conclusion of the inquiry, the State Government can (i) order the reinstatement of the chairman and members of the council or (ii) direct that the seats of the chairman and all members of the Council should become vacant and appoint a committee of management to take over or (iii) direct that the seats of all members of the Council should become vacant and order for fresh elections.

Where a Committee of Management is appointed, the Committee should remain in office until such a time as the Executive Council might otherwise direct. Generally, the period should not exceed three months, if the Executive Council is satisfied that it is necessary or expedient to run the affairs of the Council by a committee of management, it might order that the appointment of the committee be revoked and appoint another Committee in its place. The Committee of management, when appointed, should discharge all the functions of the Council, as laid down by the edict or by any other enactment.

The edict established the office of a secretary in every local government, designating him as the chief executive and assigned to him the following 'manifest' functions as the Chief Executive of the local government. The edict stipulates that the Executive Secretary:

- i. Should be responsible for the execution of the policy and the daily running of the affairs of the local government, particularly the supervision and control of the personnel of the local government and the co-ordination of the activities of the department of the local government;
- ii. should be responsible for convening all meetings of the council and its committees and for the preparations of minutes and reports of such council and committees;
- iii. should advise the local government council and its committees on all matters which he feels his advice is necessary—including the standing orders of the council and local government legislation;
- iv. should attend all meetings of the local government council and of its committees;
- v. should advise the President and Chairman of the council on all matters appertaining to their respective offices;
- vi. should perform all such other functions as may from time to time be assigned by the local government<sup>3</sup>.

The appointment of secretaries was done by the State Governments, and generally they were recruited from the Civil Service. This should not come as a surprise, because this has always been the practice in Nigeria. And as would be expected, once so appointed, secretaries are responsible to the State Government through the State Ministry of Local Government.

#### **The Establishment of Democratically Elected Local Government Councils**

One important step taken by the Federal Military Government in implementing the edict, was to arrange for general elections throughout the whole Federation which gave Nigerians the opportunity to elect their leaders at the grassroot level. The general elections took place in 1977, and as a result democratically elected local government councils were established in every local government area in the federation. State and Federal General Elections took place in 1979 and these elections brought civilian government to power, both at state and federal levels, in October of the same year.

We have stated earlier that the Local Government Edict of 1977 empowered the executive council of a state to suspend or dissolve an erring local government council and to appoint a committee of management in its place.

The first move by the civilian government in the states on coming to office in their relationship with local government councils, was to amend the section of the Edict which deals with the suspension/dissolution of an erring local government. This amendment empowered the state executive council not only to appoint, but also to extend, the life of a committee management when so appointed to a period of twelve months. In Borno State, for example, The Local Government Edict (Amendment) Law, 1980 provided that immediately the dissolution of a local government is ordered, the Executive Council of the State should appoint a Committee of Management in its place until the Council is reconstituted. The law also empowered the Executive Council, when it feels that general elections, to reconstitute a local government council, cannot be held within three months from the date of dissolution of that local government council, to extend from time to time the life of the Committee of Management

provided that the duration of the life of the Committee does not exceed twelve months in the aggregate.

Having secured the authority through the amendment of sections of the edict, every state government in the Federation went on to dissolve all the local government councils in the state and in their respective places appointed committees of management. Secretaries who were unpopular with the new government were replaced. The reason for the dissolution is not clear. But some observers held that it would have been the desire of the party in power in the state to have their party men control local government councils. Others see that whole action as the desire of the party in power in the State to create positions in local government councils for party supporters. And control of local government councils is necessary for the survival of the party in power in the state. There are some who affirm that, though the majority of the members of local government councils were democratically elected, many of the local government councils had directed appointees of state governments as chairman, while members were brought into council through direct appointments. Besides, there were a considerable number of the councils which are known to have been in disaffection with their people.

The system of committee of management was in operation until the Military took power from the civilians in January, 1984. It is important to note that between 1980 and 1984 elections were not held into local government councils, possibly because of the postures of the different political parties on the issue of local government elections. It was not therefore surprising that one of the important moves made by the Federal Military Government with regard to the local government system was to alter its structure by dissolving the system of committees of management. The secretaries of local government councils were relieved of their positions as chief executives. Sole administrators were appointed by the respective State Military Governors, in place of the committee of management and secretaries, to manage, with the assistance of head of departments, the affairs of local government councils. The sole administrators are directly responsible to their respective state military governors<sup>4</sup>. The people who have been appointed sole administrators are senior civil servants of permanent secretary rank in the state civil service.

#### Methodology

The study focuses on the period when committees of management were operational. The purpose of the paper is to determine the degree to which the role of secretaries, as chief executives of local government councils, conforms to or deviates from the classical concept, the functions of the executive, as summarised in the acronym, POSTCORD. The functions are planning, organizing, staffing, directing, co-ordinating, budgeting.

Our approach in determining these issues was to prepare and issue questionnaires to one hundred and twenty local government secretaries selected from the north-eastern states (Bauchi, Borno and Gongola)<sup>5</sup>. The questions asked were simple and direct. All the secretaries co-operated and completed the questionnaires though there were occasions when a few of them did not respond to some of the questions.

### Analysis of Data

In this section, we shall examine the extent to which secretaries, as chief executives of local governments, are involved in each of the POSTCORD staff functions during the period under study. For purposes of clarity and uniformity, we first defined each of the functions and then asked each secretary to state the degree of his administrative involvement.

### Planning

It was defined as developing in broad outline the activities which are to be carried out and the methods of carrying them out in order to accomplish the purpose set of the organization/enterprise<sup>6</sup>.

**Question:** Do you take part in planning?

Table 1

	<i>Responses</i>	
	<i>No.</i>	<i>%</i>
Participate	108	90
Do not participate	4	3
No Answer	8	7
TOTAL	<u>120</u>	<u>100</u>

**Question:** Who makes the effective decision on planning?

Table 2

	<i>Responses</i>	
	<i>No.</i>	<i>%</i>
Committee of Management	66	55
Secretaries	36	30
State Ministry of Local Govt.	18	15
TOTAL	<u>120</u>	<u>100</u>

**Question:** If the answer to (i) above is Yes, What is your role in (a) long-range policy planning? (b) short administrative planning.

Table 3

	<i>Long Range Policy Planning</i>		<i>Responses Short Administrative Planning</i>	
	<i>No</i>	<i>%</i>	<i>No</i>	<i>%</i>
To Advise	44	41	44	41
To Plan	36	33	40	37
To Evaluate & Implement	24	22	12	11
To Approve	4	4	12	11
Total	<u>108</u>	<u>100</u>	<u>108</u>	<u>100</u>

From the responses, it would appear that local government secretaries did participate in the planning process. Yet the taking of effective decision did not rest solely on them, but was collectively taken by the committee of management and was subject to approval by a superior body (the state government).

### Organizing

It was defined as the establishment of the formal structure of authority on the basis of which work subdivision are established and co-ordinated for achieving the defined objective<sup>7</sup>.

**Question:** Describe briefly how the local Government is organised in your State.

Their answers show some regional variations. One feature which all the secretaries agreed on was the emirate or traditional councils. It is true that the emirate council exists, because the Edict of 1977, as we have stated earlier, provided for the establishment of such a council. They constitute a separate sub-system, just like the local government councils at the grass-root level. They have their own respective membership, secretaries, functions, finances and staff. Local government secretaries not only liaise with traditional authorities in their respective local government areas, but also consult them on customary affairs. With regards to the relationship between an emirate/traditional council and a local government council there is the provision which makes the chairman of the component local government areas in an emirate traditional council area member of emirate council. The only exception is in areas where an emirate/traditional council area contains only one local government area. In such case the chairman becomes a member of the emirate council. Examples of such areas in Borno State are Shani, Uba, Askira Emirate/Traditional Council Areas.

However, the secretaries from Borno State (44 or 37% of the respondents) stated that their respective local governments have eight departments—General Administration, Education, Works, Finance, Agriculture, Forestry, Veterinary, Medical and Health Services. Each department has a head and is divided into sections. Each section had a head. Those from Bauchi and Gongola States (76 or 63% of the total respondents) affirmed that their local governments had six departments—Finance,

Agriculture, Natural Resources, Health, Works and Education. As in Borno State, each department had a head. All the secretaries from the three areas of study (Bauchi, Borno and Gongola) stated that apart from the chairman, they also had supervisory councillors i.e. political heads of departments.

**Question:** *What is the relationship between you as the chief executive and the various Heads of Department and between the Heads of Department and their respective supervisory Councillors?*

**Table 4**

<i>Secretary/Heads of Department Relationship</i>	<i>Responses</i>	
	<i>No</i>	<i>%</i>
Cordial	64	53
Not Cordial*	56	47
Total	120	100

Answers given by this group\* were not relevant to the question.

With regard to the second part of the above question, i.e. the relationship between the heads of departments and their supervisory councillors, all the secretaries stated that they saw the supervisory councillors as the political heads of their respective departments.

**Question:** *Can any of your functions be delegated to your subordinate officers? If so, when can such delegation take place?*

All the secretaries admitted that their functions could be delegated to their subordinate officers. As regards the time when such delegation could take place, 117 (97%) of the secretaries affirmed that such delegation could take place only during their leave of absence; 3 (3%) stated that they could delegate their functions at all times to their subordinates. This latter group also held the view that when they delegated their functions, their subordinates should carry them out under their supervision.

The apparent political/administrative dichotomy in the relationship of supervisory councillors to heads of departments should not appear really as a surprise<sup>8</sup>. There is some difference in the functions of the two sets of persons. Supervisory councillors, as we have stated earlier, exercise strictly political but not executive direction over departments assigned to them. They represent the interest of the department(s) assigned to them in council. They ensure that the policies of their local government councils are implemented. The heads of departments, on the other hand, are concerned with the administration of their departments. They are subject to the general political direction of supervisory councillors. But in matters relating to the administration of their departments, they are under the general direction and control of the Secretary of their respective local government.

On the issue of delegation, it would appear that the secretaries are zealous over executing their functions, and do not wish to delegate their responsibility/authority to their subordinates, except when they are on leave of absence. They tend not only

to personalize but also to be over-protective of their positions. However, the organising function seems to be carried out in a diffused way, with a number of structures and levels of government concerned.

### Staffing

It was defined as the entire personnel function of recruiting and training staff and maintaining favourable working conditions<sup>9</sup>. The local Government Edict provides for the establishment of a Local Government Service Board and entrusts the power to recruit officers in group grade level 06 and above (N2,196.00—N2,20.00) to the Board<sup>10</sup>. Local Government Councils on the other hand are empowered to recruit officers in group grade levels 05 and below (N2,172.00—N1,500.00).

On the basis of the above definition of staffing and the provisions of the Edict, the Secretaries were asked if they were members of a Local Government Service Board in their respective states. All of them replied that they were not. They were then asked if they have ever been invited to join the Board as members of recruitment panel. All the Secretaries again replied that they have never been so invited. Other questions asked were:

**Question:** *What is your role in recruiting staff of salary grade level 5 and below for your local government?*

Table 5

	Responses	
	No.	%
Chairman of Junior Establishment Committee*	40	33
Advisory	24	20
Recruiting and Screening of Applications	20	17
Recommendation of Applicants to State Ministry of Local Government	16	13
Approval of Appointments	20	17
Total	120	100

\*This Committee is made up of Heads of Departments, and Secretary.

**Question:** *Who takes the effective decision about the recruitment of staff of salary grade level 05 and below?*

Table 6

	<i>Responses</i>	
	<i>No.</i>	<i>%</i>
Junior Establishment Committee*	48	40
Secretaries	32	27
Committee of Management	28	23
State Local Government Service Board	8	7
State Ministry of Establishment and Service Matters	4	3
Total	120	100

The Secretaries were asked whether the local government service board, in their opinion, is playing a useful function. They all admitted that it is.

Still on the issue of staffing, the secretaries were asked, in matters concerning the training of staff, who decides on what staff to train? Responses varied. 72(60%) of the secretaries stated that it is the Secretary who decides on what staff to train and 48(40%) held that it is the State Ministry of Local Government.

Assuming that they were not responsible for deciding on what staff to train, the secretaries were asked to state if they were consulted. Apart from 28(23%) of the Secretaries who did not respond, all others admitted that they were consulted. They were then asked, 'if you were consulted, how do you rate the chances of your opinion being taken into consideration?' (High/Low). All the respondents reckoned that the chances of their opinion being taken into consideration are high. Finally, they were asked, 'if political considerations are a factor in recruiting staff?' Responses were divided: 52 (43%) of the Secretaries admitted that political considerations were a factor in the recruitment of staff. Others 58 (57%) held that they were not.

With regard to staffing function, on the evidence available, local government secretaries seem to play a major role, particularly in the recruitment and training of junior staff. They assess the needs of the local government in terms of staffing and making recommendations to the local council. They also chair the Junior Establishment Committee that act on behalf of the Council in matters of recruitment of staff.

### Directing

It was defined as the continuous task of leading the enterprises/organisation by making decisions and embodying them in specific and general orders and instructions<sup>11</sup>.

The first question here was, "Are you effectively involved in the leadership role of the local government?" 104 (37%) of the Secretaries admitted that they were, 16 (13%), said that they were not.

**Question:** *If the answer to the first question under Directing is Yes, what do you specifically do in the leadership?*

Table 7

	Responses	
	No	%
Directing and advising Heads of Departments on policies, schedule of duties rules and regulations of local government councils	60	58
Advising the Chairman on policy issues	28	27
Co-ordinating and planning local government activities	16	15
Total	<u>104</u>	<u>100</u>

The Secretaries were asked whether their leading the local government bring them into conflict with Councillors. 80 (67%) of the respondents admitted that their leadership role did bring them into conflict with the Councillors. 40 (38%) said that it did not.

**Question:** *What are the possible sources of the conflict which you experience with the Councillors?*

Table 8

	Responses	
	No	%
Interference by politicians in local government affairs	35	44
Award of contracts without funds	25	31
Lack of finance	12	15
Poor education and inexperience of Councillors	8	10
Total	<u>80</u>	<u>100</u>

Our view here is that local government secretaries do certainly play a key role in the direction of the work of local government, although they appear to compete with the efforts of councillors to play a similar role. They often see the latter's activities—in awarding contracts for example, or seeking employment for unqualified partymen—as 'political' and illegitimate.

#### Co-ordinating

It was defined as the all important duty of interrelating the various parts of the work<sup>12</sup>.

**Question:** *Whose responsibility is this in your local government area? (Please name the individual/s by his or their offices)?*

Table 9

	<i>Responses</i>	
	<i>No.</i>	<i>%</i>
Secretaries	84	70
Heads of Departments	28	23
Conjointly by secretaries and inspectors* of local government	8	7
Total	<u>120</u>	<u>100</u>

\*They are Senior officials in the Inspectorate division of State Ministry of Local Government.

They were asked to name the persons by his /their offices who oversees the disciplinary aspect of their local government. 80 (67%) of the respondents stated that it was the Secretary and Heads of Departments. They were also asked whether the person or persons involved in the disciplinary aspect of the local government has/have a free hand. 100 (83%) of the respondents held that they have a free hand, whilst 20 (17%) said that they did not have.

The role of local government secretaries in the co-ordination of local government administration is one in which they see themselves as key participants, but their relationship to the State Ministry of Local Government in the area of training mentioned above is somewhat confused. In the sphere of discipline, the secretaries are part of the establishment committee and so logically should participate in that sphere.

### Reporting

It was defined as keeping superiors informed of the status of the work through reports and records<sup>13</sup>. Having thus defined reporting, the secretaries were asked to state if they were involved in the task of reporting. They all admitted that they were.

**Question:** *To whom do you report? (Please name them by their offices)*

Table 10

	<i>Responses</i>	
	<i>No.</i>	<i>%</i>
State Local Government Service Board	20	17
State Governor's Office	12	10
State Ministry of Local Government	52	43
Local Government Council	36	30
Total	<u>120</u>	<u>100</u>

One salient observation, which we can make here is that the variety of bodies reported to illustrate some diffusion and confusion about patterns of authority relations within local government and between Local and State Government.

**Budgeting**

It was defined as encompassing fiscal plannings, accounting and control<sup>14</sup>.

**Question** *Describe briefly how finance is planned, accounted and controlled in your local government?*

In their responses, there are areas of agreement amongst the secretaries and areas of disagreement (i.e. where responses varied from one secretary to another). With regard to how finance is planned—the Secretaries held that every Head of Department prepared his own estimate. In doing this, the Head of Department was guided by Financial Minutes and Regulations. The estimates when prepared were co-ordinated by the Secretary. The Treasurer of the Local Government compiled and forwarded the estimates to the local government council for approval. After approval had been given by the council, the estimates were sent to the State Ministry of Local Government for final approval and then returned to the local government. As regards accounting, this was done by the Treasurer of the local government.

**Table 11**  
*For the Control of Finance*

	<i>Responses</i>	
	<i>No.</i>	<i>%</i>
Local Government Treasurer	36	30
Secretaries	72	60
State Audit Department	12	10
<b>Total</b>	<u>120</u>	<u>100</u>

**Question:** *What is your role in financial planning, accounting and control in your Local Government?*

**Table 12**

	<i>Responses</i>	
	<i>No.</i>	<i>%</i>
Advisory and Co-ordination	72	60
Preparation of Estimates	40	33
No Answer	8	7
<b>Total</b>	<u>120</u>	<u>100</u>

Realising that the bulk of local government revenue comes from the Federal and State governments, the following question was asked: "If you are playing an effective role (in financial management) what is the relationship between you, the State and Federal Governments with regards to financial accounting and control?" 53 (44%) of the Secretaries held that the State Governments exert control on the secretaries over

local government finance. 67 (56%) said that the Secretaries provide a channel for communication flow between the State and Federal Governments and the local government.

The Secretaries were asked to briefly state the function of State Commissioner for Finance in financial planning, accounting and control in their local government. 48 (40%) of the Secretaries held that the Commissioner for Finance did not deal directly with financial planning, accounting and control of local governments. Rather he dealt directly with the state Commissioner for Local Government who acted on behalf of local governments. 86 (80%) affirmed that he was involved in financial planning, accounting and control. 16 (13%) said that he scrutinized and submitted combined estimates of local governments to the State Executive Council for approval. He also checked and inspected through the Audit department the expenditure of local governments. 20 (17%) stated that he issued financial circulars regularly to local governments, and collected local government grants through the Accountant-General.

On the issue of budgetting, we hold that state government control of finance of local government probably creates some of the diffusion mentioned earlier and raises the whole question of the independent role and value of local government in Nigeria.

The final issue raised in the questionnaire concerns political functions. The secretaries were told that top executives in a government had to play political functions in the sense that they were involved in contributing to policy choices and in carrying on communication with the general public and with other units of government. They were then asked to briefly describe the political functions, which they played or expected to play in their local government.

The political functions which they mentioned they play included advising politicians in selecting priority areas for projects, advising and directing the politicians in the locating of projects, and on how financially viable the local government was, serving as channel of communication between the community and government; explaining government policy to the people in the local government area; serving as watch-dog of the government in power; writing and submitting regular monthly intelligence report on the local government area to the state government; assisting and guiding local government council in a fair distribution of social amenities and other development programmes; encouraging political participation at the grass-root level; advising the communities in local government areas to embark on self-help projects.

Some of the responses mentioned in the preceding paragraph are interesting and deserve some comments. One of the political functions listed above, which local government secretaries said they carried out, was holding regular meetings with the leaders of major political parties. These regular meetings, in most cases, were nothing but exercises in conflict resolution. Political rivalry, in the acute form can lead to serious tension between the followers of rival parties in some local government areas. The tension can be manifested in various ways—burning down of people's homes, wilful damage or destruction of people's farms, killing/maiming of people. When local government Secretaries have regular meetings with leaders of major political parties they use such meetings to reduce or avert any imminent or suspected tension which may exist.

The other interesting functions are serving as watch-dog of the government power, and writing and submitting regular monthly intelligence report on the local area to the State Government. Local Government secretaries are appointed by the State Government through the Local Government Service Board. With such mode of appointment one would expect the secretaries to be politically neutral. One important issue which the secretaries serving as watch-dog of the government in power raises is; 'can the local government secretaries be politically neutral and also loyal to the government in power?'

The function of writing and submitting regular monthly intelligence reports, we think, should really belong to the national security organisation and not to local government secretaries. Admittedly, this is a carry-over from the colonial days, when it was the practice for District Officers/Assistant District Officers in charge of administrative Division to write and submit regular monthly intelligence reports to Residents who were in charge of Provinces and also their immediate administrative superiors. However, these activities performed by local government secretaries may suggest difficulty in reconciling their political and civil service role.

### Conclusion

We have in this article endeavoured to determine the degree of administrative involvement of Local Government Secretaries in the North-Eastern states of Nigeria during the period 1980 - 1984 when the system of Committee of management was in vogue. Analysis of the data indicates that the secretaries were really involved administratively in the affairs of local government. But the degree to which they were involved in the conventional functions of the executive, subsumed under the acronym POSDCORB, depended on the inter-play of politico-administrative forces and not on the specification of legislation.

This aspect makes the role of the bureaucratic segment of the local government in developing countries problematic, i.e. the chief executive officer is expected to act simultaneously as a faithful servant of the state, and as the leader and teacher of people, including the councillors.

If the declared purpose of local government is to provide a credible, efficient, and fully functional administration that will ensure even development, through democratic means, at the grass-root level while ensuring that the generality of the people participate in the running of their local affairs—the selection, training, and development of local government officials, such as the chief executive officer, assume critical importance. Besides, officials such as the chief executive officer should be given sufficient power to match their responsibility.

## Notes

1. *Federal Republic of Nigeria, Public Service Review Commission Report*. Lagos, Federal Government Printer, 1974; p. 123.
2. The Edicts stated that no person who was an unsuccessful candidate at the most recent election should be nominated to any Local Government Council.
3. *Local Government Edict*—Contained in Borno State of Nigeria Gazette No. 43 Vol. 2, 1977, P.A. 49, (Borno State Government Printer 1977).
4. Sole Administrators are responsible to State Military Governors on matters concerning Law and Order, customary affairs and security matters. On other issues, the Sole Administrators are responsible to the State Commissioner for Local Government.
5. The Local Government Secretaries were attending a workshop at the University of Maiduguri. North Eastern States with its heterogeneity and variations in Local Government structures represent a microcosm of Nigeria.
6. F. A. & L. G. Nigro—*Modern Public Administration*: New York, (Harper & Row, 1977), p. 133.
7. *ibid.*
8. The issue of political/administrative dichotomy has been a thorny one indeed. Many writers of African administration have dismissed it as irrelevant, given the peculiar developmental needs of the African states. See for example—Nelson Kasfir, "Development Administration in Africa: Balance between Politics and Administration", *The Canadian Journal of African Studies* 3, 1, Winter 1969, p. 95; Lucian Pye, "The Political Context of Nation Building" in *Development Administration: Concepts and Problems*. Irving Swerdlow, ed. (Syracuse, 1963) pp. 32-35; A. L. Adu, *The Civil Service in the New States* (New York, 1965) p. 26. F. Riggs) *Administration In Developing Countries* (Boston, 1964) pp. 263-267; W. Terdoff, "Development Politics and Administration" *Mawazo* 1, 3, 1968 p. 55.  
But for the present study the dichotomy is necessary in order to place the roles of the supervisory councillors and the Heads of Departments in their proper perspectives in the context of local politics. See Alvin Magid "Dimensions of Administrative Role and Conflict Resolution among local officials in Northern Nigeria" *Administrative Science Quarterly*, Vol. 12, 2 (Sept. 1967) pp. 321-337. Abubakar Koko, "The Northern Nigeria District Officer, Past, Present and Future". *The Nigerian Journal of Public Affairs* Vol. II, Oct. 1971, N.o 1. pp. 29-38.
9. F. A. & L. G. Nigro—*op. cit.*
10. It has been the practice in Nigeria for State to exert control over the local government councils. The appointment of Local Government Service Board as a recruiting agency is only one of the means of exerting the control.
11. F. A. & L. G. Nigro—*op. cit.*— p. 133.
12. *ibid*; p. 134
13. *ibid.*
14. *ibid.*



## THE KANURI AND INTEREST GROUP POLITICS IN BORNO

by

Offiong E. Udofia

This study will adopt the theoretical model of interest/pressure group as the basis of analyzing the participatory politics of the Kanuri people of Borno during the pre-independence, First, and Second Nigerian Republics. The study will discuss briefly the historical and traditional political background of the Kanuri people.

According to Murdock, the Kanuri have a long standing history going to about the eighth century A.D.<sup>1</sup> The Kanuri are a unique group having connections with Sudanic kingdoms being located in the north-eastern part of Nigeria. Before the Borno kingdom was established, the Mais (rulers) and people suffered defeats and captivity at the hands of other related groups.

The Fulani, during the jihad, was one of the groups that made a desperate attempt to destroy parts of southern Borno, but were checked and repulsed by an organized punitive reprisal by Muhammad, Al-Amin el-Kanemi.<sup>2</sup> The successful repulsion of the Fulani attacks of the southern parts of Borno took place in the early part of nineteenth century.<sup>3</sup> The eastern part of Borno suffered in the hands of the Fulani jihad during the same period. This scholar became the Shehu (king) of the Kanuri in Borno.<sup>4</sup> The el-Kanemi realm in which the Kanuri are the sole and bona fide people, established the kingdom of Borno in nineteenth century with a defined administrative structure.<sup>5</sup> The people of Borno identified with their king (Shehu) and were loyal to him.

The Kanuri traditionally believed that they are 'tenants' as well as 'slaves' of Shehu.<sup>6</sup> The serious attachment of the Kanuri people to the Shehu and the legitimacy accorded him created solidarity and love of their culture and tradition, so that they were able to repel the sweeping Muslim jihad of the nineteenth century.

Before the twentieth century (1900), the Shehu dominated the political structure of Borno. He was responsible for awarding of individual titles which were prerequisites for power.<sup>7</sup> These individuals were mainly descendants and relations of the previous Shehus. For example, the senior son of Shehu was generally decorated with the title of Ciroma<sup>8</sup> and he was destined to succeed the father. The members of the ruling family were the people in hierarchical power and this arrangement created a neat link between the Kanuri people and the Shehu.

This feudal structure changed when the British government took control of Nigeria as a colony in the early part of twentieth century. The British government eliminated the land-based fiefs (which were controlled by one of Shehu's nominees) and replaced them by a number of political units, known as "districts". The district heads no longer had direct link with the Shehu, but became involved in various political

entities. The changes introduced by the British colonial government tended to reduce gradually the Shehu's political power.<sup>9</sup> This time most of the political power wielded by Shehu passed into the hands of members of various councils, ministries, and other governing bodies.

Nevertheless, Tessler and *et al.* wrote:

An individual Kanuri is a member and identified with political entities based on the household. This hierarchy, smallest to the largest, is for the person in rural areas, the hamlet (or, if large enough, a village), the village area (consisting of several hamlets and a principal village), and the district (consisting of numerous village areas). Each of these levels is headed by an individual with a traditional title: bulama ("hamlet head"), lawan ("village head"), and ajia ("district head"). For the person in a city, for example, the same basic hierarchy is relevant, but the bulama is the leader of what may be described as a sub-ward, the lawan heads a ward, and the ajia heads the entire city.<sup>10</sup>

This hierarchical, or pyramidal, political structure of the Kanuri people prepared them to participate in Nigerian politics as we will discuss in the following pages. The British colonial government, though, attempted to make changes in the Kanuri traditional political structure, but did not achieve much. The colonial policy of indirect rule operating in Northern Nigeria did not allow serious changes in native or traditional political structure.

The same pattern of hierarchical structure of the el-Kanemi dynasty was practised in the judicial system of Borno. For instance, a disagreement between two friends or neighbours would be taken first to the hamlet head, then the village head, and the district head. If these people failed to settle, the case would go to a district court presided by an alkali, a judge with expertise in Muslim law. The case could still continue to go to the chief Alkali's Court, and finally to either the Shehu or any other courts of the Federal Judiciary. Thus, the pyramidal political structure of the el-Kanemi dynasty identified the Kanuri people with the Shehu, forming the base for ethnic participatory politics the Bornu Youth Movement (BYM) in pre-independence politics, the First Republic and Great Nigeria People's Party (GNPP) in the Second Republic.

### Theoretical Model

For the purpose of discussing ethnic politics and the Kanuri people of Borno State, interest/pressure group theory is basic. The terms interest group and pressure group are often used interchangeably. But the term 'pressure' has perjorative connotation, hence 'interest' is preferable. Bentley<sup>11</sup> was the first American political scientist to use the term interest group while in actual parlance he meant various 'pressures' exercised by interest groups. Truman follows Bentley's tradition and defines interest group as 'any group that, on the basis of one or more shared attitudes makes certain claims upon other groups in the society for the establishment, maintenance, or enhancement of forms of behaviour that are implied by shared attitudes.'<sup>12</sup> Distinctions between pressure or interests and lobbies are sometimes difficult to draw. Among the Kanuri people there are shared attitudes of looking up to Shehu as their symbol of power and

as the father of them. They identified with one another and form a formidable front to put pressure on the government for their ultimate goal of solidarity. Similarly they identified with one another under el-Kanemi to conquer the Fulanis during the jihad in 19th century. De Grazia believes that a 'pressure group is simply any organized social group that seeks to influence the behaviour of political officers without seeking formal control of the government. The lobby is one type of pressure group whose agents apply whatever influence they may command directly upon the legislators.'<sup>13</sup>

### The Kanuri and Non-Kanuri Minorities in Borno Politics

The traditional political hierarchy (The Shehu at the apex and as the owner of all lands in Borno, with the *bulama*, *lawan*, and *ajia* heading various political units in Kanuri dominated areas) is a vital symbol of Kanuri collectivity and identity. This attribute singles them out from the rest of their neighbours and as well articulates them with the contemporary Nigerian politics. Another factor that may account for the Kanuri's individualistic attitudes can be religious belief. The Kanuris are predominately Muslims and most of their neighbours range from atheist, pagan to christian religions. This disparity in religion may contribute to the Kanuri aloofness to their neighbours. Before 1900, during the pre-colonial era in Borno, the Shehu dominated the political structure. Through him individuals received the political titles which were pre-requisites for power. In other words, the Shehu is solely and wholly responsible for appointments of people to rule different political units within his area of influence and administration. Most of these lieutenants were those who followed his own religious similarities and were important factors to holding political positions under the Shehu and in Borno. The muslim emirs of different principalities in Borno, who are not Kanuri, are appointed by the Shehu. Non-muslims are in most cases unfavourably treated in terms of holding political positions.

With the emergence of post-independence politics, and the waning of Shehu's power in political appointment, non-muslims and non-Kanuris started to occupy positions of eminence in politics. The period 1960–1985 saw a dramatic change in the politics of Borno. This period covers different systems of government—the civilian (the First and Second Republics) and military rules in Nigeria. This also affected political activities in Borno which in turn influenced human relationship in politics. The politics of the First and Second Republics cut across the ethnic lines and pays no attention to Kanuri, Bura, and others. People of all sections of Borno society contributed their men and women to the development and success of Borno. This was the era Borno asserted their participation in Nigerian politics by forming the *Bornu Youth Movement*. The Movement aimed at developing Borno politically and economically. It was not an organization aimed at attracting only the Kanuri. It embraced within its membership all people of Borno area, irrespective of religions and ethnic background.

In economic sphere, the Kanuri before colonial era traded across the Sahara mostly with northern Africa. Very little or no economic transactions were carried on with their neighbours who were non-Kanuri. The independence and post-independence period ushered in a change economic contacts. Economic and political activities

in Borno in post-independence era cut across ethnic and religious boundaries. This change situation works to the advantage of Borno State in modern period. Borno State has opened up for economic activities from the southern parts of Nigeria. There has been a substantial influx of people from other parts of Borno and Nigeria to Maiduguri since 1960. The capital city of Borno (Maiduguri) since the creation of North-Eastern State in 1968 has grown and developed tremendously, due to economic and socio-cultural exchanges with people of different parts of Nigeria and other countries. The mass participation of the Kanuri through the BYM and GNPP during the pre-independence and the Second Republic was not to control the government, but to demand its essence and show recognition of the people in the political stream of Nigeria. This explanation is confirmed by Key's analysis of pressure group as 'such groups while they may call themselves non-political are engaged in politics; there is a politics of policy in the main.....'<sup>14</sup> Pressure group or interest group could not successfully say that it does not engage in politics. The mere fact that pressure/interest group wants to influence decision of government in favour of its members indicates mobilising.

Interest groups articulate<sup>15</sup> political demands in the society and seek support for these demands among other groups. The groups action does not end in articulation of demands, but tries to translate the demands into authoritative public policy. When this process takes place, a full-scale political participation is attained. Thus interest/pressure group is active participant in public policy-making of the political system. In developing countries, interest/pressure groups and political parties are not differentiated. Interest groups take the form of lineage, status, and religious groups which transmit political demands to other parts of the political structure through informal communication. The Shehu of Borno, the father of the Kanuri people occupies the throne as one whose authority over his people is supreme. This attribute is demonstrated in the following statement:

The importance of accession rituals was indicated by the fact that immediately after the Mai had been placed on the throne a procession of various groups under his authority (including princes) came to pay their homage and swear allegiance to his authority. Indeed the ceremony was intended to show his followers that he was the supreme head of the Kingdom, the owner of the land (Kema Lardema) and the protector of his subjects.<sup>16</sup>

The Shehu rules by observing the principles of Islam in all his decisions and judgments. Usman and Alkali write, 'One of his fundamental guiding principles was the Shariat, as the throne was often referred to as the "cradle of Islam."<sup>17</sup> Thus, the Kanuri people, being Muslims in their religious beliefs, uphold the Shehu as the symbol of identity and unity. They buttressed the Borno Youth Movement and the Great Nigeria People's Party as pressure groups to project their identity during the politics of the pre-independent Nigeria and the Second Republic. Religion of Islam was their ultimate divine principle of participatory politics in Nigeria.

### The Pre-independence Politics in Borno

The politics of pre-independence in Borno is a part of the organized Nigerian nationalist movement of the 1940s. This movement reached Borno, as it did to many other parts of the North. The nationalistic and politically conscious young northerners inaugurated at Kaduna the College Old Boys' Association to discuss social and political issues affecting the north. Similar groups did the same thing in other places. Such groups were organized at Kaduna and Zaria. The association at Kaduna came under the name Jam' iyyar Mutanen Arewa A Yau (Association of Northern People of Today), and the one at Zaria was named Jam'iyyar Jaman Arewa (The Northern Nigerian Congress). Finally, the two groups merged and decided to adopt the title Jam'iyyar Mutanen Arewa (The Northern People's Congress).<sup>18</sup> The NPC formed branches all over the Northern Region and confined its activities and constitution to social and cultural organizations.<sup>19</sup> Borno was one of the provinces where the NPC had a branch. It was in Borno, where a Kanuri, born of a noble family, served as the General Secretary of the Northern People's Congress. Ibrahim Imam, a son of a former Chief Alkali and Supervisor of N.A. Works, held the high office of the Secretary of NPC.<sup>20</sup> During this decade of swiftly moving nationalist activity, a southern based national party the National Council of Nigeria and Cameroons, later known as the National Council of Nigerian Citizens (NCNC) attracted and included as its important member, 'an articulate spokesman for Northern nationalism'<sup>21</sup>-Mallam Bukar Dipcharima, another Kanuri from the ruling family, whose father was a district head. Dipcharima represented the northern region in NCNC 1947 delegation to London to protest against the Richards' Constitution of 1946. Thus, the wave of Nigerian politics made an impact in Borno. The subsequent Nigerian parties of the Northern Elements Progressive Union (NEPU) and the Action Group (AG) participated equally in the Borno politics.

The most important personalities (Kanuri) in the participatory politics of Borno were Ibrahim Imam, Bukar Dipcharima and Shettima Kashim. There were others who were equally important in and concerned with the welfare of the Kanuri in the Nigerian political system.

Ibrahim Imam occupied an important position in the NPC and as well played a strategic role in the party to project the Kanuri and the northeastern areas of Nigeria. However, he was ambivalent as an officer of the party, because Imam was not happy with the system of Native Administration (NA)<sup>22</sup> in the North. As the N.A. was the strong supporter of the NPC, the party became unhappy with Imam's stand. Nevertheless, he was the bulwark of the party for 'in March 1953, he moved the famous motion of adjournment in the Central House of Representatives which prevented debate on an Action Group resolution for self-government in 1956'.<sup>23</sup> Imam moved important motions in the central legislature to outplay NCNC and AG parties. He defended NPC policies at the London Constitutional Conference of 1953. Because of his critical views of the Native Administration and parochial attitudes of the Northern People's Congress, he fell out with the NPC party hierarchy at the Jos 1954 Party Convention. He subsequently resigned from his office of the Secretary General.

Imam's resignation came at the time when some young Kanuris were attracted by an ideology of another northern-based party, the *Northern Elements Progressive Union* (NEPU). These young Kanuri radicals were not actually attracted to have the NEPU as Borno party but only to have it as protest against the NPC. These Kanuri launched in 1954 a new indigenous party because they became dissatisfied with the NEPU. Their main objection was that NEPU was dominated by the Hausas. At that time, the political movement in Nigeria was significant in a radical political change within Borno emirate. This objection to the Hausa domination of the NEPU quickly made the young Kanuri to launch the Borno Youth Movement (BYM).<sup>24</sup> The BYM, though emerged as a political party, but its behaviour and aspirations were more of interest/pressure group. Its activities and influence were confined to Borno and particularly to the Kanuri areas of the then Borno Province. It was a protest group to inhibit the domineering and overwhelming influence of the Hausa dominated NEPU.

The newly formed Borno Youth Movement invited Ibrahim Imam and Bukar Dipcharima to join the party. Dipcharima declined while Imam accepted only as the patron. The BYM was out to use its radicalism to point out to the Kanuri the failures of the NPC and NEPU as parties and to appeal to the people of northeast that it (BYM) was to cater for their interests, justice and equality. The BYM aimed at creating a northeastern state to comprise Bornu, Bauchi, Plateau, and Adamawa Provinces.<sup>25</sup> This was against the policy of the Northern People's Congress of 'one North'. As an interest group the BYM put out as one of its principles, 'solidarity among the Kanuri people'. This principle emphasized as a slogan to people, the significance of religions background of the Kanuri—the Islam. Crescent and Stars' which indicate the concern of the party for Islam in order to create special support from the Shehu.<sup>26</sup>

Though the BYM resented the Hausa domination of the NEPU but the two parties later allied to contest the 1954 federal election. In Maiduguri, Ibrahim Imam lost the election to Dipcharima, but the BYM gained momentum and became a formidable party by 1956.

The party continued to attack the Native Authority and the Northern People's Congress in Borno. The NPC which was backed by the N.A. became an enemy of the BYM. Imam and one other candidate won election in November 1956 in the Yerwa North and South to the Northern House of Assembly under the BYM. Ibrahim Imam became popular in the BYM; especially he attracted young Kanuri who associated with him when he was the N. A. Supervisor of Works. Most of these supporters were N. A. workers who saw the injustices in the government (Native Administration). Corruption in the N.A. was rife and this and other instances of misrule played the government into the hands of the BYM and its supporters. This time the BYM was a force to be reckoned with.

Towards the end of 1957 the fortunes of the Borno Youth Movement began to decline. Thus it might be that the NPC's government of Northern Region was aware of the corruption of the Borno Native Administration. Most of the N.A. workers were members of the BYM and were involved in corrupt practices. They were subjected to criminal prosecution. These made many of the BYM members to reduce their support for the party for fear of victimization. Also the decline of the BYM

came as a result of the switching of alliance with the NEPU-NCNC to the Action Group. NCNC was in alliance with the NEPU in the Northern Regional House of Assembly while in coalition with the NPC in the Central Legislature. This angered the BYM, especially when the NCNC (as the government party of the Eastern Region) failed to assist the minority elements in Nigeria during the Willinck Commission of Inquiry into Minority Fears. During the inquiry the BYM demanded a separate northeastern state and the demands of the minorities in Nigeria were supported by the Action Group. For this reason, the BYM was endeared to the AG. The NPC became greatly disturbed by Action Group penetration of the BYM especially as it (AG) also had become the principal opposition of the NPC government in the Central Legislature. The Action Group with its strong financial resources vouched to dismember the Northern Region by supporting the BYM separate Northeast State plan as well as the demand to include Ilorin Province in the Action Group controlled Western Region.

These and other reasons contributed to the decline and death of the Bornu Youth Movement. The Northern People's Congress government of the Northern Region reconstruction of Native Authorities made room to suppress the BYM members. This time, Shettima Kashim, the NPC party leader, became the Waziri of Borno. The new Waziri played an important role in the Native Administration. As both the NPC leader and N.A. high ranking authority, he exploited his office to create an opportunity for the NPC to wield overwhelming influence in Bornu emirate, while at the same time suppressed the BYM through imprisonment and other repressive means. The persecution of the BYM members became serious in 1959, when the N.A. (which employed a sizeable number of the party (BYM) supporters) under the new Waziri, Kashim introduced stringent measures. The continuous persecution of the BYM came to an end when it finally collapsed in 1961. Thus the BYM as an interest group failed to fulfil its dream of a separate Bornu State or North East State. It could not correctly take the title of a party, because it never expanded outside Bornu Province and even its influence was only felt in the Kanuri areas of the Province.

### **The Politics of the Second Republic in Borno**

As in the First Republic, the Second Republican Government of Nigeria in Borno State assumed interest/pressure group style. But this time the Great Nigeria People's Party (GNPP), though, was a machinery of interest group politics, but acted differently from the Bornu Youth Movement. It assumed the posture of interest group initially, but later acquired political party characteristics when the Federal Electoral Commission spelled out requirements for party registration.

The Great Nigeria People's Party is the brain child of a Kanuri, Alhaji Waziri Ibrahim. Waziri Ibrahim had been in politics as far back as 1956, that is during pre-independence politics and the First Republic. He won election into the Central Legislature under the NPC platform in 1959 and was made Minister of Health and later Minister of Economic Development in 1960. As an influential Kanuri, the interest of his people was paramount in the Second Republican politics. The military interregnum of 1966 to 1978 placed a ban on politics in Nigeria and this time Waziri Ibrahim, like other Nigerians, was busy about his private commercial activities. He,

however, had a dormant interest in politics preparing himself through his political machine he formed in 1975, the National Club of Nigeria later changed to the National Union Council. His interest and involvement in politics came to the fore when he engaged most of his time as an onlooker during the deliberations of the Constituent Assembly of the Nigerian Constitution in 1976-77.

The ban on Nigerian politics was lifted in 1978 and Alhaji Waziri Ibrahim was one of those who joined with others to think of forming a political party. Three political machines—the National Union Council (Waziri's organisation), the Committee for National Unity and Progress, and the Club 19—combined to form one political unit called the Nigeria People's Party in September 1978 (NPP). At this stage, the idea of party politics in Borno could be disregarded as interest group politics, because a countrywide support of the organisation was sought. The union of the three political machines into NPP did not have a firm root when disagreement erupted. The disagreement came as a result of leadership tussle of the new political unit (NPP). The crisis centred on the attitude of Waziri Ibrahim wanting to occupy the position of the party chairman, and also to run for the country's presidency the NPP's ticket.<sup>27</sup> Why was Waziri Ibrahim aspiring to the two topmost positions in the newly formed party? Was his National Union Council more important or influential than the other two organs of the party? Or was the great bulk of the new party's financial commitments borne by his National Union Council? It might be that he (Waziri) counted more on the support of the Kanuri than the rest of the country.

Waziri's aspiration for the post of chairman of the party and for running as the president of the country pointed perhaps to his ambition for his people. The Kanuri had been left out in terms of amenities and development by the previous administration. Thus, Waziri Ibrahim thought that by occupying both the party chairman position, and perhaps becoming the President of Nigeria, he would be in a position to develop Borno and the Kanuri areas of the state.

Moreover, Waziri personally contributed the major financial share in the formation of the party and for this reason would prefer to hold top positions. In turn, this would afford him an opportunity to do more for his people. Waziri's action constituted pressure exerted to create opportunity for the Kanuri. He was interested and out to project Kanuri identity in Nigerian political system. On the other hand, why his (Waziri's) mere gesture to stand for presidential election precipitated crisis in the new organisation? Waziri was only making intention to stand for election and if granted, he was not yet the president. If by any luck he was elected, automatically his party office (chairman) would have lapsed. Further still, some members of the party, who opposed his intention for presidency, left the meeting to come back with a candidate (for the presidential office), who denounced future participation in politics—Dr Nnamdi Azikiwe. Dr Azikiwe publicly declared lack of further participation in politics and claimed to be the 'Father of the Nation'. This behaviour and motive of other members of the NPP made Waziri Ibrahim to sever connections with the party and left with his followers to form the Great Nigeria People's Party (GNPP). Looking at the other side of the crisis, Waziri could have been more reasonable in handling the situation. It was not in the interest of unity for Waziri to aspire for both chairmanship of the party and presidential candidature. The option of one of the two positions would have avoided the split or precipitation of crisis.

The new party embraced people in the nineteen states as indicated (Table 1: shows states votes for GNPP at the 1979 Federal Presidential election).

Table 1

*The Great Nigeria People's Party Presidential Election 1979*

Anambra	20,229
Bauchi	154,218
Bendel	8,242
Benue	42,993
Borno	384,278
C. River	100,105
Gongola	217,914
Imo	34,616
Kaduna	190,936
Kano	18,482
Kwara	20,251
Lagos	3,943
Niger	63,273
Ogun	3,974
Ondo	3,561
Oyo	8,029
Plateau	37,400
Rivers	15,025
Sokoto	359,021

The GNPP had been accused of being a parochial, Kanuri, supported party. An analytical look of the party activities during the Second Republic will vindicate, or exculpate, the accusation. The GNPP had been identified as not representing the cross-section of the country; but the presidential election results as shown on the table prove that all the nineteen states voted for Waziri Ibrahim under the GNPP. Nevertheless, Borno State polled the greatest number of votes for Waziri. The reason is not hard to find. This may be what is generally termed the favourite son's vote which is natural in all elections. Apart from that, Waziri had a strong base support among the Kanuri and also a leader of the party. He contributed a greater part of the party financial expenses towards elections and other contingencies. The Kanuri also were proud to have one of their sons as the top nation's office contenders. Gongola and Bauchi polled heavily apart from Sokoto. Gongola, Bauchi and Borno were three of the four states that Ibrahim Imam proposed to form the northeast state during pre-independence politics.

Thus, this plan or idea seemed to persist in the Second Republican politics. The GNPP was one of the five political parties of the Second Republic, because it fulfilled the requirements for registration laid down by the FEDECO. It was an acceptable national party: But was it strong enough in the states that represented it? Many Nigerians are greedy for money, and are not loyal to those parties they pretend to support. A similar situation might have arisen in the politics of the Second Republic. Waziri might not have been accorded sincere support by most of the so-called party supporters. Accepting this argument, it could be argued that Borno State, particularly the Kanuri, gave Waziri and his GNPP genuine support. Also Waziri himself as a presidential aspirant expected more from the so-called party supporters from other states but the Kanuri, most of whom claimed that GNPP was their God-sent redeemer from the politics of separation and ethnicity practised in Nigeria.

Waziri's aspiration and hopes started to change after the presidential elections and promulgation of results. The young, broadminded supporters, such as Muhammed Goni and others still believed in Nigeria as a unit. Goni won the gubernatorial election of Borno State on the platform of the Great Nigeria People's Party and worked hard to raise the standard of life of Borno people. As a true Kanuri, Goni effected changes in Borno—education, health, transport and other social services were top priorities in his administration. Maiduguri, the capital of Borno State under Goni's administration changed dramatically and was recorded as one of the very rapidly growing towns in the nation. The parochial attitude of the party changed as the Governor fostered friendly relationships with his compatriots from other states. The Goni administration encouraged official visits to other states in the south and vice-versa. He practised an 'open door policy'. Many indigenes of states in the south took civil service appointments in Borno State. Among these were the Secretary to the Government and Head of Services, the Chief Judge of Borno State and others. Goni's administration did not discriminate against even the National Party of Nigeria governors (NPN). Chief Melford Okilo, the NPN Governor of Rivers State, made a friendly visit to Borno State. Also to demonstrate the love and unity anticipated in Nigeria, Governor Goni granted a piece of land to Lagos State Government to build a 'Lagos House' in Maiduguri and also named an important carriage way after Lagos—'Lagos Street and Lagos Bridge'.

The administration's liberal and friendly attitude towards the UPN caused a rift between the GNPP leader, Waziri Ibrahim and Governor Goni. The GNPP wanted to maintain the parochial Kanuri pressure/interest group style, while Goni's administration was against it, hence the friction in the party. The crisis posed a threat to the party and this caused the defeat of the GNPP in Borno by the NPN in the 1983 election. The politics of Borno during the pre-independence period, the first and second republican governments assumed interest group style. This was because the Kanuri of Borno in particular wanted to maintain their proud heritage and purity of their lineage. In order to achieve this end, they lobbied to have their party controlled by their kith and kin. However, the politics of the Second Republic was confused and of mixed pattern in Borno. It was confused and mixed in that under Goni's administration the pressure or interest group characteristics were not pronounced, because key positions in the administration were not all controlled by the Kanuri. Also the factions

existed diminished pressure/interest group character and instead of exerting pressure on the national government, efforts were directed to in-fighting. This caused disintegration of the party in Borno and the nation. The result was a loss of the State to the National Party of Nigeria in the 1983 elections.

#### Notes

- 1 Footnote cited in Mark A. Tessler, *et al.*, *Tradition and Identity in Changing Africa*, New York, Harper & Row Publishers, 1973, p. 110.
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- 4 *ibid.*
- 5 Muhammad N. Alkali "The Political System and Administrative Structure of Borno under the Seifuwa Mais" in Bala Usman and Nur Alkali (eds.), *Studies in the History of Pre-Colonial Borno*, Zaria, Northern Nigerian Publishing Company, 1983, p. 102.
- 6 *ibid.*
- 7 *ibid.*, p. 116
8. Alkali, *op. cit.*, p. 104.
- 9 Alkali, p. 102; Tessler, *et al.*, p. 116; This development in Shehu's power was due to the impact of the British colonial policy of Indirect Rule.
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- 18 Richard L. Sklar and C. S. Whitaker, Jr., "The Federal Republic of Nigeria", in Gwendolen M. Carter, *National Unity and Regionalism in Eight African States*, Ithaca, NY.: Cornell University Press, 1966, p. 41.
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- 21 *ibid.*
- 22 Sklar, *ibid.*
- 23 *ibid.*
- 24 *ibid.*, pp. 328-331; 341.
- 25 Sklar, *ibid.*, p. 340.
- 26 This has been discussed earlier that the Shehu occupied the throne which is the 'cradle of Islam' see footnote 16.
- 27 Kolawole Balogun, *The Waziri Saga*, Lagos, Africanus and Company, Undated, p. 22.



## CHANGING LABOUR FORCE PARTICIPATION PATTERNS IN BORNO STATE

by

P. O. Paranavitana

### Introduction

The state planning authorities tend to believe that the structure and composition of the labour force, and labour force participation rates (LFPR) for both males and females in Borno State have not changed or changed only slightly over the last 20 years (cf MED 1980). Except for the 1963 census, there has been no comprehensive inquiry on labour force for Borno State as a whole and hence, one could not verify the above hypothesis directly.

Secondly, the labour force participation rates computed by the authorities on the basis of 1963 census (MED, 1980) are of an aggregative nature and do not reflect the variations within divisions.<sup>1</sup> The disaggregated participation rates would have revealed more information and likely changes in participation rates in future.

In the mid and late 70's there had been a phenomenal increase in the school enrolment at both primary and secondary levels, rapid increase in government spending after the 1973-74 oil boom and rapid rise in employment opportunities in both public and private sectors especially in the former. These changes would have affected the LFPRs particularly in the urban sector.

The historical experience of the other countries with similar cultural background or at the same stage of development indicates that the participation rates of both males and females have changed. In the case of females, especially married ones, these rates have increased tremendously over the years. Even in the undeveloped countries where there is a high degree of literacy, it has been noted that the LFPR of females has increased.<sup>2</sup>

### Objectives of the Study

The main objective of this study is to examine whether the hypothesis that the LFPRs have not changed over time has been supported by facts. In the face of lack of data relating to participation, we assembled scattered data (both time series and cross section) on participation. In addition to 1963 census, there has been a labour force survey of urban areas in the North Eastern States in 1974 and also there is certain data on unemployment in urban areas in Borno State for the 1975-83 period.

The second objective of the study is to examine the existing census data in more details in order to figure out the extent to which the aggregate data reveals variation in participation rates at more disaggregated (divisional) levels. It is important to examine whether low female participation rates are common all throughout the state and if not, to identify the reasons which yield low participation rates in some divisions and high participation in the other divisions in the same province.

Thirdly, we wish to examine variations in participation patterns of secondary workers: women and youth (15-19). On the one hand, the expansion of education would tie down a large proportion of younger generation to schooling and on the other hand it will slowly remove some of the barriers that women have to face when they engage in economic activities. With education, men as well as women will have more opportunities for market work. With the availability of domestic help (either in the form of domestic servants or time-saving household appliances), educated women will be able to substitute market work in place of house work.

Fourthly, we wish to examine the determinants of participation rates from the 1963 census data for Northern Nigeria. An attempt was made to study the extent to which one would be able to explain differences in labour force participation rates across divisions,<sup>3</sup> in terms of the level of employment, religious-mix, the availability of non-agricultural opportunities etc. From these results, we wish to determine the likely impact of these factors upon changes in participation rates over time.

Finally, we look at unemployment and how it responds to vacancies. Since unemployment is an important component of labour force, figures on registered unemployment for the 1975-83 period will reveal how the massive investment in education in the early 1970s have affected labour force participation, and how the educated respond to job market conditions. Though 1963 Census figures give a low rate of unemployment because of the dominance of agriculture in the economy, lack of educational facilities,<sup>4</sup> etc, recent figures on unemployment should reflect the changes that have taken place in participation.

### Labour force participation rates by Region

1963 Census figures show that Borno State has one of the lowest female participation rates, though the male participation rate is not very different from those of the other regions.

Table 1  
*Labour Force Participation Rates and Activity Proportions by Regions,  
1963 Census*

	Male	Female	Proportion engaged in		
			Primary	Secondary	Tertiary
Whole of Nigeria	83	28	67	12	17
Northern Nigeria	92	13	78	7	14
Borno State	92	8	81	5	13
Eastern Nigeria	85	32	56	15	24
Western Nigeria (including Mid-west and Lagos)	84	62	50	22	26

Source: Ekanemi (1972)

Figures given in Table 1 clearly show that there is wide disparity in female labour force participation rates of northern and southern regions. These differences can be attributed to several reasons.

In the northern parts of the country social values and religious beliefs tend to discourage women being engaged in economic activities, especially in market work. Although women do not engage in market activities, a large proportion of them assist their family units in agriculture and petty trade as helping hands whenever the need for their services arises, particularly during peak demand periods for agricultural labour. In this situation, census inquiries on labour force are likely to underestimate the size of the female labour force, partly because of enumerators' unwillingness to take account of female workers who assist their family units without any payment, and partly because those females who engage in economic activities do not wish to be recorded as economically active, because of social attitudes. This partly explains exceptionally low female participation obtained for Borno State.

Secondly, the existence of relatively high shares of secondary and tertiary sectors in the economy in the south compared to the north would have raised female labour force participation rates in the south. The relatively high level of literacy<sup>5</sup> also would have influenced the participation rates in the south.

#### **Age-sex composition of the labour force of Borno and its divisions**

Figures given in Table 2 clearly demonstrates the dominant share of males in the Borno labour force. The proportion of males in the labour force is around 92 per cent, which is extremely high compared to that of any developed country. In Great Britain, the corresponding proportion in 1961 was 68 per cent. Even in an underdeveloped country like Sri Lanka, this proportion in 1963 was only 78 per cent (CBC, 1978). It is reasonable to assume that the main reason for this tendency is the dominance of agricultural sector in the economy (absence of non-agricultural opportunities) coupled with social attitudes and religious beliefs.

Looking at the composition of total employment (see table 3) it can be seen that the majority of economically active persons (81 per cent) were engaged in farming, rearing livestock and fishing. Of the total number of employed, about 10 per cent were petty traders, craftsmen and labourers and about 6 per cent were engaged in sports, service and recreational activities. Among all these different activities, comparatively high female shares in employment were found only in agriculture, petty trade and service sectors.

#### *Labour force composition by division*

Although the proportion of females in the labour force for Borno State is 8 per cent, figures in table 2 for its divisions show that this proportion varies from 3.6 per cent in Bedde to 27.2 per cent in Biu. It is quite interesting to note that the proportion obtained for Biu was comparatively higher than that of any other division. The share of females in each category also confirms the above pattern.

Another feature emerged from table 2 is that the proportion of males in the 15-19 age category was above 10 per cent for all the divisions, except for Biu (5.8 percent),

Table 2

*Age-sex Composition of Labour Force: Borno Province and Its Divisions and Great Britain (Percentage distribution)*

	<i>Age-group</i>	<i>Bedde</i>	<i>Biu</i>	<i>Bornu</i>	<i>Dikwa</i>	<i>Potiskum</i>	<i>Borno-overall</i>	<i>Gr. Britain (1961)</i>
Males	15-19	10.2	5.8	11.2	13.8	12.3	11.0	5.7
	20-64	83.7	61.5	81.1	74.1	80.5	78.2	59.4
	65-	2.3	5.4	3.0	2.7	3.4	3.2	2.4
Females	15-19	1.0	5.5	1.2	3.2	1.2	2.0	5.3
	20-64	2.5	20.5	3.3	5.8	2.6	5.2	26.4
	65-	0.1	1.2	0.2	0.2	0.2	0.3	0.3
		<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>

Source: 1963 Census, Vol. II, Northern Nigeria.

Table 3

*Percentage Share of Females in each Occupations Category & Share of each Category in Total Labour Force:*

<i>Occupation Category</i>	<i>Bedde</i>	<i>Biu</i>	<i>Bornu</i>	<i>Dikwa</i>	<i>Potiskum</i>	<i>Share of each category in total Labour Force</i>
3 Sales workers	14.8	44.6	14.9	16.4	7.4	5.5
4 Farmers, fishermen & related	2.0	26.0	3.2	6.9	2.9	80.2
7-8 Craftsmen, production workers & labourers	6.5	12.5	4.8	2.5	1.9	4.7
9 Service, sports & related	9.2	45.5	14.5	28.1	13.3	6.3
Total employees	3.3	27.2	4.6	9.3	3.8	99.6
Unemployed	30.3	50.2	26.1	35.6	23.8	0.4
Total labour force	3.7	27.3	4.7	9.3	3.9	100.0

Source: 1963 Census, Vol. II, Northern Nigeria.

*Share of females in various occupational categories*

There are two major occupational categories: (a) Sales workers and (b) Service, sports and related activities. One can find that the proportion of females employed exceeds 10 percent for most of the divisions in Borno. As expected, for Biu this proportion reached 45 per cent for both these categories. However, the proportion of females engaged in farming, fishing and livestock rearing was low for all the divisions, except for Biu, where it was 26 per cent. Low female shares of employment can be attributed partly to under-reporting. This argument is further supported by the unemployment figures. For all the divisions, the proportion of females in the unemployed category varies from 24 per cent in Potiskum to 50 per cent in Biu, thus showing women's strong desire to engage in economic activities.

*Labour force participation rates for Borno State by age*

Age-participation rates computed from 1963 Census, for both males and females for Borno State, clearly demonstrate the following features:

*i* There is a marked difference between male and female participation rates and this difference is much larger than that for the whole of Nigeria or for any developed country (see fig. 1). This phenomenon has resulted from very low female participation rates coupled with high male participation rates.

*ii* There is a narrow gap between LFPRs of urban and rural dwellers though the gap between is somewhat larger at the beginning and end of age-participation curves.

*iii* The labour force participation rates for males remain high for their entire adult life. Comparing these rates with the ones for developed countries, it can be seen that these participation rates are relatively high at the beginning (15-19) and end (55 & over) of age-participation curves<sup>6</sup>, thus demonstrating the effect of the dominance of agriculture, non-commitment to education by young persons and the absence of social security for aged people. Since most of the economically active people engaged in agriculture and petty trade are self-employed<sup>7</sup>, there is no compulsory retirement age for these groups, except for disability. Moreover, figures for Northern Nigeria<sup>8</sup> show that the LFPR for the 55 & over category remained high despite the type of occupational category to which they belonged. Thus it is reasonable to conclude that those who survive to their old age were either forced to continue to earn their livelihood because of family responsibilities, or reluctant to be idle because of their fitness and willingness to work. As a result, the incidence of active participation in labour force is high throughout one's adult life.

*iv* It is also clear from figure 1, that schooling did not have much impact upon participation rates of the 15-19 age category. However, a distinction can be found between urban and rural youths in this age category. According to the figures, the urban population is more likely to be engaged in education, compared to the other group. This is in line with the other countries' experience.

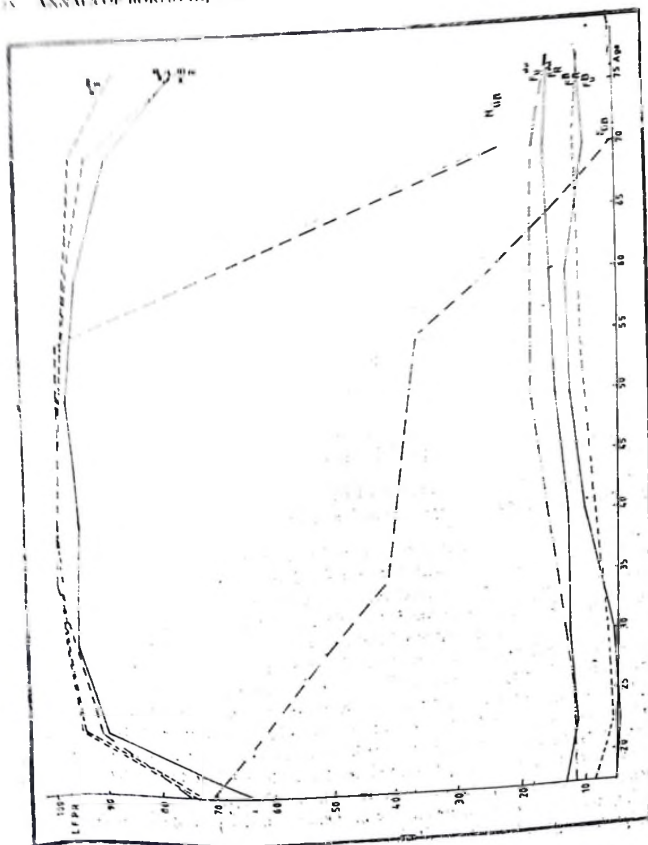


Fig. 1 Labour Force Participation Rates.

- Legend:
- M (or F) = Male (or Female) labour force participation rate
  - U (or R) = Urban (or Rural)
  - NN = Northern Nigeria
  - B = Borno
  - G.B. = Great Britain

Source: 1963 Census of Nigeria  
DEP (1971)

### *Divisional labour force participation rates*

As expected, there is not much difference between the divisional participation rates and the overall rate for males except at the beginning (15-19) and the end (see figure 2). In the case of females, however, one can notice that the LFPR for Biu stayed at a higher level compared to the other divisional rates. In fact, the gap between Biu and the others seems to be fairly large.

Looking at figure 2, it can also be noted that there is a dip at 22.5 years for all divisions, thus showing women's tendency to withdraw from the labour force at that age in order to get married. From then onwards, participation rates rise steadily in small increments towards the end of age-participation curves, keeping the gap between each other throughout.

### *Distinct nature of female labour force participation rates in Biu*

From the above discussion, we can conclude that as far as women's role in economic activities is concerned, Biu has a distinctive pattern. For Biu, the proportion of females in the labour force is high; in most of the occupational categories the proportion of women is comparatively high; and the female labour force participation rate is very much above the over-all level.

The distinctive nature of participation rates obtained for Biu may be attributed to several factors. Compared to the other divisions of the state, for a considerable period of time, Biu had been exposed to missionary activities which included the provision of health, educational and religious facilities. The missionaries had brought education early to the people in Biu and they ran a sizeable proportion of primary and secondary schools up to the beginning of 1970s. The proportion of primary schools in Biu run by them was nearly 40 per cent in 1968 (NES, 1969). Their involvement in post-primary education<sup>9</sup> in Biu had begun in 1952. In addition to education, they also brought health and medical facilities to the area by building hospitals, dispensaries, maternity and child welfare centres (C.W.C.). Even in 1969, the number of dispensaries, maternity and C.W.C.s in Biu run by missionaries had accounted for 7 out of 15 (NES, 1969).

Secondly, the religious composition of the population in Biu itself would have explained some of the differences in participation existing within divisions. The proportion of non-muslims in Biu was the highest among that of all divisions in Borno state. It is well known that these groups usually do not discourage women being engaged in market activities. In fact, there is a strong relationship between the proportion of non-muslims in a division and the corresponding proportion of females in the labour force. It is self-evident from the figures given in table 4 that the higher the proportion of non-muslims in a division, the higher the labour force participation rate and the share of females in the labour force. The areas with a high proportion of pagans such as Muri, Gwoza, Sardauna (both Northern and Southern) tend to be associated with high female participation rates.

Thirdly, following the lead of those who engaged in education and social activities, the others also gradually took part in them. As a result, attitudes of these groups on education, making use of western medical and health facilities, women's role in economic activities and women's taking part in education would have gradually changed.

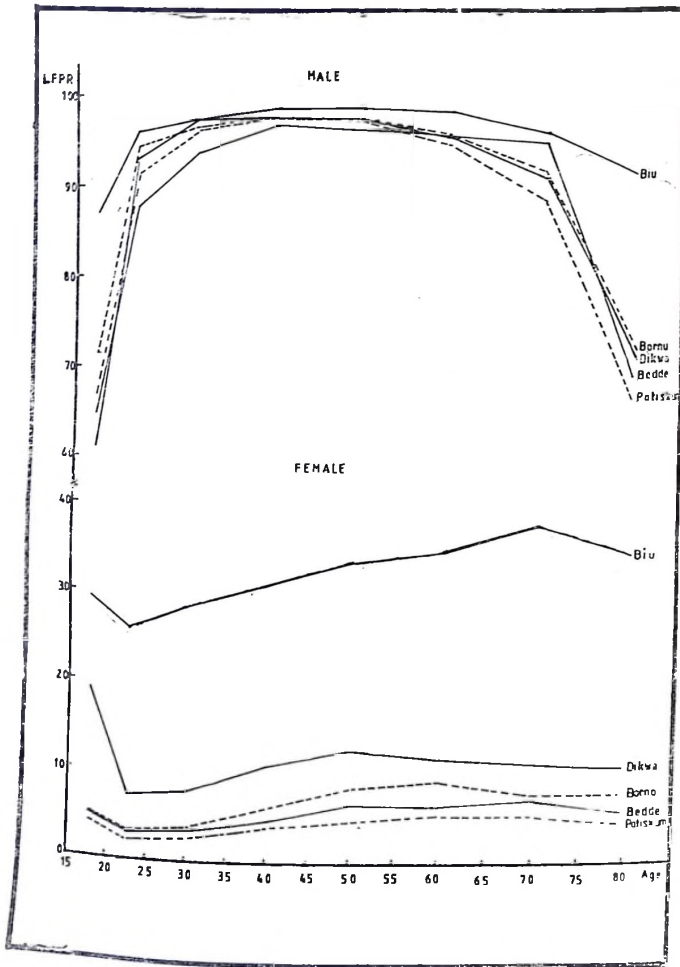


Fig. 2. Divisional Labour Force Participation Rates—Borno State.

Table 4  
*Religious Composition & Participation—North Eastern State—by Division*

<i>Division</i>	<i>Idolaters</i>	<i>Percentage of Christians</i>	<i>females in labour force</i>	<i>Labour Force participation rate</i>
Adamawa	40.4	15.8	19.3	19.7
Muri	68.3	5.9	24.7	31.3
Numan	44.2	28.3	15.8	16.9
Bauchi	24.2	2.7	10.1	10.4
Gombe	18.8	6.2	15.5	20.1
Katagum	3.8	0.3	10.4	10.7
Bedde	1.0	1.1	3.7	4.0
Biu	22.3	12.5	27.3	29.1
Bornu	1.5	0.9	4.7	4.6
Dikwa	3.7	0.3	9.3	10.4
Potiskum	17.3	1.3	3.9	3.3
Gwoza	84.0	0.4	24.4	28.9
Northern Sardauna	66.8	10.5	34.6	47.9
Southern Sardauna	45.7	11.9	31.2	44.1

*Source:* 1963 Census, Vol. II, Northern Nigeria.

Women in Biu also have had the opportunity to take part in education with the opening up of primary and religious schools. Since they were exposed to education long before the others, they had the chance of forming habits towards schooling and learning. This tradition is clearly demonstrated by the fact that even in recent times, the rate of enrolment in primary education in Biu is much higher than that of any other division in Borno State<sup>10</sup>.

#### *Determinants of divisional participation rates*

In this study, an attempt was also made to evaluate the relative importance of some determinants of labour force participation rates<sup>11</sup>. Two groups of labour force participants were identified: those below 20 years of age (secondary workers) and those of 20 years and over (primary workers). Male and female groups were considered separately.

The general model considered was as follows:

$$LFPR = b_0 + b_1P_{NM} + b_2P_D + b_3P_U + b_4P_{NA} + b_5P_E + \text{error} \dots (1) \text{ where}$$

LFPR = Labour force participation rate

$P_{NM}$  = Proportion of non-muslims in the population

$P_D$  = Proportion of dependants under 15

$P_U$  = Ratio of urban population to total population

$P_{NA}$  = Proportion of economically active population engaged in non-agricultural activities

$P_E$  = Percentage of pupils to 6-13 year-old population

This model was fitted for each of the four groups, using 1963 Census data for 43 administrative divisions of Northern Nigeria. The results obtained were presented in table 5.

Looking at the results, one can notice that though the overall fit of the cross-section model is low (ranging from 0.19 to 0.31), they shed some light on determinants of labour force participation. It appears that the factors which affect primary labour force participants were different from those which affect secondary participants. It is also noticeable that the impact of these factors on participation varied widely across different groups.

#### *Non-muslim proportion*

This variable was significant for all the groups except for males, 20 and over. There is evidence to suggest that the higher the non-muslim proportion in a division, the higher the participation rate of females in the 15-19 age group, thus showing that those who practise idolatry and christianity, in fact, encourage women's participation in the labour force. This group also tends to allow women, 20 and over to take part in labour force.

#### *Dependency-ratio*

The estimated coefficient of the dependency-ratio was significant for all the groups except for females in the 15-19 age group and had opposite signs for males and females. For males, 20 and over, this variable was associated with a positive sign thus emphasizing the role of breadwinner in the family. As expected, it had a discouraging effect on female labour force participation. In the case of females, 20 and over, it can be seen that every 1 per cent increase in the ratio will reduce the participation rate by 0.7 per cent.

The positive significant relationship between the dependency rate and the participation rate for males, 15-19 group, shows that families expect male youths to contribute their share to family income by taking part in economic activities. However, on the contrary, females in the same age group were expected to withdraw from the labour force.

Table 5

*Estimated Divisional Labour Force Participation Equations for Northern Nigeria—Equation (1)*

<i>Independent variable</i>	<i>Males, 15-19</i>	<i>Females, 15-19</i>	<i>Males, 20-</i>	<i>Females, 20-</i>
Non-muslim Proportion	-0.1277†† (1.81)	0.1859** (2.83)	-0.0091 (0.80)	0.0886† (1.48)
Dependency ratio (0-14 years)	0.6783† (1.46)	-0.4620 (1.06)	0.1532* (2.04)	-0.7845* (2.01)
Degree of urbanisation	-0.0777 (0.40)	-0.3439†† (1.91)	0.0334 (1.07)	-0.2124 (1.33)
Non-agricultural proportion	0.1467 (0.69)	0.5251** (2.64)	-0.1017** (2.95)	0.3383†† (1.88)
Educational opportunities	-0.1611 (0.93)	-0.2760†† (1.71)	0.0556* (1.99)	-0.2146† (1.46)
Intercept	43.9085	24.9232	90.6195	40.8091
R <sup>2</sup>	0.26	0.31	0.27	0.19

(t-ratios are in parentheses)

Level of significance: \*\* 1 per cent

\* 5 per cent

†† 10 per cent

† 15 per cent

*Urbanisation*

On the basis of the results, it can be stated that the higher the degree of urbanisation, the higher the participation of males, 20 & over, but the lower the participation of youths and females. The presence of a large proportion of urban population in a given division is most likely to discourage females and secondary workers from taking part in the labour force, due to competition among themselves and from prime-males.

*Non-agricultural opportunities*

According to the results obtained, this variable was an important determinant of labour force participation rates. The estimated coefficient was significant for all the groups, except for males in the 15-19 category and the positive sign was obtained for all the groups, except for males, 20 & over.

It appears that the higher the ratio of non-agricultural employment to total employment, the lower prime-male participation rate, thus demonstrating the heavy dependence of males on agriculture for their livelihood. The results also indicate that the availability of job opportunities outside agriculture encourages females and secondary workers to take part in labour force. For females in the 15-19 age group, it was seen that for every 1 per cent increase in the proportion of non-agricultural employment there was a 1 per cent increase in the participation rate. This result confirms the view that the expansion of the non-agricultural sector leads to high females participation as experienced by the developed countries in the past.

*Education*

Since one's educational achievement plays an important role in shaping one's participation decision, an attempt was made to introduce a variable to take account of differences in educational opportunities in various divisions. Because of lack of information on education, the ratio of pupils to total 6-13 years-old population was selected as a proxy for educational opportunities (development) in each division.

The results obtained show that the estimated coefficient for education was positive and significant for males, 20 and over, and negative for the rest. This clearly shows that the higher the level of educational development in a division, the higher the male participation rate. It also appears that the higher the proportion engaged in primary education, the higher the likelihood of some people engaging in further education, and hence one can explain the negative relationship that existed between education and participation for persons in the 15-19 age group. In the case of females in the 20 years and over category, there was a negative relationship between education and participation, thereby demonstrating that the higher the proportion engaged in primary education, the lower the time available for activities outside home despite females' educational achievements, because of heavy family responsibilities.

In summarising, one can conclude that though the relative importance of each determinant of participation rates varied widely in general, they seem to explain participation patterns quite satisfactorily. In this model, non-muslim proportion and dependency rate can be treated as constraints rather than policy variables, the other variables in the model can be influenced by various policy measures in varying degrees. In this set of policy-variables include degree of urbanisation, non-agricultural opportunities and educational developments. Over the last 20 years. some of these factors have changed dramatically especially after the 1973-74 oil boom.

In the following sections, we look at the rapid development of education, government spending and rural-urban migration.

**Evidence for Change in Labour Force Participation Rates 1963 and 1974**

Despite the fact that one could not find a complete set of data on participation for Borno State since 1963, one can still make use of limited data available for North-Eastern State, from 1974 Labour Force Sample Survey (FMNP, 1980) for urban areas, to examine the change that took place between 1963 and 1974. Fortunately, 70 per cent of total urban households covered in the survey for North Eastern State were from Borno State and hence one could draw inferences from this data with respect to the overall change in participation patterns between 1963 and 74.

Several features emerge from the results given in table 6. The most striking feature is that there was a distinctive upward shift of female age-participation curves over prime-age between these two years. Moreover, one can notice that the age at which the dip of female age-participation curve occurs has gone up from 22.5 years to 27.5 years. This clearly shows that the departure of women from labour force for marriage has been postponed slightly in urban areas. Over the later period of prime-age (35-54), the upward shift of female participation curves was large and truly striking.

The second feature that emerges from the data was that prime-male participation pattern was apparently unchanged, though the early entry into the labour force and

Table 6

*Urban Labour Force Participation Rates, 1963 & 74 North Eastern State*

Age Group	1963		1974	
	Male	Female	Male	Female
15-19	62.8	9.1	45.3	16.0
20-24	89.6	7.5	89.3	21.0
25-34	97.8	8.4	95.2	17.4
35-44	95.8	12.9	97.3	26.3
45-54	95.7	16.3	97.4	40.0
55-64	94.5	16.9	24.4	7.7
65-	87.3	16.7	n.a.	n.a.

Source: 1963 Census, Vo. II, Northern Nigeria.

1974 Labour Force Sample Survey, National Manpower Board.

late retirement have been drastically altered. The reduction in the participation rates for the 15-19 age group can be attributed to rapid increase in the enrolment in post-primary institutions.

Unlike in 1963, both male and female participation rates for the old age group (55) for 1974 drop drastically. This striking difference might have been due partly to mis-reporting of age, exaggeration of ability to work in the 1963 Census inquiry and partly to the enumerators' reluctance to record old-aged persons as economically active and to improved coverage as a result of small sample size in 1974.

Finally, it can be seen that the share of females in the total labour force in the urban sector had increased from 8.5 per cent in 1963 to 18.7 per cent in 1974, a remarkable increase within 11 years.

#### *Impact of dynamic factors on LFPRs in Borno*

As seen earlier, labour force participation rates have been changing over the years. The change was remarkable with female participation rates. Several dynamic factors would have affected the growth of LFPRs and some of the most noticeable ones, out of them would include: (a) high dependency rates (0 - 15) associated with rapid population increase, (b) expansion of educational opportunities and (c) increased government spending.

#### *(a) Population growth*

A 5.3 per cent annual growth rate in population was observed in Borno province between 1952 and 1963. Rapidly increasing population influences the age-sex composition of the labour force and yields a young dependent population. From the empirical findings, it is seen that the increasing dependency ratio would reduce the female participation rate, while it increases the male participation rate.

Another development one would observe during the 1970s was rapid migration from rural areas to urban areas in search of job opportunities. Though a 2.5 per cent growth rate in population was assumed for Borno as a whole, 5 per cent growth rate in urban population used by the planners seems to be the realistic figure for urban expansion.

(b) *Enrolment in education*

Rapid growth in enrolment in education (both at primary and secondary levels) would have improved the quality of the work-force. Since 1975-76, the Universal Primary Education (U.P.E.) scheme has been in operation and would have contributed to rapid increase in that segment of labour force, which requires a certain level of educational attainment.

Looking at table 7, one can clearly notice that there has been an exponential rate of growth in enrolment of both males and females, over the 1970s. There is a clear distinction between the enrolment ratio before and after the introduction of the U.P.E. scheme in 1975/76. In some divisions, the response to the scheme was immediate whereas in the others it lagged by a year.

Despite the divisional differences, one can also notice that the primary school going population (6-14), both males and females, have increasingly participated in education. It appears that the male participation rate in education has been remarkable. Even in the case of females, it was exponential and rapid, but not as high as the corresponding male rates thus showing the effect of social constraints (attitudes and values).

The examination of figures in table 7 also shows that Biu has a distinctive pattern of educational participation, compared to the other divisions, probably due to the influence of the factors mentioned earlier. In Biu division, the enrolment rates for both males and females have increased tremendously. Similar patterns are also observed for Bedde and Potiskum. Moreover, these patterns indicate the importance attached by minor ethnic groups to education as compared with major groups, whose slow response to educational advancement is clearly demonstrated by time-series figures in table 7 for Bornu and Dikwa<sup>12</sup>.

The rapid development in primary education would have filtered into the secondary and tertiary levels with a lag of several years. Their increase would not have been as rapid as the one observed for primary enrolment. Education, in fact, makes a person a potential labour force participant who has a place in the middle and upper segments of the labour force. As argued by several authors (see Harbison and Myers, 1964), the degree of educational achievement by the members of the labour force reflects the level of development of a country or a region. Educational opportunities create job desires which have, otherwise, not existed at all.

(c) *Government spending:*

With the oil boom and the resulting increase in government spending, there has been an upsurge of economic activities throughout the 70s, which has influenced LFPRs. Table 8 and 9 present recurrent and capital expenditures for Borno in 4-5 yearly averages for the 1968-82 period, in current and real terms<sup>13</sup>.

**Table 7**  
*Proportion of 6-14 aged Population Enrolled in Primary Schools by Sex and Division—Borno State*

Year	Males			Females					
	Bedde	Biu	Bornu	Bedde	Biu	Bornu	Potiskum		
1968	10.6	16.4	3.8	5.6	7.1	8.0	3.5	4.6	3.3
1969	11.7	19.3	4.5	5.5	8.7	8.4	2.6	3.9	3.3
1970	13.6	21.3	4.3	5.4	9.6	8.9	2.8	3.9	3.5
1971	14.5	22.0	5.4	5.7	10.6	9.9	3.3	4.0	3.9
1972	16.3	22.7	6.4	6.0	12.0	10.2	4.0	4.2	4.2
1973/74	21.4	24.4	7.4	6.7	16.2	11.1	4.6	4.6	4.7
1974/75	27.8	29.0	9.3	6.4	23.4	14.2	6.2	4.8	6.5
1975/76	38.2	71.5	28.6	5.6	30.7	48.2	12.8	7.2	9.7
1976/77	62.5	88.0	28.9	9.6	46.5	63.3	17.3	9.6	24.7
1977/78	74.9	69.8	33.4	15.3	37.9	50.1	22.0	14.2	25.5
1978/79	96.6	71.3	34.8	26.1	73.0	51.2	22.2	23.0	33.9
1979/80	100.0	84.8	42.1	34.4	84.8	61.3	27.2	29.4	47.8
1980/81	100.0	100.0				70.3			

Sources: 1963 Census Vol. II, Northern Nigeria

Educational Statistics and School Directory of North Eastern of Nigeria: 1968, 1969, 1970, 1971, 1972, 1973/74, 1974/75.

Educational Statistics—Borno State; 1980

Statistical Year Book—Borno State; 1978 & 1980.

Table 8  
*Current and Real Recurrent Expenditure—Borno State@: 1968-82 (4 year averages)†*  
 (N millions)

Sector Period	Current Prices		1975 Prices			
	1968/69-71/72	72/73-75/76	76/77-79/80	80-82		
Economic	3.681	16.005	61.844	120.891		
Social	2.877	8.050	30.589	59.954		
Education	1.946	5.331	23.841	56.386		
Health	0.932	2.720	6.748	2.652		
Administration	1.294	3.893	25.577	56.777		
Total	7.294	27.948	118.011	237.622		
			1968/69-71/72	1975 Prices 72/73-75/76	76/77-79/80	80-82
			7.376	17.829	38.213	51.048
			5.772	10.055	18.605	24.896
			3.922	6.603	14.183	23.463
			1.850	3.452	4.422	1.089
			2.636	4.719	15.830	23.030
			15.784	32.600	72.648	98.974

@ including Gwoza, Uba and Askira

\* author's estimates from NES data

† except for the last period

Source: Statistical Year Book—Borno State 1978 & 1980

Approved Estimates for Borno State of Nigeria: 1979/80, 1981 & 1982

Approved Estimates for North Eastern State of Nigeria, 1973-74 and 75-76

Annual Abstract of Statistics (F.O.S.), 1975 & 1981

Table 9  
*Current and Real Public Capital Expenditure—Borno State: 1970-82 (5-year average<sup>(a)</sup>) (Millions)*

Sector Period	Current Prices				Real ('75 Prices)				
	1970-74†	1975/76-79/80	1981-82*	1970-74	1975/76-79/80	1981/82	1970-74	1975/76-79/80	1981/82
Economic									
Agriculture	1.004	7.450	30.063	1.991	4.749	11.527			
Manufacturing & Craft	0.355	3.783	23.054	0.544	2.175	8.755			
Transport (Roads development)	1.721	7.688	75.077	2.925	4.491	28.977			
Social Services									
Education	1.392	16.081	71.750	1.924	9.976	27.833			
Health	0.539	5.089	10.446	0.878	2.765	4.092			
Regional Development									
Water supply	0.329	4.714	20.405	0.591	3.157	7.991			
Administration	1.119	7.196	36.490	1.863	4.732	14.100			
Total	7.605	69.092	404.618	13.016	39.824	157.062			

<sup>(a)</sup> except for the 1981-82 period

† Author's estimates (includes Gwoza, Uba-Askira

Provisional estimates)

Source: Statistical Year Book—North Eastern State 1973

Statistical Year Book—Borno State 1978 & 80

Approved Estimates for 1979/80, 1981 & 1982, Borno State

Fourth National Development Plan 1981-85, FMNP, Lagos, Jan. 1981

Annual Abstract of Statistics (F.O.S.) 1975

From table 8, it appears that there is a clear-cut distinction between average recurrent expenditures before and after the 73-74 oil price increase. Comparing figures in column 2 with that in column 3, one can notice that there had been a remarkable jump in expenditure from a comparatively low level to a considerably high level in every sector, both in current and real terms. In all cases except one, the increase in real terms was at least 200 per cent. The recurrent expenditure in the administrative sector, in real terms, rose by 335 per cent between 1972-76 to 76-80. It is also noticeable that economic and educational sectors also expanded very rapidly between these two periods. In all the sectors, the expansion has continued unabated beyond 1980.

A similar pattern also emerged from capital expenditure figures (see table 9). Between 1970-74 and 75-80 periods, the increase in real capital expenditure was 5-fold for education, 5-fold for water supply and 4-fold for manufacturing. In the other sectors, also the increase in real capital expenditure was remarkable. One can also notice that between 75-80 and 81-82, the real capital expenditure on manufacturing, administration and education had increased by 300 per cent or more. In all the sectors, the increase in real capital expenditure has continued unabatedly over the late 70s and early 80s.

Rapid growth in government spending since the 1973-74 period created job opportunities directly in the government sector as evidenced by the expansion of the administrative sector and indirectly in the private sector through the development of infrastructure such as roads, schools, hospitals. This has resulted in creating demand for manpower, both skilled and unskilled workers, and creating job opportunities for persons with some education, especially for females as nurses, clerks, teachers, sales workers, bank clerks, etc.

The upsurge of economic activities has also initiated a movement of migrants from rural areas to urban areas to look for better job opportunities. The expansion of construction and food processing industries in and around urban centres would have absorbed unskilled rural migrants at cheap rates considerably, even though the number of unskilled workers available for this type of jobs outstripped the demand for them.

The creation of job-opportunities, development of infrastructure and rural-urban migration would have increased labour mobility and, in turn, they would have affected LFPRs.

### **Changing Labour Force Participation Rates — Recent Evidence**

Despite limitations of data, one would like to examine the direction of change of the urban labour force. It is fortunate to note that there is some data available on unemployment for the period 1975-82. Unemployment being one of the main components of the labour force, it is reasonable to assume that it will reflect the direction and composition of the changing labour force to a certain extent.

With the rapid increase in educational facilities over the last 20 years, it appears that persons with some education primary or secondary have joined the labour force and as compared with the others they are more likely to be registered with employment exchanges. However, it is important to note that these centres cater only to those people in urban areas and those who migrate to urban centres.

From table 8, it appears that there is a clear-cut distinction between average recurrent expenditures before and after the 73-74 oil price increase. Comparing figures in column 2 with that in column 3, one can notice that there had been a remarkable jump in expenditure from a comparatively low level to a considerably high level in every sector, both in current and real terms. In all cases except one, the increase in real terms was at least 200 per cent. The recurrent expenditure in the administrative sector, in real terms, rose by 335 per cent between 1972-76 to 76-80. It is also noticeable that economic and educational sectors also expanded very rapidly between these two periods. In all the sectors, the expansion has continued unabated beyond 1980.

A similar pattern also emerged from capital expenditure figures (see table 9). Between 1970-74 and 75-80 periods, the increase in real capital expenditure was 5-fold for education, 5-fold for water supply and 4-fold for manufacturing. In the other sectors, also the increase in real capital expenditure was remarkable. One can also notice that between 75-80 and 81-82, the real capital expenditure on manufacturing, administration and education had increased by 300 per cent or more. In all the sectors, the increase in real capital expenditure has continued unabatedly over the late 70s and early 80s.

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In order to distinguish between school leavers with different educational backgrounds, the registered unemployed and vacancies<sup>14</sup> were divided into two by the level of educational attainment: primary and secondary. To ascertain the extent to which unemployment has resulted from long-term factors and the degree of its sensitivity to changes in short-term factors such as vacancies, a model was formulated by assuming that registered unemployment in each category is related to vacancies in that category, time trend representing long-term effects and seasonal factors. The inclusion of time trend can be justified on the basis of rapid educational development in the last two decades since the number of children enrolled as students both at primary and secondary levels have increased exponentially. Thus the time trend is expected to take account of the effect of schooling on unemployment.

The unemployment model thus constructed can be written as

$$U = b_0 + b_1V + b_2T + d_3D + b_4Q_1 + b_5Q_2 + b_6Q_3 + \text{error} \dots (2) \text{ where}$$

U = the registered number of unemployed persons

V = number of vacancies

T = time trend

D = a dummy variable to link two different series on unemployment

Q<sub>i</sub> = i th quarterly seasonal dummy, i = 1, 2, 3

This model was fitted for primary and secondary school leavers separately, using quarterly data for the period 1975 I to 1982 IV. The dummy variable, D, was included in the model as follows:

For primary school leavers: D=1 for the period 1975 I - 1978 III, =0 otherwise. For secondary school leavers: D=1 for 1975 I - 1977 II, = 0 otherwise.

The results obtained for the model fitted for two groups are given in table 10. They clearly show that variation in unemployment can be explained satisfactorily by the model considered. The overall fit as measured by the coefficient of determination was 0.81 for both groups.

Looking at individual coefficients, it was seen that the trend term is highly significant for both groups though it has opposite signs for each group. As expected, the trend term seems to capture the impact of the expansion of education in the 70s on unemployment patterns. In the case of secondary school leavers, the coefficient of trend term is positive thus demonstrating that the higher the previous rate of expansion in school enrolments the higher the level of current unemployment. It was also seen that the higher the previous expansion in education, the lower the current unemployment among primary school leavers. With the expansion in education, it seems that more and more primary school leavers will take part in secondary education.

These results also suggest that the unemployed with primary school qualifications are sensitive to vacancies, whereas the unemployed secondary school leavers do not respond to vacancies in their own category. It also appears that seasonal factors do not play an important role, except for 3rd quarter for secondary school leavers and 1st quarter for primary school leavers, thus showing the effect of school leaving quarter of the year for the respective groups.

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Table 10

*Estimated Unemployment Equations for Borno State, 1975-82*

<i>Independent Variable</i>	<i>Primary School Leavers</i>	<i>Secondary School Leavers</i>
Vacancies	0.6096† (1.60)	0.2611 (1.08)
Trend	-7.6572* (1.99)	6.5775** (4.18)
Dummy	-564.3511** (6.92)	-78.1735** (2.44)
Q <sub>1</sub>	78.5723† (1.45)	2.9715 (0.12)
Q <sub>2</sub>	28.5077 (0.52)	-8.2321 (0.32)
Q <sub>3</sub>	75.5713 (1.34)	39.9962† (1.58)
Intercept		
Sample size	34	34
R <sup>2</sup>	0.81	0.81

(t-ratios are in parentheses)

\*\*, \*, † significant at 1%, 5% and 15% respectively.

### Summary and Conclusion

Despite the limitations of data, the results can be used to draw several conclusions: Though there was not much distinction between divisional male participation rates, it seems that low female LFPR obtained for Borno State does not reveal the true nature of widely varying female LFPRs of different divisions in the state. The indicators such as the proportion of females in the labour force and its various occupational groups, female activity rate, were comparatively higher in Biu division as compared to those of the other divisions. It was seen that social factors were responsible for this phenomenon. Among them are the early exposure to missionary activities, the availability of educational opportunities, religio-ethnic mix and social attitudes. Moreover, it was found that Biu has the highest primary school enrolment ratio for both males and females.

Also it can be concluded that the view held by the authorities, that there was no change in LFPRs, was not well-supported by empirical facts in relation to the urban sector, though one cannot make definite statement with regard to rural sector participation rates, because of data limitations. However, it was seen that there had been a definite shift in the urban LFPRs between 1963 and 1974. Female participation rates by age have increased considerably, whereas male participation-age profiles have

shrunk at the entry into and retirement from the labour force. It was found that these changes have taken place as a result of rapid expansion of education and non-agricultural employment opportunities through increased government spending. These factors are likely to expand continually even in the future, as the government expands its sphere of influence in various fields of economic activities.

To ascertain the relative importance of determinants both social and economic, a regression model was fitted and observed that the divisional LFPR of any group (prime males and females, youths) can be explained satisfactorily, in terms of proportion of non-agricultural opportunities, degree of urbanisation and education. These factors would have effected changes in LFPRs of adult males, females and youth over time.

Finally, one can conclude that the degree of participation in economic activity achieved by people in Biu, can be achieved to a certain extent by those who live in other areas, despite the differences in religio-ethnic mix through the development of infrastructure and educational facilities. It also appears that what Biu people experienced will be spilled over to the other areas as a result of demonstrative effect. The distinct LFPRs of Biu clearly supports the view that despite social constraints, female labour force participation can be increased by providing educational opportunities to females. Moreover, the policy variables such as degree of urbanisation, provision of non-agricultural employment opportunities and educational opportunities, which will result in changing LFPR, can be effected through government intervention.

According to the results, increasing participation in education will raise people's expectation and change the composition and the type of unemployed. There is empirical evidence to support that current unemployment has been a product of long-term factors, rather than that of short-term ones. In recent years, it has been noted that the unemployed persons with primary or secondary education have been increasing rapidly.

In summarising, one can conclude that there is enough evidence to support that increasing enrolment in education, rapid increase in government spending and rural-urban migration have changed the composition of the urban labour force and urban LFPRs over the last two decades.

## Notes

1 Borno Province was divided into five divisions: Bedde, Biu, Bornu, Dikwa and Potiskum.

2 The share of females in the labour force of Sri Lanka:

Year	1963	1964	1968	1973	1975
Share %	22	24	24	28	30

Source: CBC (1978)

3 There were 43 divisions in Northern Nigeria in 1963.

4 The total number of post-primary schools in Borno State was 7 in 1963.

5 Proportion of (6 year and above) Population with Primary or Higher

Region	North	West	Lagos & Mid-West	East
Proportion	32.7	58.5	75.9	74.6

Source: 1974 Labour Force Sample Survey

6 Duand (1975) found that Nigerian LFPRs were of exceptional nature: Nigerian male participation curves, in fact, enveloped the average participation curve derived for 84 less developed countries. Extremely high LFPRs for the category of 60 and over would have resulted from several factors: inflation of data, exaggeration of age and ability to work because of social esteem and the few who survived up to the old age are fit and courage enough to work and support the family.

7 Percentage Distribution of Employed Persons by Employment

Status—Nigeria	Agriculture	Non-Agriculture
Employer/Own Account Worker	58.9	77.6
Employees	0.9	15.4
Unpaid Household Worker/Apprentice	40.2	7.0
	<u>100.0</u>	<u>100.0</u>

Labour Force Sample Survey 1966/67 FMEDR (1972)

8 Percentage of 55+ in the Labour Force by Occupational Categories: Northern Nigeria

Occupational Group	Male	Female
0-2 Professional, Administrative & Clerical	10	7
3 Sales workers	7	9
4 Farmers, Fisherman & related	10	8
7-9 Craftsmen, Production workers, Labourers, Sports & Service workers	5	7
Total employed	9	7
Unemployed	16	39

Source: 1963 Census.

9 The first teachers' college and secondary school in Borno were opened by missionaries at Waka, Biu in 1952 and 1959 respectively.

10 Proportion of (6-14) female population enrolled in primary education in Biu:

Year	1960	1976/77	1980/71
Prop.	8.0	63.3	70.3

Source: Table 7 footnote MEPNN (1965)

11 Lack of data prevented the inclusion of several potential determinants.

12 The dominant ethnic group is Kanuri.

13 Because of the inadequacy of the consumer's price index, current expenditure figures are presented along with real expenditure figures.

14 Vacancy data considered here does not reflect the total number of available vacancies, since all the employers do not report to the employment exchange.

15 It is most likely, rural participation rates have changed rather slowly in comparison to urban rates, because of the dominance of the agricultural sector in the rural economy.

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# AFRICA

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## PUBLIC LIBRARY SERVICES IN BORNO: AN ASSESSMENT

by

C. C. Aguolu

### **The Objectives of the Study**

This study is intended to provide some insight into the nature of existing public library services in Borno State, the problems encountered in developing them, and the extent to which they are provided, and are meeting public needs, demands and expectations. It has further attempted to discover the effects of socio-economic, cultural and demographic factors upon public library development in the state; the relationships between the government's efforts to improve the educational standards of the people and its provision of public library facilities, and to suggest some procedural steps towards the improvement of the state library services.

### **Socio-Economic Background**

By physical size, Borno State is the largest state in the Federation with about four million people, who are widely dispersed, and exposed to the extremes of heat and cold. It has a venerable record of Islamic scholarship and Koranic education, going back some centuries. This factor, as well as a deep commitment to Islamic faith, is largely responsible for its uneasy acceptance of the Western traditions, especially Western education. There are still extant many Arabic manuscripts, scattered here and there among emirs, alkalis and mallams. These records, which are largely of a theological, legal or administrative nature, and vital for research, are indicative, to some extent, of a glorious past in Islamic learning.

Despite the vagaries of climate, soil aridity and desert threats, the State is noted for its production of livestock, being one of the largest livestock centres in West Africa. The level of illiteracy is one of the highest in Nigeria. Consequently, the vast majority of the people indulge in non-reading occupational interests, such as cattle rearing, farming, fishing and petty trading. Ethnologically and linguistically complex, Borno State is composed of many disparate ethnic groups, speaking different languages. The Kanuri constitute the dominant ethnic group. Although Kanuri and Hausa are widely spoken, English is accorded official status. Serious efforts are being made to develop the lexical and orthographic aspects of the Kanuri language through the encouragement of the State Government and the study of the language at the University of Maiduguri, the premier institution of higher learning in the State, opened in 1978. Paradoxically, notable scholars in this language remain expatriates (German and American). There is no doubt that the pre-eminence of English and Hausa languages has had a retarding effect upon the development of a strong literary tradition in the local languages.

In recognition of the consequences of corroding illiteracy upon the State's cultural, economic and technological development, the Borno State Government established the Centre for Adult Education within the Ministry of Education in 1981, and in 1982 launched the Adult Education mass illiteracy campaigns. The conception of adult education is broad. It encompasses functional literacy, remedial, continuing, vocational, aesthetic, cultural and civic education for youths and adults outside the formal school system. Adult education activities are carried out in the eighteen local government areas. A great deal of effort is made to provide effective adult education to improve the lot of the working adults, by first providing them with functional literacy and ensuring that they do not relapse into illiteracy. Besides, the State is making gigantic steps at all levels of education, notwithstanding the difficulties it has encountered in the implementation of the Universal Primary Education Scheme (UPE), launched by the Federal Military Government in 1976.

Nevertheless, statistics indicate a very low level of educational development. In 1960, while 19 per cent of all children, aged six to seven years in Northern Nigeria were enrolled in Primary schools, only 8.9 per cent of all children of the same age were attending primary schools in Borno areas.<sup>1</sup> The data from the Implementation Committee of the National Policy on Education show that, whereas in 1978/79 the national average was 23 per 1000 students in post-primary institutions, Borno State had 3 per 1000. While the national average was 133 per 1000 pupils in primary schools, it was 8 per 1000 in Borno State.<sup>2</sup> The educational progress in the State can be shown by the fact that in 1976, 193,120 pupils were enrolled in primary schools, but in 1980, 693,294 pupils. There were 6,557 students in 17 secondary schools, in 1976, but 32,242 students in 48 secondary schools in 1980.

J. S. Trimmingham and Joseph Greenberg have lucidly depicted the history of the Borno people and the processes of their Islamization in *A History of Islam in West Africa*<sup>3</sup> and *The Influence of Islam on a Sudanese Kingdom*<sup>4</sup>, respectively. For a clear perception of the interplay of the forces of traditionalism and modernism in education, Alan Peshkin's *Kanuri School Children: Education and Social Mobilization*.<sup>5</sup> is an invaluable source.

### The Purpose of a Public Library

A public library is at times called the "people's University". It is open to all and sundry and is financed by the government. It should provide services to its users, free of charge and on an equal basis, regardless of religious, political, ethnic, age and educational differences. The 1949 *UNESCO Manifesto on Public libraries* portrays a public library "as a living force for popular education and as a product of modern democracy and a practical demonstration of democracy's faith in universal education as a life-long process".<sup>6</sup> The public library should supplement the work of schools in developing the reading habits of children and young adults, and help them to become adults who can use books and other learning materials with appreciation and profit.

The role of the public library in the intellectual development of children and adolescents can be separately outlined. Services to children should be based upon these objectives:

- 1 To introduce them to a world of books and other learning materials.
- 2 To make appropriate books and other material; easily available to them.
- 3 To reinforce and enrich their class work.
- 4 To co-operate with other community agencies that serve children.
- 5 To assist all those involved in the development in the mind of the child a love of reading and of books.
- 6 To help children to become discriminating readers, listeners and viewers.

The public library should employ staff with a knowledge of child psychology and of children's literature. Such staff should be skilled in the techniques of working with children and ensuring that materials are made available, reflecting the needs and interests of the exceptional child; the gifted; slow learner; and the average child.

With regard to the adolescents who constitute by far the largest community of public library users, the main purpose of the service to them would be to:

- 1 To stimulate and direct their reading interests
- 2 To assist them in the development of research skills;
- 3 To enable them to broaden the knowledge and understanding of themselves and the world they live in;
- 4 To develop their ability to evaluate sources of information and to enrich their appreciation of the good in all of the media of communication;
- 5 To create an ability to share with others the ideas and information gained from reading, viewing and listening;
- 6 To develop in the young adults life-long reading habits.

These objectives do not differ markedly from those of the new type of secondary education, embodied in the *National Policy on Education*, namely: "to raise a generation of people who can think for themselves, respect the views and feelings of others, respect the dignity of labour, and appreciate those values specified under our broad national aims, and live as good citizens".<sup>7</sup>

For those involved in adult and non-formal education, the public library plays an important role. It should provide readings relevant to the needs of those struggling to gain functional literacy, to those of the new literates who might relapse into illiteracy, unless appropriate reading materials are made available, and to those of literate workers engaged in various forms of continuing education. The public library is a powerful agency for mass education and public enlightenment. Its fundamental educational role in society rests upon this fact that it attempts to explode some lingering institutional myths of the traditional education; namely: education is a terminal activity, which is completed on graduation; most of the things that an individual needs to know can be learned at school; most of the child's education takes place in the classroom; and the child is more educable than the adult. But, in fact, education is growth—a progressive reconstruction of experience and a life-long process, not just for the acquisition of grades and certificates.

A modern public library in a developing society, to justify its existence, is expected to perform these functions:

- 1 Facilitating informal self-education of all people in the community;
- 2 Enriching or further developing the subjects on which individuals are undertaking formal study;
- 3 Meeting the informational needs of the entire community, which have to be carefully identified;
- 4 Supporting the educational, civic, and cultural activities of groups and organizations in the locality;
- 5 Encouraging wholesome recreation and constructive use of leisure time.
- 6 Providing materials on local history for research and other purposes;
- 7 Making materials available to new literates, to help develop their numeric and literary skills, lest they should relapse into illiteracy;
- 8 Maintaining dynamic reference and information services to government departments, researchers, educational institutions, business and industry.

To be able to fulfill these social functions, the public library has to be established upon clear authority of law. Such public library legislation would commit government to library service; empower appropriate authorities to provide the necessary service and financial support; define the purposes, objectives and functions of the public library, and oblige the government to employ qualified staff. Legislation ensures the creation of a state library board, comprising members of varied interests drawn from the entire spectrum of the state, who are known to be interested in libraries.

Public libraries, as essential part of education, need a strong legislative base to ensure their proper support and facilitate their development. In the communist countries where libraries are fully integrated in the prevailing political and social systems, librarians are perceived as educators—agents for advancement of universal learning, and public libraries, known as “mass libraries”, are potent instruments of social engineering, mass enlightenment and political indoctrination. In effect, since librarianship is an integral part of social history, public library services must reflect the conditions of the society they serve.

#### Evolution of the Public Libraries

The Borno State Library evolved from the North-East State Library, opened in 1973. But its gestation period could be traced further back to the beginning of the first regional library services in Nigeria, developed at Kaduna in 1952. During the Second World War (1939–1945), Reading Rooms, established in Northern Region by the Public Relations Office of the British Government were placed under the control of Native Authorities. These Reading Rooms were equipped with newspapers, official bulletins and British propaganda war literature. They were planned, after the war, to serve as the basis for future public library services. However, their growth and development had been haphazard and uncoordinated.

A comprehensive study of the library situation on Northern Nigeria by F. A. Sharr, an Australian public library expert, under the Commonwealth Assistant Plan, in 1962, and published in 1963 as *The Library Needs of Northern Nigeria*<sup>8</sup>, revealed the apparent failure of the Reading Rooms to emerge as public libraries. Consequently, the Sharr recommended the establishment of strong public libraries in each of the existing thirteen provincial towns. Thus two provincial libraries were set up at Maiduguri and Sokoto between 1964 and 1965. In May 1967, the Northern Region was split into six autonomous States, with effect from April 1968. Public library development thus became the responsibility of each State.

A British librarian, Robert L. Pearce, commissioned by the Federal Government to assist the Northern Regional Library in the smooth distribution of its resources, human and material, arrived too late for this task, as the library materials and staff had already been shared among the six states before his arrival. The North-East State, out of which Borno State was carved in 1976, inherited some 7000 volumes from Kaduna. There were already some 5000 volumes belonging to the Borno Provincial Library and a fine Arabic collection in the Native Authority Library at Maiduguri.

The North-East State Library was placed under the Information Division of the Military Governor's Office; but was soon transferred to the Inspectorate Division of the Ministry of Education, with the State Librarian answerable to the Deputy Chief Inspector of Education for the day-to-day operation of the Library.

Although Pearce missed his primary task of assisting in the distribution of the resources of the Northern Regional Library Service, he, nevertheless, toured all the six Northern States in 1968 to study the Library situation and recommended measures for improvement. His recommendations are embodied in his report, entitled *Library Services in the New States of Nigeria*<sup>9</sup>. He suggested the transfer of the State Library Services from the jurisdiction of the Ministry of Information where that was the case, to that of Education, and creation of State Library Boards to ensure continuity of services even when the governments changed and to allow adoption of methods more appropriate to the administration of public library services than the existing methods, which were best suited to Ministerial bureaucracies. He contended that public library services in the Northern States would never improve until the governmental authorities began to perceive the library as an invaluable educational and cultural institution, recognize organized information as a national resource, and accept librarianship as a profession essential to socio-economic and cultural development in the states.

Under the *North-East State Development Plan, 1970-74*, a new library building was constructed for the State Library headquarters at Maiduguri and opened in November 1973. Three provincial libraries were established at Bauchi, Mubi and Yola. With the creation of the nineteen States in February 1976, the libraries at Mubi and Yola were handed over to Gongola State and those of Gombe and Bauchi to Bauchi State, while Borno State inherited the headquarters collection at Maiduguri. Thus, the Borno State Library began its existence with 26,622 volumes and eighty periodicals. Its divisional libraries were opened at Biu in 1978; at Bama in 1979 and at Potiskum in 1980. Efforts made to establish four branches at Gashua, Monguno, Gwoza and Damaturu, as provided in the *North-East State Development Plan, 1975-1980*, could

not materialize partly owing to financial difficulties and partly owing to a sudden change of government, with different social service priorities.

### The Information Resources

From the viewpoint of quality and quantity, the information resources in the entire Borno State Library system are highly inadequate. The financial allocation to the State Library and its branches has been meagre. The allocations for the recurrent expenditures in the first four years of the State Library's existence were erratic. The library, in the absence of a State Library Board to fight for its funds, had to rely upon the precarious and niggardly allocations which the State Ministry of Education by which it was directly controlled was ready to make for it. In fact, in the 1981/82 period the Ministry had no allocation for the State Library at all. The situation was so bad that the plans to establish a separate, well equipped and functional reference room and build a library in each of the seventeen local government areas had to be abandoned.

The data in Table I shed some light of the financial support of the State Library in its early period of development.

Table I

*Recurrent Expenditures Approved Estimates, 1977/79-1981/82*

<i>Year</i>	<i>Books and Periodicals</i>	<i>Library Equipment</i>	<i>Book Binding</i>	<i>International Book Week</i>	<i>Local Govt Library Grants</i>
1977/78	₦15,000	₦6,000	₦1,500	₦1,500	3,400
1978/79	₦8,340	₦2,690	₦2,000	₦1,200	None
1979/80	₦10,000	₦3,500	₦2,000	₦2,000	None
1981/82	None	None	None	None	None

\*Culled from the *Estimates of the Government of Borno*

*State in Nigeria, 1977/78-1981/82 (Maiduguri: Government Printer, 1978/1982).*

The above data indicate that during the period (1978/79-1981/82), State Government ceased to make any financial allocation for local government libraries—a reflection of the attitudes of the governments in many developing countries towards the provision of essential social services to the rural areas, where the need is often most acute. It is an undeniable fact that in many developing countries, including Nigeria, the local government structure is very weak; it can hardly generate any funds to defray even expenses of any type. It has to depend upon the subventions from the State Government, or at times in the case of Nigeria, upon occasional grants by the Federal Government.

The State Library system serving over 4,000,000 people has just over 60,000 volumes, and small serial and Arabic collections. It does not appear that the State Library has accepted its responsibility to develop a comprehensive collection of official publications, especially those emanating from Borno State itself. This would be

ensured by an enactment of a State deposit law, compelling all State Government departments and agencies to deposit at least five copies of their publications with the State Library, and also enjoining every commercial publisher in the State to deposit at least two copies of his publication with the State Library. In this way, the Library will be able to maintain a comprehensive record of the published intellectual output of the State and develop a strong local history collection. Borno State is historically known for its rich but diverse cultural heritage; it has also had centuries of profound Islamic scholarship. The public library should reflect these in its acquisition policy.

### Services

The State Library services are very much limited in range and quality, partly because of lack of qualified staff and partly because of the long absence of a functional library board, based upon law, to give the library a sense of purpose and direction. Although the State Library Board was legally created in 1982, it could not meet before its dissolution in the military take-over of 31 December, 1983. However, it was reconstituted in August 1984. If there had been public library legislation and a functional State Library Board all along, they would have committed the Borno State Government to public library services, ensured that the necessary personnel and funds were provided defined clearly the objectives, functions and purposes of the State Library Services, and efforts would have been to diversify and bring library services to the rural areas through the establishment of more divisional libraries in various local government areas and use of mobile libraries. Experience in these Nigerian States such as Anambra, Imo, Cross River, and Bendel States, with public library legislation and library boards have demonstrated that public library services fare far much better in those states than in other states where the public libraries operate under the political umbrella of the State Ministry of Education, Information and Culture.

The Borno State Library offers the traditional lending services to registered members, comprising primarily students and other government workers studying for various examinations. The basic services expected of any public library are lacking—active information, bibliographical, and guidance services. While there is a children's collection, though mostly outdated and largely unsuited to Nigerian children in content, language and treatment, there are no professional services available to children and adolescents, such as book talks, story hours and reading guidance. The public libraries serve as reading rooms for students, disturbed by noise and poor housing facilities at home.

The role of the public library in adult education is negligible primarily because adult education activities in the State are completely divorced from the fundamental function of the State Library itself as an agency for continuing education. Since the conceptions of adult education, include functional literacy, remedial, continuing and vocational, aesthetic, cultural and civic education for youths and adults outside the formal school system, the State Library and the State agencies responsible for adult education activities have to co-operate in order to achieve the State Government's objective in the mass literacy and adult education campaign, launched in July 1982—that is, to wipe out illiteracy from the State by 1992. But there is no evidence of any co-operation between them. The State Library is in a most strategic position to

prevent new literates from relapsing into illiteracy through provision of appropriate reading materials. While at a national level over 70 per cent of Nigerians are illiterate, mostly adults, in Borno State well over 85 per cent cannot read and write, and the State Government has an enormous but ineluctable responsibility to improve the lives of these illiterate adults through effective adult education programmes.

#### **Staffing and Management Control of the Borno State Library**

A public library in a developing society needs staff with a fine understanding of the social functions of public libraries; with a distinctive service concept; with considerable dedication; with a relevant subject, linguistic and bibliographic knowledge, and with an appreciation of learning and research as key ingredients of societal development. It is axiomatic that in the developing countries libraries are accorded low priority in relation to health, communications and education. The educated elite entrusted with the responsibility for public library development do not perceive any connection between libraries and education, or between libraries and economic development. Lack of demand for library services from the largely illiterate population is erroneously construed as synonymous with lack of need for them. But demand for library service is a function of one's educational and cultural experience.

The State Library Services have continually suffered from a serious shortage and turn-over, both in regard to professional and non-professional staff. With the current staff strength of six librarians and some forty-library assistants/attendants, the State Library appears to have its strongest staff strength in its history. While five of the six librarians work in the Headquarters Library at Maiduguri, and the remaining librarian is posted to the divisional library at Biu, assisted by library officers. There is no professional staff at either Bama or Potiskum divisional library.

The early development of the State Library was retarded considerably by an acute shortage of librarians. From its inception as the North-East State Library Headquarters (1968-1975) to August 1980, only one qualified librarian served in the library. But this was only for the first two and half years of the library's existence. He left librarianship for the teaching profession. The change of leadership was also very frequent. For example, from 1971 to 1974, the headship of the North-East State Library from whom the Borno State Library evolved in 1976 changed hands four times; three of these within one year (October 1973-September 1974).

At the break-up of the North-East State in 1976, only one of the eight library officers employed in the library came from Borno State. Because of his lack of library experience, the State Library had to begin with an experienced library officer seconded by Gongola State Government to Borno State Government to man the library. He left, however, two years afterwards to become one of the founding under-graduate students enrolled in the newly established Department of Library Science, opened in October 1978 at the University of Maiduguri. This left the headship of the library to another para-professional until August 1980, when a qualified librarian, albeit devoid of any professional experience, for the first time, assumed the mantle of the library leadership. Now that the staffing situation has improved, it is expected that the professional services, for some time lacking, will be introduced, such as reading guidance to children and adolescents and information and bibliographical services.

However, the success of the State Library in providing the necessary professional service, depends largely upon its ability to remove the present serious problems of personnel administration. There is an undeniable evidence of pervasive frustration among the staff (professional and non-professional). This has inevitably resulted in low morale and productivity. There is complaint that, other fresh university graduates are placed on a higher step on the salary grade level than the new library science graduates employed in the State Library system. There is an inadequate reward system, as promotions take very long to come by for the staff who may have merited promotions. Non-separation of professional from non-professional functions leads to wrong deployment of the staff.

The problem of a large turn-over of all categories of staff needs to be addressed realistically. The junior staff generally leave for further studies without replacement, or without being replaced for a long time. Some librarians desert public librarianship for academic librarianship, or leave the library profession completely, dissatisfied with the conditions of service in the State Library. When the Library was directly controlled by the State Ministry of Education, the situation was highly unpalatable. But with the establishment of the State Library Board, especially since its reconstitution under the present Military administration, definite efforts must be made by the Board to stem this unfortunate tide; perhaps, far more important, to remove the basic source of dissatisfaction responsible for the staff drift. Unless the Library Board is able to do this (as staff desert the State Library service just when they are about to acquire, or have actually acquired, the necessary professional experience to provide effective library service), the future will not augur well for public library development in Borno State.

### **Continuing Education**

The State Library has always paid much attention to in-service training for its library assistants/attendants. Newly recruited holders of WASC or its equivalent qualifications, primary and secondary school leavers are given a six week on-the-job training course before they are posted to various secondary schools, local authority libraries, divisional libraries, or to the Headquarters at Maiduguri. After two or three years, some of the Junior Staff are sent to the Kaduna Polytechnic for further training either for three months, or for nine months, depending upon their basic academic qualifications, to qualify as Assistant Library Officers.

The Borno State Division of the Nigeria Library Association, established in May 1980, through the efforts of the State Library, Ramat Library and Department of Library Science of the University of Maiduguri, has contributed significantly to the formal training of the Library Assistants/Attendants. The role of the State Division, of the Nigerian Library Association (NLA) in continuing education of its members need to be extended to the professional staff. Membership of the State branch of the NLA means automatic membership of the parent body, which is an amalgam of both professional and non-professional library staff and other individuals interested in development of libraries. It is not strictly a professional body exclusive to professionally qualified members. This has been one of the main weaknesses of the Nigerian Library Association.

In any case, no librarian, today, would be able to meet his responsibilities if he did not take the trouble to keep up to date with the current literature through exchange of ideas at seminars, conferences, workshops, refresher courses or through formal study of new developments in his field.

The major problem of continuing education at both national and state levels in Nigeria has been a lack of defined responsibilities and co-ordinated efforts. While the individual librarian must see it as his basic responsibility to identify his need for learning and accept the concept of life-long learning, the State Library should see continuing education as its integral and vital function, continually interacting with its goals, planning and operation. The Borno State Library Board, in collaboration with the State Division of the Nigerian Library Association, should co-ordinate the continuing education efforts on a State-wide basis. The State Librarian, therefore, should give more encouragement to the professional development of his staff, by actively supporting their participation in any available continuing education programmes—local, state or national.

### Public Library Legislation

The passage of the Borno State Library Board Law on 23 December 1982, with a retroactive effect to 18 May 1982, is a significant milestone in library development in Borno State. It could be said that with the enactment of this permissive legislation and consequent creation of the State Library Board, public Libraries are now geared towards rapid development. The seeds of the conception of the law were implanted as far back as 1968 in the recommendations of the Pearce Report which called for the creation of library boards in all Northern States. But the State Division of the Nigerian Library Association, once established, produced the catalytic effect necessary to bring the public library legislation to fruition. The legislation is an acknowledgement by the State Government that it is interested in libraries for the people and that it is ready to provide all necessary support, human and material, to ensure adequate public library service in the State.

The creation of the State Library Board itself epitomizes the Government interest in public libraries, in that these libraries have been put under the control of individuals known to be interested in libraries and education. The Board lays down the policies under which the State Library operates, and ensures that adequate funds, physical facilities and personnel are provided to enable the State Librarian, entrusted with the day-to-day administration of the State Library System, to provide effective services.

The significance of the Board can only be seen within the framework of the administrative control of the State Library by Permanent Secretary to the State Ministry of Education in which the State Library operated until the implementation of the provisions of the Borno State Library Board Law. The operation of the State Library directly under the Ministry of Education did more harm than good. The Ministry has the responsibility of establishing schools, equipping and maintaining them as well as of recruiting teachers for these schools. The Staff Officer of the Ministry was delegated to recruit all library assistants for the State Library, without consulting, or without the knowledge of the State Librarian, as to their need or suitability. The State Civil Service Commission, on the other hand, was responsible for the employment of

librarians. While the State Librarian reported directly to the Deputy Chief Inspector of Education (Inspectorate Division) for the day-to-day running of the library, the state librarian was answerable to the Deputy Chief Inspector of Education (Planning and Development) and to the Deputy Inspector of Education (Finance and Budget) for library planning and development, and for financial requirements respectively. These administrative lines of control, whereby the State Librarian had to contend with indifferent senior officials of the Ministry of Education, who might have no interest at all in libraries, handicapped him in the execution of his duties.

The State Library Board is empowered to appoint, promote and discipline all staff of the Library, in contradiction to the previous situation, whereby the State Ministry of Education made the State Library, as it were, a dumping ground for unmotivated young job seekers from secondary schools, appointing them library assistants/attendants without consultation with the State Librarian. The basic function of the Board is to establish, equip and maintain library services throughout the State. It has the additional function of making provision for training its staff, examining and certifying its clerical staff, and for undertaking the publication of the State bibliography, booklists and special catalogues.

The Board is a body corporate with perpetual succession and a common seal, and has the power to sue and be sued. Its membership is as follows:-

- 1 Chairman of the Board;
- 2 Three persons who shall represent members of the public in the State;
- 3 One person nominated by the University of Maiduguri;
- 4 One person to represent the Vernacular Literature Bureau;
- 5 Two persons appointed to represent Local Government interest;
- 6 One person nominated by the Nigerian Library Association;
- 7 The Chief Librarian of the State Library.

The Library Board is legally mandated to provide these services:

- a to offer to all members of the State, irrespective of age, race, political or religious beliefs, and in accordance with their needs and circumstances, the benefit accorded by full access to books and other graphic records.
- b to produce an information service with particular relevance to commerce, science and technology;
- c to promote and encourage the use of books, and other graphic records<sup>10</sup>.

The Borno State Library Law has some glaring defects. First, the purposes and objectives of the state Library Services are too broad, vague and aggregative. Second, there is no provision of legal deposit rights for the State Library and for any other institution which might be designated by the State Government. Third, in-service training of library assistants/attendants offered by the State Library for schools in Borno State, which is an expensive, time consuming undertaking is not embodied in the law. In effect, the relationships between the State Library and schools are glossed over. Finally, oral traditions embodied in myths, legends, drama, music, dance,

songs, poetry, oral history, religion, art *et cetera*, have become an important resource for such scholars as historians, sociologists, anthropologists, and linguists. Documentation of these in pictures, tapes and films is imperative. The State Library Board Law makes no mention of this; it should have enjoined the State Library not only to serve as a documentation centre for the traditional values of Borno people but also to maintain a comprehensive local history collection for research.

### Recommendations

The Borno State Libraries should aim not only at advancing the general cultural level of the people through organizing dynamic services that enrich the individuals experience, but also at promoting scientific and technological knowledge and managerial effectiveness through provision of specific information or data needed for research and decision-making. Since the bulk of the adult population is illiterate, public libraries must play an active role in helping the illiterate working adults, through adult and non-formal education, to adapt to the contemporary process of modernization.

The Library Board should embark upon a massive staff recruitment exercise to fill long standing staff vacancies. This applies to the recruitment of both professional and non-professional staff. A rational proportion of professional to non-professional staff should be maintained so as to obviate the necessity of one being forced to do tasks only appropriate to the other. Apart from the effect of this upon the quality of library work, wrong staff deployment detracts from the image of librarians and from the library profession itself.

To many people, the public library, as a community institution, is a nonentity, and to a vast majority of people, it is a totally irrelevant institution. This is not simply because its use and appreciation are constrained by high illiteracy in the State; rather, it is because the public library, in its present form, is incapable of "delivering the goods"—of giving relevant services to the community. The State Library does little to advertise its services, limited though they might be, in an attempt to advise its potential users on what it has to offer them. It has become a common fault among the librarians in Nigeria that they are so engrossed in library routines and technical and administrative matters that they forget the *raison d'etre* of librarianship itself. Librarians, as servants of the people, should sell to them their services. They need to utilize modern public relations techniques in dealing with the society.

A dynamic reference and information service should be initiated by the State Library. This would require knowledgeable, dedicated librarians with relevant subject and bibliographic knowledge, and a lively, up-to-date reference collection with adequate representation of bibliographical and reference materials relating to Africa. The children's collection should be revitalized, by stocking materials appropriate in content language and setting. While some classic works may be acquired, given the low level of children's book publishing in the country, greater efforts should be made to acquire materials with African or Nigerian backgrounds. A children's librarian with identifiable interest in the young people, with some knowledge of child psychology and teaching methodology, should be employed to provide the diversified but needed services, such as book talks, story hours, reading guidance or cultural films. Good relationships have also to be maintained between school and public libraries.

The enormous physical size of Borno State and its peculiar demography, marked by highly dispersed population, make it imperative for the State Library Board to introduce *mobile library services* to bring library services to the rural areas. The State Library does not even own any vehicle presently for the normal official transactions. The existing divisional libraries are located in the major towns of the State.

But it is hoped that a divisional library will be created in each local government area. The State Library Board should be provided with necessary funds for the purchase of a general library van as well as mobile library vehicles. The efficient operation of mobile library services is bound to increase library readership in the State, thereby helping to improve the reading habits of the youth.

The State Library should serve as the documentation centre for the traditional values of Borno people, containing materials in printed and recorded form. It should play an active part in the collection, presentation and dissemination of these values. Besides, the State Library should maintain the most comprehensive local history collection in the State, which is a valuable source for historical, sociological, or linguistic research.

A befitting modern library building with adequate space, with room for expansion should be constructed for the State Library at its headquarters in Maiduguri. The new building should take cognizance of the climatic conditions of the area, ventilated and equipped with air-conditioning facilities.

The purpose and objectives of public library services in Borno State, as specified in the Borno State Library Board Law, need clear delineation and articulation. This means, in effect, that the law, in this early stage of implementing its provisions, needs to be amended. A legal deposit requirement should be included in the amendment. Every commercial publisher should be enjoined to deposit at least *two* copies of his publication with the State Library and one copy with any other specified institution, preferably the University of Maiduguri Library. State Ministries, Government Departments and parastatals should deposit at least *five* copies of their publications with the State Library. This would enable the Library to build up a comprehensive collection of official publications important for reference and research.

Publishers would comply with the State deposit law without prejudice to *National Library Decree* 1970, which has laid down national legal deposit requirements. By complying with the State Legal deposit, publishers operating in the State, will be contributing to its cultural development and ensuring the availability of their publications for learning and research. Besides, without this legal instrument, it would be difficult for the State Library Board to compile the comprehensive State Bibliography.

With the rapid development of primary and secondary education in the State, the relationship between the State Library and schools will become closer and symbiotic. The State Library Board should be legally mandated to assist in the development of school libraries throughout the State, as in Bendel or Anambra State. This would involve formal recognition of the in-service training course for library assistants/ attendants provided by the State Library for various schools and other institutions, establishment of a State Library Book Depot along the lines of the Bendel State Library Board, and assisting schools to establish and maintain their libraries.

The New National Policy on Education has called for inculcation in Nigerian children and adolescents an appreciation of their national heritage or cultural values. If the State Library truly becomes a documentation centre for the traditional values of the diverse peoples of the State, the oral traditional materials, made available to the young in *transcribed* or *recorded* form, could help to achieve this objective. In this way, these young people will grow with right types of attitudes towards their country, while at the same time respecting the views, values, and feelings of others from different socio-cultural backgrounds.

#### Notes

- 1 Alan Peshkin, *Kanuri School Children: Education and Social Mobilization in Nigeria*. New York: Holt, Rhinehart and Winston, 1972).
- 2 Data collated from the Implementation Committee on National Policy on Education, Federal Ministry of Education, Lagos.
- 3 J. S. Trimingham, *A History of Islam in West Africa* (London: Oxford University Press, 1961).
- 4 Joseph Greenberg, *The Influence of Islam on a Sudanese—Kingdom*, (New York: J. J. Augustin, 1946, p. 17).
- 5 Peshkin, *Op. cit.*,
- 6 Quoted in Frank Gardner, *Public Library Legislation: A Comparative Study*, (Paris: UNESCO, 1971), p. 17.
- 7 *National Policy on Education* (Lagos: Federal Ministry of Education, 1977), p. 10.
- 8 F. A. Sharr, *The Library Needs of Northern Nigeria* (Kaduna: Ministry of Education, 1963).
- 9 Robert L. Pearce, *Library Services in the New States of Nigeria*. (Lagos: Federal Ministry of Information, 1968).
- 10 Borno State of Nigeria. *Gazette Law, No. 5 of 1982. A Law to Provide for the Establishment of the Borno State Library Board*, Part III Section 10, No. 2.

## IS MOBAR A KANURI DIALECT?

by

Umara Bulakarima

### Introduction

THE notion that Mobar<sup>1</sup> is a "Chadic" language has penetrated the literature of African languages, and many scholars have come to accept Greenberg's classification of African languages in the *Language of Africa* (1970) as the authority on the subject. Lukas (1937:ix) refers to Mobar as a dialect of Kanuri, whereas Westermann and Bryan (1952) are silent over this issue. Mobar as a Chadic language is also mentioned in Hansford (1976 : 129) where it is assigned to the Bade Group within the Western Chadic Branch, but he does not cite any data in support. As Mobar cannot be both Chadic and Saharan at the same time, there must be a mistake somewhere, which needs to be corrected. Those who have classified Mobar as Chadic must have relied on Greenberg (supra).

The purpose of the present paper is to determine whether Mobar should be recognised as an autonomous language (Chadic) as stated by Greenberg (1970:46), or be regarded as a dialect of Kanuri (Saharan), as indicated by Lukas (1937).

Whether Mobar is a dialect of Kanuri or an independent Chadic language can be deduced from:

1. historical evidence;
2. linguistic evidence

### Historical evidence

Let us consider the history of the Kanuri Language, clan position in the old Kanem empire, the origin of the sub-clans, the movement of the Kanuri people to the present day Borno etc. to ascertain the true historical place of Mobar.

#### 2.1. Origin of the Kanuri language

Kanuri is an ancient language with many dialects, which were caused by the geographical spread and political influences and changes of the Kanuri people. The development and expansion of the Kanuri language is closely related to the political history of the Kingdom of Kanem which was established as early as the Ninth century A.D.

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<sup>1</sup> *Mobar* is now pronounced as *Mowar*, which is closer to the way the people call their own variety. The former spelling goes back to colonial times, in which *Mober* and *Mobber* were also used. Lukas transcribes it *Mavar*.

During this period the major groups that occupied the region North and North-East of the Lake Chad were the Bulala, Kanembu and Zaghawa. Of these groups the Kanembu appear to have taken over the control of the state under the leadership of the Saifawa *mais*. There have been clear distinctions among the three groups (Bulala, Zaghawa and Kanembu) in the languages which they originally spoke and indeed it is difficult to assume that they either understood one another's language, or ever communicated with one another through their different languages. This state of non-communicability necessitated the emergence of a lingua-franca, a language which was used by all the groups to communicate with one another in the transaction of their business, in administration, and as a medium of instruction. For this reason, the Kanembu language came to be accepted in Kanem by various other groups as a common language. Evidence for this is to be found in that most of the earlier written records, such as the Girgam and the praise-songs which made references to the earlier *mais* of Kanem, like Mai Hume and Mai Dunoma, were written in Kanembu. There is also further evidence that the Bulala themselves used Kanembu in recording the history of their rulers. The Bulala Girgam which was recorded by Palmer (1970) was largely written in Kanembu

*Example:*

Bəla Jil ye kəji ilala

"Town Jil also nice"

Maina Jil, Kafe Salmami

"Prince of Jil, of Kafe Salmami"

Sikumami Adamami, Kanji bəla Njimibe

"of Sikuma of Adama smoke of town of Njimi,"

(Jil Town it is also nice to sojourn. The Prince of Jil, Prince of Kafe Salma. Son of Sikuma and of Adama, is the beacon of the town of Njimi).

It is clear that many Kanuri today believe that their language is a variety of the Kanembu language and take the latter in its original form as the "mother" of the former. For this reason Kanembu is used today as the language of *tafsir* in Borno, to maintain the purity of the Quran.

## 2.2. Clan Position in the Old Kanem Empire

There were twelve major clans which were further sub-divided into twelve sub-clans within the settlers in Kanem. Each of these twelve major clans produced a *mai* or king in turn. When a clan produced a *mai* or king, the immediate courtiers were chosen from its sub-clans, while the other lower officers would be distributed evenly among the remaining eleven major clans and their sub-clans.

The twelve major clans are:

- |           |             |
|-----------|-------------|
| 1. Maami  | 7. Təmagəri |
| 2. Kuwuri | 8. Kayi     |
| 3. Kangu  | 9. Ngazar   |
| 4. Təra   | 10. Karde   |
| 5. Ngəma  | 11. Kajidi  |
| 6. Bade   | 12. Kəngəna |

Each of these major clans is again subdivided into twelve sub-clans (branches). For example, Maami being a major clan is divided into the following sub-clans.

Maami Duwua	Maami Jilla
Maami Sayiwa	Maami Ummea
Maami Arjoa	Maami Dunoa
Muami Bewua	Maami Biria
Maami Arilla	Maami Dalla
Maami Katuria	Maami Tsillima

Each of these has a specific title given by the *mai* or king (now the Shehu). They are the *mai*'s/shehu's immediate courtiers. For example, if it happens that the Maami clan produces a *mai* or king, each of the twelve sub-clans will get a leader to run the day-to-day affairs of his clan. The title of Maami Duwua is Bagama, Kuturia is Talba, Arilla is Malilima, Jilla is Kawuskema, Dunoa is Kaloma, Dalla is Yerima, Tsillima is Shettima (Kanuribe), Biria is Suwundurema. Arjoa is Arjinoma and Saywa, being the *mai* or king.

During that period (9th Century A.D.) there was nothing like Wuje, Kaama, Karda, Zarara, Mowar, Fada, Lare or Ngumati. They refer people to their clans only. One can be Tumagari, Maami or Tera, etc.

### 2.3. The Origin of the sub-clans

The above mentioned twelve major clans were considered not only as clans but also as tribes.

According to Barth's Chronicle, an Arab of the Wahad tribe married into a Tubu royal family called Tumagira. Their daughter Aisha married the eponymous ancestor of the Maami tribe and to them was born Ibrahim from whom sprang the first Maami sub-clan, the Duwua. Ibrahim, according to the chronicles, married a woman of the Kayi tribe, and from him onwards, all the *mais* down to Tsilim married either into the Kayi or Tumagira families. This was how the Maami sub-clans originated.

Tumagira is explained by Imam Ahmed as "Ashel-Gara" i.e. the people of Gar and one important section of the Teda of Tibesti is still called Tumagira. The Kayi is explained also by Imam Ahmed as a "Ahel-Dirku" (Borno nobles). The Kayi, according to Mallam Kaka Mallam (1972), are the Bulala people.

According to oral tradition, the Mobar people descended from Ibrahim who was the ancestor of the Maami Duwua sub-clan.

### 2.4. The Movement of the Kanuri People to present-day Borno.

Ibn Said, who lived about 1282, is the first Arab scholar to use the term "Borno". The name supplied by him did not refer to the present day region which lies south of the River Yo (between Geidam and Dikwa; and in the South to Gujba), but to the country South-West and East of the Tibesti Mountains.

Towards the end of the 13th Century, according to Kaka Mallam (reprinted 1972) the Kanuri (Tubu and Tuareg) crossed the River Yo and began to wage war against the Sau and other pagan tribes who lived in Borno. He adds that by the time the Tuareg and the Zaghawa settled in Kanem, there had been a settlement of the Bade,

Bura, Marghi and Ngalaga tribes who are relatives of the Sau, in present day Borno. Here Kaka Mallam has clearly shown that there was no existence of the Mobar or the Maami Duwua sub-clan South of the River Yo before the 13th century A.D. Out of the five languages or tribes recorded by Kaka Mallam, only Ngalaga is non-Chadic: Ngalaga is a sub-clan under Kuwuri. The evidence to show that Mobar is Chadic does not exist either in the history of Mobar or the Kanuri language in general. The existence of the Mobar people in the North-Western part of the Lake Chad neighbouring the Sau, who were in the South of the River Yo, does not mean that Mobar is Chadic. Though their oral tradition states that they lived in the Western part of Lake Chad mixed with the Bade and Yedima people before the "big move" of the Kanuri people to the Western part of the Lake Chad, which made the 'Chadic-speaking people move away from the region and share the same location with the Sau people, this is not enough to treat Mobar as Chadic. If the Sau hypothesis is true, the whole Kanuri-speaking people/language could be considered as Chadic, because they all have ethnic affiliation to the Sau, according to their oral traditions.

Based on oral tradition, within the Mobar people there is a Bade clan (which is divided into twelve sub-clans. Some of which are Bade Modua, Bade Gawoa, Bade Kadea, Bade Razagaa, Bade Sogawua, Bade Saiya (Saraiyama), Bade Dəgama, Bade Mintuama, Bade Tuworima and so on). It is one of the twelve major clans mentioned above who are "jesting companions" to the Bade-speaking people (of Gashua), yet this does not imply relation in language at all. To this effect one can consider the—jesting companionship between a Fulani and a Kanuri. But the Bade (of Gashua) to Bade clan jest companionship is so cordial that they cannot attack one another, even on the battle field. Other examples of jest companionship are those of Koyam and Kajidi clan, Kanuri and Kona (Jukun) and so on. Such jest companionship are many among ethnic groups and if one is not careful one could count such a relationship as indicative of linguistic relationship.

Also, according to Kaka Mallam (reprinted 1972) it was towards the end of 14th century A.D. that the Kanuri crossed the River Yo and came to present-day Borno. The reason was that a conflict arose between the Kanuri and the Bulala. By the year 1386, the Bulala drove away the Kanuri from the country of Kanem and destroyed the seat of the Government at Birni Njibi, which led the Kanuri to flee to the Western part of the Lake Chad. Some went South, others went West and started waging wars against Mali and Songhay.

According to the above-mentioned sources one could conclude that though the Kanuri language is an offshoot of Kanembu and Bulala, both Zaghawa and Teda have contributed much towards its development and expansion.

Since the Kayi are Bulala, the Teda Tumagita and the Kuwuri Kanembu, and since the Bade and the Maami (duwua) are largely Mobar, there is no doubt that the twelve clans mentioned earlier were tribes originally. But presently there is no certainty that these twelve clans with their sub-clans have mixed, due to intermarriage and are possibly to be found in a single dialect/variety of Kanuri. The only one out of the twelve major clans which has retained its identity is the Ngazar clan which is now a speech form within the central dialect of Kanuri.

We have now seen the position of Mobar within Kanuri and how the Kanuri language itself sprang up. It is now left to discuss the linguistic aspects of Mobar to

determine whether it is a dialect of Kanuri (Saharan), or is really an independent language within the Chadic language family (Greenberg 1966).

### Linguistic Evidence

Before proceeding further, it is necessary to know the differences between *language* and *dialect*. These two words, have been so variously used, both by linguists and non-linguists, that there is no agreed meaning except for a general notion that languages are somehow more distinct than dialects. Chambers and Trudgil (1980) define the two terms as follows:

“a language is a collection of mutually intelligible<sup>2</sup> dialects, whereas dialects are subparts of a language”.

#### 3.1. Greenberg's Classification of Mobar as Chadic

In his classification of African languages into families, Greenberg (1970) classifies the Chadic language family into nine groups. He includes Mobar in the Bade - Ngizim Group as follows:

(1) Ngizim, Mobar, Auyokawa, Shirawa, Bade (1970: 46). If his classification and grouping are correct there must be mutual intelligibility to a certain extent, between Mobar and Ngizim, Auyokawa, Shirawa, Ngamo or Bade.

In his comparative wordlist, for this particular group, examples cited are from Bade and Ngizim only. No example from Mobar, Auyokawa and Shirawa is given.

Below are glosses taken from Chadic and Saharan languages to determine the position of Mobar. (The glosses under Bade and Ngizim are those of Greenberg).

Ngizim	Bura	Marghi	Bade	Hausa	Mobar	Yerwa	
tira	thiya	thiya	-	wata	kɔmbal	kɔmbal	“moon”
salo	tha	tha	salo	sare	salta	salta	“cut”
agwoi	thithi	thith	-	kway	nguul	ngɔwɛl	“egg”
demanu	viya	viya	demanu	daamuna	dɔlau	dɔlau	“rain”
podo	for	fodu	-	hudu	diyau	diyau	“four”

Truly, there are similarities between the glosses of Ngizim and Bade cited above and the rest of the Chadic languages, but no trace of similarities could be found with those of Mobar. Rather, similarities may be observed between Mobar and the Yerwa dialect of Kanuri.

#### 3.2. Criteria for Language Classification

##### 3.2.1. Mutual Intelligibility

We expect speakers of any given language to be able to understand each other. If two people can understand each other, then they speak the same language; if not, they speak different languages. If we compare Mobar to Bade, Ngizim and Marghi for example, we do not obtain such mutual intelligibility, because Mobar belongs to a different group (contrary to Greenberg's claim). But there is mutual intelligibility

<sup>2</sup> Note that there are cases of mutual intelligibility between languages of the same family, whereas outlying 'dialects' may not be so mutually intelligible.

between Mobar and Yerwa<sup>3</sup> and especially between Mobar, Manga and Suwurti, because they are all dialects of the same Kanuri language (see the glosses cited above and appendix 1).

### 3.2.2 Mass Comparison

The importance of mass comparison, as opposed to isolated comparison, between pairs of Languages has been emphasised by Greenberg (1970). It is the former method he uses in classifying and grouping the languages of Africa into families and sub-families. It should be noted that even when this particular method is used, the relationship between Mobar and the Chadic languages cannot be traced. It is doubtful if he ever applied this method when he grouped Mobar into the Bade-Ngizim group.

The languages in the comparative chart (see appendix 1) are Teda, Zaghawa, Berti, Kanembu, Mobar and Suwurti which are *Saharan* and Hausa, Bade, Ngizim, Kilba and Marghi which are *Chadic*. The Chart clearly shows that the percentage of similarities between Mobar and the Chadic languages is nil. The more words we add the greater the dissimilarities. But between Mobar and Saharan languages, especially

Appendix 1	One	Two	Three	hand	eye	ear	mouth
Hausa	+ daya	biu	+ uku	+ hannu	+ ido	+ kunne	baaki
Bade Ngizim	+ gade + gayi	+ sara shirin	+ kwan + kwan	+ amun + amai	+ dan + da	butan agud	+ mnyan + miya
Mobar (Kanuri)	O + lakka tilo	O + ndi indi	O + yako	O + muko	O + sam yim	O + cimo semo	O + ci
Teda	O + toro	□ cu	□ agozo	□ daha	O + samo	O + sumo	O + ci
Zaghawa	O + lakai	□ swe	we	□ taha	O + im	□ kebbe	sa
Berti	Δ sang	□ su	goti	□ yung	O + sing	□ keme	□ a
Kilba	Δ jan	Δ multhu	Δ maker	Δ ci	Δ li	Δ hime	Δ nya
Marghi	fulthu	Δ Multhu	Δ maker	Δ si	Δ li	Δ time	Δ nya
Suwurti (Kanuri)	O + tilo	O + indi	O + yako	O + mukko	O + sam	O + semo	O + kyi
Kanembu	O + Lakka tullo	O + ndi indi	O + yaku	O + nduko	O + sam	O + sumo	O + kyi

#### Key

+ and Δ represent Chadic

O

+ and □ represent Saharan

<sup>3</sup> Central dialect of Kanuri comprising the following accents: Wuje kaana, Ngumati, Fada Bodai, Koyam, Lare, Ngazara and Zarara.

Kanembu and Suwurti,<sup>4</sup> the percentage of similarities is high and there is mutual intelligibility.

### 3.2.3. *Bundles of Isoglosses*

The term "Isogloss" is a boundary between two or more regions which differ with respect to some linguistic features (i.e. a lexical item; the pronunciation of particular words etc). An isogloss, literally means "equal language" (Chambers and Trudgil 1980).

The seven different kinds of isoglosses which we shall consider here are:

Lexical isoglosses	Morphological isoglosses
Pronunciation isoglosses	Syntactic isoglosses
Phonetic/Phonemic isoglosses	Semantic isoglosses.

#### 3.2.3.1. *Lexical Isoglosses*

A lexical isogloss involves suppletive words used systematically in different regions to mean the same thing.

For example, in the Manga dialect of Kanuri, the word meaning "small" is /təngoli/; in the Suwurti dialect it is /wollɪ/; and in the Yerwa dialect it is /gana/. Mobar use both forms /wollɪ/ and /gana/. They are all different words that mean the same thing.

The word for "finger nail" in Manga and Yerwa is /fərgami/, but in Mobar and Suwurti it is /kudi/.

#### 3.2.3.2. *Pronunciation Isoglosses*

This is a situation whereby one or several words are consistently pronounced differently, but in which the pronunciation cannot be generalized to become a phonetic rule.

For example, in Kaama, Wuje, Lare and Ngazar accents of the Yerwa dialect, the word for "room" is /nəm/. In the Mobar dialect and some other accents of Yerwa, it is /njim/. In Manga, it is /gim/. The underlying form is /njim/.

The word for a "hand" in the Yerwa dialect is *musko* (and *mukko* in some of its accents); in Lare (an accent of Yerwa) it is *nguko*; and in Ngazar (an accent of Yerwa) it is *juko*. The underlying form being /musko/. In all these examples, there is no straight-forward phonological change, but we see only a pronunciation difference which has not yet become a rule.

#### 3.2.3.3 *Phonetic Isoglosses*

Phonetic isoglosses occur when there is a generalised and systematic difference in pronouncing words or contrast in the phonetic output of two or more regions.

Typical of this kind of isogloss is the word /kaske/ "mine" in Yerwa. In Suwurti it is *kak:e*. In Mobar it is *kake* and in the Manga of Kanuri it is *kaye*, the underlying form being /kaske/. /kaske/ > (kaske) in Yerwa /kaske/ > (*kak:e*) in Suwurti. In Suwurti, the voiceless alveolar fricative /s/ in /kaske/ assimilated to the preceding voiceless velar plosive /k/ in (*kak:e*). This is total assimilation. /s/ > (k) - /k/. /kaske/ > *kake* in Mobar dialect. In Mobar there is segmental consonant deletion.

/s/ > [ɸ] - k

<sup>4</sup> Suwurti is a dialect of Kanuri.

/kaske/ - *kake* in Manga dialect. In Manga there are two rules:

- (1) Segment deletion rule:

/kaske/ > *kake*

/s/ > [ϕ] - k (as in Mobar)

- (2) Palatalization rule: . . . . .

*kake* > *kaye*

/k/ > [y] / - e

Another typical example of this kind is the word /kʌska/ "tree" in the Yerwa dialect of Kanuri. In Suwurti it is (kʌk:a) or /cək:a/. In Mobar it is (kʌka) or (cika). The underlying form being /kʌska/.

/kʌska/ > (kʌska) in Yerwa.

/keska/ > (kek:a) or (cek:a) in Suwurti, is an assimilation of the voiceless alveolar fricative /s/ which becomes voiceless velar plosive (k) before another voiceless velar plosive.

/s/ > [k] / - k

/keska/ - (keka) or (cika) in Mobar.

Here two processes are involved.

- (1) The voiceless alveolar fricative /s/ in /kʌska/ (the underlying form) is deleted in (kʌka) of the Mobar dialect.

/s/ > [ϕ] / - k.

- (2) The initial voiceless - velar plosive /k/-is palatalized to affricate (c) which is sometimes automatically followed by the high vowel i.

(kʌka) - (cika).

The fricatives are voiced after liquid consonants, /l/ and /r/ in the other dialects except Mobar and Suwurti. This is apparent in the third person singular of the class two verb form.

sin  $\left\{ \begin{array}{l} \text{jɪn/L- /faljɪn/, /guljɪn/} \\ \text{"she/he charges", "she/he says".} \\ \text{jɪn/r- /farjɪn/, /tarjɪn/} \\ \text{"it flies", "it spreads".} \end{array} \right.$

In the Mobar and Suwurti dialects, however, the voicing occurs only after the liquid consonants /l/ but, not after /r/ systematically.

sin  $\left\{ \begin{array}{l} \text{jɪn/L- /faljɪn/, /guljɪn/} \\ \text{"She/he changes", She /he says.} \\ \text{cin/r- /farcin/, /tarcin/} \\ \text{"it flies", it spreads..} \end{array} \right.$

### 3.2.3.4. Morphological Isoglosses

A morphological isogloss shows difference in paradigmatic, inflectional and derivational morphemes between two or more regions.

Such paradigmatic, inflectional and derivational differences can be largely found in Manga, Suwurti and to some extent in Mowar dialects.

The phrase for "I am talking to you" in Yerwa is (*mār.ānzēgekiñ*). In Mobar it is (*mananjiikin*) in the first person singular and (*mārāsəqmin*) in the second person singular, -k (g) - being the applied derivational morpheme which is deleted between identical vowels as in the second form. In Manga and Suwurti it is (*mananjiiki*). Here -nj (nz) - being the object derivational morpheme and -i - is an epenthetic vowel which is influenced by aspect -i. The original form of the applied morpheme K (g) had been weakened and as a result deleted. In the Kanembu language it is /*mananjiriki*/, here -nj (-nz) - is the object morpheme and -r (k) - the applied morpheme. It is possible that the applied morpheme K (g) in Kanuri and -r-in Kanembu) - was lost in Mobar, Suwurti and Manga, being substituted by vowel lengthening.

### 3.2.3.5. Syntactic Isoglosses

A syntactic isogloss shows a difference in sentence formation between two or more regions. Such examples of syntactic isogloss have thus far only been attested between Manga and other dialects of Kanuri. But at present there are no such syntactic difference between Mobar, Suwurti and Yerwa, (possibly if more research is done instances of syntactic isoglosses can be established between Suwurti and the other dialects.)

A purely syntactic difference is that of the agent postposition in Manga.

The sentence "hunger seized him" is /*tia kəna cita*/ in Manga, but in the Yerwa, Mobar and Suwurti dialects it is /*shiga kənyaye cita*/ or /*kənyaye shiga cita*/.

In Manga, *kəna*/, which is the agent is not marked, while it is marked in Yerwa and Mobar dialects. The victim /*shi*/ or (*ti*) in Manga is marked by the direct object marker (which is in postposition) -*a* (*ga*). Manga does not use the postposed agent marker "-*ye*" in this environment. This clearly represents a syntactic isogloss distinguishing Manga from the other dialects of Kanuri.

### 3.2.3.5. Semantic Isoglosses

A semantic isogloss involves a word which exists in two or more varieties, but which is used for different meanings in each variety.

Typical of this example is the word /*bul*/ which means "white" in Yerwa, Mobar and Manga, whereas it means "palm" in Suwurti, /*kənəm*/ means "sleep" in Mobar, Yerwa and Manga, while it means "night" in Suwurti (in Kanembu it also means "night") /*dadata*/ means "walking" or "going for walk" in Manga, while it means "parking" or "repeated stopping" in the Mobar and Yerwa dialects of Kanuri.

## Conclusion

We have pointed that the Kanuri language is an offshoot of Kanembu, and that the the Bulala, Zaghawa and Tubu languages (Teda and Daza) have contributed much towards its development and expansion. The coalescence of the older twelve clans (which now form the Kanuri nation) has also contributed to the development and expansion of the Kanuri language.

As mentioned earlier, a language by definition is made up of a group of mutually intelligible dialects whereas dialects are varieties which are grammatically, semantically, morphologically, phonologically and perhaps phonetically different one from

the other. We have established the link between Mobar and other dialects of Kanuri showing their similarities. So one could conclude here that Mobar is a dialect of Kanuri. It is therefore, not Chadic as Greenberg (1970 : 46) indicates. There is no linguistic evidence supporting the claim that Mobar is Chadic.

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## PULAAKU: ETHNIC IDENTITY AMONG THE ADAMAWA FULBE

by

Catherine VerEecke

The following is an exploration into the nature of Fulbe ethnic identity. The focus is upon "key concepts" in Fulfulde which may be considered and interpreted as aspects of Fulbe identity and which approximate Fulbe own perceptions of their identity. In contrast to many anthropological perspectives on ethnicity which emphasize such "critical" markers as kinship and descent as having strategic importance for ethnic groups, Fulbe themselves stress their general character and mode of behaviour, as well as their physical appearance as factors distinguishing them from other ethnic groups. Fulbe identity and ethnicity is embodied in the concept and symbol—*pulaaku*—which is the focus of this paper. We thus attempt a thorough description of *pulaaku* and in so doing provide insights into its meaning and practical usage in Fulbe society. A comprehensive understanding and interpretation of the diverse aspects of ethnic identity, we argue, is a necessary prelude to any study considering ethnic process.

### *The Problem*

Anyone familiar with anthropological work since the early 60's would be aware of a sharp rise in interest in ethnicity, ethnic groups, and ethnic interaction. Hence a good deal of ink has been spent upon such questions as "What exactly is ethnic?" "Why do people cling to their ethnic identities and groups?" and lastly, "Why the apparent clashes between ethnic groups?" After two decades of argument, all these questions have yet to be satisfactorily answered, although some patterns in viewpoint have emerged. Ethnicity itself has been reduced to a few omni-present attributes having to do with social organization, namely common ancestry and kinship (Barth 1969; Parkin 1974; Schildkrout 1978), though some have also included language among these attributes (e.g. Keyes 1981). Such definitional considerations have sought to isolate a common denominator of ethnicity, assuming that such is possible, rather than accounting for the variety of factors that *together* constitute an ethnic identity.

Following this reductionistic trend in thinking, the remaining questions have been answered as follows: ethnic group members cling to their identities *precisely* because of interaction (Barth 1969) or competition (Cohen 1969) with other ethnic groups. Ethnic groups and the form of their identity exist because they serve specific ends: namely that groups can compete more effectively than individuals, all of whom are competitive in nature. Ethnicity serves the assumed goals of the ethnic group—getting ahead of other ethnic groups. Hence a majority of studies are concerned with how this basic tendency is played out in ethnic situations: ethnic incorporation, ethnic encapsulation; ethnic competition; ethnic domination; ethnic change; and so on. Such an

overt concern with the purposiveness of ethnic groups generally overshadows the nature and meaning of the ethnic identities manifest in the groups under consideration. We do not deny the importance or reality of the problem of ethnic pragmatics, but we do assert that what is gravely lacking in any of these studies is a consideration of the meaning of ethnic identities in general and with reference to ethnic groups' members own perceptions of their identity, which apparently would place less emphasis upon the purposes of the identification than on the cultural meaning of the identity itself. As anthropologists well know, discrepancies between subjects' and observers' perspectives can be marked. Cultural definitions of ethnicity must be considered against anthropological or academic definitions of that phenomenon. Such a perspective will reveal that ethnic identity has a good deal of meaning in its own right, and has a certain degree of internal logic or consistency, particularly when considering the subjects' own views of their ethnicity (Parkin 1978). Hence, the focus of this study is upon ways of examining the "meaning" of ethnic identity, quite apart from its functions and even reductionistic definitions. We thus seek to find the range of meanings of ethnic identity—to the Fulbe—within the context of their culture and society.

### Background

Ethnographic and ethnohistorical research<sup>1</sup> has focused on the Fulbe of Adamawa, particularly in the Yola area, although the discussion here may be applicable to Fulbe outside Adamawa. This research has been restricted to permanently settled Fulbe Muslims, those with a mixed cattle and agricultural economy (*Fulbe na'i*) and those practicing agriculture or engaging in urban labour, such as the civil service or business (*Fulbe wuro*). Research has yet to be conducted among Fulbe nomadic pastoralists (*bororo'en*) although ample documentation on their social structure and livelihood has been provided by Stenning (1959) and Dupire (1962). In some, but not all ways the *bororo* may be said to represent Fulbe culture in its traditional, unadulterated form. But at the same time, many such attributes may have been distinct to the *bororo* for some time. To be sure, *bororo'en* and the settled Fulbe of Adamawa have distinct histories, from at least as far back as the 18th century (Mohammadu 1970). Hence, such references to the *bororo'en* as representing "true" Fulbe culture will be used with caution.

Contemporary Adamawa Fulbe culture cannot be fully understood without respect to Fulbe historical experience. Historical events in "Nigeria" since the early 19th century have influenced and even today are factors in some aspects of Fulbe identity and culture. Fulbe "culture" has also been a major element in shaping Adamawa history as well as Fulbe own views of their history (cf. VerEecke 1985). We briefly summarize such phenomena.

Prior to the 19th century, Fulbe populations were scattered throughout the area that is now Northern Nigeria. At this time, their way of life may have paralleled that of modern-day *bororo*: their primary means of subsistence was cattle rearing which rendered them nomadic or seasonally-transhumant which was consistent with a relatively fluid social organization, based on patrilineal units which themselves, at the time, were little more than genealogical and wife-giving units. Islam appears to have been

accepted only among a minority of the Fulbe (Stenning 1966). Pre-19th century Fulbe society was highly egalitarian in nature—governed by its elders and in only some instances by its chiefs (*ardo'en*). It appears that these positions proliferated when the Fulbe began settling down and commenced farming in the 19th century, particularly in Adamawa.

The *precise* reason behind Fulbe movement from more northern regions, particularly Boruo, has yet to be discovered by historians. Apparently, prior to the 19th century, some Fulbe “drifted” (cf. Stenning 1959) into the Benue region. As has often been the case with Fulbe pastoralists and non-Fulbe agriculturalists, increasing antagonisms with Kanuri in Borno and possibly drought conditions led many additional Fulbe to gather their kin and head southward. But, according to the Fulbe this was only the beginning; a majority of Fulbe migrants to the Borno area came in support of an Islamic holy war (*jihad*) initiated by their clansmen or tribemen and perhaps (at least from their point of view) to aid in the cause of the spread of Islam. There is strong evidence to support that many Fulbe clans arrived in the Benue region in the early 19th century and began founding settlements shortly thereafter.<sup>2</sup>

An adequate discussion and evaluation of precise events and “causative” agents culminating in the jihad in Adamawa would be lengthy and is beyond the scope of this paper (cf. Abubakar 1978; Njeuma 1978; R. Cohen 1978; VerEecke 1985). Suffice it to say that Fulbe motives were dual in nature: they sought to defend themselves from and to eliminate practices of the non-Fulbe (*Habe*) agriculturalists which they perceived as oppressive in nature: and, of greater importance to the Fulbe, they sought to spread Islam among the “Habe”.

As mentioned earlier, prior to the jihad, the Fulbe were relatively egalitarian in nature. Due to their success in the jihad and the concurrent Islamization of many Fulbe, their society and culture were dramatically altered. Structurally, the model of the Islamic state was implanted among the Fulbe state of Adamawa, based in Yola, so that a diversity of offices proliferated from the state down to the district and village levels of the political hierarchy. Besides the authority conferred on these office holders, a sizeable portion of the Fulbe held political-jural rights over slaves who were captured during the war and who provided the bulk of necessary labour for Fulbe agriculture. With the exception of some Muslim Hausa and Kanuri migrants to the Yola area (who were ultimately assimilated into Fulbe society), there was a hiatus between Fulbe and their Habe subjects (including the slaves), which began to diminish only after some years into the Colonial Period. With the introduction of a cash economy to Nigeria in the early 20th century distinctions were heightened between ruling families, and particularly the wealthy Fulbe (*mar'be*) and commoner Fulbe (*talaka'en*). Such distinctions had their roots in the 19th century success of such families in the war and in Islamic affairs.

The sedentarization of the Fulbe also had some impact on the nature of political process at the local level. Although village and district heads and Islamic leaders began to figure in such affairs, lineage elders were paramount in dispute settlement and counselling among their people. Lineages—i.e. the descendants of village founders—became increasingly important as political and landowning units, and the lineage members worked jointly on occasions. Such was the case up to recently.

In spite of the presence of Colonial administration since early this century, the Fulbe have, up to recently, enjoyed considerable power and autonomy, particularly in Yola. However, much burden has fallen upon the *talaka'en* who have been forced to accommodate to spiralling tax rates and more recently the high cost of living. Today, many Fulbe continue to hold positions of importance in Gongola State.

As we know, changes brought about by modernization have been most acute in urban areas in Nigeria, such as Yola, while many rural villages remain highly traditional in nature, particularly as regards the Fulbe. According to Fulbe from urbanizing areas, ethnic interaction between Fulbe and non-Fulbe who previously did not intermingle is now on the upswing. Contrary to this indigenous perspective, evidence suggests that throughout this century numerous ex-slaves and non-Fulbe Muslims (i.e. Hausa and Kanuri) were in fact readily incorporated into the Fulbe identity primarily in the interest of the propagation of Islam. Today, the Fulbe-Habe cultural boundary is less rigid and the components of traditional Fulbe identity are becoming diluted, particularly among youths. Some non-Fulbe Muslims are now "becoming Fulbe" simply to enhance their status in Yola and in other areas of Northeastern Nigeria. However, in Yola town and in most Fulbe towns and villages, many Fulbe still adhere to their "traditional" identity, and it is this which is the focus of our discussion. (Ethnic change among the Fulbe will be discussed in a subsequent paper).

In sum, we may characterize the history of Adamawa since the 19th century as one of ever-increasing importance of both Islam and statehood, among nearly all Fulbe. Certainly, Islam has intermingled with traditional values and has undoubtedly shaped the form and meaning of 19th and 20th century Fulbe history. Equally as important is that it is at this time that Fulbe values on leadership (*ardungal*) and authority (*'bau'de*), particularly that conferred by Islam, replaced egalitarianism in a majority of Fulbe towns and villages in Adamawa. Furthermore, the rigid ethnic boundary between Fulbe and "Habe",<sup>3</sup> which appears to be the case in many areas of West Africa, irrespective of jihads, has made the Fulbe very conscious of their own identity in all of its aspects—in their day-to-day behaviour and in interaction with others. As such, the Fulbe are quite amenable to a comprehensive and interpretive study of ethnicity.

### Fulbe Ethnic Identity—Basic Components

Although the subject of this paper is *pulaaku*—as the primary aspect of Fulbe ethnic identity (and this will become clearer in the course of our discussion)—we must also consider other factors or components which do play some role in this phenomenon. As we noted earlier, contrary to some views, ethnicity cannot be reduced to a single component (e.g. descent, kinship); ethnic identity is comprised of several components—a unique blend drawn from a range of possibilities—a product of the historical experience of the ethnic group under consideration. These may include "kinship", descent, birthplace/territory of origin, race, region, religion, language, patterns of custom, and undoubtedly others (Geertz 1973; Nagata 1981). Of these, we will consider descent, place of origin, kinship, language, patterns of custom, and race, as critical markers between Fulbe and non-Fulbe, and their relative degree of importance.

### 1. *Descent/Territory of Origin*

Fulbe do not make clear-cut distinctions between these two conceptions which are embodied respectively in the concepts "*lenyol*" and "*asngol*", which themselves refer to a variety of phenomena. These concepts cannot be considered apart from each other. *Asngol* (pl. *asli*.) has a dual meaning, generally having to do with both "origin" and "place of origin". It may mean either a territory of origin or a "people" originating from the same locale (e.g. a tribe), but without any reference to descent. Hence, the Fulbe as a "tribe" or ethnic group are referred to as "*asngol*", since reputedly they share the same origin. But even within this large group (*asngol*) there are smaller *asli*—places of origin (e.g. Borno, Malle) which also correspond to categories of people (tribes or sub-tribes) from those areas, such as Fulbe Borno, Fulbe Sokoto, etc.

Broadly speaking, *lenyol* (pl. *le'i*) connotes "ancestry", "descent", or "heritage", depending on the point of reference; its key defining criterion is the notion of "giving birth through generations". More specifically, *lenyol* refers to "descent group", the members of which share a heritage and which recognize a specific place of origin (*asngol*), migrations from that place, and often a founder of the group. Genealogically, there are different kinds of *le'i*, ranging from the most inclusive to the most restrictive. Fulbe all have been said to belong to one *lenyol*, while other types of *le'i* are, in descending order of inclusiveness, patrilines, lineages, or even lineage segments, whose members are still extant.

While many informants had difficulty in distinguishing between *lenyol* and *asngol*, or even comprehending what kind (or level) of *lenyol* we were considering (and certainly this is not unrelated to the ambiguities in the concepts' meanings), Adamawa Fulbe do share notions of origin, heritage, and ancestry. They all are aware of the origin of the Fulbe from Malle, migrations to Borno or Hausaland, and from there many can begin to trace their precise ancestry. In particular, a majority can "charter" their contemporary positions in Fulbe towns by citing relations to the town's founders or originators (*asli'en*). Those present day Fulbe who have had, historically, a strong foothold in Fulbe towns are likewise referred to as *asli'en*, and they maintain a dominant position *vis-a-vis* "newcomers" to Fulbe-founded towns.

*Lenyol* and *asngol* are thus important identifying criteria at several levels of Fulbe society: Fulbe as an ethnic group in opposition to other ethnic groups and even among Fulbe where clans and lineages have a strong sense of identity and often cooperate/compete in a political capacity. To be sure, Fulbe in rural areas are quite conscious of the *le'i* or *asli* of their own town's inhabitants. This is less the case in more urban areas like Yola where it is more difficult to refute an individual's claimed identity and some Fulbe are simply unaware of their ancestry.

### 2. "Kinship"

The discussion of descent/origin leads logically to that of blood ties—both real and metaphorical. Implicit in the concept *lenyol* is the notion of "blood relation"—through the father's descent line, although the precise nature of ties may not be known. All members of a *lenyol*, particularly from the level of clan down to that of localized *le'i*, according to many Fulbe, are blood relatives. Definitive ties and obligations of kinship on both mother's and father's sides are embodied in the concept—

*bandira'be*—which refers to descendants of common maternal or paternal grandparents. It is here that precise behaviours and obligations (*bandigu*) are specified most clearly. The degree to which the metaphor of kinship (*dendirabe*) and its obligations are extended beyond one's real kinship network—i.e. immediate kin—appears to vary from individual to individual. Our research thus far indicates that only some Fulbe felt that they would extend their obligations only to their actual *bandira'be*, while among the remainder, equal numbers of Fulbe said they did consider either *kenyal* members or all Fulbe as true *bandira'be*.

Hence, in many but not all cases the symbolic and obligatory aspects of "kinship" do distinguish Fulbe from non-Fulbe. Clearly, such a metaphor is also interwoven with Fulbe notions of descent and origins and cannot be considered independently. We also argue later in this discussion that Fulbe kinship may be considered equally as an aspect of *pulaaku*—the Fulbe moral code of behaviour.

### 3. Race

In logical sequence, we can now turn to the idea of "race" which is often discarded from many discussions of ethnicity. This may be due in part to anthropologists' reservations in confronting the "reality" of race, or also that many ethnic groups do not lay emphasis upon their physical characteristics. Clearly, this is not the case among the Fulbe as they believe they are distinguished from other ethnic groups by specific physical features which are acquired through blood or descent. These include: long, straight hair; light complexion; tall and thin stature; large ears; flat feet; a pointed nose; thin lips and so on. These and several other traits are emphasized by the Fulbe, regardless of whether or not they actually possess them. Furthermore, Fulbe lay emphasis on physical beauty (*wodugo*) among both men and women. Such value upon discrete physical characteristics and beauty and hence "racial purity" has contributed, among other factors, to the Fulbe emphasis on group endogamy (*teegal bandiragu*) in which marriage to the closest possible relative is most desirable.

### 4. Language

As noted by Stenning (1959) on the Fulbe and in other works on ethnicity (e.g. Keyes 1981), "language" alone usually does not constitute an ethnic marker. Rather it is the mastery of the language and speech patterns which may distinguish a member of one ethnic group from another. Indeed, the mere speaking of the Fulfulde language alone does not mark-off a Pullo from a non-Pullo; clearly there are many non-Fulbe Fulfulde speakers throughout Adamawa and in many other areas of West Africa. Before the recent infiltration of Hausa into Adamawa, Fulfulde was widely spoken as that region's lingua franca. In considering the Fulbe language as an ethnic marker we therefore must refer more specifically to Fulbe "speech" (*wol'de*): patterns of usage, intonation, and accent which the Fulbe believe is manifest only among true Fulbe. Many Fulbe state that it is only in some instances that a non-Pullo may learn the intricacies of Fulfulde that may make his speech indistinguishable from that of a true Pullo. Nowadays, however, both language and speech are becoming increasingly tenuous as ethnic markers among the Fulbe. In many Fulbe-dominated towns, non-Fulbe children are being brought up with Fulfulde as their first language so that

their speech differs little from that of the Fulbe. Hence, ancestry/origins, kinship, and race are of greater importance among the Fulbe as ethnic diacritica.

### 5. *Patterns of Custom*

Geertz (1973) rightly refrains from including "culture" as one defining criterion of ethnic groups as culture refers to the broad collectivity of meaning underlying all aspects of behaviour in a society. Clearly, not all behaviours or patterns for behaviour within an ethnic group are emblematic of that group's identity. However, certain culturally-specific behaviours and the patterns or meanings underlying them may constitute ethnic diacritica. The Fulbe are no exception to this rule. They are most clearly distinguished from other ethnic groups by definitive patterns of and for behaviour and specific personal qualities or virtues (cf. Stenning 1959:55), all of which are subsumed under the symbol/concept—*pulaaku*. *Pulaaku*, by definition is "Fulbeness"—the ways in which a Fullo must behave and present himself in order to be considered as a Fullo and as a reputable member of Fulbe society. *Pulaaku* entails the guidelines or rules for appropriate as well as prohibited behaviour (e.g. regarding social interaction), rules for presentation of self (e.g. etiquette, demeanor), as well as the rewards—personal qualities or virtues deriving from following the rules of *pulaaku* (*laawol pulaaku*).

*Pulaaku*, we argue, is the key symbol among the Fulbe; it captures many aspects of Fulbe society and impels the Fulbe to behave in an appropriate manner. For instance, if a Fullo behaves in a manner viewed as unbecoming to a Fullo, his peers will often instantaneously remind him of his *pulaaku*. *Pulaaku* sets-off the Fulbe and gives particular meaning to Fulbe behaviour, since it is generally a Fulbe-exclusive attribute: only the Fulbe can have *pulaaku*; it is acquired by birth.

After lengthy discussions with Fulbe from the Yola area, from a variety of sectors of the society, we have concluded that *pulaaku* is the most important defining criterion among the Fulbe. The other previously-discussed elements are of less significance and could, if time and space would allow, ultimately be considered as aspects of *pulaaku*. A Fullo is distinguished by his *pulaaku*—by simply acting like a Fullo.

Given the cultural as well as linguistic significance of *pulaaku*—e.g. the Fulbe have elaborated precisely upon its meaning and components—we devote the next section of this discussion to *pulaaku*.

### **Pulaaku—Being a Fullo**

There is a diversity of meanings implicit in the concept *pulaaku* itself. We thus attempt a description and interpretation of *pulaaku*, but which is by no means exhaustive.

To the Fulbe, *pulaaku* is an entity unto itself, it is something which can be possessed or owned. But it is not something to be observed directly, but rather it is part of a Fullo—inside him, inside his heart. ("Pulaaku haa nder 'bernde woni"—*Pulaaku* is in the heart). It is not something that can be obtained or acquired (e.g. through specific actions or learning), but rather a Fullo is born with it; it is inherited from one's parents, particularly the father as well as from the *lenyol* (ancestry, clan) and the tribe (*asli*) in general. As such, only Fulbe can have *pulaaku*. Fulbe recognize that *pulaaku* makes them free from or independent (*ndimu*) of other tribes—it is a Fulbe-exclusive marker. Traditionally speaking, *pulaaku* cannot be acquired, it can only be lost.

*Pulaaku* is an in-born attribute, but its degree varies from person to person and is contingent upon one's behaving appropriately—like a Pullo. One's *pulaaku* is not static, but rather may be enhanced or diminished depending upon one's actions. *Pulaaku* thus also specifies the actual rules or guidelines for appropriate behaviour and presentation of self (e.g. a moral code), as well as a series of virtues and personal attributes which may be viewed as rewards for behaving like a Pullo.

The behavioural aspects of *pulaaku* are codified into a diversity of "components" of which many Fulbe have an awareness. They refer to them as "Kujeji hautata wada pulaaku" or "Ko hauti wadi pulaaku", basically meaning "the things which pertain to or bring together *pulaaku*". Most Fulbe can easily list at least 5 of these components, though our research thus far has ascertained at least 15 (and probably more) which can be included. Obviously, we have encountered difficulties in isolating these concepts, due to both overlap and ambiguity in meaning, as well as in determining which ones are culturally-significant among the Fulbe. We will discuss 10 such concepts and in so doing we will mention many other concepts which were less frequently discussed as components. Regarding Fulbe behaviour we include *semteende* (shyness, reserve); *munyaal* (patience, endurance); *ngoru* (bravery); *marugo na'i* (owning cattle); *en'dam* (kindness) and *Juldanku* (being a Muslim). As desirable or virtuous personal qualities we include: *ne'd'aku* (dignity), *ardungal* (leadership), *daraja* (honour or prestige obtained through position); *ndottaku* (honour accumulated with age). We will now proceed to examine the contextual usage of these concepts.

### 1. *Semteende*

By far, *semteende* is the most significant component of *pulaaku* and thus of being a Pullo. A majority of informants defined *pulaaku* as *semteende* and all emphasized its priority over all aspects of *pulaaku*. To demonstrate that one is a Pullo, one must show his *semteende*. Like *pulaaku*, *semteende* has several meanings—be it actual rules or as a personal characteristic. Thus a Pullo can follow *semteende* or he can possess it. *Semteende* as the broadest of an array of related concepts (to be discussed below) has a dual nature. It entails first, rules for social interaction, particularly with relatives, and second, rules for self-presentation in the general public. All such rules require Fulbe to be shy and reserved in definitive situations. Such prescriptions are numerous so that we can only list those most frequently cited among the Fulbe.

Interaction with kin (*bandira'be*) obviously is frequent among Fulbe and hence, certain categories of "kin" must demonstrate *semteende* towards each other. Generally, they must be shy, bow their heads and not look at each other directly; they may even go so far avoiding each other. *Semteende* thus occurs between parents and children, particularly the first-born, and from a junior sibling towards a senior sibling. In addition, *semteende* is pronounced between affines—particularly husband and wife and a wife and her in-laws (*esira'be*). *Semteende* towards *bandira'be* is thus reflected in Fulbe kinship terminology—in both terms of address and reference. For instance, Fulbe terminologically make distinctions between senior and junior siblings to whom they must show *semteende* or respect (*doutare*) accordingly. In some instances, such as wife towards her husband, children towards their mother or mother towards her first-born, *semteende* is so strong that names simply cannot be spoken without extreme embarrassment.

Of equal importance in *semteende* is its prescriptions for presentation of self in public—again emphasizing shyness and reserve. In fact, in this domain of interaction, *semteende* is comprised of negative prescriptions or sanctions. Essentially, *semteende* militates against any behaviour in the public eye. If a Pullo interacts with anyone in public (e.g. elders, non-Fulbe), he must do so with *semteende*. More specifically a Pullo cannot be seen eating in the public, particularly in the market. They often state that “It is better for a Pullo to die of starvation than to eat in public or even outside his household.” Every precaution must be taken to ensure that a Pullo will not be forced to eat outside his *own* household. Likewise, a Pullo should not be loud or boisterous in public, as this violates *semteende*. Hence, part of *semteende* entails quietness and self-composure—*moftare*. Such demeanor is common among both men and women and is perhaps more pronounced among women who must demonstrate extreme modesty and shyness and are hardly ever seen in public.

Violations of *semteende* which are thus also violations of *pulaaku*, result in shame (*chemtungol*), which essentially is an abomination among the Fulbe. Several informants gave the following proverb which captures the pervasiveness of *semteende*: “Pullo nastan luumo wade, amma nastata luumo semteende” (It is better for a Pullo to die than to be shamed in public). Essentially, if one loses or violates *semteende*, he loses his *pulaaku* and essentially his Fulbeness.

The cultural significance of *semteende* is reflected in its conceptual elaboration. Hence we have the following derivations of *semteende* (shyness): *semtowo*, pl. *semto'be* (a shy person); *semtugo* (to be shy); *chemtungol* (something which is shameful); *chemtugo* (to be shameful, shamed); and *semtudo* (a person who does something shameful).

## 2. *Munyal*

This personal attribute (as well as behaviour), is nearly as important as *semteende* as a component of *pulaaku*. However, its meaning is simple and straightforward—patience and endurance. A Pullo must be patient under all circumstances, no matter how much pain he suffers on account of it. Further, he must not show any emotions in such trying situations. For instance, if a Pullo is being harassed by someone, he must exercise *munyal* at all costs. If somebody owes him money he must also have *munyal* and not request repayment. The Fulbe believe that *their* kind of *munyal* distinguishes them from most other ethnic groups, even if they are Muslims, whose patience is not as strong as that of the Fulbe.

## 3. *Ngoru* (bravery)

In close association with *munyal* (endurance) is *ngoru* (or *ngorgu*) which means bravery. In the 19th century the term *chusal* was more frequently employed to refer both to bravery and military prowess—i.e. in the Fulbe jihad. In the 20th century *ngoru* has not diminished in significance. A Pullo must defend his cows against any “prey” such as wild beasts or thieves. Even in Yola a Pullo is expected to manifest *ngoru*. For instance, a Pullo must defend his household against thieves or his companions against robbers while travelling. Having *ngoru* is thus an aspect of a Pullo's responsibilities as head of a household. *Ngoru* thus contributes to a Pullo's honour (*ndottaku*) (which will be discussed below); “the head of a house must defend the house.”

4. *Marugo na'l* (owning cows)

Historically speaking there is a strong correlation between *ngoru* and *marugal* and the ownership of cows (*na'l*). A Fulbe must exhibit bravery and endurance when confronted with the hardships of herding. Furthermore, in order to be considered a true Fulbe (*Fulbe ndoso*) and to have *pu'okku* one must own cattle. The Fulbe believe they were first tribe to own cows: cows originated with the Fulbe. Later, some other tribes got cows and they are now often misidentified as Fulbe. In spite of the decline in numbers of herdsmen among the Fulbe over the course of this century, Fulbe still consider the ownership and proper management of cattle as an integral aspect of *pu'okku*.

5. *En'dam* (Kindness, preserving the group)

Literally, *en'dam* means kindness or love.<sup>5</sup> Thus, as part of their *pu'okku*, Fulbe are to manifest kindness towards any other people. However, contextual usage reveals that *en'dam* has more specific meanings.

*En'dam* is most frequently discussed in connection with one's *kie*—*bandira be*—on both mother's and father's side. In particular, a Fulbe turns to his mother's side of the family in times of trouble because they show him *en'dam*, more so than the father's side. Secondly, *en'dam* is often cited as a rationale for *teegal bandira be*—endogamy—marriage within one's *lenyo'l*. Fulbe say "we marry our relatives to keep kindness in the group". Relatives generally are kind to each other so that marrying them perpetuates kindness and keeps out conceivably unkind strangers. Furthermore, it guarantees the perpetuation of the *lenyo'l* as well as Fulbe physical characteristics. *En'dam* are expanded through endogamy.

From all indications, *en'dam* is applied only towards Fulbe, particularly relatives. A variation of *en'dam*, "*en'dam dingo'l*", specifies more precisely the nature of this general phenomenon, meaning—"Kindness within the group". A Fulbe must go to the extent of going on behalf of his relatives as a means of preserving the group's integrity.

*En'dam*, we thus argue, may be viewed as a symbol—representing the unity of Fulbe as "*bandira be*" as well as their goal of preserving their "*pu'okku*" and the integrity of the group.

6. *Ar'dungal* (leadership) and *Lamu* (Office)

As discussed in the previous section on the history of the Adamawa Fulbe, leadership and leading office have, since the 19th century, become an increasingly significant attribute of this society. Historically, the Adamawa Fulbe (exclusive of the *Reere*) have been distinguished from non-Fulbe by the simple fact that they had *lamu*. They ruled over, dominated and enslaved the black so that the *om'dam* possess this attribute and perpetuated among many members of the society to the extent that even those without legitimate rights to office have some degree of *ar'dungal* within them. They value leadership and may seek to dominate others, both Fulbe and non-Fulbe. The informant described this as follows: "If ever there be two Fulbe in a group, they will all compete with each other for '*lamu*', to be leader of the group."

Many Fulbe have also included *maunitare* as an aspect of *lamu* and perhaps *pulaaku*. This means feelings of importance and *superiority* which result in certain behaviour towards Fulbe and non-Fulbe alike. A person with *maunitare* will not greet others or speak to them and will be generally aloof. In so doing, such a person commands respect and acknowledgement of his position. In Fulbe-Habe interaction (and even among Fulbe) it bolsters the Fulbe view that they are quite distinct from others, both culturally and in their relative position. In so doing one also emphasizes his *pulaaku* and more specifically his *semteende* (shyness).

### 7. *Dina* (Islam)

Like *ardungal*, Islam (*dina*) and Islamic piety (*Juldamku*) have become an increasingly important aspect of Fulbe behaviour and culture since the 19th century. To be sure, Islam with its formal code of behaviour (in the Koran and Shari'a) penetrates deeply into many aspects of societies in which it has been accepted. In fact, nowadays, especially in urban areas, Islam is beginning to surpass *pulaaku* in its capacity to engender specific kinds of behaviours. However, many Fulbe still consider *dina* and *pulaaku* as aspects of each other. For instance, many Fulbe stated that they thought of their *pulaaku* five times a day—every time they prayed—and, at the same time, they listed their Islamic obligations of praying (*julligo*) fasting (*sumugo*), and reading the Koran (*jangugo*) as integral aspects of their *pulaaku*. Some, however, would argue that *dina* is a recent addition among the many components of *pulaaku* whereas *pulaaku* has been with the Fulbe since their creation. Islam, according to some Fulbe, commenced among the Fulbe from around the time of Mohammed, but others acknowledge its more recent "origins" in Adamawa around the time of the Fulbe jihad. Hence, *pulaaku* is a more elementary quality among the Fulbe and a majority see *dina* as an aspect of their *pulaaku*.

### 8. *Ne'd'daku*

*Ne'd'daku* is a personal characteristic associated with being a Pullo and one's *pulaaku*. It is often confused with the behaviours that are actually associated with it. Basically, *ne'd'daku* refers to human dignity, one's essence or personhood. It derives from the word *ne'd'do* (or *go'd'do*), meaning "a person". In order to have *ne'd'daku* or personal dignity, one must behave or carry himself in a prescribed manner. It entails a specified kind of demeanor, etiquette of manners; generally speaking it derives from being well behaved—being good in general. More specifically *ne'd'daku* derives from such behaviours like being obedient and loyal to others (*nedi*) and having sympathy towards others (*yurmineki*). A person with *ne'd'daku* (*ne'd'dindo*) is calm and gentle (*de'itare*), and is polite and well-mannered (*hakiilo*). A person who is troublesome—i.e. does not have good behaviour, is imprisoned, lacks restraint at a party, or frequently chases women—will be viewed as simply not having *ne'd'daku*. If he does not have *ne'd'daku* he cannot have *pulaaku* and thus is not considered a Pullo.

### 9. *Daraja*

Like *ne'd'daku*, *daraja* it is a personal quality which derives from a series of behaviours valued by the Fulbe. The essential meaning of *daraja* is honour, or having respect, though *daraja* in itself is a variable—contingent upon an individual's personal

qualities, behaviours and achievements. Generally, all Fulbe have some degree of *daraja*, provided that they have good character (*gikkku* and *neddaku*). However, *daraja* is commonly associated with men of high standing in the society. One may thus obtain *daraja* by having *lamu* (Office) or a position of importance (*yake*) or by being a religious scholar. In addition, those with wealth (*jaudi*) in money or cows may also have *daraja*, but if they abuse this wealth or their people, their *daraja* diminishes. To be sure, one's *daraja* is not an unchanging attribute; it is not inherited from one's honourable father or lineage. A Pullo must live up to the standards of the society in the face of losing his *daraja*. Likewise a man's *daraja* is contingent upon the behaviour of his family. His *daraja* is enhanced by the behaviour of his wife and children as well as his *ndottaku* (see 10 below).

Among women, *daraja* is also a desirable or virtuous quality. A woman must be married and devoted to her husband. Her *daraja* increases with her success in the domestic realm as well as with the "honourable" behaviours of her husband and children. A woman's beauty, *wodugo*, also has bearing on her *daraja*.

#### 10. *Ndottaku*

*Daraja* generally means honour and respect as regards one's position and success in the Fulbe community. *Ndottaku*, on the other hand is the honour and respect achieved with age (*dubi*), knowledge (*andal*) and persistent generosity (*chahu*). One with *daraja* need not have these attributes. In order to attain *ndottaku*, a Pullo must fulfil certain criteria: he must be generous irrespective of his wealth or poverty; he must be honest (*ngongaku*), responsible (*amana*) and keep to his word (*alkawal*); he should have four wives, give birth to many children and must provide adequately for his family and, as mentioned, he must demonstrate *ngoru* (bravery) in protecting his family members. Also in the domestic realm, a Pullo must gain the favour and obedience of his wives through *ngorgaku* (manliness, virility) in threat of ridicule from his wives or even the community at large.

At the close of this section on *pulaaku* one final point should be made. Many ethnolinguistic studies have gone beyond listing of culturally-significant concepts to positing relationships (i.e. taxonomic) between such conceptualizations. Such was also considered in this case. However, due to the high degree of contingency of Fulbe concepts of self-identity we cannot order these concepts taxonomically—according to relative degree of inclusiveness/exclusiveness or even as contrasting sets (cf. Frake 1962). Rather we can state generally that Fulbe do categorize the components of *pulaaku* into "core elements" which relate to appropriate behaviour and presentation of self. These include *semteende*, *munyaal*, *ngoru*, *marugona'i*, *en'dam*, and *ne'd'daku*. Other such elements are considered more peripheral to *pulaaku* and, according to some, they may be treated independently. They encompass *dina*, *daraja*, *ndottaku*, and *ardungal*. Unlike the core elements of *pulaaku* which are seen almost to be natural to the Fulbe, these attributes are achieved and are relatively recent additions to *pulaaku* (relating to the rise of Islam and Fulbe hegemony). However, many Fulbe agreed that such attributes do touch upon *pulaaku* and that they should be included in the discussion.

### Discussion and Conclusion

From the previous discussion the complexity of *pulaaku* has become clear. It penetrates into many aspects of Fulbe society; politics, religion and social organization. Its pervasiveness is evidenced by its codification into numerous concepts—prescriptive in nature and with complex, multiple meanings, all of which the Fulbe are quite aware. Also apparent is the high degree of overlap in the concepts, meanings which have rendered their isolation somewhat difficult. Furthermore, most of these conceptions are highly contingent upon each other. For instance, one's *semteende* has impact upon one's *ne'd'daku* as well as one's *daraja*. One who misbehaves or lacks *munyaal* will see all of *pulaaku's* qualities diminished. Likewise for one who does not show *en'dam* symbolizing kindness towards one's relatives and generally does not act in the interest of the group, again such qualities will be diminished. As such, failure in any of these areas will reduce one's *pulaaku*, which, we have emphasized repeatedly, underlies all such behaviour prescription and personal attributes. *Pulaaku*, as a symbol, underlies and integrates all these aspects and impels Fulbe to continue in the constant struggle to avoid public confrontation and to behave in a virtuous manner. *Pulaaku* is what makes all of its component behaviours "Fulbe" in nature. Many non-Fulbe people have *semteende*, *daraja*, etc, but only the Fulbe have their own unique "kind" and blend of these attributes. *Pulaaku* gives a unique patterning and meaning to Fulbe behaviours. Summarily, one Yola informant described it as follows: "Pulaaku 'dum daangol ha mangol kuuje 'bo'd'de fuh feddi" (Pulaaku is the rope upon which all good things are tied).

In considering their identity, Fulbe do not emphasize "Pragmatics". Certainly the strength of *pulaaku* does enable the Fulbe in some instances to act as a cohesive unit in opposition to others; clearly, this assisted the Fulbe in their domination of the "Habe" up to recently. Even today, especially in urban settings, ethnic ties do assist Fulbe in many aspects of their life. However, Fulbe emphasize their participation in *pulaaku*, not for its "pragmatics" but as simply being part of their way of life. They follow it first, because "*ngam finugo tawa*" (it is what they found the ancestors practicing). Secondly, they are gravely concerned with maintaining *daraja*, and *ne'd'daku* in the face of being shamed (*chemtungo*). Lastly, the simple pride (*teedal*) in being members of their ethnic group to them is a rationale for following the rules of *pulaaku* and hence emphasizing their Fulbeness.

To the Fulbe, *pulaaku* may thus be seen as a logically-ordered system, which has meaning in its own right. Fulbe emphasize the consistencies within the code of *pulaaku*, though as outsiders, we can note some of the inconsistencies in the system. For instance, *lamu* and *maunitare* at times may go against the grain of *semteende*. *Semteende* and *munyaal*, in their extreme form (i.e. to the extent of personal suffering) may be detrimental to a Fullo or perhaps his *ne'd'daku*. Many aspects of *pulaaku* have rendered the Fulbe conservative, in entering into modern day circumstances, particularly education, and the negative effect of this is now being felt among Fulbe. Furthermore, the fact that *pulaaku* is both in-born as well as accumulated may appear contradictory to outsiders though this is not readily apparent to the Fulbe themselves.

*Pulaaku*, apparently has had some impetus in the development and maintenance of Fulbe social and political structure. Earlier studies of the Fulbe (Stenning 1959,

Dupire 1962) have over-emphasized the rigidity and relative autonomy of Fulbe social structure. We argue that *pulaaku* and its components must be considered in their relation to Fulbe social structure. "Values", or emphases upon shame, kindness, honour have been demonstrated to have strong structural implications particularly among "Middle Eastern" and Mediterranean societies (cf. Peristiany 1965; Campbell 1964; Meeker 1976). For instance *en'dam* (kindness) can be viewed as having an impact on Fulbe social structural aspects—*lenyol*, *bandira'be*, and *teegal bandiragu*. Furthermore, consideration of such values more closely approximates the "natives" own view of their society.

In conclusion, we return to the general discussion of ethnicity. The case of the Fulbe is quite illuminating as regards the general problems and issues of this phenomenon. Firstly, we have seen that among the Fulbe, ethnicity has a variety of basic components including descent/origins, kinship, patterns of custom and race. Ethnicity therefore cannot be reduced to simply one or two components especially since, as we have shown, they are highly contingent upon each other and are separable only for analytic purposes. The meaning of all such elements must be given serious attention before attributing political or economic functions or manipulations of such ethnic markers. We argue, contrary to a majority of ethnic studies, that such identities and components have meaning in their own right, though, at times, political significance may be grafted on to the identities (cf. Parkin 1978). Identities must be understood, first terms of their meaning and internal logic, particularly with respect to the subjects' own views of their identity. As we have also shown, at least among the Fulbe, the most significant aspect of membership in the ethnic group is a culturally defined mode of behaviour, integrated by one or several cultural symbols, even though such behaviour may be similar to that of proximal ethnic groups. Of second greatest significance among Fulbe is "race" or inherited physical characteristics which is seldom considered in studies on ethnicity. This suggests that indigenous emphases upon "critical" ethnic markers differs significantly from those considered by anthropologists (e.g. who focus upon social structural attributes).

This we believe, demonstrates a need for anthropologists to give greater consideration to cultural definitions of ethnicity and the practical nature and implications of features of ethnic identities upon structural and normative elements of society (cf. Bordieu 1978, Ortner 1984).

## Footnotes

- 1 Research on the Fulbe has been in progress since 1983. Thus far 4 months have been devoted to the study of Yola and 5 months to the study of the town, Fufore. Comparative information has been collected from the villages Njoboli, Pariya and Ribadu. Participant observation and interviewing have been the primary means of collecting information on *pulaaku*. In addition extended questionnaires were administered by University of Maiduguri indigenes of the areas of study in order to obtain a full range of viewpoint on the meaning of *pulaaku* and being a Fullo. Some also assisted at interviews as interpreters.  
 Much of this research has been conducted with the generous assistance of the University of Maiduguri. For that I am most grateful. I also express my thanks to Mustapha Girei, Lawans, Kabiru Tanko, Umar Kalli, Barkindo, and "Aminu Song" for their valuable insights into *pulaaku*, as well as "Him'be Fufore" who showed me *pulaaku* in action.
- 2 The "clans" appear to have arrived in the very early 19th century and settled the towns Gurin, Ngaundere, Tibati, and Banyo, while others continued unsettled until the founding of villages like Ribadu, Fufore, Njoboli, Namtari, and Yola in the 1820's and 30's.
- 3 Although "Habe" initially referred to non-Muslim pagans, Fulbe often refer to all non-Fulbe as "Habe".
- 4 *Dendir'a'be* refers to brotherhood", particularly in a metaphorical sense (i.e. "All Fulbe are brothers"). This may actually have derived from the Islamic emphasis on "brotherhood" in which all Muslims are considered as distant relatives.
- 5 *En'dam* is also the word for the milk of a woman's breast as well as sappy liquid flowing from trees. Hence, the evocation of "en'dam" draws sentiments like those between a mother and infant.
- 6 *Daraja* derives from Arabic in which it also means honour and having respect. Apparently, the word is also used synonymously in Kanuri and Hausa and it has been in use for some time among the Adamawa Fulbe as we could find no definition equivalent for it in Fulfulde.

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## PERIODIC RURAL MARKETS IN BORNO, NORTH-EAST NIGERIA<sup>1</sup>

by

Gina Porter

### Abstract

This paper examines the historical evolution and present structure of the periodic market system in part of Bornu emirate. A questionnaire survey of traders in 35 markets allows detailed observations about the economic and social characteristics of the markets and their daily working. It is concluded that rural periodic markets in this region are essentially local institutions. The system of periodic marketing has altered little over the past century or more and response to changing conditions (especially the transport developments of recent years) has been slow. This is attributed largely to the sparsity of professional itinerant traders in these markets. Some suggestions are made as to the way in which change might be accelerated and the perpetuation of current uneconomic conditions prevented.

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Over the past few decades a great deal of literature has been produced concerning periodic markets in the Third World, for the importance of such markets in both economic and social terms is widely recognised. Much of the early work in this field by geographers concentrated on the basic description and analysis of market cycles, the hierarchy of market centres and the application of central place theory. More recently, and in accordance with a common trend in Geography as a whole, it has been suggested that there is a need for greater emphasis on the dynamic nature of market systems and their significance in the ongoing process of rural development. In a study of periodic markets in Western Nigeria, Filani and Richards have drawn attention to specific questions:

“We need to know more about the day-to-day working of periodic market systems, especially how people, goods and vehicles move through the system. In addition we need to know much more about the long term dynamics of the market system, for example, where markets are declining; where they are expanding; where new markets and roads are being built; who takes the decision and where about new investments and with what consequences; how markets vary from week to week and season to season in terms of people present and goods exchanged, and how well the potentialities and alternatives of the existing system are understood by people trading in particular markets.”<sup>2</sup>

In this paper an attempt has been made to examine some aspects of both the long-term and short-term dynamics of periodic rural markets in Borno, North-East Nigeria. It includes a study of the long-term evolution of rural markets within the region over the past one-and-a-half centuries, and the short-term fluctuations which occur in periodic markets between the wet and dry seasons. In addition, a questionnaire survey of traders in 35 markets allows some detailed observations to be made about the day-to-day working of the periodic markets. On the basis of these studies some suggestions are made regarding periodic markets and their potential role in the development of the region.<sup>3</sup>

The geographical context of the paper is the emirate of Borno, but field investigation was restricted to a smaller region, indicated in Figure 1 and comprising 4 rural districts: Auno, Mafa, Konduga and Maiduguri. This limitation was necessary in view of the size of the emirate and the fact that many established rural markets remain unknown to the Local Authority officials who administer it. Within the four districts investigated, only 18 of the 48 periodic rural markets currently in operation were listed in the L.A. schedule of markets and only 13 of their associated villages are shown by name on published maps of the region.<sup>4</sup> A detailed examination of 35 of these markets was undertaken in 1977/78. A questionnaire survey of market traders was made at each of the markets at the start of the wet season in June and July, 1977, when roads were still motorable and traders less occupied with business and prepared to answer a fairly lengthy questionnaire. At some of the smaller markets it was possible to question all traders and at large markets a random sample was taken. In the dry season of January, 1978 many markets were revisited for further discussions with the village head, and six markets of varying sizes and locations were selected for resurvey. In all over 3,000 interviews were conducted with traders and only a low percentage of refusals occurred, mainly of women.<sup>5</sup> Many market studies rely on the evidence of only a few traders and it is hoped that this detailed survey will provide a more representative view of rural periodic markets.

### **The Borno Region**

The emirate of Borno is a flat, dry, mainly Sudan savanna region lying in the extreme north-east of Nigeria, south-west of Lake Chad. It is primarily peopled by Kanuri, together with smaller groups of semi-nomadic Shuwa-Arab, Fulani and Kwoyam. The climate is harsh with an average rainfall of only 22-27" per annum, which falls in the rainy season months between June and October.

The economy of the region is based on agriculture and almost all Kanuri outside the state capital, Maiduguri, are involved in farming as either a full-time or part-time occupation. The principal staple food crops of the Kanuri are millet and guinea corn; in some areas groundnuts or vegetables are grown for cash.<sup>6</sup> Population densities are low and thus bush fallowing is widespread, with farm plots cultivated for about 4 to 8 years, followed by 4 to 8 years fallow.<sup>7</sup> Around Maiduguri, where population densities are higher, bush fallowing is limited and there is greater emphasis on the use of manure and fertilizers. In addition to farming, the Kanuri keep sheep, goats and a few cows around their village compounds. In the dry season most have a second occupation, either trading or making craft items such as mats, calabashes, woodwork products or blacksmithing. By contrast, the semi-nomadic Shuwa-Arab

Fulani and Kwoyam populations of Bornu are primarily cattle herders, though they may also keep goats and sheep. They exchange their dairy products for grain and craft items with the sedentary populations, especially in the wet season when they often occupy fixed villages and remain in one location.

The Borno region is remote from the rest of Nigeria and has had a long history of separate development. It originated as an offshoot of the ancient Islamic Kingdom of Kanem which was centred in the area north and north-east of Lake Chad and dates back to the end of the 9th century or before. The emergence of Borno as a state distinct from Kanem and the Kanuri as a people distinct from the Kanembu stems from about 1390 when a rebellious group upset the rulers of Kanem and moved to the south-west of the Chad basin to establish what later became the empire of Borno.<sup>8</sup> The emirate of Borno was established in the late 15th century and, as Cohen describes in his study of the Kanuri people, having survived insurrection, warfare and colonialism, it even today remains within the framework of national independence as a viable social and political entity.<sup>9</sup>

#### **Rural periodic markets, an outline**

It is useful to begin this study with a general description of Borno rural periodic markets, their characteristics, spatial distribution and organisation, since they have not been discussed elsewhere in the literature on periodic markets and are, in some respects, rather different from markets in other parts of northern Nigeria and beyond.

The majority of markets in Borno emirate are predominantly Kanuri and are located in association with Kanuri settlements.<sup>10</sup> As in Hausaland (and in contrast to many Yoruba bush markets) village and market lie in close proximity to one another.<sup>11</sup> A few large settlements are found which possess no market or only a small market, while some small settlements have large thriving weekly markets. There is no direct relationship between settlement size and market size. There is, however, some correlation between market size and location with respect to road transport. In the survey area the smallest rural markets were generally in remote locations and the largest on the tarred roads or major bush roads which have mammy-wagon and mini-bus services to Maiduguri and other market towns. They are all basically retail markets, though some bulking of goods takes place for sale in larger regional markets. Markets usually commence around 10.00 a.m. and close about 4.00 p.m. with a peak of activity occurring at mid-day. During the rainy season if there has been a heavy fall of rain, however, markets sometimes start as early as 8.00 a.m. and most of the traders will have disappeared by 11.00 a.m. The Hausa-style late afternoon and evening markets are not a common feature of Borno rural areas.<sup>12</sup>

The physical structure of the rural markets is very limited today as it has always been. In the market at Kukawa, Barth found only a few very light sheds or stalls, with no regular layout, and in many markets nowadays there are only flimsy stalls constructed of poles and a zanna-mat sunshade, or nothing at all—in which case traders sit under any available tree with their wares spread out in front of them. Despite the outward appearance of disorder, the internal arrangement of goods in the markets tends to follow a common pattern which is most apparent in the larger markets of the region. The hub of the market is focused around the sellers of vegetables, spices, cloth, groceries and jewellery items. At the periphery sit the Shuwa and Fulani

women with their milk and butter for sale and the grain, rice and groundnut sellers, in a specially demarcated area, often with their goods piled up in shallow—sometimes concrete-lined-hollows in the ground. Other peripheral positions are occupied by the butchers and the water sellers and, at the south-western side of the market, in the lee of prevailing winds, sit the blacksmiths, associated woodcarvers (making handles for the blacksmiths' products) and the cooked food sellers. Finally, at some distance from other traders, the livestock sales take place. The arrangement is a logical one which takes account of fire hazards, access to transport for heavy, bulky products and so on.

In all the rural markets examined, foodstuffs occupied the greatest area. Imported manufactured goods were much less well represented than foodstuffs, though far more are sold today in the small bush markets than used to be the case. Locally made craft items were found to be almost as important as manufactured goods. In the survey area as a whole (and in some of the largest markets) there were more traders dealing in craft items than in manufactured goods. In the smaller remote markets only one or two stalls were occupied by manufactured items and, in a few cases, none at all. Table 1 shows the results of a comparative study of goods for sale in three markets in varying locations: Sherif Kyari is a small bush market, Yale Garu a fairly busy bush market some way (24 km) from a tarred road, and Konduga is a large roadside market.

Table 1

*Percentage of traders dealing in major categories of goods in Borno markets, June 1977.*

6 major categories	Sherif Kyari	Yale Garu	Konduga	All 35 markets
Foodstuffs including cooked food	62.8%	59.0%	48.3%	57.6%
Livestock and Livestock products	4.6	2.5	8.1	10.1
Cloth and clothing	2.3	7.6	6.8	4.7
Crafts and craft products	9.3	7.8	18.1	11.1
Imported manufactured goods	14.0	17.9	11.4	13.1
Services	7.0	5.2	7.3	3.4

*N.B.* This table shows only the proportion of traders selling in each category, not the volume of goods for sale.

Generally, the larger the market, the greater the range of items which were displayed for sale. A total of 15 kinds of goods were distinguished in total in Sherif Kyari; 22 in Yale Garu and 35 in Konduga market.

A final note is necessary regarding the functions of Borno markets. In common with perhaps all African markets they are important not only for their economic function but also as major sources of news, gossip and social contact.

"Gambling, strangers, new bits of gossip, perhaps a new woman or two, drummers and entertainers, all contribute and create not just an ordinary day for buying and selling goods, but a festive occasion that is regarded as a welcome break or relief in the daily monotony of rural life."<sup>13</sup>

#### Temporal periodicity and locational spacing

The temporal periodicity of markets in West Africa follows a variety of patterns and has been discussed extensively in the literature.<sup>14</sup> In Borno, rural markets operate once every seven days or if (as occasionally occurs) they meet more frequently. There is one major market every seven days. In this respect they are similar to those of Hausaland, to the west, where seven-day markets are practically universal.<sup>15</sup> The reason for this particular periodicity in both regions is probably the influence of the Islamic seven-day week.<sup>16</sup>

Within the survey area markets are fairly well distributed over the seven days: Monday, six markets; Tuesday, six; Wednesday, five; Thursday, seven; Friday, seven; Saturday, nine; Sunday, nine. However, three of the fairly recently established markets in the area had chosen Friday, previously less popular than the other days of the week. In these villages, village elders said that Friday had been chosen as the only day available for a market, and that markets do not normally operate on Fridays because it is a rest day. In Borno as a whole, Friday is not a popular market day in either major or minor settlements and the slightly above-average importance of Saturday and Sunday is probably due to resumption of business following the Friday break. This presents a contrast with parts of Hausaland where Hill and Smith found a significantly greater number of markets operating on Fridays in large centres, which may be attributed to the fact that consumers can attend mosque and market on the same day.<sup>17</sup> The reason why some Islamic areas should favour Friday markets and others have, in the past, avoided Friday markets is not readily apparent.

The basic reasons for periodicity in rural markets have been disputed but have tended to emphasize the role of the supplier, the itinerant trader.<sup>18</sup> However, Ghana's explanation of periodicity in terms of demand, rather than supply, for rural Hausaland appears to fit the Borno situation equally well: "Since rural households cannot support daily markets offering less essential goods, market-days have to be spaced in time to allow a sufficient build up of effective demand."<sup>19</sup> In the Borno rural markets studied, the professional itinerant traders are in a minority; the predominant dealer is the small scale produce-retailer who visits only his local market or, at most, a few markets per week (*ibid p. 17*). It would seem more likely that the periodic market in this area is a facility which has developed for the convenience of such people, rather than for the convenience of the itinerant trader; especially since the vast majority of traders return to their home base each night (*ibid p. 17*).

The spacing of rural markets within the survey area varies. The minimum nearest neighbour distance between markets is three km, the maximum is 17 km. In the Konduga and Maiduguri districts, which are more densely populated than the other two districts, markets are fairly closely spaced and are concentrated along the major tarred roads<sup>20</sup>. In the less fertile districts of Auno and Mafa where population is sparser, markets are more widely spaced, and there are more remote bush markets. The average distance, apart of nearest post-adjacent markets (meeting on the following day

in the survey area as a whole, is 16.74 km but, because of the mutual repulsion of markets operating on the same day, these have a much greater average spacing of 26.5 km.<sup>21</sup> It is interesting to note how close this is to Ghana's figure (of 27.4 km) for Zaria Division and may be a useful guide to spacing when new markets are established.

### Long and short-term changes in the market system

#### (a) Long-term changes

It has been possible, using historical accounts of European travellers to Borno, British colonial records and reports, and oral testimony, to build up a picture of the long-term changes in rural marketing patterns in Borno and, from this, to draw some general conclusions about the dynamics of the market system here.

In the 19th century there seems to have been an established network of trade throughout Borno, despite a fairly low density of population. Borno occupied a special position on the junction of routes across the Sahara from the east and north and, despite a reported decline in the Tripoli-Fezzan-Borno route over the 19th century, the larger markets of Borno continued to attract strangers from far afield.<sup>22</sup> The political stability of the region (disturbed to some extent by wars between Borno, Waday and Bagirmi after the death of El Kanemi in 1837) usually guaranteed market peace. It is unlikely that large quantities of goods from Europe and North Africa reached the small rural markets, but they were on sale in the main markets of Borno and especially, of course, in the famous market at the capital, Kukawa.<sup>23</sup> European explorers, including Denham, Barth and Nachtigal, visited Borno at intervals over the 19th century and they present a fascinating picture of the main urban market at Kukawa. But only Barth took note of the small rural markets. Of Uje district (in the Maiduguri area) for example, he wrote: "every large place in this district has a market of its own" and he described Uje Maiduguri where a market was held every day (and still is today) on the west side of the settlement "where a small quadrangular area is marked out with several rows of stalls or sheds". At another (unidentifiable) market he visited, there were a number of traders from Kano and Kukawa with items of European manufacture among their stock.<sup>24</sup>

So, up to the last decade of the 19th century markets, urban and rural, were in operation in Borno, meeting then, as now, once per week or having one major market day per week; though there were also small daily markets (*duriya*) in the larger centres.<sup>25</sup> Trade was perhaps hindered by the absence of a standard currency but bartering occurred in all markets.<sup>26</sup>

The events of the last decade of the 19th century brought many changes in Borno. First came the invasion by Rabeh, an adventurer who arrived from the central Sudan in 1893 and wrought havoc in the region. Many villages were razed to the ground in the early stages of his campaign. However, the British, French and Germans were already dividing Borno amongst themselves on paper. The French eventually defeated and killed Rabeh but it was the British who occupied what is now Borno early in 1902. A new period of market peace gradually came into being and the rapidity with which trade was re-established is evident from Boyd Alexander's description of Borno in 1907. In the area round Maiduguri he describes "flourishing markets where traders come from afar." Similarly the Borno Annual Report of 1909 states "the trade in the

local markets is yearly increasing." Many of the small village markets appear, surprisingly, to have survived the upheavals of the late 19th Century. In the survey area 15 markets claim a continuous existence from at least the middle of the last century (fig. 3).

During the period of British administration, a number of new markets were established in Borno, including 17 within the survey area. On the whole, market foundation in this era seems to have been the result of indigenous initiative, rather than British intervention. A new market at Baga Ngelewa, for example, on the shores of Lake Chad was opened in the 1910's by the District Head, to take some of the lake trade in dried fish, potash and salt.<sup>28</sup> The construction of roads during the British occupation connecting the district capitals to Maiduguri and to one another had an influence on markets, by both encouraging the establishment of new markets and accelerating the growth of markets located in the district capitals.<sup>29</sup> By 1930 many dry season roads had been improved in Borno, which brought an influx of lorry transport and ever increasing trade.<sup>30</sup>

Occasionally the British administration intervened directly in the foundation, closure and movement of markets though, most commonly, in the pagan districts on the borders of the region, where they were used as a means of pacifying the populations, rather than in Borno emirate itself.<sup>31</sup> It was sometimes necessary to close markets which were trouble spots, as in the case of a large market at Jabulum in Mobber District which was ordered to move to Fogua by the Shehu and Council in 1951. Fogua, on the Niger border, had been the market many years previously and it was hoped that the return of the market to the village head's direct supervision would deter the gamblers and other undesirables who had been frequenting the market. Because considerable opposition was anticipated, the case had been referred to the Shehu, though normally the closure of a market was within the jurisdiction of the District Head.<sup>32</sup> In another case, this time within the survey area, the removal of the District Head resulted in the decline of one market and the establishment of a new market. The British moved the throne of the District Head of Mafa in 1940 from Dalori, near Maiduguri, to a new, more central location, since the District was considered very wild. A market was established at this new headquarters about four years later, on Saturdays (the same day as Dalori market) and Dalori market, once an important terminus of Sahara caravans, declined considerably.<sup>33</sup>

Since Independence in 1960 there have been further adjustments in the rural market system in Borno linked, in particular, to the building of new roads, tarring of others and the enormous expansion of transport services. New markets have grown up by the roadsides, while some bush markets have declined or disappeared. In the survey area seven markets have been established altogether since Independence and three old markets re-established, while six markets have disappeared.

Village heads in the survey area were asked what changes they had seen in the size of their markets in the past five years (Fig. 4). Of the six markets said to be definitely shrinking in size, only two were located on tarred roads; Mairamri and Aulari. In each case the decline of the market was attributed to the increasing accessibility of other markets, held on the same day, as motor transport has increased. In the case of Aulari, competition has now arisen from the very important urban market at Maiduguri (Yerwa), also held on Monday, and 60 km distant, because traders in the

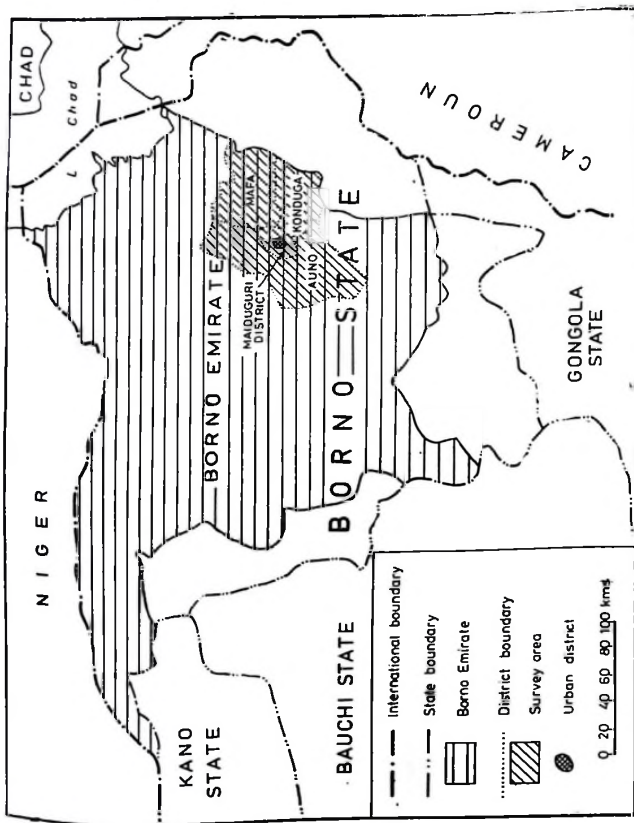


Fig. 1. The location of Borno Emirate and the survey area.

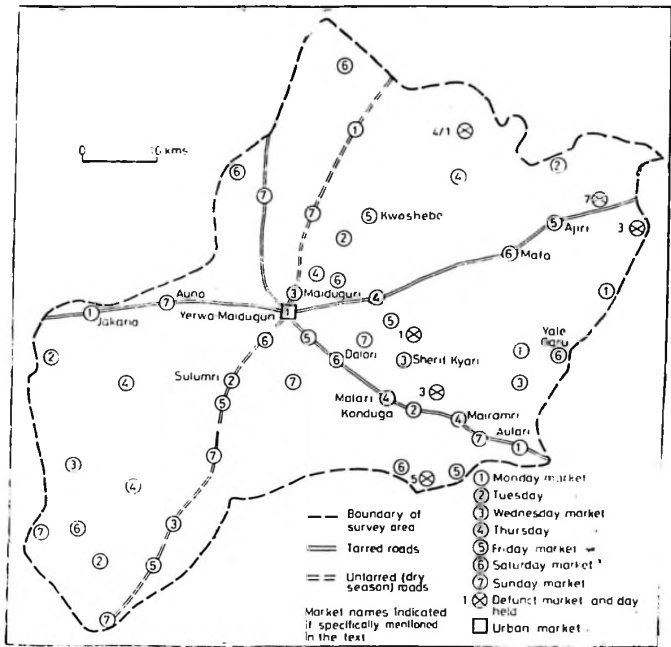


Fig. 2. Market days in the survey area.

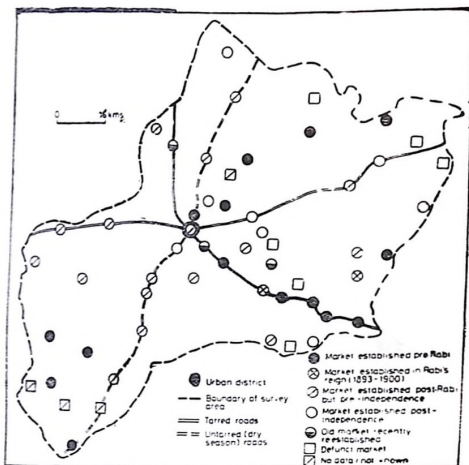


Fig. 3. Periods of market foundation.

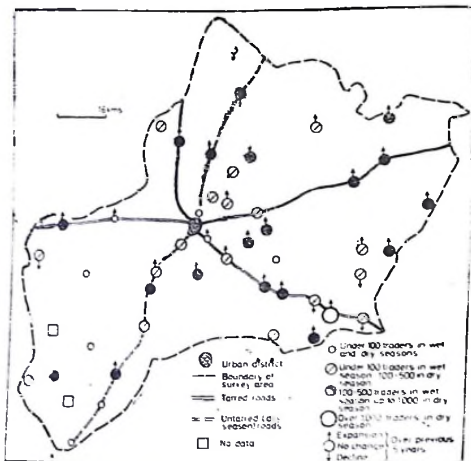


Fig. 4. Approximate market size on main weekly market day.

Aulari area can reach Maiduguri in only 40 minutes by minibus. Mairamri has similarly suffered from its location near a large market at Malari also held on Thursdays. Reasons for decline in the other four markets were various, but generally include drought and lack of good boreholes. A reliable water supply is very important to markets where many participants are nomadic herders; the low rainfall of recent years has caused some change in herd movements.

On the other hand, many markets have experienced an increase in trade over the past five years. Some are bigger because they have moved their site to the main road (Sulumri, Auno, Jakana, Mafa) or because the road on which they are located has been improved (Ajiri and Mafa on the newly tarred Dikwa road). The presence of a good water supply in certain cases has attracted nomads to these locations (Kwo-shebe, Jakana) from drought affected areas.

*In toto* the pattern of rural periodic markets in Borno appears to have altered somewhat since the beginning of the last century, as markets have appeared, grown, declined moved site or disappeared.<sup>34</sup> The actual mechanics of change in individual cases are usually difficult to establish, though some general observations can be made. In the survey area, market foundation was found to occur most commonly some time after the establishment of a new settlement; only in one case did the market come first. When a new village is established, the village head will encourage the establishment of a regular market. This market may at first be regarded as a 'duriya' or small (perhaps temporary) market but subsequently, if it grows, it will obtain the full status of 'kasugu'. The rural markets which have thrived best in Borno over the years have, on the whole, been those located by good roads; though there are still some healthy bush markets which continue to grow because they supply a population far from any road, have a good water supply, a long-standing reputation or specialize in a particular local product which attracts purchasers from elsewhere.

At the opposite end of the spectrum market disappearance is generally preceded by a long period of gradual decline. Markets once viable are reduced in size due to changing conditions. In the survey area, this can usually be attributed to either increased mobility (better roads and/or better transport services), or declining demand (reduced population due to drought). An alteration in these conditions in the last five years has caused a decline in certain bush markets and in a few roadside markets (*ibid* p. 10). There is, of course, a time lag between the onset of changing conditions and the decline and disappearance of markets (inevitable in a society which lacks complete economic information), so further change may be anticipated.<sup>35</sup>

A market may try to survive by changing its day — this was attempted in one, now defunct market — but such a measure is unusual. In Borno as a whole, market days have rarely changed. All seven of the markets mentioned in the 1927 survey of Konduga District which are still alive today have kept to the same day for fifty years.<sup>36</sup> A more common way for markets to resist decline in Borno has been to relocate. Many villages have moved their market place some hundreds of yards in recent years to a site by the road; a fairly easy process since investment in infrastructure is usually very small. Sometimes whole villages have moved, together with their markets, from bush locations to the roadside. In 1976, for example, the village and market of Sulumri moved about one mile to the road, leaving four concrete stalls at the former site, which is now utterly deserted. In another case some years ago, a market moved seven miles,

from a bush village to a village which had already been established on the roadside, and in one remote market a move of ten miles was necessitated by problems of security at the original (dense bush) site. In the survey area as a whole, a change of site was recorded for 16 markets and one small bush market was reported to have moved its site on at least four occasions.<sup>37</sup>

(b) *Seasonal changes*

Between dry season and wet season many of the rural periodic markets of Borno vary in respect of size, type and range of goods for sale, prices and (to some extent) type of traders they attract. In order to assess the degree of change, six markets were surveyed in detail in both seasons. In many respects, this examination of seasonal change was the least satisfactory aspect of the survey, because of the problems of taking a representative sample of traders in the large, very busy, dry season markets, but a brief resumé of results is given below.

The rural markets of Borno reach their nadir in the middle of the rains in late July and August when motor access to markets on bush tracks is often almost impossible, especially on the 'firki' soils.<sup>38</sup> and most people in the district are busy planting crops. When there has been heavy rain the previous night or in the early morning, some of the least accessible markets are like "ghost towns" on market day with perhaps three or four traders in a sea of unoccupied stalls. Generally at this time of the year, markets start and finish early. By contrast, markets are at their most full after harvest and in this season may not close till darkness falls. On average markets are between 50% and 100% larger in the dry season than in the wet season and the character of the market scene changes for, in addition to the throngs of traders, onlookers and buyers, there are sometimes entertainers, riding competitions, racing and wrestling, especially in the larger bush markets.

The types of goods for sale naturally vary seasonally, depending on the agricultural produce available at different times of the year. However, after the harvest, the range of products of all types is at its maximum in the rural markets since farmers have money to spare. Prices also vary seasonally with foodstuff prices rising in time of scarcity and falling after harvest. Conversely, prices for luxury goods such as jewellery, clothing etc., reach their peak after harvest when demand is greatest.

Traders vary their patterns of market visitation seasonally too, travelling to slightly more markets and to markets at rather greater distance from their base in the dry season when movement is fairly easy and the returns from trading greater. However, little real difference was found in the composition of traders between wet and dry seasons in respect of distance travelled to market or, for that matter, sex and age, in the six markets. Despite the presence of a number of long distance traders in dry season markets, in both seasons the great majority of traders apparently resided within the area in which they trade. Further details concerning the characteristics of traders are considered in the following section.

### Market traders and the organisation of trade

Traders encountered in the markets of Borno fulfil various functions and can be grouped into discrete types: indeed, in Kanuri they are given special names. Representatives of the most common trading groups encountered in the survey area were the *gurdoma*, the *fakema* and the *tewurma*. The *gurdoma* is a woman trading in small items, particularly food items and spices, but also pots, bowls and ear and neck ornaments. She generally carries her merchandise in a large calabash. The *fakema*, mentioned by name by both Barth and Nachtigal in their descriptions of Kukawa market,<sup>39</sup> is in some respects the male equivalent, also selling small items of low value, but of a greater variety than the *gurdoma*. In addition to food items and spices, he may sell trinkets, hair powders, needles and thread, spices, wool and a host of other bits and pieces. He may visit just one local market per week or a few local markets. The *tewurma* is a person who sells—often from a table—various Western-type items, biscuits, wrapped sweets, matches, cigarettes, soap, etc. All the above-mentioned traders operate on a small scale with very little capital invested in their stock.

Less frequently encountered in the rural markets of Borno is the *sawurma*, the itinerant trader, usually male, who travels from market to market.<sup>40</sup> He is more commonly found trading in the larger urban markets. He may travel long distances in order to buy commodities and each has his own speciality (*sanya*). He normally deals in sizeable quantities or items of high value and tends to use motor transport to carry his goods, because of the quantities involved. The *sawurma* was found in the survey area dealing in such goods as salt, potash, dried fish, mats and cloth. He may sell in the markets through the *dilalma*, an agent who sells on commission, and will contact this agent when he arrives at a market to sell his merchandise. The *sawurma*, like the small-scale traders of Borno, tends to return to his home each night, whatever the distance involved. He generally lives in a major market centre and spends days when he is not trading carrying out a secondary occupation.

The *dilalma*, like the *sawurma*, specializes in various commodities such as livestock (horses, donkeys, cows, goats, sheep, hens) grains, mats, clothing (gowns, shoes, caps, etc) or manufactured goods.<sup>41</sup> He arranges sales between prospective buyers and prospective sellers and takes his commission from either one or other, depending on who contacted him first.

Since the broker advises on the price which can be expected at a particular market, he is often regarded as a thief.<sup>42</sup> The *dilalma* has been a long standing feature of Borno markets. Barth in Kukawa notes:

“All this sale of horses, camels etc., with the exception of the oxen, passes through the hands of the *dilalma* or broker, who, according to the mode of announcement, takes his percentage from the buyer or the seller.”<sup>43</sup>

Schultze (1910) reports the presence of numerous brokers in the markets of Borno and a report on the Bama region in 1926 remarks on the importance of brokers in the livestock trade.<sup>44</sup>

The *dilalma* may be male or female, but in the survey area no women were encountered. The majority of commission agents here were selling livestock (for which they must have a permit to deal from the Local Government headquarters each year), corn and millet, new cloth, hardware and sometimes groundnuts and kolanuts. They

were generally located in the bigger markets. In the smaller markets of the district there are no commission agents at all, with the exception of those dealing in animals. Only in the case of livestock is trade in a commodity exclusively in the hands of the commission agents. In all other commodities, in addition to the *dilalma*, ordinary traders are selling on their own account and, in most of the rural markets, the brokers form a small minority.

In some markets, especially the small ones, the commission agents tend to be people native to the village, but in other markets those encountered were mainly outsiders from Maiduguri, Dikwa and other towns. Most of the local *dilalmawa* deal only in their home market but a few operate in a number (though still usually returning home each night). One such *dilalma* regularly visited four markets, all within 45 km of his home, and returned home each night. He specialized in grains and reckoned his commission was 50 kobo or less per sack. On the day he was interviewed, he has 3 sacks for sale. He was a Kanuri and gave his main occupation as farming. Most of the *dilalmawa* recorded in the survey area were Kanuri, although a few Hausa were found dealing in sheep for their Fulani owners.

A considerable amount of data was collected in the questionnaire surveys about all types of traders in the rural markets; their age, sex, tribe, birth place, residence, other occupations, mode of transport to market, market routine, and so on.<sup>45</sup> This information provides valuable insight into the economic and social set-up of the markets and their day-to-day working.

Dealing firstly with age, 75% of all traders interviewed were between the ages of 26 and 55 (62% between 26 and 45). No marked differentiation was apparent by age in type of goods for sale. (A slight weighting was found towards older traders in grain selling and younger traders in bread selling; while the very old and the very young deal in cooked food, empty bottles and tins, stock requiring little capital. There was, however, some distinction by age in quantity of goods for sale. Many young girls walk round the markets with trays of oranges and cooked food and boys with small trays of kolanuts and sweets, for the immediate consumption of marketers. Sometimes, though, even young boys are dealing in considerable quantities of expensive goods such as groceries; not on their account, but for their masters, for these are apprentices.

Representation of the two sexes varied to some extent between markets. As a generalization, women tended to outnumber men in many small bush markets, while men probably slightly outnumbered women in some of the biggest markets. This would be a logical reflection of the differing roles of the sexes with reference to goods sold (see below). A slight seasonal difference was also apparent, with an increase in the proportion of males trading in dry season markets.

The differentiation of goods sold according to sex was quite marked in all Borno markets as, indeed, it often is elsewhere in West Africa. Women were particularly predominant in the sale of milk products (all traders were female), small scale grains and pots, cooked foods other than meat, vegetables, fruit and soup leaves. In other goods such as livestock, cloth, salt, potash and kola, male traders were predominant, to the virtual or complete exclusion of women.<sup>46</sup> Basically, women in Borno deal in the less costly items, very largely food products, while men deal in more costly and imported goods. Very few women were found trading on more than a very minor scale,

although they often gave their occupation as 'trading'. They are more appropriately classed as housewives who earn a little cash by trading in a small quantity of items from their garden or farm, collected from the bush, or made by themselves at home. The small scale nature of female trading activity in Borno is further reflected in their market visitation routine; the vast majority visit only one market per week (their own local market) and they travel there on foot. By contrast, and as might be expected in a muslim society, men sell a wider variety of goods, travel further to markets, often using motor transport and visit more markets than women.

Collection of statistics regarding occupation presented some difficulties since almost all traders were involved in farming to some extent and many also possessed yet another additional occupation. The incidence of dual occupations is hardly surprising in view of the long dry season in Borno which limits farming. Farming can not occupy all a man's time or satisfy all his needs and trading is a natural alternative. In the sample of traders interviewed, 36% stated their main occupation as trading while 53% were primarily farmers.

Statistics of ethnicity, residence and market visitation patterns were particularly interesting. The vast majority of traders encountered in the survey area markets were Kanuri or members of minor related ethnic groups native to the area. In addition, there were Shuwa-Arab and Fulani women in many markets selling milk and bush gathered products and some Shuwa and Fulani men selling animals through the *dilalmawa*.<sup>47</sup> A certain number of Hausa were also present, generally itinerant traders based in Borno and dealing in valuable items such as salt, kola, new clothes or manufactured goods. They often belong to Hausa communities long settled in large towns such as Maiduguri, where they dominate much of the large and medium trade. No non-northern traders were encountered in any of the rural markets visited. Stranger traders do not seem to thrive in the rural markets of Borno, especially in the rural areas east of Maiduguri where languages other than Kanuri, Shuwa and the Chad Basin languages are, apparently, not widely understood.<sup>48</sup>

Analysis of the residence patterns of traders indicated that Borno rural markets are essentially local institutions. Of all traders interviewed, 80% lived permanently no further than 10 miles (16 km) from the market in which they were trading at the time of interview and 90% lived within 20 miles (32 km). All except one of the remaining traders resided within Borno State. When the residence patterns of women were examined separately this was even more apparent; 81% lived within five miles (8 km) of the market within which they were trading and 92% within 10 miles (16 km).<sup>49</sup> Not surprisingly, therefore, over 60% of all traders interviewed had travelled to market on foot (a further 6% came on bicycle and 26% by minibus, lorry or mammy-wagon). In the case of women, 92% had travelled on foot and only 7% by motor vehicle. By contrast 49% of the men travelled on foot and 33% by motor vehicle. Three-quarters of the traders estimated that they had taken no more than one hour to travel from their residence to market<sup>50</sup> and the vast majority of traders returned home each night. The latter point is important since it means that the spatiotemporal sequence of markets in the area is not of major significance to them.<sup>51</sup>

Market visitation patterns confirmed the view that the markets are primarily local institutions. Of all traders interviewed, 52% said that they visited no other markets regularly to trade, other than the one in which they were interviewed. (A breakdown

by sex showed figures of 41% and 79% for males and females respectively). Nineteen per cent of traders visited only one other market regularly (males, 22% females, 13%), 14% visited two other markets regularly (males, 18% females 5%) and 9% three other markets regularly (males, 12%, females 1%). Only 3% of traders visited four other markets regularly and only 2% five or more markets regularly. These latter two categories contained only three women.<sup>52</sup> When questioned whether they would visit another market the following day, only 12.8% of all women, 14% of all men replied in the affirmative. Of these 12% the majority, both men and women, were bound for a market between 11 and 20 miles (18–32 km) distant from the market in which they were interviewed. It is interesting to note that some traders purported to vary their market visitation pattern each week, according to the weather, news gathered during their travels about conditions in other markets, and so on.

Analysis of source of traders' merchandise showed that in the sample interviewed nearly one-third of all items for sale were the produce of the trader himself and had not been purchased elsewhere. Three-quarters of all traders had purchased or obtained their merchandise from no more than five miles (8 km) distance from the market and less than 2% of traders had purchased or obtained their merchandise outside Borno State. A total of 28% of all traders obtained their goods from Maiduguri town which is an important supply centre for the rural areas, especially for groceries, kola, salt, jewellery and cloth, all expensive items imported from outside Borno.

An attempt was made to obtain a further indication of the scale of trading from an enquiry into traders' money returns. This delicate subject was reserved until the end of the questionnaire and two-thirds of all traders declined to answer the question, which referred to their average gross sales in the market. Of those who responded, half anticipated gross sales of between one and five Naira, and a quarter gross sales of less than one Naira. Probably a good proportion of the large scale traders were among those who declined to give information and consequently this investigation was considered unsatisfactory.

To summarize this section, some of the more important characteristics of traders in the rural periodic markets can be listed: traders can be classed into various trading groups, which have probably existed for a century or more; there is no marked differentiation of goods traded by age, but considerable differentiation by sex; the majority of traders have a second, more important, occupation—the professional itinerant trader is in a minority; there is a remarkable absence of non-native traders; the vast majority live within a short distance of (16 km) 10 miles; of the markets they visit regularly and almost all return home each night; most traders visit only one or two markets regularly; most traders obtain their merchandise close to the markets in which they trade and many are producer - retailers; most women trade only on a very small scale and only in their nearest market place. The overall picture is one of overwhelmingly small-scale trading in the periodic rural markets of Borno. Rural markets here are essentially local institutions.

## Conclusion

In Borno, as elsewhere in the Third World, periodic markets at present play an essential part in the economic (and social) life of the rural areas, despite the fact that the rural markets are primarily local in nature. It is here that many agricultural and craft products first enter the exchange economy and it is also here that imported goods from other regions, and other countries, reach the rural consumer. As Hill has shown elsewhere, it would be unwise to over-emphasize the role of the periodic markets: in Borno, as in other parts of West Africa, there are alternative channels of trade.<sup>53</sup> Nonetheless, the stability of the markets in the survey area over the past century is an indication of their continuing value to the communities they serve. Although old markets have disappeared and new ones emerged, as this survey has shown, the system of periodic marketing and the role of traders within that system appears to have altered very little indeed.

In recent years it is the reorganization of transport which has had the greatest impact on Borno markets. The tarring of old roads and the construction of new ones, together with the great increase in motor vehicle numbers (all ultimately stemming from Nigeria's oil wealth) has encouraged the decline of previously viable bush and roadside markets, which now fall within the expanding hinterlands of larger roadside markets. Agricultural schemes now in progress, such as the small Lake Alau Irrigation Project (within the survey area) and larger schemes, particularly the South Chad Irrigation Project, can be expected to have some impact on the market system of rural Borno in the future, and yet further change may be anticipated if government investment in rural areas increases.

As conditions have changed in Borno over the years the market system has responded, but with inevitably a very long time lag. It is suggested that one of the basic reasons why readjustment to new conditions has been slow can be found in the fact that the majority of traders have another occupation. Only just over one-third of the traders interviewed in the survey district were primarily traders. The majority are farmers first. They do not have time to experiment by visiting various markets, perhaps at some distance from their home, and are unlikely to risk loss of sales by altering their existing pattern of trade.

At present in Borno there are many small markets barely alive and doomed to ultimate extinction and, on the other hand, large markets whose facilities lag far behind what their size warrants. The alternative to the current *laissez-faire*—the perpetuation of uneconomic conditions for years—is intervention. Rural planners may be able to speed up the natural process of change by identifying potentially viable markets and then allocating new investment to such villages—and conversely, by denying government investment in market villages with little future. The likelihood of such intervention, however, depends on the importance attached by government to periodic markets and their perceived role in future rural development: unfortunately the desire for 'modernization' of rural areas is often accompanied by undervaluation of the importance and adaptability of traditional marketing institutions. Moreover, there are political implications and hazards to intervention. During the market survey my attention was often drawn by village officials to the lack of physical facilities in their market and village. The allocation of concrete market stalls, slaughter

blocks and abattoirs, boreholes and wells, were all discussed with enthusiasm and the injustices of present allocations implied, whatever the current health of the market. Indeed many small market villages attributed their market's decline to lack of facilities rather than to the true reason: a no longer viable location. Nonetheless, if a sensible allocation of money to improve market villages with growth potential can be achieved, this will be of benefit to the development of the region as a whole.

The imposition of change externally is not welcomed by rural people in somewhat remote areas like Borno. Only by a very careful examination of the evolution of the present system of markets and the way in which they operate can sympathetic—and consequently successful—rural planning be achieved. It is hoped that this paper makes contribution to that understanding.

#### Notes

- 1 I wish to acknowledge financial assistance for the survey from the University of Maiduguri, the co-operation of District Heads in the survey area, and Hugh Jones of COCIN for his information on Kanuri trading terms.
- 2 M. O. Filani and P. Richards, 'Periodic market systems and rural development: the Ibarapa case study, Nigeria' *Savanna*, 5, 1976, 149-162.
- 3 The focus throughout this paper is on rural markets. A subsequent study will consider linkages between rural and urban markets in Borno.
- 4 This excludes 'duriya': small temporary markets, often held daily, purely for petty trade. (Though these markets may, if they become established, be promoted to 'kasugu'). Presumably the data compiled from Native Authority records in northern Nigeria by Polly Hill was more reliable; see P. Hill and R. H. T. Smith, 'The spatial and temporal synchronization of periodic markets: evidence from four emirates in northern Nigeria'. *Economic Geography*, 48, 1972, 345-355.
- 5 Assisted by Kanuri-speaking students from the University of Maiduguri.
- 6 Acreages of groundnuts have declined considerably since the onset of the drought in 1971. Farmers have subsequently expanded their acreage of other crops such as millet which can be sold locally and provide an alternative cash income.
- 7 In 1952 the average population density for Borno emirate (excluding urban Maiduguri) was 15 per km<sup>2</sup> and in 1963, 30 per km<sup>2</sup>. No later figures are available, since the 1973 census was discredited.
- 8 L. Brenner, *The Shehus of Kukawa*, 1973, 9-10  
H. A. S. Johnson, *The Fulani empire of Sokoto*, 1967, 74.
- 9 R. Cohen, *The Kanuri of Borno*, 1967.
- 10 A few Shuwa markets occur in bush locations on major cattle routes.
- 11 M. G. Smith, 'Exchange and marketing among the Hausa', in P. Bohannan and G. Dalton, *Markets in Africa*, 1962, 305.
- 12 P. Hill and R. H. T. Smith, *op. cit.* (See Note 4), 346.
- 13 R. Cohen, *op. cit.* (See Note 9), 87.
- 14 R. H. T. Smith, 'West African market places: temporal periodicity and locational spacing', in C. Meillassoux (ed), *The development of indigenous trade and markets in West Africa*, 1971, 319-46, etc.
- 15 P. Hill and R. H. T. Smith, *op. cit.* (See Note 4), 345.
- 16 Though seven-day markets are also found in non-Islamic areas according to R. H. T. Smith *op. cit.* (See Note 14).
- 17 P. Hill and R. H. T. Smith, *op. cit.* (See Note 4), 346, 353.
- 18 J. H. Stine, 'Temporal aspects of tertiary production elements in Korea, in F. R. Pitts (ed), *Urban systems and economic development*, 1962, 68-78.
- 19 A. H. May, 'Notes on the economic basis for periodic marketing in developing countries', *Geographical Analysis*, 3, 1971, 393-401.
- 19 J. A. Gana, 'The locational pattern and functions of periodic markets in Zaria division, Nigeria', *Savanna*, 5, 1976, 163-174.
- 20 This area includes a stretch of largely arable cultivation along the more fertile brown sand plains north of the Bama ridge.
- 21 The mean distance between nearest neighbour markets for the survey area as a whole is 9.5 km and the Nearest Neighbour Statistic ( $R_n$ ) is 1.37.

- 22 A. A. Boahen, 'Britain, the Sahara and the Western Sudan 1788-1861', 1964, 107.
- 23 R. Cohen, *op. cit.* (See Note 9), 29.
- 24 H. Barth, *Travels and discoveries in north and central Africa*. 1857, II, 93, 96. Uje Maiduguri is the village lying close to the present state capital which gave the latter its name.
- 25 H. Barth, *op. cit.* (See Note 24), 51 and see Note 4
- 26 H. Barth, *op. cit.* (See note 24), 55.
- 27 B. Alexander, 'From the Niger to the Nile', 1907, I, 241. Nigerian National Archives, Kaduna (NNAK) SNP 1271/1909, Bornu Annual Report, 1909.
- 28 NNAK, NAIPROF 2493.
- 29 NNAK, SNP17 K2041. Assessment Report, Borsari District 1918. "The Dapchi market has increased greatly in importance since the District Headman made his headquarters there".
- 30 NNAK, 16817 Vol. 1 Annual Report, 1981.
- 31 NNAK, e.g. SNP 1024/1908. Quarterly Report, 16817 Vol.1 Annual Report 1931.
- 32 NNAK, 4270, Rural Markets.
- 33 Oral evidence from the village head at Dalori and the district head at Mafa.
- 34 A comparison of the Nearest Neighbour Statistic (Rn) for 1930 (1.27) with that for 1977/78 (1.37) for the survey area suggests that the overall pattern of market distribution has not altered greatly (despite the disappearance of five markets and the appearance of a new one in the intervening period). There has apparently been a slight move towards a more regular hexagonal pattern. The mean distance between nearest neighbour markets in 1930 (10.2 km) was slightly greater than in 1977/8 (9.5 km) but the markets were fewer in number.
- 35 R. Symanski and R. J. Bromley, 'Market development and the ecological complex', *Professional Geographer*, 26, 1974, 382-388.
- 36 NNAK, K5487, Special Report on Konduga District, 1927.
- 37 Removal of villages over short distance is not an uncommon practice in Borno. It is encouraged, for example, by the system of keeping cattle in the village compound.
- 38 Dark clay soils which become bogs when flooded in the rainy season.
- 39 H. Barth, *op. cit.* (See Note 24), 54.
- 40 Hausa 'fatake'.
- 41 Hausa 'dillalai'. See P. Hill, 'Two types of West African house trade' in C. Meillassoux *op. cit.* (See Note 14), 303-318. For an interesting discussion the role of the dillalai see pp 315-316
- 42 But Hays found the income of marketing intermediaries low relative to the services performed. H. M. Hays, 'Agricultural marketing in northern Nigeria', *Savanna*, 5, 1976, 139-148.
- 43 H. Barth, *op. cit.* (See Note 24), 53.
- 44 P. Benton, 'The sultanate of Bornu', (translation of original German version by A. Schultze) 1913. NNAK. SNP 17/K5742, Special report on Bama District, 1926.
45. An SPSS cross-tabulation programme facilitated analysis.
- 46 Livestock, fresh meat, cloth and new and second hand clothes, caps, wood products, leather goods and cobbling, rope making, bread, sweets, cooked meat, local medicines, firewood, all services (all 100% male); kola, groceries, jewellery, cosmetics (99% male); mats and baskets (97%); salt, potash (93%).
- 47 A few markets were almost exclusively Shuwa and very few Kanuri visited these markets.
- 48 A notable exception are the fish markets round Lake Chad where traders from southern Nigeria have for many years played an important role.
- 49 The great majority had been born within close vicinity of their present residence (and 74% of traders had been born within 10 miles of the markets in which they were interviewed): an indication of the stability of rural society in the region.
- 50 Calculated by interviewers using various methods.
- 51 P. Hill and R. H. T. Smith, *op. cit.* (See Note 4), 350.
- 52 Some traders volunteered reasons why they did not visit more markets: bad roads and shortage of funds were mentioned. But for the majority the basic reason was involvement in their second occupation, either farming or craft work, for much of the week.
- 53 P. Hill, 'Hidden trade in Hausaland', *Nau* IV, 1969, 392-409 and P. Hill in C. Meillassoux *op. cit.* (See Note 14) (303-318).
- Throughout the year there is a large house trade in Bornu operated by 'fatomawa'. These are wealthy dilalmas who have goods to sell. See A. Rosman, 'Social structure and acculturation among the Kanuri of Bornu Province, northern Nigeria', Ph.D. Thesis, Yale, 1962.
- In the harvest season there are 'scale men' who set up temporary huts in major villages all over Bornu and buy directly from the farmers. See R. Cohen, *op. cit.* (See Note 9), 85.

#### Editor's Note

This article was initially accepted by *Savanna*, a *Journal of the Environmental and Social Sciences*, published at Ahmadu Bello University, Zaria, from which it was transferred by the consent of author and editor, since *Savanna* appeared to have ceased publication. (with volume 8, no. 1, June 1979). At the time of writing, the author did not yet have access to the English translation of Nachtigal's *Sahara & Sudan* which contains an important description of the market of Kukawa. This work, in the translation and edition of A. G. B. and H. Fisher (London, Christopher Hurst 1974 ff, 4 vols), is reviewed in this volume.



## FACTORS INFLUENCING TRADE MOVEMENT OF SHEEP AND GOATS FROM BORNO STATE TO OTHER PARTS OF NIGERIA

by

Ogbonna Alaku and J. O. Igene

### Abstract

Data from the records of 18 different Livestock Control Posts of the Federal and Borno State Ministries of Agriculture and Natural Resources were analysed to determine the influence of season on the volume of sheep and goats moved, as trade animals, from Borno State to other states of Nigeria for half a decade (from 1977 to 1981). There exist highly significant ( $P < 0.001$ ) seasonal variations in the number of both species moved. More than half (58.76%) of the sheep and (52.21%) of the goats traded annually were moved within the first three months (October-December) of the dry season. The greatest proportions of both species (18.61% and 18.27% of annual volumes of sheep and goats respectively) were moved in the month of October, immediately after the rains. The lowest proportions were in May (only 2.73%) for the sheep, March (4.38%) and July (4.57%) for the goats. There also exist seasonal variations in the relative proportions of animals moved, but in any given month, more goats than sheep were moved. For the five years under study, the count was 1.67 goats for every sheep. The difference (4484.95) between the overall monthly means (11138.23) for goats and (6653.28) for sheep was highly significant ( $P < 0.001$ ). This study revealed that more cattle than either sheep or goats were moved within the period. These may be a reflection of the fact that in most parts of the North, among the ruminants, cattle are greatest in number, followed by goats and then sheep.

### Introduction

The very pronounced dichotomous climate conditions existing between the south and north of most West African Countries have helped to create a great imbalance in livestock production in these areas. This has resulted in farm animals being very important articles of trade between the north and south of these countries as is the case in Nigeria (Oyenuga, 1967; de Leeuw, 1974). It is estimated that Borno State contributes about 40% of the livestock production of Nigeria, owing largely to its unique position where it shares borders with the three northern neighbouring countries of Chad, Cameroon and Niger. Livestock rearing is the main occupation of the people inhabiting these areas. However, the major livestock rearers here are the nomadic Fulani who spread all over these neighbouring countries. Also in this business are the semi-nomadic Shuwa Arabs who inhabit the northeastern corner of Borno State.

The decision of offtake animals for sales is not made by any one individual in the family. This is because livestock ownership among the Fulani is diffused (with women, children, head of households, mothers, etc having specific control on individual

animals). Such decisions are usually based on effective demand for non-animal goods. However, recent studies (Mboho, 1981; Alaku and Igene, 1983; Igene and Alaku, 1984) have revealed that the greatest offtake of animals for either slaughter or trade occurs during the long dry seasons of the sahelian zone. It is probable that in anticipation of the shortfalls in the forage availability during the long dry seasons, the decision to sell off livestock is more readily reached among family members. Livestock are therefore culled so as to reduce the flock to the carrying capacity of the land and also to avert losses due to starvation, water deprivation and inevitable deaths that prevail for up to seven to eight months of the year.

Except for some little study on cattle (Alaku and Igene, 1985), no literature exists on the seasonality of movement of trade in other animals from these areas to other parts of the Federation.

This study was therefore conducted to investigate the influence of the season of the year on the volume of sheep and goats, moved as trade animals, from Borno State to other States in Nigeria from 1977 to 1981.

### Materials and Methods

Data used in this study were collected from 18 different locations of the Federal and Borno State Ministries of Agriculture and Forestry Resources Livestock Control Posts—all located in Borno State of Nigeria. Records of Sheep and Goats moved from Borno State to other States of Nigeria from 1977 to 1981 were included. It was not possible to find out the number of animals that went to which particular State of the Federation. Data on climatic variables for the period were collected from the records of the Nigerian Meteorological Services at the Maiduguri International Airport.

Monthly and yearly totals were calculated for both sheep and goats. Monthly means over the years were also calculated for both species and represented in graphs (Figure 1). All data were subjected to analysis of variance and the monthly means over the years compared.

### Results

Table 1 shows the total number of sheep and goats transported per month for the five years under study. The results show that there existed very highly significant ( $P < 0.001$ ) seasonal variations in the number of both sheep and goats moved from this State for the period. The results are clear that the greatest numbers of each species were moved within the first three months of the dry season (October, November and December) (see Figure 1). The total figure for these three months represented 58.76% and 52.21% of the annual totals for sheep and goats respectively. This means that about, or more than, half of all animals moved yearly were moved within these first three months of the long dry seasons.

On a monthly basis, the greatest number of either sheep or goats were moved by the month of October, immediately after the rains. The numbers moved in this month alone represented 18.61% and 18.37% of the total annual movement for sheep and goats respectively. For the sheep, this October figure was greater than the total number moved from May through August which represented 17.87% of the annual

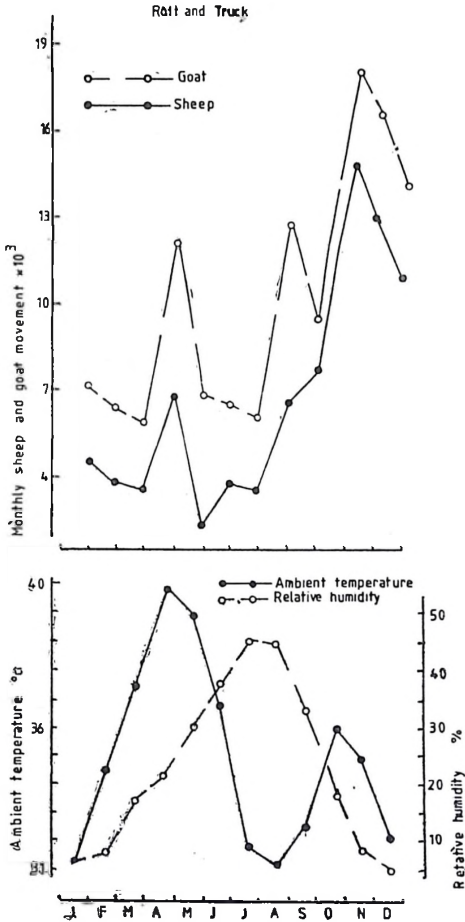


Fig. 1 Relationship between climatic variables and livestock movement.

M (or F) - Male (or Female) labour force participation rate  
 U (or R) - Urban (or Rural)  
 NN - Northern Nigeria  
 B - Borno  
 G. B. - Great Britain  
 Source: 1963 Census of Nigeria  
 DEP (1971)

Table 1

Total number of sheep and goats transported per month by road in the State of Karnataka, India

Month	1977		1978		1979	1980	1981	1982	
	Sheep	Goats	Sheep	Goats					
January	4,747	12,628	2,576	6,014	3,351	2,932	3,089	3,624	
February	8,181	16,836	3,528	6,029	4,338	3,451	4,247	4,131	
March	10,718	14,173	2,481	7,503	1,286	3,122	2,140	2,221	
April	7,873	15,891	8,570	12,808	4,414	11,058	13,141	10,140	
May	3,691	14,713	4,411	10,006	307	1,883	107	3,603	
June	3,117	12,316	3,301	9,141	613	1,036	1,203	4,150	
July	2,256	15,720	5,092	5,811	105	133	3,150	3,071	
August	6,161	18,068	3,559	11,564	7,345	11,370	4,613	7,340	
September	5,208	17,944	5,392	11,889	8,197	9,779	10,846	19,788	
October	6,405	26,349	6,883	14,366	11,188	16,947	32,195	43,189	
November	17,872	27,912	13,014	13,256	6,091	7,715	11,407	13,588	
December	9,462	14,556	8,914	6,127	6,081	7,234	20,105	31,000	
Totals	85,691	207,106	67,721	114,734	31,870	83,016	109,235	138,158	
								51,650	105,518

totals. For the goats, the October figure was about equal to the total movement for the months of June, July and August which represented 18.93% of the annual total for this species.

Movement was lowest in May (only 2.73% of the annual total) for sheep, and March and July (only 4.38% and 4.57% respectively, of the annual total) for the goats. For the sheep there was a continuous rise in the number moved from July to October (see *Figure 1*) after which a sharp decline followed. The same was true for the goats except that for this species, there was a drop in September which was later followed by a sharp rise in October and then a decline through November till March the following year.

For both species there were rises in the numbers moved in the month of April and then a decline by May. These results are clear that off-take for trade was higher during the dry, than during the rainy seasons, with the greatest number occurring within the first three months of the long dry seasons.

There also occurred significant variations on the number of sheep ( $P < 0.01$ ) and goats ( $P < 0.05$ ) moved from year to year. The lowest number of 51,870 sheep were traded in the year 1978, while the greatest number of 109,235 sheep were moved the following year 1979 (see *Table 1*). For the goats, the lowest number of 83,048 were moved in 1978 also. The highest number of 207,106 goats were transported in 1977.

At any given month, however, more goats than sheep were moved out of the State. There also exist some seasonal variations in the relative proportions of sheep and goats moved within the period. About equal numbers of both species were moved at the beginning of the dry season (October-December), while a far greater number of goats than sheep were traded towards the end of the dry seasons as well as during the rainy seasons. For example, in November for every one sheep there were 1.25 goats moved. By the month of May, the proportion was 3.19 goats for one sheep. The overall monthly mean of 11138.23 for goats was significantly ( $P < 0.001$ ) greater than that (6653.28) for the sheep. This shows that in each month of the year under study, about 4,485 more goats than sheep were moved.

Data on cattle movement from Borno State within the same period (Alaku and Igene, 1983) were compared with data from this study. The comparison also reveals that irrespective of the livestock involved, ratios were always lowest at the onset of the dry seasons. For example, the ratio was 1 sheep: 1.64 goats: 1.25 cattle in October. This means a ratio of 1 head of cattle to 1.32 goats. In May, however, the ratio was 1 sheep: 3.19 goats: 8.46 cattle and this is a proportion of 2.65 cattle for every goat.

The overall ratios for the *five years under study* was one sheep: 1.67 goats: 2.43 cattle and this means a ratio of one goat to every 1.45 cattle. These results are clear that more cattle than either sheep or goats were moved within the period while more cattle were involved in these trades, sheep were least involved.

## Discussion

The very highly significant seasonal variations in the movement of sheep and goat as observed in the present study could be explained in part by the pronounced seasonal variations in the climate of this zone, which is situated in the subsahel region of West Africa. The results show that there were three peaks of movement for the goats and

two for the sheep. The peak occurred in October and May for both species, with an additional peak in August for the goats. For each species, however, the October peak was the highest. It is also interesting to note that, except for the August peak for the goat, other peaks occurred during the long dry seasons of the sahelian zone. The highest (October) peak was immediately after the rains. In these areas, rains start by late May-early June and stop by late September-early October. In the very northeast corner of the State, that is, areas bordering Lake Chad, rains come only by July and August and very often prove erratic (Khalil, 1974). Maximum ambient temperatures may vary from below 30°C by December/January to 45°C and above by April/May (figure 1). The relative humidity is highest (about 45%) by July/August and lowest (about 5%) by December/January.

The October peak in livestock movement may be explained in part by the fact that the pastoralists usually start their southward migration early enough as to completely avoid the undesirable consequences of the oncoming dry spell. The sheep, but not the goats, are often moved with the cattle when the nomads start on their seasonal migration. However, they choose to trim down their flock sizes at this stage. By October-December, crop residues are readily available in these areas and animals are in relatively better conditions and could command better prices than later in the dry seasons. Experience has also shown that huge losses can occur when the long dry seasons are advanced. This probably, helps to swell the offtake of livestock for trade and also for slaughter.

Secondly, the steady rise in the number of sheep moved from July till October could also be explained by the fact that this animal is used by the Moslems for the Sallah (Eid-el-Kabir) celebrations which took place at this time of the year throughout the period under study. The observed drop in goat movement in the month of September (Figure 1) could be as a result of a shift in emphasis. More sheep were traded, probably to meet up with the demands of the Eid-el-Kabir celebrated in all parts of the north, and to some extent parts of the southern Nigeria within the study period.

Another peak of movement occurred in April. Animals involved in trades about this time of the year are mostly from the neighbouring countries of Chad, Niger and Cameroon. At this time also, the Sudan Desert sheep are often identified in the Maiduguri Livestock market. The nomadic pastoralists from the drier areas just south of the Sahara migrate southwards often to occupy the grazing lands earlier abandoned by our native pastoralists who had migrated south at the very beginning of the dry spells (Oyenuga, 1967; Mohammed, 1974). This situation is known to have subjected our grazing lands to perpetual overgrazing (Mohammed, 1974) and this has been identified as one of the processes that encourage desertification.

Ambient temperatures are highest by this time (April/May) of the year. Trekking by these nomads and their animals is often restricted to very early morning and late in the evenings. By now most of the soil in these areas is virtually bare and most watering holes dry. Mortality rate is so high during these periods that one would not go up to one kilometer without seeing a carcass or two, especially of cattle. At this time, the nomads are compelled to sell off as many of their animals as possible. The major reason is to avert huge losses that often occur due to exhaustion, thirst and starvation. They also sell off some animals and use the money to purchase essential requirements, such as salt and other consumer goods.

The third peak of movement for the goats which occurs in August to some respiratory diseases that often befall goats during the rainy season in July/August due to relatively high humidity. This situation is known to have increased the offtake of goats for either slaughter or trade.

Seasonal variation in the offtake of livestock, either for slaughter or trade, is restricted to the tropical areas (Wilson and Clarke 1976; Alaku and Igene and Alaku, 1984). There are also records that the volume of sales or slaughter fluctuates from season to season, even in the temperate zones (Paker and Pope, 1983).

Comparison of the data from the present study with those on cattle and sheep (Alaku and Igene, 1983) revealed that greater numbers of cattle (see Table 1) or sheep were traded or moved away within the five years under study. There exist seasonal variations in the relative numbers moved. For example, for every one sheep that was transported, 8.46 cattle were moved. For goats the proportion was 1:2.65 at this time. In October, on the other hand, the proportion was 1.25 cattle for one sheep moved. For the goats and cattle the proportion was 1.32 goats. However, the overall proportions stood at one sheep and one goat to 1.45 cattle.

That more cattle than either sheep or goats were involved in the movement in these areas may be explained by the fact that cattle had always been the most preferred species. Mohammed (1974) recorded 3,213,000 goats and 1,501,721 sheep for the then Northeastern State of Nigeria. The Federal State was a part. This worker also recorded 7,289,996 cattle, 6,348,875 sheep for the entire north of Nigeria. Another reason for the preference for cattle could be moved on the hoof, and by truck and rail, sheep and goats transferred only by truck and rail. Such costly means of transportation reduce the number of the small ruminants transferred.

Furthermore cattle is assumed to be the main source of meat and the preference for beef in Nigeria. Beef also appears much more desirable than soups and seems to preserve better than mutton or goat meat.

The result of the present study is clear that the offtake of livestock in these areas is highest during the long dry seasons (Alaku and Moruppa, 1983a; b) have shown that while the Bororo recorded 15.74% of body weight and 22.94% of carcass weight loss during the period up to 18.29% of its body weight and up to 25.31% of carcass weight in December and April the following year. These workers also reported slaughter weights of goats were 10.5% of the lower upper limit to the upper desirable limit of 15.74% of the same period. These losses were also very pronounced in the offals as well as in the intestine within the same period. Alaku and Moruppa (1983a) also reported that offals are considered delicacies by many people in Nigeria. However, from biological implications, the offals are also considered as a waste in our own animal production system.

In addition to these losses in the offals, animal shrinkage also occurs under these conditions, more losses owing to the fact that animals occur during the rounding up and

Table 2

*Mean monthly movement of trade cattle from 1977 to 1981*

<i>Month</i>	<i>Means of Movement</i>		
	<i>Hoof</i>	<i>Truck</i>	<i>Rail</i>
January	7510	8695	3633
February	4518	10048	2615
March	5334	8506	3031
April	4583	7740	4423
May	5971	8734	3758
June	3970	5621	2506
July	3237	4655	2015
August	4678	5722	2463
September	5965	8512	2594
October	6793	8972	2746
November	6139	7879	3242
December	7445	6451	3242

*Source:* Alaku and Igene, (1983)

Table 3

*Seasonal and Yearly Means for Sheep and Goats Movement*

(A) <i>Seasons</i>	<i>Means</i>	
	<i>Sheep</i>	<i>Goats</i>
December-February	6425.00 <sup>a</sup>	9301.53 <sup>a</sup>
March-May	4219.80 <sup>b</sup>	8337.33 <sup>a</sup>
June-August	4028.67 <sup>b</sup>	8431.80 <sup>aa</sup>
September-November	11939.87 <sup>c</sup>	18482.27 <sup>b</sup>
Overall	6653.33	11138.23

(B)	<i>Yearly Means for Both Species Combined</i>
1977	146,398.5 <sup>a</sup>
1978	91,227.5 <sup>b</sup>
1979	67,459.0 <sup>c</sup>
1980	133,696.5 <sup>a</sup>
1981	94,965.5 <sup>b</sup>

In A and B, Means within the same column not followed by the same superscript letter more significantly different at  $P < 0.01$ .

enrailment. Shrinkage and other losses naturally occur any time sheep and lambs are held in pens without feed and water, or are being transported (Scott, 1975). It would actually be of very great interest to investigate the after-effects of transportation on body, carcass and organs weights of animals moved from here to the other parts of Nigeria and especially to the south—some distances are up to 1,600km and sometime take three to four days to cover. Lusweti-Collins (1984) has recorded 6.8kg and 3.1kg losses in body weights for Wadara and Red Bororo breeds of cattle respectively after transportation from Maiduguri to Bauchi, a journey of 400km, lasting only 10 hours.

Sheep and goats are often transported by truck or rail. According to Williamson and Payne (1978) rail transportation is preferable to that by truck, and loss under the worst conditions by rail is said to be as high as 10%, but normally should be between 3 and 5% on a journey of 72 hours. This does not include loss before enrailment. These workers observed, however, that a single-sex group of polled, indigenous cattle that were provided with bedding would suffer the least bruising during transportation. Other measures of minimizing losses include loading animals at the farm instead of first taking to the rail, feeding and watering at rail heads, animals not to be loaded more than one hour before rail journey starts (Williamson and Payne, 1978). Still other measures include avoiding transportation in extremely hot or cold conditions proper and gentle handling prior to loading, proper protection from sun, cold and droughts as well as offloading the animals for resting and feeding when journeys lasted more than three days (Scott, 1975; Williamson and Payne, 1978). All the above measures could be adopted in our local conditions to minimize the double losses that occur here. The first losses are brought about by the harsh local environment while the second are due to the method of transportation. Here animals are often subjected to inhumane treatment during loading and transportation. Some animals are in a very pitiable condition on arrival at the southern markets where they are sold.

It is true that in most areas of Nigeria or other parts of West Africa, animals are not usually weighed at the time of selling. However, the look and condition of an animal determine the price the individual animal commands. A thrifty and smart looking animal invariably commands a better price than an emaciated and dull looking animal.

It will be very interesting to have a co-ordinated study of these trade movements in livestock. Such a study should include records on species, breeds, age, and sexes of animals moved.

There should also be records on the origin and destination of the animals. Body weight at the start, and end of the journey should be recorded. Treatments given to the animals such as frequency of resting, watering and feeding should be recorded.

Above all, the reasons of offtake for sale and at what season should be ascertained from the pastoralists. Also what are the animals used for when eventually they are sold at the southern markets should be ascertained.

The authors strongly believe that these records will go a long way to enable scientists to discern the core objectives and goals of the actors in this scene. In addition, such records would help towards better decision taking by both state and Federal governments on our livestock industry. Above all, elements involved in this analysis have

significant economic implications for the pastoralist, the trader and the Nigerian livestock industry. Given the body and carcass weight losses resulting from poor animal husbandry and management of meat animals, it is imperative that more humane methods of trade animal movement should be evolved in order to avoid significant weight losses and to insure quality meat production.

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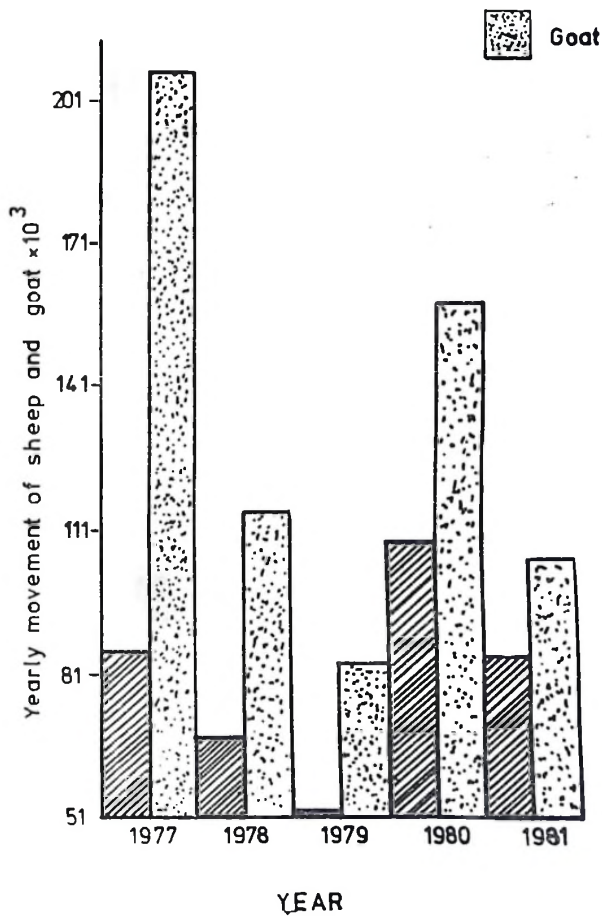


Fig. 2 Total yearly volume of animals



# SOCIO-ECONOMIC IMPACT OF SOUTH CHAD IRRIGATION PROJECT ON PARTICIPATING FARMERS IN BORNO STATE

by

B. O. Ogunbameru

## Abstract

The South Chad Irrigation Project (SCIP) is one of the largest irrigation projects in Nigeria. This study was conducted to examine the impact of SCIP on its participants. Mailed questionnaires were administered to random samples of the participants. Data from the returned questionnaires and Annual Progress Reports on SCIP were analyzed.

The study revealed that the farm holding and yields of the participants have increased since their participation in SCIP. The farmers adopted modern farming techniques. Their farm inputs and operations were highly subsidized. The farmers also had higher income accumulation and enjoyed improved living standard.

The SCIP has "opened up" the project areas through the construction of feeder roads, supply of regular electricity and pipe-borne water. Other social infrastructures provided within easy reach of the participants are schools and health centres. Finance and inadequate irrigation water were two major problems facing the participants. With timely operations the SCIP could still perform better.

## Introduction

Up to the early post-independence years of Nigeria's economic development, agriculture provided not only all of the country's requirements for internal food consumption but produced surplus agricultural raw materials such as cocoa, coffee, palm products, groundnuts and cotton for export to other countries. In other words, agriculture did not only provide the population with all its food requirements but also earned the much needed foreign exchange with which the country financed its development programmes. Barely two decades after independence, Nigeria is today in a critical position with regards to its ability to cope with the production of enough food and other agricultural raw materials for the needs of the country and for export.

The contribution of the agricultural sector to Nigeria's Gross Domestic Product (GDP) has been on the decline in this period. Its share in the GDP dropped from 61 per cent in 1964 to 48 per cent in 1970, to 18 per cent in 1980, and regrettably it is still on the decline (Abdullahi 1983). Agricultural export increased from ₦304 million in 1964 to ₦498.5 million in 1979. In relative terms, however, agriculture's share of the total value of all exports declined from 70.8 per cent in 1964 to only 4.6 per cent in 1979, (Federal Office of Statistics 1981). This performance is a reflection of the drastic decline in the proportion of agricultural export over the years. Moreover, there is an alarming increase in the value of food imports to Nigeria in relation to total import. For example, Olayide *et al* (1979) reported a more than twenty-fold increase between

1964 and 1980: from about ₦41 million in 1964 to over ₦1 billion in 1980. Unfortunately, effective food demand in the country is growing at 3.5 per cent per annum while agricultural production is growing only at 2.1 per cent, (Agboola 1979). Thus there is a wide gap between food demand and supply which results in high consumer prices. Many factors have been blamed for the low agricultural productivity, such as ineffective agricultural institutions and inappropriate farm technologies.

The Federal Government had, however, at different times made specific conscious efforts to transform agriculture from subsistence to commercial. Some of the specific strategies included the National Accelerated Food Production Projects, The Agricultural Credit Guarantee Scheme, Guaranteed Price Scheme and The River Basin Development Authorities. In addition, the Federal Government launched in her Fourth National Development Plan (1981-85), a programme christened the Green Revolution. The objective of this scheme in a nutshell, is the attainment of self-sufficiency in the production of food and agricultural raw material for domestic consumption and the surplus for export (Federal Ministry of National Planning, 1981). During this development plan, the government announced an allocation of ₦3.5 billion for the agricultural sector. In the same development plan, an allocation of ₦924 million was earmarked for water resources development projects of River Basin Development Authorities (RBDA) in the country. The primary objective of RBDA is to tap, harness and develop the abundant water resources in the country for crop and livestock production, forestry, fisheries and water supply schemes for rural, urban and industrial use.

### The Study Area

This study focusses on the South Chad Irrigation Project (SCIP) of the Chad Basin Development Authority (CBDA). The CBDA was established by Decree No. 32 of 1973. Although it has multiple objectives, the principal ones are: (1) to undertake comprehensive development of both surface and underground water resources for multiple use, (2) developing irrigation schemes for the production of crops, livestock and for forestry, and (3) undertaking large-scale multiplication of improved seeds, livestock breeds and tree seedlings for distribution to farmers.

The major function of the CBDA is the planning and execution of projects aimed at water resources and agricultural development. The present administrative and organizational set up is based on Decree No. 87 of 1979 which is an updated version of the earlier decree. Its statutory area covers the entire Borno State and the northern parts of Gongola State north of latitude 10°. It thus covers an area of over 136,000km<sup>2</sup>, which is about 15 per cent of the total land area of the country. CBDA has its administrative headquarters at Maiduguri, Borno State capital.

SCIP which is the focus of this study is the major project undertaken by CBDA. As the name implies, it lies south of Lake Chad. The area falls in the clay plains west of River Ebeki, which is the international boundary with northern Cameroun.

The South Chad Irrigation Project (SCIP), is one of the largest irrigation projects in Nigeria. The project's irrigated area at present is 21,887 hectares, but when fully developed it is projected to cover a total area of 67,000 hectares. The SCIP aims at producing food and agricultural raw materials for one-third of the Nigerian population

(Kolawole 1981). Thus the 67,000 hectares are planned to produce annually 175,000 tonnes of rice, 87,000 tonnes of wheat, 33,000 tonnes of cotton, 12,000 tonnes of sorghum, plus considerable quantities of vegetables, (CBDA Report 1983). Irrigation water and agricultural inputs such as improved and proven seeds, fertilizers, and plant protection chemicals are provided at subsidized prices to participants.

### Objectives of the Study

Lack of empirical study of the socio-economic impact of SCIP on its participating farmers has necessitated this study. The paramount objectives of the study, therefore, are:

- 1 To investigate the preliminary socio-economic impact of SCIP on its participants.
- 2 To assess the general opinion and/or attitude of the participants on SCIP authority's activities.
- 3 To highlight the problems facing the participants, and
- 4 To make suggestions for the improvement of SCIP.

### Methodology

Mailed questionnaires and scheduled interviews were used to collect the primary data used in this study. One hundred and fifty copies of pilot tested (using "test audience") questionnaires were distributed to random sample of participating farmers. Secondary data were assembled from progress reports prepared by the SCIP authority. The data from the questionnaires were coded, tabulated and analyzed using non-sophisticated descriptive statistical methods, mainly arithmetical sums and frequency distributions of the responses.

### Results and Discussion

Of the 150 copies of questionnaires distributed to the sample, 80 percent (120) of them were returned. The returned forms were carefully gone through and found to be properly completed and therefore used for this study. For logical analysis, the presentation is grouped into two broad areas: (1) demographic characteristics, farm distribution, crop grown and livestock raised, farming techniques and respondents' opinion on their achievements and problems; and (2) the socio-economic impact of the project on the farmers as assessed by them.

Part of the demographic characteristics of the respondents is presented in *Table 1*. Majority of the respondents, 41.7 per cent, fall within the age bracket of 31-40 years. This was followed by those who are between 41-50 years, 32.5 per cent, and those above 50 years of age, 21.7 per cent. Only a small proportion, 4.2 per cent, of the respondents is between 20-30 years of age. A significant proportion, 87.5 per cent, of the sample had no formal education. However, 12.5 per cent of them indicated they had received primary and/or Koranic education.

**Table 1**  
*Age and Educational Characteristics of the Respondents*

<i>Years</i>	<i>AGE</i>		<i>Level</i>	<i>EDUCATION</i>	
	<i>No</i>	<i>Frequency</i>		<i>No</i>	<i>Frequency</i>
Below 20	—	—	Primary/Koranic School	15	12.50
20-30	5	4.17	Secondary School	—	—
31-40	50	41.67	Post Sec. School	—	—
41-50	39	32.50	No formal education	105	87.50
Above 50	26	21.66			
<b>TOTAL</b>	<b>120</b>	<b>100.00</b>	<b>TOTAL</b>	<b>120</b>	<b>100.00</b>

The marital status of the respondents is presented in Table 2. Over 70 per cent of the respondents are polygamists, claiming to have two or more wives. About 23 per cent of the respondents indicated that they have one wife each and 6.6 per cent were unmarried. Fifty per cent have 1 to 5 children while 45.83 per cent of them have more than 5 children. Respondents without children constituted 4.17 per cent of the sample.

**Table 2**  
*Marital Status of the Respondents*

<i>Category</i>	<i>WIVES</i>		<i>Category</i>	<i>CHILDREN</i>	
	<i>No</i>	<i>Frequency</i>		<i>No</i>	<i>Frequency</i>
None	8	6.67	None	5	4.17
One	27	22.50	1-5	60	50.00
Two and above	85	70.83	above 5	55	45.83
<b>Total</b>	<b>120</b>	<b>100.00</b>	<b>Total</b>	<b>120</b>	<b>100.00</b>

A high proportion, 92.50 per cent of the sample were farmers by vocation before participating in the project, Table 3, while 3.33 per cent of them were migrant farm labourers. Those who claimed to be businessmen and office workers were 2.50 and 1.67 per cent respectively. Table 4 highlights the participants' farm size and yields. Over 63 per cent of the participants owned 5-hectare land each, followed by 33 per cent of them with plot size of 6-10 hectares each. Eighty-three per cent of the sample claimed that their farm sizes were bigger than what they had before participating in the project. However, 10 per cent of the farmers said their farm sizes were the same as before and 5.8 per cent of them claimed to have no idea of any change in their farm sizes.

Table 3  
*Occupations of Respondents Before Participating in SCIP*

<i>Occupation</i>	<i>No.</i>	<i>Frequency</i>
Farming	111	92.50
Business	3	2.50
Office work	2	1.67
Others*	4	3.33

\* Others = Migrant farm labourers.

Eighty per cent of the farmers said that their harvests were bigger since their participation in the project. However, 7.5 per cent of them indicated there was no difference in their farm yields and 12.5 per cent claimed to have no idea whether their farm yield was bigger or smaller. No farmer categorically indicated that there was a decrease in their farm yield.

Table 4  
*Farmers' Farm Sizes and Yield Before and After Participating in the SCIP*

<i>Hectares</i>	<i>Before</i>		<i>Category</i>	<i>No.</i>	<i>After</i>		<i>Yield</i>
	<i>No.</i>	<i>Frequency</i>			<i>Size</i>	<i>Frequency</i>	
1-5	76	63.33	Bigger	100	83.33	96	80.00
6-10	40	33.33	Smaller	1	0.83	-	-
Above 10	-	-	No difference	12	10.00	9	7.50
No response	4	3.33	No response	7	5.83	15	12.50

Types of crops grown and livestock raised by the participating farmers are shown in Table 5. Fifty-eight and 57 per cent of the respondents grow rice and wheat, respectively, while 34 per cent of them grow vegetables and 11.67 per cent grow cowpeas, onions and sorghum. Apparently, the aggregate number of farmers is inflated above the 120 sample size. This is because most of the respondents grow both rice and wheat in one cropping season. Similarly, some respondents grow both rice and vegetables. About 66 per cent of the respondents raised goat and/or sheep while 13 per cent of them raised cattle. Over 3 per cent of the sample raised poultry.

**Table 5**  
*Crops Cultivated and Livestock Raised by SCIP farmers*

<i>Type</i>	<i>Crops No.</i>	<i>Frequency</i>	<i>Type</i>	<i>Livestock No</i>	<i>Frequency</i>
Rice	70	58.33	Goat/Sheep	79	65.83
Wheat	57	47.5	Cattle	16	13.33
Fruits/Vegetables	41	34.17	Poultry	4	3.33
Others <sup>1</sup>	14	11.67	Others <sup>2</sup>	21	17.50

<sup>1</sup> Cowpeas, onions and sorghum

<sup>2</sup> No response on the item

Table 6 shows the modern farming techniques adopted by the participating farmers. Eight-five per cent of them claimed to use improved seed/seedling, fertilizers, irrigation as well as tractor and combines during their participation in the project. Only 25 per cent indicated that they used efficient post-harvest handling equipment for their farm produce. It is interesting to note that 33.3 and 8.3 per cent of the respondents

**Table 6**  
*Modern Farming Techniques adopted by SCIP Participants*

<i>Techniques</i>	<i>Before</i>		<i>After</i>	
	<i>No.</i>	<i>Frequency</i>	<i>No.</i>	<i>Frequency</i>
New and improved seed/seedling	—	—	102	85.00
Fertilizer	40	33.3	102	85.00
Irrigation	10	8.3	102	85.00
Tractor & Combines	—	—	102	85.00
Post-harvest handling of produce	—	—	30	25.00
Some of the above	—	—	18	15.00
None of the above	—	—	0	—

respectively, claimed to have used fertilizers and irrigation systems before participating in the project. Fifteen per cent of them asserted that they only adopted some of the modern farming techniques since the project was established.

Infrastructural facilities and socio-economic benefits enjoyed through participation in the project are presented in Table 7. The majority, 94.2 per cent, of the respondents claimed to have been provided with pipe-borne water, electricity and agricultural extension services. Also, a large proportion, 92.50 per cent, of the respondents asserted that their farm earnings have increased and consequently their living standards have improved. Five per cent claimed to own houses as a result of their participation in the project. All the respondents indicated they now own personal means of transportation, such as bicycles and motorcycles, as well as having wider business opportunities following their participation in the SCIP.

**Table 7**  
*Infrastructural Facilities and Socio-Economic Impact on SCIP Participants*

<i>Categories</i>	<i>No</i>	<i>Frequency</i>
Pipe-borne water*	113	94.17
Electricity	113	94.17
Extension Offices	113	94.17
Increased Farm Income**	111	92.50
Higher standard of living	111	92.50
Own a house	6	5.00

\* Some respondents who claimed to enjoy pipe-borne water also had access to Extension Services.

\*\* Those who claimed to have increased farm income also claimed to enjoy a higher standard of living.

Problems of respondents and their attitudes towards SCIP are presented in Table 8. Twenty-five per cent of them complained of financial problems, while 56.7 per cent of them reported that they have had a very busy farming schedule. The 22 respondents who checked "others", indicated that they faced the problems of inadequate grazing land for their livestock particularly during the prolonged dry season, and that the project has disrupted the socio-cultural fabrics of their community. However, all the respondents expressed their complete satisfaction with the overall achievement and activities of the SCIP.

**Table 8**  
*Problems Encountered by the Respondents*

<i>Problems</i>	<i>No</i>	<i>Frequency</i>
Finance	30	25.00
Always engaged in farming	68	56.67
Others	22	18.33
<b>TOTAL</b>	<b>120</b>	<b>100.00</b>

When asked to make suggestions for the improvement of the SCIP as it affects the respondents, 88 per cent of them advanced the following suggestions.

1. The irrigated area should be increased in order to increase the hectares allotted to participating farmers.
2. The total effective "cropped area" for every season should be planned on the basis of the water reserve of the Lake Chad.
3. The execution of farming operation like planting and harvesting should be more regular and timely.
4. The Extension Service machinery of the authority should be strengthened to enable it educate the farmers properly on the modern farming techniques they are expected to adopt.
5. Provision of more infrastructural facilities, such as better feeder roads, schools and medical clinics.
6. Livestock tracts and grazing reserves should be provided particularly during the prolonged dry season.

#### **Summary and Conclusions:**

Contrary to the general conception held by many people that farming is for the aged and dying, this study revealed that an economically virile proportion of the sample takes to farming in the project as a lucrative business. This is attributable to the modern farming techniques such as the use of fertilizers, pesticides, improved seeds, irrigation service and farm mechanization. Eighty-five per cent of the participants claimed to have adopted the improved farming practices.

The majority of the farmers - 83 per cent - confirmed they have larger farm holding since their participation in the project. Thus they were able to increase their scale of operation as well as their farm output. The sampled farmers in the project obtained inputs and other agro-services at highly subsidized costs: fertilizers, seeds and land preparation are respectively subsidized as high as 90, 60 and 75 per cent. The ultimate salutary impact of the modern irrigated farming being developed in the project by the authority is that 80 per cent of the

participants claimed they had bumper harvests, while 93 per cent asserted that they had a higher farm income. Some 17 per cent of the respondents claimed they were able to build better houses and to buy bicycles and motorcycles. The authority provided infrastructures to the participating farmers. This is evident in the claim by 94 per cent of the participants that they had access to pipe-borne water, extension services and feeder roads. All the respondents felt satisfied with the activities and achievements of the SCIP so far.

One of the most positive effects of modernised and mechanised farming is of course the increase in wealth it produces. Generally speaking, the people interviewed claimed that they used rather than sold their crop, selling only part of it to buy clothes and other available goods. The people invest any excess cash from the sales of their crops on livestock as a form of insurance against future poor harvests. The sale of crops automatically creates cash in the area available to be absorbed by traders offering a variety of goods for sale. This process has also been aided by the creation of wages employment in the area which came along with the birth and operation of SCIP. Based on the findings of his study, it could be stated that the SCIP has improved the agricultural productivity of the participants, the social amenities in the area and the economic well-being of the participants.

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## HIGH ENVIRONMENTAL TEMPERATURE—A PROBLEM TO POULTRY PRODUCTION IN BORNO STATE.

by

Elizabeth N. Gadzama

### Abstract

Poultry production has expanded greatly over the past 4 to 5 years in Borno State. A conservative estimate puts it at about 10 times increase, despite natural and man made problems being confronted by the industry. However, out of the several obstacles facing the poultry industry, a single natural one which has considerable detrimental effect on poultry production is that of high environmental temperature of this geographically distinct sahelian region.

A survey to determine the effect of high environmental temperature on egg production, broiler production and hatchability was conducted over a three-year period. The results of the survey showed that between the period of March to May when environmental temperature of up to 43°C was recorded in Maiduguri, a 8–20% drop in egg production, 4–100% mortality in broilers, and a drop to 20% hatchability resulted. Methods of cooling birds in hot weather are discussed.

### Introduction

Since the introduction of the 'Operation Feed the Nation' Programme by the former military administration and now the 'Green Revolution' Programme by the present Federal Government, the awareness of the farmers and individuals to invest capital on poultry production had greatly increased. There has also been marked need for this country to solve its acute animal protein shortage. With this problem, it is realised that poultry production with its advantage of giving a quick turn over in terms of meat and eggs is a useful venture to go into. Therefore, both the government and private individuals have, within the past few years, established either hatcheries to produce day old chicks or broiler farms.

For example, the Federal Government is establishing hatcheries in Kano, Ogun and Cross River States with a total production capacity of 5.4. million day old chicks annually (Federal Government Progress Report 1982). A grand parent stock farm had also been earlier established at Lafia in Plateau state to supply day old chicks to poultry farmers. Small scale egg production are being supported with the supply of over 96 x 800 units of battery cages in all the States at subsidised prices through the green revolution programme. In Borno State too, there has been an increase in number of commercial poultry farms as well as small scale producers in the past five years. A conservative estimate puts it at about 10 times increase. However a problem that poultry farmers face in Borno State because of its sahelian location is that of high environmental temperature and low humidity in the dry season.

This sub-region contains two prominent patterns of weather. There is the rainy season from June to September where environmental temperatures range between 20.8°C to 26.4°C. The dry season starts from October to May. Within this season however two distinct weather patterns exist. The period from October to February is characterised by the harmattan, which is a cold dusty wind blown from the Sahara desert. At this period environmental temperatures have ranged between 20.0°C and 32°C. The period from March to May is dry with high environmental temperatures ranging between 40°C to 43°C. This is the period that constitutes a major problem to poultry production in Maiduguri.

On ambient temperature effect, Prince *et al* (1960) had shown that increasing environmental temperature from 10°C to 24°C resulted in a highly significant linear decrease in feed consumption in 4 to 8 weeks old chicks. In 1964, Prince *et al*, further established that 4 - 8 weeks old chicks, when subjected to environmental temperatures of 12.6°C and 23.8°C feed consumption was significantly lower at the higher temperature. Weight gain was also lower at 23.8°C than at 12.6°C but the relative humidity had no significant effect on feed consumption at both temperatures. Adams *et al* (1961) raised broiler chickens of 4 to 8 weeks and 6 to 10 weeks old and at 21°C and 32°C found that the groups of chickens kept at the higher environmental temperature were less in growth and feed intake. Davis (1966) subsequently reported that, in Australia, fowls were able to live for a short while in temperature up to 37°C and that heat regulating mechanism breaks down at this temperature. The birds died of heat stroke at about 47°C. As with regard to temperature effect on egg laying, Smith and Oliver (1971) reported that, the comfort zone was 4.5°C to 21°C and that the optimum temperature for egg production was 12.5°C.

Literature on the effect of high environmental temperature on egg production, hatchability and broiler mortality in Borno State is very limited. In fact the only experimental assessment was done in Baga by Ubosi (1981), where he assessed the effects of roof insulation on performance of laying hens in floor pens. The average ambient temperature during the hot season ranged between 39°C to 41°C. He compared 3 roof insulations—*asbestos roof only* (which had a poultry house temperature of 37°C) *asbestos roof with straw mat ceiling* (with temperature of 36.40°C) and *grass roof only* (temperature of 35°C). He reported that during the hot season, the poultry house with grass roof only had an average egg production of 72.14%, *Asbestos* had 63.73% while *Asbestos with straw mat ceiling* had 64.97% which meant that grass roof had better insulation capacity than the other two. Mortality was 2% in *Asbestos roof only*, 1% in *Asbestos with straw mat ceiling* and 0% in grass roof only.

On the effect of temperature on hatchability, North (1978) demonstrated that temperature above 27.5°C is not satisfactory for holding fertile eggs.

Nature has however, provided birds like other members of the animal kingdom with some cooling device. Chickens pant and raise their wings in an attempt to reduce the stress caused by heat factor. In the free living birds dwelling under natural surroundings such mechanism have proved adequate, but not with birds which are housed indoors as they are today on a high density basis. Their inbuilt heat regulating mechanism is inadequate to cope with some of our man made stress factors, particularly on days that register very high temperatures with low humidity. Birds themselves

also act as little 'heat machines' giving off quite an appreciable amount of heat. In a well ventilated, uncrowded backyard poultry house, made of cement walls with wire netting and zinc roofing, a temperature of 46°C had been recorded. In such instances the heat regulating mechanism of the birds break down and body temperature are no longer under control. The body temperature therefore keeps rising until the birds die of heat stroke. If the birds do not die, production decreases, which still means losing money.

To assess the effect of high environmental temperature on egg production, broiler production and on hatchability, a survey was carried out in Maiduguri over a three-year period by examining egg collection and mortality records of various poultry farms, and as much as possible trying to identify the causes of mortality. Oral interviews were also conducted with the poultry farmers to discuss their experiences in poultry production in relation to the weather. High temperature effect on hatchability was also examined through oral interview with the personnel of the hatchery in Maiduguri.

## Results and Discussion

### Effect on Egg Production

In a survey where 5 poultry farmers managing large scale egg laying flock and 20 small scale poultry farmers were interviewed, and their egg collection records examined, the results indicated that there was a distinct drop in egg production of between 8-20% between the period of March and May. Twenty-two thousand layers were involved in the survey. The large scale farms use mainly asbestos as roofing materials and the walls are of 1/3rd solid cement and 2/3 wire mesh. The small scale poultry keepers mostly used corrugated iron or zinc for part of the walls as well as for roofing. However, the side walls are 1/3 or sometimes 1/2 solid and the rest wire netting. The large scale producers experienced a drop between 8-10%, while the small scale farmers experienced a 18-20% drop. The difference between the production drop of the small scale keepers and the commercial producers may be attributed to the differences in the housing and roofing materials. It is known that Asbestos has more insulation capacity than zinc or corrugated iron. The fact that commercial producers have to be more strict in terms of good management because they are more profit oriented than small scale producers might also have a contributory effect. The drop in egg production experienced between the months of March and May could be mainly due to the fact that the birds consume less feed due to the high environmental temperature (Prince *et al* 1960. Adams *et al* 1961) and consequently less nutrients are available for egg formation.

### Effect on Broiler Production

Three large scale producers and 10 small scale producers were interviewed and their mortality records examined, the results indicated a mortality range of between 4-100%. Post mortem reports revealed a diagnosis of death from heat stroke. One large scale producer discussed his experience with 20,000 broiler chicks which he ordered from Lagos. He lost all the 20,000 broiler chicks while transporting the chicks from Maiduguri airport to his farm which took him about 30 minutes drive. In this case too a

diagnosis of death from heat stroke was made. This experience had made him to poultry farming. In Maiduguri 90% of the broiler producers suspend production between March and May when environmental temperatures are high. Adams (1961) has shown that temperatures above 32°C caused reduction in growth and decreased feed intake. Unfortunately however, it could not be established from a survey if the broilers produced during the hot weather had lower growth rate and body weight than those raised at other times.

### Effect On Hatchability

On assessing the effect of heat stress on hatchability it was discovered that the egg hatchery based in Maiduguri, suspends hatchery during the period of March to May because of the poor hatchability experienced during this period. The hatchery records revealed a drop in hatchability up to 20%. The hatchery here in Maiduguri supplies day old chicks to all government poultry farms in the local government areas of the State, as well as selling some at subsidised prices to local farmers. It therefore means that when egg hatchery is suspended for 3 months the supply of day old chicks to the local government poultry farms and to the local farmers also suffers. This has a detrimental effect on the efforts to reduce our acute protein shortage.

The ideal holding temperature for fertile eggs appears to be 12.5°C at relative humidity of 75% for about 3-7 days. Temperatures above 27.5°C are not satisfactory for holding fertile eggs because slow embryonic development occurs which weakens the embryo thereby resulting in high embryonic mortality during incubation (North, 1978). It is expected that in Maiduguri too, the detrimental effect on the egg is produced by the high environmental temperature prior to collection and storage of the eggs in a cool room.

### Cooling Methods

Various methods are recommended for cooling birds in hot weather. One of such methods is to deliberately locate poultry houses in areas with lots of shade trees. Or alternatively to plant trees near poultry houses so that sufficient shade is provided.

Where corrugated iron sheets are used for roofing, the roof should be painted with reflective paint on the upper surface and black paint on the under surface. This assists in reflecting away sun rays, thus keeping the birds cool. The placement of thatch on corrugated iron roofing is used by some farmers to reduce the temperature in a poultry house. Infact, Ubosi (1981) had shown that placement of straw mat ceiling in an asbestos roofing reduces the temperature in a poultry house from 37°C to 36.4°C. Asbestos and thatch are good roofing materials which assist in keeping the birds cool. But for small scale poultry farmers asbestos may be too expensive to use. It was however noticed in Maiduguri that even where asbestos were used for roofing the environmental temperatures were still high enough to cause a drop in egg production. Thatch has the disadvantage of being liable to vermin attack, and needs changing often. Misting or fogging of pens with series of nipples ejecting a fine spray of water assists in keeping birds cool. However this system is difficult to operate in Maiduguri because it requires large quantity of water which is in acute shortage during the hot period.

Another shortcoming of this system is also due to the fact that most poultry farms use deep litter management and cannot therefore fog the birds in such houses because damp conditions are conducive for the out break of coccidiosis and other diseases. It is best used for birds in cages.

Another cooling system recently described is the covering of poultry house windows with wet curtains. But like fogging its shortcoming is that it needs a large quantity of water to be operational. It also cannot be used in deep litter system.

### Conclusion

It is difficult at this stage to attribute all the drop in egg production, hatchability and mortality to temperature alone. Other management factors and diseases not obvious to the farmers, might have some contributory effects. However, several points arise on the problems of heat stress in chickens in Maiduguri. For example, the best housing designs, the appropriate roofing materials for this environment and the amount of insulation needed are but a few important areas for immediate research. Other areas which need consideration include, the cooling systems conducive for this weather, the bird density per unit area, the best egg holding conditions and the frequency of collection. Our local breeds of chickens and guinea fowls which appear to be tolerant to heat stress, could also be studied for improvement of their production potentials. Certainly answers to these points are needed by the poultry farmers in order to assist in boosting poultry production in Borno State during hot periods.

### Acknowledgement

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## THE SYSTEM OF CATTLE MARKETING AT THE MAIDUGURI STOCK-YARD

by

O. D. Famure

### Abstract

This paper examines the procedure by which cattle are traded at the Maiduguri stockyard. Specifically it looks at the size distribution of the participants in the market, the facilities and infrastructures for marketing, and the price-making mechanism.

The participants in the market comprise the buyers, the sellers, the licensed buying agents, and a series of middlemen. The market shows more competition among sellers than buyers, and pricing and exchange is done exclusively by private treaty.

Cattle sold are not standardized by weight, grade, backfat, or any other measure. Visual inspection is mostly used to determine the market value of a cow, and the price paid, therefore, is a function of the size and physical condition of the animal.

It is suggested that modern cattle marketing facilities like standard weight scales, feeding mangers, watering points, loading and holding points, etc. be provided. A more efficient pricing system can evolve from the establishment of standardized grades for various types of cattle. The use of scales would also help in standardizing the price paid per head of cattle on weight basis and the extent of body fat.

### Introduction

Some of the reasons adduced for the insufficiency of animal protein in the diet of many Nigerians are that there exists insufficient livestock production and a defective distribution system for livestock and meat products in Nigeria. (Green Revolution Mission, 1981). Although the marketing channels of live animals in Nigeria have been widely documented and its essential features identified (Famoriyo, 1979), no rigorous studies have been done on the spot market for live animals in terms of structure, conduct and performance, volume of infrastructural deployment, inter-temporal and spatial price relationship, and degree of efficiency, as a channel to improving animals protein deficiency. These aspects of the livestock subsector are important because in terms of producer problems, doubts, frustrations, and dissatisfaction, it is the pricing of the product—the outcome of the buying-selling function—which sets the pace for increased production and efficient marketing.

The purpose of this paper is to outline the pattern of trade and exchange of cattle at the Maiduguri stockyard. Although the research results reported in this paper and the ideas discussed are drawn essentially from the study of the Maiduguri terminal market, they have relevance to many other terminal markets in Nigeria where Livestock are traded.

### Objectives of the Study

This paper deals primarily with the physical arrangements and agencies concerned with buying and selling of cattle at the Maiduguri stockyard market. The specific objectives of the paper are:

1. To examine the structural organization of the participants in the market with a view to determining the degree of competition.
2. To investigate the mechanics of pricing and exchange of cattle among the buyers and sellers.
3. To determine how well the market performs its facilitative functions by examining the level of physical facilities and infrastructures used for handling livestock or for bringing buyers and sellers together.

### Methodology

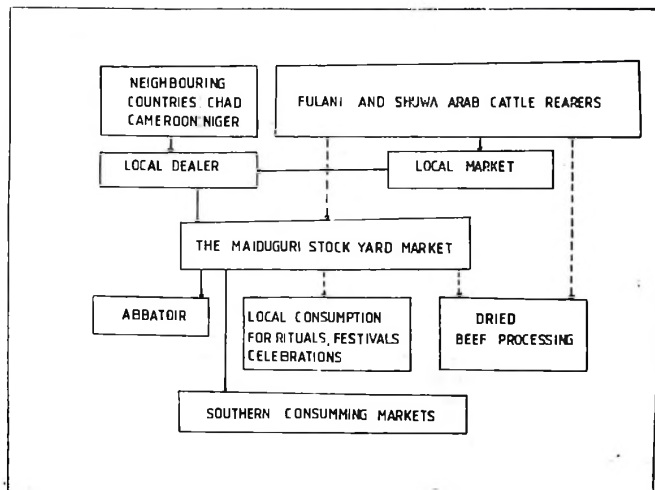
Data collected and analysed were essentially primary. One hundred and forty-three (143) people with various cattle holdings comprising 62 buyers and 81 sellers were randomly interviewed (*Tables 2 and 3*). Most sellers had very small holdings ranging from 1 head to 20. Secondary data and published market information were virtually non-existent. The study is organized into four parts. The first part deals with the physical structures and facilities available in the market and the organizational arrangement of cattle and the participants in the market. The second part looks at the size distribution of sellers and buyers in the market and the variety of middlemen involved in the exchange process. This leads us to the discussion of the operational features of the market in terms of how buying and selling is done and prices established. Part four analyses the implications of the pricing and exchange procedure at the stockyard market.

### Marketing Practices at the Producer Level

The Nigerian livestock producer has several ways in which he may sell his livestock, the choice depending to a large extent upon the quantity and type of livestock to be sold, the extent of market information known to him and the experience of the individual stock raiser. He has the choice of marketing his livestock: (Fig. 1)

1. direct to the abattoir or the local butchers;
2. through a terminal market or public stockyard;
3. through a country or local dealer;
4. through a local market.

This paper deals with the terminal market since it is the dominant system of cattle marketing in Nigeria, and it operates as the balance wheel for the livestock industry as a whole. The public stockyard has several features that give it a definite advantage over other outlets. The stockyard is a competitive market which establishes prices for the cattle market as a whole. Prices established on the stockyard market are used as a basis for consummating transaction in livestock selling and buying elsewhere throughout the southern part to the country<sup>1</sup>. Buyers are usually present, offering competitive bids, thus giving the producer a good chance of getting top prices.



Source Field survey Analysis  
 Key ——— Strong Channel  
 - - - - - Weak Channel

Fig. 1. Cattle Producers Marketing Channels in Borno area.

### Facilities and Infrastructures

Established by the control of Trade Cattle Regulation of March, 1943, the Maiduguri stockyard had grown to be the largest of the fourteen major terminal markets in Borno State (Northern Ministry of Justice, 1963). The area spanned by the market is about 15 hectares. The market has approximately half a kilometer of railway track located on its property and used exclusively for livestock service. There are seven sale ring layouts or wooded racks for loading livestock departing by rail to the southern markets. There are also five truck loading and unloading facilities.

There are, however, no covered sale and storage pens, alley ways, and corrals, and cattle are continuously moved from one part of the market to the other. There is thus no ensured protection from weather while there are no feeding and watering facilities. On standardization there are no weight scales and no grades. Sales are generally not by weight, and prices depend on visual inspection of size and physical condition of the animal.

### Organization Arrangements

The yard physically is divided into sections by species: cattle, sheep, horses, goats, camel and poultry. Cattle, however, is the most numerous type of animals sold. Cattle traded can be classified into three broad groups according to size and physical condition or appearance (Table 1). The first class of cattle is the Kuri. These are the biggest-sized cattle found in Nigeria and are indigenous to the Lake Chad region. This breed of cattle command the highest price in the stockyard market. The second class of cattle is made up of many breeds, of cattle, e.g. Abore, Mbala, Bunaji, Rahaji, etc. as such there is a wide variation in sizes and physical appearance within this group depending on the breed of the cattle. The larger breeds of this group include the Bunaji, and Rahaji, while the smaller breeds include the Abore and Mbala.

Table 1  
*Cattle Classification by Size and Physical Condition*

<i>Group</i>	<i>Size</i>	<i>Breed</i>	<i>Physical Condition</i>
1	Large	Kuri	Healthy and Strong
2	(a) Medium	Rahaji, Bunaji	Healthy and Strong
	(b) Small	Mbala, Abore	Healthy and Strong
3	Any	Any of Above	Sick and Weak

*Source:* Author's Evaluation Survey.

The third class of cattle are differentiated from the preceding two by their physical and health conditions. This group constitutes the weak or sick-looking cattle which cannot withstand further marketing strains like being transported to the distant markets in the south. They are thus mostly bought and consumed locally. Cattle in this group can belong to any of the breeds mentioned above except that they are of relatively lower quality, hence they sell at the lowest prices. The smaller the size or weaker or more sick-looking a cattle is the smaller the price it would fetch.

### Structure of the Participants in the Market

The Maiduguri stockyard market operates daily and the buying and selling is open to the public although activity is light on Fridays. Selling is done exclusively by private treaty, by a wide range of people who market directly or indirectly the cattle supplied to the market. These include: producer-sellers, middlemen, and country (local) dealers—(Table 2). Buying is done almost exclusively by personnel of licensed merchants with minor purchases made by local butchers, semi-independent agents, and others comprising social celebrants and workbull purchasers (Table 3).

### Producer Sellers

These are cattle owners who sell direct to the market. They walk their cattle to the market on hoof and to a lesser extent through hired truckers. This class constitutes the highest proportion of sellers (about 67%) in the market (Table 2), but usually with very small holding ranging from 1 head of cattle to 3. The producer-seller acts as his own agent in selling but often enlists the services of friends or relatives which are usually rendered free. Most sellers in this class are Shuwa Arabs or Fulani. A great loss in weight or shrink occurs to the cattle when the cattle are "driven" on hoofs for a long distance to the market. While, however, the producer-sellers constitute two-thirds of the sellers in the market, they do account for a smaller proportion—one-third—of the total number of cattle sold.

**Table 2**  
*Size Distribution of Sellers and Market Share*

<i>Class</i>	<i>No of Sellers</i>	<i>% No. of Cattle Sold (Mean Sales)</i>	<i>Market Share (%)</i>	
Producers	54	66.67	2.67	33.64
Middlemen	22	26.16	8.32	41.88
Local Dealers	5	6.17	21.40	24.48
Total	81	100.00		100.00

Source: Author's Evaluation Sarvey

Table 3  
*Buyers Classification and Share of Purchases*

<i>Class</i>	<i>No. of Buyers</i>	<i>%</i>	<i>Share of Purchase</i>	<i>%</i>
Licensed Merchants	3	4.84	87.46	
Service Middlemen	45	67.74	—	
Other Middlemen	2	3.23	8.86	
Butchers	12	19.35	3.01	
Others	3	4.84	0.67	
Total	62	100.00	100.00	

*Source:* Author's Evaluation Survey.

#### **Middlemen or Commission Agents**

A producer who wishes to sell livestock at the stockyard consigns his livestock to a middleman. Most producers who patronize the market have such acquaintanceship. Most of the middlemen are regular users of the market and hence are more informed about the existing market situation than most of the producer-sellers.

The middlemen are few in number relative to the producer-sellers. They account for about 27 per cent of all the sellers but control a relatively higher share of total cattle sold—about 42 per cent. The middleman receives a fee or commission for his services. The fee is based on the value of the animals sold and neither on a per head basis nor a fix percentage of the proceeds. The commission therefore bears no relation to the amount of services provided.

#### **Local or Country Dealers**

The local dealer provides an important link in the marketing system. Dealers purchase primarily at the farm; they buy livestock from farmers and market them on their own account<sup>2</sup>. After collecting the desired number of heads from the producers in the scattered areas of production, the local dealers trek their stock to the market where they sell either in bulk to the licensed cattle merchants or decide to sell each head individually. Some of the local dealers have established sound customer relationship with the licensed merchants to whom they always sell. Some even have contract financing from the licensed merchants to facilitate purchase of cattle from farmers. Such dealers are thus obliged to sell cattle to the merchants or their agents at the market. The local dealers form about 6 per cent of the sellers in the market but handle a relatively higher percentage (24 per cent) of all cattle sold.

## The Buyers

As opposed to the sellers the buyers demand and buy cattle either to resell for profit, to celebrate an occasion, to use as work animals or for breeding purposes. In contrast to the sellers the buyers usually are more enlightened and more literate. They have urban attitudes; they are regular users of the market and hence are better informed about the market situation. Buyers can be classified as follows:

"Licensed merchants". These are cattle merchants who have licenses that authorize them to buy cattle at the stockyard and sell them in the southern markets. They provide an important outlet and the regional link between the northern production areas and the southern consuming markets<sup>3</sup>. They assemble livestock from farmers or local dealers, load their stock and ship them by rail or truck.

The proportion of the licensed buyers relative to other buyers in the market is very small, about 5 per cent; but they account for a proportionately large share of total purchases (87.5) in the market. A licensed buyer has to show evidence of great financial networth or undertaking. This requirement is made necessary because of the tremendous expense of shipment and transportation involved. Thus there exists a high degree of concentration on the buying side of the market.

"Commission Agents". Commission agents are employees of the licensed merchants. They act as agents of the merchants in purchase of livestock since the purchases are made on a head to head basis, and are time-consuming. The agents also coordinate with the markets to which the merchants intend to transport their stock. In procuring livestock, commission agents sometimes are authorized by the merchants to transport cattle to the southern market under the latter's license.

Most of the agents are salaried employees of the license merchants and in addition paid some commission based on the volume of business handled. Commission is also sometimes based on the price at which the animals are bought. The lower the purchase price of the cattle the more commission the agent is likely to receive.

The commission agents form the largest group of buyers in the market accounting for over two-thirds of all buyers. They are highly instrumental to the large volume of cattle handled by the licensed merchants.

"The Butchers". These are the people who buy and slaughter cattle at the abattoir so as to supply meat to Maiduguri community. Sometimes the butchers travel to the nearby villages and buy livestock from the farmer; but the Maiduguri stockyard market which is strategically located very close to the abattoir is the main source from which most of the cattle consumed in Maiduguri are bought. The butchers are about one-fifth of the buyers in the market but account for a proportionately less volume of trade (3.01 per cent) in the market.

"Other Buyers." Other buyers include those who buy cattle either to use as workbulls or to slaughter during celebrations, This category of buyers account for about 5 per cent of the cattle buyers but share less than 1 per cent of the purchases.

## Pricing and Marketing Practices at the Stockyard

A producer who wishes to sell livestock at the stockyard market would conspicuously display his animals in order to attract buyers. He also makes arrangements regarding feeding or handling of the livestock at the market. The animals are sorted with regards

to species but not to uniformity in weight, grade, or colour. The seller or stockowner stays with his animals while the middlemen or commission agents come around to assist in selling the cattle if their services are needed.

The animals are offered for sale at the most advantageous terms from the standpoint of the seller. Selling is done exclusively by private treaty—a system under which the final selling price of a cattle is determined by bargaining and negotiation. The salesman takes bid privately on each individual animal and terminates the transaction by selling to the highest bidder. Much haggling is involved and thus the act of buying and selling is much more time-consuming than when sales are done by auction or goods standardized by grades. However, the skill and expertise of a commission agent comes in at this point to buy at a reasonably low bid. If the seller on the other hand is unable to obtain a reasonable offer, he may hold the livestock over for the following day's market.

Upon the completion of sale, ownership of the cattle is transferred to the buyers or delivered to the ring layout of the buyer for shipment to the southern markets. Details of the transaction (volume, and name of buyer) are transmitted to the Bulama's (market head) office, and one naira (₦1.00) is charged by the State government for each head of cattle sold.

### Results and Implications

*Structure:* The structure of the sellers segment of the market is such that there is no concentration and therefore no market power exercised by the sellers. Because there are many sellers, competition is high and no single seller could influence the market.

Conversely the buyers side of the market is highly concentrated, being dominated by a few large merchants. These merchants form about 5 per cent of the total buyers, but account for 87.5 percent of all cattle purchased; while the remaining 95 per cent of the buyers bought 12½ per cent of the stock. The merchants under the umbrella of "patent licensed rights" thus control a high degree of market power and constitute high barrier to entry into the market<sup>4</sup>. There are also more sellers in the market than buyers and so there is imbalance in the structure of buyers and sellers. The imbalance gives advantage to the buyers in the negotiation of selling price<sup>5</sup> and in the nature of competition that exists in the market.

### Operational Features

Selling of cattle is done on a head to head basis, and not by lots, exclusively by bargaining and negotiation. The salesman exhibits his livestock to all possible buyers individually, takes bids privately and terminates the transaction by selling to the highest bidder. This method does not give all the buyers equal opportunity to bargain for the cattle at one and the same time and the buying and selling operation to be seen by every one. The outcome (price and other terms of the transaction) is known only to the participants. This is in contrast to an auction where bidding is done by public outcry and terms of the transaction are known to everyone in attendance. Another limitation of the head-by-head selling methods is the lower selling which results in higher shrinkage and higher selling expenses when compared with selling in lots or direct to an abattoir.

Cattle are not standardized by weight or any other measure such as amount of back fat, leanness of meat, etc. The price paid per head depends on the size and physical condition of the animal. The market in this regard does not seem to perform its facilitative function of improving pricing efficiency through standardization of quality grades. This has serious implications for the commercialization of the beef sector.

### **Facilities and Infrastructures**

Market infrastructures are grossly inadequate. There are no feeding or watering facilities, weighing scales, but only few loading and holding points. There are no houses or cover provided for cattle to ensure protection from the weather, neither are there comfortable quarters for buyers and the general public to sit. The poor facilities do not augur well for the cattle and the producer-seller who might have driven his cattle for a long distance to the market with physical hazards on the trail. The producers are therefore usually put at the mercy of an unfavourable market condition and would like to sell their cattle once they are shipped to the market rather than bring them back to the farm.

### **Market News and Information**

The Borno State Veterinary Services Division keeps records of cattle that are shipped from the stockyard market to other markets either by rail or by truck while the Metropolitan town Council keeps records of the number of trucks that load cattle from the market. But no records are kept concerning other essential variables such as prices based on grades of cattle, number of cattle refused entry into the market, because of health conditions, number of cattle sold to buyers other than merchants etc. There are also no market news and reports on daily activities and conditions in the market. Selling, therefore, is a risky and unpleasant activity especially as the producer-sellers who drove their cattle from the country side are mostly illiterates, and constitute the highest proportion of sellers in the market. It is not surprising why these group of producers cherish rearing cattle more for social than for economic reasons (Adesipe, 1982).

### **Middlemen and Commission Agents**

Middlemen receive fees for the services (buying or selling) they perform in the exchange transaction. The fee which based on the value of animals sold and not on a per head or a fix percentage of the proceeds does not bear any relation to costs of providing the services. It is therefore discriminatory since the time, effort, and knowledge required by middlemen to hand each animal for sale is reasonably equivalent. Thus, depending on the stock owner, the middleman may or may not get a fair remuneration for his services.

### **Recommendations**

Hitherto Government intervention in livestock marketing has been limited to trade route regulations and prevention of diseases and maintenance of standards in

abattoir/slaughter slab operations. It can certainly do much more. With regards to marketing at the stockyard the following things can be done to promote marketing efficiency:

### 1. **Facilities and Infrastructure**

It is of most importance that the stockyard market permits the maximum amount of protection and benefit to the shipper. This is so because long-term development of the meat industry will depend on the incentive given to the producers to improve their methods of cattle raising. Where practicable objective standards and modern facilities for live animals should be established. This will involve the establishment and use of standard weight and grades for different qualities of livestock in the market.

The use of scales and grades is advantageous from the standpoint of promoting an efficient pricing system. It will help in standardizing the price paid per head of cattle on the weight basis and extent of body fat. The innovation can also be of help in ordering cattle on weight basis without having to physically inspect each head. The standardization process will also reduce haggling, marketing costs, and the service of some middlemen.

Other facilities that can modernize the marketing system include weighting scales, modern feeding mangers, covered pens, watering points and loading and unloading points. A section of the yard could also be set aside for the storing of livestock in transit. This section be well removed from sales area to allow animal in transit to rest without being disturbed.

### 2. **Cooperatives or Marketing Boards**

Livestock marketing Cooperatives or Boards should be formed by the isolated atomistic producer-sellers to counteract the market power concentrated in the hands of the cattle licensed merchants. Cooperatives could also be formed into shipping associations for assembling and forwarding stock to the stockyard instead of the long distance that cattle have to be driven on hoof. In the same vein, marketing boards could be used to provide production and marketing credit, faster improvements in market news services and grade standards, sponsor research, and carry out various educational activities that would improve the quantity and quality of livestock produced.

### 3. **The Auction Method**

A system of selling by auction should be evolved to supplement the only currently used system of bargaining in privacy. Under the auction methods the animals are shown openly in a sale ring for all interested buyers to see and bids by public auction are known to everyone in attendance. This method in essence gives the producer a good chance of getting top prices for his cattle, and the established price would represent a more competitive price than that established under private treaty.

## Notes

1. The Nigerian Livestock Market is a national one where changes in supply from the cattle production belt of the north tend to be reflected in the retail price of meat in the southern consuming markets.
2. In addition to the in-state gathering of cattle for the stockyard market, a large proportion of the cattle handled by the local dealers are those entering Nigeria through the neighbouring countries of Niger, Chad and the Cameroun.
3. The licensed merchants are the only buyers in the market authorized to engage in the inter-regional cattle trade to the south.
4. High barriers to entry do not in themselves furnish proof of adverse economic behaviour. However, if an industry has high barriers to entry, this would at least provide some grounds for investigation of behaviour and performance of firm in the industry.
5. The middlemen, especially those who assist cattle sellers play an important role in moderating the price at which cattle are sold by hard bargaining and negotiation with cattle merchants and their agents.

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## EXTERNALITY RAMIFICATIONS OF RESOURCE ALLOCATION UNDER COMMUNAL RIGHTS IN LAND IN THE SAHEL

by

Michael B. Olufolaju

### Introduction and Problem Statement

The problems of poverty, malnutrition and starvation in many of the less developed countries of the world have become a major issue of world-wide concern. In these nations domestic food production, largely undertaken by the peasantry, has not kept pace with population increase. Where a poor nation also lies within the arid or semi-arid region, the usual problems of peasant farming are complicated by drought conditions. Such is the case of the Sahelian region, where the problems of agricultural production are further compounded by the existing land tenure system.

In the Sahelian region, exploitation of land is undertaken on an individual (or family) basis, whereas ownership of the land is vested in the community as a whole. According to Thompson (1977), who undertook a study of the problems being encountered by the government in the enforcement of soil conservation regulation in the Inuwa District, Niger, "local variations do exist throughout the West African Sahel, but the general pattern holds, as does the range of associated problems... traditionally Inuwa farmers practiced a type of fallow agriculture which left a substantial portion of the land with some form of cover... village fields revert to communal pasture land"—during the long dry season.

Thus, in the Sahelian region agricultural production is confronted by three levels of problems, namely, (i) the usual problems of peasant agriculture such as illiteracy, low levels of investment and low level of technology, (ii) the problems of low levels of precipitation and occasional drought occurrences, and (iii) the problems of externalities in resource allocation associated with communal system of land ownership.

### Objective of this Article

This article is centred on a theoretical discussion of the impacts of property rights in land in the Sahel on agricultural production within the framework of economic theory of property rights. Therefore, as an exercise in externalities (in micro-economic price theory) the emphasis in this article is not on the details of the land tenure system in this region, but rather on a theoretical exposition of the externality implications (deleterious effects) of communal rights in land in terms of divergence between private and social costs of land utilization, technological constraints and price (or economic) incentive/disincentive. In other words, all we need for the exercise we are about to undertake is a confirmation that the general pattern of land ownership/operatorship in the Sahel is that of communal rights/private operatorship. Such a confirmation we have already got as indicated in Thompson's (1977) article.

In section one, the economic efficiency of agricultural production under communal rights/private operatorship is analyzed within the framework of economic theory of property rights. In section two, our technical analysis of section one is substantiated with real life examples of land over-exploitation activities in the Sahel. The emphasis here is on the prohibitive private costs of land utilization, the burden of which has been manifested in considerable human sufferings. Finally, in section three, we show that the same problem can be examined from the standpoint of technological progress. Here, the aim is to rigorously demonstrate that communal rights in land invariably imposes severe restrictions on technological progress, a factor without which no abatement in human sufferings in this area can be envisaged.

### Analysis

#### I Private Cultivation under Communal Rights Examined within the framework of Economic Theory of Property Rights

First, we distinguish between three types of property rights—private, communal and state ownership—with particular reference to the right of usage, exclusion and transferability. A private owner of a piece of land is recognized by the community as having the right of use as well as the right to exclude others from interference. It is also of considerable economic significance if such right is transferable so that an enterprising individual or group of individuals who wish to purchase land for exploitation is not inhibited. In a system of communal ownership, a citizen has the right of usage but not the right to exclude others from the use of a piece of land which is not already under cultivation. Furthermore, the community as a whole denies the state the right to interfere with a citizen's communal right of land utilization. Finally, the state has the right to exclude anyone from the use of a state owned piece of land in accordance with the constitution and laws of the land. State rights in land are transferable.

To have a clear understanding of the externality problems posed by communal rights in land, we shall first examine the factors which a private owner of a piece of land would tend to take into consideration in maximizing the benefits from his land resources. In exploiting his land resources, a private owner, concerned with the economic welfare of his family and his future generation, will tend to take into consideration the conditions of resource supply and product demand during his life time, as well as during the nearby period of future generations. Under such a circumstance, output maximization during each production period is constrained by considerations for future streams of costs and benefits. Because the community confers on him the right of exclusion, he will be willing to make improvements in his land resources, knowing fully well that he and his offspring have the prospects of reaping the reward of any investments he may choose to make in the land. Land utilization under such expectations has the benefit of preserving the productivity of the land as much as possible and as long as possible. However, because he has no right to exclude others from exercising the rights they possess in their own land, he would tend to have no incentive to use his land in such a way that other land owners around him are not adversely affected. For example, in using irrigation water he would tend to ignore the impact which his actions would have on the level of aquifers under the land adjacent to his own.

In contrast to the foregoing pattern of land utilization, the holder of a communal right in land has no incentive (or basis) to take future costs and benefits into consideration when exploiting the resources for a given piece of land, because his right of exploitation of that particular piece of land is not guaranteed indefinitely by the community. For the same reason (lack of exclusion right), a farmer sees no wisdom in making improvements in the land, because he has no assurance that he would reap the benefits from such investments. This can be illustrated with a comment from Thomson's (1977) article: "... an individual villager's efforts to preserve or increase ground cover would be senseless. He might plant or refrain from destroying standing timber, but he gains thereby no assurance he will harvest the fruits of his efforts or abstinence. Another user may well appropriate the wood before he decides to use it, leaving him with no return on his outlay."

Given this form of expectations, the holder of a communal right will tend to over-exploit land resources during each production period because a substantial portion of the cost of doing so is borne by the community (this constitutes a social cost). To curtail the rate of land exploitation, the community would have to undertake negotiations in which every member of the community must participate. The cost of such negotiation can be prohibitive. For example, suppose that a farmer (say farmer A) has prepared a seed bed at the lower end of a wadi (nearer to the player). Farmer B comes along and decides to construct a dam at the upper end of the wadi (nearer to the in-selberg). Noting that his hope of taking advantage of some form of orographic precipitation is threatened, farmer A decides to negotiate to pay Farmer B for desisting from building the dam. Farmer B agrees with the terms of the negotiation, but Farmer C comes along and decides to go ahead with the construction of the dam and it becomes necessary for Farmer A to negotiate with Farmer C. It is apparent that for Farmer A to be sure that the dam would not be constructed, he may have to negotiate with all members of the community.

We can easily think of factors which could pose serious difficulties to negotiation. For example, if we can establish the thesis that the behavioural underpinnings of the consumption of public goods, namely, the problems arising from the absence of any efficient method of inducing groups of consumers to reveal their preferences, are analogous to those that influence soil exploitation decisions under communal rights, it becomes very easy to show that negotiation would be virtually impossible when the community becomes very large. We know that the peasant farmer produce largely for subsistence requirements. Therefore his production decisions are largely influenced, not by the market conditions of input and product prices, but by his consumption preference structure. His communal rights guarantee him the right of consumption. Given the degree of publicness of his communal/consumption right, he will be unwilling to reveal the intensity of his intended land exploitation activities, if called upon to participate in a negotiation. We can, of course, think of the possibility that a negotiation could be forced upon him if he should fail to reveal his preference for the intensity of land exploitation.

Suppose that it were possible for the community to reach an agreement about a desirable level of exploitation of the land by the current users, the cost of policing such an agreement would be substantial. Moreover, one aspect of negotiation costs which cannot be possibly taken into consideration under this system, has to do with expected

costs and benefits to future generations. "With communal rights there is no broker and the claims of the present generation will be given an uneconomically large weight in determining the intensity with which the land is worked. Future generations might decide to pay present generations enough to change the present intensity of land usage. But they have no living agent to place their claims on the market ... communal property means that future generations must speak for themselves" (Demsetz 1975). This is equally applicable to the present generation in relation to past generations. The present generation had no representative to place their claims on the market of past generations. Consequently, given the nature of expectations characteristic of communal right in land in the Sahel, past generations exploited the resources of the land in a way that a substantial portion of the social cost of their action has been passed down to the present generation in the form of the recent morphogenic and socio-economic crises, in which an estimated one hundred thousand people lost their lives through starvation.

It is apparent that one appropriate solution to these externality problems is to internalize a substantial portion of the externalities through a change in property rights from communal to private ownership. A change to private ownership means a change in expectations from those inhibitory to entrepreneurial risk taking to those consistent with security of tenure, so that investors are willing to undertake investments in land resources, confident that they would reap the benefits from their efforts. Some externalities still remain with private ownership, but these are more amenable to solutions than the externalities associated with a communal ownership system. For example, suppose that the whole length of a wadi from the inselberg to the playa belongs to two private owners, farmers A and B. If farmer B decides to construct a dam at the upper end of the wadi, farmer A would only need to negotiate with one person, farmer B, to prevent the construction of the dam. Another form of solution that makes for the internalization of this type of externality is merger.

Admittedly, negotiating costs are positive in land utilization under both private and communal rights. However, the rights of exclusion under private property provides for considerable reductions in negotiating and internalization costs, whereas the absence of exclusion right under communal ownership makes negotiation and internalization cost prohibitively colossal. In other words, in terms of social versus private costs, private rights facilitate the narrowing down of the divergence between private and social costs. The desirable goal (economic efficiency), of course, is the equality between private and social costs.

What has happened in the Sahel within the last one and a half decades, can be viewed within the framework of the foregoing economic analysis of property rights. For a brief diversion from theoretical exposition we shall consider, in the next section, some land utilization activities which, in practice, have given rise to externality problems in the Sahel.

## II. LAND UTILIZATION ACTIVITIES GENERATING EXTERNAL EFFECTS IN THE SAHEL

Under communal rights in land, individual wishing to maximize the value of his communal right will tend to overwork the land because a significant portion of the costs of doing so is passed on to the society. This in practice has happened extensively in the Sahel. In this section we examine some land utilization activities which have had considerable external effects on agricultural production in this area. We also elaborate on how such land exploitation activities have driven the private cost of land utilization to prohibitive heights. Finally, we corroborate our economic analyses so far with empirical findings from some other academic disciplines (especially climatological related disciplines).

*Overgrazing and Overcultivation:* Overgrazing is directly linked to increase in population. The minimum requirement for the maintenance of subsistence level of living is estimated to be between two and four standard stock unit per person. In many areas of the Sahelian region the animal/man ratio falls below the minimum subsistence level. To keep up with the minimum subsistence requirement, animal population must increase with increases in human population with the result that animal population per given unit of land exceeds its carrying capacity. This leads to a destruction of vegetative cover, exposing the land to wind and water erosion following the torrential downpour of the monsoon. This encourages desertification.

Overcultivation follows the same patterns as above. Subsistence requirements of cereal per person (including seed reserve for planting) is estimated to be 250 kilograms per person per annum. In many parts of the Sahelian region this minimum subsistence requirement is not being met and, to keep up with this minimum requirement, more land has to be brought into cultivation. This has resulted in the extension of cultivation beyond the steppe margins. In many parts of the region cultivation has been extended into areas with as little as 150 mm (6 in) of mean annual precipitation, whereas the minimum desirable precipitation regime for regular cropping in these areas, as recommended by agronomists, is 400 mm (16 in) of mean annual precipitation. The result is a progressive fall in crop yield per unit area of land and reduction in the length of time of fallowing the land. This also means that as cropping is extended toward the desert, the risk of crop failures increases due to the erratic nature of arid land precipitation.

In summary, the results of overcultivation in the arid land margin are decreasing yields per unit area of land, increasing frequency of crop failure and the acceleration of the rate of desertification. The result of desertification is to further reduce crop yields per unit area of land, leading to increased pressure on the land and the vicious cycle continues.

### *Pressure on Wood for Fuel:*

On top of overgrazing and overcultivation comes deforestation for fuel on a massive scale. Due to poverty, the rural families are largely dependent on wood for fuel. At a very conservative estimate, of one kilogram of wood per day per person, and on the assumption that one hectare of this steppe region contains between 500 and 1000

kilograms of biomass, two persons will devastate an average of one hectare per annum. If we assume that some regeneration takes place every two years, deforestation could be estimated to be at the rate of one hectare per annum per family of five. This, on the aggregate, results in considerable acceleration of desertification process.

*Private Cost of Land Overexploitation Activities:* The economic significance of the foregoing soil exploitation activities can be fully comprehended through an examination of the private cost of these activities. We know that, in this region, input factors in peasant farming are predominantly made up of land and labour. If we also add to this the fact that production is largely for subsistence requirements, the costs of land utilization can, appropriately, be computed in terms of units of labour (man-hour or man-day or man-year) and/or units of land (hectare). First, we use the labour (as costs) approach. If we assume that labour requirements for the cultivation of a given unit of land area is constant from year to year, it is quite easy to see that land overexploitation and its accompanying desertification effects, through reduction in the productive capacity of the soil, increases labour requirements (and hence cost) of land cultivation year after year. Consider the following simple example. Suppose a farmer cultivates one hectare of millet each year for six years in succession. Suppose further that he realises 1 ton per hectare the first year and during the subsequent years yields decline by 0.1 ton per hectare successively. The following gives a summary of his land cultivation activities and their cost:

Year	Area Cultivated (hectare)	Yield ton/ha	Requirement to maintain one ton of millet	
			Man-year	Hectare
0	1.0	1.0	1.0	1.0
1	1.0	0.9	1 $\frac{1}{9}$	1 $\frac{1}{9}$
2	1.0	0.8	1 $\frac{1}{4}$	1 $\frac{1}{4}$
3	1.0	0.7	1 $\frac{1}{3}$	1 $\frac{1}{3}$
4	1.0	0.6	1 $\frac{1}{2}$	1 $\frac{1}{2}$
5	1.0	0.5	1 $\frac{1}{2}$	1 $\frac{1}{2}$

It is clear from this simple illustration that by the sixth year, overcultivation and desertification have increased the labour cost per hectare of cultivated land from 1 man-year to 1 $\frac{1}{2}$  man-year. Exactly the same results are obtained if we use land as cost. To maintain a harvest of one ton of millet, land (or cost) has to be increased from 1 hectare to 1 $\frac{1}{2}$  hectare. In other words, both labour and land (being complementary) have to be increased by 50 per cent to maintain the same level of yield during the 6th year of production. Given that the opportunity cost of land and labour are positive, the imputed cost of these input factors can be computed for each year. Even when we assume constant factor cost, imputed cost per ton of millet will increase with decreases in per hectare yield of millet. Indeed, this is precisely what has happened in African sub-Sahara, as shown in the following real life example. Here

(Table 1) groundnuts yields in the Kordofan province of Sudan declined progressively from 0.4 ton/hectare in 1960/61, to 0.09 ton/hectare in 1972/73. This is a decline of 444 percent in yield within a period of 12 years.

The result of this on a regional (and national) scale presents a grim picture. In 1960/61 season, a total of 184,000 hectares were devoted to groundnuts in the Kordofan province and the total harvest amounted to 73,000 tons. During the 1972/73 season 810,000 hectares were devoted to groundnuts in the same province and the total harvest was 73,690 tons, about the same as was realized in the 1960/61 season. This means that to maintain the same level of harvest, the amount of land to be brought under cultivation had to be increased fourfold. Because we are dealing with fixed factor proportions under inflexible resource structure, this also means that labour had to be increased fourfold. This clearly indicates that, abetted by human activities, desertification has pushed land and labour cost of agricultural production to prohibitive heights. Investigation in other academic disciplines have furnished evidence in support of the external effect of land overexploitation, as we have brought out in the foregoing economic analyses. Some of these empirical findings will be related here.

#### *Climatological Findings on Human Contribution to Desertification:*

Charney (1975, 1977) and some other climatological related scientists have come up with findings suggesting that human activities such as overcultivation, overgrazing and deforestation, by exposing the ground to direct insolation, have contributed to desertification through a process known as "biogeophysical feedback mechanism." Experiments conducted with varying levels of desert albedo have yielded results, suggesting that higher levels of precipitation are associated with areas having less surface albedo. For example, Charney and others (1975) ran a model of the general circulation of the atmosphere with a "dark sahara" (with 14% albedo) and a "light sahara" (with 35% albedo), with a difference in precipitation on the lighter area.

In addition to increased surface albedo, it has been suggested that the destruction of decaying debris by overgrazing and trampling of the soil by animals can have the effect of reducing certain bacteria (*pseudomonas syringae*) which can effectively act as freezing nuclei and, hence, overstocking has the additional disadvantage of reducing convective rainfall.

Another argument about human contribution to desertification, is the one which associates human activities involving the release of carbon dioxide from the burning of fossil fuel and dust from agricultural and industrial activities with the behaviour of the circumpolar vortex (the air system circulating the poles, especially the northern hemisphere) in suppressing precipitation in the Sahelian region. We summarize below this behaviour of the circumpolar vortex in relation to the Sahelian rainfall pattern.

Precipitation coverage in the Sahelian region is determined by the intertropical Discontinuity (ITD), a gradient formed by the confluence of the warm-dry subtropical high and the cool moist southwesterly. Rainfall usually occurs only to the south of this gradient. However, the surface position of the ITD is determined by the Northern Hemisphere circumpolar vortex, whereas the size of the circumpolar vortex is determined by its southern edge latitude. The further south the circumpolar vortex extends, the larger it becomes, and vice versa. Thus, when the circumpolar contracts toward

the north the subtropical high and the ITD move northward, and the monsoon rains advance into the Sahel. By the same token, the expansion of the circumpolar vortex pushes the ITD, and hence, the region of dryness further south, depriving much of the Sahelian region of much needed seasonal precipitation.

It has been alleged that dust (tropospheric dust from agricultural and industrial activities and stratospheric dust from volcanic eruptions) and carbon dioxide (from the burning of fossil fuels) can influence the behaviour of the circumpolar vortex through some sort of "green house effect" process, which we shall not elaborate upon here. Proponents of this process have suggested, that the increases in carbon dioxide and dust through human activities have been responsible for the expansion of the circumpolar vortex and, hence, the suppression of precipitation over the Sahelian region. There have been suggestions also that dust by itself has the potential of suppressing precipitation by reducing rain-producing clouds.

We can also examine the foregoing problem from the stand-point of the technological levels at which land exploitation is carried out. We know very well that there are some contemporary technologically advanced societies in analogous climatic and edaphic environments, who have successfully managed the resources of their drought vulnerable environments to attain appreciable levels of prosperity. It is for this reason that we shall devote the next section to technological considerations.

### III. TECHNOLOGICAL CONSTRAINTS IMPOSED BY COMMUNAL RIGHTS IN LAND

It is unambiguously admissible that technological progress (in terms of biochemical and/or mechanical innovations) provides a solid foundation for increased agricultural productivity, leading to agricultural development. Therefore, it should be of interest to examine the constraints which communal rights could impose on technological progress. This provides an alternative and/or a more rigorous way of elucidating the depressed agricultural production problems inherent in land exploitation under communal rights. Our technological approach here aims at strongly demonstrating that communal rights in land constitute an immense bottleneck to flexibility of resource structure and input demand responses and that on the other hand, inflexibility of resource structure and input demand responses constitute a serious impediment to agricultural productivity.

Again, it is our strong belief that the foundation of agricultural development rests on resource structure and input demand responses in the agricultural industry. As steady growth is attained in the course of agricultural development, innovations will make new input factors available. There will be changes in factor prices, calling for factor substitution, and hence, changes in demand responses and resource mix. Elasticities, such as price elasticity of input demand and elasticity of substitution between input factors, constitute measures of such input demand responses.

When fertilizer and irrigation water are not extensively used (as would be the case under private land utilization in a system of communal rights in land), peasant agriculture is generally characterized by the use of only two factors, namely, land and

labour, in fixed proportions, with little opportunity for factor substitution and, also, thereby leading to inflexible inputs demand responses. Such inflexible input demand responses impose severe limitations on agricultural productivity.

Our analysis in section one has shown that the form of expectations associated with private rights in land, could encourage an enterprising farmer to make investments in land improvements and yield boosting input factors such as fertilizer and irrigation water, whereas the expectations associated with private land utilization under communal rights in land would have the opposite effect (i.e. disincentive to make improvements in land resources). Thus, communal rights in land in the Sahelian region aggravates the limitations imposed on agricultural production and development. It is, therefore, for this reason that we now examine this problem in greater details using the analytical tools of input demand function.

Suppose that  $x_i$  represents input factors used in the production of an output,  $y$ , of groundnuts, then for a determination of own-price elasticity of demand, say  $E_{x_i}$ , for a factor, say  $x_i$ , we need examine four sources of influence, namely, (i)  $S_{x_i}$ , the share of input factor  $x_1$  in the cost of producing  $y$ . (ii)  $E_y$ , the elasticity of demand (absolute) for the commodity produced. (iii)  $e_{x_i}$ , the elasticity of supply for the other input factor, say  $x_2$ ; or  $x_3$ —and (iv)  $r_{ij}$  the elasticity of substitution between the input factor in question and the other input factor.

Because land, say  $X_1$ , and labour, say  $X_2$ , are the most significant factors in peasant agriculture, and because we are dealing specifically with the issue of property rights in land, we shall focus on the elasticity of demand for land in the remaining part of this article.

Given input factors,  $x_i$  and output,  $y$  and their respective prices,  $P_{x_i}$  and  $P_y$ , the per units of output (i.e. input coefficient) and the average product of an input factor are dependent on factor proportions or the ratio in which  $x_{ij}$  are combined. They are also dependent on the ratio of factor prices,  $P_{x_{ij}}$ .

$$\begin{aligned} \text{Thus: } x_i/y &= g(x_2/x_1) \\ y/x_i &= Q(x_2/x_1) = f(P_{x_1}/P_{x_2}) \\ x_i &= Y \cdot f(P_{x_1}/P_{x_2}) \end{aligned}$$

Taking the log, with respect to  $x_i$ , of both sides we have

$$\log x_i = \log y + \log f(P_{x_1}/P_{x_2})$$

Taking the derivation, with respect to  $x_i$ , of both sides and dividing through with the derivation, with respect to  $x_i$ , of  $\log P_{x_j}$  we have

$$\frac{d \log x_i}{d \log P_{x_j}} = \frac{d \log y}{d \log P_{x_j}} + \frac{d \log f(P_{x_i}/P_{x_j})}{d \log P_{x_j}} \dots\dots\dots(i)$$

which is the slutsky equation giving the output and substitution effects. Thus, in general,

$$\frac{dx_i/x_i}{dP_{x_j}/P_{x_j}} = \text{output effect} + \text{substitution effect.}$$

The output effect represents the change which would occur when output changes in response to a change in its price, holding factor proportions constant. The change

in product price could be initiated by a change in factor price. Suppose there is a rise in the cost of land, holding labour wage,  $P_{x_2}$ , constant, then under perfect competition product price will be

$$P_y = P_{x_1} + P_{x_2}$$

$$\frac{dP_y}{P_y} = \frac{P_{x_1}}{P_y} \frac{dP_{x_1}}{P_{x_1}} = S_{x_1} \frac{dP_{x_1}}{P_{x_1}}$$

$$\text{i.e. } d \log P_y = S_{x_1} d \log P_{x_1}$$

where  $S_{x_1}$  is the share of land in the total cost of production.

An increase in the cost of production should lead to an increase in the price of groundnuts which, in turn, should lead to a decrease in the demand for groundnuts. Output reduces with:

$$d \log Y = E_y d \log P_y = E_y S_{x_1} d \log P_{x_1}$$

and because of fixed factor proportions the proportional fall in each factor will be the same as the proportional fall in output

$$d \log X_1 = d \log Y$$

$$\frac{d \log X_1}{d \log P_{x_1}} = E_{X_{11}} = S_{x_1} E_y \dots \dots \dots (2)$$

in general, the expression

$$E_{xii} = S_{xi} E_y \text{ (output effect)} \dots \dots \dots (2b)$$

measures the output effect in  $E_{xii}$  in the case where there is also a substitution effect. Thus, given fixed factors proportions, the elasticity of demand for land,  $E_{xii}$ , is equal to the elasticity of demand for groundnuts,  $E_y$ , weighted by the share of land,  $S_{xi}$ , in the total cost of production.

Reduced output of groundnuts will lead to a fall in the demand for labour and this, in turn, will lead to a fall in labour wage.

$$P_y = P_{x_1} + P_{x_2}$$

$$d \log P_y = S_{x_1} d \log P_{x_1} + S_{x_2} d \log P_{x_2}$$

But  $d \log Y = E_y d \log P_y$

$$\text{Thus } d \log Y = E_y S_{x_1} d \log P_{x_1} + E_y S_{x_2} d \log P_{x_2} \dots \dots \dots (3)$$

Due to fixed factor proportion  $d \log x_1 = d \log x_2 = d \log Y$  and  $S_{x_2} = 1 - S_{x_1}$ . Dividing equation (3) through by  $d \log Y$ ,  $d \log x_1$  and  $d \log x_2$  and substituting  $1 - S_{x_1}$  for  $S_{x_2}$  we have

$$1 = E_y S_{x_1} \frac{d \log P_{x_1}}{d \log x_1} + E_y S_{x_2} \frac{d \log P_{x_2}}{d \log x_2} \dots \dots \dots (4)$$

where:  $\frac{d \log P_{x_1}}{d \log x_1}$  refers the demand function for land

$\frac{d \log P_{x_1}}{d \log x_2}$  refers to the supply function of labour. Noting that demand and

supply functions are reciprocals of their elasticities, equation (4) can be written thus:

$$\frac{E_y S_{x_1}}{E_{x_1}} + \frac{E_y(1 - S_{x_1})}{e_{x_2}} = 1$$

$$Ex_{ii} = \frac{e_{x_2} (E_y S_{x_1})}{e_{x_2} - E_y (1 - S_{x_1})}$$

$$Ex_{ll} = \frac{E_y S_{x_1}}{1 - E_y (1 - S_{x_1}) / e_{x_2}} \dots\dots\dots(5)$$

In equation (5) we can identify three of the parameters that could influence the elasticity of demand for land, namely, the share of land in the total cost of production  $S_{x_1}$ , the elasticity of demand for groundnuts,  $E_y$ , and the elasticity of supply of labour  $e_{x_2}$ . Under the assumption that labour supply in peasant agriculture is infinitely elastic (due to considerable under-employment and un-employment of unskilled labour in the developing countries) the term  $E_y (1 - S_{x_1})/e_{x_2}$  in equation (5) is zero so that  $Ex_{ii}$  in equation (5) reduces to  $Ex_{ii} - E_y S_{x_1}$  as in equation (2). Because land and labour are strictly complementary in our analysis of peasant farming, especially under communal rights in land, the substitution effect in equation (1) will be irrelevant.

Thus under communal property rights in land (with private land utilization), we are limited to only two sources of influence on the elasticity of demand for land: namely the share of land in the cost of production,  $S_{x_1}$ , and the elasticity of demand for groundnuts,  $E_y$ . This represents a severe limitation on resource structure and input demand responses in the agricultural industry, in the sense that opportunity for factor substitution to take advantage of innovations (which should emanate from climatological, geomorphological, hydrogeological and stream morphometric studies through which, among other things, source of surface and subsurface waters such as wadis, playas, oases, eolian deposits, ephemeral streams, orographic precipitation and fault escarpment could be identified) is severely curtailed.

Such limitations (arising from fixed factor proportions) have had profound negative effect on agricultural productivity and development in the Sahel, as we have pointed out several times. Farming under fixed factor proportions (land and labour) requires that any increase in aggregate food supply must come through replication of production units, bringing more land under cultivation. Bringing more land progressively under cultivation, on the other hand, means less recouperating time/period for land, and hence more pressure on a landscape already vulnerable to drought. Lack of incentive to make investments in land improvements under communal rights in land, results in the deterioration of the productive capacity of the land and this, in turn, results in progressive decline in yields per hectare of cropped land. Congestion externality (and, hence overgrazing), resulting from communal grazing and overcultivation and deforestation, also add to a further deterioration of the productive capacity of the land. All the foregoing in addition to drought occurrences, result in the acceleration of the process of desertification. Desertification, on the other hand, reduces the productive capacity of the land, forcing agricultural activities to be extended toward the desert with the associated risks of crop failure.

The rate of decrease in yield per unit area of land brought about by the foregoing process of vicious cycle can be very alarming, as we have vividly demonstrated by the depressed yields of groundnuts in the Kordofan province of Sudan.

What we have done in this article is to vividly describe the sort of constraints which communal rights impose on agricultural development in the Sahel and, indeed, in any other community where a communal right/private cultivation system is in vogue. Technological backwardness, typified by peasant subsistence fixed factor proportions farming, is alone sufficient in crippling agricultural progress. Drought conditions alone, pose formidable difficulties for agricultural production. When these two are compounded by communal right (with its associated poor economic expectations and disincentive in making improvement in land resources), we have a situation in which the vicious cycle of low levels of productivity and investment cannot be broken from within the system. It follows, therefore, that a necessary condition for agricultural progress in this region—assuming a continuation of the price system of resource allocation—is the internalization of communal right externalities through a system of private land ownership.

We do not intend to make any recommendations as to an exact land reform exercise, or a process or method by which a change to private right should be effected. This is not due to a dearth of historical and contemporary examples of land reform exercises and theoretical formulations from which recommendations can be made, but rather because there is a plethora of these available for consideration, adaptation or adoption by the authorities in the Sahel. In other words, the issue here is not necessarily due to lack of model solution but, possibly, due to the lack of the will to act, elusive socio-political stability and socio-cultural inertia, factors sufficiently formidable to be capable of pre-empting any success emanating from the best of economic plans, strategies or formulations.

### **Conclusion and Recommendation**

In the light of our analysis of resource allocation under flexible resource structure, and input demand responses in a land tenure system characterized by private rights in land, the solution to the agricultural development problems of the Sahelian region will come only through, (1) the adoption of existing innovations (where applicable), and the generation of innovations through the application of existing and potential tools of scientific research in the areas which include those already enumerated in this article, and (2) the application of economic principles and research results in the allocation of the land and human resources of the region. The alternative to a solution as indicated above is one which comes in "Malthus way".

Substantial amount of invaluable innovations could emanate from climatological, geomorphological, hydrogeological and stream morphometric studies. One important product of these studies is the identification of sources of surface and subsurface waters such as wadis playas, oases (riverine and non-riverine), eolian deposits, ephemeral streams, orographic precipitation and fault escarpment—sources which have been successfully tapped for agricultural production by past and contemporary arid land societies (especially in the technologically advanced countries). This climatic/adaphic related research would furnish the technical basis for flexible resource structure and input demand responses. Such technical basis is only a necessary but not sufficient condition for a successful agricultural development. It is common knowledge that many small and large-scale economic projects in many African

developing countries have collapsed or are heavily subsidized. If it were possible to aggregate all the economic losses involved over the years, they represent economic waste on a magnitude bewildering to the imagination of any economic man. Therefore, in addition to the technical empirical investigations, economic research must be undertaken for optimum allocation of the available resources of this region. Before large sums of money are committed to agricultural projects, economic empirical investigations must be conducted to ensure that such projects are based on intelligent information relating to resource structure, input demand responses, input supply sources and responses and production response functions. Take an irrigation project for an example: Recommendations regarding the application of water should be based, not on the rule of thumb, as is usually done, but on established response functions on different soil types. This implies, that prior to the establishment of an irrigation project, studies should be conducted to establish the water response functions for various crops and soil types. Water allocation to different crops and soil types, should thereafter be based on the economic principles of marginal productivities established through the water response function studies. Water could then be applied, such that its marginal productivities are equal in the production of different crops concerned. Because water can substitute for land, optimal allocation also requires that the marginal rate of substitution of water for land in the production of one crop, should be equal to the marginal rate of substitution of water for land in the production of all other crops. What we have done in our analysis of the input demand function in this article, is an illustration of some of the economic research which must of necessity be carried out in the Sahelian region for optimum resource allocation.

**Table 1**  
*Production of Kordofan Province, 1960/61-1972/73*

Year	Groundnuts		Prod. (fedden)	Sesame		Prod. (fedden)
	Total area cropped (hectares)	Total Prod. (tons)		Total Area cropped (hectares)	Total Prod. (tons)	
1960/61	184,000	73,000	0.400	112,000	38,000	0.384
1963/64	200,820	58,777	0.297	299,200	30,719	0.106
1966/67	211,200	45,657	0.216	282,000	31,560	0.083
1969/70	300,000	69,728	0.232	450,000	43,268	0.097
1972/73	810,000	73,690	0.090	778,940	14,722	0.090

Source: Letteuou, H. M., 1977. The nature and causes of Desertification. In: Glantz, Michael H. (ed). *Desertification*. Westview Press, Boulder (Col.)

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## PASTURE AND RANGELAND POTENTIALS OF BORNO STATE

by

P. O. Ugherughe and P. A. Ekedolum

### Abstract

Livestock production constitutes one of the principal resources of Borno State, as well as the only practical way of utilizing the larger part of its land that is too poor or dry to be used for cropping. Borno State is best suited to beef production because it is perennially free from tsetse-fly which transmits trypanosomiasis. The state accounts for about 45% of Nigeria's livestock trade, yielding an annual revenue of about 140 million naira.

The pastures and rangelands in the state, however, provide sufficient nutrients for no more than three to five months of the year and fall below maintenance level in the dry season. In this study, the pasture and rangeland potentials of the state were therefore evaluated and the major obstacles limiting their improvement were identified.

Some measures recommended as means of improving the pasture/rangelands and/or for their more efficient use include:

- (a) Since more uniform grazing can be achieved by a better distribution of water points on grazing lands, the government should ensure that water points are approximately three kilometers apart.
- (b) *Acacia albida* ("Gawo"), whose pods are a relatively rich source of protein to livestock during the critical months of February, March and April, should be planted about 100 meters apart over all the grazing lands where it is adapted and does well.
- (c) The government should mount a vigorous campaign to encourage stockmen to cull out and sell old animals and to move young cattle (2 to 3 years old) into feed lots in order to reduce the number of livestock on presently overstocked ranges.
- (d) A stockmen's cooperative society or committee should be established in each local government area. Such a committee should be a part of the decision-making body particularly when it relates to policy or management decisions affecting stockmen directly or indirectly.

## PASTURE AND RANGELAND POTENTIALS OF BORNO STATE

### Introduction

Livestock production constitutes one of the principal resources of Borno State, as well as the only practical way of utilizing the larger part of its land that is too poor or dry to be used for cropping. Borno State which lies within the semi-arid region and falls within latitude 10°–13° 44'N and longitude 9° 39'–14° 38'E in the extreme northeastern part of Nigeria (Fig. 1) is best suited to beef production because it is perennially free from tsetse-fly which transmits trypanosomiasis.

However, the pastures and rangelands in the state provide sufficient nutrients for livestock for no more than three to five months of the year and fall below maintenance level in the dry season, at which time the cattle are moved southward in search of water and good pasture. At the approach of the rains the cattle are again moved to the semi-arid region. This seasonal migration leads to weight loss during the latter part of the dry season. This set-back is one of the most serious factors restricting production as it retards maturity and increases the susceptibility to diseases.

This study was therefore undertaken to evaluate the pasture and rangeland resources of Borno State; to identify the major constraints limiting their improvement; and to recommend ways of improving them so as to help increase livestock productivity in the state.

### Types of Pastures and Rangelands

Borno State which lies within the semi-arid region has a land area of 116,589 sq. km. (Table 3), and out of this 46, 846 sq. km. which represents 40.2% of the total land area (Table 3), is under pastures and rangelands. The distribution of pastures and rangelands in the state on local government area basis (Fig. 2) is given in Table 3.

The mean annual rainfall in the state ranges from less than 300mm. in the north to 700 mm. in the south. Most of the rainfall is normally distributed over a 3 to 5 month period (Table 1) and comes in the form of short but violent downpours. The annual temperature pattern is shown in Table 2. Temperatures are high throughout the year. The mean relative humidity is from 30–50% with a minimum in February–March when it drops to as low as 10%. The maximum relative humidity which is about 90% occurs in August.

The main soil types in the state are Entisols covering an area of about 5,443, 940 ha, Alfisols—3,171, 910 ha, Inceptisols—534, 145 ha, Vertisols—207, 355 ha, and Mollisols—36, 140 ha. The area covered by non-soil is about 204, 900 ha (Nwaka, 1985). The types of pastures and rangelands in the state as influenced by the climatic and soil conditions are as follows:

#### *Shrublands with trees and grasses*

This type of rangeland is predominantly a shrubland with trees and patches of grasses. It is found in the southeastern part of the state. The major areas are Gujba and Damaturu local government areas.

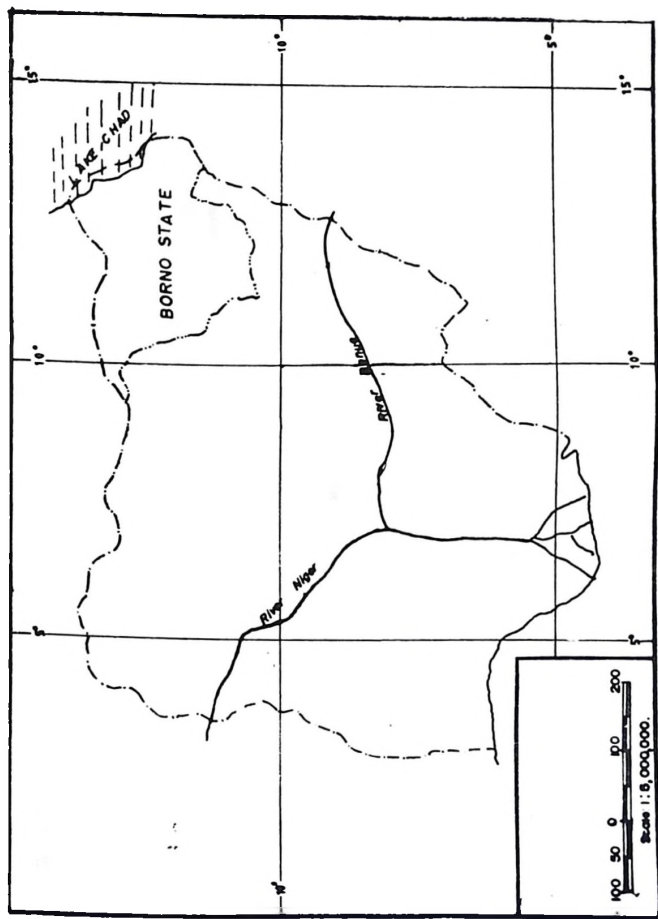


Fig. 1. Map of Nigeria showing Borno State.

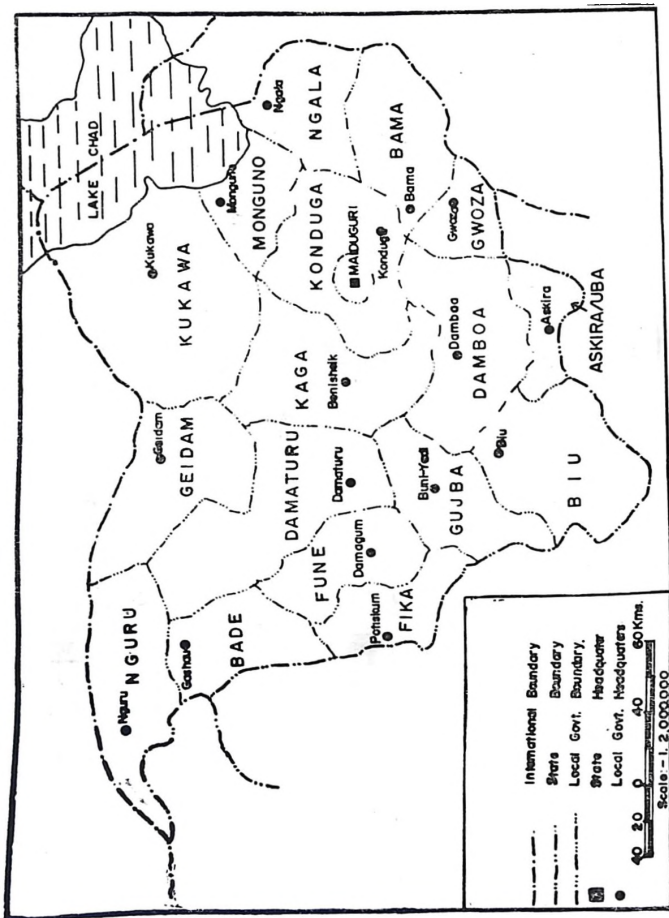


Fig. 2. Map of Borno State showing Local Government areas.

*Grasslands with trees and shrubs*

This refers to natural grasslands dotted with shrubs and very few trees. Most of the shrubs are browse plants. The area covered by this type of rangeland includes Biu, Damboa and Konduga local government areas.

*Natural grasslands*

This type of pasture virtually consists of grasses, though very few shrubs are sometimes found. This type of pasture forms the bulk of the pastures in the state. It is most predominant in Biu, Askira-Uba, Gwoza, Monguno and Damboa local government areas.

*Sown pastures*

It was found that in some of the sown pastures in the state such as at Gujba cattle ranch, Gambole cattle ranch and the Dalori Livestock Improvement and Breeding Centre, some forage legumes are under trial. However, in areas like Damboa, Konduga and Damaturu local government areas, *Stylosanthes humilis* (Townsville stylo) and *Stylosanthes hamata* (verano stylo) are already in use as mixtures in sown pastures to supplement the protein content of the grasses.

*Roadsides, Wastelands, Fallow and Crop stubbles*

The use of roadsides, wastelands, fallows and crop stubbles as grazing area for livestock is also important. The grazing of crop stubbles by livestock is mainly on farmlands after harvest. Livestock also do some grazing on fallows, wastelands and along roadsides.

**Ownership of Pastures and Rangelands**

Individual ownership of pastures and rangelands is not common in the northern parts of Nigeria (Gazetter No. 127, 1977). There is no corporate lineage in these tribes, and accordingly no concept of lineage or family land over which members of a family have permanent rights. In addition, the nomads amongst them are always on the move and are never settled. Moreover, areas covered by pastures and rangelands which would have compelled the nomads to be attached to the land, are usually either of poor soil fertility or too dry and therefore unsuitable for settled agriculture.

The lack of interest in individual and family ownership of pastures and rangelands by the nomadic Fulanis and Shuwa Arabs which are the two major ethnic groups in Borno State also stems from seasonal fluctuations in forage quality. Oyenuga (1968) reported that the fluctuations in forage quality with seasons, result in the movement of cattle southward in search of water and good pasture in the dry season and again northward at the beginning of the rainy season. Furthermore, the pastures and rangelands in the semi-arid regions provide sufficient nutrients for no more than three to five months of the year. Borno State happens to fall within this region. Therefore, under these conditions if the nomads are to be very much attached to the pastures and rangelands, their livestock no doubt, will suffer tremendously from poor nutrition

Table I

## Monthly Rainfall Figures (mm) for Borno State, 1977-1985\*

Months	1977	1978	1979	1980	1982	1983	1984	1985
January	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
February	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
March	0.00	0.00	0.30	0.00	0.00	7.5	0.00	0.4
April	0.00	55.4	36.3	0.00	0.00	0.00	3.8	0.00
May	16.8	54.4	147.3	3.26	2.0	1.6	27.7	36.7
June	144.0	129.4	251.3	93.6	10.7	29.8	39.5	83.1
July	112.5	291.6	199.8	138.2	100.0	126.5	142.7	58.7
August	295.4	99.5	75.6	198.6	70.9	74.2	84.9	96.0
September	89.6	71.9	0.8	157.4	48.8	43.8	25.9	141.0
October	0.00	23.9	-	0.9	1.6	0.00	4.2	0.00
November	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
December	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Averages	42.9	43.9	59.2	49.3	17.8	23.6	27.8	34.7

\* No records for 1981

Source: Meteorological Department, Maiduguri.

Table 2  
 Monthly Average of Maximum and Minimum Temperatures (°C) for Borno State, 1977-1985\*

Months	1977		1978		1979		1980		1982		1983		1984		1985	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
January	36.9	14.0	31.6	12.6	32.2	13.2	32.8	13.2	32.1	15.3	25.5	10.6	30.0	11.0	34.3	16.0
February	33.6	15.5	35.3	16.0	35.3	16.2	34.3	16.8	34.5	16.4	24.9	16.0	33.5	15.2	32.1	14.6
March	35.5	19.8	38.9	20.0	38.9	21.7	38.3	20.3	31.8	15.3	35.3	17.5	39.4	21.0	39.0	22.0
April	40.2	23.1	-	-	40.4	24.9	40.7	24.7	41.4	24.1	40.6	22.9	40.6	25.6	37.6	24.0
May	40.8	26.2	39.3	25.3	39.6	25.8	39.8	24.7	39.1	26.5	42.4	27.1	39.4	26.4	38.5	26.3
June	37.7	25.4	35.4	23.8	34.0	23.5	34.6	20.4	38.5	24.0	36.8	25.8	38.1	26.0	36.4	25.0
July	33.8	23.4	30.6	22.2	32.1	22.8	31.8	19.8	34.3	22.5	34.2	23.6	34.7	24.0	32.9	23.0
August	30.5	22.5	32.0	22.3	31.3	22.1	31.5	21.0	32.1	21.7	33.5	23.5	34.4	23.5	32.5	22.8
September	33.8	22.8	33.2	21.6	33.6	22.2	35.0	23.0	35.2	22.8	35.5	23.0	34.5	23.6	33.2	22.8
October	34.4	20.2	36.5	21.3	37.0	21.6	36.7	21.8	36.8	21.3	37.3	21.6	37.5	23.8	36.6	21.0
November	34.4	15.1	-	-	36.2	19.3	35.4	19.0	33.6	16.0	35.3	14.4	35.7	16.4	35.8	17.3
December	30.3	12.7	32.8	13.7	30.2	13.2	30.6	13.3	33.1	13.6	33.5	12.6	31.7	12.4	30.7	13.8

\* No records for 1981

Source: Meteorological Department, Maiduguri.

**Table 3**  
*Distribution of Pastures and Rangelands in Borno State*

<i>Local Government Area</i>	<i>Land Area (Sq. km)</i>	<i>Land Under Pastures and Rangelands (Sq. km)</i>	<i>% age of total land area</i>
1. Askira-Uba	3,464	616	20%
2. Bade	5,004	2,502	40%
3. Bama	6,990	2,476	35%
4. Biu	8,641	4,320	50%
5. Damaturu	10,696	5,347	50%
6. Damboa	8,500	4,250	50%
7. Fika	3,946	986	25%
8. Fune	5,270	1,581	30%
9. Ga'idam	8,697	1,478	20%
10. Gwoza	2,687	667	25%
11. Gujba	7,432	1,858	25%
12. Kaga	8,890	4,045	40%
13. Konduga	8,104	2,431	30%
14. Kukawa	11,535	8,071	70%
15. Maiduguri	1,059	55	5%
16. Monguno	4,412	2,206	50%
17. Ngala	3,917	1,751	30%
18. Nguru	7,354	2,206	30%
Total	<hr/> 116,598 <hr/>	<hr/> 46,846 <hr/>	<hr/> 40.2% <hr/>

With the ever-increasing pressure on land use, the need for individual ownership of pastures and rangelands has become inevitable. This study has shown that 15% of the total land area under pastures and rangelands in the state is now owned by the people whose animals graze on them. Although, this is very small, yet it is much better than what it used to be many years ago. This individual and family ownership is more in areas where pastures and rangelands provide nutritious forage for a longer period in the year owing to higher rainfall. Such areas are Biu and Gujba local government areas.

It is, however, envisaged that in the near future, with a greater pressure on land use coupled with increase in human population and consequently a greater demand for livestock products, a higher percentage of the pastures and rangelands will be owned by those whose animals graze on them.

### Grazing Systems

The nomadic and semi-nomadic Fulanis and the semi-nomadic Shuwa Arabs in Borno State carry out mainly two types of grazing systems on the pastures and rangelands. These are continuous and rotational grazing. Zero grazing is carried on only on a very small scale. During the day, the animals often graze close together since this provides better protection against wild animals, but they are almost continuously on the move.

The continuous grazing system practised is an extensive system of grazing in which the animals remain on the same pasture area for about a month or more. With this system, the pastures and rangelands are undergrazed during the rainy season and overgrazed during the dry season with a consequent deterioration of pastures and rangelands. The animals are generally carried over the dry season on submaintenance rations. Areas like Damaturu, Gujba, Gwoza and Konduga local government areas have their pastures and rangelands mostly under continuous grazing.

Rotational grazing, an intensive system of grazing, is also practised in the state. In this system, the grazing area is subdivided into paddocks usually at least six, and the animals are moved systematically from one to another of these paddocks in rotation. The stocking rate in each paddock is quite high. For instance, at Gambole cattle ranch it is 100 animals to 3 hectares of land for a period of 3-6 days. The length of the grazing period on each paddock depends on the stocking rate and herbage growth. This system enables the herds to use the pastures and rangelands at a time when they are young and highly nutritious and allows an adequate recovery period in order to ensure the most efficient utilization of the pastures and rangelands. This system is practised in Kukawa, Konduga and Biu local government areas.

Zero grazing is practised only on a very small scale. This system makes the most intensive use of fresh forages. It involves cutting the forage twice daily and hauling it to the animals in the feed-lot where it is fed from wooden feed wagons. This method is popular with the settled Fulanis and Shuwa Arabs and is practised only in Konduga and Damaturu local government areas.

Two types of grazing days are practised. One involves a grazing orbit that originates at and leads back to one and the same camp and kraal while the other is accompanied by a simultaneous shift of both camp and kraal. In the latter case the move might be over a distance of not more than a few kilometers or might entail a long day trekking for both herd, herdsman and dependants. Whereas the first move is normally undertaken to obtain more readily access to grazing grounds and water points in the neighbourhood, the second is usually part of periods of successive days of intensive trekking that make up a seasonal long-distance migration. The times of departure from and return to the camp are taken as determinants of the length of the grazing day. Generally from June to February, the departure of the semi-nomadic herdsman falls between 8 and 10 am. In the rainy season in particular, there is a tendency to leave fairly late, especially when it is expected that the dew that clings to the grasses will soon evaporate. The reluctance of the Fulanis to let their animals graze on moist terrain is prompted by fear of certain diseases and also by the consideration that animals suffer from excessive intake of wet grasses because the appetite is satisfied too quickly. Usually the herds return home between 5 and 6 p.m., producing grazing

days of 8-10 hours duration from June to February. From March to May the herds leave camp between 6.30 and 8 a.m. and return between 6 and 7 p.m.

The average grazing day of the semi-nomadic Fulanis is thus approximately 10 hours with a minimum of 7 hours and a maximum of 12½ hours between May and August. In the case of the semi-nomadic Shuwa Arabs the average grazing day is approximately 9½ hours.

### **Water Points**

Although watering expressed in time does not account for a large proportion of the total time afield, the search for water and the location of water points is a decisive factor in the strategy of daily movement of livestock on grazing lands.

The average distance between water points on grazing lands in Borno State is 10 kilometers. However, some places like Kukawa local government area have a distance of 50 kilometers from one water point to another. During the dry season some herdsmen resort to fetching water in calabashes from any available source to animals. However, the animals sometimes walk very fast to the water points themselves with a subsequent rest of 20-30 minutes before they trek back to the grazing grounds. This walking and resting to and from the water points takes up a large proportion of the non-grazing time, especially between February and May. This is because during this period the pastures and rangelands have been completely run down by the animals and in addition they suffer from the effects of the dry season. Also during this period, watering is done more than once a day because of the effects of the intense heat.

The source of water in the state could be boreholes as in Gambole cattle ranch or streams as in Biu local government area and the use of dams as in Kukawa and Biu local government areas. The most reliable of them all seems to be the dam because it retains water throughout the rainy season and the dry season, whereas water supplies from boreholes are not reliable throughout the year because of frequent break downs of the pumping machines. In the case of streams, they dry up during the dry season and are therefore useful only during the rainy season.

### **Fertilization and Weed Control**

The grazing lands in the state are mostly natural grasslands which have never received any type of fertilizers. However, in some ranches like the Gambole cattle ranch and the Dalori Livestock Improvement and Breeding Centre, nitrogen, phosphorus, potassium and ammonium phosphate fertilizers are in use.

Weeds are as important in pastures and rangelands as in any crop production area. Heady (1960) has indicated that regrowth is the major deterrent to high forage and livestock production from semi-arid areas of East Africa. This study has shown that this is also true of pastures and rangelands of Borno State. Even where a pasture is established, it is a continuous challenge to management to maintain the pasture in the face of the natural succession of weeds and bush regrowth. The unique aspects of weed control in pastures and rangelands is the close relationship it has with the management.

The simplest way to avoid new weeds is not to plant them. Many of the weeds are introduced into the pastures and rangelands through seeds. The use of certified seeds is therefore one of the best methods of preventing the introduction and the spread of

weed seeds. At Gambole and Gujba cattle ranches which are owned by the state government, certified seeds are used and this has helped in reducing the problems of weeds in the ranches.

Mowing, as a mechanical method of weed control, has been found to be effective in some pastures while in others it is relatively ineffective. Timing and frequency of cutting are extremely important. Mowing of weeds 3-6 days after blooming prevents production of viable seeds and thus prevents the propagation of such weeds.

The use of herbicides in weed control in pastures and rangelands is not yet practised in the state even on government ranches. This may be attributed largely to the high overhead cost involved.

### Poisonous Plants

Poisonous plants in pastures and rangelands are not considered as a major problem in most parts of northern Nigeria. Reports, however, indicate that livestock poisoning on some of the pastures and rangelands could pose serious problems. In any case, some of these plants are poisonous only during a certain period of the year and are unpalatable to livestock except when the livestock are forced to remain on a particular grazing area in which the good forage has been grazed.

There are many instances in which livestock are poisoned by plants. Many weeds which do not cause the death of animals but may cause ill-health, do exist in the pastures and rangelands. There are also certain plants which when eaten, result in animals being sensitive to sunlight and consequently leads to sunburn. Other cultivated crops may sometimes be poisonous. Sorghum, for example, under certain circumstances such as when grazed at very young stages, may cause prussic acid-poisoning. Reports show that the leaves of some wild plants also cause similar problem and that the fungus ergot which is sometimes found on seeds of cereal grasses is toxic.

Also, when phosphorus fertilizer is used on pastures and sufficient time is not allowed before grazing, the animals get too much of the mineral and this results in poisoning.

Certain poisonous plants act so quickly that cure is almost impossible especially if the animal has consumed large quantities of the plant. It has been discovered, however, that the most harmful period of these poisonous plants is during the dry season. This is because during this season the livestock, having almost nothing to feed on, take to feeding on any plant they come across. On the average, annual deaths of animals due to poisonous plants in the state is about 3%.

However, some measures are undertaken to check the rate of animal death through poisonous plants. One approach is for the herdsmen to know at what period of the year the poisonous plants are most harmful so that the grazing of such areas is avoided at that period and to know which kind of animals are most susceptible. In addition, some herdsmen are able to recognise poisonous plants and they remove them when found in the pastures or rangelands.

This approach is time wasting and tedious.

### Forage Conservation

There are several reasons why forage conservation should be practised. Surplus forage in the rainy season has to be conserved for use in the following dry season when good grazing areas are not available.

Forage conservation provides more efficient animal production by making use of left-over pastures in the rainy season during the dry season. This helps to reduce the loss in body weight or production which may occur in the dry season and prevents animal mortality in years of drought.

Forage conservation in the form of hay has assumed a wider dimension in research conducted in the northern states of Nigeria than elsewhere in the country. The conservation of forage here in Borno State is either as hay or silage. However, the production of valuable hay and silage has been prohibited by limited technical know-how and the magnitude of financial implications.

The final quality of stored herbage is usually dependent on the original nutritive value of the standing crop. Hay which is produced by dehydrating green forage to a moisture content of about 15% or less, can best be made at the onset of the dry season. Unfortunately, at this time, the quality of adapted crops is on a rapid decline. The nutritive value of grass hay at this time may be improved by late fertilization to stimulate a delay in maturity.

The purpose of making hay is to produce a dry product of high quality. The grass must therefore be harvested and dried with a minimum loss of nutrients. The grass is preferably cut at the early flowering stage. At this stage, the rains may still continue, making hay curing and drying difficult. The bulk of the forage in the state are conserved by this method.

Grass conservation as standing hay is another method utilized in the state. The grasses are, however, over mature, seeded, and have nearly lost all usable nutrients and are of low feeding value. The standing hay method gives good quality hay only in the years when rains stop unexpectedly when the grasses are still in flower. This is because the perennial species wilt and dry up and the annuals die before they seed and may produce standing hay of reasonable or even good quality.

Silage is prepared in virtually only two locations in the state and these are the Dalori Livestock Improvement and Breeding Centre and the Gambole cattle ranch.

### Renovation

The attention given to pasture and rangeland renovation in the state by the semi-nomadic Fulanis and Shuwa Arabs is quite encouraging. There are three methods employed by these two major ethnic groups in the state in a bid to renovate the pastures and rangelands.

One of the methods is a system whereby livestock are kept completely out of the grazing area to allow the pastures to regenerate. This method is the most popular one among the ethnic groups. About 16% of the pastures and rangelands in the state is renovated by this method. The areas where this method of renovation is practised are Biu, Kukawa, Monguno, Askira-Uba and Konduga local government areas.

Another method that is employed is the burning of pastures and rangelands and a complete reseedling of the area. Controlled burning at the appropriate time is an effective means of pasture and rangeland improvement. Burning late in the dry season removes old and dry vegetation of low feeding value and facilitates the growth of new forage crops in the early rains. The least damage done to tree growth is when the burning is carried out soon after the first rains, but if the grass and not the trees, is the first consideration, the burning is normally done late in the dry season. This method is not as popular as the first one. However, it is practised at the Gujba and Gombole cattle ranches. The replacement of dead grass stands with new ones is another method used in the renovation exercise. Only about 10% of the pastures and rangelands in the state is under this type of renovation. The areas include Damaturu and Gujba local government areas. The remaining 74% of the pastures and rangelands in the state is not under any type of renovation.

### Conclusions and Recommendations

In Borno State, many problems are encountered by the Fulani and Shuwa Arab herdsmen, most especially as they affect pastures and rangelands. One of such problems facing these herdsmen is the loss of animals through deaths. These deaths are caused either by poisonous plants, snake bites or sometimes by diseases.

Although management is not a complete solution to the poisonous plants problem, in most instances, it is all that is economically feasible. The following general management rules are therefore advocated as measures to prevent poisoning:

- (i) The range should not be misused, else there will be an invasion of new species or the spreading of poisonous species which already exist but in amounts not dangerous to animals.
- (ii) Areas where poisonous plants are abundant should be avoided. This may require the fencing of such areas.
- (iii) Animals should not be moved hastily through an area where poisonous plants are present. This is because unhurried animals select a variety of forage and are less likely to consume poisonous plants in toxic quantities.
- (iv) Animals should not be forced to remain on a range after they have utilized the good forage species, or ultimately they will turn to the less desirable, and often poisonous ones.
- (v) Animals should not be allowed on the range until the good forage species have made sufficient growth to support them, otherwise they may be forced to consume the early-growing poisonous species.
- (vi) Since many plant species which are seriously poisonous to one kind of livestock are not poisonous to another, or, at least under practical conditions, are not dangerous, the right kind of livestock should always therefore be used.

Most of the pastures and rangelands in the state are completely run-down. These should be oversown with forage legumes such as *Stylosanthes humilis* (Townsville stylo) and *Stylosanthes hamata* (verano stylo) which can be successfully grown in this area. Aerial seeding of these legumes will be the best approach.

Fallow lands should also be reseeded with *Andropogon gayanus* which is a perennial grass that is well adapted to the state. This will help to establish fallows containing a mixture of annual and perennial grasses and thus increasing the area of available grazing lands.

More uniform grazing can be achieved in the pastures and rangelands in the state by a better distribution of water points within the grazing areas. The state government should therefore intensify her efforts in constructing more wells and boreholes so that water points can be approximately three kilometers apart.

*Acacia albida* ("gawo") whose pods are a relatively rich source of protein (10.5% crude protein content) to livestock during the critical months of February, March and April should be planted about 100 metres apart over all the grazing lands where it is adapted. This is advocated because large trees of *Acacia albida* have been reported to produce as much as 250 kilograms of pods per annum and these pods are relished by livestock.

The government should mount a vigorous campaign to encourage herdsmen to cull out and sell old animals and to move young cattle (2 to 3 years old) into feed lots in order to reduce the number of livestock on presently overstocked ranges.

It will be advisable to establish a herdsmen cooperative society in each local government area. Such a cooperative society should be a part of the decision-making body particularly when it relates to policy or management decisions affecting herdsmen directly or indirectly.

In the course of this study, it was found that there is a lack of adequate management of the pastures and rangelands in the state. This is largely attributable to the lack of trained personnel in rangeland management. Furthermore, some rangelands were found to suffer from frequent burning. To overcome these problems, the training of manpower in the area of rangeland management should be intensified and the state government should legislate against bush burning.

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## DISTRIBUTION OF FIELD-MEASURED STEADY-STATE INFILTRATION RATE FOR A BORNO STATE SOIL

by

O. A. Folorunso

### Abstract

Steady-state infiltration rates were measured at 36 random locations on a 0.23 ha of land at the University of Maiduguri teaching and research farm. Values of the parameter, sorptivity, comprising the influence of the soil matrix suction and conductivity on the transient flow process, were also calculated. Both the measured steady-state infiltration rates and the sorptivity values exhibited a three-order of magnitude variation with coefficients of spatial variation of 24.83 and 25.20 per cent respectively. The two infiltration parameters appeared to be equally well described by both the normal and the log-normal distributions and they exhibited a good linear relationship with each other with a statistically significant ( $p < 0.01$ ) correlation coefficient of 0.87. Sample size calculations revealed that infiltration measurements at twenty-four randomly-spaced field locations would enable the true mean infiltration rate for the study area to be estimated within  $\pm 10\%$  of its value and this would hold true 95% of the time. An average infiltration rate of 13.49 cm/hr obtained in this study suggests that the study area is not suitable for gravity irrigation and can only be recommended for over-head irrigation.

### Introduction

Infiltration rates in field soils have been measured by several investigators over the years (Rogowski, 1972; Nielsen, Biggar & Erh, 1973; Cassel and Bauer, 1975; Biggar and Nielsen, 1976; Warrick, Mullen & Nielsen, 1977a, 1977b; and Vieira, Nielsen & Biggar, 1981). Infiltration rate is the rate at which water enters the soil surface. It determines how much of the water supplied to the soil surface (either through irrigation or rainfall event) actually enters the root zone and how much of it, if any, will runoff. The infiltration rate therefore affects not only the water economy of plant communities but also the amount of surface runoff and its attendant problem of soil erosion. A knowledge of the soil infiltration rate is therefore a prerequisite for efficient soil and water management.

One of the major problems facing soil and water scientists is the inherent spatial variability of soil-water properties. The knowledge of spatial variability of soil physical properties had long been documented (Waynick, 1981). Unfortunately however, soil and water scientists, until recently, had ignored the consequences of spatial variability on the reliability of the results of field measurements of soil-water properties. Most workers in the field of soil and water science have been satisfied

with taking relatively few samples and regarding the results obtained from the composite of these samples as accurate within limits of experimental error.

The fact that variations between different samples taken from a small area may be of such magnitude as to cause experimental data obtained from limited number of samples to be questionable, or even to invalidate such data entirely, was not considered (Waynick, 1918). Several hydrologists and soil physicists have recently been concerned about the problems posed by the spatial variability of soil and water properties (Nielsen *et al.*, 1973; Cassel and Bauer, 1975; Warrick *et al.*, 1977a; 1977b; Babalola, 1978; Vieira *et al.*, 1981; Sisson and Wierenga, 1981; Folorunso and Rolston, 1984). Most of these investigators determined the frequency distributions for the field measurements of the soil and water properties studied. Vieira *et al.* (1981) and Sisson and Wierenga (1981) reported normal and log-normal distributions for their field-measured infiltration rates respectively. Vieira *et al.* (1981) also reported that a minimum of 128 infiltration measurements was enough to obtain similar information compared to 1,280 measurements made. Babalola (1978) reported an average infiltration rate of 4.1 cm/hr for the 0-15 cm depth interval of the University of Ibadan experimental farm with a coefficient of variation of 80.70%. Kowal (1968) reported an average steady-state infiltration of 25.40 cm/hr for the soils of Samaru, Nigeria. There is little or no published information at present on the distribution of steady-state infiltration rate for the soils of Borno State of Nigeria.

The objectives of this study are (1) to evaluate the magnitude of the spatial variability of field-measured steady-state infiltration rates and sorptivity; (2) to determine the shape and properties of the frequency distributions of the measured infiltration rates and sorptivity; (3) to relate the steady state infiltration rates to the calculated values of sorptivity using the classical least squares method, and (4) to calculate the number of samples needed to estimate the mean infiltration rate of the study area at specified precision levels.

### Materials and Methods

This study was conducted at the University of Maiduguri Experimental Farm between January and February 1984 when the soil profile had dried out. The soils of this area was tentatively classified as *Typic Ustipsamment* (Rayar, 1984). The soils are generally well drained and appear to be fairly homogeneous.

Infiltration measurements were made at thirty-six random locations in an uncropped 30 x 75m (0.23 ha) experimental plot with double-ring infiltrometers (Bertrand, 1965). The internal diameter of the outer and inner rings were 50cm and 26cm respectively.

At each sampling location, both the outer and inner rings of the infiltrometer were inserted into the soil to a depth of about 10cm. The sides of the rings were carefully packed with soil to minimize edge effects on the measured infiltration rates. Water was ponded inside the inner and outer rings to a depth of about 8cm and the heads of water in both rings were kept constant throughout the period of measurement. The volume of water entering the soil within the inner ring was measured at 5 minute intervals for the first one hour; 10 minute intervals for the second hour and 15 minute intervals for the last three hours. Thus, measurement at each sampling location lasted five hours.

## Data Analysis

The data obtained in this study were analysed as explained in the following sections.

### Determination of the Infiltration Parameters:

Phillip (1957) indicated that when water is ponded on a deep, homogeneous soil with uniform water content, the cumulative volume of water infiltrated in unit time,  $t$ , per unit area of soil surface, i.e.  $I$ , is approximated by:

$$I = St^{\frac{1}{2}} + Mt + m' \quad (1)$$

Where  $S$  is sorptivity, and  $M$ ,  $m'$  are other soil parameters.  $M$  is related to (and for a saturated soil surface it is equal to) the saturated hydraulic conductivity which in turn is the steady-state infiltration rate. The sorptivity,  $S$ , is a parameter that includes both the influence of the soil matric suction and conductivity on the transient flow process, and  $m'$  is a constant.

During the very early stages of infiltration, the contribution of gravity is small and vertical flow at this stage is due mostly to the matric potential gradient. Consequently, the second term of equation (1) is negligible at this stage and therefore the sorptivity,  $S$ , was calculated in this study as the slope of the equation:

$$I = St^{\frac{1}{2}} + m_1' \quad (2)$$

For each location (and hence each value of  $S$ ), the data for the first one hour of infiltration was fitted to equation (2). Significant ( $P < 0.01$ ) correlation coefficients of 0.98 and 0.99 were obtained for all the thirty-six sampling locations.

Since the plots of  $I$  against  $t$  for  $t > 60$  minutes showed a highly significant ( $P < 0.01$ ) linear relationship (with  $r$  values ranging from 0.980 to 0.997), the data for the last four hours of each infiltration measurement were fitted to the equation:

$$I = Mt + m_2' \quad (3)$$

The steady-state infiltration rate,  $M$ , was then determined as the slope of equation (3). The sum of the parameters  $m_1'$  and  $m_2'$  of equations (2) and (3) respectively gives the parameter  $m'$  of equation (1). The parameters,  $M$  and  $S$  are assumed to be spatially independent in this study.

### Frequency Distribution:

Frequency distributions for both the steady state infiltration rate and sorptivity were determined by means of the probit diagram (Hald, 1952). This approach had been used by other investigators to determine the frequency distributions of various measured and calculated soil and water properties (Nielsen *et al.* 1973; Vieira *et al.*, 1981; Biggar and Nielsen, 1976; Wagenet and Jurinak, 1978; Hajrasuliha, Baniabbassi, Metthey, and Nielsen, 1980; Folorunso and Rolston, 1984).

The probit diagram is a plot of probits (coined after probability units) against the observations (arranged in increasing order of magnitude). Some of the above mentioned investigators used plots of the fractile against the sorted observations. The probit corresponds to the fractile plus 5 (Hald, 1952). If the plot of the probits against the sorted observations is linear (based upon the least squares method), the observations are said to be normally distributed. But, if the plot of the probits against the natural

logarithmic transformed values of the observations, is linear, the observations are said to be log normally distributed. If a frequency distribution for a particular variable is established, the extent of flatness of its probability distribution in comparison to the ideal normal probability distribution must also be known. This is achieved by calculating its moment coefficient of Kurtosis. The concept of moments indicates that the  $r^{\text{th}}$  sample moment about the sample mean,  $M_r'$ , is given by the expression:

$$M_r' = \frac{1}{n} \sum_{i=1}^n (X_i - \bar{X})^r \quad (4)$$

Where  $X_i$  represents the observations,  $\bar{X}$  is the mean of the observations and  $n$  is the number of observations. The moment coefficient of Kurtosis,  $Y$ , is given by the expression:

$$Y = \frac{M_4}{M_2^2} \quad (5)$$

Where  $M_4$  and  $M_2$  are the 4th and 2nd sample moments respectively (Haan, 1977). The Kurtosis for an ideal normal distribution is 3 and the ideal normal distribution is said to be mesokurtic. If a distribution has a greater concentration of probability near the mean than does the ideal normal, (implying a smaller spread and hence a smaller standard deviation than that of the ideal normal distribution with identical mean), the Kurtosis will be greater than 3 and the distribution would be platykurtic.

#### *Sample Number Requirement:*

The number of infiltration measurements,  $n$ , needed to estimate the mean infiltration rate for the study area with a specified precision level was calculated using the equation:

$$n = \left( \frac{Z_{\alpha/2} S}{e} \right)^2 \quad (6)$$

Where  $S$  is the sample standard deviation,  $e$  is the specified allowable error and  $Z_{\alpha/2}$  is the  $z$ -statistic. If the sample mean is used as an estimate of the population mean one can be (1- $\alpha$ ) 100 per cent confident that the error in estimating the mean infiltration rate for the study area will be less than a specified amount,  $e$ , when the number of infiltration measurements is  $n$  (Hald, 1952).

## **Results and Discussion**

### *Extent of variability of the Infiltration Parameters:*

The field-measured steady-state infiltration rates show a three order of magnitude variation from 7.20 to 22.20 cm/hr with a mean of 13.49 cm/hr and standard deviation of 3.55 cm/hr (Table 1). This wide range in measured infiltration rates over a land area of 0.23 ha clearly manifests the high variability characterizing field-measured infiltration rates. The mean value of steady-state infiltration rate reported in this study is higher than values reported for some soils of the South-Western part of Nigeria (Babalola, 1978). This is however not too surprising since the soil on which this study

was conducted is more coarse textured and hence has a higher percentage of macroporosity than the soils of South-Western Nigeria. The coefficient of spatial variation, (C.V.) was calculated as the ratio of the standard deviation to the mean infiltration rate expressed as percentage. The coefficient of spatial variation calculated for the infiltration rates in this study was 24.83%. This coefficient of spatial variation should provide a good estimate for the population coefficient of spatial variation since a sample size of 36 used in this study is statistically considered "large". The value is however lower than values reported by other investigators. Babalola (1978) reported values of C.V. ranging from 47.6 to 146.9% for steady-state infiltration rates measured at the University of Ibadan experimental farm while Nielsen *et al.* (1973) reported C.V. of 91.39% on panoche clay loam in California. The differences in the values of C.V. reported by these and other investigators were probably due to the differences in soil types of their respective study areas.

Calculated values of sorptivity also depict a three order of magnitude variation from 10.69 to 31.29 cm/hr with a standard deviation and coefficient of spatial variation (C.V.) of 5.47 cm/hr and 25.20% respectively. The C.V. for the infiltration rate and sorptivity values are quite close. Their relationship will be discussed in a subsequent section of this paper.

#### *Frequency Distribution:*

Both normal and log-normal distributions were fitted to the steady-state infiltration rates and the values of sorptivity (Figures 1 and 2). Figures 1a & b show that both the normal and log-normal frequency distributions describe the infiltration data with identical statistically significant ( $P < 0.01$ ) correlation coefficient of 0.97. This clearly indicated that both the normal and log-normal distributions were equally adequate for describing the infiltration data. Similarly, Figures 2a & b show that the normal and log-normal frequency distributions describe the sorptivity values with statistically significant ( $P < 0.01$ ) correlation coefficients of 0.93 and 0.96 respectively. As in the case of the infiltration rates, it is apparent that both the normal and log-normal distributions were equally adequate for describing the sorptivity values. Since no data transformation was required for the use of the normal distribution as opposed to the log-normal distribution, the former was adopted for both the infiltration rate and sorptivity and all statistical analyses in this paper therefore assume normal distribution.

**Table 1**  
*Normal statistics for infiltration Rate and Sorptivity*

	<i>Mean</i>	<i>Std. Dev.</i>	<i>Coeff. of Kurtosis</i>	<i>Coeff. of Variation C.V.</i>
Infiltration Rate (Cm/hr)	13.49	3.35	3.87	24.83
Sorptivity (cm/hr)	17.58	4.43	5.47	25.20

Vieira *et al.* (1981) also reported that their field-measured infiltration rates were better described by the normal distribution. But Nielsen *et al.* (1973); Sharma, Gander & Hunt, 1980; and Babalola (1978) reported that their steady-state infiltration rates were better described by the log-normal distribution. Such a difference in reported frequency distributions may be due to the type and nature of the soil on which the infiltration rates are measured, especially when field observations were seldom ideally distributed (Vieira *et al.*, 1981). The spread of the probability distributions of the infiltration rate and sorptivity were examined. Table 1 shows that the infiltration rate and the sorptivity exhibit moment coefficients of Kurtosis of 3.87 and 5.47 respectively. Both parameters can therefore be said to be leptokurtic (Haan, 1977). This implies that both parameters exhibit a greater concentration of probability near the mean (and hence less spread) than does an ideal normal distribution with the same mean as each of the parameters.

#### *Relationship between the steady-state Infiltration Rate and Sorptivity:*

There appeared to be a linear relationship between infiltration rate and sorptivity (Fig. 3). This linear relationship was quantified using the classical least squares method and a statistically significant ( $P < 0.01$ ) correlation coefficient of 0.87 was obtained. The immediate implication of this quantitative relationship is that infiltration rates can be predicted from values of sorptivity. For instance, the prediction equation obtained in this study is given by the expression:

$$I = 1.88 + 0.66S$$

Where  $I$  is the steady-state infiltration rate and  $S$  is the sorptivity. However, this prediction equation needs further testing to make it valid for the study area. With the availability of a validated and time-tested prediction equation for a given soil type, field measurement of steady-state infiltration rate would become less time consuming. Sharma *et al.* (1980) working on a 9.6 ha watershed in Oklahoma, USA obtained a similar linear correlation between the steady-state infiltration rate and sorptivity with a correlation coefficient of 0.81.

#### *Sample Size Requirement:*

The frequency distribution and variance of the measured steady-state infiltration rates were used to calculate the number of observations needed to obtain a given accuracy of the mean infiltration rate for the study area, using equation (6). Figure 4 gives the mean values of infiltration rate expected 95% of the time as a function of the number observations taken randomly throughout the study area. The shaded portion represents the region in which the mean infiltration rate, as a function of the number of observations, is expected to fall 95% of the time. As the number of samples taken increases, the true population mean would be enclosed within narrower limits (Figure 4).

Twenty-four samples would allow the true mean infiltration rate to be estimated within  $\pm 10\%$  of its true value while only six samples would be needed to estimate the true infiltration rate within  $\pm 20\%$  of its value and this would be true 95% of the time. Similar calculations have been made by Biggar and Nielsen (1976) on field-measured pore water velocities, Hajrasuliha *et al.* (1980), Waggenet and Jurinak (1978)

on electrical conductivity measurements; and Folorunso and Rolston (1984), on field-measured denitrification gas fluxes. Such calculations would enable both the investigators and prospective users of these calculations to know how much confidence to attach to their results.

### Summary and Conclusion

Field-measured steady-state infiltration rates and sorptivity exhibited moderate variability with coefficients of variation on 24.83 and 25.20 percent respectively. These coefficients of variability are smaller than those reported in the south-western part of Nigeria and this would probably be due to differences in the type and nature of soils of the different study areas. The infiltration rates showed a three-order of magnitude variation from 7.20 to 22.20 cm/hr with a mean of 13.49 cm/hr, while the calculated values of sorptivity also revealed a three-order of magnitude variation from 10.69 to 31.29 cm/hr with a mean of 17.58 cm/hr. The average infiltration rate of 13.49 cm/hr obtained in this study suggests that the study area is not suitable for gravity irrigation and can only be recommended for overhead irrigation (FAO, 1979). Both the infiltration rate and sorptivity appeared to be equally well described by the normal and the log-normal distribution while the normal distribution for each of the parameters exhibited a narrower spread than the ideal normal distribution with identical mean. A significant ( $P < 0.01$ ) linear relationship ( $r = 0.87$ ) was obtained between the infiltration rate and sorptivity. This suggests the possibility of making prediction of steady-state infiltration rate for a given field location from the value of sorptivity obtained for that location using a time-tested and validated prediction equation. Calculations revealed that infiltration measurements at twenty-four randomly spaced field locations would enable the true mean infiltration rate for the study area to be estimated within  $\pm 10\%$  of its value while measurements at only six locations would be needed to make the estimation within  $\pm 20\%$  of its value; and this would be true 95% of the time.

### Acknowledgement

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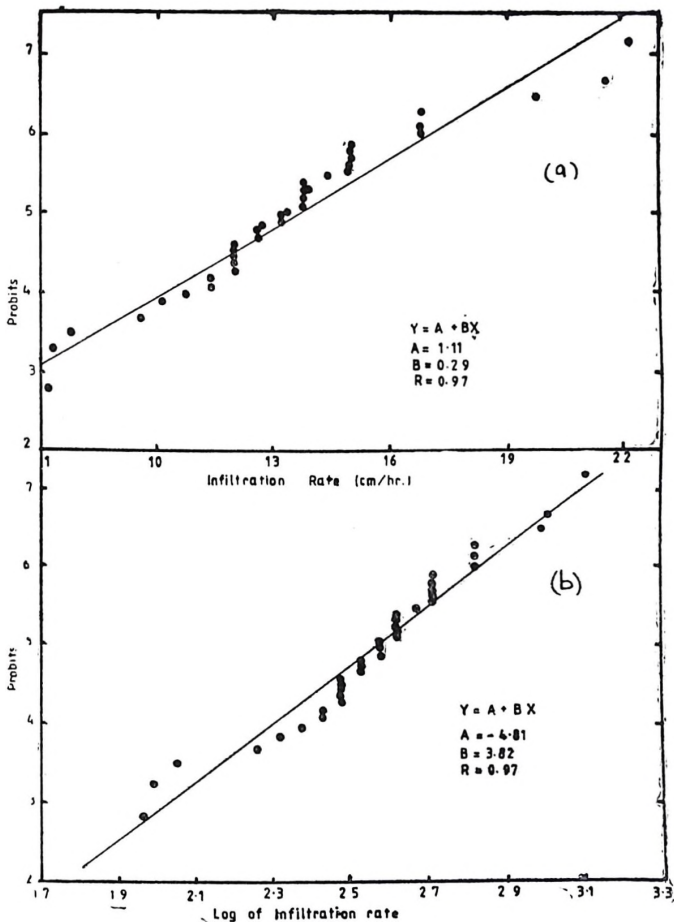


Figure 1 (a) Normal probit diagram for the field-measured Infiltration rates  
 og-normal probit diagram for the infiltration rates.

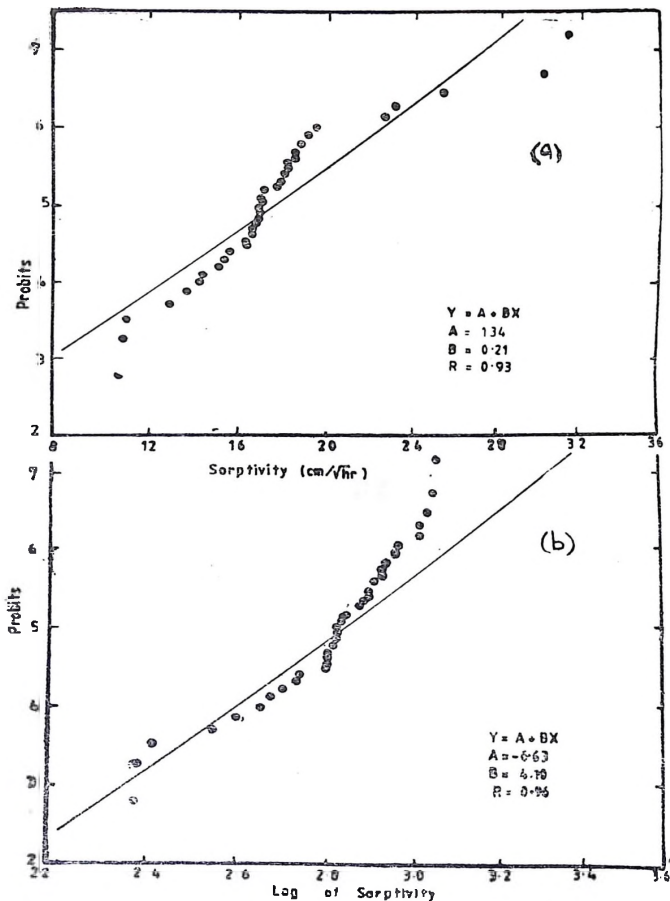


Figure 2 (a) Normal probit diagram for the calculated sorptivity values,  
 (b) Log-normal probit diagram for the sorptivity values.

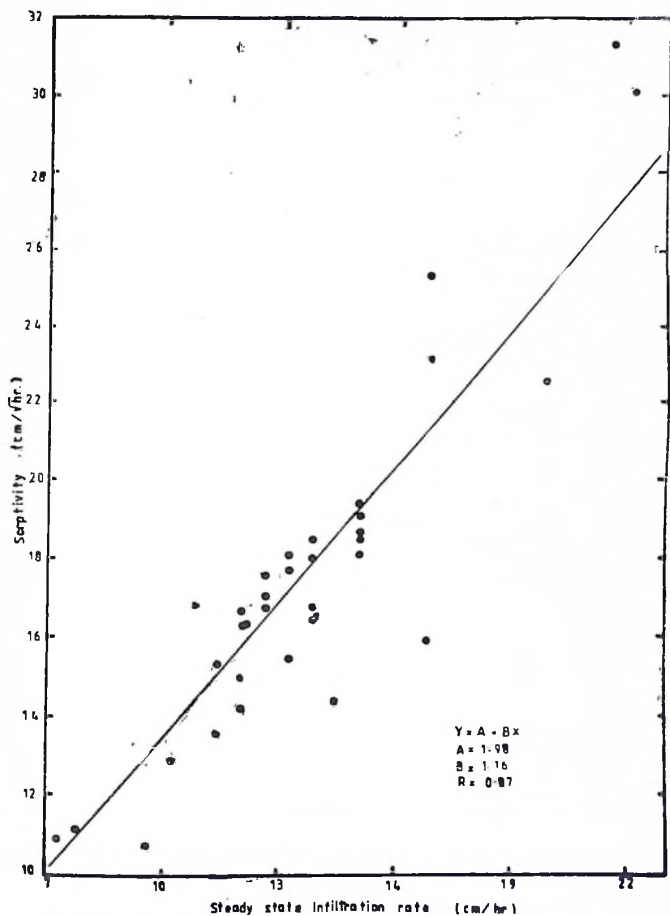


Figure 3. Linear correlation between the Sorptivity values and the field-measured infiltration rates.

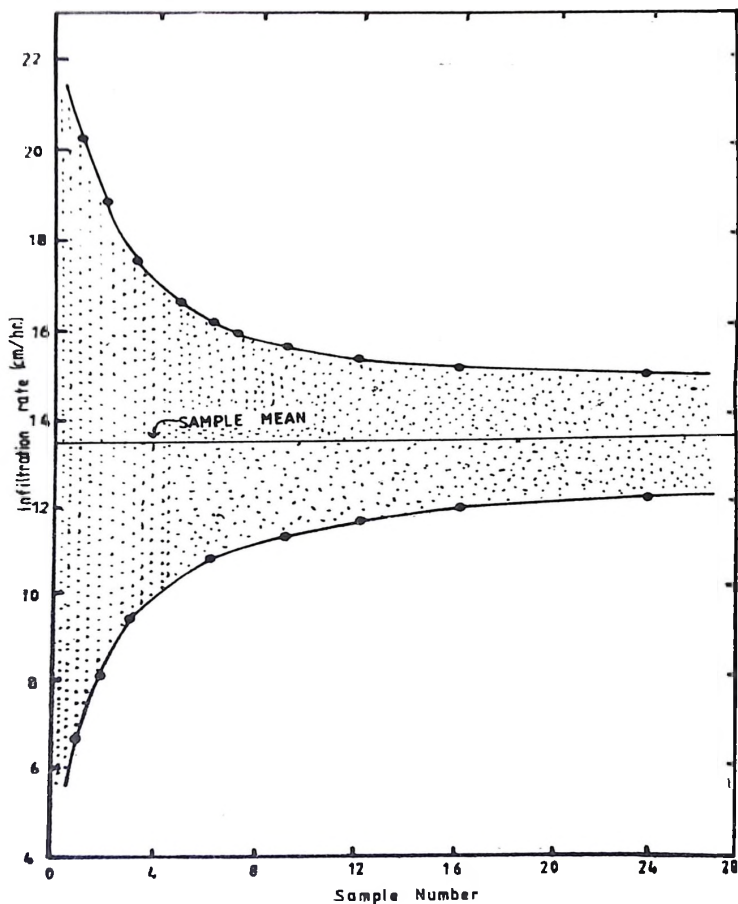


Figure 4. Mean values of Infiltration rate expected 95% of the time as a function of number of samples taken throughout the entire field.

# PRELIMINARY GEOPHYSICAL INVESTIGATION OF WATER-BEARING FORMATIONS IN SHAFFA AREA OF BORNO STATE

by

O. T Nkereuwem

## Abstract

A preliminary study of aquifers was carried out in Shaffa. It was observed that permeable zones occur in the basalt flows which constitute a predominant feature of the area. Three distinctly different aquiferous zones have been identified based on the interpretation of resistivity sounding curves. The study also revealed the following: That the eluvial deposits which all the hand-dug wells in the area penetrate, form an aquifer under water-table conditions. Secondly, that some scoriaceous or vesicular as well as heavily fissured flows are probably responsible for artesian aquifers within the basalts. Lastly, there is a third aquifer which exists between the basalts and the upper part of the basement rocks, the latter of which is found to be densely fractured. The work has afforded a sufficiently definitive picture of the sub-surface within the study area to a depth of about 130m. Depth estimates made by geophysics generally agreed with those obtained from existing boreholes in the area.

## Introduction

The location of large groundwater resources for both human and animal consumption as well as for irrigational purposes has posed a considerable problem for several years in the Shaffa area of Borno State. (Fig. 1). It is probable that permeable zones exist in the basalt flows as well as within the fractured upper part of the basement rocks. Since the hydrogeological parameters used in describing the characteristics of granular or scoriaceous aquifers are uniquely related to geophysical parameters of water-bearing strata, it follows that some geophysical techniques are inevitable tools in the qualitative evaluation of groundwater potentialities.

In this regard, the resistivity sounding technique has the most extensive application in the development of groundwater. Some of the tasks in this area include the search for permeable formations suitable for water accumulation, the location of optimal drilling sites and the determination of the thicknesses of water-bearing formations. The primary objectives of the present work are to determine the presence of water-bearing formations in the study area as well as to establish the geoelectric section of the area.

The resistivity depth sounding technique was used. A total of 12 depth soundings were carried out in the area in September 1984 (Fig 2). This paper summarises the results and interpretations of the geophysical study. Figure 3 presents the important information on the geologic stratification as well as aquifer thicknesses. The graphical presentation of results are shown in figures 4-6.

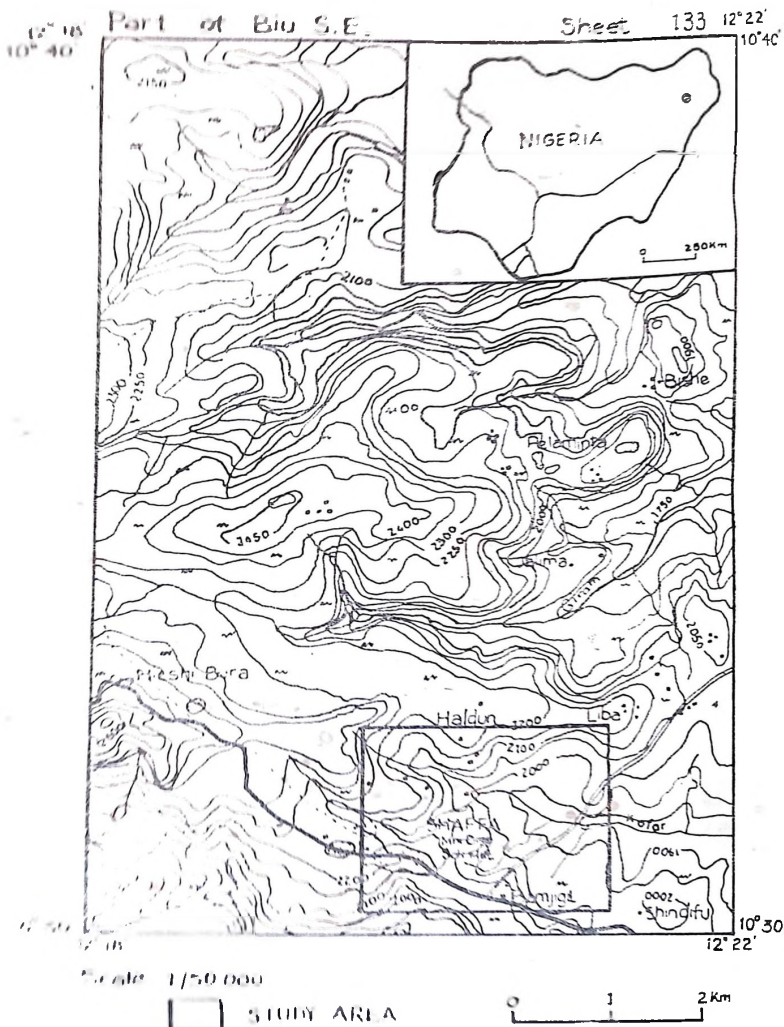
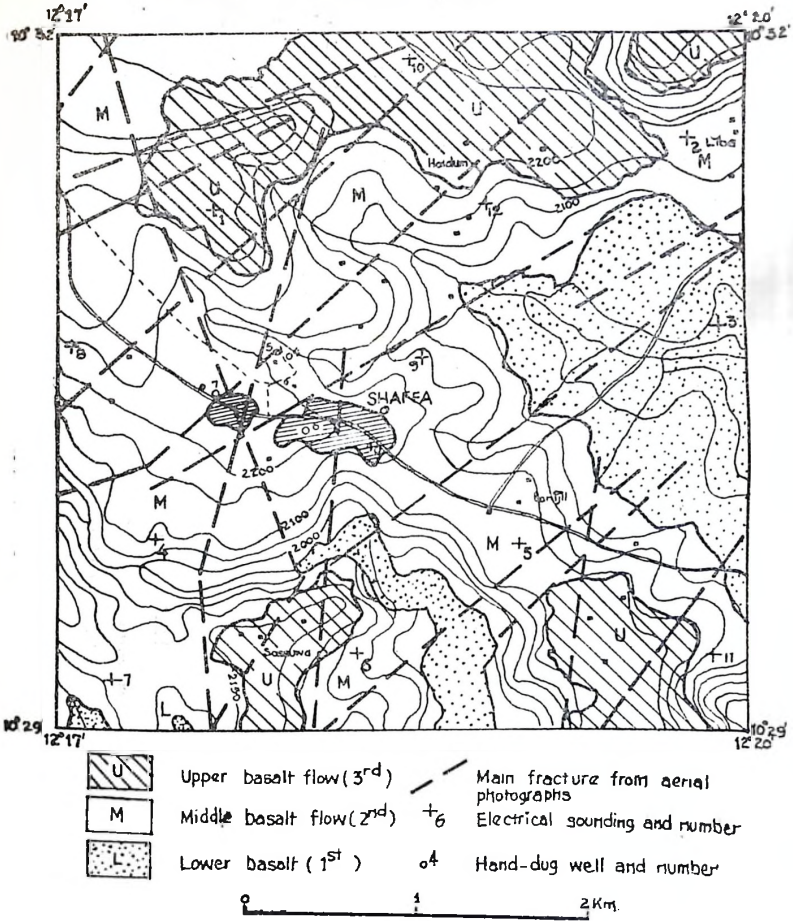


FIG. 1. Location map of the Study area after Federal Survey, 1962.



Scale 1:25000  
 Fig 2 Geological map of Shafia area after Conred Nigeria Limited, 1978

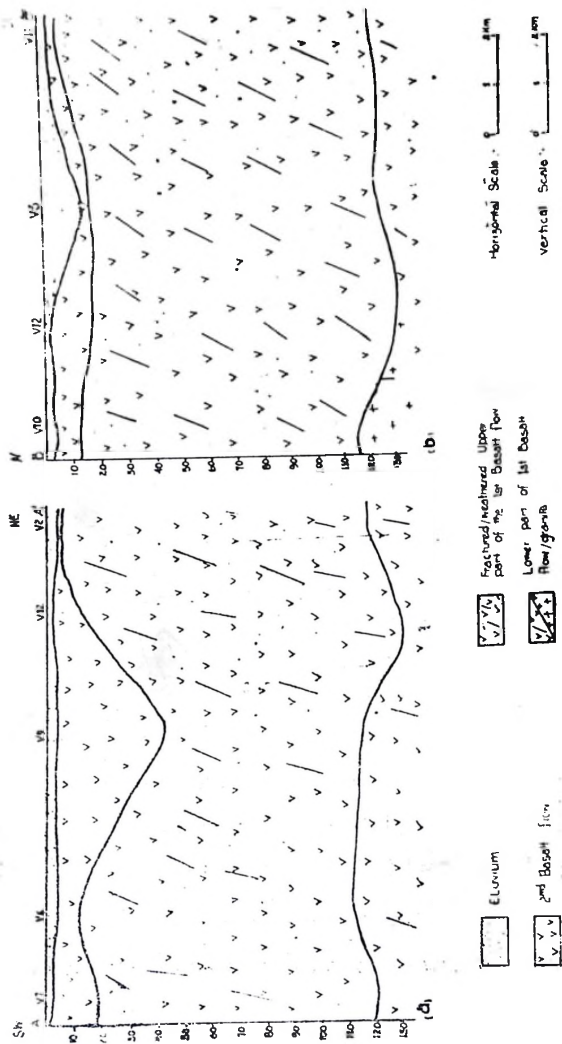


Fig. 3 Geohydrological cross sections

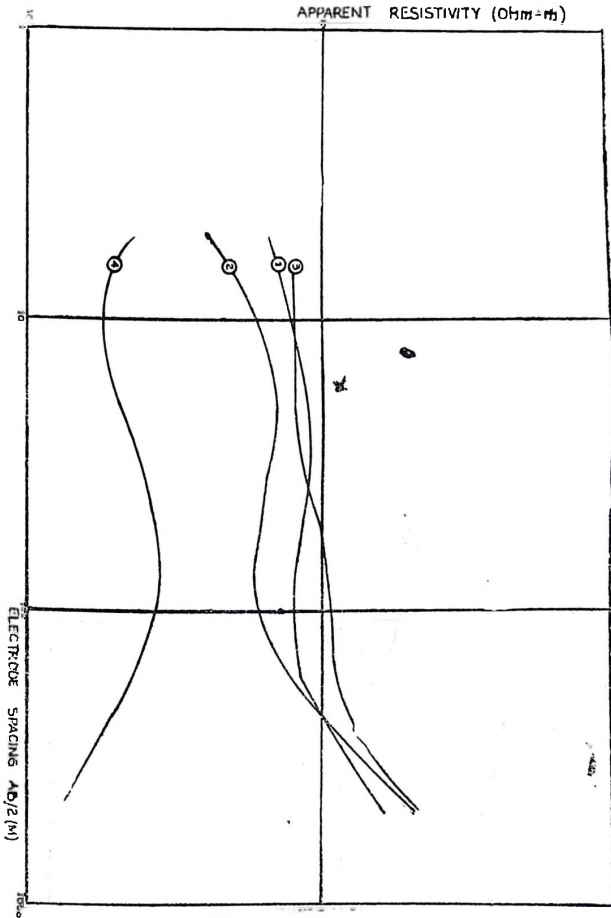


Fig 4

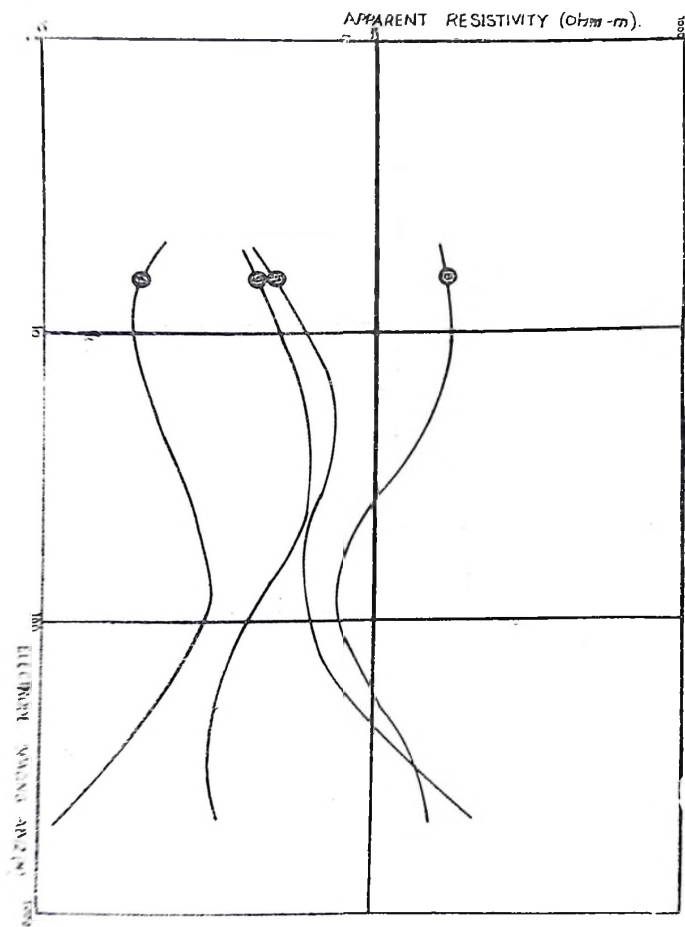


Fig 5

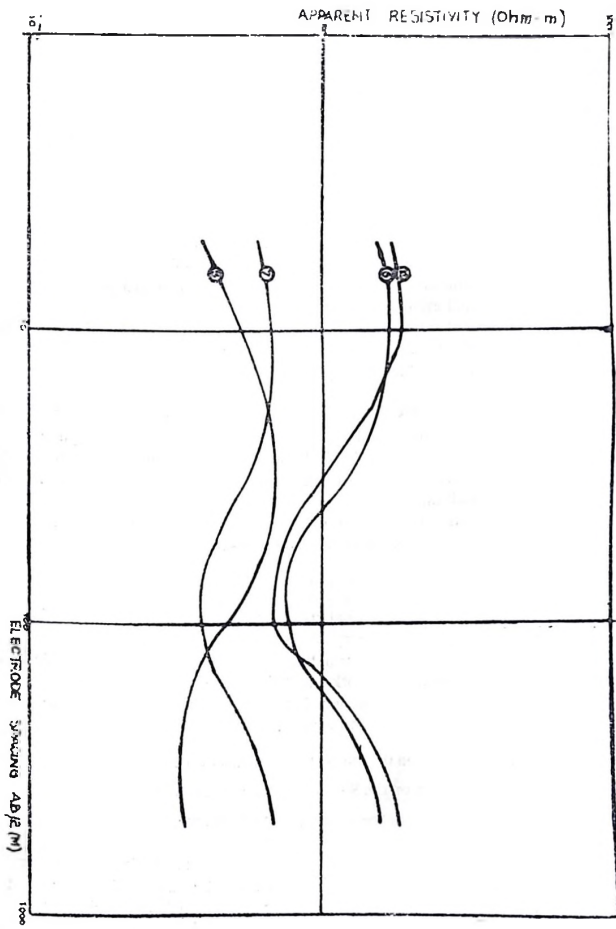


Fig 6

It was observed that the proliferation of hand-dug wells/boreholes, high rate of evaporation and inadequate recharge contribute to the initiation and development of the socio-economically damaging problem of receding water tables in the area. This problem could be solved by regulating the number of boreholes in the area and basing their locations strictly on geophysical recommendations. It can be concluded that geophysical methods are cheap as well as effective tools for geohydrological investigations. The problem of the location of optimal drilling sites in the area is still open and will be thoroughly investigated in a forthcoming work.

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# THE PETROLOGICAL STUDY OF BIU PLATEAU BASALTS, BORNO STATE, NIGERIA

by

M. R. Islam

## Abstract

The Biu Plateau basalts are in general alkaline olivine basalts. They show little petrographic variations which are related to their mode of occurrence and origin. Petrographic differentiation supported by geochemical evidence reveals that there are two basic types of basalts in the Biu Plateau—the Biu type and the Miringa type. Though they have similar mineralogy and texture, the Biu type basalts are characterized by the substantial alteration of the olivine crystals to iddingsite, whereas the Miringa type undergone very slightly or no alteration at all. The varying degree of alteration of olivine in Biu type basalts indicate that this is older than the Miringa type.

The preliminary geochemical investigation of the Biu type indicates that this is alkali basalt whereas the Miringa type is a basanite. More chemical analyses of the Biu Plateau basalts are necessary for their interpretation into such groups.

## Introduction

The Biu Plateau is the largest area of volcanic rocks in Nigeria. It extends for over 5000 km<sup>2</sup>: The area is characterized by the wide occurrences of alkaline olivine basalts which thickness varies from 30 to 250m. Over 80 volcanoes have been distinguished in the area (Fig. 1). They occur in the form of tephra rings, cinder cones and maars and are composed of basaltic agglomerates, lavas, volcanic bombs, ashes and tuffs. But these are less in abundance in comparison to basalts and are not uniform in their distribution. The various forms of volcanics indicate that there was variation in viscosity of the basaltic lavas as well as differences in time, place and mode of extrusion. There is no sign of vents and fissures from which the Plateau basalts have extruded, but the wide occurrences indicate an eruption from a central vents of Hawaiian or Strombolian type (Carter *et al.*, 1963).

The Biu Plateau is a part of the Tertiary-Recent Volcanic Province of Nigeria and Cameroun, and like the Adamawa Plateau of Cameroun, it lies away from the Gulf of Guinea Islands, through Cameroun Mountain and the Bamenda Volcanic District towards Lake Chad (Fig. 2). Hence, its location does not seem to have any structural control (Turner, 1978). Locally, however, the volcanoes form a linear alignment on the Western part of the plateau and related to a linear fracture in the basement (Tegure, 1978).

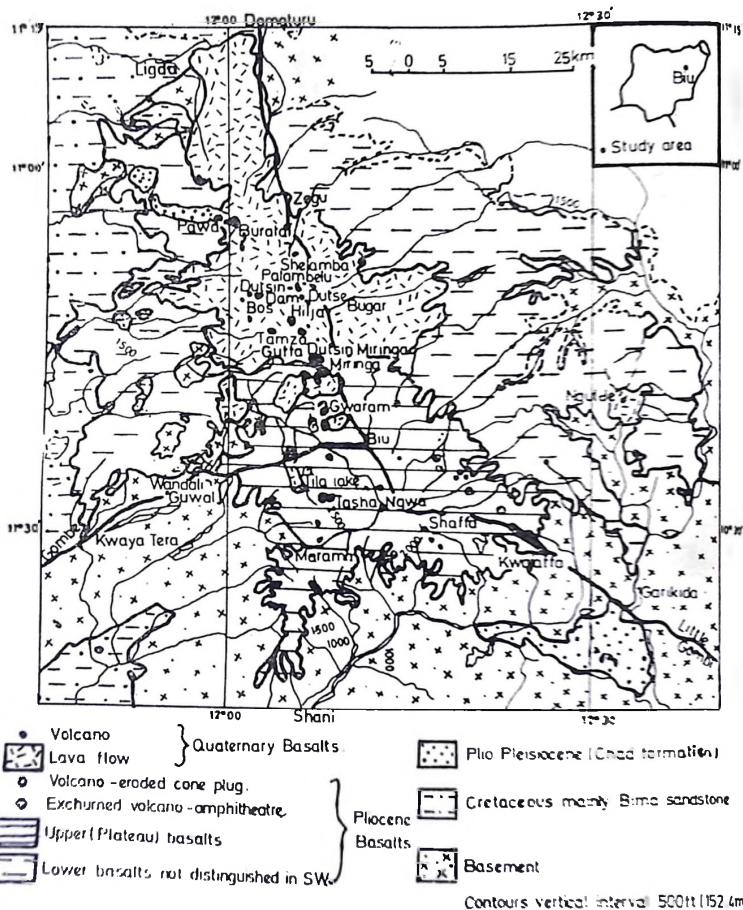


Fig. 1 Geology of the Biu Plateau, (after D. C. Turner, 1978, p. 63, modified).

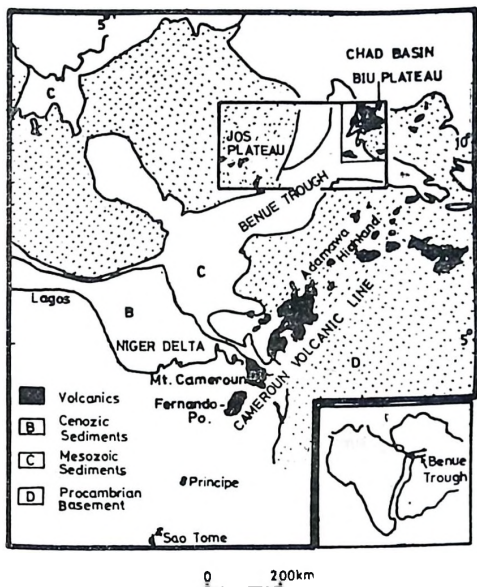


Fig. 2 Location of the Biu Plateau and other Rocks in the Nigerian-Cameroon-Gulf of Guinea Province, (after J. B. Wright, 1976. Fig. 25, p. 119, modified).

Several geologists have studied this area previously on different aspects of geology. Turner (1978) described the geology and volcanology of the area and dealt briefly with the petrology of the lavas and their ultramafic inclusions. Carter *et al.* (1963) gave petrographic descriptions and chemical analyses of two basalts at the western margin (West of 12°E) which does not fully represent the Biu Plateau. Grant *et al.* (1972) gave K-Ar dating for five basalts from the Biu Plateau which indicate two age group, an older Pliocene group (5.0 to 2.9 m.y.) and a younger Quaternary group (less than 1.4 m.y.). Ultramafic nodules from the Dustin Miringa were studied by De-Preez (1949). Wright (1976), described in detail the mineralogy of some megacrysts of the area. Tegure (1978) reported on the geology of the Biu Plateau (Standered Sheet 133).

The above evaluation work shows that the petrological and geochemical data of the area are scanty. However, an attempt has been made in this paper to describe the petrology of basalts of the Biu Plateau and to correlate them, with the previous work mentioned above.

#### Mode of Occurrence of Biu Plateau Basalts

The basalts in Biu Plateau mostly occur as "Flood basalts" in a number of flows and in fact cover nearly 85 per cent of the area with its centre around Biu. The Plateau basalts are probably erupted through fissures and fed by dikes. The basalt at some places has been built up large number of flows. From the dimensions of the flows and the marked absence of pyroclastics in and around Biu, Biu Dam site and S.E. of Biu, it is obvious that the eruption of basaltic magma in these places was not violent. The basaltic sequence is surrounded in other places, particularly N.W. of Biu, by several youthful scoria, cinder cones, tephra rings, etc. exhibiting well defined craters with craters rims from which small thin flows of basaltic lava issued. The pyroclastics are located around Miringa, Zagu and Buratai Hills and are generally restricted to the area west of Biu-Damaturu road. These rock types strongly suggest that the eruption in these places was violent in nature.

#### Mineralogical Characters of Biu Plateau Basalts

The Biu Plateau basalts are in general alkaline olivine basalts. They show little variation in mineralogical characters and petrography which is related to their mode of occurrence and origin. In hand specimens the basalts are dark, dense, fine grained rocks in which individual olivine and pyroxene crystals can sometimes be seen. Porphyritic and vesicular varieties are very common. Occasionally the olivine crystals are concentrated into large pockets and there are frequent cavities and vesicles filled with zeolites, chalcodony, etc.

In thin section the basalts are seen to consist of phenocrysts of only olivine, sometimes olivine and pyroxene (diopsidic-augite), set in a groundmass consisting of late of labradorite, magnetite, ilmenite and volcanic glass. Apatite is the most common secondary mineral, rarely analcite. The secondary mineral whenever present are usually zeolites, chalcodony, etc.

The olivine occurs both as phenocrysts and as small crystals in the groundmass. The phenocrysts have a composition of approximately  $FO_{75}FA_{25}$ . The iron content increases slightly towards the rims. The olivine shows alteration to varying degrees.

The pyroxene in most specimens are iron-rich. The phenocrysts of pyroxenes are usually diopsidic-augite and the smaller crystals, and the groundmass pyroxene are more pigeonitic. The pyroxene crystals are idiomorphic, weakly to moderately zoned, occasionally showing ill-defined hour-glass structure. The pyroxene also shows alteration. The feldspar is labradorite. It varies in size from cryptocrystalline laths to large zoned crystals. It is irregularly distributed, but occasionally well oriented crystals form a trachytic texture.

The iron titanium oxides are magnetite and ilmenite, but magnetite is more abundant. They are irregularly distributed in the groundmass. The groundmass is usually holocrystalline though occasionally small amounts of volcanic glass are present. The glassy content is one of the characteristics of the Biu Plateau basalts.

There are several flows of basalts in some places lying one over the other. The basalt flows are very fine grained where pyroxene are confined to the groundmass. The upper flows are more porphyritic and contain phenocrysts of both olivine and diopsidic-augite set in a groundmass of labradorite, olivine, pigeonite, iron titanium oxides and interstitial glass. The topmost layer, in some places, contain largest phenocrysts of diopsidic-augite and smaller crystals of pigeonitic-augite and olivine, and the groundmass more of pigeonitic.

As mentioned earlier, the basalts of Biu Plateau show variation in mineralogy and petrography. These variations are reflected in the descriptions of the basalts from different localities.

#### *Biu town along Biu-Garkida Road*

A fine grained basalt with a very few smaller size phenocrysts of olivine set in a groundmass of labradorite, olivine, magnetite, ilmenite and volcanic glass. The olivine is partially or completely altered to iddingsite. This basalt shows hypidiomorphic texture and does not have any fractures or vesicles in it. Basalts having similar composition, but slightly vesicular with high percentage of iron titanium oxides have been located in Yimirshika and in Gula and of equigranular trachytic texture in Sabon Kashuwa, Fuma and Kwajaffa localities south western part of Biu Plateau.

#### *Tashangwa*

A fine grained basalt. Its mineralogical composition differs slightly from that of Biu town. Phenocrysts of both olivine and pyroxene are equally abundant and in addition some large crystals of labradorite are present. Unlike the basalt of Biu town, the labradorite constitutes a very high percentage of the groundmass together with olivine, pyroxene, iron titanium oxides and interstitial glass. The olivine is partly altered to iddingsite. The pyroxene sometimes shows parallel growths, pigeonite in the core and augite in the margin. A very few crystals of apatite and nepheline are found. Chalcedony occurs as a secondary mineral; Basalts of similar mineralogical composition have been located at Kumar but the latter contains high amount of interstitial glass than the former.

*Pawa:*

There are at least seven flow of basalts in the area. The earliest flow is a fine grained olivine basalt becoming vesicular at the top. This is similar in mineralogical composition to that of Dustin Miringa. The overlying flow is similar too, except that the feldspars are smaller and altered to cloudy appearance. Both olivine and pyroxene in it are altered too. The succeeding flows have the same composition but there is a decrease in the olivine content. The rock in the sixth flow contains phenocrysts of diopsidic-pigeonite. The seventh flow of basalt is characterized by the presence of three distinct pyroxene. Diopside form the largest phenocrysts which are associated with smaller crystals of pigeonitic-augite and the groundmass pyroxene is more pigeonitic.

*Gowal:*

The basalts are similar in mineralogical composition to that of Biu Gombe Road cutting and Biu Dam Site. The plagioclase is somewhat altered and cloudy inter-woven with pyroxene. The pyroxene phenocrysts are diopsidic augite and the groundmass pyroxene are rather more pigeonitic. This is associated with red pumice and vesicular basalts and have more or less similar mineralogical composition.

*Kaya Tera:*

A fine grained porphyritic olivine basalt similar to that of the Biu type. This rock is associated with weathered nodular, equigranular olivine basalt. The nodular basalt is composed of roughly aligned labradorite laths, olivine, little augite, iron oxides and some interstitial glass. The olivine is partially altered to iddingsite. The groundmass olivine is more iron rich. To the east of Kaya Tera, a narrow outlier of basalt is located. It consists of micro phenocrysts of olivine set in a groundmass of olivine, pyroxene, labradorite, iron oxides and interstitial glass. The pyroxene is pigeonitic and the olivines are much altered to iddingsite.

**Petrology of Biu Plateau Basalts**

From earlier discussion it may be ascertained that there are two basic types of basalt differentiated petrographically in the Biu Plateau. These are the Biu type and the Miringa type.

The Biu type of basalts are located in and around Biu town and mostly in southern part of the Biu Plateau. The Biu type is a fine grained porphyritic lava having irregularly distributed laths of plagioclase (bytownite to labradorite), magnetite, ilmenite forming the groundmass. Phenocrysts of olivine are common though some smaller crystals of olivine form part of the groundmass. The vesicles in the rock are filled with secondary minerals like zeolites, chalcedony, etc. The Biu type is characterized by the alteration of the olivine crystals. The olivine crystals, particularly the smaller ones, have undergone a substantial alteration to iddingsite, whereas the phenocrysts show alteration to varying degrees along the rims and fractures. These are variations in the texture, the content of phenocrysts and in the mineralogy of the infilled fracture materials and amygdals.

*Schindler*

A very fine grained basalt, like with vesicles and contains olivine as phenocrysts and in the groundmass partially altered to iddingsite. Both labradorite and olivine are abundant in the groundmass but labradorite predominates over the olivine. The labradorite shows trachytic texture. The pyroxene is aegirine and the iron titanium oxides are less in abundance than that in the other localities. The amount of interstitial glass is also very less in this rock.

*Bas along Bui Gombo Road:*

A fine grained basalt having a very few phenocrysts of olivine and pyroxene set in a groundmass consisting of smaller crystals of labradorite, olivine, pyroxene, iron titanium oxides and interstitial glass. Olivine is predominant than pyroxene and is partly or completely altered to iddingsite.

*Bui Dam Site:*

A very fine grained basalt, similar in mineralogical composition to that of the Bui town, but the quantity of interstitial glass is much more in it than found elsewhere.

*Dustin Miringa:*

A porphyritic basalt but variable in texture, contains larger phenocrysts of olivine and pyroxene set in groundmass composed of laths of plagioclase and smaller grains of olivine and pyroxene, magnetite, ilmenite and interstitial glass. The distribution of plagioclase laths give a trachytic texture. Some plagioclase (bytownite-labradorite) phenocrysts show zoning. The olivine phenocrysts (0.1-1.0mm) are slightly altered along the fractures and rims to iddingsite or serpentine though most of them are still fresh. The pyroxene in this rock appeared to be titan-aegirite. In other places it contains leucite or analcite which indicates that the rock may be a basanite.

*Tila Lake:*

The topmost flow at Tila Lake is a porphyritic olivine basalt similar in mineralogical composition to that of Dustin Miringa. It contains megacrysts to smaller phenocrysts of both olivine and pyroxene and in addition some larger crystals of titanomagnetite. It is more vesicular and some of the vesicles are filled with zeolites, chaledony, etc. The basalt flow at the northern part of the Tila Lake caldera appears to be similar to that of the Bui type in respect of mineralogy.

*Loda:*

A porphyritic olivine basalt similar to that in Dustin Miringa. It contains large phenocrysts of iddingsite, olivine with subordinate pyroxene set in a groundmass composed of olivine, pyroxene, labradorite and iron oxides. Around the rims and along the fractures, the olivine has undergone alteration to iddingsite. The pyroxenes vary in size from phenocrysts to very fine groundmass. The larger crystals are diopsidic-anorthite but the surrounding groundmass is aegirine or pyroxene.

*Pawa:*

There are at least seven flow of basalts in the area. The earliest flow is a fine grained olivine basalt becoming vesicular at the top. This is similar in mineralogical composition to that of Dustin Miringa. The overlying flow is similar too, except that the feldspars are smaller and altered to cloudy appearance. Both olivine and pyroxene in it are altered too. The succeeding flows have the same composition but there is a decrease in the olivine content. The rock in the sixth flow contains phenocrysts of diopsidic-pigeonite. The seventh flow of basalt is characterized by the presence of three distinct pyroxene. Diopside form the largest phenocrysts which are associated with smaller crystals of pigeonitic-augite and the groundmass pyroxene is more pigeonitic.

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A fine grained porphyritic olivine basalt similar to that of the Biu type. This rock is associated with weathered nodular, equigranular olivine basalt. The nodular basalt is composed of roughly aligned labradorite laths, olivine, little augite, iron oxides and some interstitial glass. The olivine is partially altered to iddingsite. The groundmass olivine is more iron rich. To the east of Kaya Tera, a narrow outlier of basalt is located. It consists of micro phenocrysts of olivine set in a groundmass of olivine, pyroxene, labradorite, iron oxides and interstitial glass. The pyroxene is pigeonitic and the olivines are much altered to iddingsite.

**Petrology of Biu Plateau Basalts**

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The Miringa type is located at the volcanic cones and plugs and is distributed in and around Miringa and to the north and the west of Biu Damaturu road. The mineral composition of the rock is similar to the Biu type. It contains essentially plagioclase (bytownite to labradorite), olivine, pyroxene and iron titanium-oxides. The phenocrysts are usually larger and are of olivine, pyroxene and even labradorite. The unique character of the rock is the freshness of the olivine minerals. The olivine phenocrysts and even the smaller grains have undergone very slightly or no alteration at all. It is more porphyritic, scoraceous and vesicular than the Biu type. Fine laths of labradorite make up the groundmass, some of which exhibit trachytic texture. The groundmass includes magnetite, ilmenite and a very small quantity of interstitial glass. Large olivine nodules also characterize Miringa type basalts and some of them even reach a diameter of 8 cm. Vesicles and fractures are filled with mineral like zeolites, calcite etc.

The varying degrees of alteration of olivine in Biu type basalts indicate that this is older than the Miringa type which contains fresh or only slightly altered olivine. This difference indicates that there were different eruptions over a period of time. This supports the finding of Grant *et al.* (1972) and Tegure (1978). Grant *et al.* indicated that there are two types of basalts in the Biu Plateau. The older basalts of Pliocene age (5.0 to 2.9 m.y.) are distributed in and around Biu town and the younger basalts of Quaternary age (less than 1.4 m.y.) are distributed in and around Miringa.

#### **Petrogenesis of Biu Plateau Basalts**

The Biu type basalts are common alkali olivine basalts with olivine phenocrysts set in a groundmass of clinopyroxene, calcic plagioclase (bytownite to labradorite), iron titanium oxides and in addition interstitial glass. These rocks are more or less uniform and show frequent alteration to iddingsite. No feldspathoid mineral is detected in these rocks under the microscope. However the basalts are essentially alkaline as shown from a chemical analysis of a lava from Wandali, near the southern margin of the Biu Plateau (Table 1). It shows a normative nepheline of 0.57 per cent. The feldspathoids if present may remain hidden in the very fine grained or partly glass groundmass. Even when these are lacking the presence of titan augite leads to the appearance of a small amount of normative nepheline (Nockolds, Knox & Chinner, 1978).

The Miringa type basalts are essentially basanitic. These basalts show variation in texture with clinopyroxene (diopsidic augite and augite) and calcic plagioclase (bytownite to labradorite) more frequent as phenocrysts phases. The calcic plagioclase sometime enters into the phenocryst phases and it shows zoning. A few crystals of leucite and rarely analcite have been detected under the microscope. The groundmass is composed of olivine, clinopyroxene, calcic plagioclase, iron titanium oxides and interstitial glass.

Zeolites, particularly natrolite, chabazite and analcime have been detected as secondary minerals in cavities and fractures. The chemical analysis of a basalt (Miringa type) from Ligda, northern margin of the Biu Plateau shows normative nepheline content of 12.21 per cent (Table 1). Grant *et al.* (1972) suggested that the Quaternary basalts from the Biu Plateau includes basanite which is supported by Wright (1976).

**Table 1**  
*Chemical Analyses and Norms of Basalts*  
 (After Carter *et al.*, 1963, p 83).

	1	2	3	4	5
SiO <sub>2</sub>	44.59	45.37	43.85	45.86	44.44
Al <sub>2</sub> O <sub>3</sub>	15.99	16.58	13.95	16.46	18.45
Fe <sub>2</sub> O <sub>3</sub>	3.61	2.95	2.60	3.93	4.71
FeO	7.73	7.44	9.19	7.19	7.52
MgO	7.00	8.26	10.13	7.90	5.54
CaO	9.83	9.11	10.61	10.22	8.93
Na <sub>2</sub> O	4.39	2.50	3.71	3.83	3.87
K <sub>2</sub> O	1.84	1.93	1.54	0.56	1.85
H <sub>2</sub> O	0.27	0.57	0.43	0.40	0.46
H <sub>2</sub> O†	1.94	2.19	0.62	1.22	1.20
TiO <sub>2</sub>	2.43	1.87	2.29	2.61	2.13
P <sub>2</sub> O <sub>5</sub>	0.83	0.73	0.92	0.28	0.52
MnO	0.19	0.18	0.21	0.17	0.20
CO <sub>2</sub>	Nil	Tr.	0.15	Tr.	Tr.
BaO	0.04	0.03	0.05	Tr.	Tr.
S	Nil	0.41	Nil	Nil	Nil
<b>Total</b>	<b>100.68</b>	<b>100.12</b>	<b>100.25</b>	<b>100.63</b>	<b>99.82</b>
Sp. gr.	2.75	2.74	2.90	3.00	2.89
or	10.56	11.12	8.90	3.34	11.12
ab	12.05	19.91	8.91	22.01	16.77
an	18.63	28.63	16.96	26.41	27.52
di	19.92	9.15	23.29	17.86	10.79
ol	11.13	17.05	18.37	13.40	12.18
ne	13.63	0.57	12.21	5.40	8.52
il	4.56	3.65	4.41	5.02	4.10
mt	5.34	4.41	3.71	5.57	9.73
ap	2.02	1.68	2.02	0.67	1.34

1. Plug, near the Tula road junction, Gombe-Numan road.
2. Lava, Wandali on the southern margin of the Biu Plateau.
3. Lava, Ligda on the northern margin of the Biu Plateau.
4. Top Lava, Chikila, Longuda Plateau.
5. Basal lava, Chikila, Longuda plateau

Basanites usually contain olivine and leucite as an essential constituents. In addition it has abundant clinopyroxene and calcic plagioclase. Typical euhedral crystals of leucite both as phenocryst and in the groundmass are detected in these rocks. Sometimes analcite partly or wholly takes the place of nepheline. The clinopyroxene commonly present both as phenocrysts and in the groundmass. Olivine normally confined to the phenocrysts and may be abundant. The calcic plagioclase varies in composition from bytownite to labradorite when occurring as phenocrysts and is often zoned, prism or needles of apatite are always present: and the iron titanium oxides are variable in amount (Nockolds, Knox & Chinner, 1978). The basanites of the Biu Plateau truly fits into this definition.

A problem that arises is where to draw the line between the alkali basalts and the basanites. It is necessary to have the chemical analyses and to calculate the norms before the basalts of the Biu Plateau can be classified. Chemical analyses of only two basalts from two different localities of the Biu Plateau (Table 1, No 2 & 3), are so far available. In the absence of adequate data, if the basalt from the Wandali is considered to be the representative of the Biu type and the basalt from the Ligda to be the Miringa type, on the basis of their mineralogy, the Biu Plateau basalts can be classified geochemically as alkali olivine basalt and basanite (Fig. 3 & 4).

A plot of  $\text{Na}_2\text{O} + \text{K}_2\text{O}$  percentage against  $\text{SiO}_2$  percentage of the basalts from Biu Plateau (Fig. 3) along with other localities e.g. Longuda Plateau (Table 1, Nos 4 & 5) to the south shows that the Biu type (No. 2) falls in the field of alkali basalts and the Miringa type (No. 3) falls in the field of basanites. Again a plot of the Biu Plateau basalts along with the other localities mentioned above in normative system of diopside-olivine-nepheline (Fig. 4) shows that the Biu type falls in the field of alkali olivine basalts (No. 2) and the Miringa type (No. 3) in the basanites. If 10 per cent of normative nepheline is taken as the dividing line between the alkali basalts and the basanites, nepheline being an essential constituent in basanite, the classification of the Biu type as alkali olivine basalts and the Miringa type as basanites holds good. This is supported by the classification adopted by Nockolds, Knox and Chinner (1978) for such rocks.

### Summary and Conclusion

The Biu Plateau basalts are in general alkaline olivine basalts. They show little petrographic variations which are related to their mode of occurrence and origin. Individual olivine and pyroxene crystals are often seen in the hand-specimen. Porphyritic and vesicular varieties of basalts are very common with occasional concentration of olivine crystals into large pockets. Cavities are sometimes filled with zeolites, chalcedony, etc. Thin sections show phenocrysts of only olivine, sometimes olivine and pyroxene set in a groundmass of laths of plagioclase (mostly labradorite), magnetite, ilmenite and volcanic glass. Apatite is the most common accessory mineral, rarely analcite. The olivine and the pyroxene show alteration to varying degrees.

The plagioclase varies in size from cryptocrystalline laths to large zoned crystals and are usually irregularly distributed, but well oriented crystals occasionally form trachytic texture. The magnetite is more abundant than ilmenite and are irregularly distributed in the groundmass. The groundmass is usually holocrystalline, but small

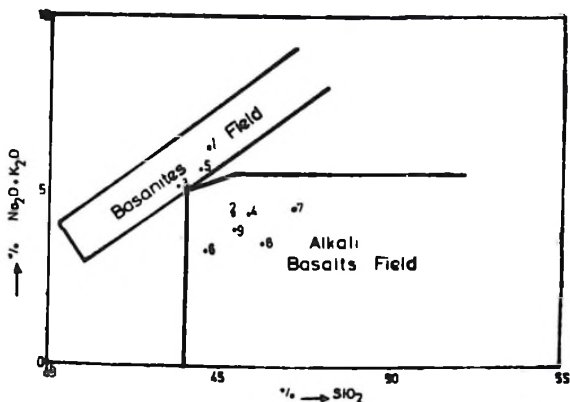


Fig. 3. Alkali - Silica diagram for Biu Plateau basalts (2 & 3) showing their distribution in Alkali basalt and Basanite fields Plot: 1-Tula Road Junction, Gombe - Numan Road; 4 & 5 - Longuda Plateau basalt. 6 - Alk. Ol. basalt (Green & Ringwood 1967) 7 & 9 Alk. Ol. basalts (Hyndman, 1972) 8 Alk. basalt (Nockolds, Knox & Chumer 1978).

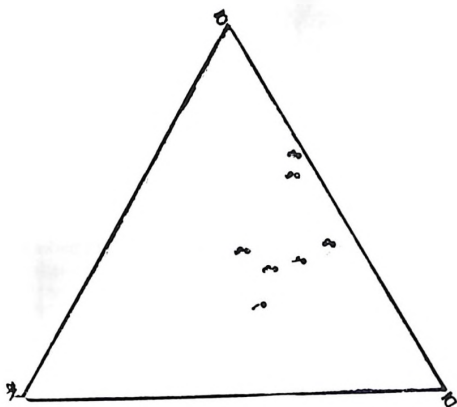


Fig 4: Plot of Biu Plateau basalt (2 & 3) in the normative system Diopside - Olivine - Nepheline. Plot: 1 - Tula Road Junction, Gombe-Numan Road; 4 & 5 - Longuda Plateau basalt; 6 - Alk. Ol. basalt (Green & Ringwood, 1967) 8-Alkali basalt (Nockolds: Knox & Chinner, 1978, Average of 45 samples).

amounts of volcanic glass are always present) characteristics of the Biu Plateau basalt), which indicated a rapid cooling and contraction of the magma.

Petrographic differentiation supported by geochemical evidence suggest that there are two basic types of basalts in the Biu Plateau. These are Biu type and Miringa type. The Biu types are located usually in and around Biu town but mostly distributed in the southern part of the Biu Plateau. The Miringa type is located at the volcanic cones and plugs and is distributed in and around Miringa and to the west of Biu Damaturu road.

The Miringa type shows similar mineralogy as to the Biu type, but phenocrysts in the basalts are usually larger and consists of olivine, pyroxene and labradorite. The olivine in this rock is fresh and have undergone very slightly or no alteration at all. The basalt often exhibits trachytic texture as mentioned earlier and is more porphyritic, vesicular and scoracious than the Biu type.

The Biu type indicate that the basalts are essentially alkaline as shown from a chemical analysis (Table 1). Feldspathoids are usually remain hidden in the ground-mass and sometimes the presence of titan augite, which is true with the basalt, leads to the appearance of a small amount of normative nepheline. The Miringa type basalts on the other hand are essentially basanitic. The chemical analysis show high normative nepheline, diopside and olivine which is characteristic of a basanite.

The plot of  $\text{Na}_2\text{O} + \text{K}_2\text{O}$  percentage against  $\text{SiO}_2$  percentage of these basalts (Fig. 3) also indicate Biu type as alkali basalts and the Miringa type as basanite. This is supported further by the diagram of normative diopside-olivine-nepheline (Fig. 4) which shows Biu type as alkali olivine basalts and the Miringa type as basanite. However, it would be necessary to have more observations and chemical analysis of basalts from different localities to classify them into alkali olivine basalts and basanites, and to know more about their petrogenesis and origin.

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# AIMS, OBJECTIVES AND ASSESSMENT. A CRITIQUE, BASED UPON EXPERIENCE IN THE COLLEGE OF MEDICAL SCIENCES

by

Harold Scarborough

(Formerly Provost of the College)

Probably many persons would not differentiate between an Aim and an Objective believing that to do so would be to make a distinction without a difference. In educational parlance, however, there is a difference which it is important to recognize and maintain because it can illuminate and clarify the educational process and can lead to a fresh approach to the vexed question of evaluation and assessment.

An Aim is an end toward which efforts are directed. It is something aimed at, striven for; a design, a purpose, a declaration of intent. It is a goal, a direction, even an ideal which is held in the mind but often never achieved. It is quintessentially a subjective activity, a product of the mind in its capacity to look forward, to plan, to control, to invent.

When used in relation to education an Objective has qualities of a different kind. Education is a process, the end of which is to bring about changes in human thinking and behaviour. The kinds of behavioural changes that a course attempts to bring about constitute its objectives. The definition of the objectives of a course or curriculum is that of the result sought, not a description or a summary of the course content. It expresses a purposeful activity as the result of which the behaviour, knowledge, attitudes of a student are changed. Thus, an objective is in a sense exterior to the mind. It is that which is real or exists in nature in contrast to what is ideal or lies merely in the thought of the individual (the aim). To state the objective of a lecture or a course is to describe the result intended or sought. A behavioural objective directs that at the end of a course a student can do something that he could not do before. It is a concise, precise and explicit statement demanding a certain behaviour; it forces the attention both of the teacher and the taught into a certain clearly prescribed channel and towards a specific activity. The definition of behavioural objectives can be a process that is both painstaking and painful. "Asking someone to define his goal in terms of performance is a little like asking someone to take his clothes off in public—if he hasn't done it before, he may need time to get used to the idea" (Mager, 1962).

The distinction between these two activities may perhaps be clarified by references to the aims of the College of Medical Sciences and the objectives of the Clinical Course.

As stated in the University of Maiduguri Prospectus 1982-85, at page 253, the *aims* of the College, are stated thus:

The main functions of the College of Medical Sciences are to produce doctors who:

1. are soundly trained in the scientific basis of medicine;
2. are of international standard and at the same time well-versed in the medical and health problems of Nigeria;
3. are orientated towards preventive medicine and the health problems of the community.

It is also the responsibility of the College to train other cadres of health personnel and so to foster the concept of the Health Team.

These are very general statements but that does not mean that they are superfluous. The uncharitable, or the cynical, might even hold that they are too broad, too largiloquent to serve any useful purpose. But they would be wrong: such statements are satisfactory as aims, as intentions, ideals, articles of faith. It is true that they are not stated in behavioural terms: there is no quality of 'doing' about them and it is hard to see how they can be measured, evaluated, or assessed.

The objectives of the clinical course are, however, stated thus, avoiding as far as possible the use of words open to many interpretations such as know, discuss, understand, (or really understand) appreciate (or fully appreciate), believe, apprehend.

At the end of his period of clinical training a student should be able to:

1. —apply his knowledge of the subjects of the Pre-clinical period, namely, Anatomy, Physiology and Biochemistry, to the understanding of clinical problems;
2. —explain the causes, mechanisms and natural history of disease processes in terms of Pathology, Microbiology, Immunology, Clinical Chemistry and Haematology;
3. —take an accurate clinical history and perform systematic physical examination of patients of all ages;
4. —assess the emotional, mental and social status of a patient;
5. —diagnose the principal clinical problems in Nigeria by the use only of clinical methods and simple investigations;
6. —prescribe effective drug treatment for, and supervise the management of, patients with the disorders commonly met with in Nigeria;
7. —monitor both the good, and the potentially harmful, effects of such treatment and evaluate its cost-effectiveness;
8. —initiate, plan, organise and administer clinical trials of the efficacy of a drug/therapeutic procedure and evaluate evidence of validity;
9. —perform common surgical, obstetrical, gynaecological and anaesthetic procedures;
10. —define social, psychological and environmental factors in the production of disorders of health, or their expression, and modify his management of a patient in the light of such factors;

11. —*work* with other members of a health team to sort, differentiate and treat large numbers of patients in general outpatient clinics;
12. —*define* the health problems of a community, and, working with other members of a team, identify the factors contributing to them. He should be able to organise an effective programme to resolve or prevent them, basing such procedure upon sound principles of Community Medicine, Epidemiology, Statistics and Health Education;
13. —*derive* throughout all his clinical work, his understanding and management of new problems as they arise from the basic principles of structure and function in health and disease;
14. —*plan* for himself his on-going education.

These objectives are stated in behavioural terms. They describe the act of 'doing'. They define what the student should be able to do at the end of a period of learning that he could not do before. They are learning objectives rather than teaching objectives. Deriving from professional tasks, which they define, they codify professional activity. As such they are relevant, logical, clear and practicable. What is more, except for the last two, they are observable and they are measurable.

Examinations, like many other human activities nowadays, are inflicted with the myth of objectivity. This has led to the invention, not to say the exploitation, of the MCQP, the multiple choice question paper—50 questions, answer right or wrong, in 60 minutes, sort of thing. Anyone, apparently, can now construct an MCQ, and many people do. As a general rule MCQs are apt to be carelessly set, ambiguous, containing indefinite words such as usually, sometimes, rarely, often, occasionally, and loose phraseology including the words 'always' and 'never' and 'may'. For example, "the following may occur in pneumonia", creates an opportunity for the candidate to write almost anything. These and other pitfalls (see Fleming, Sanderson, Stokes and Walton 1976) have caused some to become suspicious of the MCQP as an instrument of assessment. Nonetheless, the MCQ paper has gained an almost idolatrous acclaim.

Some of these difficulties are no doubt due to lack of precision in specifying what is to be tested, that is to say to lack of objectives. It is important also to be clear about the taxonomic level to be tested. As a rule the MCQ paper is confined to testing in the cognitive domain, for which it is the more readily suited, so that one has to begin by asking oneself if it is merely memory-recall that one wants to test. It is of course true that an MCQ paper can be constructed to test in the affective domain if not in the psychomotor, but in those areas the construction of suitable questions requires much more thought than many people are prepared to give. For example in an attempt in 1969 to devise a paper designed to test reasoning power, deduction and the ability to project, a small study done by five senior clinical staff of an academic department of Medicine showed that some 70% of the questions offered by experienced teachers had to be discarded if rigorous criteria were applied. And surely the students are entitled to rigorous criteria.

As far as Medicine is concerned, one may ask oneself the pertinent question "if my child were gravely ill, would I want him to be looked after by someone who had scored 100% in an MCQ paper?" The answer is clearly, No. You would want someone with experience, mature judgement, kindness, sympathetic understanding, albeit with sound knowledge of the disease process, its complications and implications: one capable of making an accurate diagnosis, skilled in the management of sick children, judicious in his choice of treatment and capable of predicting the likely outcome in this particular patient. Such qualities are difficult to quantify and to assess. An MCQ test paper is not likely to get us very far; memory-recall is only one of the qualities required. Incidentally, it may be noted in passing that the popularity of the MCQ paper and its close relation, the short answer test paper, must bear their share of the blame for the fact that young people nowadays are usually unable to express themselves in writing, whether in the form of an essay, a case report, or even a letter. What remains of such facility will soon be destroyed by the word processor.

We have seen that the MCQ paper is well suited to testing memory-recall. It is also a suitable instrument for testing knowledge over a wide area. Thus an MCQ paper of, say, 100 questions can be constructed to cover much detail if confined to a single subject, let us say for example, respiratory disease. Alternatively the 100 questions may be used to test the memory over as wide a field as possible; all the way from Abortus Fever to Zollinger Ellison Syndrome, if that is really what you want to do. Nowadays this latter property of the MCQ paper makes an instantaneous and clamant appeal to the large number of medical teachers who believe that coverage is more important than understanding (Scarborough 1984). Such misdirection of the educational process, especially in the preclinical subjects of Anatomy, Biochemistry and Physiology overloads the students' minds with irrelevant detail and renders them incapable of appreciating important basic principles which will be of value to them when they come to study clinical medicine.

If, then, we find the current popular methods of assessment unsatisfactory to our purpose, except in the matter of memory-recall, can we perhaps devise some other forms of assessment more relevant to our need? However reliable or objective a test may be, it is of one value if it does not measure the ability to perform the tasks expected of a professional man or woman. We may as well abandon currently popular methods of assessment and try to evolve something more suitable for our purpose.

It is a difficult problem. But if we have an array of behavioural objectives before us we may begin to think of methods of deciding if they have been fulfilled, and to what extent. Evaluation (assessment) properly consists of finding out the extent to which each and every one of our objectives has been attained. It is not likely that written tests, even those designed to evaluate in the psychomotor domain, will play a large part in such a process. Scrutiny of the objectives set out above strongly suggests that a more satisfactory way of approaching the problem is by way of successive monitoring of students' attitudes and activities, that is to say by continuous assessment rather than by on-going assessment or by progressive assessment both of which activities usually pre-suppose a series of tests, at more or less frequent intervals (see Appendix). To be satisfactory, continuous assessment implies almost constant observation and requires a higher staff/student ratio than is either usual or ever obtained. In medical schools this involves a reduction in the student intake because, in the clinical sphere at any

rate, (that is to say for two thirds of the medical curriculum), the number of teachers at consultant level, as well the numbers of sub-consultant staff, are determined by the patient/work load, rather than by the needs of teaching. It is this pressure of numbers, as much as the chimera of objectivity, that has forced upon us the MCQ paper and other short-cuts to assessment.

Apart from its demands on staff there is another objection to continuous assessment, namely that it departs from the principle of objectivity. Indeed it may become a highly subjective procedure, because the assessment may depend upon the personal impressions of individuals. It can also be unfair because the teacher may acquire a prejudice against a particular student or in other ways develop a personal incompatibility. To some extent these objections can be overcome by using a number of different assessors/consultants: nonetheless, the process inevitably contains an inherent subjective element that is unpopular nowadays. This author however, believes that a refinement of the procedure of continuous assessment represents the best approach to solving the problem—a return to Salernitan methods, in fact.

That something needs to be done is evident from the following findings. In a clinical department there was no correlation between the marks of an MCQ and the results of a process of continuous assessment carried out independently by two consultants ( $r = +0.03$ ;  $N = 21$ ). In a preclinical department it was surprising to find a low, although statistically significant, correlation between 'objective' tests (namely an MCQ plus a short answer paper) and the results of an on-going assessment procedure involving MCQP and short answer questions at the end of each course combined with the results of a practical and oral examination ( $r = +0.03$ ; standard error 0.14;  $N = 50$ ).

The way to sail between the Scylla of the MCQ and the Charybdis of continuous assessment has yet to be found. We have to evolve better ways of assessing a medical student's competence as a potential doctor. To suggest ways of doing so is beyond the purpose of this review. There are, however, a number of points that have to be kept in mind. One is that the type of examination or assessment test used determines what a student learns and the way that he learns it. Another is that medicine is so wide and comprehensive a subjects that to qualify as a doctor creates opportunities for the young graduate to work in a large number of specialised fields ranging from Academic Medicine to the Zoonoses. Thirdly, the MBBS degree confers legal rights of importance to people's lives: the public naturally demands that before this can occur, certain minimum standards must be seen to have been achieved.

## Appendix

*Continuous Assessment* means close, even day-to-day, observation and evaluation. It is particularly suited to testing in the psychomotor domain, but practicable only when the group to be assessed is small and the relationship between the tester and the tested is close and continuous, as for example when 3 or 4 medical students are 'attached' to a consultant, or say in the case of a small number of postgraduate students working together under a senior member of staff. The disadvantage inherent in continuous assessment is the high degree of subjectivity involved.

*On-Going Assessment* means intermittent testing as the student proceeds through his course or curriculum. It is applicable especially to the cognitive domain and as a rule involves the administration of an MCQ test at the end of each course. It tests the gradual accumulation of knowledge, (so called facts) as the student 'goes on' through his course. This kind of assessment is appropriate to the unit course or 'cafeteria' system of education.

*Progressive Assessment.* This is the most sophisticated of the forms of evaluation. It means testing progressively through the three taxonomic levels: starting with the cognitive (accumulation of knowledge) proceeding through the affective (assessment of professional attitudes) to the psychomotor domain (the testing of skills, as in laboratory work or clinical practice).

All the above forms of evaluation are included within the term '*In-Course Assessment*'.

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# NATURAL RESOURCES OF BORNO STATE AND UNIVERSITY RESEARCH: REPORT OF A VISIT—NOVEMBER 1982

by

Roger Revelle

## Introduction

At the invitation of Vice-Chancellor Jibril Aminu. I visited the University of Maiduguri and some areas of Borno State, Nigeria from November 14–17, 1982. This visit was both a happy experience and a memorable one which provided, impressions to reflect on and ponder for a long time to come. I am most grateful to Vice-Chancellor Aminu, Registrar Bobbo and their staffs, and to many members of the University community for their generous hospitality. Their kindness and patience in explaining things I did not at first understand, and in helping me to see the relationships between the people of Borno and their environment, were greatly appreciated.

During our stay in Borno, I had opportunities for extensive discussions with the heads of the faculties of Agriculture and Science and members of their faculties, and with senior members of the Geography Department. Together with some of these faculty members, I visited the Borno State Water Board, the headquarters of the Chad Basin Development Authority, and the Lake Chad Research Institute. Senior officers of these agencies discussed their activities and plans and some of their problems with us. We also spent several days in the field on trips to the mountains along the border with Cameroon, by way of Bama and Gwoza; to Lake Alau, the nearby agricultural development area, and the Sambissa Marsh; New Marte and the great South Chad Irrigation Project; and Baga, where we inspected the irrigation works and irrigated fields, had a marvelous boat trip on Lake Chad, and learned about the fishery research of the Lake Chad Research Institute. One high point of the two weeks was the privilege of meeting and talking with his Highness, the Shehu of Borno. On this occasion, I learned something about the 1000-year-old culture of Kanem. Toward the end of my visit, I reported verbally to the Deans and to the Vice-Chancellor and gave a university lecture, "Water and Man's Life". I left Maiduguri for Kano on Saturday morning, November 27; in Kano I was courteously taken care of by the local representatives of the University of Maiduguri, who gave me a guided tour of the remarkable old city and its surroundings.

The following report summarizes some of the impressions and ideas gained during the visit. These are given in a series of short discussion under two broad headings: Aspects of the University, and Natural Resources and Agricultural Development in Borno. Because of the shortness of my visit, the discussion is inevitably impressionistic and disjointed. In such a short time, no foreigner can hope to obtain more than a glimmer of understanding of the motivations, cultural values, or social relationships of the people of Borno, let alone the constraints imposed by tradition and the strain

of rapid change. But the physical environment, the technical possibilities for agricultural development (in contrast to the social and economic possibilities) and the nature and functions of the University are more easily understood; hence, I have concentrated on these.

I owe grateful thanks to many individuals. Unfortunately, I did not write down all their names, but among my notes I find the following: special acknowledgements should go to Dean U. C. Shukla and Professors M. A. Satter, G. P. Azer, F. A. Adeniji, and G. G. R. Thambyapillay who accompanied and guided me on the field trips. Also on the list are Dean Sultanbawa and Messrs Hammad, Dadek, Bokhari, Nkereuwem, and Sachdeva of the Faculty of Science, Messrs B. Babare, R. P. Agrawal, S. M. Faiz, and T. A. Khan of the Faculty of Agriculture, M. M. Ali of the Borno State Water Board; and Alhaji Bunu Sherif Musa, M. M. Gorini, Riaz ul Haq, Tanwir Sheikh, Mai Mohammed Jir, Mohammed Aden, Malam Baba Fadh, and Abba K. Askira of the Chad Basin Development Authority. I can only apologize for not naming the many others who helped me but whose names I did not record.

#### **A marriage between Lake Chad Research Institute and Maiduguri University**

Experience in Nigeria, India and the United States shows that agricultural research and development are most productive when a university can be intimately involved. The Institute of Agricultural Research at Ahmadu Bello University and the Moor Plantation of the University of Ife are Nigerian examples of productive and successful agricultural research institutes that are integrated with universities. The agricultural universities at Ludhiana in the Indian Punjab and at Hissar in the Indian State of Haryana have established intimate contacts with the farmers throughout their respective states, which greatly facilitate the early application of research results. The experiment stations of land grant colleges in the United States have likewise contributed immeasurably to the development of American agriculture. Examples are: the University of California at Davis, Berkeley, and Riverside; Iowa State University at Ames, Iowa; the University of Wisconsin at Madison; the Experiment Station of the University of Illinois at Urbana Champagne; Colorado State University at Fort Collins, and Utah State University at Logan, Utah.

The opportunity of a merger between the Lake Chad Research Institute and the University of Maiduguri may be especially favourable at the present time, while the Institute is still embryonic, with a relatively small staff and skeleton facilities.

Necessary facilities such as a museum for taxonomic identification of crop pests and plant and animal diseases, a library with an adequate collection of books and journals, an adequately sized computer, field stations, and expensive equipment such as chromatography, nuclear magnetic resonance apparatus, mass spectrometers, and radioisotope counters could be most economically procured (and duplication avoided) if the Research Institute and the University's College of Agriculture were merged.

Liaison with the international centers of the Consultative Group on International Agricultural Research (CGIAR) could be more easily established and maintained. Two of these centers should be particularly important for Borno State—the International Center for Research in the Semi-arid Tropics at Hyderabad, India and the

International Center for Research in Arid Lands, now located in Syria. Closer relationships could also be established with such American land grant colleges as Washington State, Colorado State, Utah State, and the University of California, Riverside.

One of the advantages of a merger between Lake Chad Research Institute and the University of Maiduguri would be that the differences in organizational structure would ensure complementarity. The University is properly organized around scientific disciplines, while the Lake Chad Research Institute could be organized around groups of commodities and problems such as cereal grains, vegetables, legumes, fast-growing trees, fibers, livestock husbandry, and farming systems. In each research problem-area there could be sub-programs such as: (1) variety improvement; (2) cultural practices and management; (3) protection from diseases and pests; (4) socio-economics of production; and (5) post-harvest technology.

#### *Need for research infrastructure*

The University has recruited a competent faculty in agriculture and other scientific fields, but this faculty is inhibited in one of its primary functions by a lack of scientific equipment and supplies—the infrastructure for research. To remedy this situation, budget reallocations may be necessary, even at the cost of recruiting fewer faculty members, to provide for larger expenditure on laboratory equipment, spare parts, and supplies; on salaries and training of technicians to maintain and repair scientific equipment after it is procured; and on machine shops and glass-blowing shops to modify equipment and to construct new laboratory hardware and glassware.

In addition to laboratory and field equipment, all departments need scientific journals and books. Departments of Geography and Geology and the faculty of Agriculture also need geological and topographic maps, high resolution satellite imagery, and aerial photographs in sufficient detail to enable the user to locate himself in the field.

One of the problems of acquiring adequate laboratory equipment is its very high cost when purchased in Nigeria, and long delays in deliveries. Apparently Nigerian agents for overseas companies impose very large mark-ups over the catalog prices in the countries of origin. It might be less expensive to arrange for the University's faculty members to purchase equipment directly on visits to Europe and North America. On these journeys, faculty members could visit university and government laboratories to learn about new instruments and their operation and repairs. They should be accompanied by technicians who could take short courses on equipment maintenance and repair.

In principle, it would seem reasonable that the offices of the Nigerian Universities Commission in Europe and North America should act as purchasing and procurement agents for scientific equipment and supplies, maps, satellite images, aerial photography, and scientific books and journals. However, these offices would undoubtedly need advice on specific purchases and procurement from visiting faculty members.

#### *An Academic Department of Microbiology and Molecular Biology*

The most rapidly-moving field of science at the present time is Molecular Biology and Genetics—primarily of prokaryotes (bacteria and blue-green algae), but also of

fungi and related organisms and tissue cultures of higher plants and animals. Fundamental discoveries concerning gene action, regulation, and interaction are being made at an astonishing rate.

Nigeria, one of the world's ten largest countries in population, with its considerable natural resources and large number of educated people, cannot afford to be left out of the race for biological understanding. Such understanding is applicable in at least ten areas that affect the welfare of the Nigerian people: health, nutrition, food processing, agriculture, forestry, fisheries and aquaculture, energy production and conversion from biomass, industrial materials, and human reproductive biology. Recent advances in the bacterial production of insulin are an example of practical application.

In Agriculture, a greater variety of nitrogen-fixing bacterial is needed, especially those associated with non-leguminous plants, together with bacteria that can break down organic nitrogen compounds to ammonia, and others that will inhibit "denitrification" of nitrogen compounds to molecular nitrogen. In Forestry, tissue cultures to produce clones of superior trees are already being effectively used by some of the large forest-product companies.

Creation of a department in the Faculty of Sciences in the University of Maiduguri, with a 'critical mass' of three or four microbiologists and molecular biologists, a well-but inexpensively equipped laboratory, and access to the burgeoning scientific journals in this field would help to ensure that Nigerian scientists and technologists are made aware of on going scientific advances in molecular biology throughout the world, and would provide a center for training of younger scientists.

If possible, this department should be staffed with Nigerians who have been sent abroad by the Federal government for graduate and post-doctoral study. It is likely to be very difficult to recruit competent expatriates who are in the forefront of research in these disciplines, because employment opportunities in the industrialized countries are so great. Moreover, faculty continuity over a period of years will probably be necessary to build up first-rate research and teaching programs.

#### *Public Health Hazards in Borno*

Perhaps the most worrisome hazards are the open village wells from which water is drawn in buckets of various sorts and transferred to ceramic pots and other containers. These open wells appear to be universal in the villages and even in large towns such as Gwoza. The danger of contamination with disease-carrying microorganisms—particularly typhoid, cholera, and dysentery—may be serious. The well waters should either be chlorinated (chlorination is usually disliked by the villagers because it gives a bad taste to the water) or covered, with the water being extracted by a hand pump. In the wells we looked at between Bama and Gwoza, the water table was about 20 meters below the surface. This is much too deep for the usual hand suction pump. A hand pump that "pushes" the water rather than "pulls" it is required. It may be necessary to design such a pump or to adapt an existing design used elsewhere. In either case, this poses an important engineering problem for the Department of Agricultural Technology or the future School of Engineering in the University of Maiduguri.

The City of Maiduguri apparently depends mainly on septic tanks to dispose of sewage and human wastes. As the city grows, the subsoil will become saturated with the effluent from these tanks, posing a grave threat of contamination of domestic water supplies, particularly during times when the pressure in the domestic water pipes is low. An interim solution would be construction of water storage tanks, elevated about 20 feet above the surface in different parts of the city, which would maintain hydraulic pressure on the domestic water system. In the long run, a sewerage system with a primary and secondary treatment plant may be desirable for reasons of both health and water conservation. Because of its high nitrogen and phosphate content, the effluent from this plant will be useful for irrigation. However, it should not be used to recharge the ground water reservoirs that provide the City's water supply. High nitrate in drinking water causes methemoglobinemia in infants and young children. Moreover, nitrate may be reduced in the human stomach to nitrite, which combines with dimethylamine and other secondary amines in foodstuffs to produce highly carcinogenic n-nitrosoamines.

With the implementation of the South Chad Irrigation Project, the hazards of bilharzia and malaria to the villagers of the region are greatly increased. Lake Chad is infested with schistosomes and their molluscan hosts; these organisms may now be widespread in the irrigation canals and drainage ditches of the project. Also, standing water in the drainage ditches and ponds will form a happy environment for *Anopheles* larvae unless vigorous countermeasures are taken against them.

Although peanuts (ground nuts) are commonly grown, stored and consumed in Borno, the danger of aflatoxin or other mycotoxin poisoning may not be serious because of the dry climate. This could be tested to some extent by an epidemiological study of the incidence of liver cancer in different parts of the state.

Exposed asbestos insulation is still used, at least in some University buildings. Asbestosis is a slow-acting, usually fatal disease. Workmen installing this insulation are especially vulnerable to the disease, but it can affect other persons who spend time in an asbestos-containing environment.

#### *Need for Nutrition Surveys*

With increasing urbanization and other changes in life style, human diets and methods of food preparation in Borno may also be changing, perhaps in unhealthy ways. Data are needed on the quantity and composition of the traditional diets of villagers and pastoralists, particularly of the rural poor. Average daily intakes of carbohydrates, fats, protein, vitamins and minerals should be measured for men, women, and children of different ages and differing economic levels.

These surveys should be designed to answer a series of specific questions. Is the intake of food energy sufficient for vigorous physical activity throughout the year? How is the needed balance of essential amino acids maintained in largely vegetarian diets, and what are the sources of vitamins—especially B<sub>12</sub> (cyanocobalamin)—iron, calcium, and other essential elements? What is the incidence, if any, of diseases related to nutritional deficiency?

After the data on traditional diets are obtained, they should be compared with the range of diets in the urban population, which may be significantly different.

*Water-Law and Water Politics*

Because water is of such overwhelming importance to northern Nigeria and the neighbouring Sahelian countries, conflicts in water use will inevitably arise as populations grow and economic development proceeds. These conflicts will be international, between different countries, and intranational, between different states, different regions in the same state, and different water users.

A body of international law already exists which can help to resolve water conflicts between countries. But apparently there is no systematic law within Nigeria that could serve as a framework for resolving local conflicts over scarce water resources.

In the western United States, which has similar problems of water scarcity, water law has been extensively developed over the last 100 years, based in part on interstate compacts and in part on the principle of 'first in use, first in right'—that is, the first person or agency to appropriate a certain quantity of water for a definite use from a flowing stream or an underground aquifer has a legal right to that water superior to all future users. These "water rights" usually run with land ownership so that a purchaser of a certain piece of land acquires the water rights appropriated by previous owners of that land. Laws have also been established about "interbasin transfers" in which river waters are diverted from one watershed to another.

In international law, two main principles seem to apply: the upstream riparian has a superior right to the downstream riparian; but the upstream riparian is bound not to act in such a way as to damage the interests of countries that lie downstream on a river system. As applied to Nigeria and Chad, for example, breaking of the levees on the Chari River, which might permanently reduce the flow into Lake Chad, would be a violation of customary international law.

In a democratic society, the politics of water are at least as important as water law. Several government agencies at different levels usually have partial jurisdiction over each resource. These bureaucracies compete with each other, at the same time attempting to minimize what they deem to be "outside interference," to justify to the legislators and to the public their own use of very large public funds, and to conceal the less attractive parts of their usually complex motivations. They tend to hoard data, releasing only information that will serve their political objectives. On the other hand, their tasks are made more difficult by political conflicts between groups of would-be users of the same resource. For example, electric utilities using hydroelectric power from a dam and reservoir usually want a pattern of water releases that is quite different from that desired by farmers using irrigation water.

*A New University Calendar*

Suggestions have been made that the University calendar should be modified to provide for the long vacation during the hot months of March, April and May. There are arguments pro and con for such a change. It would enable the Faculty of Agriculture to conduct field trials and student teaching during the rainy season when conditions are best for production of certain crops. And it would avoid concentrated academic activity during the time of year when temperatures are so high that intellectual work is difficult. On the other hand, students may want to return to their villages during the rainy season to help on the farms. Moreover, as long as schools follow the present

schedule, it would be difficult for faculty and staff families, for children to have a different vacation time than their parents. Vacations during the hot season might not serve the purposes of rest and renewal that now come with vacations during July, August, and September.

### **Agriculture and Natural Resources in the State**

#### *The Green Revolution in Borno and the need for research*

The Green Revolution can be defined as the application of scientific and technical knowledge of agriculture, in order to increase the productivity of the natural resources of water, soil, plants, and domestic animals. Increases in the productivity of natural resources have been made necessary by rapid population growth. In Nigeria, for example, the human population after the year 2000, twenty years from now, is likely to be twice what it is today.

In essence, the Green Revolution marks the transition from subsistence agriculture, in which the cultivators use farm products mainly to feed themselves and their families, to market agriculture, in which farm products provide the necessities of life for many people. To increase his productivity, the farmer must buy *inputs* from outside the farm, including fertilizers, improved seed varieties, pesticides, herbicides, irrigation water, and farm tools, often also farm machinery and transportation vehicles and fuels and electricity to operate machinery, vehicles and irrigation wells. He must sell a large portion of his *output* to pay for these inputs.

One of the objectives of the Green Revolution is, of course, increased food production, but this does not necessarily mean food self-sufficiency in every region, let alone each Nigerian state. A visit to the market in Maiduguri demonstrates this—only about 70 per cent of the food products on sale there were grown in Borno State.

Two other Green Revolution objectives are more significant: higher farm profitability, that is, higher net income for the farmers, and increased rural and small-town employment. These objectives can best be attained by utilizing the comparative advantage of each region to maximize the net economic value of farm production for the farmer, and if possible for the non-farm population as well. In Nigeria, and specifically in Borno, this means taking advantage of the diversity, among different regions, of climate, soil, and land areas per caput to grow those crops, horticultural products, and livestock that will bring the highest net overall return.

As populations grow, a major need will be employment outside agriculture. Even now, high levels of underemployment exist in the villages. In rural areas, a major source of employment can be agro-industries—industries that process or add value to agricultural products. Consequently, appropriate emphasis should be placed on those farm products, such as milk, leather, vegetables, oil seeds, fruits, nuts, and sources of essential oils, medicinal products, cosmetics, spices and waxes, that can serve as the basis for processing industries.

Because of the special agro-ecological conditions in Borno, the development of agriculture here must follow different paths than elsewhere in Nigeria. Present knowledge is insufficient to point to the best paths for development, and many kinds of applied research are needed. Not only the results of this research, but the research process itself could be of great benefit for the University's teaching programs in agricultural sciences.

One major avenue of research will be selection and improvement of the most suitable crop species. Species are needed that have one or more of the following characteristics: (1) deep root systems that can tap underground water supplies; (2) high economic value per unit of cultivated area; (3) protein-rich vegetative mass suitable for cattle feed; (4) short growing season to take maximum advantage of the short rainy season and to minimize evapotranspiration; and (5) drought resistance and/or low water requirements.

Experimental trails should be conducted of the potential economic value, under suitable methods of cultivation, of plants that now grow in Borno, but are not much exploited in agriculture, and plants that have been successfully grown under similar climatic and soil conditions elsewhere in the world, but are not now utilized in Borno. The following table lists some of these plants.

### **Reconnaissance Surveys of Environmental Conditions in Borno State**

Because of its large size and geographical location in the transition zone between the desert to the north and the sub-humid areas on the south, a considerable diversity of climate, hydrology, soils, and plant and animal ecology exists in Borno State. To optimize agricultural production, the choices of crop species and varieties, practices of animal husbandry, farming systems should be adjusted to environmental conditions in different regions of the State. These conditions are imperfectly known. The University of Maiduguri could take the lead in organizing and guiding programs of measurement and observations aimed at their better definition. Reconnaissance surveys and mapping are needed.

1 *Climatology*. In general, the State is characterized by relatively low rainfall, occurring during only a few summer months; high potential evaporation throughout the year, including the rainy season; low atmosphere humidity, except during the rainy season; relatively high temperatures throughout the year, with very high temperature in April, May and early June; abundant sunshine except during the Harmattan; and relatively low average wind velocities, but occasional strong winds, which cause wind erosion and sand dune movement even of partially stabilized dunes. As one proceeds from north to south, average annual rainfall becomes greater by 1 to 1.5 mm/km, and the duration of the rainy season becomes longer.

To define the ranges of climate more precisely, a network of meteorological observing stations should be established throughout the State, at which semi-continuous measurements would be made of atmospheric temperature, potential evapotranspiration, rainfall, relative humidity, solar radiation, and wind speed and direction. Monthly averages of these quantities should be obtained during each year for at least a ten-year period. A few stations to monitor long-term climatic changes should be maintained indefinitely. During times of extreme rainfall or high wind velocity, hourly averages should be computed from continuous-recording gauges, in order to gain insight into processes of wind-and rain-erosion.

## Some Plant Species that might be more fully Exploited in Borno Agriculture

Common Name	Scientific Name	Potential Use	Notes
A. Species now grown in Borno			
Cashew	<i>Anacardium occidentale</i>	commercially valuable nut, edible fruit	Mostly wild, not cultivated
{ Ber Indian plum-Assam	<i>Zizyphus Nannularifolia</i>	edible fruit	
	<i>Zizyphus jujuba</i>	edible fruit	
"Gina" (Hausa)	<i>Cucumis pustulatis</i>	edible gourd-like plant	Could be crossed with one another— Assam variety is thornless
"Chilakala" (Mandara)			
"Zaukwana" (Mandara) bitter gourd		Insecticide	
"Yakwa" (Hausa)	<i>Hibiscus subitriffa</i>	Flowers used for coloring lipsticks and other cosmetics	
"Karkade (Arabic)			
"Fotna" (Arabic)	<i>Acacia nilotica</i>	Essential oil in flowers used for perfume; source of tannin and gum arabic; wood resists termites	Thorny bush grown as a natural fence around cultivated field
Green Panic	<i>Panicum maximum</i>	nutritious livestock fodder	Grown only at research stations
—	<i>Stylosanthes hamata</i>	" " "	" " "
—	<i>Acacia senegal</i>	Main source of gum arabic; livestock feed; tannin	Best firewood; foliage and pods protein-rich
Cotton	<i>Gossypium</i> sp.	Fiber for textile; seeds for oil and animal feed	Variety from Indian state of Gujarat might grow in black clay soils of Chad Basin Irrig. Proj. during winter
Date palm	<i>Phoenix dactylifera</i>	edible fruit	California varieties with superior fruit might be introduced
—	<i>Prosopis chilensis</i>	Foliage and pods provide protein- rich animal feed	200-400 mm annual rainfall; 8-11 dry months, thornless variety should be used

## B. Species that might be introduced

Sisal	<i>Agave sisalana</i>	Fillers for numerous uses	Principal crop of Yucatan peninsula, Mexico
Buffalo gourd	<i>Cucurbita foetidissima</i>	Oil and humanly-edible protein from seeds; huge high-starch root	1.3 tons of seeds/hectare/year; much larger quantity of starch in root
Guar (cluster bean)	<i>Cyamopsis tetra-zonoloba</i>	Gum, protein, oil, livestock feed from seed, leaves and stems	18-14 tons green fodder per hectare, grows in USA, Pakistan, India, Australia, South Africa
Guayule	<i>Parhottium argentatum</i>	Natural rubber from whole plant	Grows mostly wild in USA and Mexican deserts
Jojoba	<i>Simmondsia chinensis</i>	Seeds contain liquid wax identical to sperm oil	Grows mostly in US and Mexican deserts
Grain Amaranth	<i>Amaranthus tricolor</i>	High protein cereal	Grown mainly in Andean region of South America and in Mexico
Spirulina (blue green algae)	<i>Spirulina platensis</i>	Very high protein for human and poultry food	Grown in Lake Chad "Polders" on east side of lake.

2. *Hydrology.* Gauging stations to measure flow velocity and volumes of water transported should be established at a series of points on the major rivers. These measurements would have a three-fold objective: (a) to determine the statistics of the relationships between rainfall and river run off over a number of years; (b) to estimate evaporation losses throughout the periods of run-off along different stretches of the rivers; and (c) to estimate groundwater recharge. Although the nearby-flat topography over wide areas of Borno appears to provide few opportunities to construct dams for water storage, water harvesting may be possible, and surface irrigation from barrages linked to canal systems seems promising.

A series of bore holes should be drilled throughout the state to determine the depth, thickness, extent, and hydrologic properties of underground aquifers, and to monitor the effects of municipal and agricultural withdrawals and of natural or artificial recharge. The data would be used to construct, evaluate, and improve models of the underground water resources and to estimate safe yields. It is generally believed that ground water supplies are limited and rates of recharge are low, but adequate quantitative information is lacking.

3. *Soil Surveys.* UNESCO and FAO have jointly published a soil map of Africa on a scale of one to five million (1 cm=50km). This scale is too small to show the patterns of soil types and variability in Borno, where there is a range from black clay vertisols through silty or sandy loam to sand. However, these UN agencies may be able to provide the larger-scale maps from which they compiled the data for the one-to-five-million series. It should also be possible to use Landsat imagery, obtainable from the US National Aeronautics and Space Administration, in combination with some ground observations, to prepare a useful map showing distribution of soil types. Other soil information can be obtained from field observations and laboratory measurements of samples, including soil profiles, base-exchange capacity, base saturation, pH, and content of plant nutrient elements such as magnesium, boron, molybdenum, zinc, and copper. To understand the distribution of soil types, studies should be made of the origin of the soil materials. Some of these probably came from the largely pre-Cambrian basement complex of the Mandara Mountains and the Jos Plateau, while others probably originated in the Cretaceous sedimentary rocks of the Biu Plateau. The black clay soils near Lake Chad may have originated from weathering of basaltic rocks. But where are the basalts?

4. *Ecology.* Three broad ecological zones exist within the state—Guinean, Sudanian, and Sahelian savanna. In travelling through the country, one is struck by the variations on this theme, in differences in the density of trees, shrubs, and grasses, and in the relative abundance of different species. Landsat imagery should be ideal for mapping and locating these variations in plant associations and in understanding their relationships to climatological, hydrological, and soil factors.

Surveys and collections of plant pathogens and pests and their natural enemies should be made for each crop and cropping system. Data should be obtained on the biology and life histories of pests, including their seasons of occurrence, habits, and behaviour in relation to crop phenology.

*Ways of Water Conservation*

1. Water, rather than land, is the limiting resource for human welfare in Borno, especially in agriculture. Consequently, optimal conservation and use of water is the *sine qua non* for increase agricultural production. There are several different ways in which water can be conserved and used to maximum advantage.

2. In irrigated agriculture, an important method of water conservation is to grow high-yielding crops—crops that produce as many tons of grain and other products as possible per hectare of land. Because a leaf-covered field behaves like a lake, it takes hardly any more water to produce five tons of maize or guinea corn per hectare than to produce one ton. By using high-yielding crop varieties, sufficient fertilizer, and good agronomic practices, the same amount of food can be grown in a small area and irrigation water can be saved.

2. In irrigated agriculture also, high-value crops can be grown—crops that contribute the most economically to the society per unit area of land. Here we think of vegetables, fruits, oil seeds, cashew nuts, sources of essential oils, medicinal products, cosmetics, spices, and waxes, which can serve as the basis of agro-industries engaged in processing farm products. Such industries can provide both additional employment and increased income in rural areas.

3. The best way to use Borno's scanty river and underground supplies is to use them for supplemental irrigation at about the time of the rainy season, when the irrigation water can be combined with rain water and residual soil moisture to meet the evapotranspiration requirements of the crops.

4. Where irrigation water is being used as a supplement to rainfall, a fourth way to conserve water is to plant crop varieties in the rainy season that have a short growing period. A crop that matures in three months will use only three-fourths as much water as one that matures in four months. Consequently, less supplemental irrigation will be required.

5. Deep-rooted crops such as mangoes and other fruit trees are an efficient way to use underground water where the water table is not too deep. Each tree behaves as if it were a small well, sucking up water from under ground, and very little water is lost in non-beneficial evaporation. Cassavas and other tubers store water when it is available and transfer it to the leaves during the dry season, thereby reducing the need for irrigation.

6. Much water can be conserved by improved irrigation practices, such as the use of straightened conveyance channels lined with clay or other impermeable material, drip irrigation wherever it is economical, and "pitcher irrigation" for fruit trees and other crops that do not completely cover the ground. (In pitcher irrigation, a narrow-necked, porous clay pot is partially buried next to each tree to be irrigated, and filled with water by hand. The roots of the tree maintain an hydraulic pressure gradient which ensures that nearly all the water actually goes into the tree).

7. Where it is not possible to utilize all river water for supplemental irrigation before, during, and just after the rainy season, attempts should be made to induce recharge of the underground aquifer by spreading the river water over highly permeable soils. Such induced recharge is widely practiced in the intermittent streams of Southern California, thereby preventing large water losses from evaporation and run-off of the ocean.

8. Crops such as groundnuts and millet that are resistant to water stress "drought-resistant"—meaning that some useful production may be obtained, even when the evapotranspiration requirements of the plant are not met, can be planted on non-irrigated land, thereby taking maximum advantage of scanty rainfall.

#### *Beneficial use of River Waters now lost by Evaporation*

Before they enter Lake Alau, the Yedzeram and Ngadda rivers pass through the Sambissa swampy area, where the waters spread over many square kilometers and the velocity of flow is greatly reduced. A large fraction of the river run-off is lost by evaporation from the sluggishly flowing water in the swamp. Most of this water could be saved for beneficial use by constructing a lined channel through the swamp. The channel should have outlets to an irrigation-canal system into which the water could be diverted. Without data on the volume of flow of these rivers at different points, I am unable to estimate the quantity of water that could be conserved in this way.

It is possible to be more quantitative about the Yobe River in the northwestern part of Borno State. Hydrographs of this river at different locations during 1965-66 are summarized in Table 1. The volume of flow decreased continuously downstream from Faggo, the highest point at which measurements were made. But nearly 40 per cent of the total diminution in discharge in 1965-66 occurred in the stretch of 160 km between Gashua and Damasak. This loss was 775 million cubic meters. The data of peak discharge at Damasak was two and a half months later than at Gashua, and the duration of the period of significant discharge was three weeks longer. The water loss per km of river length was nearly twice in the stretch between Faggo and Gashua and nearly four times that below Damasak. These data taken together probably indicate that the river spreads over a wide, low-lying area between Gashua and Damasak, and its velocity of flow is greatly decreased. Part of the water loss in this stretch may be due to seepage underground, but a major fraction must be the result of evaporation during the several months required for the water to pass through the area of spreading. See Table 2.

By channelling the river into a clay-or asphalt-lined canal over the 160 km between Gashua and Damasak, seepage losses could be largely eliminated and evaporation greatly reduced. A canal 5 meters deep and 125 meters wide could carry the peak 1965-66 flow at Gashua of 160 m<sup>2</sup>/sec without danger of overtopping, even at a water velocity of only 30 cm<sup>2</sup>/sec. The actual velocity would probably be much higher (permitting construction of a much smaller canal), but I am unable to estimate this without knowing the slope of the land. At the postulated water velocity, the time of passage of a water particle between Gashua and Damasak would be 6.25 days. With an evaporation rate of 7 mm/day, only about one per cent of the flowing water during

Table I  
 Summary of Yobe River Hydrography in 1965-66

Distance Km	Beginning of Runoff	Peak Discharge Date	End of Runoff	Duration of Runoff Days	Average Discharge $10^6 \text{ m}^3/\text{day}$	Peak Discharge	Total Discharge $10^6 \text{ m}^3$	
Faggo	0	June 10	Sept. 5	Oct. 15	115	17.3	86	1991
Gashua	210	June 25	Oct. 10	Jan. 5	190	7.6	13.8	1441
Geldam	305	July 2	Dec. 1	Jan. 30	208	4.7	7.4	972
Damasak	372	July 8	Dec. 25	Feb. 10	212	3.3	5.3	666
Geshagar	-	July 12	Jan. 3	Feb. 16	214	2.8	4.3	582
Yau	472	July 16	Jan. 20	Feb. 28	222	2.5	3.9	544

Source: Dyam Consultants, River Havel Studies, Federal Republic of Nigeria  
 Report to Chad Basin Development Authority, pp. 1-36, 1981

Table 2  
Downstream Losses in the Yobe River

Between	Distance km	Water Loss $10^6\text{m}^3$	Water Loss per km $10^6\text{m}^3$	Loss as percent of discharge at upstream location	Loss as percent of of total discharge at Faggo	Velocity of wave of peak flow km/day
Faggo and Gashua	210	550	2.64	27.6	27.6	6
Gashua and Geidam	95	469	4.94	32.6	23.6	1.9
Geidam and Damasak	67	306	4.57	31.5	15.4	2.7
Damasak and Yau	100	122	1.22	18.3	6.1	3.85

Losses between Faggo and Yau, 72.7% of total discharge at Faggo  
Remaining in river at Yau, 27.3% of total discharge at Faggo)

Source: Computed from Table 1

the peak flow period would be lost by evaporation in the main channel. The percentage of water loss from evaporation would be somewhat higher before and after the peak-flow period and significantly higher in the canals, distributaries, and water courses of the irrigation system that should be built to utilize the water saved by channelling the river.

Assuming that 1400 million  $\text{m}^3$  would be available above Damasak for use in irrigation and that approximately 55 per cent of this discharge could be applied to beneficial evapotranspiration, one five-month crop could be grown on about 100,000 hectares. Alternatively, with sufficient rainfall, a short-duration, rainy-season crop could be grown using the river water for supplemental irrigation, and a crop planted by October 1 could be grown with the remainder of the river water, using residual soil moisture in January.

Mr Brian Rogers of Samaila, Omale and Partners in Kaduna told me in a telephone conversation that he remembered a report to the Chad Basin Development Authority, by Ward Ashcraft and Partners, which discussed channelling on the Yedzeram and Ngadda rivers. Dyam Consultants, in their report to the Chad Basin Development Authority on River Hawel studies, may have made a similar suggestion about the Yobe River.

#### *Possible transfer of water from the Gongola River*

A barrage and pumping station supplying water to a concrete pipe aqueduct could be built on the Gongola east of Nafada where the river bends to form the boundary of Borno State. According to the report of the Benue Valley Survey Appraisal Mission of the British Overseas Development Administration, the average annual flow of the Gongola at this point is about  $8 \times 10^3 \text{m}^3$ , mostly during the four months of July through October. The report gives no information about inter-annual variability of the flow, but this may not be very great, because the Gongola arises in the high-rainfall area (average 1350 mm/year) of the Jos Plateau.

The Benue Valley is severely flooded during the rainy season from July through October, and insufficient potential storage sites are available for adequate flood control. Consequently, diversion of water out of the Benue basin from a major tributary such as the Gongola would be beneficial.

Serious study should be given to transferring around  $0.6$  to  $1.2 \times 10^9 \text{ m}^3$  (500,000 to 1,000,000 acre feet) from the Gongola to a suitable area in the interior of Borno State, where the water could be used for irrigation to supplement rainfall during the four or five months from the beginning of July to the end of October or November. Rainfall in Borno exceeds potential evaporation for only about one to three months during this period. The net water deficit averages about 120 mm between July and October and 300 mm between July and November. The suggested quantity of water transferred from the Gongola, when added to the rainfall, would ensure production of high-yielding crop on 200,000 to 300,000 hectares—enough to feed the entire anticipated population of the state in the year 2000, if necessary.

Interbasin transfer of water for multiple uses, including irrigation, is practiced in California over a distance of about 800 km and over a mountain range nearly 2000 meters high. Besides amortization of the capital investment, the principal cost in California is for electrical energy to pump the water over the mountains. The cost of electric power for pumping from Nafada to central Borno, with an equivalent lift of approximately 100 meters, including friction in the pipe, would be about 30 naira/1000  $\text{m}^3$ —perhaps 120 naira/hectare of irrigated land. Other cost would be amortization and interest payments on the capital investment in the barrage and aqueduct and the water distribution system. I am unable to estimate the capital cost, but at a guess, it might be 300 million naira. Amortized over 50 years at 8 per cent interest, the annual cost would be about 18 million naira, approximately 60 per cent of the cost of electric power for pumping. At a yield of 5 tons of food-grain per hectare, the value of the crop would be about four times the cost of irrigation water.

I understand from Mr Brian Rogers of Samaila, Omale and Partners in Kaduna that this project has been suggested previously by some of the consultants to the federal government and the state, but I have not seen their report. It should be referred for consideration to Al Haji Buna Sherif Musa, general manager of the Chad Basin Development Authority. My "guesstimate" of the construction costs may be unrealistically low, but I have also been conservative in estimating grain yield per hectare and cereal prices. Average maize yields in the US corn belt are now over 9 tons/hectare, and yields of irrigated wheat in California's Imperial Valley are about 7.5 tons/hectare.

#### *Combined farming and animal husbandry*

In developing agriculture in Borno, the shibboleth of food self-sufficiency within the state should not be permitted to stand in the way of the more basic objectives of developing profitable agriculture and animal husbandry for the farmers and of producing the raw materials for profitable, employment-creating, diversified agro-industries. Attaining these objectives will depend on fully exploiting the comparative advantages of this semi-arid northeastern corner of Nigeria, at the same time minimizing or avoiding the disadvantages.

One possible way to do this would be to increase the productivity of animal husbandry—the traditional industry of much of northern Nigeria. Both a milk, butter and cheese-making dairy industry and meat and leather-producing livestock farming should be considered. Both would depend for stability, profitability, and increased productivity on farm production of green fodder and use of agricultural residues to supplement open-field grazing.

In a combined cattle and crop-farming operation, the gross return per cultivated hectare, with irrigation used as a supplement to rainfall, could be about 1300 naira. The cattle would be fed during a three-month rainy season on approximately 5 hectares of uncultivated grazing land for each cultivated hectare and during the remaining nine months on farm-produced feed. It is assumed that on the cultivated land, five tons per hectare of sorghum or maize grain could be produced, an equal tonnage of crop residues, and about 10 tons of green fodder per hectare.

A further assumption is that digestible nutrients in uncultivated grassland during the rainy season would be about 0.5 tons/hectare. After the rainy season, the cattle would be fed for three months on the grain stover and for six months on green fodder harvested from cultivated land. The sorghum-or maize-grain would be sold or used for household subsistence. It is also assumed that net conversion of feed to meat by a cattle herd, including breeding cow, fed in this way, would be 6 per cent. Assumed prices at the farm gate are 150 naira/ton for sorghum and maize-grain and 1500 naira/ton for beef. All these assumptions are crude and should be refined by more sophisticated analysis.

Development of animal husbandry along these lines would depend on many socio-economic factors, including existence of processing and marketing facilities, availability of farm credit and crop insurance for the farmers and of consumers goods for farm families, and price incentives to encourage farmers to increase their production.

#### *Some problems of the South Chad Irrigation Project*

In this impressive project of the Chad Basin Development Authority, over 60,000 hectares will eventually be irrigated with waters from Lake Chad. Fluctuations in the level of the lake are critical variables in this operation. The Lake levels are now uncomfortably low, and there is concern that a change may have occurred in the regimes of the Chari and Logone rivers, which are the principal sources of the Lake waters.

Measurements of water levels in Lake Chad were made for many decades at Bol, on the Chadian side of the Lake by the French Government's ORSTOM (Organization de Recherche Scientifique et Technique Outre Mer). ORSTOM has now withdrawn from Chad, and the Bol station has been abandoned. Continuation of the lake measurements in such a manner that they are compatible with past ORSTOM measurements is essential. The obvious agency to undertake this is the Lake Chad Commission, which was formerly located at N'djamena and is now established in Cameroon. The Federal government of Nigeria is represented on the Commission, and it should insist that the organization set up procedures to continue the Bol measurements.

It is rumoured that the flow of the Chari River into Lake Chad has been greatly reduced by flooding over a broad area in South Chad, resulting from a break in the

levees that confine the river. A strong effort should be made to determine whether this is so. Equally important is recovery of the past records at Bol which are presumably in the ORSTOM archives in Paris. Although the University may be able to help in both these activities, the primary responsibility should rest with the Federal government of Nigeria.

An attempt is being made to grow wheat during the period from November to April in the black clay soils of the South Chad Irrigation Project. But an extremely hard crust forms on this soil when it dries out, and many of the germinating wheat seeds are unable to penetrate this crust in parts of the planted areas.

Black clay soils similar to those of the Chad Basin Irrigation Project are widespread in India, where they are called "black cotton soils". In Surat, in the southern part of the Indian state of Gujarat, a special variety of cotton is grown during the winter months on these heavy soils. Field trials should be conducted with this cotton variety in the black clay soils of the South Chad Irrigation Project, perhaps using a seed drill to break the crust where the cotton seed is planted. If the trials are successful, cotton might be substituted for wheat and alternated with paddy rice culture in the Project. Soil amendments, using gypsum or sand, may also be desirable for these soils.

#### *Need for Machines to help increase Soil Organic Matter*

The water-retaining capacity and fertility of the light, sandy soils of Borno would be improved and their resistance to wind erosion would be increased if the content of organic matter could be raised. This might be accomplished by deeply plowing into the soil animal wastes, weeds, and crop residues which are not used for livestock feed. Parts of these organic materials would be subject to rapid oxidation under the prevailing high temperatures.

Experiments should be conducted to determine the proportions of added organic materials that will remain at different depths in the soil over the course of a year and the equilibrium level of soil humus that can be expected after several years of addition of organic waste. Apparently, the present practice is to burn the long sticks of stover from maize and sorghum and to spread the ashes on the fields, presumably to recover potassium, phosphorus, and trace metals. The Department of Agricultural Technology in the University should be encouraged to design a hand-or diesel-powered chopper to break up agricultural waste materials so that they could be plowed under rather than burned.

#### **Conclusion**

One of the underlying thrusts of this report is intended to encourage greater integration of the University of Maiduguri with the larger community of Borno State and of Nigeria as a whole, particularly northern Nigeria. I have suggested possible University initiatives in health, nutrition, water law and politics, natural resource surveys, studies of soil organic matter, and development of both indigenous and exogenous crop species. To serve the larger communities, the university should be deeply involved in fundamental and applied research. Consequently, I have urged integration of university research activities in Agriculture with those of the Lake Chad

Research Institute, reallocation of funds to build a more effective research infrastructure, and establishment of a University department of Microbiology and Molecular Biology. I believe the University must take the lead in focussing the Green Revolution in agriculture on increasing farm profitability and creation of employment, as well as on more food production. Modernized animal husbandry would be one approach to these goals. In its teaching and research, the faculty and staff should pay particular attention to optimizing the use of scarce water resources in Borno, and I have outlined various means to accomplish this.

I have also suggested actions by the national government through the Chad Basin Development Authority that could increase and stabilize water resources in Borno by such means as river channeling and development of canal irrigation, diversion of part of the Gongola River flow, and monitoring of Lake Chad levels and of the rivers that supply the lake with water. In these matters, the University might play a supporting role by undertaking economic and engineering analyses and developing monitoring methodology.

These various suggestions must take their place among many other urgent goals and necessities of the University and the State. For this reason, I have not ventured to suggest priorities or timing.

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## THE DEVELOPMENT OF WATER SUPPLIES IN THE CENTRAL SUDAN

by

W. S. Richards

The Central Sudan lies in the same latitudes and is subject to the same climatic regime as Borno State in North Eastern Nigeria. As in Borno, there are large areas of light permeable soils and tracts of impermeable black cracking clays. Apart for the need for water for permanent settlement, since the crops grow in the short rainy season, but ripen at the beginning of the dry season, there is a need for local supplies of water for harvesting.

Permanent surface water is restricted to the Blue and White Niles, and to a few pools in their seasonal tributaries. Away from these, the traditional sources is hand dug wells (up to 30m deep) usually at the edge of hills, and a few temporary pools. supplemented by camel's milk water-melons, and water stored in the hollowed out trunks of baobab trees, which give enough water to bring in the harvest. However immense tracts of fertile land lie outside the range of these solutions to this water problem.

Part of this region is underlain by a great aquifer at a doph of some 300m, far out of reach of hand dug wells. This has been tapped by mechanised drilling, the standard well delivering about 20,000 litres a day. Elsewhere excavation teams of carry-all scrapers and bulldozers have dug surface reservoirs in areas of impermeable clay soils. Since evaporaton can account for anything up to 3m of water, they have to be dug to a depth of at least 6m. Hence the standard size of reservoir (Sudanese 'hafir') dug by this heavy machinery is about 50,000 cu. m. In addition, the advent of mechanised farming with far less need of water for harvesting has opened up large areas which could not be exploited by traditional methods, because of the lack of water at harvest time.

However, in practice, the large amounts of water concentrated in one place has led to a corresponding concentration of people and livestock, resulting in severe soil deterioration and exhaustion in the surrounding area. Furthermore, there are problems in the maintenance of the deep bore wells and their machinery, and of the silting up of the mechanically dug surface reservoirs, which because of their size, need special excavating teams to deepen them, so that the water stored is not lost to evaporation before the end of the harvest period. This policy of providing water points, far in excess of the carrying capacity of the land, has contributed greatly to the problems of the present drought, both by creating running sores of desertification, due to pressure of people and livestock on their immediate vicinity, and through the failure of the relatively complicated needs of the pumps and excavating teams needed to maintain them. This has been the subject of a recent Oxfam report (1986).

It need not have happened. A programme was outlined over 30 years ago for matching the water supply to the carrying capacity of the land by spacing out a network of small water supplies (i.e. 25,000 litres a day deep bore wells, or 4,000 cu. m. reservoirs) so that the population at any one place would not outrun the productivity of the local area, but at the same time, by suitable spacing, the region could be dotted with small settlements, hence the aggregate population that could be supported by the region for the foreseeable time to come, would be much larger than that made possible by the current system of large water supplies spaced widely apart.

The kind of simple calculation needed to adjust the water supply, and hence the population, to the carrying capacity of the land is exemplified in the following example for light loamy sands in a rainfall belt of about 500mm a year (Mantor, 1954). It is based on the best traditional local practice for keeping the land in good heart for the use of future generations.

- Average area per family under cultivation: 10 hectares Area needed for traditional rotation system: 40 hectares (4 years cultivation, 16 years bush fallow);
- Hence average number of families per sq. km. that can be supported by subsistence farming: 2.5 families.
- Now the average radius of cultivation around the villages in the area in question is: 6 km.
- This gives a total area of cultivation per village of about: 100 sq. km.
- Hence the total number of families based on a village centred round a water point should not exceed 250 families in this region if the land is to be kept in good heart by traditional methods for the use of future generations.
- In this region, the average daily consumption of water (including village livestock) is about: 100 litres per day
- For a village of 250 families, this is equivalent to a consumption of some: 24,000 litres per day
- So the total consumption of such a village for the 100 days of harvest would be equivalent to a total of 250,000 litres or: 2,500 cu. m.
- This amount of water can be supplied
  - (a) by a pump delivering some: 25,000 litres per day
  - (b) by a reservoir (allowing for evaporation) of 4,000 cu. m. capacity

From these calculations it can be seen that the optimum spacing of water points in this region should be about 10 to 12 km apart, and that the water supply should be in the form of either 4,000 cu. m. reservoirs (the inhabitants moving to major water points after the harvest) or in the form of wells delivering some 25,000 litres a day. Since no water point is more than about 10 km from another, failure of one well can be temporarily compensated by drawing on the water supplies of the neighbours.

In the case of deep bore wells, it is true that four 25,000 litres per day, wells are four times as expensive to construct as one 100,000 litre per day water supply. However, as the Sudan has demonstrated to its sorrow, the provision of too much water in one place produces soil exhaustion through the pressure on the land of too many people concentrated in one place which has led to complete desertification within a generation, so bringing to an end the useful life of the well.

The production of very large 50,000 cu. m. reservoirs was made possible by the heavy excavating team mentioned above. Indeed such a team is expensive when it comes to constructing small reservoirs, partly because of the limited room for manoeuvre and partly because of the increased proportion of travelling and setting up time to construction time. So here again, the emphasis was on constructing water supplies out of all proportion to the carrying capacity of the surrounding area. For the relatively small 4,000 cu. m reservoirs described above, simpler methods are possible. Traditionally, they were constructed by forced labour, but nowadays, they can be excavated simply and cheaply by wheeled tractors fitted with rippers to loosen the earth, rear mounted earth scoops to transport and dump the earth, and a rear mounted scraper blade to shape the banks and intake channels. In addition, this outfit can be used to make graded access roads. This provides work for idle tractors during the dry season, and since tractors are numerous and the earth moving outfit simple to construct and cheap to make, it might seem there could be a future for such outfits in building access roads, the construction and cleaning out of small dams and reservoirs, and the earthworks needed to control erosion.

It cannot be too strongly emphasised that the matching of water supplies to the carrying capacity of the land must be calculated afresh, according to the conditions prevailing locally at the time. However, this must and should be done. Otherwise, either the land will be underused, because there are too few people to exploit the land to its full capacity; or over-population will lead to soil exhaustion and desertification and not only will the investment in the water supply be lost, but the land will go out of production for the foreseeable future.

So far the calculations outlined above have been concerned with the needs of subsistence farmers. For pastoralists, similar calculations will apply to the provision of watering points for pastoral herds of free range cattle. Again the parameters involved will need to be worked out in the light of local conditions.

In conclusion, I still find it strange that after a generation, this approach to the siting of water supplies has not been developed or even rediscovered. Perhaps it is because it is based on having the trust and confidence of the local people facilitated by the ability to visit them in their villages, accept their hospitality, stay in their guest houses and speak to them in their own language. This takes time, and in the search for quick returns, the need for long term work has been pushed into the background. So in the upshot, a generation of time has been lost. Perhaps I am wrong. I hope so, and I shall be delighted to hear of areas where a policy of matching the population to the productivity of the land is now in being.

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## FILIPPO DA SEGNI: HIS LIFE AND MISSION TO BORNO

by

Raymond Hickey

### I

"We have often remarked that Catholic missionaries, whose dedicated spirit of sacrifice and courage are widely known, often undertake long and hazardous journeys. But no trace of these will be found in the usual works of science, and are sometimes not even found in those of Propaganda Fide" .....One such journey is the following, undertaken by Father Filippo da Segni, a Franciscan.

This pertinent observation introduces the narrative of Filippo da Segni's journey to Borno in the year 1850 which was published by the Italian Geographical Society twenty years later.<sup>1</sup> It is certainly true that his journey from Tripoli to Kukawa has remained largely unknown and has been neglected by historians. Although he spent three weeks in Kukawa in early 1850, he is not mentioned in the diaries of Heinrich Barth who arrived in Kukawa a year later, on 2 April, 1851. It seems inconceivable that Barth, who remained in Kukawa (apart from his journey to Yola) until September 1851, did not hear of the recent visit by another European or meet with the elderly Maltese couple who remained in Kukawa after Filippo's departure. They are not mentioned in his diaries. An air of silence and secrecy seems to have surrounded Filippo's journey from the beginning.

Filippo da Segni's journey to Borno has also been neglected by the Catholic Church historians who have written about the region. Although Fr. Costanzo Bergna makes reference to Filippo in *La Missione Francescana in Libia*, he also laments that the mission archives (presumably in Tripoli, where the book was published) contain no record of an exploratory journey to which Filippo was commissioned "about 1851"<sup>2</sup>. We shall see presently that this does not refer to his journey to Borno but to a later proposed expedition to the Fezzan. Neither is the journey to Kukawa mentioned in the authoritative *Memoria Rerum* of the Sacred Congregation of Propaganda Fide. This includes an article by Professor Teobaldo Filesi which deals with the period and refers to Filippo da Segni, but there is no mention of his historic journey to Kukawa<sup>3</sup>. This is probably because there is no record of the journey in the archives of Propaganda Fide which I have carefully examined and on which this article is partly based. An article did appear in the *Osservatore Romano* (14 October 1981)<sup>4</sup> which gave a resumé of Filippo's narrative published in 1870. This article mistakenly refers to Filippo as a lay brother and claims that the journey to Borno was made in obedience to the Prefect Apostolic, Fr. Angelo da S. Agata. But the latter was not appointed to Tripoli

until 4 November 1850<sup>5</sup>, while Filippo's journey to Borno was made in January-February of the same year.<sup>6</sup> At that time Fr. Vincenzo da S. Venanzo was Prefect Apostolic at Tripoli. The author of the article does lament the fact that so little is known about the life and mission of Filippo da Segni.

Most surprising of all is the apparent neglect of Filippo da Segni by his own religious order. He was a member of the reformed Roman Province of the Franciscan Order of Friars Minor, a group which was reunited with the main body of the Order in 1897. The Franciscans had been charged with the administration of the Prefecture of Tripoli or *Barberia* in the year 1659<sup>7</sup> and Franciscans have remained in Tripoli to the present day. They were responsible for the first abortive attempt to establish a mission in Borno between 1700-1713 and three of their member were appointed Prefects of Borno<sup>8</sup>. The history of the Reformed Roman Province makes no reference to Filippo's journey to Borno, although it does note the fact that he left Rome for Tripoli in the year 1850<sup>9</sup>. He is not even mentioned in the relevant section of the history of Franciscan missions, published in Rome in 1967<sup>10</sup>. Is it any wonder then that his name has been omitted from the necrology of the Reformed Roman Province of the Franciscans<sup>11</sup>? From the evidence so far available Filippo da Segni was a Melchisedech-type figure who appears fleetingly in the records and then disappears into obscurity.

## II

It was inevitable that I should take a keen interest in Filippo da Segni. He was, after all, the first Catholic priest to visit the Kingdom of Borno where I have worked as a missionary since my ordination in 1960. The modern Prefecture of Borno was established on 29 June 1953<sup>12</sup> and a Prefect Apostolic, Fr. Timothy Cotter OSA, was appointed on 5 July 1962. He was the first Prefect of Borno to arrive safely in his territory. The earlier expedition of the second Prefect of Borno, Fr. Carlo Maria di Genova, had ended in disaster in Katsina in 1711—and so he failed in his attempt to reach Borno<sup>13</sup>. I had offered Mass in a small hut in Kukawa on 17 May 1963, believing that it was the first Mass to be offered in the former Kanuri capital. Some years later, while resident in Potiskum, Mr John Lavers told me of Filippo's journey to Kukawa<sup>14</sup>. On a subsequent visit to Rome I located Filippo's narrative in the *Biblioteca Nazionale Vittorio Emanuele* and translated it into English. This was published in *Savanna* (the journal of Ahmadu Bello University, Zaria) in 1976, together with a postscript about the author<sup>15</sup>.

The purpose of the present article is to trace the life of Filippo da Segni. His journey to Borno has now received recognition and will be accorded its rightful place in history. Very little is known about the man, as has been shown in the preceding section. The narrative he wrote tells us very little about the author and even adds to the air of secrecy that surrounds him. Although written in simple and moving style by Filippo, it was submitted for publication by a member of the Italian Geographical Society named Tommaso Trincia. This was in 1870, eighteen years after Filippo's final return to Rome from Tripoli. Were it not for this article, the record of his journey to Kukawa would have been lost to posterity. What possible explanation can there be for such a long delay in publishing his narrative, and even then only indirectly?

My research into the life of Filippo da Segni was carried out in the archives of Propaganda Fide and in the Franciscan monastery of San Francesco a Ripa in Rome<sup>16</sup>. It revealed that the ignorance and confusion concerning his life and journey to Borno can be attributed to two causes (apart from his own natural reticence). These concern a double name and a double appointment to Tripoli. Discussion of the latter point will follow later. The archives of San Francesco a Ripa show that there were two members of the Reformed Roman Province of the Franciscans bearing the name Filippo da Segni at much the same time. Both were missionaries although the Borno Filippo was clearly overshadowed by his namesake. This other Filippo da Segni was born in the year 1816 (just six years earlier than his namesake), made profession of vows in 1842 and spent twenty years as a missionary in Chile. He published a compendium on domestic medical care and died in Chile on 25 April 1877<sup>17</sup>. This is the Filippo da Segni who is mentioned in the history of Franciscan missions and is recorded in the necrology of the Reformed Roman Province. It explains how his less illustrious namesake (whose journey to Borno seems to have been kept a secret from his confreres) was disregarded or just forgotten by historians of his own Order. But how, it may be asked, is it possible to avoid confusing the two missionaries in the records? The answer lies in the fact that the Filippo da Segni who laboured in Chile was a lay brother and is listed as such in the records. His namesake who went to Kukawa was an ordained priest and so his name is usually prefixed P. (*Pater*) instead of Fra.

So it was that the main events in the life of Father Filippoda Segni came to light from the faded handwriting of old registers in the archives of San Francesco a Ripa. He was born on 17 November 1822 at the town of Segni, some fifty kilometres south-east of Rome<sup>18</sup>. His real name was Carlo Cascioli but, according to the custom at that time, he received a new 'religious' name when he entered the Franciscan Order. And as with many Muslims in Northern Nigeria he also retained the name of his birth place. And so Carlo Cascioli became Philip from Segni or, in Italian, Filippo da Segni. He entered the Franciscan Order at the early age of fifteen on 4 June 1858 and received the religious habit shortly afterwards<sup>19</sup>. His year as a novice was spent in the monastery at Greccio and he made profession of vows on 29 June 1839<sup>20</sup>. I could find no record of his ordination to the priesthood, but it probably took place about 1845.

### III

The malaise which set in like dry rot and stifled Catholic missionary activity towards the end of the eighteenth century had by then been overcome. The new missionary awareness in the Church had its origin in post-Revolutionary France and it received sustained encouragement during the pontificate of Pope Gregory XVI (1831-46). A new Prefect, Fr. Vincenzo da S. Venanzo, was appointed to the mission at Tripoli in 1843<sup>21</sup>. His reports to Rome were at least partly responsible for the decision to create a Vicariate Apostolic of Central Africa in 1846<sup>22</sup>. This ambitious project was doomed to suffer numerous setbacks and disappointments but eventually it would take root as the Vicariate of Khartoum. It included the desert regions south of Tripoli towards Borno in the south and the Nile valley in the east. One of the proposed

missions was to be situated at Murzuk in the Fezzan. In 1848 a congregation of Sisters, already established in Tripoli, proposed the opening of a school in Murzuk<sup>23</sup>. This was followed by the arrival of Fr. Dionisio d'Alfragola in 1849. He was charged by Propaganda with ascertaining the true situation and preparing the way for a missionary expedition from Tripoli into Central Africa<sup>24</sup>.

It was in this atmosphere of missionary fervour and expectation that Filippo da Segni left Rome in late 1849<sup>25</sup>. According to the catalogue of missionaries in the Franciscan monastery at Tripoli, he arrived in Tripoli on 1st January 1850<sup>26</sup>. Less than three weeks later, on 20 January 1850, he left in a camel caravan which brought him to Meslata, Murzuk, Bilma and on to Kukawa. Just before his departure, on 18 January 1850, Heinrich Barth and his party arrived in Tripoli<sup>27</sup>. It is just possible that the two men met and discussed their plans for crossing the desert. It is more likely however that they did not know of each other's existence, either then or later.

There is no evidence to suggest that Filippo's journey to Kukawa was in any way connected with the grand design of establishing a mission in Murzuk and thus opening up the centre of Africa to the Gospel. The fact that there is no mention of his journey in any ecclesiastical record, either of his Order or of Propaganda Fide, indicates that it was a private venture undertaken on his own initiative. This is borne out by his narrative. He wrote that while in Tripoli he heard of some Catholics living in the Sudan who longed for a missionary so that they could fulfil their religious duties. He resolved to visit them although the journey would be both long and dangerous. Naturally Filippo would have required the permission of the superior of the Franciscan community in Tripoli before setting out for Borno and we must presume that this was given. His narrative however does not mention any priest or ecclesiastical superior, not even Fr. Dionisio d'Alfragola who was then in Tripoli making preparations for the mission to Murzuk. It was to the French consul, M. Pellisicer, and to the Bey of Tripoli that Filippo turned for help in order to be accepted in a camel caravan bound for Borno<sup>28</sup>. This was readily given and the Bey entrusted Filippo with letters to be delivered in Murzuk and in Borno.

Filippo da Segni was only twenty-seven years of age when he set out for Borno. He had spent scarcely three weeks in Africa and had no idea of the difficulties that lay ahead. It may be that his older and more senior Franciscan confrères reacted to his proposed journey with a knowing smile and a certainty that he would not get far. If this were so, he certainly confounded them. Having crossed the desert and after spending twenty days in Kukawa, he was back in Tripoli in April of the same year. In Kukawa he stayed with the Lanzon family who were the object of his journey and also visited Lake Chad. He was well received by the reigning Shehu Umar, eldest son of the great Shehu Laminu, founder of the Al Kanemi dynasty. It appears that Filippo and Barth crossed paths somewhere in the Sahara Desert during his return journey in April 1850 (Barth took the route through Agadez to Kano, whereas Filippo went direct from Kukawa to Bilma). The two sons of the Maltese couple with whom Filippo stayed in Kukawa accompanied him and settled down in Tripoli. They also planned to bring their parents back to Libya but had not done so by the time Filippo returned to Rome<sup>29</sup>.

Filippo concludes his narrative by stating that he returned to Rome. This seems most unusual as he had arrived in Tripoli such a short time earlier. It may be that his relationship with the Prefect at Tripoli, Fr. Vincenzo da S. Venanzo, was not all that cordial; or that his successful journey to Borno may not have been appreciated by some colleagues who may have felt overshadowed by the younger man's freelance achievement. That much is mere conjecture. What is known is that he did return to Rome in 1850; that later in the year a new Prefect was appointed to Tripoli; and that representation was immediately made at the highest level to request that Filippo da Segni be posted to Tripoli.

#### IV

The new Prefect at Tripoli, appointed on 4 November 1850<sup>30</sup>, was Fr. Angelo Maria da S. Agata. His long and successful ministry there has been noted by Bergna in *La Missione Francescana in Libia*<sup>31</sup>. Just a month after his appointment, on 4 December 1850, the Secretary of Propaganda Fide, Mgr. Alessandro Barnabo, requested the Minister General of the Franciscan Order to appoint Filippo da Segni to Tripoli. The appointment was made on the same day and in his reply to Mgr. Barnabo, the Minister General stated that Filippo would seek the Pope's blessing before setting out for Tripoli. This was no routine appointment.

It is this second appointment to Tripoli that is well documented, both in the archives of Propaganda Fide<sup>32</sup> and in those of the Franciscan Order<sup>33</sup>. It constitutes the second reason for the confusion that surrounds the life and mission of Filippo da Segni. It explains how Salvatore Bono, in his article in the *Osservatore Romano*, wrote that Filippo undertook the journey to Borno in obedience to the Prefect, Fr. Angelo da S. Agata. It led me at one stage to doubt the accuracy of the dates given by Filippo in his narrative<sup>34</sup>. It seems likely however that the new Prefect sent for Filippo precisely because he had made the journey to Borno, and was therefore the best equipped to lead a second mission to the Fezzan.

Murzuk and the Fezzan seem to have caught the imagination of Propaganda Fide ever since the establishment of the Vicariate of Central Africa in 1846. Planning continued and at one stage it was proposed that the missionary to go to the Fezzan should also become the French Vice-consul there and so avail of diplomatic protection<sup>35</sup>. At no time was the possibility of sending a mission to Borno considered. The disastrous outcome of the 1710-11 expedition, which was known in Rome, would have precluded that. A mission to Murzuk was considered feasible: and Filippo had indeed met with a few Catholic families there while passing to Borno and had attended to their spiritual needs. We may conclude therefore that Filippo was recalled to Tripoli in order that he might lead the proposed mission to Murzuk. According to Bergna (who is supported by Filesi), "about the year 1851" the new Prefect commissioned Filippo to undertake an exploratory journey to the Fezzan via Ghadames and to avail of French diplomatic protection. Tribute is paid to his knowledge of Arabic and to his spirit of sacrifice but there is no mention of his previous journey to Kukawa<sup>36</sup>. In the event, the much-beralded expedition to the Fezzan did not take place until 1866 when it was undertaken by Fr. Angelo da S. Agata himself, accompanied by two of his confrères<sup>37</sup>.

What then prevented Filippo da Segni from making a return visit to Murzuk which he had visited with so much ease in 1850? Such a mission had been long desired by Propaganda and it had the blessing of the French consul, M. Pellisicer, with whom the Prefect enjoyed a cordial relationship<sup>38</sup>. It seems that the project floundered over the question of whether the missionary priest at Murzuk should also be appointed a French vice-consul. Without this diplomatic shield it would be difficult and dangerous to establish a mission in the completely Muslim Fezzan. According to Bergna, Propaganda finally ruled out this possibility<sup>39</sup>. Filippo himself was willing to go and had written to the Prefect to request that he be accompanied by a zealous and good-hearted companion. This much was reported in a letter sent from the Prefect to Propaganda on 29 January 1852 in which he also asks for further instructions regarding the mission<sup>40</sup>. Later in the year, in September 1852, Filippo was again recalled to Rome<sup>41</sup>. His second and final tour of duty in Tripoli was over.

Filippo spent the remaining forty-three years of his life in monasteries of his Order in the province of Rome. His name appears in the annual 'list of religious families' preserved in the archives of San Francesco a Ripa in Rome. His first appointment, in 1852, was to the monastery of Montefortino (Artena)<sup>42</sup>. In 1854 he appears as church organist at Montefortino. During the next forty years he never held any special position in his Order but is always recorded as organist. He appears for the first time among the community at Frascati in 1888<sup>43</sup>. And it was there, listed each year as church organist, that he spent the remaining years of his life and where he died on 16 August 1895<sup>44</sup>.

In March 1977 I visited the Franciscan monastery at Frascati (south of Rome) but could find no trace of his tomb or record of his death. All had been destroyed, the Guardian assured me, during the bombardment of Frascati during the Second World War. And so the air of mystery and secrecy which had characterized the life of Filippo da Segni, followed him to the grave. Nevertheless, this humble, reticent and self-effacing Franciscan priest will now be remembered as the first Catholic priest to visit the Kingdom of Borno.



The route from Tripoli to Kukawa .....

Route followed by Barth in 1850 \_\_\_\_\_

#### Notes

APF : Archives of Propaganda Fide

AFR : Archives of San Francesco a Ripa

1. T. Trincia, "Viaggio del Padre Filippo da Segni da Tripoli di Barberia al Bournou", *Bollettino della Società Geografica Italiana*, 1870, 137-50.
2. C. Bergna, *La Missione Franciscana in Libia*, (Tripoli, 1924), p. 143.
3. T. Filesi, "L'Attenzione della S. Congregazione per l'Africa Settentrionale", *Memoria Rerum* (1622-1972), Vol. 3/1, (Herder, Rome, 1975), p. 161.
4. Salvatore Bono, "Un Italiano nel Sahara: Fra Filippo da Segni, apostolo in Sudan", *Osservatore Romano*, 14-10-1981.
5. APF: *Lettere e Decreti*, vol. 339 (1850), f. 907.
6. Filippo wrote: 'Amid great confusion the caravan began its journey at midday on 20th January, 1850'. (All quoted passages are from my translation of his narrative: see note 15)
7. AFR: XII A. d 14. The year 1668 is given by G. Sanita, *La Barberia e la Congregazione di Propaganda Fide* (1622-68). (Cairo, 1965), 123, 385.
8. These were: Damiano da Rivoli, Carlo Maria di Genova and Benedette da Teano (who declined to accept the appointment). Filesi, "L'Attenzione...", pp. 856-57.
9. B. Spila da Subiaco, *Memorie Storiche della Provincia Riformata Romana*, Vol. 2 (Milan, 1896), p. 295.
10. *Historia Missionum O. F. M.* Vol. 2, Africa (Rome, 1967), pp. 61-74. The article in question contains a useful bibliography.
11. Necrology as given by Spila, *Memorie Storiche*.
12. *Acta Apostolicae Sedis*, 14 (1953): 775-76.
13. R. Gray, "Christian traces and a Franciscan mission in the Central Sudan, 1700-11", *Journal of African History*, 8 (1967): 383-93. Useful sources are also given by T. Filesi, "L'Iniziativa per una missione nei regni di Bornu e del Fezzan", *Memoria Rerum*, Vol. 2 (1700-1815), pp. 856-58.
14. It had been referred to in a review by D. M. Last of Britain, *the Sahara and the Western Sudan, 1788-1816* by A. Adu Boahen (Oxford, 1964) in the *Journal of the Historical Society of Nigeria*, Vol. 3 (Dec. 1964), p. 162.

15. R. Hickey, "The first visit by a Catholic priest to Borno in 1850", *Savanna*, 5 (June 1976): 45-54.
16. This was the headquarters of the former Reformed Roman Province of the Franciscans.
17. AFR:108, *Registro di tutti i religiosi della Provincia dell' anno 1814 all'anno 1899*, p. 82; and 104. *Registro dei defunti* (1849-1894), p. 92.
18. AFR: 108, p. 20.
19. AFR: 95, *Registro dei novizii dell' anno 1834 fino al 1899*, p. 5, His measurements for the habit are given in the *Registro dei Giovani*.
20. AFR:108, p.20; and 95, p. 5.
21. Bergna, *la Missione*, p. 137
22. Gray, *Christian traces*, p. 387.
23. Filesi, *L'Attenzione*, pp. 160-61.
24. *idem*.
25. His narrative begins: 'In the year 1849, I, Father Filippo da Segni of the Order of Friars <sup>Minor</sup> Reformed, set out from Rome for the mission of Tripoli in Barbary'. I could find no record of this departure in the archives of his Order.
26. Bergna, *la Missione*, p. 186.
27. A. H. M. Kirk Greene, *Barth's Travels in Nigeria* (OUP, London, 1962), p. 76.
28. It is clear from his narrative that Filippo made the arrangements for his journey. Thus he wrote: 'I returned to the hospice and informed my missionary companions of the favourable outcome' (of his meetings with the Bey).
29. The names of the two youths were Paolo and Carmelo Lanzon. It should be possible to trace their progeny in the parochial records in Tripoli.
30. APF: *Lettere e Decreti*, Col. 339 (1850), f. 907.
31. He remained in Libya until his death in 1890. Bergna, p. 159.
32. APF: *Scritture Riferite nei Congressi. Barberia*. Vol. 17 (1848-54) ff. 379-80.
33. AFR:247, *Registro dei Missionari* (1803-1867), p. 66. This mistakenly gives the date of his appointment as 4 November 1850. In fact it was 4 December. The year 1850, but not the month is also given in AFR:258, *Indice dei Missionari Apostolici dei Minori Riformati* (see XIX), p. 11, and by Spiro, *Memorie Storiche*, p. 295.
34. Hickey, 'The first Visit', p. 46, note 9.
35. Filesi, 'L'Attenzione', p. 161. cf. Bergna, *La Missione*, p. 144.
36. Filesi and Bergna, *ibid*.
37. Filesi, *ibid*.
38. APF: *Scritture Referite nei Congressi, Barberia*, Vol. 17 (1848-54), f f. 472-75.
39. Bergna, *la Missione*, p. 144.
40. APF: *Lettere e Decreti*, Vol. 341 (1852), f. 87.
41. AFR:258, *Indice dei Missionari*, p. 11.
42. AFR:203, *Tavole delle Famiglie*, 1852.
43. AFR:234, *Tavole delle Famiglie*, 1888.
44. AFR:108, *Registro di tutti i religiosi*, p. 20.

#### Editorial Note:

For an appraisal of the historical context and significance of da Segni's journey to Kukawa see the author's article, "Filippo da Segni's journey from Tripoli to Kukawa in 1850" *International Journal of African Historical Studies*, 18, 1 (1985) 145-56.

## FULFULDE GRAMMATICAL TERMINOLOGY FROM THE 19TH CENTURY

by

Hans G. Mukarovsky

A Fulfulde grammar was composed by Prince Saidu Dan Bello, one of the sons of Sultan Mohammadu Bello (1818-1859), who followed Shehu Usmanu Dan Fodio as second ruler of Sokoto.

The German author Gottlob Adolf Krause, who published some fragments of this work called 'nahaw fulfulde' in a booklet with the title *Contribution to the knowledge of the Fula Language in Africa* at Lipsia, Saxony in 1884, had learnt of its existence from a Pullo he met in Tripoli in 1879. The latter, by name El Hajj Ibrahim ibn Ali-Krause calls him further El Fulani Es-Sokoti—had been a student of a then famous Fulani scholar Usmanu ibn Muhammadu Jam, from whom he had probably learnt what he knew of Prince Saidu's grammar. He was on his way back from a pilgrimage to Mecca and preparing to return to Sokoto. By the way, Krause was not the first German he met, because the latter noted "that he was a friend of the late traveller Erwin von Bary". Krause spent altogether 12 hours with him, making notes on Hausa and Fulfulde. He says that they conversed with each other in Hausa, but that El Hajj Ibrahim had also full command of Arabic.

It would not be worth to repeat all these details, were it not for the fact that no other report on Prince Saidu's grammar seems to have been published since. Thus Krause's book became an invaluable testimony of the apparently forgotten existence of a Fulfulde Grammar in the second half of the 19th century.

As to its terminology Krause (p.40) says: "The grammatical terms of Prince Saidu's grammar are partly copied from those of the Arabic grammar. In some cases the Arabic terms are even retained in Fulfulde translation". As the author had an Arabic education this seems normal, just as most traditional grammars of European languages were modelled after the grammar of Latin. Krause lists some of these terms:

Thus 'singular' ( مفرد mufrad un in Arabic) is rendered by فَعْرَة gooto, 'plural' جمع jam<sup>c</sup>-un) by دُوْدَا duuda, 'noun' ( اسم 'ism-un "name" like nomen in Latin) by اِنْدِي innde, 'verb' ( فِعْل fi<sup>c</sup>-un) by كُوغَالِي kuugal. An adjective ( اسم الصفة 'ismu-ssifah "noun of quality") is called تِنْدِينُوْر tinndinoore, a term that became also known to F. W. Taylor, who quotes it on p.194 of his Fulani English Dictionary (Oxford 1932). 'Paradigma' ( مِيزَان mizan-un) is rendered by etirgal "measure" and the diminutive ( صَغِيْر 'asghir-un) by پَمْدِيْنَاْغَالِي pamdinaagel "the small one which has been made small". Yet Fulfulde possesses also a special form for the augmentative of a noun for which there existed no Arabic model, and which Krause compared to the Italian noun suffixes—one,—otto. Prince Saidu, obviously by his own creation, called this form تَيْيِيْنَاْغَالِي cayyinaanga. This is very interesting, because the possibility of forming by derivation pamdinaagel and cayyinaanga forms



## ADOLF OVERWEG'S LIFE AND DEATH IN BORNO

by

Herrmann Jungrathmayr

Within the grounds of the Governor's house—the old Residency—in Maiduguri there is a small shady enclosure containing ten marked graves. Of these, the one which immediately strikes the eye carries the simple inscription:

### OVERWEG, EXPLORER, DIED 1853

recalling the mid-nineteenth century period in Borno's history and the part played in it by the explorers of many lands. The curious visitor to the graveyard is bound to ask: 'who was Overweg? "What did he explore? "How did he die?" And it is an attempt to answer these questions, and at the same time to make a small contribution to the history of the period, that this note has been written.

Adolf (Adolph) Overweg was born on July 24, 1822 in Hamburg, Germany, as the only male child of Heinrich Christopher Overweg, a broker in iron and other metals. From A. Petermann's "Die letzten Tage Dr Adolf Overweg's " we learn that Adolf had two sisters, Auguste and Wilhelmine. According to a letter written by Auguste to Petermann, their father had come from Westhofen near Unna in Rheinpreussen, while their mother was Hamburg born. Adolf pursued his secondary education at the Johanneum in Hamburg; at the age of 21 he went to Bonn and two years later to Berlin Universities, where he studied Philosophy (acc. to H. Schiedder 1854) and/or natural sciences (Meyers Konversations-Lexikon 1877). According to Auguste's letter (contained in Petermann 1853: 211-212) he earned his doctorate in Berlin already one year after his move from Bonn (1845?) He was then planning to operate a coaling mine which he hoped to exploit profitably, when his fate made him to turn towards Africa.

On December 8, 1849 Dr *Heinrich Barth* and Dr *Adolf Overweg* embarked on a ship from Marseille to Tripoli, Libya. Under the leadership of Mr *Richardson* they left Tripoli on 24 March, 1850. On their way to Borno they passed through Murzuk (6-13 June). Ghat (18-24 July). Tintellust in Air (3 September -5 November) and Taghelel in Dameru (7 January 1851), where they separated, with the view of reaching Kuka by three different routes. Overweg first went to Gobir and Maradi, spent two months there and reached Kuka via Zinder and Mashena on May 7, 1851. Barth, who had already arrived on the 2nd of April came to meet him outside the town. He wrote: "I found Overweg in the shade of a nebek-tree near Kalilwa. He looked greatly fatigued and much worse than when I left him, four months ago, at Tasawa; indeed, as he told me, he had been very sickly in Zinder—so sickly that he had been much afraid

lest he should soon follow Mr Richardson<sup>1</sup> to the grave..... He had had an opportunity to witness, during his stay in Gobir and Maradi, the interesting struggle going on between this noblest part of the Hausa nation and the Fulbe, who threaten their political as well as religious independence" footnote: "Unfortunately, Mr Overweg made no report on this his excursion, most probably on account of his sickness in Zinder, and his being afterwards occupied with other things. His memoranda are in such a state that, even for me, it would be possible, only with the greatest exertion, to make anything out of them, with the exception of names". Mr Overweg was, in some respects, very badly off, having no clothes with him but those which he actually wore. all his luggage being still in Kano... I was therefore obliged to lend him my own things....." (Barth 1965, II: 80/81).

While Barth proceeded on his unfortunate journey to Yola, Adamawa, Overweg undertook his famous voyage on the Tsad (Lake Chad): He assembled the boat that they had brought all along from Tripoli at Maduari and embarked on 28 June from Maduari to the islands of Lake Chad, the easternmost of which he reached was Guraia. On July 12 he was back in Maduari. Barth found that at that time he "enjoyed excellent health" (Barth 1965, II: 233). After their common expedition to Kanem (15 September -14 November) and after they accompanied the Bornuan army on a slave raid to Musgu country (25 November, 1851-1 February, 1852) they separated again: Barth went towards Bagirmi in the east. Overweg visited the southern frontier areas of Borno bordering with Bauchi ('Jakoba') : he came through Magomeri, Gafata ('Gudscheba'). Shemgo, Dora, Fika—back to Shemgo, from there to Gebbeh and again to Gujiba, and eventually back to Kuka (24 March-22 May). This journey must have demanded great energy from Overweg because he did not leave Kuka for the next two months—apart from a few smaller trips mainly to Lake Chad. A few days after Barth's return from Bagirmi (21 August), he undertook another excursion to the river Komadugu Yobe. When he returned to Kuka (14 Sept.) his health was seemingly good, but five days later he had a strong fever. On his demand he was taken to Maduari, where he died on September 27, 1852.

The most detailed description of Overweg's last days is contained in a letter written by H. Barth to Miss Wilhelmine Overweg, the other sister of Adolf, O., dated Kuka 28 September, 1852 (cf. Petermann 1853: 208-211). According to this source, Barth and Overweg undertook a ride to the pool of Dauerge, about 2½ hours northwest of Kuka. Although Overweg did not feel well, he insisted on going on this trip. In pursuit of a water-fowl, he followed it into the pool. Although his clothes had therefore become quite wet, he did not change them before late evening. In "Dorugu's Narrative" (Kirk-Greene and Newman 1971: p. 52) the event is described as follows: "While there Tabib saw a white bird he wanted to shoot, so he took his gun from Abbega. He got up, followed it, and shot at it. He ran without catching it and his shoes got stuck in the mud. He didn't catch the birds. So he got out of the mud, but without his shoes. Abbega went to look for them and I think he found them and washed them. Then Tabib put them on again...That night, my master began to have chills. A few

<sup>1</sup> Mr Richardson who had taken the Zinder route died at Ngurutua, only 6 days' journey from Kuka, on 3rd to 4th March, 1851.

days passed and his illness became more serious". (Dorugu and Abbege were both slaves freed by Overweg, whose local Arabic name was Tabib, "doctor" (cf. also Kirk-Greene's "Abbege and Durogu". *West African Review*. Nov. 1956). On September 23, Overweg wanted to be taken from Kuka to Maduari which was situated near Lake Chad. There, in the house of his friend Kashella Fugobo Ali he hoped to recover from his fever. The following day they started transporting him on horseback to that easterly village: however, it took them more than a day to reach the place only about 7 kms away from Kuka. Barth visited him in the evening of Friday, the 25 September: at that time Overweg has already fallen into a delirium and only spoke German, though unintelligibly. In the morning of Saturday 26, Overweg tried to tell Barth something, but the latter could not understand him. Barth then returned to Kuka. Sunday very early in the morning, on September 27, 1852, Overweg died. Barth concludes his letter to Miss Wilhelmine Overweg as follows (translation from German): "In the afternoon we buried your brother after his corpse had been washed and wrapped first in calico and then in jerid. We used a carpet as a floor and his hdik and bornus as a cover. The grave, dug in the shade of a hajlij, was 6 feet deep...The valuables which your brother had taken with him were given to the village supervisor Fugobo Ali, in order to engage him to fence in and guard the grave. A fat bull was also distributed among the people of the village. Tomorrow I plan to present the inhabitants of the town with 6 oxen & 10 ox-loads of corn... (Your brother) died lamented and mourned by many natives of these lands, among whom his name will continue to live. He died beside the boat on which he travelled around the lake, whose waves, when its waters are high, caress the place where his body rests...I have kept all of his people on the same terms on which they served him. In the next few days I shall add a few lines for you on his literacy legacy. But, to judge from his entire manner, I fear that this will be very disorderly and fragmentary—mere notes. He was always of the opinion that one's diary should be completed only after one's return".

H. Barth and A. Overweg certainly were of different character and nature. According to all records available, one may perhaps say that Barth was certainly respected by the people of Central Africa with whom he got in touch, whereas Overweg was not only respected but also loved. Especially the way how they took down their notes must have been very different. Barth writes on this point as follows: "...instead of employing his leisure hours in transcribing his memoranda in a form intelligible to others, he left them all on small scraps of paper, negligently written with lead-pencil, which after the lapse of some time, would become unintelligible even to himself. It is a pity that so much talent as my companion possessed was not allied with practical habits, and concentrated upon those subjects which he professed to study". (Barth 1965, pp. 233-234).

The manuscripts and notes left by A. Overweg were handed over to A. Petermann "in einem chaotischen mit Wustenesand und Staub stark untermischten, unordentlich untereinander geworfenen Haufen von Papieren und Papierfetzen" (in a chaotic state, soiled with dust and desert-sand, jumbled among a disorderly heap and scraps of papers). Petermann made a classified list of them (Petermann 1853/1912:212-213); an English translation of this list is found in Benton. As to the language materials, Benton hints at the possibility that Prietze, a nephew of Gustav Naclitigal, who had

entrusted in him his linguistic notes for publication, may also have received "Overweg's lost vocabularies".

Today, Overweg's remains are buried in the "European grave yard" within the walls of the Governor's house. In 1908, the British Resident, Mr Hewby, had them exhumed and brought to Maiduguri. The brief inscription on the cross runs "Overweg Explorer died 1853" (obviously mistakenly for 1852).

## THE HISTORICAL BEGINNINGS OF DAU-DAU: THE KANURI TRADITIONAL THEATRE

by

Atabo Oko

Studies in African theatre history tend to show that the development of sophisticated political systems by the various ancient African Empires and Kingdoms were equally accompanied by a corresponding development of the theatrical arts. A possible explanation for this could be that theatrical creativity, like all forms of artistic creativity, tends to emerge in a period of relative psycho-social stability such as was provided by these ancient kingdoms.

The Mali empire whose political organisation and security aroused the admiration of Ibn Batoutah<sup>1</sup> provides an example. Bakary Traore had used the authorities of Labouret and Moussa in *The Black African Theatre and its Social Functions*<sup>2</sup> to show that the Mandiugo civilization of ancient Mali did develop a specific form of theatre which could in all senses be called a "Malian theatre". The emergence of theatrical culture in the wake of sound socio-political atmosphere was not a feature of the kingdoms of the Sahara alone: the same trend is observable in the forest region. As far back as the sixteenth century, for instance, the ancient Oyo Empire during the reign of Alaafin Ogbolu<sup>3</sup> developed the *alarinjo* theatre, a travelling theatre which emerged from the *egungun* mystery and went extinct only during the collapse of the empire in the nineteenth century<sup>4</sup>. In part, therefore, stable social, economic and political situations provided the leisure and the stimuli for the release of the creative energies that led to the development of theatrical activities in these ancient kingdoms.

This being the case, it is hardly surprising that theatrical activities should emerge in the ancient kingdom of Borno at the time it did in the nineteenth century. For by the middle of that century this already politically stable and secured kingdom had even re-opened trade routes to Hausaland following unofficial cessation of hostilities with the Sokoto Caliphate, and had extended its recognition to the Karamanlis and the Ottoman Empire—with the result that its external trade boomed with North Africa, the Middle East and the Mediterranean. The political economic and psychological situations were so favourable and viable that by 1830 the Kingdom "was in fact better known than the newly established Sokoto Caliphate"<sup>5</sup>. It is out of this favourable political and psycho-social milieu that *dau-dau* emerged.

*Dau-dau* is a Kanuri theatrical tradition of popular entertainment. The earliest and the only document on it is a two-page review by R. T. E. Ellison who states that it emerged in the middle of the nineteenth century during the reign of Shehu Umar.<sup>6</sup>

*Dau-dau* is generally regarded as a puppet theatre. This is because *dau-dau* as a theatre employs puppets, and the Kanuri refers to a puppet as *dau-dau*. The entire theatre, or each performing group, is led by a *dau-damma*, which, in Kanuri, means the

puppet manipulator, or "the man who does the puppet". The *dau-dauwa* is simultaneously the producer and the director of the theatre's performance. There are as many *dau-dauwa* as there are theatre groups, since without one the group would lose its legitimacy. To some extent, it is a misnomer to call this theatre "a puppet theatre", since a performance sometimes does consist of solo actions which do not employ puppets.

#### History

*Dau-dau* was originated by Mai Gambo, a native of Dabari district, to whom all *dau-dauwa* trace their origin through a teacher-pupil line of succession.<sup>7</sup> This fact seems well established enough, for in the words of Sherima Kafi, (9) who confirms it in an apt epigram, "all the branches of a tree come from one stem". The immediate inheritor of *dau-dau* from Mai Gambo is not known, but there is evidence that one or two people could have existed between Mai Gambo and Maina Doma, a prominent *dau-dauwa* from Monguno.<sup>8</sup> Oral history holds that Maina Doma, whose mother was Abba, was born in Niger Republic and later settled in Monguno at an early age.<sup>9</sup> Having inherited the art from one of the pupils of Mai Gambo, he went back to graze his herd in Monguno where he became one of the greatest *dau-dauwa* in the empire.<sup>10</sup> As his retirement from the profession, he was known to have handed over the art to Mals Doma who lived in Cawaga in Maiduguri district.<sup>11</sup> He in turn handed over the art to Sherima Kafi, the retired *dau-dauwa* who lives in Abba Ganaram ward in Maiduguri.<sup>12</sup> The other *dau-dauwa*, Ama Doma, who was probably a pupil and a blood descendant of Maina Doma of Monguno, is credited with having introduced the art to Galdam, and is no longer living.<sup>13</sup>

*Dau-dau* was a professional job second only to farming.<sup>14</sup> According to the records of Ellison, there were three *dau-dau* groups in the entire Borno at the time of his writing.<sup>15</sup> This number has decreased to two, following the migration of the group in Dapchi to Chad Republic.

The heritage gained such a wide-spread popularity in the Borno empire that on occasions like weddings, engagements, initiation ceremonies, and the installation of Galadima's, Mais and Shehus, the groups were always invited to perform. They had official recognition throughout the empire. Oral accounts insist that there was never a ruler in the Borno empire that did not know of *dau-dau*. The group usually performed for any Shehu at his installation, since *dau-dau* performance was part and parcel of installation entertainment. The group, however was not a court entertainment group waiting on the Shehu's pleasure. Still, when Rabeh the Sudanese disrupter heard of the group in the later part of the nineteenth century, he invited the two group leaders of his time, Mai Gambo Zarami and Masta Kura Doma to perform for him in his palace at Dikwa.<sup>16</sup> Moreover, Rabeh's eldest son, Fadl Allah, who ruled some parts of Borno for a chaotic one year, also invited the same people to perform for him.<sup>17</sup> This incident took place sometimes between 1900 and 1901.<sup>18</sup>

But in spite of its widespread popularity and common origin, *dau-dau* in its early days was a hazardous job and an extremely risky profession. The risk had to do with the unhealthy rivalry between the various groups in the attempt of each to overshadow the other. Each group regarded the other as a competitor and an enemy and each

on the basis of this sought to neutralise the other through physical elimination. The major target for elimination was the *dau-dauma*, who as a group leader was seen as the symbol of the group's survival. But on the other hand, any member of a group could be eliminated in place of the *dau-dauma*, if the *dau-dauma* was too difficult to get. In general, however, the *dau-dauma* was the primary target of interest and other members did not stand in as much danger as him.<sup>19</sup> This was the only method which each group thought it could use in a theatrical world where huge financial gains and recognition from high quarters were considered very important, and none welcomed any competition.

As a result of this danger associated with the profession, each *dau-dauma* took great care to explain the perils in the profession to his pupils, especially the one to whom he intended to hand over the heritage. Indeed, a pupil who felt he could not stand the danger of being a *dau-dauma*, was free to reject the succession, though this was more in theory than in practice, because to object was tantamount to womanly cowardice which nobody wanted to be associated with.<sup>20</sup> Consequently, a pupil often had to take over from his ageing teacher and seek out means of protecting himself and his group against any act of sabotage or elimination by rival groups and their agents. According to oral sources, this explains the presence of religio-magical elements in *dau-dau* performances, elements which were intended to frighten off enemies and also serve as defence mechanism against elimination by rival groups and their agents. These elements consist mainly of concentrated incantations and religio-magical manifestations that smack of pre-Islamic pagan rites<sup>21</sup>. For this reason, some Kanuris refer to *dau-dau* groups as magicians.<sup>22</sup>

The pupil who succeeds his teacher must know both the artistic and magical aspects of the profession. The process by which a pupil succeeds his teacher as *dau-dauma* itself involved a hand-over ceremony which follows some procedures and recognised patterns. These patterns are strictly adhered to by any *dau-dauma* who wanted to hand-over the art to his pupil. The system was such that the *dau-dauma* would first hand-over the art to his student at a private level and on temporary basis. This temporary hand-over had no ritual or ceremonies associated with it. After this private hand-over, the *dau-dauma* would then send the pupil to the field, among the people, to be performing. The pupil would be performing and would be sending the gains of gifts and money acquired from the performance to his teacher. This would continue for some time, even for years, while the *dau-dauma* on his part would be conducting some audience research through which he would assess the capability of his pupil.

This research would continue until the *dau-dauma* becomes convinced, through public opinion, that his pupil has acquired the technique, skill and competence that would justify the bestowing on him the responsibility of being a *dau-dauma*. At this point in time, the *dau-dauma* calls for an official hand-over ceremony to which he would invite other *dau-dau* groups. It is a tradition that all *dau-dau* groups must bury their hatchets and attend this hand-over ceremony. The ceremony mainly consists of puppet shows, dramatic performances, and magical demonstrations by each of the existing *dau-dau* groups in a large open air square in the community where the hand-over took place. It was attended by the entire community who gathered in an open air space in the manner of a fifth century Athenian festival audience. All the *dau-dau* groups were expected to manifest their highest artistry.<sup>23</sup> This ceremony

gave a social stamp of recognition to the pupil who from henceforth would be known and addressed as *dau-dauma*.

#### Notes

1. Bakary Traore, *The Black African Theatre and its Social Functions*, IUP, 1972, p. 7.
2. *op. cit.*, *ibid.*, p. 7.
3. J. A. Adedeji, "Alarinjo": The Traditional Yoruba Travelling Theatre", in *Drama and Theatre in Nigeria: a critical source book*, ed. Yemi Ogunbiyi, Nigeria Magazine, Lagos, 1981, p. 221.
4. *op. cit.*, pp. 225-227.
5. Sa'ad Abubakar, "Borno in the 19th Century", in *Groundwork of Nigerian History*, ed. Obaro Ikime, Heinemann, Ibadan, 1980, pp. 334-336.
6. R. T. E. Ellison, "A Bornu puppet show", in *Drama and Theatre in Nigeria: a critical source book*, *op. cit.*, p. 254.
7. *op. cit.*, p. 254.
8. *Dau-dauma* Shettima Kafi is sure that Maina Doma did not inherit the art directly from Ma Gambo, but could not tell who did. (Interview with Shettima Kafi in Maiduguri in his Abba Ganaram home in 1984).
9. Maina Doma is a Kanuri in spite of his Niger connection. (Interview, 1984).
10. Interview, 1984.
11. Interview, 1984.
12. Interview, 1984.
13. The *dau-dau* group in Geidam died with Ama Doma. (Interview, 1984.)
14. *Dau-dau* wasn't a full time profession. Every member of the group is also a farmer. (Interview, 1984.)
15. R. T. E. Ellison, *op. cit.*, p. 254.
16. The *Dau-dauma* said he was "very little" when this group performed for Rabah. (Interview, 1984.)
17. The *Dau-dauma* said he could recollect all these events even though he was very small at the time. (Interview, 1984).
18. i. e. the period of Fadl Allah's rule.
19. Hence the *Dau-dauma* described the job of a troupe leader as "extremely dangerous" because it was a job in which "people will try to get your head". (Interview, 1984).
20. The *Dau-dauma* has no record of any pupil who had ever rejected the responsibility of being a leader.
21. In one of such magical manifestations, the *dau-dauma* took a long white piece of cloth, cut it in two with a knife, and then heaped some sand on top of the cloth. After some intense incantations, he moved the heap of sand from the top of the white cloth. He pulled it up, and behold, the piece of cloth which had been cut in two became joined together as if it had never seen a knife before. There was no knife mark on it.
22. Baba Gana Teibu, a senior social welfare officer for instance, calls them "magicians" without intending to be derogatory.
23. This was also an opportunity for the pupil to prove himself worthy of the new responsibility.

# SEROLOGICAL SURVEY OF MYCOPLASMA SYNOVIAE AND MYCOPLASMA GALLISEPTICUM IN CHICKENS IN BORNO STATE

by

Elizabeth N. Gadzama

## Introduction

With the devastating effect of rinderpest on the country's cattle population compounding the already existing protein shortage in Nigeria, a study of the exact disease situation in poultry, based on which possible control measures can be recommended, is appropriate.

*Mycoplasma gallisepticum* (*Mg*) the major causative agent in chronic respiratory disease (CRD) of chickens (Adler and Yamamoto 1956), while *Mycoplasma synoviae* (*Ms*) either singularly or jointly with (*Mg* or other agents is the primary cause of infectious synovitis (Olson and Keer 1967), but in addition can cause air-sacculitis (Olson *et al* 1964, Jordan 1975).

Onunkwo and Onoviran (1978) had provided the first serological evidence of mycoplasmosis in Nigeria, through a survey of market chickens in Plateau State. They documented a seropositive rate of 69.0% for *Mg* and 22.0% for *Ms*. Abdu *et al* (1982) conducting a survey in Kaduna State on chickens managed under different management systems observed that the free range birds had 66.3% seropositivity for *Mg*, and *Ms* had 81.9%. In semi-intensive system, the values were 38.1% for *Mg* and 24.4% for *Ms*. In the intensively managed birds *Mg* had 38.1% and *Ms* had 41.9%. In an earlier survey for mycoplasmosis in market chickens managed as free rangers, the first serological evidence of mycoplasmosis in Borno State was provided (Gadzama 1985).

This preliminary survey was therefore undertaken to serologically determine the prevalence of *Mg* and *Ms* in chickens managed as free rangers and intensively in Borno State. The free rangers surveyed are from the local breeds of chickens, while the intensively managed ones are from the exotic breeds.

## Materials and Methods

Five millilitres of blood was collected aseptically from 50 birds per flock selected randomly from 10 flocks each from the intensively managed birds, making a total of 500 birds from each system. This group included the birds managed in battery cages and on deep litter system. In the free range birds 5 millilitres of blood was collected from 5-10 birds per flock, and 10 flocks were involved in the survey. A total of 250 birds were surveyed.

The free range birds are those allowed to roam around the houses and surrounding environment and they spend the nights in an improvised poultry house. While the intensively managed birds are never allowed out, remaining all the time either in the battery cages or in the deep litter houses.

A questionnaire was used to obtain information on each flock. The information obtained included age of birds, number in the flock, source of birds, history of disease condition in the flock, history of drugs used in treatment or prevention of diseases and vaccination history.

The sera were centrifuged at 2,000 rpm for 10 minutes to settle out any red blood cells and debris. The sera were collected into bijoux bottles, inactivated at 56°C for 30 minutes and stored at 4°C until analysis. The rapid serum plate agglutination test (RSPT) as described by Adler *et al* (1956) was used.

*Mg* and *Ms* commercially prepared antigens (Wellcome Diagnostics Laboratory UK) were used. Positive and negative control sera obtained from the sub-Department of Avian Medicine, University of Liverpool were used. Essentially the RSPT consists of mixing a drop (0.02ml) of the *Mg* or *Ms* antigens with a drop of the inactivated serum on a white tile. The tile was rotated for a few seconds and reaction read within 2 minutes. The known positive and negative sera controls were included in the test in order to provide a basis for comparing the test sera.

## Results

The results of the ten flocks surveyed from each management system is presented in Table I. All the ten flocks from the free range management had birds that had antibodies to both *Ms* and *Mg* i.e. 100% seropositivity. Battery cage had 40% seropositivity for both *Ms* and *Mg*, while deep litter had 60% for *Mg* and 40% for *Ms*.

The results of the individual bird seropositivity is presented in Table II. Out of 250 birds surveyed in the free range system 28.8% had antibodies to *Mg*, while 36% had antibodies to *Ms*. In the battery cage system the figures were 48.6% for *Mg* and 70% for *Ms*, while in the deep litter it was 25% for *Mg* and 51.6% for *Ms*.

Table I

*Serological survey of Mycoplasma gallisepticum and Mycoplasma synoviae antibodies in chicken flocks raised under 3 different Management systems in Borno State.*

Management system	No. of Flocks examined	No. Postive	
		<i>Mg</i>	<i>Ms</i>
Free range	10	10(100%)	10(100%)
Battery cage	10	4( 40%)	4( 40%)
Deep litter	10	6( 60%)	4( 40%)

## Discussion

In an earlier survey for antibodies for *Mg* and *Ms* in local market chickens (Gadzama 1985), the first serological evidence of mycoplasmosis of chickens in Borno State was provided. This work has further corroborated the earlier findings and has further provided an evidence of antibodies to *Mg* and *Ms* in incensively managed exotic breeds.

Table II

*Serological survey of Mycoplasma gallisepticum and Mycoplasma synoviae antibodies in individual chickens*

Management system	No. of Chickens examined	No. Positive	
		Mg	Ms
Free range	250	72(28.8%)	90(36%)
Battery cage	500	243(48.6%)	350(70%)
Deep litter	500	125(25%)	258(51.6%)

All the ten flocks surveyed in the free range flocks contained birds that were positive for both *Mg* and *Ms* (100% flock seropositivity). This was expected because the free range flocks who were not under confinement had a greater opportunity of exposure than the birds managed intensively in battery cages and on deep litter.

However, the most disturbing finding in this survey is that the birds in the battery cage had higher individual bird seropositivity to both *Mg* and *Ms* (48.6% and 70.0% respectively) compared to 28.8% and 36.0% in free range. Similarly in the deep litter the seropositivity was 51.6% for *Ms* and 25% for *Mg*. In addition to horizontal transmission, both *Ms* and *Mg* are transmitted through the egg, and most of the birds surveyed were table egg producers obtained from hatcheries based in this country maintaining their own breeding flocks. It is therefore important that these breeding flocks be screened for mycoplasmosis, in order for the transmission cycle to be broken at this level. Abdu *et al* (1982) working in Kaduna State also observed seropositive birds in intensively managed flocks and also suggested a need for screening of breeding flocks for mycoplasmosis.

The overall prevalence of *Mg* is 100% in free range flocks, 40% in battery cage and 60% in deep litter, and for *Ms* is 100% for free range, 40% for battery cage and 40% for deep litter. These figures indicated that the infection is widespread in chickens in this State, and will justify a call for a definite control policy for this disease.

### Acknowledgement

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# A REPORT ON THE "GEOLOGICAL STUDIES AND EXPLORATION OF INDUSTRIAL ROCKS AND MINERALS IN THE NORTHERN PART OF THE MANDARA HILLS, NIGERIA"

by

M. R. Islam, S. Ostaficzuk & Saidu Baba

Ancient crystalline Basement rocks with later volcanic intrusions at some places characterize the solid geology and the relief of the region. Gneisses, quartzites, and calcisilicate rocks of the former sedimentary series were later regionally metamorphosed, partially migmatized and subjected to the emplacement of Older granitic rocks. Later dykes of fine granite and dolerite were intruded into both granites and metasediments. Several belts of mylonite and brecciated rocks were also encountered.

Several pegmatitic and hydrothermally metamorphosed zones were discovered in the hills and vicinity. Economic minerals and industrial rocks of different types have been located in these zones. The localities having such mineralized zones are Ngoshe-Pulka and Liga-Disa hill regions.

The following works have been carried out in order to establish the basic geological informations and to explore the mineral and industrial rock deposits in the areas.

1. Preliminary study of the aerial photographs and photointerpretation of the mineralized zones under investigation.
2. Reconnaissance survey of the areas concerned, collection of rocks and mineral samples, preparation of thin sections, and petrographic and mineralogic studies.
3. Examination of the areas subjected to tectonic activity and the evolved geologic structures.
4. Selection of areas of composed geologic structures with rich mineralization for more detailed work, i.e. trenching, pitting and geochemical sampling.

The findings of the present works are stated below: The mineralized zone in the main hill extends from Ngoshe to Pulka covering a distance approximately 20km having a width ranges from more than 1km at Ngoshe (south) to less than 100m at Pulka (north), Fig. 1. The zone at Ngoshe is pegmatized, while at Pulka it is more hydrothermal.

The presence of pegmatite, graphic granite, and quartz and feldspar mineralizations in veins are the indicatives of the pegmatization.

The presence of actinolite (altered augite) in the graphic granite, cancrinite in nepheline syenite, leucoxene (altered ilmenite) in tonalite, and the chalcidony vein within the zone are the indicatives of the hydrothermal activity. In addition, the desolution of the feldspar from the Older granite within the zone is an indication of presence of the hot fluid circulation in the area. Various types of granitic rocks are located in the hill which could be used as building and decorative stones and as road materials.

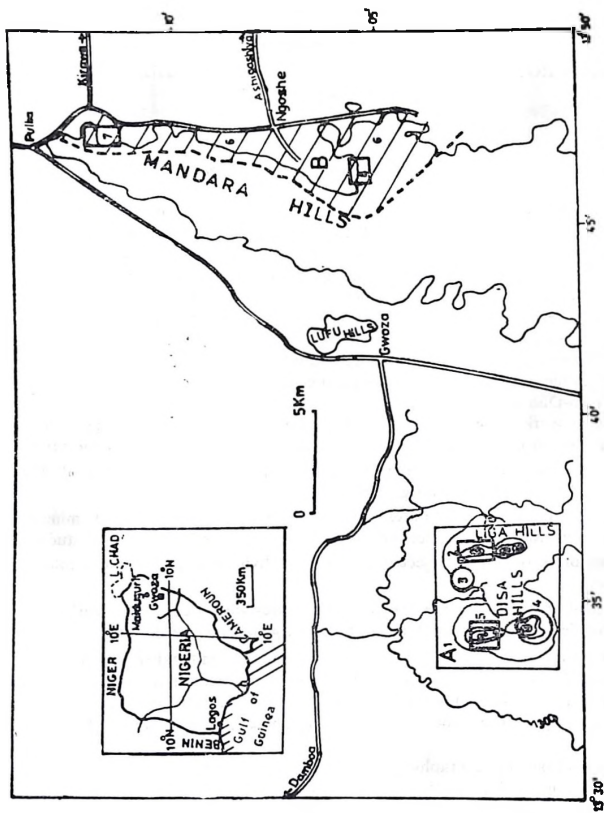


Fig. 1 Location map of the Northern part of Mandara hills including Dlisic & Ligo hills showing minerohgel Zones (A & B).

- 1. Area subjected to Photogeology study.
- 2-3. Zones with known deposit of quartz & telospar
- 4-6. Areas of composed geological structures with mineralization.
- 7-8. Zones of mineralization subjected to field examination.

Occurrence of massive quartz and alkali feldspar bodies in pegmatite zone has been located in the Liga and Disa Hills situated 10–15 km WSW of Gwoza. Mineralization of manganese in association with quartz, chlorite in feldspar, brown iron rich mica in tectonic contact with blue quartz bearing rock, etc, have been found in Liga hill. The blue hue in quartz is perhaps due to rutile inclusion. Besides, zonal kaolinisation has been discovered in the vicinity of that hill. The feldspar is being mined from the northern tip of Liga hill since last year by the Quest Two Enterprises Limited, Kaduna.

Similar mineralizations are detected in the Disa hill and its surroundings. The minerals other than quartz and feldspar mentioned above are detected in the area, in small quantities, but may be found in large quantity if the area is explored in more detail.



**OCCURRENCE OF ROOT-KNOT NEMATODE MELOIDOGYNE  
JAVANICA (TREUB, 1885) CHITWOOD, 1949 ON SOME PLANTS  
IN BORNO STATE OF NIGERIA**

by

**Inderjit Singh**

Root-knot nematodes, *Meloidogyne* species are obligate parasites of a large number of cultivated and wild plants. The most common and conspicuous symptoms of infection of *Meloidogyne* species is the presence of distinct enlargements of the roots, called galls or knots. In addition to the galls, the heavily infected roots are much shorter than uninfected and have fewer branch roots and root hairs. The root system does not utilise water nutrients from the soil as in uninfected root system. Vascular elements in the root are broken and mutilated due to the formation of 'giant' cells in the roots (Rohde and McClure, 1975), and thus the normal translocation of water and the nutrients are mechanically hampered. Furthermore, the *Meloidogyne* species interact with bacteria and fungi and thus increases the incidence of the diseases caused by them by predisposing the plant tissues to such infection (Pitcher, 1961, Powell, 1971).

A large number of samples collected from the kitchen gardens in Maiduguri and on examination revealed the prevalence of *Meloidogyne javanica* in the soil and in the roots of the plants in abundance. It appeared that there is no such observations available in the literature on the present studies undertaken on the occurrence of *M. javanica* on cultivated and wild plants. The identification of *M. javanica* was based on the perineal pattern of the adult females. The pure culture of *M. javanica* was carried out from a single egg mass, and an experimental (sick) plot was developed for the studies. The culture was maintained on *Solanum melongena* and a number of plants were grown in the sick plot. The study on the host infection index was based on the percentage of root system galled and was rated as + = 25%; ++ = 26-50%; +++ = 51-75%, and ++++ = 76-100%. The size of root galls ranging from small (S), medium (M) and a large (L) were also noted. Thirty-seven plants belonging to 19 families were recorded to be infected with *M. javanica* as detailed in the Table 1.

**Acknowledgement**

The author is thankful to Professor M. H. Bokhari, former Head, Department of Biological Sciences, University of Maiduguri, for assistance in identifying the weeds.

Table 1

*List of the host plants of M. javanica and the host infection index*

<i>Name of The Plant</i>	<i>Family</i>	<i>Host Infection Index</i>
<i>Abelmoschus moschatus</i>	Malvaceae	†††; L
<i>Allium cepa</i>	Amaryllidaceae	††; S
<i>Amaranthus spinosus</i>	Amaranthaceae	†; S
<i>Brassica campestris</i>	Brassicaceae	††; S
<i>B. Oleracea</i>	Brassicaceae	††; S
<i>B. rapa</i>	Brassicaceae	††; S
<i>Caesia</i> spp	Liliaceae	†††; M
<i>Cajanus cajan</i>	Fabaceae	†††; M
<i>Capsicum frutescens</i>	Solanaceae	††††; L
<i>Carica papaya</i>	Caricaceae	†††; L
<i>Cassia obtusifolia</i>	Caesalpinaceae	††; S
<i>Cassia occidentalis</i>	Caesalpinaceae	††; M
<i>C. toria</i>	Caesalpinaceae	†††; L
<i>Citrullus lanatus</i>	Cucurbitaceae	††††; L
<i>Corchorus olitorius</i>	Tiliaceae	††; S
<i>Cucumber sativus</i>	cucurbitaceae	††††; L
<i>Cucumis melo</i>	Cucurbitaceae	††††; L
<i>Daucus carota</i>	Apiaceae	†††; M
<i>Desmodium triflorum</i>	Fabaceae	†††; S
<i>D. umbellatum</i>	Fabaceae	††; S
<i>Hibiscus subdariffa</i>	Malvaceae	†††; S
<i>Indigofera</i> spp.	Fabaceae	††; S
<i>Tycopersicon esculentum</i>	Solanaceae	††††; L
<i>Mentha piperita</i>	Lamiaceae	††; S
<i>Mimosa</i> spp.	Mimosaceae	††; S
<i>Ochroma</i> spp.	Bombaceae	††; S
<i>Orobanche</i> spp.	Orobanchaceae	†; M
<i>Phasiolus aureus</i>	Fabaceae	†††; M
<i>P. vulgaris</i>	Fabaceae	††††; M
<i>Pisum sativum</i>	Fabaceae	††††; L
<i>Raphanus sativus</i>	Brassicaceae	††; S
<i>Ricinus communis</i>	Euphorbiaceae	†††; S
<i>Solanum melongena</i>	Solanaceae	††††; L
<i>Striga</i> spp.	Scrophulariaceae	†† S
<i>Vicia faba</i>	Fabaceae	†††; L
<i>Vigna Unguiculata</i>	Fabaceae	†††; M
<i>Zea mays</i>	Poaceae	†; S

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## REPORT ON GRASSHOPPER RESEARCH, 1984/85

by

W. S. Richards

1984 was a year of exceptionally poor rains in Borno State (only about half the long term average). This was reflected in the incidence of the dominant grasshopper pests. *Aiolopus simulatrix* was first reported in May, 1984 in very large numbers at night at Ngala in the area of cracking clay soils around Lake Chad, and were reported to be attacking plots of seedling rice on the nearby Lake Chad Irrigation Scheme. Further night flights were seen at Maiduguri in May and June, and initial rains breeding observed along the Bama-Mubi road in the area of heavy clay soils just south of Bama. This was followed by reports of attacks on ripening Guinea corn (sorghum) around Gwoza, immediately to the south. In 1985, by contrast, which has so far turned out to be a year of good rains, the incidence of *Aiolopus* is much reduced, and instead, there have been heavy night flights of *Oedaleus senegalensis* at the end of June, the product of at least one generation of early rains breeding. It will be interesting to see if this results in crop damage later in the year. This pattern, viz. the importance of *Aiolopus* as a crop pest in dry years, and of *Oedaleus* in wet years has been a feature of grasshopper infestation in previous years, both in Nigeria, and elsewhere in the sub-Saharan zone.

Work is also in progress to try and establish whether there is anything resembling the solitary and gregarious phases of such locusts as *Schistocerca* and *Locusta* in the life histories of the two crop pests mentioned above. So far as other species are concerned, there has been heavy breeding of a number of *Acrotylus* species, and of *Pygomorpha*, but these are not usually crop pests.



## SOIL RESOURCES OF BORNO STATE

by

Antoni J. Rayar

It has been well established that increased food production to feed the world's ever increasing population cannot be met mainly through expansion of cultivable land, but through the intensification of agricultural productivity. This vital objective could hardly be achieved without, among other things, detailed diagnosis of soil potential, development and adoption of high yielding varieties, and the use of chemical fertilizers. The soils of arid and semi-arid regions possess many unique characteristics that distinguish them from their more well-known counterparts in the humid regions. Dryland agriculture or rainfed farming is beset with many complex problems in Northern Nigeria and in Borno State in particular. In this state, the problems are more acute on account of scanty and uncertain rainfall with a short rainy season. A thorough knowledge of the potential and problems of the soils of any region is absolutely essential for the sustained agricultural production. A comprehensive study of the soils of Borno State was undertaken to identify as clearly as possible their fertility status and production potential. A brief summary of the results so far obtained is given below.

Forty representative surface soil samples (0-15 cm) were collected from different parts of Borno State and subjected to various physico-chemical analyses. The results obtained in this study showed that the soils of Borno State were mainly neutral to slightly alkaline. The mean values recorded for pH and E.C. were 7.07 and 0.146 mmohs/cm, respectively. There was no accumulation of soluble salts on the surface of the soils, as indicated by the low electrical conductivity. However, soils from Baga area registered high pH and E.C. values, indicating the possibility of salinity hazard. The soils were mainly loamy sand to sandy loam in texture which has a tremendous implication on their moisture conservation. The water holding capacity of the soils were considered to be low due to the general sandy nature. The pore space registered a mean value of 46.9% which is most common for sandy soils. This study revealed that about 70% of the soils contained low amount of clay which affect many physico-chemical properties. The clay content of the soils was highly correlated with water holding capacity ( $r = 0.80^{**}$ ) and pore space ( $r = 0.83^{**}$ ).

Chemical analyses of the soil samples have indicated that the content of total and available N, available P and exchangeable K were low, and it is most probable that these soils will respond very well to the application of NPK fertilizers. The mean values of total N, organic carbon, available N, available P and exchangeable (available) K were 0.066%, 0.458%, 43 ppm, 11 ppm, and 0.17 me/100g of soil, respectively. Total N content was significantly correlated with organic carbon ( $r = 0.39^*$ ) and available N ( $r = 0.72^{**}$ ). The organic carbon content of the soils was highly correlated with

available N ( $r = 0.47^{**}$ ) and available P ( $r = 0.42^{**}$ ). The per cent of available N from total N ranged from 2.01 to 12.76, with a mean value of 6.40. The C:N ratio of the soils ranged from 3.05 to 33.69, with a mean value of 7.03. It was also evident that the texture of the soils highly influenced the nutrient content. Maximum organic carbon content and C:N ratio was observed in loamy soils, followed by clay, sandy clay loam, sandy loam and loamy sand.

The cation exchange capacity of the soils ranged from 3.4 to 50.4, with a mean value of 14.6 me/100g of soil, and was highly correlated with organic carbon ( $r = 0.45^{**}$ ) and clay ( $r = 0.84^{**}$ ). It was observed that 62.5% of the soil samples studied were low in cation exchange capacity. The total exchangeable bases registered values from 1.99 to 40.61, with a mean value of 10.88 me/100g of soil. The results obtained in this study indicate clearly that a major proportion of the soils of Borno State are sandy which requires special soil management systems so as to conserve the limited available soil moisture. Generally, the soils of this State are poor in plant nutrient elements and their fertility status could be raised by the addition of fertilizers and manures. It is also evident that most of the soils of this State are not suitable for surface irrigation due to their sandy nature. Alternative method of irrigation like sprinkler should be adopted, if the soils are to be brought under irrigated farming. The moisture-holding and nutrient retention capacity of these soils could be improved by the addition of organic manures. Proper selections of N fertilizers are to be made, considering the sandy nature of the soils. Slow releasing fertilizers are to be preferred.

## PROGRESS REPORT ON CBRDA AND RURAL DEVELOPMENT IN BORNO

by

Olu Ogunnika

This research is conducted with the primary aims of evaluating the contributions of the *Chad Basin and Rural Development Authority* to the life of Borno ruralites. The study defined development not only in physical terms; it includes social dimensions such as political awareness, attitudinal change, receptiveness to ideas, adoption of innovation and development of leadership ability by the ruralites.

The project is being executed in three stages. Stage one covers the work of the authority (CBRDA) in the *South Chad Irrigation Project* (SCIP) area. Stage II examines Baga Polder project while stage three examines the CBRDA organization itself.

When completed, the project will provide insight into two different problems. These are (a) the extent to which a government established Agricultural Organization can improve the ruralite's living condition and increase his agricultural productivity and (b) the effect of environmental complexity on organizational effectiveness. What this means is that the project will show how change/complexity in the environment leads to organizational transformation.

The CBRDA is viewed as an institutional innovation in the study. It therefore belongs to a system or norms, method of production, values and organizational structures which are recently introduced to rural Nigeria by the government and other agencies in response to the problems of low agricultural productivity and fallen rural standards of life. Experts in Agricultural Economics and Rural Sociology have, in some cases, argued that such innovations might not be successful. Olayide (1980) argued that the agents and operators of such large government agricultural organizations are lacking in the right attitude, foresight and integrity which would make such innovations successful. Another interesting argument is that such innovation cannot successfully change the rural living condition and enhance his productivity because it is externally generated. Instead it might lead to a cultural lag in which a state of deregulation and social instability would be witnessed in the society. Other schools of thought, however, believe that the innovation represents a movement to modernization which will surely improve the rural condition. When analysed, the research will provide an insight into the Nigerian situation. For phase one, we conducted a survey research at the SCIP areas in New-Marte district of Borno State. Interview schedule was designed seeking the following information from the villagers (1) Innovation and adoption of new crops; (2) Method of cultivation before and after the emergence of CBRDA; (3) Types of tool; (4) Income of the CBRDA and non CBRDA farmers; (5) Sources of information and awareness on matters of national interest; (6) Change in socio-economic status including land holding and educational achievement of children; (7) CBRDA extension services in the area; (8) Land Tenure

systems and method of plot allocation by the CBRDA; (9) Social amenities and health services.

Our analysis so far shows that the CBRDA is not so much effective. Two factors—the natural and social—were responsible for this. The natural factor is the uncontrollable effects of natural occurrences like drought. The social factor refers to the defects in CBRDA's organizational apparatus which is manifested in the poor performance of its extension officers in the field and the insensitivity of the authority to the needs of the ruralite. About 90% of our sample were aware of the existence of the CBRDA clinic but less than 5% answered that they have ever visited there for treatment. Most believe that their productivity would remain the same without the CBRDA. Despite the availability of an electricity power plant which can satisfy the electricity demands of Maiduguri town, none of the villages around is supplied with electricity. The level of awareness of the ruralites in New-Marte on National matters is also low. About 55% failed to identify the person who handed power to Shagari, while 80% did not know the name of their sole administrator. The average income of the farmers is also very low. Phase II and Phase III of the research is expected to commence shortly.

## REVIEW

### *Studies in the history of Pre-colonial Borno*

edited by

Bala Usman and Nur Alkali

Zaria: Northern Nigerian Publishing Company.

1983, ix + 237pp. 1 map.

It goes without saying, that the problems dealt with in the book under review, *Studies in the history of pre-colonial Borno*, transcend the 'artificial' boundaries of present day Borno created by European imperial powers and religiously adhered to by the chunk of territories comprising present day independent states of Cameroon, Chad, Niger, Nigeria, Libya and the Sudan at one time or the other, came directly or indirectly, under the suzerainty of Kanem Borno rulers. This explains the specific scientific interest in the empire of Borno.

Unlike most African empires or kingdoms, a large amount of our knowledge of Borno is based on written records: royal correspondences and reports: diaries, memoirs, essays, etc. of scholars, political figures, royal officials, merchants, diplomats, travellers and so forth. The book under review is a worthy successor to the great works of the above people, some of whom have left an indelible impression in the development of Bornoan and African historiography in general. The traditional King Lists (The Diwan), 'Girgam' (History) have in no small way contributed to the growth of Bornoan historiography.

On the role of those who have greatly contributed to the laying of a firm foundation of Borno historiography, Dr Nur Alkali in his speech at the launching of the book under review succinctly stated:

We have been making reference to the history and the literature of Borno. We have also said that the kingdom survived because of its unique position in the Central-Bilad al-Sudan and its rich history. But we must admit that this was only made possible by the continuous interest in research and learning among its scholars. The literature that has survived to the present day was the individual and collective effort of the great Ulama who persistently sought knowledge in various disciplines and in various parts of the Central-Bilad-al Sudan. They devoted a great deal of their time to the writing and recording of their history" (Speech on the occasion of the Launching Ceremony of the book: *Studies in the history of pre-colonial Borno* in Maiduguri, 4th June 1983).

While we doff our hats to these distinguished figures who have made their contributions to the development of the historiography of Borno and that of Africa in general, one cannot but agree with Disraeli, a Nineteenth century English Statesman when he said:

If the history of England be ever written by one who has the knowledge and the courage, because both qualities are equally necessary for the understanding, the world would be more astounded than when reading great events of Niebuhr. Generally speaking, all the great events have been distorted, most of the important causes concealed, some of the principal characters never appear and all who figure are so misunderstood and misrepresented that the result is a complete mystification" (Quoted in A. Temu & B. Swai, *Historians and Africanist History: A Critique* (London: Zed Press, 1981. p. 13).

Disraeli's remark is equally applicable to Borno. The historiography of Kanem-Borno from ca. 800 to 1400 A.D. (the reign of the Seifuwa in Kanem); from 1400 to early 1800s (the Seifuwa in Borno); the Nineteenth century (El-Kanemi dynasty in Borno, including the seven-year interregnum of Rabih ibn Fadlallah) dealt mostly with politics, diplomacy and religion and very often rich in imprecision, and romantic overstatements. The existence of several legends in various versions on some aspects of Borno history makes it very difficult, if not impossible, to draw a clear line of demarcation between myth and history.

Many European authors, with their eurocentric views, did not only compound the problems associated with Borno and African historiography in general, but grossly distorted, obfuscated and debased it. These European authors embarked on this scholastic fraud for the purpose of justifying and perpetuating European imperialism in Africa and rationalising and articulating the myth of the negroid race's inferiority to the caucasian race. Most of the European authors, if not all, tried in various ways to present Africans as a bunch of people without any meaningful past (history), at least in pre-European era. The 'primitive' Africans were, until quite recently, alleged to have contributed nothing to world civilization. Any remarkable or inexplicable feat or achievements of Africans that is clearly noticeable were attributed to non-negro people. Such distortions of history led to the emergence of the Hamitic Theory, among others.

*Studies in the history of pre-colonial Borno* is a bold and serious attempt towards the demystification and decolonisation of the historiography of West-Central Sudan and Africa in general. It attempts to correct misrepresentations, omissions and to restore the true value and place of Borno history before the imposition of European colonial rule in this area. This study stands above many other works on the history of pre-colonial Borno because of its depth, lucidity, meticulous and systematic analysis. The editorial introduction is authoritative and well written. The contributions are heavily documented, mutually reinforcing and complementary. The book is written in simple and clear English.

The book is highly recommended for students, teachers, researchers in Universities, Colleges of Education and other tertiary institutions, where history, politics, international relations, economics and culture of Africa are taught. The general reader interested in the African past will also find the book very useful.

In the introduction, the editors give the aims and objectives of the book and draw the reader's attention to the wide range of the book's content, shedding light on the various facets of the ten studies comprising the book. It is clearly noted that the complexity of the problems and the methodological approach to these problems in this collection of essays have not only rendered some of these essays controversial, thought-provoking and intellectually stimulating, but also a great challenge to future researchers on the history of Borno and her neighbours.

The editors are quite aware of the shortcomings of the book. This, however, is inevitable in a book of such nature which marks the first stage by stage study of the rich history of Borno.

In accordance with the editors' aim of providing a lucid and authoritative synthesis of the history of pre-colonial Borno, in a chronological order, the first section of the study deals with the pre-history and early history of Borno. It is indeed commendable that two main sources by which historians and other scholars try to piece together the pre-history of any society—archaeology and oral traditions—are employed in this study. The section on pre-history and early history of Borno was contributed by two eminent scholars and teachers, Graham Connah and the late Professor Abdullahi Smith. The latter has not only pioneered the demystification of the historiography of the West-Central Sudan but also brought genuine scholarship to Borno historiography in particular. (See *Tributes to Late Professor Abdullahi Smith on the Occasion of the First Anniversary of his death* organised by the Dept of History, ABU Zaria, 12 June 1985).

The archaeology of Borno is dealt with by no less an authority than Graham Connah, a former Senior Lecturer at the University of Ibadan and ABU, Zaria, who has for several years now carried out archaeological excavations in some parts of Borno, and has published extensively on the pre-history of Borno. The brief article of Connah in this study performs a useful service in recreating the missing links in the information about pre-historic times of Borno. In his contribution, Connah, like all true scholars, gives credit to archaeologists who have carried out some archaeological excavations in former Metropolitan Borno and its environs and works published by them on the subject. Archaeology is generally divided into two major areas (i) prehistory archaeology (connected with cultures that existed before the invention of writing) and (ii) historic archaeology (which studies artifacts left by societies that have also left written records; an area where archaeology and history particularly overlaps). In piecing together the pre-history of Borno, Graham seems to have applied both major archaeological areas. The archaeology of Borno bears testimony to the rich culture and the great technological achievements of the various peoples who occupied the Chad Basin region.

The late Professor Abdullahi Smith, internationally recognised as a leading authority on the history of West-Central Sudan, with special reference to Islam in this region, examines 'The Legend of the Seifuwa: A study in the origins of a tradition of origin'. The legend of the Seifuwa dynasty says that it (the dynasty) descended from the great Arab hero Sayf ibn Dhi Yazan of Himyar who lived in the Yemen of Arabia at the time of the rise of Islam (See also Alhaji Abba Jiddum Gana, *Our History and Origin*, pp. 6-17). The importance of this contribution goes far beyond the study of the pre-history of Borno. His interpretation of the traditions of origin

of the Seifuwa dynasty of Kanem/Borno helps to throw light into the traditions of dynastic origins of many Nigerian peoples, e.g. the Yoruba, Hausa and Bura, all of whom suggest a Middle East origin. Professor Smith looks at the tradition of Islamic scholarship inherited by the Kanuri Ulama; and the historical sources on which history was based including the Holy Qur'an. The late Professor Smith authoritatively discusses the factors that gave rise to these traditions of origin. His arguments are richly supported by documents some of which are given at the end of the article as an appendix. But in the manner of most genius and dedicated teachers, the late Professor Abdullahi Smith made no attempt to dish out ready made answers to all the questions posed by this problem, especially the issue of "how historically correct is the Yemenite origin of the Seifuwa dynasty?" This may probably have been done intentionally, so as not to pre-empt further researches into this problem.

The second section of the book focusses attention on the economy of pre-colonial Borno. Again the editors deserve commendation for this excellent manner of presenting history. It is widely accepted that society cannot exist without producing the material values needed for human existence. In other words, the existence and development of human society is determined by the production of material values. And production pre-supposes the sum total activity of people—a social phenomenon. Therefore, in order to understand the historic and social-economic development of any given society, it is necessary to delve into the economic situation, i.e. the development of the means of production, productive forces, production relations, distribution and consumption pattern of the society. In addition one also needs to focus attention on the various elements of the superstructure. The economic situation plus the superstructure furnished the key to the proper interpretation of the internal structure of society and its relationship with the external environment. And in my view, Dr Muhammed Nur Alkali's contribution 'Economic factors in the history of Borno under the Seifuwa' (Ch. 3) is highly conscious of the above facts. For example, commenting on one of the main reasons (the destruction of the sacred Talisman—*Mura*—by Mai Dunama Dabelemi) given by the Kanem Ulama for the decline and eventual collapse of the Kanem kingdom, Dr Nur Alkali notes that:

A great deal of emphasis has been placed on political or religious factors. No serious attempts have yet been made to consider the economic factor which is mostly being overlooked. But when we begin to ask ourselves certain general questions about the Seifuwa history at various stages certain facts particularly in connection with the economy of the state would emerge. (p. 57).

Contrary to the dominant view found in many earlier works that the main factor behind the Seifuwa long dominance in the Central Sudan was military superiority, Dr Nur Alkali argues that the economic policy of Seifuwa Mais and the general set up of the economic system is more acceptable explanation (pp. 57–61). Dr Nur Alkali, examines, in relative detail, 'the basic factors in the economy of Borno which gave rise to a stable political system' (p. 59). The productive forces, production relations, the mode of distribution and consumption and the general role of the state in these economic processes are discussed.

The other essay in this section, (Ch. iv) 'The revenue system of the government of Borno in the nineteenth century' by Abdulkadir Benisheikh, Provost of the Borno College of Education, Maiduguri an historian, appeared in an earlier publication (Akinjogbin & S. O. Osoba, eds. *Topics in Nigerian economic and social history* (Ile-Ife; Unife Press Limited, 1980, pp. 66-82). That notwithstanding, its appearance in this particular book adds more scholastic touch to the said book, especially in the economic section. Benisheikh's contribution does not only collaborate and complement the preceding essay of Dr Nur Alkali but attempts to show the extent to which the Bornoan peasantry, artisans and other less privileged classes were subjugated and exploited by 'an aristocracy closely patronising an Islamic intelligentsia! (p.v). The author asserts that, 'The government of the Shehus was, at least, supposedly, an Islamic government, and as such, its deals were already laid down by the Sharia' (p. 78). But the extent to which all the extraction and allocation of revenue in Borno, during the reign of the Shehus, strictly conformed with the sanctions of Sharia is one of the key issues dealt with in the essay

In conclusion Benisheikh observes that:

"The government was essentially law and order oriented and thus the subject population benefitted from governmental revenue only in terms of the provision of security. In the day-to-day conduct of affairs, the government incurred little or no expenditure on public welfare" (p. 98).

This essay is of great significance in this book especially in relation to the discussion/debate opened or articulated by Bala Usman over the issue of "Tribute" (See BUR. Ch. x, p. 186).

### Section C—Political and Administrative Organisation

Comprised three contributions by Muhammad Nur Alkali, 'The political system and administrative structure of Borno under Seifuwa Mais (Ch. v); Kyari Tijjani, "Political and constitutional changes in Borno under the Shehu Muhammad al-Amin al-Kanemi: the case of the Majlis (Ch. vi) and Abdulkadir Benisheikh, "The 19th century Galadimas of Borno". (Ch. viii) A very interesting aspect of this section is the chronological arrangement of the contributions. The first author examines the political set up from the establishment of the Seifuwa Mais dynasty in Borno. The second author deals with the subsequent political and constitutional changes under the founder of the successor dynasty, Shehu Muhammad el-Amin el-Kanemi with particular reference to the Majlis (the Council of State). The third author, Benisheikh, looks at the fate of the Galadima institution in 19th century Borno.

The early part of the 19th century Borno's political life was complicated by the existence of a dual power: the Seifuwa Mais and the Kanembu Shehus. The Seifuwa Mais were still clinging to power, while the Kanembu Shehus were de facto rulers of the state. One result of this friction was that many of the ancient titles under the Seifuwas greatly lost their pre-eminence. For instance, the Kaigama title, formerly associated with the leadership of the state army while on military campaign, was dropped by the Shehus and replaced with the title of Kachella, a title previously reserved for a slave who bears arms. A number of the old traditional titles of Borno were gradually dropped in the 19th century.

It is in the light of these that Kyari Tijjani and Abdulkadir Benisheikh attempt to examine the evolution of two very important institutions, Majlis and Galadima, respectively at the beginning and during the 19th century.

Interestingly enough, 19th century Borno is relatively well documented. We have rich first-hand accounts of the period by such people as Denham and Clapperton in the 1820s, Henry Barth in the 1850s and Nachtigal in the 1880s, in addition to what we have from the indigenous intellectual sources and oral traditions.

**Section D: External Relations and Diplomacy** comprises three contributions. The external relations and the influence of Borno extended far and wide. Diplomatic relations of Kanem-Borno with the Muslim world goes as far back as the eleventh century. And after the collapse of the Songhai empire in 1591, Borno emerged as the most powerful state in West-Central Sudan. It is the extent and implications of Borno's external relations and diplomacy that are discussed in the works of Muhammad Al-Hajj, "Some diplomatic correspondence of the Seifuwa Mais of Borno with Egypt, Turkey and Morocco" (Ch. viii); Yusufu Bala Usman, "A reconsideration of the history of relations between Borno and Hausaland before 1804" (Ch. ix); and Sa'ad Abubakar, "Relations between Borno and Fombina before 1900" (Ch. x).

The greatest asset of the late Professor Muhammad Al-Hajj's essay, in my view, lies not in the translation or the interpretation or the analysis of available documents on the diplomatic exchanges, but in the fact that he was able to retrieve these documents from far away countries and to make them accessible to both the Arabic and non-Arabic speakers and readers and for posterity. The correspondences are provided at the end of the essay in a form of an appendix.

Dr Yusufu Bala Usman, in his contribution, 'A reconsideration of the history of relations between Borno and Hausaland before 1804 A.D. opens a very serious and challenging discussion on the relations between the peoples and governments of Borno and Hausaland before Uthman Dan Fodio's jihad. Yusufu Bala Usman does not buy the dominant or widespread view propounded in the works of such people like Henrich Barth (1890); Richmond Palmer (1928 and 1936) and Yves Urvoy (1947) in which Borno's relation with her Hausa states neighbours as being based mostly on warfare and imperial domination. Bala Usman does not think, at least from sources at his disposal, that the Hausa states, collectively or individually, were vassals of Borno. "When we examine the records of the military encounters involving Borno directly with the Hausa states, there is no conclusive evidence that any of these states was conquered by Borno or maintained as a vassal through the exercise of military force or the threat of it", he argues (p. 179).

And after critically examining some military conflicts which involved Borno and Hausa states, directly or indirectly, Bala Usman concludes that:

"There is, it seems, no conclusive evidence in the sources available now, of a Bornoan conquest of any of the larger Hausa states. There are records of a few military encounters which seem to have arisen over specific issues between Borno and the Hausa state involved. But these cannot be lifted together to form the picture of Bornoan imperial expansion that we get in most of the published works". (p. 186).

On the issue of the payment of 'tribute' by some Hausa States to Borno mentioned in some published works, Bala Usman argues that: "It does not seem however as if the thing sent to Borno was "tribute in the sense of "a tax or impost paid by one prince or state to another in acknowledgement of submission or as the price of peace, security and protection" (p. 188).

According to him, the basis of Bornoan influence in the Hausa states lies mainly in the areas of commerce, cultural and educational exchanges. And these exchanges are discussed in the essay. Bala Usman's contribution is a masterful work of meticulous scholarship. The debate he has opened or articulated cannot be overlooked by those people willing to weigh the evidence and take up the challenge.

Professor Sa'ad Abubakar in his contribution examines the extent of Borno influence on her southern neighbours. He throws some light on the peopling of the area south of Borno at various periods. On discussing the southward migration of various people from the Chad Basin, he wrote:

"Certainly, it cannot be denied that there had been large-scale movements of population into the Benue basin from the north. The two basins, the Chad and the Benue, were separated not by 'an iron curtain' but by a watershed from which rivers flow northwards' into the Lake Chad and southwards into the Benue River' (p. 212).

On the early political relations between Borno (the Kanuri) and her southern neighbours, Professor Sa'ad Abubakar contends that:

'The hegemony of the Kanuri in the south had never extended beyond the confines of the Chad basin. The Seifuwa Mais probably exercised authority over the northern Margi group, but the vast majority of the peoples and chieftaincies in the south had never been under any external control. At best, the region was regarded by the Mais as one where they were free to undertake military expeditions for the purpose of acquiring slaves. However, relations between the Kanuri (Borno D.K.) and their southern neighbours were not always characterised by conflicts' (p. 214).

Professor Sa'ad discusses the political, economic and cultural relations between Borno ('the Kanuri') and her southern neighbours before and during the 19th century. The impact of the Fellata problem and the early 19th century jihad movement itself in Borno and the Rabe Factor in the relations between Borno and Fombina get a considerable attention.

In spite of the hostility that existed for a long time between the ruling elites of Borno and the emirate of Fombina, Professor Sa'ad Abubakar acknowledges the cultural, and to a great extent the political, influence of the former (Borno) on the latter (Fombina). He notes *inter alia* that:

"The majority of the Fulbe who had established their hegemony in Fombina were immigrants from Borno and some clans, such as the Ngara'en, had been strongly influenced by the Kanuri...Kanuri influence also expressed itself through Islamic scholarship and a number of Fulbe had received their education in Gazargamo, including those that had been in Fombina before the 19th

century. The leader of the jihad in Fombina, Modibbo Adama, was educated in the Birni Gazargamo and so were the other Modibbe in Fombina at the time of the jihad" (p. 228).

Professor Sa'ad Abubakar gives great prominence to the economic factor in the relations between Borno and Fombina before 1901. He contends that:

"Commercial relations had existed between Borno and Fombina long before the foundation of the emirate (Fombina—D.K.).....

Certainly, the establishment of a single authority over heterogenous ethnic groups who were hitherto independent, and in conflict with one another, was a big stimulus to trade. Prior to the conquest by the Fulbe, the hostility of the Fombina autochthons to the peoples in the north, who had been raiding them for slaving purposes greatly limited the development of trade" (pp. 230-231).

Professor Sa'ad Abubakar's contribution is not only geared towards stimulating discussions on the history of the relations between Borno and her southern neighbours comprising of various ethnic groups/nationalities but also to try to unite the knotty points of these relation for contemporary researches.

While it is generally accepted that each generation must rewrite its own history, no serious work on Borno, for a long time to come, will properly be able to ignore the analyses the contributors to this study have provided.

Admittedly the book does not claim, as the contributors themselves admit, to be a complete collection of all the research material or of the information and points of view presently available on the history of pre-colonial Borno. That would have called for a more detailed record and a much larger volume or volumes and much longer period than it was practicable.

One of the major strengths of this book lies in its readiness to show the divergencies of opinion where they exist and to point out relevant areas that suffered neglect in the various contributions. In this way the book has prepared the ground for future researches

The book, however, has few minor weaknesses. The work is a victim of typographical oversights. For example on page 73, line 6, the reference No. 55 should possibly not be there for there is no reference No. 55 at the end of the essay.

On page 78, line 3, 'Sndanese' is given for Sudanese; on page 101, line 1, 'kidgom' is given for *kingdom*; on page 108, line 11, 'place (Mainari)' should possibly read *palace (Mainari)*. On page 110, line 5 from the bottom, "he and" *should* be deleted.

On page 124 the reference Nos 20 to 35 are given after reference Nos 36 to 52. On page 132, line 18, 'seperation' is written for *separation*.

On page 137, line 7, from the bottom, 'tenetative' is given for *tentative*. The spelling of one of the professional jurists brought into the Council of State during the Shehus, Mainin-Kinandi, is given as 'Mainin-Kinendi' on p.138, line 9. On page 142, line 11, 'subjogated' is given for *subjugated*. On page 152, line 20, 'at Kanemi' is written for *el-Kanemi*. On page 162 line 12, from the bottom, 'sfrom' should read *from*. On page 182, line 10, 'Scholas' is written for *Scholars*. On page 193, line 11 from the bottom, 'as Abu Bakr. . . "should read of *Abu Bakr*. On page 208, reference No. 98 the page is omitted. On page 211, line 11, 'the jihad the Borno' should read the *Jihad in Borno*.

On page 216, line 11, 'infiltrating' is written for *infiltrating*. On page 223, line 11 'was' should be deleted. On page 229, line 4, 'Filbe' is given for Fulbe.

These minor mistakes, however, do not in anyway reduce the general merits of this study. In conclusion, this reviewer will like to make the following suggestions. The book should be revised, enlarged and reprinted at the earliest possible time. New relevant materials, especially the historical experiences of the numerous ethnic groups in and around the former metropolitan Borno, the intellectual history, the class experiences of the Borno peasantry and artisans, cultural developments (art, music, dancing, etc.), architecture and so forth in the pre-colonial era should be incorporated.

A comprehensive bibliography on pre-colonial Borno and an index should be provided. More Maps, diagrams or sketches should be included.

Attempts should be made to transfer the copyright to either the publishers or the editors. As things stand now, the copyright is owned by individual contributors to the book. And unfortunately, two of the contributors, Professors Muhammad Al-Haji and Abdullahi Smith passed away in 1983 and 1984 respectively.

The editors and contributors should think of bringing out a school edition. Last but by no means the least, the editors, contributors to the book under review, scholars, and all those interested in the study of Borno, should think of continuing the work already begun. Works on Borno during and after the colonial era should be collected and published.

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ADVENTICES TROPICALES (FRENCH)  
(TROPICAL WEEDS)

by

H. Merlier and J. Montagut

Orstom - Gerdats - Ensh, 1982, 490 pp.

Writing monographs on any aspect of a particular order, family, genus or a species of animals or plants has been the usual practice in the scientific world of biology. Clearly deviating from this norm, the authors took a different but appealing course in choosing West Africa as their study ground and tropical weeds, which are indeed a menace to farmers and of great concern in today's world of agriculture, as the relevant and attractive material for the present manual of *Adventices Tropicales* written in French. It has been published at the appropriate time to fill a gap in a comprehensive knowledge of weeds of tropical Africa. With 490 pages, the book describes 120 species of common weeds belonging to both monocotyledons and dicotyledons. The colour photographs and their layout along with the line drawings are so splendid, even a layman would find it easy to use them as keys to identify any weed listed in the book.

The aim of this manual is to enlighten the native farmer, the student and the researcher in agriculture about the common weeds that grow in the region, stretching from the shores of Senegal in West Africa to the Sahelian environment around the Lake Chad basing with climatic variations ranging from wet humid to the semi arid zone of Borno.

For any weed to be controlled it first has to be identified. For this purpose, though there exists "*The Flora of West Africa*" which describes the general flora of West Africa, it is accessible and understandable largely to the specialists in the field of plant taxonomy. Furthermore, it does not offer any proper key to identify any given plant or adequate elements of description that would help the layman to determine the indigenous name as well as the scientific name of the species, without possible confusion. The present manual with its clear-cut keys, definitions and lucid descriptions of various morphological aspects, aided by neatly drawn illustrations with appropriate captions is certain to adequately fill that gap.

While weeds are a major problem for the hand cultivator, particularly during the rains, mechanisation can bring its own problems and can even enhance weed growth. The authors explain that chemical methods of weed control have proved to be more effective than mechanical methods. However, identification of the weed in question is the essential pre-requisite to applying the right herbicide. It is for this reason also the book, which describes several noxious weeds such as *Cyperus difformis* (Cyperaceae), *C. esculentus* (Cyperaceae), *C. rotundus* (Cyperaceae), *Echinochloa colona* (Graminae), *Euphorbia hirta* (Euphorbiaceae), *Fimbristylis littoralis* (Cyperaceae), *Ipomoea* sps. (Convolvulaceae), and *Tridax procumbens* (Compositae) to name only a few that

grow in the rice fields or lakes or irrigational canals in the semi arid zones of Bauchi, Borno and Gongola where these weeds constitute a major problem in agriculture, may prove to be a valuable guide to the professional in this field and an ordinary farmer.

Though the book was mainly written for West Africa, it is sure to be found useful for the whole of tropical Africa, since the majority of the weeds described in this book are found not only in Africa but also in many parts of the tropical world. The present French version of the manual with its practical approach to common problems of weeds may find wider audience if the book is translated into English, and I strongly recommend this should be done early. In any case, the book is a good addition to anybody's library, particularly the farmer's the student's, and the researcher's in agriculture.

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## 'SAHARA AND SUDAN'

by

Gustav Nachtigal

Being a translation of '*Sahara und Sudan*' by A.G.S. Fisher and N. J. Fisher.  
Published in four volumes by C. Hurst, London, 1974-1984.

It gives me great pleasure to review Volume I: 'Fezzan and Tibesti' and Volume IV: 'Wadai and Darfur' in the excellent translation produced by the Fishers, father and son; a translation whose fidelity both to the text and to the spirit of the original is vouched for by a scholarly and bilingual German colleague. They are of particular interest to me since I have travelled extensively both in the Fezzan and in Darfur, though at a later date and in considerably greater comfort.

He arrives in North Africa as a young doctor, since at that time, a dry climate was thought to benefit his lung ailment, fits smoothly into the polyglot life of the North African port of Tripoli, and is there persuaded by the former African explorer Gerhard Rohlfs to take charge of a consignment of presents from Wilhelm, King of Prussia, to Shaykh Omar, the Sultan of Borno who had befriended several German travellers in the past. So a diffident young man of 35, deeply conscious of his deficiencies, he sets off eagerly into the heart of Africa. At this stage of the journey he is attended as to all the best boys' stories of the period, by a faithful old guide and companion, Muhammad el-Gatruni who we first meet stuffing a camel saddle. And true to form, we have the comic relief in the shape of his valiant Italian pastry cook, Guiseppe Valpreda.

After a merry picnic party with waltzes and polkas and graced 'so far as their social dissensions permitted' by 'the educated representatives of the European colony' he sets off in 1869 on the well worn trail to Murzuk in the south of the great strings of oases which from the Fezzan of Southern Libya. This was the gateway to the great African empires south of the Sahara, and in particular, to the ancient kingdom of Borno, based on Lake Chad. He found the provincial capital in decay. The trans-Saharan slave trade whose grisly traces Nachtigal was to meet on his journeys across the desert, had been recently suppressed by order of the Sublime Porte (for Libya was then part of the Turkish Empire) and the role of Murzuk as a great entrepot for trade was in consequence sadly diminished. Small wonder that the Governor, stranded in his 'palace' without ceilings or floors, deprived of his main source of customs duties, far from the intellectual companionship and gustatory delights of Istanbul, and stuck in a land 'where wheat is a food for kings and butter as difficult to find as as is the philosopher's stone', like many a colonial administrator since his day, took to drink.

In contrast, the indefatigable Nachtigal records enormous amount of information concerning the history, geography climate (of which he made systematic readings), natural history, agriculture, and the manners, languages (not recorded in this edition)

and modes of the local people including in conference with his fellow medical practitioners (mostly old women) of the current medical practise in the Fezzan, the use of local herbs, of cupping, of the use of the cautery, and of live fowls, and of the convenient belief in a community of long distance travellers that an embryo may lie dormant in its mother's womb for months or even years before quickening into life. Not content with this, he takes the opportunity of a delay in his programme due to a more than usually severe outbreak of banditry on the road south, to visit the Tibesti Mountains, then unknown to Europeans. I understand his motives. For forty years I have circled the Tibesti Mountains. It has become the 'Ultima Thule' of my ambitions, but always the omens were unpropitious, and now that it is Gaddhafi's forward base for Chad, it seems further away than ever. But Nachtigal, despite the direst warnings, made it there and back.

He had a terrible time. Both on the way out and on the way back, he and his companions found water only when they were at their last gasp. The local guides were mainly interested in extorting every scrap of profit, the local inhabitants looked him over with a view to easy pickings, dropping such cheerful hints as 'Great possessions slay their master'. In the end he has to escape by night in company of a noble who told him he had nothing to fear as he had slain his man and so was not to be trifled with. They make the last stage of their journey on foot, their overloaded camels having collapsed since their main transport had been arranged by a widow who withdrew when Nachtigal refused to hand over his well hung Italian cook to seal the bargain. The cook whose feet had given out completed the journey in gumboots and a short shirt. Even the faithful Musa was at last driven to burst out 'Have I not told you before how it would be. Oh, these Christians who full of obstinacy, have much knowledge but no understanding! You can choose now whether you will be killed, or die of starvation'. But despite all this, Nachtigal continued to make his observations and to record the topography and climate of the Tibesti mountains and the manners and mores of the Tubu who were causing him so much distress. To this was added the tragic news of the death of his friend Miss Tinné at the hands of the Tuaregs, she having set out from Murzuk at the same time, but westwards instead of south east.

So I leave him once more in the Fezzan to the threshold of his journey to Borno. He liked the amiable Fezzanis and summed up the difference between them and the Tubu of the Tibesti Mountains in these words: 'Dealings with the Arabs are often unpleasant because of their double dealing and lack of frankness, but the transaction of business with the Tubu Reshade is nothing short of uncanny; with the Arabs, a certain sense of propriety, often a lofty generosity is always breaking through, but with the Tubu Reshade I invariably found the opposite. Even so, he leans over backwards to find excuses and good points in them and remarks that the ladies, though a little lean and sharp featured for his teutonic taste, had the reputation of making excellent and faithful wives. Indeed, throughout this account, he shows himself to be a scholar and a gentleman, and one who I would have dearly liked to number among my friends.

I pick up the story again in Volume IV. His mission accomplished for his overlord Wilhelm, now German Emperor, he is on the point of travelling eastwards from the Kingdom of Borno towards the Nile and Europe. It is like meeting an old friend again after a long absence. The indefatigable scholar is still there, absorbing every kind of

knowledge, but it is an older, more mature Nachtigal. His companions of the Fezzan have returned to their homes and he is on his own. His portrait which forms the frontispiece of this volume shows a self-reliant man, equal to anything the journey may bring forth. Nothing was quite so continuously hair raising as his journey to the Tibesti Mountains. His dangers stem from the whims and fears of local princes, kings and governors. He goes armed with letters from each potentate to the next, commending him for protection and giving veiled hints of what might happen if this is not forthcoming. So he approaches the court of King Ali of Wadai on the next stage of his journey with cautious confidence, since that monarch had the reputation of being a just and upright sovereign who on his succession to the throne of what is now Chad, had blinded only three of his least trustworthy brothers. Indeed Nachtigal even has the temerity to enquire about the journals of his predecessor, Eduard Vogel (who had been clubbed to death by the 'police' of the previous king) and gets away with it.

Little by little he wins the confidence of the local people, as much through his character as through his skill in the practice of medicine; and in the end they are agreeably surprised that this Christian at least is quite likeable. He even gets permission to detour south into Dar Runga where on the way he meets a 'real Semitic beauty' who cordially invites him to enjoy the comfort of her mosquito proof room on the way back. Alas history is silent on this point though he must have passed very close on the return journey.

His capacity for making friends stands him in good stead. On the latter part of his journey to the Kingdom of Darfur in the Western Sudan, he accompanies Hajj Ahmed Tangatanga, a merchant from the Nile, who travels in some state complete with Egyptian story teller to while away the evenings. This same Hajj Ahmed protects him from the suspicious governor of the Western Province who advises his king to have Nachtigal quietly done away with as a possible Turkish spy. However King Ibrahim decides to honour the rules of hospitality, the more so since the Egyptians who were pressing on his eastern border sent a letter commending Nachtigal to his care.

At last he reaches El Obeid, the capital of Kordofan now swallowed up by the steadily expanding Egyptian Empire, and is welcomed with hospitality that includes 'knives, spoons and forks' and even a military band playing 'Heil Dir im Siegerkranz' in his honour. The wheel has come full circle. He has returned to civilization, so here he ends his chronicle.

If in this review I have encouraged the reader to pursue these volumes on his own account, I shall have achieved my purpose. I am sure that the company of this entertaining scholar and gentleman will give him the same pleasure.

W. S. RICHARDS



CHIMAH EZEOMAH, *The Education of Nomadic People: The Fulani of Northern Nigeria*. N. Humberstone and Stoke-on-Trent, UK: Nafferton-Deanhoude Publishers, 1983, 142 pp.

Ezeomah's work is a serious and well-researched attempt to document and reconcile a menacing but often neglected problem in Nigeria's development—that of educating the nomadic Fulani (*bororo'en*). The study also strives to provide a comprehensive overview of *bororo'en* education—traditionally and in its western form, the latter of which has been at a bare minimum. Without a doubt Ezeomah shows an expertise in this area, developed over the course of several years of research in the Jos/Kaduna area.

By far, the greatest contribution of the monograph is the illumination of the severity of the problem of providing education to the *bororo'en* and the numerous obstacles that must be overcome in order to accomplish this end. What is most outstanding to the reader, though insufficiently emphasized by the author, is the lack of interest and support of Federal and State governments and secondly to this objective, the outright lack of feasibility and resultant failure of the few nomadic education programs that were attempted.

Briefly, we summarize the nature of such aborted or unsuccessful programs as reported by the author. Education programs designed exclusively for or inclusive of *bororo'en* were initiated by several local governments in Bauchi and Kano States. Radio broadcasts were also made to *bororo'en* in Jos regarding animal husbandry and the value of education. After some initial enthusiasm towards the *bororo'en* education efforts in Bauchi and Kano States, children were withdrawn from the schools by their parents. The few who did attend school only did so during the rainy season when they were free from treks with their herds. Attempts to fine parents for their children's poor attendance were met with hostility and even migration. Thus Ezeomah rightly concludes that such nil or poor attendance was due to the failure of the programs (which emphasized sedentism) to cope with the lifestyle (nomadic or semi-nomadic) of the *bororo'en*. Education programs, he says, must accommodate to the needs and lifestyle of the nomads. Likewise, radio broadcasts were an ineffective means of assessing these needs, or reaching the target population.

The bulk of Ezeomah's discussion and proposal on nomadic education hinges upon one apparent finding in his research: that *bororo* parents see the benefits of western education and want their children to attend school—provided amenable circumstances. This view is based upon results of questionnaires, the nature of which—e.g. subject matter, locale and extent of distribution, and underlying methodology—is nowhere specified. Any scholar, particularly those versed in the ways of the Fulani, would know that to a stranger, a Fullo might answer such questions favourably, but also that in real-life situations and after a few years of suffering without his children's herding assistance, the informant might not remain true to his initial favourable response. Even the author himself noted (though only in one instance) that elders

(whom Ezeomah does not mention as representing the peoples' interest) showed extreme suspicion towards education. Underemphasized is the fact that nomadic Fulani culture hinges largely upon cattle ownership and herdsmanhip (see my article this volume) and that this may forestall any serious long-term strains on the Fulani system of herding. We repeat, the data as presented by the author are inconclusive as to whether *bororo'en* are in practice supportive or suspicious of western education. Historically, we know that for sedentary Fulbe from other areas of northern Nigeria, the latter was the case up to recently.

Questionnaires with known-to-be-suspicious and aloof Fulani pastoralists are no substitute for in-depth and long term research among the *bororo'en*, and the reviewer, as an anthropologist queries as to what extent the author actually participated in and understood *bororo'en* culture or Fulfulde. A good deal of ethnographic information presented in the monograph, particularly that on an *bororo'en* identity and socialization is merely drawn directly from the ethnographies of Stenning (1959) and Hopen (1958), whose research was conducted over 30 years ago. Such aspects of Fulbe society must also be considered in light of contemporary Nigerian society. Furthermore, this lengthy discussion on socialization (children's learning orientation) is irrelevant to the author's major conclusion that it is the Fulani parents who must decide the educational fate of the children. More appropriate would have been a synopsis of Fulani kinship relations and the concurrent system of respect (*semteende*), as well as seasonal variability in kin group composition. Apparently, such a system could be extended to the formal educational domain, though this is only a minor and perhaps unnecessary point in the monograph. Furthermore, such a system is not unique to the Fulbe.

After pointing out the failure of previous programs but the apparent willingness and susceptibility of the *bororo'en* to western education, the author attempts to provide his own alternative educational scheme. Such a program provides some remedies to problems experienced in earlier programs—particularly the need to seek parental input into the programs. Hence, nomadic schools moving with the pastoralists, staffed by educated *bororo'en* themselves is the apparent solution. A broad curriculum, among which animal husbandry is only one component (the others are language arts, maths, home economics, civics, science, physical and health education) is also proposed. This, however, raises further questions. How will such "schools" or staff keep up with the highly mobile and fluid *bororo'en* social groups? How will the indigenous staff be trained/obtained in the first place, especially since so few have been educated thus far? (We note that Fulbe who do receive education often choose urban career alternatives). Lastly, how will the actual interests of the parents be determined and would they see value in the author's proposed curriculum?

Ezeomah does point out that such is actually a long term objective which must be preceded by further research into the values of the *bororo'en*, and it is with this that we concur. Before any further programs are haphazardly designed, more intensive research must be undertaken among the *bororo'en* with these educational objectives in mind. The classic and overly-relied upon studies on the Fulani (Hopen 1958; Stenning 1959) are in grave need of updating. Secondly, appeals must be made to Federal and State governments to assist in the design and implementation of more general, wide-scale development programs for the nomads. Particularistic schemes,t

including the one proposed by Ezeomah, appear to lack the impetus and support for their successful operationalization. Such larger-scale development programs would be oriented not only towards the education of the *bororo'en*, but also to improving their general standard of living or awareness of alternative life styles. For instance, land has been provided for the sedentarization of *bororo'en* on the Mambilla Plateau of Gongola State, thus facilitating the education of the former nomads who have still preserved a good deal of their traditional culture.

Dr Ezeomah's work, however, is a step towards fostering an awareness of the *bororo'en* dilemma and the need for large-scale involvement and assistance of State and Federal governments, or perhaps other outside development agencies in the cause of the *bororo'en*.

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This is a bibliography of the final year essays submitted by the students of the University of Maiduguri in partial fulfilment of the requirements for the award of Bachelors Degree. The value of these essays is in the information they provide in subjects of local interest, both historical and contemporary.

The bibliography is in two parts:

1. By Department
2. Subject Index

The Departmental list is arranged alphabetically by authors.

Each essay bears a notation identifying the Department, the year the essay was submitted and a serial number. This makes for easy and accurate identification. For example:

ACC — Accountancy Department  
81 — Year of submission of essay  
001 — Serial number of the essay.

The subject index provides two approaches to the Departmental list:

1. Geographical—where major and minor geographical areas are identified and the essays appropriately grouped.
2. Subject—a collocation is provided so that the smaller subjects within a major discipline come together. Thus for example under the broader discipline of Education come the smaller and related subjects like adult, Christian, college, curriculum, Islamic, primary, secondary, teacher. The essays are arranged as far as possible within the most appropriate subject area.

The essays are available for consultation in the University Library, or in the Department concerned.

## KEY TO THE DEPARTMENT CODE LETTERS AND ARRANGEMENT

<i>CODE LETTERS</i>	<i>DEPARTMENT</i>
1. ACC	ACCOUNTANCY
2. IS	ARABIC & ISLAMIC STUDIES
3. BIO	BIOCHEMISTRY
4. BOT-ZOO	BIOLOGICAL SCIENCES
5. BUS	BUSINESS STUDIES
6. CHE	CHEMISTRY
7. ECON	ECONOMICS
8. EDUC	EDUCATION
9. ENG	ENGLISH
10. GEO	GEOGRAPHY
11. GEY	GEOLOGY
12. HIS	HISTORY
13. LL	LANGUAGES & LINGUISTICS
14. LW	LAW
15. LS	LIBRARY STUDIES
16. MATH	MATHEMATICS & STATISTICS
17. PHE	PHYSICAL & HEALTH EDUCATION
18. PHY	PHYSICS
19. PLS	POLITICAL & ADMINSTRATIVE STUDIES
20. SHA	SHARIA
21. SOC	SOCIOLOGY & ANTHROPOLOGY

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*Department of Languages & Linguistics*

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## QUALITY/STRESS IN NIGERIAN EDUCATION

by

JIBRIL M. AMINU



M.B., B.S., Ph.D. (London), FRCP. (London). FMCP. (Nig.), FWACP.

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CMBB 13/7/86

\*cf. the *Tenth Anniversary Calendar*, published by the University this year (1986) to record its development.

\*\*all honorary doctors of the University of Maiduguri.

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