AN ARCHAEOLOGICAL STUDY OF ANCIENT IRON WORKING SITES IN MAHURUM, BOKKOS L.G.A, PLATEAU STATE, NIGERIA

BY

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M.A/ARTS/4682/2010-2011

BEING A THESIS SUBMITTED TO POST GRADUATE SCHOOL, AHMADU BELLO UNIVERSITY, ZARIA IN PARTIAL FULFILEMENT OF THE REQUIREMENT FOR THE AWARD OF M.A DEGREE IN ARCHAEOLOGY

March, 2014

DECLARATION

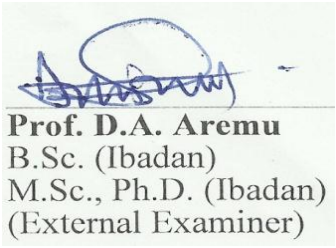
I hereby declare that this thesis is the outcome of my research and was completely written by me. The thesis has neither wholly nor partially been presented for the award of a higher degree in any other university. All sources of information regarding this research have been duly acknowledged.

_____ _____

Signature Date

CERTIFICATION

This thesis titled " An Archaeological study of Ancient Iron working Sites in Mahurum, Bokkos Local Government Area ,Plateau state Nigeria" written by Maram Mafulul Mahurum has been thoroughly read and approved for meeting the standard and requirement for the award of Master of Arts (M.A) Degree in Archaeology, by the Department of Archaeology, Ahmadu Bello University, Zaria, Nigeria.



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DEDICATION

I dedicate this work to my late paternal grandmother Umuanat Mangut Maram whom I received so much from but gave nothing in return.

ACKNOWLEDGEMENT

The outcome of an intellectual work of this nature cannot be credited to the sole effort and sacrifice of the author alone. So I wish to sincerely express my deepest gratitude to other authors whose work directly or indirectly gave relevant impetus to this thesis. I wish to acknowledge CODESRIA for awarding me the Small Grant for Thesis Writing which I used in carrying out this research. I also wish to thank my supervisors in the persons of Dr K.T Odofin who with much patience and humble mien took his time to supervise this thesis. Without his advice, mentoring and cohesive supervision, it would have been impossible to put this research together. To Dr Mrs B.N Mangut my second supervisor, I wish to thank her for making very decisive contribution to this work from the beginning of the research till the end. I am also grateful to her for allowing me unrestricted access to her book collection.

My heartfelt gratitude goes to Dr Zacharys Anger Gundu who from the onset of my research gave me his attention on several issues. I cannot also forget his candid advice and the books he gave me throughout my study period. I want to also thank Dr M. K Aliyu who has always given me his attention when needed. Special thanks goes to Dr Joseph Mangut for all the encouragement and the opportunities he granted me to take part in the field work he organized at Digot- Manau and also for inviting me to Ibrahim Badamasi Babangidas' Archaeology Departments Field School. Thus, what I learnt from his tutoring cannot be described in words hence I will ever be grateful. My sincere appreciation also goes to Professor Joseph Jemkur of Department of Archaeology, University of Jos who lent me some of his books for a considerable length of time and also to Professor Peter Schmidt of the Department of Anthropology, University of Florida who equally sent me some of his articles on iron smelting in addition to the articles of Hamo Sassoon on grinding grooves and pits.

My appreciation also goes to Dr Clement Bakinde for encouraging me throughout the period of research and also for allowing me access to his library. I want to also thank Dr Jonathan N. Ndera, who also contributed immensely to this research

Among some of the people I am grateful to are Mr Augustus Nansok Danburi who has been not only my lecturer but a great brother and mentor. His humility has thought me many things. I am also highly indebted to Dr Sule Abubakar who has been a strong force in my guest for archaeological knowledge and for his assistance in several ways including inviting me for a field work in Kirfi Local Government Area of Bauchi State. I am also indebted to other lecturers in the persons of Mrs Abigail Idoko, Mallama Ruhaimat Lawal, Mallama Asmaú Giade, Rabiyu Yusuf, Mallam Isa, Richard Chia and Aliyu Adamu.

To my colleagues namely, Victoria Bello, Mngusuun Du-Sai, Aisha Zubairu, Sadiq Adeiza, Otobong Akpan, Jude Aribido, Mrs Jemimah Marcus, Maryam Tani Aliyu, and Agnes Okah, I am grateful to all of them for their affable postures throughout our programme. At the beginning of our M.A programme, time had seemed endless but it is obvious everything in life is transient. I am going to miss all of you and also the 'Class seminars' which used to be heated but quite brain- storming.

It would have been practically impossible for me to embark on the M.A programme without the prayers and financial assistance of my siblings namely; Mangut Maram, Mrs Rebecca Gimba, Maren Maram, Sundung Maram, Umbule Waziri, Joe Maram, Malan Maram, Sundung Maram and my 'only mother in the world' Mrs Saraya Maram. I owe all of you so much. My cousin Haruna Samson Mashat, whose assistance to me has always been sky-high, will always be remembered. I want to also thank my friends in History Department namely Chongo Dese, Joseph Gajere a.k.a McFish and Sule Purdue a.k.a Sohon Zomo. I also wish to

thank Bodisa Zidon, Amos Matoh, Aaron Adams, Isaac Bopai, Agog Nathan for been very wonderful friends. To everyone who has assisted me in one way or the other and yet your names are not mentioned, I am eternally indebted to you and may God will bless all of you.

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ABSTRACT

This research was undertaken with the purpose of studying evidence of ancient iron Smelting technology in Mahurum area. In the research, cultural ecology which emphasises on the role of ecology in influencing the culture of a society was adopted as the theoretical framework. Methods adopted for the research were oral tradition, archaeological survey, consultation of written materials and classification and analysis. In the research, oral tradition reveals information on the material and non-material evidence of iron working in the Mahurum area and the processes that were involved. Also information on the settlement history of the Ahurum was collected. Consultation of written materials provided a background on the historiography of iron smelting in Nigeria which impacted on the work. Archaeological survey on the other hand, reveals vestiges of iron smelting among others which were duly studied and mapped and classification and analysis was carried out on the basic components of the finds and features studied. The finding of the research includes furnace remains, slag from smelting and refining of bloom, rock hollows, house and granary foundations, monolith, stone embankment, grinding stones and other finds and features. The result of the research shows the uniqueness of iron smelting tradition of Mahurum because iron was smelted in non-slag tapping shaft furnaces and as a result, the bloom obtained was refined which resulted in creation of rock hollows. The research also shows how the knowledge from oral tradition has helped in bringing to fore tangible and intangible evidence of ancient iron smelting tradition of Mahurum. In addition, the research reveals how the Ahurum interacted with their natural environment by smelting iron which was the main stay of their economy.

CHAPTER ONE: BACKGROUND TO THE RESEARCH

1.0 Introduction

This research was informed by the numerous and varied evidence of ancient iron smelting in Mahurum of Bokkos Local Government Area of Plateau State Nigeria. The evidence suggests that the area was a hub for iron smelting (Mangut 1986, 2006). Some of the evidence was discovered during this researchers undergraduate field work in 2008. Therefore, the earlier discoveries of evidence of ancient iron smelting was what led to the re-investigation of the area and the details of the findings is what is presented in this thesis.

1.1 Statement of Research Problem

Based on earlier reports of evidence of ancient iron smelting in the Mahurum area by Mangut (1986) and Maram (2008), it became very imperative for the evidence to be archaeologically investigated. Also, an aspect of the evidence of iron working in the Mahurum area was said to have involved refining of bloom which created rock hollows identified in association with slag heaps. This aspect of the archaeology of the area was not documented in the earlier investigations. Furthermore, history of the Ahurum along with most people of Manguna district was studied under the context of the larger Ron tribe by colonial historians like Meek,(1925; Temple,1922; Ames 1934) who did not pay adequate attention to the significant differences found amongst some of the Ron groups. Therefore, this research is poised towards the study of the material and non- material evidence of ancient iron smelting in the Mahurum area, rock hollows that were said to be associated with bloom refining and settlement history of the Ahurum.

1.2 Significance of Research

This research is significant because it reveals diverse data on ancient iron smelting technology in Mahurum ranging from furnace remains, slag from smelting and refining in addition to detailed oral history on processes of iron smelting and rock hollows. The research also brought to fore the complex history of the ancient Ahurum, various intangible aspects of their culture and the material evidence of ancient abandoned settlements ruins where they are said to have lived.

1.3 Literature review on iron smelting on the Jos Plateau and other Areas in Nigeria

The earliest recorded attention on the Jos Plateau as an iron smelting area was in 1902 when Col. Laws as part of British Colonial economic drive discovered large tin deposits in the Naraguta area of Jos (Pidan 2010). Sassoon (1962) during his study of grinding grooves on the Jos plateau explicitly mentioned some of the grooves as products of refining of bloom after smelting. He had the opportunity of taking the pictures of people in the act of refining bloom. Sassoon's discovery was later reiterated by Shaw (1978). More so, picture of iron smelting scene was earlier taken in 1911 showing naked men in the act of smelting iron around Dilimi River (Williams, 1911). The picture was only discovered on Lord Lugards Desk in May 1968. Though it cannot be established whether this picture was taken as a hobby, for the picture to have been found on Lord Lugard's desk means that smelting in the Jos Plateau area might have aroused the Governor General's interest. The picture, in essence gives credence to the fact that iron smelting was widely practiced in the Jos Plateau area.

In recent times, studies of iron smelting on the Plateau area have been undertaken by Daze (1981) and Longkat (2007) in Pankshing Local Government Area, about 60 kilometres to the east of Mahurum. Jemkur (1990) on the other hand studied iron smelting in Berom land an area about 50 kilometres to north of Mahurum. Jemkur's research points to the fact that most of the

furnaces in Berom land were sited close to streams which is in line with findings in the Nok area (Jemkur 1989). Jemkur also suggested that the Berom might have obtained the idea of iron working from the Nok area situated in close proximity directly south-west of Berom land (Jemkur 1990)

While Daze researched on iron smelting in Lankan District in present Pankshing Local Government Area, Longkat's focus was on iron smelting in Ngas land which comprises both Pankshing and Kanke with special focus on Kor. These researches have brought to light evidence of iron smelting using shaft furnaces which are cylindrical free standing mud structures and other residues, including socio-religious issues associated with smelting and their economic appendages. Incidentally, the *Ron* of Bokkos Local Government Area are said to have migrated from Mupun, which is in Lankan the area where Daze carried out his research. But previous studies have shown that the migrants from Mupun into the Bokkos area did not know how to smelt iron (Mangut, 1986; Iliya Garba, 2012, Pers. comm.).

Whether Lankan got its iron technology from the Daima corridor which has been dated to 200BC-500AD, or Taruga within the Nok culture area which has been dated to 500BC, or there was independent invention in the area was not clearly discussed by Daze.

From other parts of Nigeria, iron smelting has been studied by archaeologists revealing complex and extensive technological diversity and ritual practices associated with the smelting.

From eastern Nigeria, evidence of iron workings has emerged showing diversity in smelting (Anozie 1979; Okafor 1993, 2004; Eze-Uzomaka 2010). The round blocks of slag from eastern Nigeria especially Llejja and Umundu in Enugu State are larger than any that have been discovered in Africa. These slag are said to have come from shaft slag tapping furnace hence are have the dimension of their tapping pits (Okafor 1995, 2004). This is in contrast to Anozie's

earlier view that the slag were from pit bowl furnaces. Anozie considers the pit/ bowl furnace as the earliest furnaces used in smelting (Anozie 1979). Western Nigeria on the other hand has one of the earliest records of research on iron smelting. Bellamy (1904) reported mining of ore which goes through roasting before smelting in Ola Igbi near *Oyo* State (in Akinade 2001). Other studies of iron in the area include that of William (1973) who reported that more than 100 people involved in smelting were sighted by visitors in 1904 at Laagbe in Oyo (in Akinjogbin 2004).

Archaeological investigations on iron smelting have also been extensively carried out in central Nigeria (Fagg 1969; Nadel 1942 in Abubakar 1987; Tylcote 1975b in Jemkur 1989, 2004; Akinade 2001). These investigations reveal complex iron working using different furnace types. For example, non slag tapping shaft furnaces were discovered in Taruga (Fagg 1969, Tylecote 1975 in Shaw 1978). Other furnace types were discovered in Nupe area (Williams 1969 in Anozie 1979) Also, in Mangu, Local Government Area of Plateau State about 600 kilometres north east of the Nupe and Igbirra areas and less than 50 kilometres east of Mahurum, a bowl furnace was identified by this researcher.

Archaeological investigation has also shown that shaft furnaces were used in ancient Zamfara kingdom, Kaduna, Kebbi, Kano, Zaria and Katsina areas of Northern Nigeria. This has come to light from the researches of Abubakar (1987) who carried out research in Zamfara and some parts of northern and central Nigeria, Sutton (1985) who carried out research in the Zaria area with a view to identify the style of furnaces and the smelting process, Jemkur (1989) on the other hand carried out research in some parts of central Nigeria especially the Nok area and established the fact that most of the furnaces in the area were shaft furnaces and they were sited close to streams. Odofin (2010) on his part carried out research in Tsauni north and south. The studies by Odofin established radio carbon dates of between first and fourth centuries AD for

Tsauni iron smelting sites in the Zaria area. The 21 furnaces studied during this research were identified in a location close to streams which is in line with the opinion of Jemkur (1989) that most iron smelting furnaces in central Nigeria were located close to streams. Thus further research should be conducted in the area in order to shed more light on the ancient iron metallurgy of the Jos plateau and Nigeria as a whole.

1.4 Aim and Objectives

The aim of this research is to study ancient iron smelting technology in Mahurum. This aim will be achieved through the following objectives:

1. To identify, study and document evidence relating to past human activities in the Mahurum area
2. To attempt an understanding of the possible relationship between refining of bloom and rock hollows in Mahurum.
3. To collect and document oral traditions on early iron smelting technology in Mahurum and also on the history of the Ahurum.

1.5 Scope of Research

This research identified, studied and documented material and non material evidence of ancient iron working in Mahurum area especially furnace remains, tuyere, slag from smelting and smithing and rock hollows through oral tradition and surface survey by traversing the area on foot. The research also identified, studied and documented finds and features that have relevance to our objectives on the Mahurum abandoned ancient site. No excavation was carried o-ut but surface potsherds were collected and analyzed and all other finds and features especially house and granary foundations, monolith, smithing workshop, stone embankment were studied in situ.

1.6 Theoretical Framework

The theoretical framework for this research is cultural ecology; a theory that emphasizes on culture-nature interaction in which culture is considered as an environmental adaptive mechanism by man. This theory seems to have had its beginning in the early 1900s when Forde (1934 in Alabi 2001) postulated with environmental bias that problems of human civilizations can be understood through their connection and adaptation to their physical environment. Childe (1951) in Anderson (1982) was also suggestive of the connection in nature- ecology relationship when he opined that culture is an enduring expression to an environment thus, giving the incline of inter-relatedness of buildings, instruments of war, tools, aesthetics materials among others as being components of a functional whole. Steward (1955) is credited with expounding the cultural ecology theory. In his book "The Theory of Culture Change", he provides a view on how environmental endowments and adaptation can influence cultural change. Therefore, signifying that ecological locale plays a vital role in shaping the culture of an area. Other scholars that contributed to the culture - ecology school of thought include Hodder (1982) and Ortner (1984) in Alabi (2001).

In this research, culture- ecology relationship can be viewed from the fact that the ancient Ahurum had a clear knowledge of their ecological endowments which they harnessed for their benefit. For example, it was observed that ore for smelting iron and materials used for construction of furnaces and charcoal production were from the Mahurum ecological locale. In the same vein, the utilization of rock surfaces for refining of bloom in which rock hollows were created can be seen as a nature given alternative to Iron anvils. Also, the use of rock slabs as monoliths, basalt rocks for pounding of bloom, stones used for construction of houses among

others is a clear indication of the culture- nature relationship in the cultural practices of the ancient people of Mahurum. In addition, when the natural environment is negatively managed, it can also influence cultural changes. This is so when we consider the fact that Goucher (1981) and Haaland (1985) attributed the decline of iron smelting to the depletion of the vegetation which adversely affected hardwood supply used for smelting.

Therefore, we can say that when the ecology of an area is endowed or affected, it tend to influence the social and cultural components of a society and this has been identified in the ecological and cultural fabric of ancient Mahurum.

1.7 Research Methodology

Research methodology in archaeology may be seen as procedural techniques which are consistent with archaeological research that archaeologists adopt in acquiring data during archaeological investigation. In an attempt to achieve the purpose of this research, the following arrays of methods of enquiry were employed:

Oral Tradition

Oral traditions are viable sources of information about historical settings dating back far into time (Echo-Hawk, 2000). The efficacy of the interplay of archaeology and oral traditions has gained currency among scholars as seen in the works of Alagoa and Derefaka (1993), Afigbo(1985), Gundu and Igirgi (1993), Echo-Hawk (2000) and Schmidt (2006).

Oral tradition was utilized in this research as an explanatory medium from which information on the location of sites, processes of ancient iron working, types of trees that were used to produce charcoal for smelting iron, history of the Ahurum, names of masquerades among

others were obtained from people in Mahurum and other villages in Manguna district as well as from Daffo located about 10 kilometres south of Manguna town. Twenty seven people from Mahurum and neighbouring villages were interviewed and their selection cut across clan, sex, status, age and occupation. Also, verbal opinion of Prof David Aremu on likely reasons for paucity of grinding stones on Mahurum hill was taken into consideration (pp 102).

Individual oral interview was embarked using structured open–ended interview method which provided a platform for verification with key informants. The oral information helped in understanding among other things the ancient iron smelting tradition of Mahurum, economic relationship involving iron bars between the Mahurum people and their immediate neighbours, the Ahurum socio-religious culture and how they relate with their natural environment.

Written Sources

Consultation of written materials was very imperative for this research. This is because the study of African Iron Age has myriad of literature written with different views and on different data. Therefore, various public libraries and individual book collections were utilized during the research. Books with information on previous works on the Ron people, iron smelting, geology of the Jos plateau inter alia were consulted which provided a wider resource for the research. The consultation of written materials also formed the basis for a broad literature review on iron working on the Jos plateau and other areas in Nigeria (pp2-5).

Archaeological Survey

Archaeological survey involves the initial data gathering to record as much as possible about an archaeological site without excavation (Sharer and Asmore, 2003).For this research, survey was conducted in which finds and features especially furnaces, rock hollows, iron slag from smelting

of iron and from refining of bloom, house foundations, monolith, grinding stones among others were identified, studied, their measurements taken and maps produced respectively based on the data gathered. Also during the survey, potsherds were collected from rock overhangs, but features were studied in situ. This was achieved by traversing Mahurum area on foot. The major equipments that were used during the survey were Germin Gpsmap 76csx with error margin of -6m which was used in recording longitude, latitude and height above sea level and 14.6 mega pixels Canon 180 Camera which was used in taking pictures. Ranging pole alongside photographic scale was used during the taking of pictures of features. Thirty and five meter measuring tapes were also used to measure the distances between features, and also to take measurements of height and diameter.

Classification and Analysis

Classification and analysis are very essential aspects of archaeological research. Classification is the process of arranging finds and features into groups or classes based on certain shared attributes (Sharer and Ashmore 2003). According to Andah and Okpoko (1994), this helps to summarise the elements of individual objects and their relationship for further studies such as analysis and interpretation. Classification helps in organizing in whole, undifferentiated data into manageable components (Balme and Paterson 2006; Sharer and Ashmore, 2003). Analysis on the other hand is the examination of finds and features in order to understand their constituent elements and their relationships.

The duo of classification and analysis were employed in the course of the research on the data derived from the iron smelting and Mahurum abandoned settlement sites through which attempt at the reconstruction of the technology of the Ahurum has been made showing the

meaning and purposes of the objects. As earlier mentioned, finds like potsherds were collected for analysis but features like furnaces remains, rock hollows and structures of the ancient habitation ruins were studied in situ. Classification and analysis of the finds and features culminated in interpretation.

CHAPTER TWO: GEOGRAPHICAL AND HISTORICAL BACKGROUND OF MAHURUM

2.0 Location

Mahurum is in Manguna district of Bokkos Local Government Area of Plateau state Nigeria and is located between latitudes 9° 19”23’ and 9° 21”00’N, and longitude 8° 44”47’ and 8° 47” 20’E. The area is about seven kilometres west of Manguna town and about six kilometres north of Kurra Falls and is bordered by Zakarek to the north-west, Danbwash to the south-west, Manguna to the east, Taggai to the north-east, Hurti to the south and Ankwil in Barkin Ladi Local Government Area to the north. Mahurum village is made up of four hamlets namely; Tahang in the south, Zayau to the north, Shumush in the north-west and Fiish in the west (Fig 1, 2 and 3 pp12, 13 and 14).

There are two access roads into Mahurum. One is in the western flank from Zakarek and the second one is in the south-eastern flank when coming from Hurti or Manguna. Aside the motor roads, there are several foot paths connecting Mahurum to other villages and hamlets especially from Tahang linking Manguna to the east, Hurti to the south ,Dambwash to the south-west, from Zayau linking Tisir *–Lai* to the south-east, Taggai to the north-east ,Ankwil 2 to the north and Zakarek to the north-west.

While the motor roads in Mahurum can be considered as a recent development with the arrival of automobiles which dates back to the 1970s, most of the foot paths on the other hand are relics of human traversal dating back to antiquity (Maram 2008).

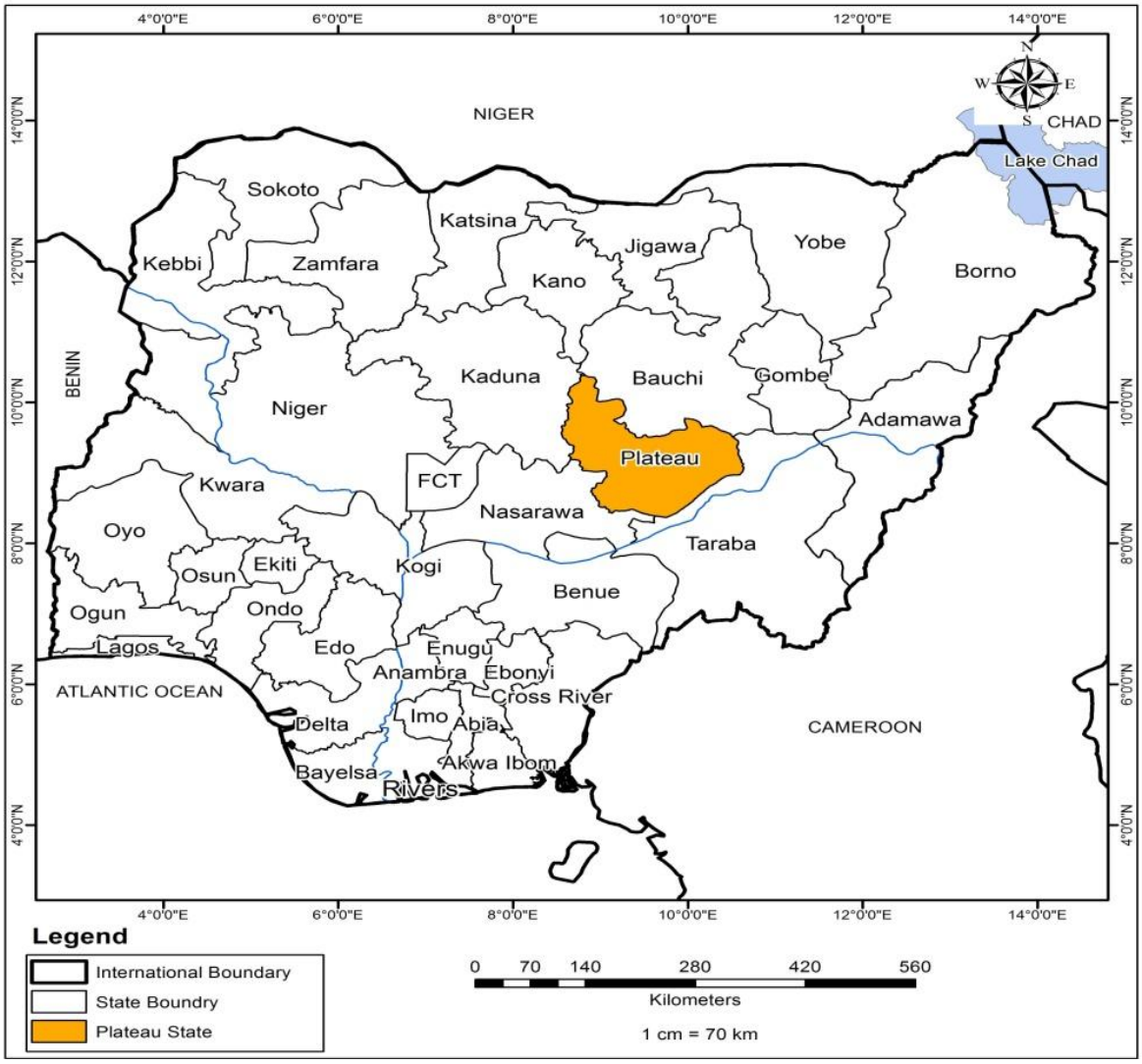


Fig 1: Plateau State in Nigeria Soure: Dept. of Geography,ABU Zaria

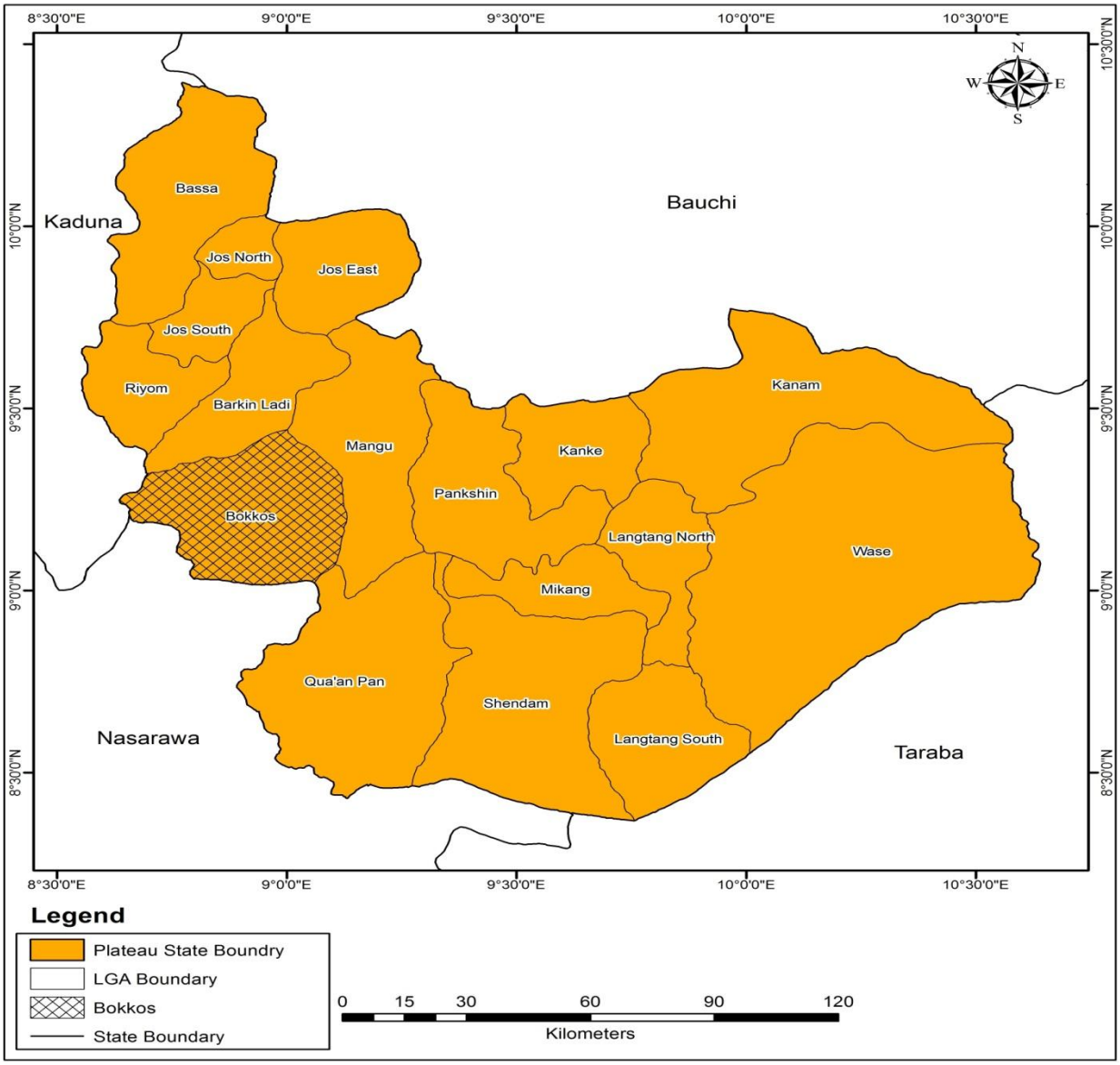


Fig 2: Bokkos Local Government Area in Plateau State Source: Dept. of Geography, ABUZaria

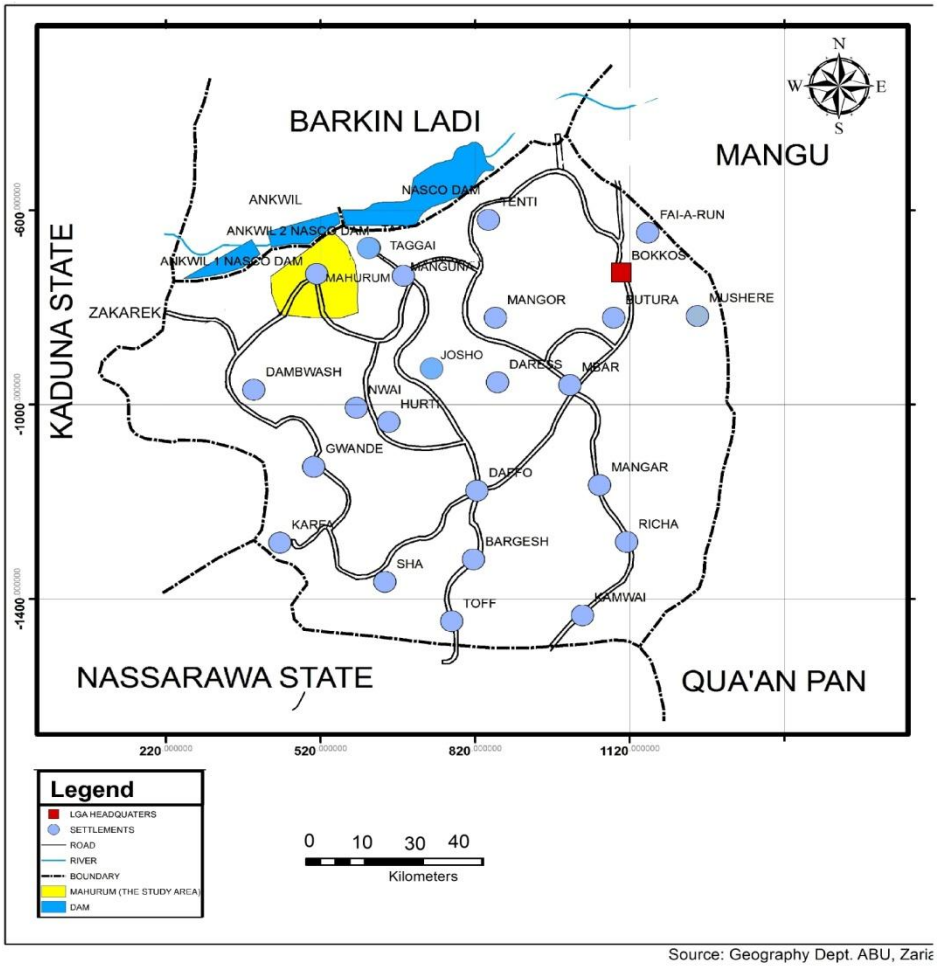


Fig 3: Mahurum the study area in Bokkos Local Government Area

2.1 Weather and Climate

The weather and climate of Mahurum is not markedly different especially from that of areas within the south western part of the Jos Plateau escarpment though there are slight variations. Generally, the Jos Plateau normally records temperatures between mean annual temperatures of 21. 6°c, mean monthly minimum of 19.7°c in January, and mean monthly maximum of 24.3°c in April (Schoneich and Mbonu 1991). This makes the area cooler than most areas at lower elevations. Annual rainfall can be up to 1500mm (Roder 2008).This weather pattern is highly

influenced by the geological elevation of the Jos plateau which stands at 1250m (about 4100 ft) above sea level (Schoneich and Mbonu 1991; Roder 2008; Shaw 1978).

The climate of the Jos plateau is generally determined by two main factors: "Its high altitude and its position across the path of the seasonal migration of the inter-tropical convergence zone ITCZ" (Ajeagbu et al 1992:21). In West Africa generally, the climate is controlled by two wind systems: The South-Westerly, moisture-laden monsoon, and the dry, North-East Trade Winds (Harmattan) asnd also variations in the position of the Intertropical Convergence Zone (ITCZ) which is the area where these two wind systems meet (Sowumi 2006).

Thus, the orographical advantage of the Jos Plateau induces high rate of precipitation and condensation in form of rain, dew and fog. Rainfall averaging1500mm-2000mm is experienced in the area every year (Hossain et al 1986; Ajeagbu et al 1992). Dew is common during the dry season whereas, fog which is a common climatic phenomenon in West Africa is high in south western part of the Jos Plateau, Ojo (1977), and can be seen blanketing mostly the hilly areas in Mahurum especially around late April to mid-September. Rainy season in Mahurum and in most of the Jos Plateau normally starts around April terminating around early October after which the dry season starts from October and ends around April. Harmattan which is characteristic of the dry season normally occurs around November and terminates mostly around late February.

There are five seasons in a year in the Manguna Calendar which are astro-weather related. The Year in Manguna normally starts by December. From December to April is called *Humbil,* May to June is called *Tumwat,* July to August is called *Taafy* because of the intensity of

rainfall. September is called *Fuwil- a- bing* (Dark *Fuwil*) and October to November is known as *Fuwil-a-fell,* (white *Fuwil*) (Saraya Maram 2012, Pers. Comm.).

2.2 Geology

The geology of the Jos Plateau is part of the Precambrian to Mid Cambrian and Jurassic Northern Nigerian Crystalline shield. (Diary of Plateau State, 2002; Schoneich and Mbonu 1991).The elevation of the Jos Plateau is purported to have occurred about 570 million years ago with the latest occurring 500 thousand years ago due to tectonic upheaval which was followed by gradual denudation in which the whole of Jos plateau became eroded. The denudation is evidenced in the relief of the whole of Jos Plateau with Mahurum inclusive.

2.3 Soil

The soils of the Jos Plateau are said to be the product of the "interaction of pedogenic factors (climate, biota parent material, topography and time) which has produced a series of soils that reflect the particular influence of parent material (in terms of texture and nutrient status) and topography in terms of drainage" (Ajaegbu et al 1992:19).

Based on observation, the soil of the area supports the cultivation of a variety of crops like (*Foo),* Acha also known as hungry rice *Digitaria Exilis,* (Muar), Cocoyam, *Colocasia esculenta* , (*Asho*), garden egg, *Solanum incanum* , (*Amboree*), pepper *Capsicum Frutensis,* (Angiriem), different species of native bean *Sesquipedalis, (Rawul Ti Nafal),* Sweet potatoes *Ipomoea Bandurata,* (*Nguni*), Sesame *Sesamun Indicum*, (*Avat*/Risga), Livingstone potato *Plectranthus esculentus,* (*Amarak/Tamba*) finger millet, *Eleusine coracana* and many others.

The cultivation of some of these crops is said to date back to antiquity while others were recently introduced. Thus, the cultivation of such varieties of crops might be due to the fertility

of the soil. Most of the farms in the Mahurum area are in the plains but in ancient times, farms and gardens were mostly maintained within hill dwelling enclaves (Akamang Mafulul, 2012, Pers. Comm.). Therefore, fertile soil and other factors like presence of different games and the elevation of the hills which served as natural fortifications might have been the major attraction for the peopling of the area right from period of antiquity (Maram, 2008).

2.4 Relief

The relief of Mahurum falls under the Manguna hills and is heavily characterized by dissecting rocky hills and hillocks including few Messa hills and inselbergs of post Jurassic (Mid cretaceous age) which are characteristic of areas in the south-western isostatic plateau escarpment (Schoeneich and Mbonu 1991). The Manguna hills which Mahurum is part of are said to be as high as Shere Hills which are located north-east of Jos (Mangut 2006).

The hills and hillocks of Mahurum have to a great extent influenced the historical and cultural behaviour of the people of the area. This can be seen in the rock columns which were used as monoliths where rituals were performed, rock surfaces were used as anvils during iron smelting, refining and smithing, some of the caves and rock shelters were used as initiation and masquerade dressing temples and they also served as ideal fortresses due to their elevation and natural fortification during the turbulent slave raiding periods, the Fulani Jihad of 1800s and intertribal wars with the Berom of Heipang who are to the north (Maram 2008, Boroks 2011). Surmise to say that the area might have been occupied since the Late Stone Age based on its proximity to Rop rock shelter which is about 27 km to the north-east (Fagg 1956 in Shaw 1978).

2.5 Fauna and Flora

Some of the key components of every environment are her fauna and flora except where neither exist which is rare. Mahurum has the type of vegetation which is common to wetter areas in the South Western part of the Plateau escarpment. Plateau state generally falls within the Guinea Savannah zone which is also known as 'savannah forest mosaic' (Shaw, 1978) and altitude is said to be what gives the Plateau area such floral endowments which are characterised by prevalence of the grasslands (Shaw, 1978).

The flora of Mahurum is mostly found on hilltops, uncultivated plains and along water causeways. Some scholars are of the opinion that the multifarious floral outlook of the Jos Plateau has been greatly depleted due to incremental changes induced by human actions especially cultivation, felling of trees for fuel, bush burning and grazing (Morgan et al 1979; Ihenacho, 1985; Maram,2008).This assertion by the aforementioned scholars is exemplified in Mahurum which has bare plains devoid of vegetation especially trees due to the above mentioned factors except for seasonal planted crops and the attendant grasses hence the area is a carcass of its former vegetational status because of farming activities (See plate one). Some of the plants common to the Mahurum area are (*Aharja)* Wild date palms *phoenix reclinata* (*Angaru*), Physic nut *Jethropha curcas*, (Agirii), Acacia *Mimosoideae* ,(*Asher*) Tickseed *Bidens*, (*Atirin*) Carandas Plum *Carissa edulis*, (Akungom) Iroko *Milicia exelsa*, (*Ambok*) Sycamore (*Ficus sycomorous*) and many others (ABU Herbarium,2013)



Plate 1: Showing the bare nature of Mahurum plains stripped of Vegetation

The fauna of Mahurum varies based on the niches that exist which has sustained its adaptation and survival or otherwise. Most of the animals in the wild in this area, both nocturnal and diurnal which can be herbivores, omnivores or insectivores live in the rocky hills, uncultivated plains that still have vegetation and in the vestiges of former forests located around water causeways.

2.6 Drainage

There are several streams that crisscross the Mahurum landscape. Streams are the major source of drainage for the area. The streams are effluent for most part of the year fed by high mean annual average rainfall of 1500mm-2000mm and surface run-offs from the hills (Schoneich and Mbonu 1991; Mangut 1986).

All the streams that flow northwards in the Mahurum area drain into Nesco Dams which stretch from Tanti located north east of Manguna town running to Zakarek which is in the North West. Other streams in the southern part of Mahurum especially around Tahang that flow south

west to Dambwash are tributaries to rivers in Nasarawa State which are further drained into river Benue (Mangut 2006).Also, all the southern banks of National Electricity Supply Corporation (NESCO) dams namely Ankwil (1) and Ankwil (2) are mostly located in Mahurum and one of the artificial cataracts of the NESCO dams which also act as flow stations is located in the northern part of Mahurum.

2.7 Historical Background

Origin

The settlement history of the Ahurum shows they evolved from several groups that migrated to Mahurum hill from different areas (Mangut, 1986), (Akamang Mafulul, Pers. comm., 2012). It is believed the group that first settled on the hill was the Acham Angbong family. This group is said to have lived in the Ahurum hill for a long time until the advent of slave raiding which pushed other groups to seek refuge in the hill (Akamang Mafulul, John Sila, 2012, Pers. Comm.). The area in the hill where Acham Angbong family settled is called Talaf-A- Nahai which symbolically means the higher or upper shrine. Other groups that are said to have joined the Acham Angbong in Talaf A-Nahai were the Anvou and Ahang Aboi families. The two families are said to have paid two horses before they were considered to live on Talaf-A-Nahai (Gideon Sila, 2012, pers. Comm.).

Other groups are said to have arrived on the hill much later starting with the Pwol family. This family is said to have come from the Mangor area located about fifteen kilometres to the east. The Pwol family was later joined by Kikim and Naf-A- Kuju families which are said to have first settled at Kai, an area directly north of Mahurum and presently in Zakarek, Barkin Ladi Local Government Area. They were again later joined by the Ahwel family. (Ajoro Kating, Pers. comm., 2012). The later migrants to the hill might have arrived in the early to mid 1800s.

The area where all the later groups settled is called Talaf-A-Jinik which also symbolically means lower shrine. The reasons for the later group to have stayed in Talaf-A-Jinik was because they were not able to pay the Acham Angbong family a horses as a price hence they were restricted to that area. Other groups are said to have arrived the Mahurum area like the Sundung and Mann clans from a place south west of Mahurum called Tala Hurti in present Hurti village but the Sundung and Mann settled at an adjacent hill. The last group that is said to have arrived at Mahurum area but did not settle on Mahurum hill was the Rikina from Nimzon area in the present Kaduna State.

Mahurum is the name of the village as well as the name used in addressing any one from the area. Thus, the name (Mahurum) could have evolved from the way people generally in Manguna district are addressed. Someone from Mahurum will be addressed as Ma-Hurum and likewise someone from Manguna will be addressed as Ma-Nguna hence the word Ahurum means people of Ahurum clan where as Ma-Hurum (Singular) means a person from Mahurum and Naf-A-Hurum (Plural) means people of Mahurum.

Before the colonial era, Mahurum is said to have been the headquarters of the whole Manguna people (Mangut 1986; Maram 2008; Akamang Mafulul, Pers.comm. 2012). All the villages in Manguna in ancient times used to pay tribute to the Ahurum except Hurti (Maram 2008). For example, it was stated that when a big game is hunted in Karfa which is about 30 kilometers south-west of Mahurum, the head of the animal killed will be presented to Gwande people, the Gwande people will take it to Dambwash and the Dambwash people who are located south west closest in proximity to Mahurum will now take it to the Ahurum as a sign of allegiance. This system of tribute paying was said to have continued until when colonial officers arrived at the area and realizing that the Ahurum refused to come down from the hill and the

location of Mahurum hill was not suitable for a district headquarters, decided to instigate Hurti people to assemble skulls from the Mahurum skull repositories towards Manguna and then claiming that ancestors of the land had chosen a new seat of power which is Manguna (Mangut, 1986; Maram, 2008). Why Hurti people were used in this scheme is not understood. A similar change of power is also said to have been orchestrated in the Daffo area (Mangut 1986).

The Mahurum people today have spread to areas like Makoli to the north east, Manguna to the east and Taggai to the north east. The population of Mahurum today is composed of three major clans which are the minor and major Ahurum. The first set of settlers namely the Angbong family, the Pwol family, the Kikim-Kuju and the Ahwel families are today considered as the actual Ahurum clan living in the Mahurum village where as some of their relatives migrated to other villages like the Naf-A-Nvou and Naf-A- Ahang Abwoi.

On the other hand, Rikina who have Nimzon ancestry and Chirang who came from the Chirang-Mangor area via Hurti which makes them either Mupun or Daress are today considered as non Ahurum (Mangut 1986). The language of the Mahurum people falls under the Manguna dialect called Shagau which is spoken in all villages of Manguna district except Karfa which is to the south west and has been categorised as one of the intrusive languages in Bokkos Local Government Area along with Mabo and Barkul in Richa District (Mangut 1986). The Manguna dialect seems to be related to Sha and Kulere dialects more than the Butura-Daffo, Bokkos dialects. The reason for this relationship is not clear to this researcher but it could be that the initial settlers of Mahurum area might have mingled into the Sha and Kulere areas mixing with other groups from the Nasarawa area or vice versa.

While the Ahurum had always been headed by the Saf-A-Tarmush that is the chief priest, the colonial government through its indirect rule system is said to have appointed and imposed

chiefs in Mahurum and the chieftaincy system is still been practiced. Some of the chiefs that have ruled the area are Saf Mafulul,Akpo, Acham Ambong, Arafan Agangan, Ashash Adot, Pwol Andung, Ashash Apwol, Mafulul Agangan, Mafala Ambong, Mafulul Apwol, Akamang Mafulul, Mahwel Mangai, Kuran Aboi, Malo Mafulul and the last one being Ayuba Machief who died about 17 years ago (Manasseh Sila 2012, Pers. Comm.). The above listed traditional rulers came from different families. No dates and periods of reigns were given for the listed traditional rulers.

2.7.1 Socio-Religious Structure of the Ahurum.

The political leadership amongst the Ahurum was not detached from the religious one. The leadership was structured based on religious functionality and age grades. The highest ruling body was the *Mi-Kochok* (Council of elders) which took major decisions ranging from rituals to making and execution of laws. The most senior position among the *Mi-kochok* was *Saf-A-Tarmuash* which literally means 'The chief priest'. The *Mi-kochok* were elders who attain that position by coming of age and rising through the ranks by performing certain rituals and taking titles. For any man to qualify as *Ma-Kochok*, he must have been amongst *Unon Asua*, a youth cult group that is joined immediately children of certain age group were circumcised. Before they are circumcised, they are known as *karbwia*. At that level, the children only run errands. At adulthood, a man can perform *Muor Rai* which is a title taking ceremony to become *Makama*. The Kama was the most senior cult group and its members are called *Mi-Kochok*. Once the ceremony is performed, one becomes *Ma-Kochok*. The *Mi-Kochok* title taking involves donating about five goats to the *Mikochok*, cooking burkutu (Local beer) to fill seven large pots call *Alang* including cooking of meat. The title was given with the presentation of a stick which has some designs on it. During crucial meetings or when a title holder is going for visits, he is expected to

carry the stick along with him and he is identified as a title holder from the stick. The word *mikochok* means people of high position.

There were several masquerades and oracles that play very prominent roles in the socio-religious aspect of the Ahurum. Some of the masquerades are similar to the masquerades of Kulere people found south west of the area (Mangut and Mangut, 2007). The masquerades include *Mangam, Mundja, Anjakawa, Andong* and *Ukuk*. The oracles on the other hand are *Yisum, Harkil Asua* and *Andurumbuan*. All the masquerades and oracles are under what is called *Tarmuash* which is considered as the overall most senior cult and deity of the people and is controlled by a chief priest called *Saf- Atarmush* with the Kama as cabinet. The Mahurum people including all the people of Manguna have the same name for God and Sun which is *Faht*. Probably in the distant past, the people might have been sun worshippers because of the similarities in name for both God and Sun.; they equate the powers and mysteries of the sun and God as the same and unfathomable. Presently, they Ahurum have abandoned such practices due to foreign religious influences especially Christianity (Maram 2008).

2.7.2 Masquerades

In the order of functions of the masquerades, *Mangam* was saddled with the responsibility of protecting the people by placing charms yearly especially before each farming season where monoliths were erected especially in entry points of the Ahurum hill settlement. *Mangam* generally was regarded as the gate keeper of the people against diseases and other natural calamities that are regarded as humanly induced by their enemies. Also, before iron smelting commences, Mangam must embarked on purification of all the designated smelting sites by giving the charms that will be buried beneath before furnaces are constructed. The *Mangam* masquerade costumes are said to include iron leg bangles call *Shukwa*, a carved wooden mask

and a body covering made from dry dead palm leaves *phoenix reclinata.* The Mangam masquerade is also associated with the *Mama* people to the west in present Nasarawa state, the Kulere to the south west and the Gomei people in Shendam Local Government Area (Mangut B.N 2008; Kirk-Green 1972). Women were forbidden from seeing *Mangam* and any woman that violets the law will be barren for life.

Mundja was regarded as the lawgiver and controlled the villages' civil life. *Munja* usually comes out during festivals and harvest periods hence women and children can see it. The *Mundja* masquerade regalia were made up of woven dry leaves of date palm (phoenix reclinata) and antelope horns.

Anjakawa was the masquerade that normally comes to take children of a particular age grade for circumcision and also leads in the main activities associated with the circumcision. According to Mallam Akamu, (2012, Pers. Comm.,) the functions of *Andong* was the same with *Anjakawa*.

Ukuk was a female masquerade that used to run errands from the shrine to homes when children are undergoing circumcision. The duty of *Ukuk* was to go to those houses to collect palm oil, salt among other items. It was believed that nothing could be hidden from *Ukuk* even if it is buried underground hence when *Ukuk* asks for a particular thing and it is denied, it will go and pick it from where ever it is hidden. The *Ukuk* masquerade costume was worn only by women that had reached menopause, hence, could go to the shrine. As earlier mentioned, such practices as mentioned above have been abandoned but each of the clans in Mahurum area and the whole of Manguna district to this day have a sacred grove where it is believed each member of the family is represented by a totem tree and an invisible animal.

2.7.3 Oracles

Harkil and Andurunbuan were oracles whose function was mainly to dispense justice especially the one that involves some form of punishment. Harkil was used only by *Mangam* under the *Kama* which is made up of *Mikochok. Harkill* is a small flute which is used in torturing people that commit serious offence while *Andurunbuan* is an instrument with a thunderous noise that was used in summoning people when there was an attack, when some capital judgement will be passed and women are asked to stay indoors or when elders are been called upon to assemble at the shrine. Thus, symbolically, *Andurumbuan* is considered as the male and *Arkil* as the female.

Yisum was an oracle that was represented by a pot. Charms were normally kept in the pot and when a man proved himself to be brave in terms of war or hunting expedition, he will be given a drink from *Yisum.*

2.7.4 Burials

Burials amongst the *Ahurum* were done based on gender and status of the deceased. People in the past used to be buried in a crouched position in graves dug like wells but with chambers at the bottom. Several grown members of a family can be buried in a single well-like grave regardless of the periods they become deceased. The graves of women and children were separate from that of men. In subsequent periods, titled men were buried inside their rooms in their compounds. After a given period the rooms were opened and their skeletons were removed and then thrown in rock crevices then the first male child of the family will relocate into his father's room.

During burials, only title holders bury their fellows and women don't go to grave sites because of some rituals that were normally performed like removal of the heart of the deceased. Title holders were buried using goat and sheep hides in which the corpse was wrapped. The meat

from the slaughtered goats used for the burial rites is called *Liu Alot* and the title holders normally take it home raw before cooking it themselves not by their wives. During the washing of the corpse, women usually hold their hands and will be wailing and gyrating backward and forward throwing ashes on themselves as part of the mourning procession which is called *Go Chaat*. A widow could marry any of her late husband's relation in an arrangement called *Kahtal* only after mourning her husband for eight months. During the period of mourning, her head will be shaved continuously and she must tie weaved rope on her neck called *Shuwe* until the eight months mourning period is completed. Once the eight months mourning period is completed, she would cook Burkutu before the Shuwe will be removed from her neck.

Generally, the Ahurum bury their deceased with all their belongings especially knifes and spears for the men and jewelleries for the women. This is done for the deceased to use their most cherished belongings in their afterlife. The Ahurum also have a system of removing of skulls of the deceased after three to six months of internment and placing them in rock crevices in order to ascertain what might have killed the deceased. This practice is common amongst all the populations of *Bokkos* Local Government Area especially the Ron (Mangut 1986, 2007; Maram 2008). According to Adamu Mallo, (2012 ,Pers. comm..), after the removal of the skulls, traditional brooms collected from a plant called *Bukam* were used to trace marks on the skull to ascertain the reasons for the persons death specifically whether the person was killed through witch craft or any other means. Also, skulls obtained as war trophies in which the captured people were beheaded and their heads taken were also placed in rock crevices (Mangut 2006). It is the opinion of this researcher that it was such skulls that were arranged from the Ahurum during the dubious transfer of power from the Ahurum hill to Manguna (Mangut 1986; Maram 2008).

2.7.5 Marriages

Marriage in Mahurum was done just like other areas in Manguna district. In a more remote period of the Ahurum's history, a father or grandfather usually selects the first wife of his male child or grandchild. This is done by just mentioning to a girl's father that when the girl grows up, she would be a bride to his son. The contract is sealed when some token is given. The boy will grow up to marry the girl as his first wife but has the liberty of marrying a second wife. Dowry in ancient times used to include iron billet (manila), horses, goats, salt and palm oil. In later periods, blankets were added to the dowry and presently, money in terms of legal tender (*naira*) has been added replacing iron manila and horses. The girl on the other hand must marry the boy chosen for her even if she does not like him but she can later divorce him and marry a man of her choice.

At later periods, the marriage system evolved into a different process whereby, when a boy sees a girl he likes, he will inform his friends who will in turn talk to the girl. Once the girl agrees, her parents will be informed by the parents of the boy wooing her. The boy must invite his friends to go and perform *Hassi A kunnet* (farm for his would-be brides' parent). This signifies that he is capable of feeding their daughter. Before the marriage, scarification will be performed on the girl. The scars or marks are in two forms. The round ones are called *Un'gwal* and the groove types are called *Ale*. The *Un'gwal* is done on the chest and back, the *Ale* is done on the stomach. The *Un'gwal* is said to signify the girls' virginity and chastity and is done on girls while standing on a stone called *Dungulun*, the Ale represents the girls' fertility for child bearing. (This type of body scarification is also very common among the Sha people). It was after this that the girl is married out with much celebration. Presently, marriage can be contracted by elopement, the Christian way or through court wedding.

2.7.6 Economy

The economy of the ancient people is said to have been heavily dependent on iron smelting until its eventual demise. The Mahurum people are said to have been great iron smelters in the Manguna area. Thus, after smelting, iron bars were traded to people in Daffo, Sha, Gwande, Mangor Karfa and other places. The Ahurum on the other hand used to also buy items like clay pots, soup condiments, salt and palm oil in addition to obtaining their carved masquerades from the Mama area in Present Nasarawa State. Most of the exchange was trade by barter. It was not stated whether the Ahurum did exchange the iron bars with the Mama people. Another aspect of the peoples' economy is said to have been farming of which the produce were traded (Uhan Daudu, 2012, Pers.Comm).

CHAPTER THREE: THE ARCHAEOLOGICAL SURVEY

3.0 Introduction

Archaeological survey was conducted by this researcher in the Mahurum area by traversing its geographical landscape in order to identify evidence of iron smelting. Thus, through the survey, furnaces, slag from smelting and refining, rock hollows, stone hammers among other finds and features were identified in different areas of Mahurum which were eventually studied and documented.

This chapter is sub-divided into two. The first part is the details of the material evidence of iron working that were identified which were mainly furnaces, slag from smelting and refining and rock hollows. The second part looks at the material evidence of the habitation ruins located on the Mahurum Hilltop abandoned settlement site.

3.1 Location of the study sites

The study sites here refer to designated locations where finds and features were identified within Mahurum. The first cluster where furnaces and slag were identified is Dnahau located about 3 kilometres south of Zayau hamlet and about 900 meters north of Tahang. The area is named Dnahau which means a rock shelter in Manguna language because of a rock shelter located about 220 meters north of cluster 1 which was earlier studied by Maram (2008).

The second cluster is located on the northern foot of Ahurum hill about 80 meters west of (Ruga-ta-Ishaku) a Fulani compound and about two kilometres east of furnace cluster one Dnahau. There is a stream called Ale-A- Masare located about 20 metres west of the furnaces. The stream might have been closer to the furnaces in ancient times but presently the stream bed is located in a deep narrow gorge. The third cluster is located in Kase about two kilometres from the second site (Ruga-ta-Ishaku) and one kilometre from Taggai village. To reach Kase, one

would have to follow a foot path from Zayau, travelling east through Plain Truth Camp or travel directly north from furnace site 'B'. The furnaces in Kase are sited about 6 metres east of a stream that flows under a concrete bridge from south to north emptying into Ankwil 1 dam located just about 120 meters from the furnaces.

The rock hollows clusters and slags heaps on the other hand are located mainly within Tahang hamlet and the Mahurum hill. In Tahang, the hollows are found on a hillock that stretches from east to west on the northern part of the hamlet. The ones on Mahurum hill are found on the north western part in the same vicinity with habitation ruins. The Mahurum hill is located about 600m north east of Tahang. To get to the hill, one needs to travel east from Tahang through a foot path to Manguna and turn north at about 650 meters (Fig 4 below).

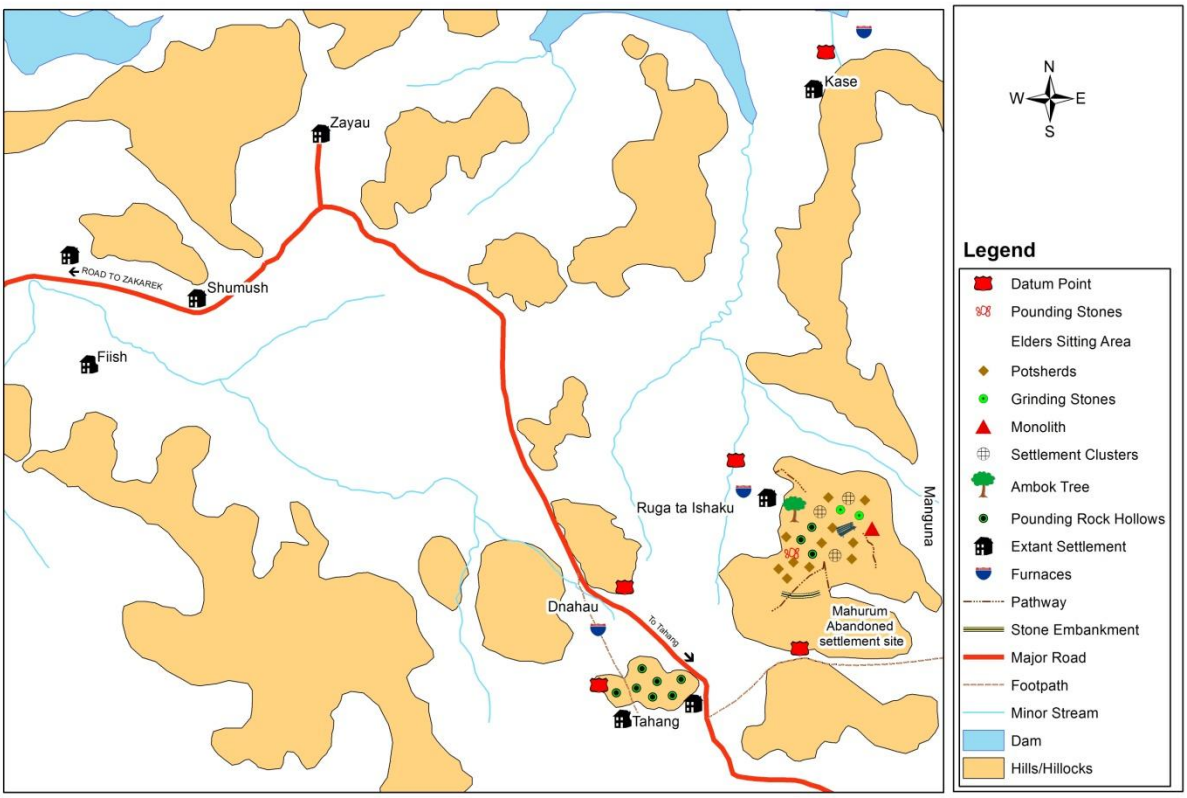


Fig 4: An outline of the study area. Source: Maram. M, M (2014)

3.2 The sites description

The Mahurum study area is characterised by different topographies. The three areas where furnaces were identified have undulating terrains dissected by hills and hillocks and streams that meander on the landscape.

In contrast to the general environment where furnaces were found, rock hollows which were identified in close proximity to slag heaps from refining of bloom are found on rock surfaces both in Tahang hamlet and Ahurum hill. The hillock in Tahang where most of the pounding rock hollows and slag heaps were found and the Ahurum hill are characterized by interspersed extrusive igneous rocks hence they do not share the topographical characteristics of the plains. The Dnahau furnaces remains are located very close to a major road and two of the furnaces were destroyed by road rehabilitation leaving only their impressions (Plate 4 pp 35). Also two of the furnaces at Ruga Ta Ishaku are on a cattle route hence were destroyed leaving only the slag deposits within the furnace floors (Plate 7 pp 37). One of the refining slags heaps in Tahang has been cut-through by a footpath (Plates 14 and 15 pp 46). While some of the rock hollows in Tahang hamlet are found on intrusive rock surfaces, those of Ahurum are on extrusive rock surfaces (Plates 17 pp 48, 19 pp 49 and 20 pp 51). Also the Mahurum abandoned settlement is on a hill (Plate 26 pp58).

3.3 Archaeological evidence of iron smelting in Mahurum

There are furnace remains in Mahurum numbering 21 which were identified in three areas designated as clusters A-C. All the furnaces are cylindrical in shape constructed with clay and 17 of the furnaces still have residues of slag in them. The slag residues found in the furnaces is shiny black. The furnace remains are free standing and they have the characteristics of none-slag tapping shaft furnace.

3.3.1 Furnace remains cluster ‘A’ Dnahau

Cluster ‘A’ is in Dnahau, located between latitudes 9° 19” 52’ and 9° 19” 54’ N, and longitudes 8° 46” 18’ and 8° 46” 20’ E. There are six furnace remains in Dnahau and slag debris designated as furnaces 1-6 located east of a stream called Ale-A-Gigin which runs south to northwest and a motor road from Zayau to Tahang passes through the site. Two of the furnaces were destroyed in 2010 during rehabilitation of the road leaving only their outlines (Plate 4 pp 35). A rock boulder located on latitude 19° 19” 53’N and longitude 8° 46”17’ E was chosen as the datum point.

Furnace 1 is located 18.7 meters south of the datum point. The furnace has a diameter of 82cm, height 8cm and width 10cm. Slag debris was discovered 2.6 meters west of furnace 1. Furnace 2 is located 4.4 meters south east from furnace 1. Furnace 3 on the other hand is located 1.3 meters north east of furnace 2. Both furnaces 2 and 3 as mentioned earlier were destroyed leaving only a barely visible outline. The diameter of furnace 2 is 82cm just like furnace 1 and the diameter of furnace 3 is 83cm. The width of furnace 2 is 7cm and that of furnace 3 is 8cm (Plate 2 and 3 for slag debris and furnace 1, pp 33 and 34).



Plate 2: Iron Slag debris in cluster ‘A’ Dnahau



Plate 3: Furnace base 1in cluster ‘A’ at Dnahau

Furnaces 4 and 5 are located about 68 metres south east of furnace 3. An enigmatic feature of these furnaces is that they are joined back to back hence they have been designated as twin furnace. Just like furnace 1, furnaces 4 and 5 have their inner walls lined with slag. Furnace 4 has a diameter of 90cm, width 15cm and height 10cm.Furnace 5 on the other hand has a diameter of 90cm, width of 12cm and height of 8cm. Furnace 6 is located 2.5 meters south of furnaces 4 and 5. The furnace also has a diameter of 90cm, width 5cm and height 10cm.One major characteristics of these furnace remains is that they have almost similar heights which is 8-10cm.Their average diameters are between 82-90cm and width of 5-15cm (Plates 4 and 5 pp 35).



Plate 4: outline of recently destroyed furnaces in cluster ‘A’ at Dnahau



Plate 5**:** Twin furnaces with a single one to the far centre at cluster ‘A’ at Dnahau

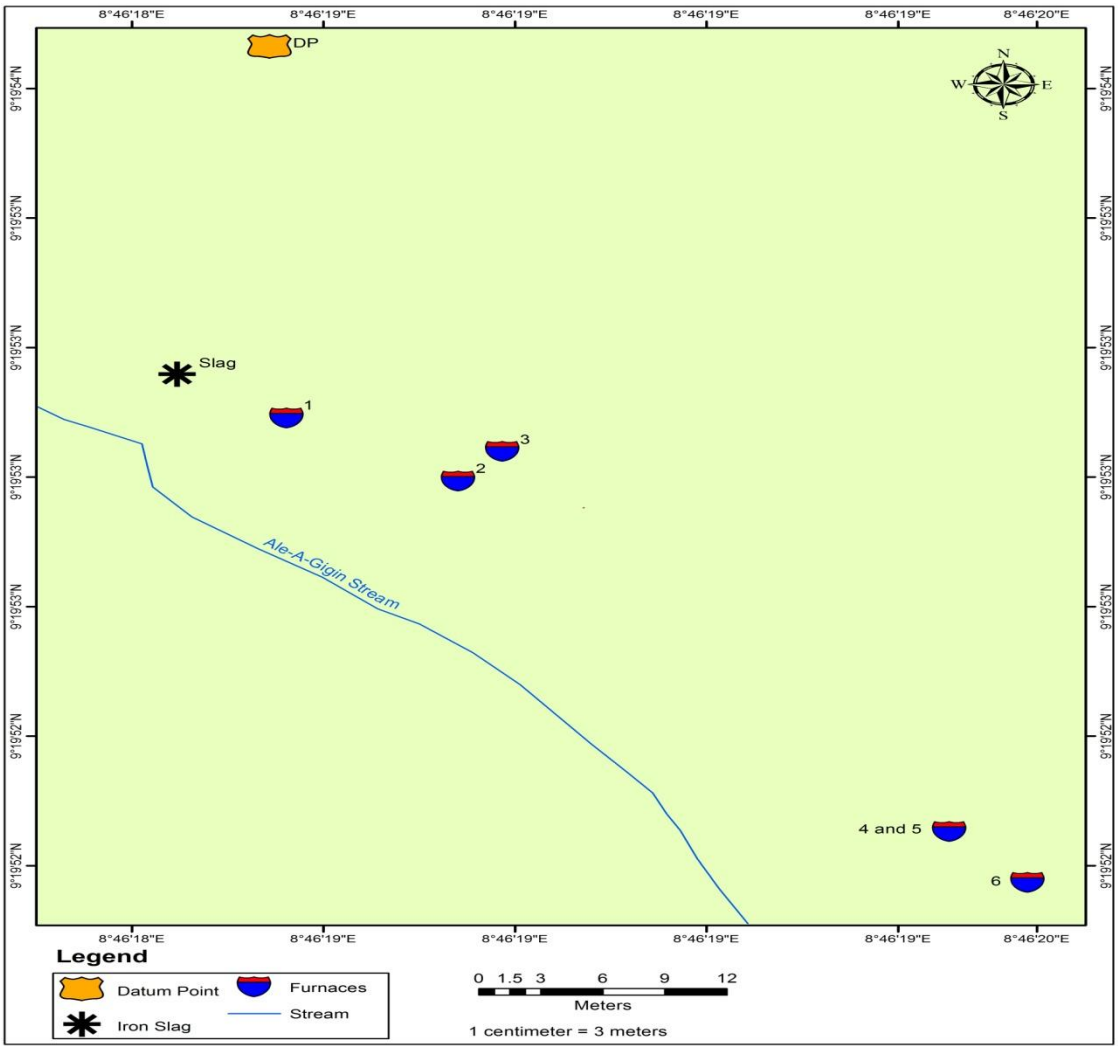


Fig 5: Furnaces in cluster 'A' Dnahau Source: Dept. of Geography, ABU Zaria

3.3.2 Furnace remains cluster 'B' at Ruga-Ta- Ishaku

Cluster 'B' is in Ruga-Ta- Ishaku located between latitudes 9° 20"11' and 9° 20"14' N, and longitude 8° 46"41' and 8° 46"44' E. A large rock boulder in the north western part of the site located on latitude 9° 20"13' N and longitude 8° 46"41' E was chosen as the datum point (Fig. 6 pp38). There are 3 furnaces on this site. Furnace 1 is located about 38.5 meters south west from the datum point. The diameter of this furnace is 50cm and the height is 40cm (Plate 6 pp 37).



Plate 6: Furnace 1 in Cluster ‘C’ at Ruga- Ta-Ishaku

Furnace 2 is located about 6 metres north east of furnace 1 and it stretches 1.8 meters east to west which probably also makes it a twin furnace. Furnace 3 on the other hand is located 1.3 metres north from furnace 2. Just like furnace 2, furnace 3 has been heavily treaded upon by cattle hence it is the outline that remains visible as earlier mentioned (Plate 7).



Plate 7: Furnace remains (2 to the right and 3 to the left at cluster ‘B’ Ruga- Ta-Ishak

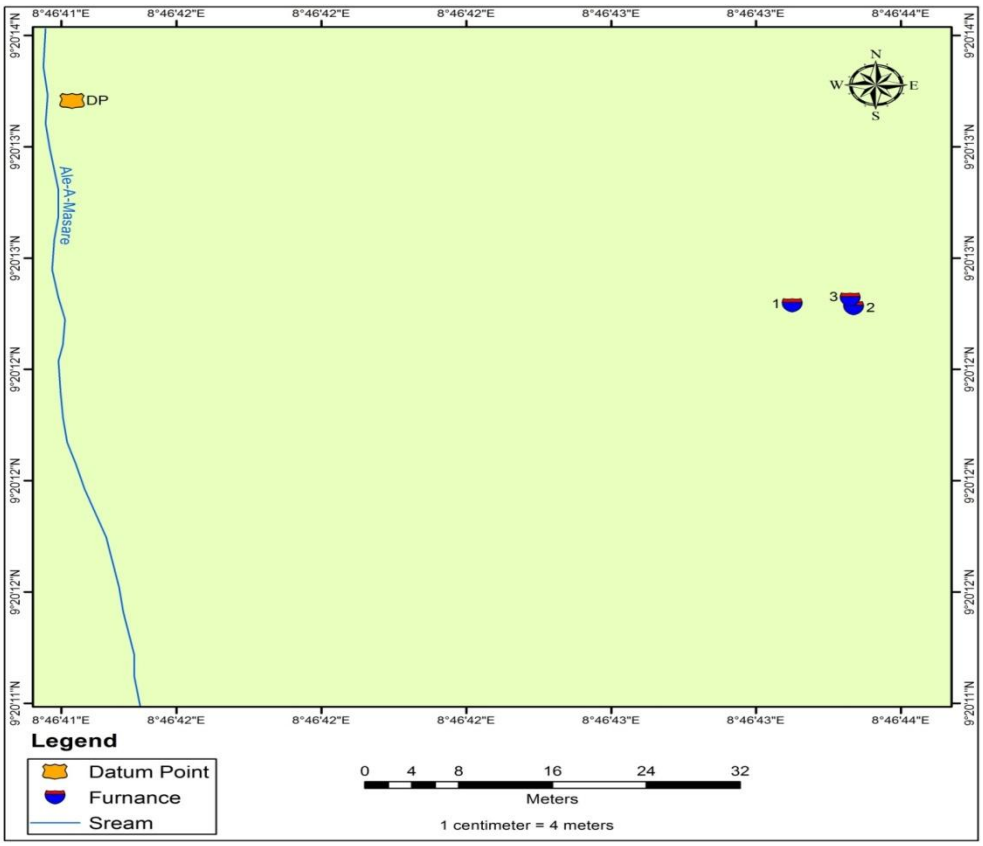


Fig 6: Furnaces in cluster 'B' at Ruga- Ta-Ishaku Source: Dept. of Geography, ABU Zaria

3.3.3 – Furnace remains cluster 'C' at Kase

This cluster is located in an area called Kase between latitude 9° 21" 17' N, longitude 8° 47" 0' and 8° 47" 1' E. There are 12 furnaces located within this vicinity. A large rock boulder located 84.6 meters northwest of the furnaces on latitude 9° 21'18.N and longitude 8° 46" 58' E was chosen as the datum point(Fig 7 pp 41). Furnace 1is located 84.6 meters south west from the datum point and is one of the tallest amongst the twelve that were studied on this site. The furnace is 40cm in height with a diameter of 86cm. Furnace 2 is located 8.8m directly west of furnace 1. This furnace has a height of 30cm and the diameter is 60cm. Furnace 3 is located 1.7m north east of furnace 2. Its height is 30cm just like furnace 2 and the diameter is 70cm.

From furnace 3 to furnace 4 is 1.4m west. Furnace 4 is 30cm in height and 85 cm in diameter. Furnace 5 is located 2.4m north east of furnace 4.The diameter of the furnace is 95cm and the height is 43cm. Directly 3.2 north of furnace 5 is furnace 6. The diameter of this furnace is 90cm and the height is 30cm. Furnace 7 is located 2.3 m north of furnace 6. The next furnace to 7 is furnace 8 which is regarded as its twin. The furnaces are joined back to back just like the twin furnace in Dnahau site 'A'. One of the twin furnace on the eastern side has a height of 10cm and its diameter is 80cm.The other twin on the western side has a height of 20cm and the diameter is 85cm. After the twin furnace is found furnace 9 located 1m north east from the twin furnace. The furnace measured 65cm in diameter and 40cm in height. In the same light, furnace 10 is located 1.1m east of furnace 9. Its diameter is 75m and height 40cm. Furnace 11 is located 1m north of furnace 10.The diameter of the furnace is 79cm, height 18cm. The 12th furnace surveyed in this cluster is located 4m north east of furnace 11. The furnace has a height of 15cm and the diameter is 70cm. All the furnaces are constructed with mud and are cylindrical in shape and most of them have slag linings on their walls (Plates 8, 9 and 10, pp 39-40).



Plate 8: Furnace remains 1 in the eastern part of cluster 'C' at Kase



Plate 9: A set of eight furnaces remains in cluster ‘C’ at Kase



Plate 10: Twin furnace remains in cluster ‘C’ at Kase

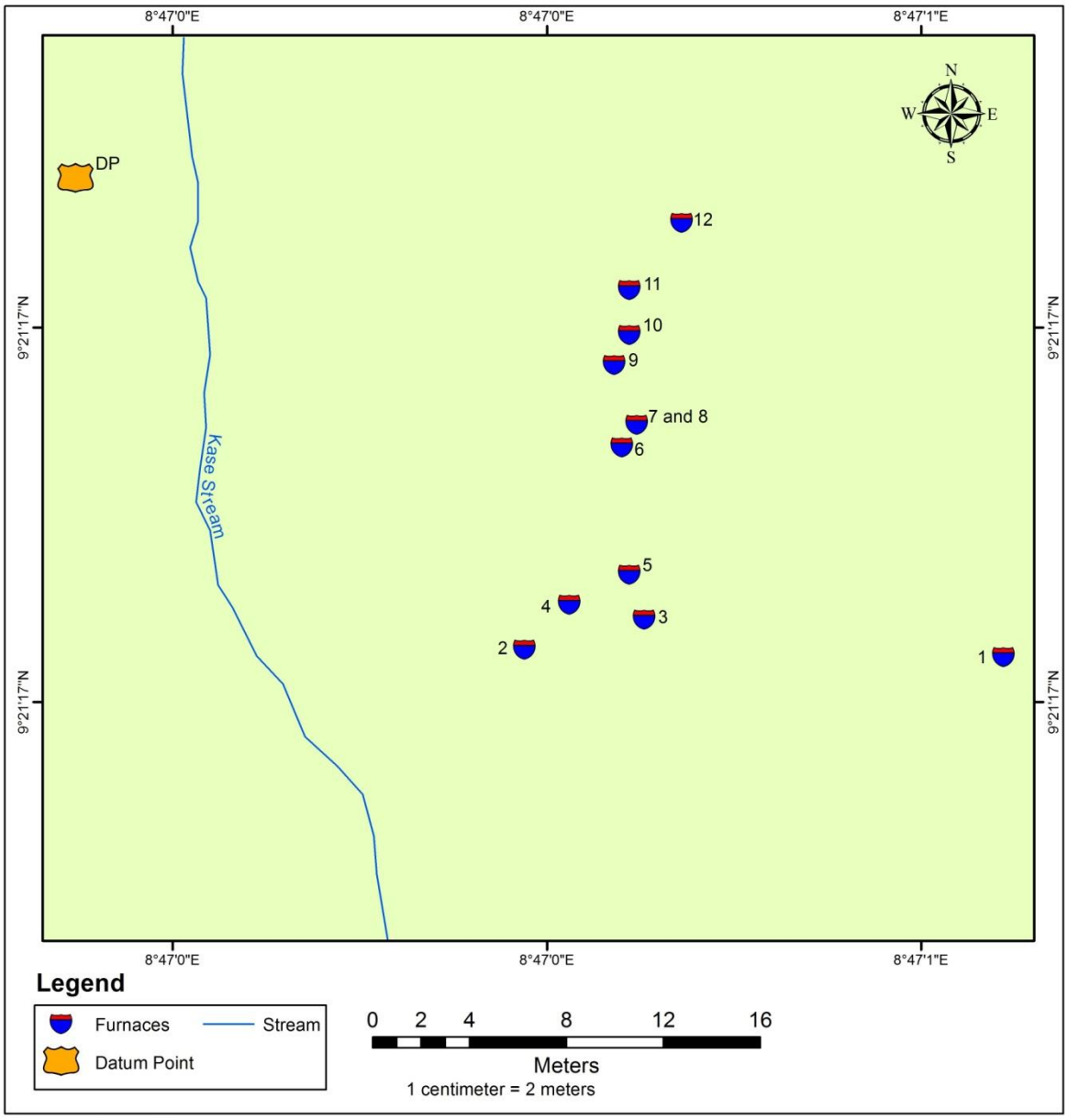


Fig 7: Furnace in cluster 'C' at Kase Source: Dept. of Geography, ABU Zaria

3.4 Rock Hollows

Rock hollows are cylindrical depressions that can be found on blocks of granite, rock boulders, bedrocks, massive slabs and on inselbergs (Gleaser, 1981; David, 1998). Rock hollows have also been described by Shaw, (1978: 88) as "deep circular depressions found on rock outcrops used for pounding of bloom". Thus, rock hollows can generally be described as holes on rock surfaces that were formed through natural or cultural process.

Different scholars have provided explanations on natural and artificial rock hollows which are also called grooves (Sassoon 1962; Shaw 1978; Gleaser 1981; Daze 1981; David 1998; Mangut and Mangut 2007. Gleaser (1981) is of the opinion that rock hollows are natural but can be artificial if they satisfy certain criterion which includes their characteristics, form and location. Sassoon (1962:145) in explaining rock hollows associated with bloom refining posited that "*At a late stage in the lengthy process of making iron by local methods on the Jos Plateau, the core from the iron smelting furnace is pounded very thoroughly with a stone hammer in a rock depression"*. Shaw (1978), Jemkur (1990), David (1998), and Mangut and Mangut (2007) have also postulated that some rock hollows are products of cultural activities like grinding of cereals, threshing of beans, crushing of bones and pounding of bloom (Semi finished Iron) obtained during iron smelting.

Based on information from oral tradition that connects bloom refining and the creation of rock hollows, archaeological survey was carried out and rock hollows were identified along site slag heaps littered in Mahurum mainly in Tahang and on top of Ahurum hilltop abandoned settlement site. According to Akamang Mafulul and Chuwang Madung (2012,pers.com), the Mahurum rock hollows were created when bloom obtained from smelting was refined through pounding to remove impurities and the slag heaps discovered in close proximity with the rock

hollows were dust that were hammered out in the process of refining and thrown away which later solidified. This opinion by Akamang Mafulul (2012 pers.Comm) is in line with the research findings of Crew (1996:1) who posited that "The smelting of iron by the direct process results in a bloom, which must be refined to produce forgeable iron stock". Thus, based on oral tradition and archaeological investigation, the rock hollows are clearly an appendage of the iron smelting process of the area.

3.4.1 Rock hollows and slag heaps in Tahang

Forty nine rock hollows in association with slag heaps from refining of bloom were identified in different areas of Tahang hillock which have been designated into clusters 1-8. The Tahang rock hollows and iron slag heaps clusters are located between latitudes 9° 19" 34' and 9° 19" 40' N, and longitudes 8° 46" 22' and 8° 46" 34' E. A rock boulder in the westernmost part of the area on latitude 9° 19" 35' N and longitude 8° 46" 23' E was chosen as the datum point (Fig 8 pp 50).

Cluster one is located 28.8 meters south east of the datum point. There are four rock hollows in this area. The first set of the hollows are located 6m west of an extant compound belonging to Maren Agbangau on a rock outcrop that stretches north to south and the other two are located 1m away from the entrance of the compound which is facing north. The rocky outcrop is between a farm and the compound. There are several deposits of slag close to the rock hollows that are said to be discarded impurities that were hammered out of the bloom during refining and later caked on the rock surface. Two of the four hollows which are on the western part of the Agbangau compound were measured. The diameters of the hollows are between 35cm -60cm and their depths are 18cm-28cm.

Cluster two is located about 80m north east of cluster one. This area seemed to have been fenced probably during the period of refining of bloom because there are stones arranged from

the north western area to south west which seems to be sloppy. There is caked slag debris located about 1m from the hollow to the right. The hollows have diameters of between 52cm-60cm and depths of 16cm-20cm. (Plate 11 below).



Plate 11: Rock hollows and slag in cluster two at Tahang. The arrow is pointing at the slag and the fence is to the left

Cluster three is located about 118m north east of cluster two. There are two heaps of slags located in the northern and western parts. One of the hollows is surrounded by layered slag from north eastern to south western part. The heap in the northern part measured 87cm in height and covered an area about 3m in length. The diameters of the hollows in cluster three are between 23cm-47cm and depths of 9cm -12cm (Plates 12 and 13 pp 45).



Plate 12: Rock hollow and layered slag heap in cluster three at Tahang



Plate 13: Slag heap from refining of bloom in cluster three at Tahang

Cluster four is located about 80m directly south of cluster three. The cluster has three rock hollows and a heap of slag that has been divided into two because of a foot path that passes through it from the Akbangau's compound in the west to Akamang's compound in the east. The first half of the heap measured about 1.2m in height and covers an area of about 6.4m east to

west. The other heap towards Akamang's house measured about 1.1m in height and stretches about 1.7m eastward. The rock hollows on the other hand have diameters of between 43cm-44cm and depths of 6cm-8cm (Plates 14 and 15 below)



Plate 14: Rock hollows and Slag heap dissected by a footpath at Tahang



Plate 15: Other half of slag heap in cluster four. The ranging pole to the far left is on a footpath at Tahang.

Cluster five is located about 70m south east of cluster four. There are five rock hollows in this cluster. There is caked slag debris on the surface of the three rock hollows to the north and to the west. There are two slag heaps located about 6m to the south of this cluster. The slag heaps measure about 76cm in height and cover an area of about 5m. The rock hollows in this cluster have diameters of between 45cm-55cm and depths of 15cm-22cm (Plate 16 below).



Plate 16: Slag heap in cluster five

Cluster six is located about 12 meters from cluster five to the north east. There are four rock hollows and one slag heap in this area. The diameters of the rock hollows are between 40cm-60cm with depths of 15cm-20cm. (Plate 17 pp 48)



Plate 17: Rock hollows and slag heap to the left in cluster six

Cluster seven is located about 93 meters from cluster six to the north and about 18m west of Akamang's compound. There are nine rock hollows in this area and two heaps of slag. Seven of the rock hollows are on the southern part of the cluster on a rock platform that slants eastward while the other two are located 8m from the ones in the south. The rock hollows in this area are the largest so far studied. The first slag heap is located at the entrance of a rock overhang 2m away from the hollow on the southern side on a rock platform and about 48cm away from two hollows on a rock platform in the eastern side. The second slag heap is located 4.7m east of slag heap one on a rock platform that slants to the east and about 2m away from rock hollows to the north. The slag heap has a height of 32cm and covers an area of 2m east to west and 2.2m north to south. To the east of the slag is a cocoyam farm. The farm is gradually encroaching into the slag heap. The diameter of the rock hollows is between 45cm-68cm and a depth of between 10cm- 40cm. Some of the deepest rock hollows are found in this cluster (Plate 18 pp 49).



Plate 18: Slag heap in cluster seven. To the far right are two rock hollows.

Cluster eight is located about 62m north east from cluster seven and about 17m north from the Akamang's compound. The cluster is located on a footpath connecting the Akamang compound and a motor road to the north. There are 7 rock hollows on a rock outcrop and a slag heap to the south. The rock hollows have diameters of 30- 57cm and depths of 14cm - 28cm (Plate 19).



Plate 19: Slag heap and rock hollows in cluster eight

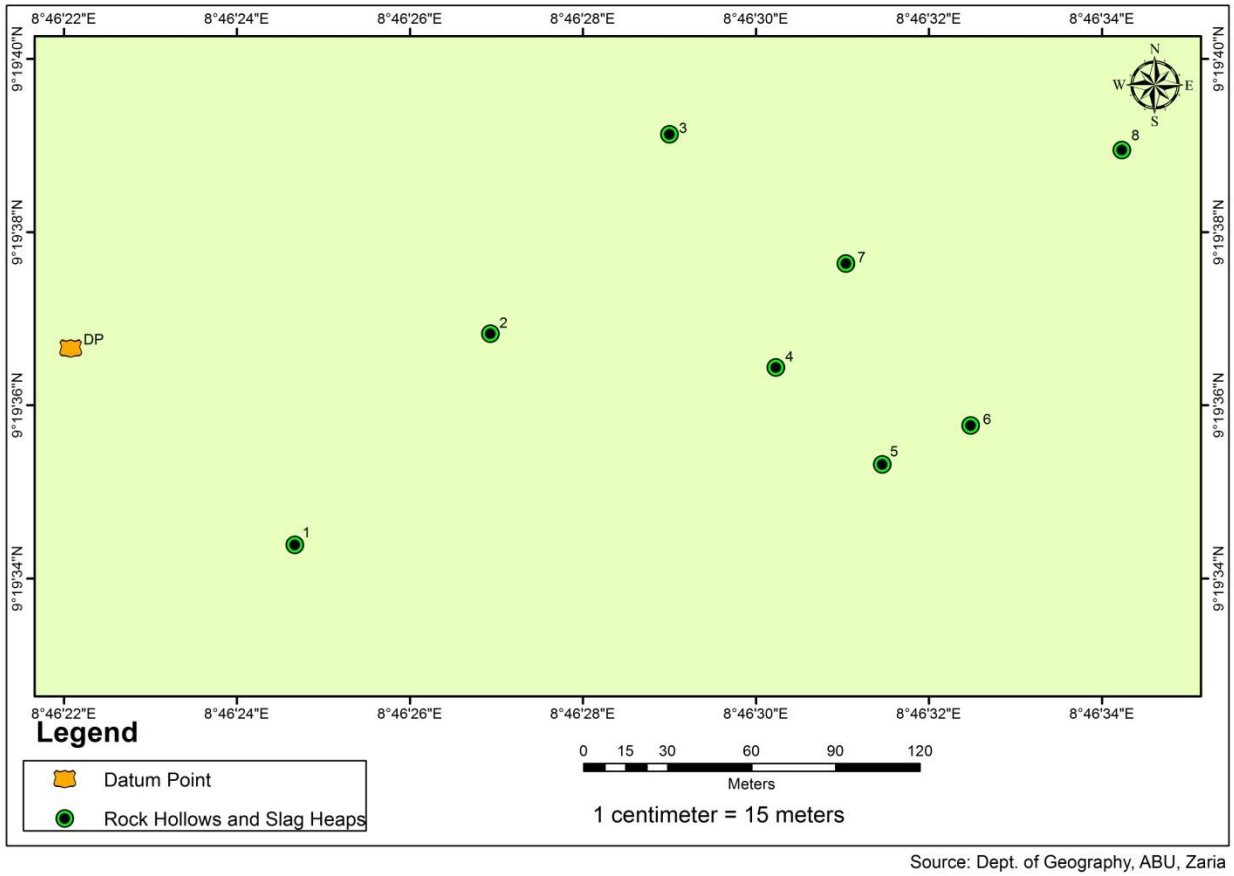


Fig 8: Rock hollows in Tahang.

3.4.2 Rock hollows in Mahurum hill

The site is located about 600m north east of Tahang town between latitudes 9° 19"52' and 9° 20" 02' N, and longitudes 8° 46" 54' and 8° 47" 2' E. Three clusters were identified located on the north western part of Mahurum hill close to habitation ruins. Cluster one is located about 25 meters northwest of settlement cluster one. There are eight rock hollows in this cluster and a slag heap that measures 94cm in height. The slag heap is located north of the first five rock hollows and the remaining three rock hollows are located on another rock platform 4m south of the five and the slag heap. The hollows in this cluster have a diameter of 20cm-53cm and a depth of 6cm-28cm. (Plate 20 pp 51).



Plate 20: Rock hollows and slag heap in cluster 1 at Mahurum Hill. Ranging pole is on the slag heap.

Cluster two is located 16 meters north-west of cluster one. This cluster has the highest number of pounding rock hollows numbering about fourteen spread out on the same rock platform that slants to the east. Slag is noticeable on the rock platform close to the rock hollows on the western side.

Cluster three is located about 14m from cluster 2 and 3m from an *Ambok* (*Ficus Sycamoros*) tree. About seven rock hollows were counted in this cluster but the researcher believes there are more on this rock boulder which has been covered by decayed fallen leaves of the *Ambok* tree (*Ficus sycamorous*) and grasses that have overgrown the area. There is iron slag heap to the west of the rock hollows which is said to have been deposited there during refining of bloom.

3.5 Mahurum hilltop abandoned settlement site

According to oral traditions, ancient Ahurum were the ones who carried out smelting including bloom refining in the Mahurum area. It is worthy of mention that early studies by Mangut (1986) mentioned that iron smelting was carried out not only in the Mahurum, but that it

was a wide spread occupation in the Manguna area. Thus, considering the substantial evidence of iron smelting in the *Mahurum* area both tangible and intangible, it became imperative to also study the settlement history of the Ahurum people that oral tradition linked with the smelting. Therefore, in the process, an abandoned settlement said to be the ancestral home of the Ahurum was identified which necessitated the study of finds and features found on the hill.

Mahurum hilltop abandoned settlement site is located in the north eastern part of Tahang hamlet between latitudes 9° 19" 52' and 9° 20" 02' N, and longitudes 8° 46" 54' and 8° 47" 2'E. From Tahang to the top of the hill is about one kilometre as the crow flies and probably two kilometres on foot through the south western footpath. To get to the abandoned settlement, one would have to take a footpath eastward to Manguna then turn north at a distance of about 600m. The hill is connected to a hillock in the southern part through a pass which incidentally is the pathway to Manguna. A flat rock surface that stretches from east to west located south east at the ascending point to the hill close to the first feature which is the stone embankment on latitude 9° 19"52' N and longitude 8° 46"48' was chosen as the datum point (Fig 9 pp 64).

Several circular foundations of stone which are said to be ruins of houses and granaries were identified. Other finds and features that were discovered in the abandoned settlement site are a monolith (which is a singular stone slab), elders sitting place called *Mareh*, workshop with an anvil, pounding stones, grinding stones, rock hollows and potsherds. One major issue about the abandoned settlement is the fact that the compounds are spread according to families and settlement hierarchy. This is because the compound of Acham Angbong family which is said to be the earliest settler on the hill is located on the north western part, an area more spacious and protected than the other two compounds as observed by this researcher. The second families that

are said to have arrived are the Pwol, and Kikim-Kuju clans. The third family is that of the Ahang Aboi which settled directly north. (Akamang Mafulul, 2012, Pers.com)

The hierarchy of the settlers is reflected in the symbolic names of the settled areas. The area where the Acham Angbong family settled is called *Talaf-A-Ban* meaning the big/high shrine and the area where the Pwol and the Kikim-Kuju families settled is called *Talaf-A- Jinik* meaning lower shrine

3.6.1 Finds and features on the Mahurum abandoned settlement site.

Finds

3.6.2 Potsherds

Potsherds were identified and collected from different areas of the abandoned settlement using simple random sampling method. All the settlement clusters in the abandoned settlement did not yield any potsherd with decorations. The only potsherds with decorations were discovered in rock crevices and rocky overhangs south west at the ascending point into the hill in an area called *Tai-A-Jakash* about 90m to rock hollows clusters 1 and 2. About 120 potsherds were collected from Tai-A- Jakash and other areas of the abandoned settlement (Plate 21 pp 54).



Plate 21: Potsherds in a rock overhang at Tai-A-Jakash at Mahurum hill abandoned Settlement

3.6.3 Stone hammers (Mute Ayii)

Seven stone hammers were discovered within the vicinity of rock hollows cluster 1and 2 on the Ahurum hilltop abandoned settlement site. The stone hammers are unusually heavy and look basaltic in nature which might have been from a riverine area. The Stone hammers have scars probably as a result of hammering of other objects. The use of stones as hammers in iron smelting in the Jos Plateau area has been reported by Sassoon (1962), Daze (1981), Jemkur (1990) and in the Sukur area by David (1998) (Plate 22 pp 55)



Plate 22: Stone hammers at Mahurum hill

3.6.4 Lower grinding stones (Fufunash ADuk)

Two lower grinding stones were identified. The first grinding stone was found in the north eastern part of compound two. The grinding stone is a rock boulder that has a depression in the middle and is said to have been used in grinding a soup recipe called *Mia*. The rock boulder has a diameter of 63cm and height of 8cm.The diameter of the depression on the boulder is 8cm and depth of 4cm.

A second lower grinding stone was identified 6m south east of grinding stone two. The grinding stone is said to have been used for grinding condiments like *Wanjang* which is a soup recipie and *Dambu* which is used in cooking gruel (*Afe*). The grinding stone has a height of 12cm, and depth of 5cm (Plates 23 and 24 pp. 56).



Plate 23: Lower Grinding stone 1 at settlement cluster two, Mahurum hill Abandoned settlement



Plate 24: Lower Grinding stone 2 at settlement cluster two at Mahurum hill Abandoned settlement

Features

3.6.5 Stone embankment

There is a stone embankment located about 620m north east of *Tahang* hamlet on the ascending point to the Ahurum Hill. The embankment is located 56.4m northwest of the datum point and is constructed with stones horizontally from west to east and measured about 53m. The height of the embankment varies according to the stones used but the area that was measured which is the middle of the wall is 1.1m.

There is an expanse of land to the north. Some of the stones that were part of the embankment have been disturbed due to erosion. According to Akamang Mafulul (2012 pers.com), the embankment was originally a defensive wall constructed for security reasons and as a gateway into the hill where a visitor must wait to be allowed into the hill settlement but when there was relative peace and the people in the abandoned settlement did not feel threatened any longer, the expanse of land surrounded by the wall was later converted to farm land and at a later period, the wall was enforced as a farm embankment (Plate 25 below).



Plate 25: Stone embankment at southern foot of Mahurum hill abandoned settlement. The entrance is located to the right from the second ranging pole.

3.6.6 Foot paths (Tarash)

Three major footpaths which meander into and out of Mahurum abandoned settlement site were identified. The first one is located at the south western part of the hill; the second one is located in the south eastern part. The third is on north western part which is directly on a steep that descends directly into the compound of *Ishaku Waje* close to Furnace site 2 (Plate 26 below).



Plate 26: The south western footpath into Mahurum hill abandoned settlement

3.6.7. Settlement cluster one

Settlement cluster one is located on the southern part of Mahurum abandoned settlement about 73m south of settlement two and 80m to the peak of the hill. The settlement is said to have been occupied by the Pwol, Kikim Kuju lineages. The settlement is characterized by several circular and sometimes disturbed house/granary and granary stone house foundations which numbered about 20.The compound stretches from west to east and directly on the south-eastern part is the pathway to the hilltop (Plate 27 pp 59).



Plate 27: Western Area of settlement cluster one at Mahurum hill abandoned settlement

3.6.8 Elders sitting area (Mareh)

This area is located in the eastern part of settlement cluster one. The area is said to have served as the *Mareh* (Relaxation area for elders) of the people of *Talaf-A- Jinik*. The Mare has stone slabs used as seats. The whole *Mareh* is round in structure and has 14 slabs which can accommodate up to 16-18 people at a time. The diameter of the *Mareh* is 3m (Plate 28)



Plate 28: Elders sitting area (Mareh) in settlement cluster one at Mahurum Hill Abandoned Settlement

3.6.9 Settlement cluster two

The settlement is located about 73m north of settlement cluster one. It is the largest in the abandoned settlement with over 60 mostly nucleated circular foundations of stone structures which are said to be ruins of houses/granaries (houses build with dome roofs that are used as granaries) and granaries among others. Settlement cluster two is said to have been the first to be established in the hill by the Acham Angbong family. The compound stretches from the north-west to the north east .The circular house and granary foundations of stone are more extensive at the north-western part than in the east. Some of the circular stone foundations have a diameter of 2m-3m (Plate 29).



Plate 29: North western part of settlement cluster two at Mahurum abandoned Settlement

3.6.10 Ambok Tree (*Ficus sycomorous*)

There is an *Ambok* tree located about 18m south west of the stone structures said to be the habitation ruins within compound two and just about 7m from rock hollow cluster 2 and 3m from rock hollows cluster three

This tree is tall and may be about 20-25 meters and it has a wide canopy cover. The *Ambok* tree can be sighted from areas like Manguna, Zayau, Zakarek, Shumush, Fiis, Ankwil among others. This tree is very significant in the cultural practices of the people of the Ahurum because the people normally plant the *Ambok* tree for the value of its canopy for shed and for hanging newly harvested farm produce especially Millet, Guinea corn and in later period Maize. The Ambok tree is normally found in abandoned settlements and also in contemporary compounds. The *Ambok* tree is to the Manguna people what baobab tree is to most people in the Sahel Savannah. Accordng to Akamang Mafulul (2012, Pers.com), this particular Ambok tree is almost 200 years old and has never been felled because it is considered sacred (Plate 30).



Plate 30: The *Ambok* tree

3.6.11 Workshop (*Puk A-Duk Muan)*

An area said to have been a smithing workshop containing a forge was discovered 6m east of rock hollows clusters 2 and 3 south of the western part of settlement cluster two. The workshop has round stones which are said to have been the foundation of a collapsed structure. It has a diameter of 4m.There is a stone boulder situated 70cm to the eastern wall of the workshop which

is said to have served as the anvil on which iron implements were hammered. The anvil has a height of 57cm and a diameter of 68cm. There is an opening to the north which is said to have been the door to the workshop (Plate 31)



Plate 31: Ruins of a smithing Workshop at Mahurum abandoned settlement. The horizontally placed ranging pole is on the anvil.

3.6.12. Monolith (*Achef*)

A monolith was discovered in the extended western part of settlement cluster two. Monoliths are usually erected in the *Manguna* area for reasons ranging from ritual, butchery and relaxation for elderly people. Oral tradition could not state whether the monolith was broken out of a larger parent rock or it was found in its present nature and then erected. The monolith in the extended part of settlement cluster two is said to have been that of butchery where big games that are hunted were butchered and shared. The height of the monolith is 82cm (Plate 32 pp 63).



Plate 32: Monolith in the eastern part of settlement cluster two at Mahurum Abandoned Settlement

3.6.13 Settlement cluster three

This compound is located on the north eastern slope of the hill about 70m from compound two. The compound has less than 9 circular stone structures which are said to be foundations of houses and granaries. Some of the circular stone structures measured 3m - 3.2 meters (Plate 33)



Plate 33: House foundations in settlement cluster three

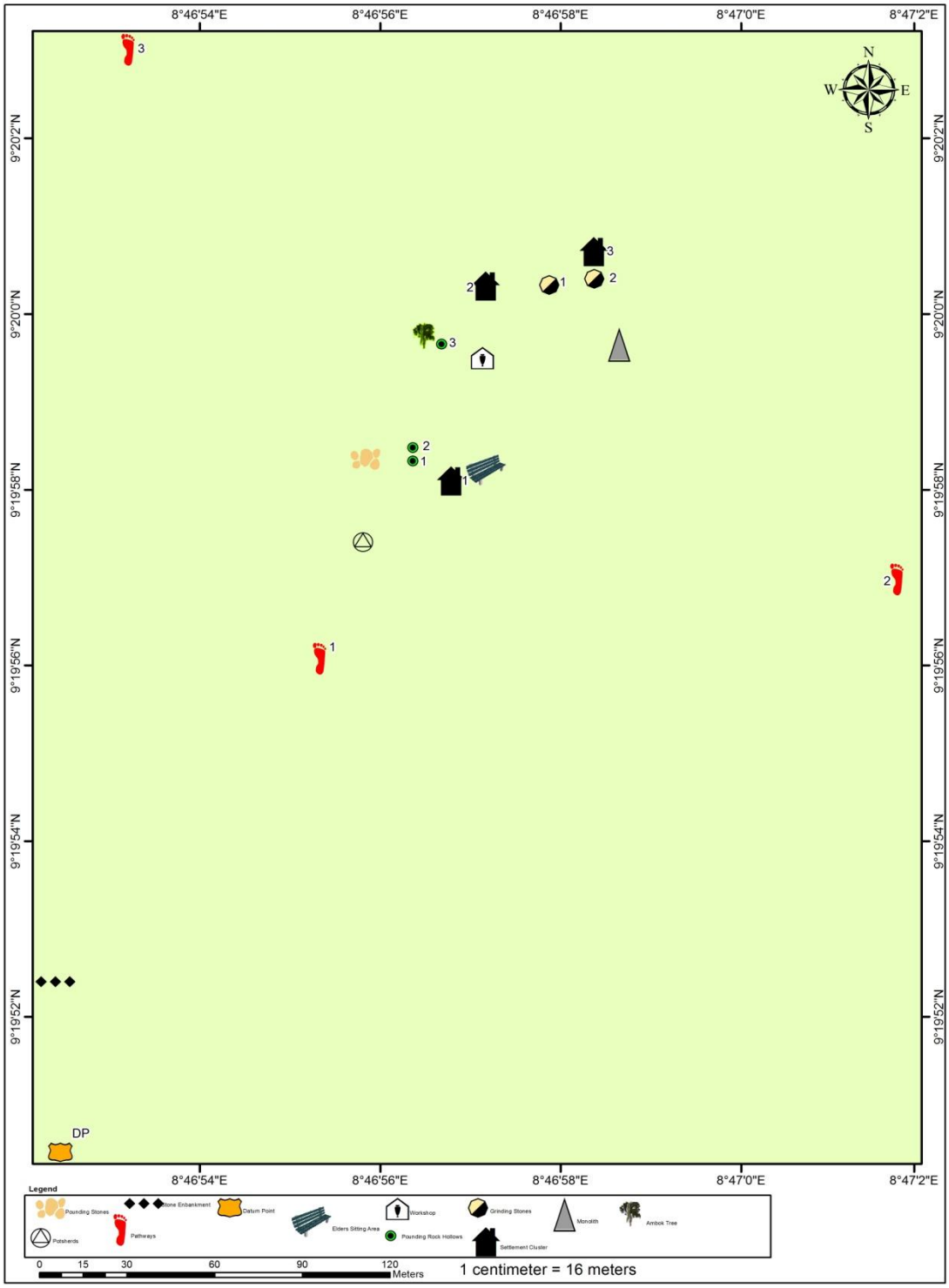


Fig 9: Mahurum Hill abandoned settlement site. Source: Dept. of Geography, ABU Zaria

CHAPTER FOUR: ORAL TRADITION ON THE PROCESSES OF ANCIENT IRON SMELTING IN MAHURUM

4.0 Introduction

In the quest to have a wide understanding of the evidence of iron smelting in the Mahurum area, it was also imperative to seek for further explanation on how iron was smelted. Hence, as earlier stated in (pp 7-8) on the efficacy of oral tradition and how it has been utilized in this research, oral information was obtained during the research which reveals vestiges of how iron smelting was conducted in the Mahurum area as a sequential activity from procurement of raw materials to construction of furnaces and tuyere, smelting of iron and finally refining of the bloom; a process that is also said to have created rock hollows. Below is the information on iron smelting in the Mahurum area in ancient times as given by some of the listed informants (Appendix11 pp 125).

4.1 Procurement of raw materials

4.1.1 Iron Ore *(Hurte/Ayai a Duk Muan)*

Iron ores are iron bearing rocks. Ores are found in abundance in the Mahurum area and in most of Manguna district. From physical observation, the ores found in Mahurum are mostly haematite. According to Akamang Mafulul, (Pers.comm. 2012), iron ores were mostly obtained by digging from several areas especially hills or plains that have large deposits. The procurement of ores is said to normally start with the identification of large and suitable ore deposits after which the ore will be mined and then taken to the smelting site. The ores were most times collected using a basket but the larger lumps were collected singularly. The collection of ore was only done by young initiates that have been circumcised called ***Unon- a fia*** in the company of an elder possible chief smelter who identifies the ore. Because of the availability of the ores on the

surfaces and some located near stream beds, the smelters hardly needed to continue to dig a particular area to obtain the ores. The ores will be broken into smaller pieces after been collected and washed thoroughly before they are fed into the furnace along with the charcoal. This might have been done in order to remove impurities that may contaminate the ore which may affect the smelting.

4.1.2 Charcoal (*Ang'gaa*)

Charcoal was the major fuel for smelting of iron. Without charcoal probably there would not have been an effective way of generating enough heat that could melt the ores. In the Mahurum area, charcoal procurement started with the felling of the identified species of trees that were considered ideal for smelting based on some considerations ranging from slow burning and their availability within the Mahurum environment. According to Akamang Mafulul, Mahanan Mangam and Chuwang Madung, (2012 pers.comm.), different trees were used for charcoal. These include (Aroll*), Terminalia spp*, (Arawe), *Syzygium guineanse*, and (Agiri) Acacia among others which when felled will be cut into average sizes of 60cm and then a pit like a grave will be dug. The logs will be lined inside the hole with an infusion of *Ashel* which is hay obtained after the harvesting of acha (*digitaria exilis*) then fire will be lit which will burn for about 20 minutes. According to Akamang Mafulul (2012, Pers.comm), the charcoal was not in any way purchased because of the availability of the trees to be used for producing it. Once it is realised by the master smelter that the logs have burnt enough to produce charcoal based on the reduction of burning and the colour of the smoke which will automatically change from dark to greyish-white, the fire will be extinguished using either water when it is necessary but in most cases, green leaves will be cut and then flapped on the fire. The charcoal will be allowed to cool down

after which baskets were used to pack the charcoal to the nearest rock shelter for safe keeping until when it is to be used for smelting.

It was observed that the trees used for fuel shows that the trees identified (plate 34 pp 67) were preferred against other trees that are huge and can provide more charcoal. All the trees that were shown to this researcher as the preferred ones, grow in rocky areas or plains which means they can survive without much water which means the water intake of the trees was minimal hence this could have impacted on their slow burning nature. Aroll Terminalia spp one of the trees can be cut fresh and wet then instantly burnt to produce charcoal (Plate 34 below). Trees with similar characteristics have been reported by Longkat (2007) to have been utilized in iron smelting.

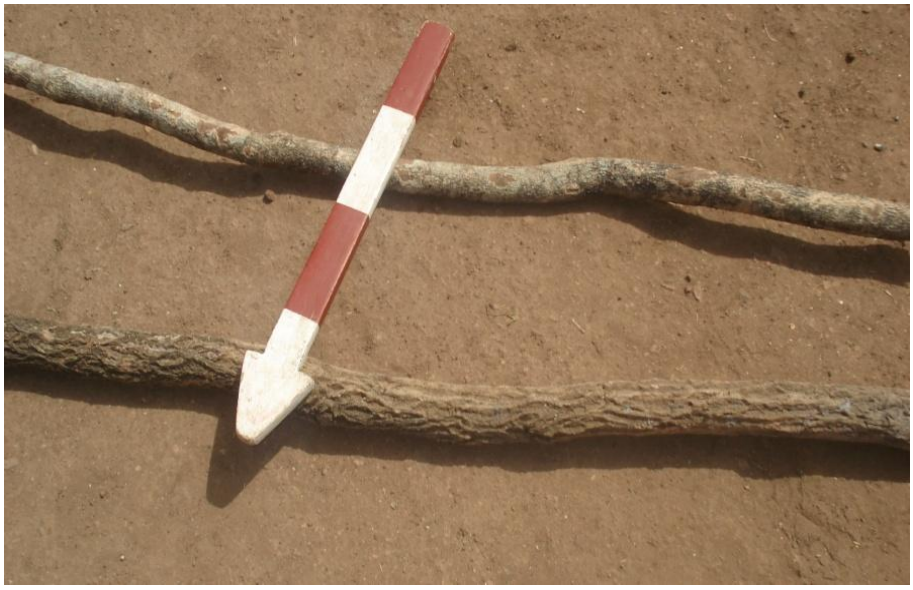


Plate 34: Stems of *Aroll* and *Arawe* trees. (Through the direction of the arrow, Aroll is on the arrow head and Arawe is to the north).

4.2 Smelting apparatus

4.2.1 Furnaces (*Mulesh*)

Furnaces which are called ***mulesh*** in Manguna Language are shaft cylindrical clay constructed structures. According to Akamang Mafulul, (2012, Pers. Comm.), the construction of the furnace was only done by skilful craftsmen and and involved some rituals. The construction normally starts with the designation of the area close to a stream that will be the smelting site. The choice of areas close to streams for iron smelting according to Akamang Mafulul and Madung Chuwang (2012.Pers.Comm), was because of the need for construction of furnaces, accessibility to water for the convenience of washing of ores before feeding them into the furnace to remove impurities which may affect the smelt and also for removal of the bloom because in those days, apart from clay pots, there were no containers to fetch water with and larger pots were too delicate to be moved when filled with water considering the fact that they can break. Therefore, these may explain the reasons why most furnaces in central Nigeria have been discovered close to streams. (Jemkur 1989; Abubakar 1988)

After the identification of a suitable area close to a stream, a pit of up to 40cm or more will be dug then the construction will start by digging preferably brown soil and in most cases termite mound was preferred because they believe termites normally mixes soil with grasses which makes it stronger. The soil will be soaked and allowed to absorb the water till the following day. On the following day, the soil will be mixed with *Ashel*(hay from acha hungry rice- *Digitaria exilis*) by treading on it with the feet. After the mixing, the furnace will be erected using the homogenous mass. The furnace will then be erected using coiling method whereby the homogenous soil mass will be moulded into coils and will be used as the foundation after which each successive layer will be built from the coil. It normally takes three to five days to build the

furnaces by constructing just four to five layers of the furnace in a day. Normally, half of the height of the furnace will be built and allowed to dry before another layer is added the next day. At the end of the construction, the furnaces normally stand at 1-2m in height and the thickness of the wall can be 3-8cm.This measurement was given by informants through hand demonstration. After the construction, some rituals will be performed which involved using a chicken for sacrifice and burying of charms for a good smelt at the bottom of the furnace for the purpose of protecting the furnace against evil spells that may hamper the smelting.

4.2.2 Tuyere (*Atinin-A-Mulesh*)

Tuyere is called ***Atinin-A –Mulesh*** in Manguna language meaning nostrils of a furnace. They are called nostrils because they take air to the furnaces for proper smelting just like humans breath to live. In order to create enough droughts in the process of smelting, a functional tuyere was very necessary. The tuyere is the pipe or channel that is used to pump air into the furnace in order to generate the necessary temperature for the iron ore to melt and separate bloom from slag.

For the Mahurum smelters, construction of the tuyere usually starts with the selection of a bamboo trunk that will be used for the initial construction of the tuyeres based on its size. When the bamboo is obtained, a knife will be used to reduce the outward part of the bamboo into a nozzle. Once that is done, the bamboo will be coated with clay that has been mixed with *Ashel* (hay obtained after harvesting *acha* Hungry rice *Digitaria exilis*) to the preferred thickness and length. According to Chuwang Madung, (2012, Pers. Comm..), many tuyeres more than required at any point of smelting were usually constructed so that if any of the tuyere fails, they can be easily replaced for the smelting to continue. Once the construction of the tuyere is accomplished, the bamboo will be removed by hitting it from the nozzle point when the tuyere is at leather hard

stage to prevent it from cracking or breaking after which it will be left to dry waiting when smelting will take place. When using the tuyere for smelting, it will be inserted into the furnace after attaching skin bellows at the larger end of sticks of about one meter for eventual pumping of air into the furnace. No tuyere was discovered during archaeological survey (pp 32-40).

4.2.3 Skin Bellows

According to oral tradition, bellows were made using goat and sheep skin. The skin was normally obtained from slaughtered goats or sheep by removing it whole without cuts on the hide and then it is sewn into a round object. Then sticks are attached to the skin which when bellowing, will be pulled backward to collect air, and pushed forward to pump the air into the furnace via the tuyere which the bellow is tied to. Bellowing air into the furnace is said to have been an activity that was given to young people under apprenticeship. Anybody can do bellowing provided he does it correctly and can endure long hours of work.

4.3 Smelting of Iron-(*Duk Muan*)

Smelting in Mahurum was the stage at which the ores were heated to a certain temperature which melts and reduces the ore to two separate elements which are bloom and slag. As earlier mentioned, four major processes were the necessary requirements to smelting; ores were the major ingredients in this iron smelting technological activity; fuel in form of charcoal, tuyere/bellows and the smelting structure which is the furnace where the smelting takes place. According to Chuwang Madung (2012, Pers. Comm.), before the smelting begins, the smelters will be asked not to (*duk Nguni*) grind sesame seeds which is a euphemism for sex. This means to abstain from any sexual activity. Women were generally forbidden from going to smelting areas because it is believed they have strong spirits that can hamper good smelt and stronger

emphasis was placed on women menstruating. Smelting was normally done from mid-January when there was no farming activity because there was no irrigation farming. Rituals were performed with emphasis not only about the smelt but even the area where the smelting is taking place must undergo some cleansing. Thus, the first step to smelting after the rituals was usually some form of preheating which involved the use of *fellel* which is a bunch of *Ashel* (hay from *acha Digitaria exilis* Hungry rice) which will be lit and then the burning *ashel* will be inserted into the furnace then it will be moved inside in all directions. After this act, the tuyere will be inserted into the furnace then the broken ore and charcoal will be fed into the furnace in alternating layers i.e. the smelters will put the ore in the furnace then put the charcoal and then the ore. The feeding of the furnaces with the charcoal and ore will be done continuously until the furnaces are filled to the brim after which the fire will be lit and intense bellowing will commence. Ahmadu could not confirm whether charcoal or the ore was fed into the furnace first.

The informant could not give the precise or approximate time that the smelting must last for the bloom to be obtained but he said he was told that bellowing normally start in the morning lasting till evening. The smelting was an activity for any willing person. It was also mentioned that people used to come from Sha and Gwande which are areas about 10-15 km south west of Mahurum to join in the smelting after which they will cart their bloom home for a secondary smithing in exchange for palm oil which they normally brought with them when coming to Mahurum probably after the purchase of the palm oil from the Mam*a* or the kulere people. Manguna and Sha were earlier mentioned by Mangut (1986) as the only iron smelting areas in the whole of *Ron* land. According to the informant, in the process of smelting, if any one amongst the smelters sneezes, that is an indication that the smelt will be a good one. This could

be the stage at which the bloom normally grow and then interfere with the air blast hence causing sneezing as mentioned by Crew (1996).

4.4 Refining of Bloom (Duk Chef)

Refining of bloom in practical terms can be considered as the last part of the Mahurum iron ancient smelting process. According to Akamang Mafulul and Madung Chuwang (2012, Pers.comm.), bloom retrieved after smelting was heated and then beaten or pounded to remove the slag attached to it in order to work it into a saleable and useable iron billet because the bloom was usually extracted from the furnace along with the slag . The bloom refining on rock surfaces is said to have created rock hollows which were identified on Tahang hamlet and on top of Ahurum hill (pp 42-51). Therefore, after the bloom had been fired and the impurities are hammered out with stone hammers, the slag which was in dust form will then be scooped and thrown away in which it will solidify and cake. This may explain the presence of heaps of slag found in association with rock hollows in Tahang and Ahurum hill. Similar process of refining of bloom associated with rock hollows in other areas of the Jos Plateau was earlier reported by Sassoon (1962), Shaw (1978), Jemkur (1990) Longkat (1995) and Daze (1991).Thus refining of the bloom was the final phase of smelting until the billet is sold to smiths.

According to Akamang Mafulul (2012, Pers.Comm.), in the Mahurum area, smelters were not necessarily smiths hence in most cases, the refined iron was sold to smiths in other places like Sha, Gwande, Karfa, Hurti, Daffo among other areas.

4.5 Decline of iron smelting in Mahurum

Traditional iron smelting is no more carried out in the Mahurum area and oral tradition could not state the definite reasons and period for the decline apart from the fact that some of the

informants claimed iron smelting declined during the period of their parents. But this researcher is of the opinion that the decline of Iron smelting in Mahurum could have been in the late 1800s considering the fact that Akamang Mafulul, Madung Chuwang (2012 Pers. Comm.) claimed their parents smelted iron and both of them are above eighty years old.

The decline of iron smelting in Mahurum could have been caused by many factors. Some of the factors could have been changing attitudes on the purchase of iron implements especially arms with adverse effect on smelting. For example, the Ahurum and also other people in Manguna district had the practice of tying knives on their waists. This practice is said to have evolved during the turbulent days of slave raiding during which every man was expected to defend himself but with the abolition of slave trade, the practice waned thereby denying the smiths a high percentage of purchases of knives and other war iron tools like spears by the people. This invariably might have cut down much of the sales of the iron implements from the smiths and it directly affected the purchase of iron billets from the smelters.

In addition, in the Mahurum area and elsewhere, hunting was a communal act and a lot of iron hunting tools like spear and arrows were expended and not recovered during hunting. Therefore, the hunters would get new hunting iron tools from the smiths to replaced the ones irrecoverably used during hunting hence this kept the smiths and the smelters busy in their production. But this changed with the decline in games because of expansion of farms into animal habitats, the use of iron traps that did not need to be replenished frequently like arrows and spears. Also, hunting generally as a vocation also declined which translated into less purchase of iron objects. In addition, agriculture was a growing trend characterized by the introduction of different varieties of crops. Some of the new crops especially maize can better be cultivated with more efficient tools hence the Ahurum adopted the long hoe for which the

smelters could not produce a wide billet for the smiths to produce the blade nor the rod. This shortfall in the upper lower blade and the rod might have influenced the preference for the long hoe possibly from neighbouring areas like Birom land to the north or imported iron by smiths of the area.

But generally speaking, different reasons have been given for the decline of iron working in Sub-Saharan Africa (Schmidt 2005; Kense and Okoro 1993; Okafor 1995). One of the causes is said to have been attributed to cheap imports from Europe which discouraged local production (Flint, 1974). Goucher (1981) and Haaland (1985) on the other hand attributed the decline to the depletion of the vegetation which adversely affected hardwood supply used for smelting. The opinion by Gaucher and Haaland has been supported by Okafor (1995). Pole (1982) considers socio- economic factors, price, the tedious nature of African iron smelting as been too labour intensive hence it was abandoned. But looking at these factors advanced for the decline of iron smelting in Sub- Saharan Africa by the aforementioned scholars, influx of imported iron nor the environmental factors may not have wholly caused the decline in Mahurum. Therefore, factors for iron smelting decline in Africa could have varied within time and space; Factors that might have influenced decline in one area may not be entirely applicable in other areas. This assertion is evident in the fact that iron smelting is said to have survived up to the 1960s in the Sukur area where the people rejected imported iron as inferior (Sassoon 1964; David 1998). Also, studies in the Nsukka area shows that iron smelting continued up to the 1950s (Okafor 1995).

4.6 Decline of smithing in Mahurum

According to oral tradition, the Ahurum did practice iron smithing. But smithing is said to have declined and eventually became extinct more recently than iron smelting because of the establishment of the National Electricity Supply Corporation (NESCO) in Kurra Falls about five

kilometres north of Mahurum. The company is said to have had a foundry as one of its departments where the company's spare parts were fabricated and its services especially forging, welding and sharpening of iron implements was opened to the public hence it took away the customers of the local smiths. Thus, working on a hoe which could take five hours for a local smith was being performed in the NESCO foundry with much efficiency in 30 minutes from welding and sharpening hence the *Mahurum* people, including people from adjoining villages abandoned the patronage of traditional smiths and this pushed the local iron smithing industry to its demise just like the smelting industry before it.

CHAPTER FIVE: CLASSIFICATION AND ANALYSIS OF FINDS AND FEATURES

5.0 Introduction

Classification and analysis is the process of arranging archaeological data into groups or classes based on certain shared attributes, and the separation of archaeological data into its constituents in order to illustrate what the archaeological material looks like, what it contains, where it comes from among others. Classification and analysis is also geared towards examining individual parts, or to study the structure of the whole (Sharer and Ashmore, 2003; Balme and Paterson, 2006).

In general, archaeologists normally strive to understand through classification and analysis three major attributes of artefacts which are stylistic attributes, form attributes and technological attributes (Andah and Okpoko, 1994).

5.1 Lithic Materials

Stone is one of the most utilized natural resource in the archaeological context. The utilization of stone as a tool and also as by-product of use is said to predate the evolution of modern homo-sapiens (Joukowsky 1980; Sharer and Ashmore, 2003). The use of stones as hammers in iron smelting in the Jos Plateau area has been reported by Sassoon, (1962), Daze (1981), Jemkur (1990) and in the Sukur area by David (1998). Lithic materials were amongst the finds discovered in Mahurum which are chiefly stone hammers, monolith and lower pounding stones.

For the stone hammers, according to oral tradition, they were used for pounding of bloom to remove impurities after smelting because in ancient times, there were no iron hammers. The stone hammers are unusually heavy and look basaltic in nature which might have been from a riverine area. The Stone hammers have scars probably as a result of hammering of other objects.

For the two lower grinding stones, they are small stone boulders with round depressions which are said to have been achieved by grinding activities.

The monolith on the other hand is flat and is wider at the base than at the upper part. Oral tradition could not state whether the monolith was broken out of a larger parent rock or it was found in its present nature and then erected.

Table 1: Summary of Lithic Materials

S/N	LITHIC TYPE	QUANTITY	PERCENTAGE	TOTAL
1.	Lower grinding stones	2	20%	2
2	Stone hammers	7	70%	7
3	Monolith	1	10%	1
		Grand total	100	10

5.2 Furnaces

Twenty one furnaces were identified in three areas designated as clusters A-C. All the furnaces are constructed with mud and 17 of the furnaces still have residues of slag in them. The furnaces are free standing and they have the characteristics of a shaft furnace (Anozie 1979). Cluster "A" has one twin furnace, cluster "B" has a furnace structure that stretches up to 1.8m which could be that the furnace broke during smelting and poured out its molten content, and cluster "C" also has a twin furnace. The reason behind the nature of this furnace relic was not concretely established but it could have been a furnace that broke during smelting and poured out its molten content. The twin furnace on the other hand could have been constructed that way so that one person can bellow the two furnaces at the same time. The slag found in the furnaces is shiny-black. There are stones in the middle of furnaces 2 and 3. Though the presence of the stones in

the furnaces could not be explained, it looks as though the stones were either used as a foundation, were used to hold the slag so that the bloom will not be pushed too deep into the furnace or were later introduction into the furnace after smelting and not meant to serve any purpose.

Table 2: Summary of Mahurum furnace structure

S/N	**CLUSTER 'A'**			**CLUSTER 'B'**			**CLUSTER 'C'**		
		Qty	**Percentage**		**Qty**	**Percentage**		**Qty**	**Percentage**
1	Single	4	67%	Single	3	100	Single	10	83
2	Multiple	2	33%				Multiple	2	17
	Total	6	100		3	100		12	100
Grand total		**21**							

5.3 Rock hollows

The rock hollows found in Mahurum fit into the description of circular rock depressions found on rock surfaces as described by Shaw, (1978), pounding grooves as described by Sassoon (1962), holes as described by Jemkur (1989) and mortar basin hollows as described by David (1998). Most of the rock hollows discovered during the research have flared openings but rock hollows in cluster seven have flared rims but do not have inflections, and rock hollows in clusters one and two in Ahurum hill have flared rims with narrow bases without inflections. While rock hollows with flared rims have a bell-like nature, those without flared rims have narrow bottoms.

5.4 Mahurum abandoned settlement site

The Mahurum abandoned settlement is characterised by stone structures which are said to be ruins of houses, granaries and walls that were constructed linking one mud structure to another.

One major issue about the abandoned settlement is the fact that the settlement clusters are located according to settlement hierarchy and family ties. This is because the Acham Angbong family which is said to be the earliest settler on the hill is located on the north western part of the hill in settlement cluster two, an area which is more spacious and protected. The second families that are said to have arrived are the Pwol and Kikim-Kuju who settled in the south western part of settlement cluster one. The third family is that of the Ahang Abwoi which settled in settlement cluster three directly north east of settlement cluster two.

Also, the hierarchy of the settlers is reflected in the symbolic names of the settled areas. The area where the Acham Angbon family settled is called Talaf-A-Ban meaning the big/high shrine and the area where the Pwul and the Kikim-Kating families settled is called Talaf-A- Jinik meaning lower shrine.

All the foot paths leading into and out of the Ahurum abandoned settlement site meander in one form or the other. The footpath located at the south western part is said to have been the most traversed. This might be because the major industrial site which is where most of the rock hollows and slag from bloom refining are located in the south west. Also, Hurti is located south of Mahurum and Dambwash is to the south-west hence the Ahurums' interaction was mostly with these two villages hence it prompted the use of the south western routes more than others. Another possibility is that the footpath in the south western area is more accessible to a stream which might have been the major source of water hence the people normally use the route to fetch water and to their farms. It should also be noted that some of the footpaths might have been too strenuous to traverse especially the one in the north eastern part of the hill.

5.5 Pottery Classification

Pottery was the first synthetic material humans created and it is said to combine the four basic elements identified by the Greeks: earth, water, fire and air. Pottery is one of the many materials within the large sphere of ceramics (Rice, 1987). It also forms the largest body of artefactual evidence recovered from archaeological sites largely because of its durability and abundance coupled with great variety of forms and decorations which are of great importance to archaeologists.

According to oral tradition, the Ahurum never had pottery making tradition but usually purchased their pottery wares from the Wamba area to the west, Sura area to the east and Mangar area to the south east (Akamang Maful, Uvuat Mallo, 2012, Pers. comm.)

A total of one hundred and twenty potsherds were randomly collected from the surface from different points of the three settlement clusters of the Mahurum hilltop abandoned settlement site. But one major concern is the fact that out of the one hundred and twenty potsherds collected, fifty seven are from the abandoned settlement and none have decorative motifs. The potsherds with decorative motifs came from areas that are less exposed especially rock overhangs found south west of the abandoned settlement on the ascending path to the hill. Thus, classification of potsherds from the Mahurum hilltop abandoned settlement site was diligently done in the following categories;

i. **Paste Characteristics:** This looks at the paste constituents which include clay inclusions, hardness, colour among others.
ii. **Vessel Parts:** This addresses the sorting of potsherds according to which part of a pot they belong to.
iii. **Surface Finish:** This looks at how the pot was finished during manufacture

iv. **Vessel Forms:** This looks at the pottery forms in order to determine their morphology and by extension whether they belonged to a pot, bowl or any other vessel.

v. **Decorative Motifs:** This looks at the different decorations on the potsherds and how they could have been achieved.

5.6.1 Paste Characteristics

In analyzing the potsherds collected from Mahurum abandoned settlement site, attention was also given to paste characteristics which are also known as ware-fabrics. The study of paste characteristic can help the archaeologist understand the combination of clay and tempering elements especially the type and shapes of inclusions and their density (Joukowsky1980).

Generally, the analysis of paste characteristics can yield better results when carried out in the laboratory using specialised machines but there are aspects that can be diagnosed by observation. From physical observation, the noticeable inclusions in most of the potsherds are quartz granules and mica but more specialised analysis like thin sectioning and computer analysis of cores among others can help us understand the pottery fabric.

5.6.2 Vessel Parts

In furtherance of classification and analysis, attempt was made to identify from the total potsherds collection the different parts of pottery as represented by the potsherd which could reveal the nature of pottery and any other ceramic ware that might have been used in the area. Therefore, out of the one hundred and twenty potsherds collected from Mahurum abandoned settlement site, there were ten rims. One of the ten rims has a handle attached to it. Thus, all but one part of pottery is not represented in the total potsherd collection which is the neck. From the

inventory, it is obvious that body parts make up the majority of the total collection followed by rims with base and handle trailing behind.

Table 3: Summary of Vessel Parts.

S/N	Vessel Parts	Quantity	Percentage
1	Body	108	**90%**
2	Rim	10	8 %
3	Base	1	1 %
4	Handle	1	1 %
	Total	**120**	**100**

5.5.3 Vessel Forms

The classification and analysis of pottery cannot be complete without an articulate study of the Vessel forms. The study of pottery forms involves the identification of rims which are the outer edge of pottery vessels located within the orifice to which the neck or body is attached depending on whether the vessel is a pot, jar or bowl. This helps the archaeologists understand the descriptive and predictive framework for establishing what particular class of prehistoric vessels looks like and how they might have been used (Rice, 1987). The study of vessel forms through their morphology undoubtedly helps the archaeologist understand the vessel type, size and in some cases the function.

The classification and analysis of potsherds collected from Mahurum abandoned settlement site was carried out through the sorting of potsherds according to body parts, identifying rim forms, charting of the rims profiles with emphasis on the type of rims and also

establishing the diameter and thickness of the rims. Out of the ten rims analyzed, there were six rims belonging to the pot category, three belong to bowl and one is that of a jar.

5.5.4 Rim Forms

Out of the ten rims studied, six fit into the pot form description. The six rims were analysed based on their identifiable characteristic forms and their details are presented below:

Form 1: Form one indicates a pot with everted rim and round lip. The form has vertical fine string roulettes. The diameter of the pot measured between 18cm and a thick wall of 1cm-1.2mm. There are two pots in this category (Form1 fig 10 pp 85).

Form 2: Form two indicates a pot with a slightly everted rim and a tapered lip. The diameter of the pot is 24cm with a wall thickness of 1cm. There are three pots in this category (Form 2 fig. 11 pp 86).

Form 3: Form three indicates a pot with straight rim and a round lip. The diameter of the pot is 22cm and a thick wall of 1.2mm. There is one potsherd in this category (Form 3 fig. 12 pp 87)

Bowl Form

In pottery analysis, a bowl is normally determined through its rim diameter which is usually more than the bowls height. Only one rim that indicates bowl forms was identified in the total rim collection.

Bowl Form 1: This form indicates a bowl with inverted rim, a flat lip and an internally rim-lip protrusion. The rim diameter is 12cm with a thick wall of 1.4mm (Form 4 fig. 13 pp 88).

Jug Form

Form 1: This form indicates a jug with a slightly everted rim and a flat lip. The rim diameter is 18cm with a thick wall of 1.8cm. The jug is decorated with fine string roulette and a notch on the handle possibly for finger grip (Form 5 fig. 14 pp 89).

Table 4: Summary of Rim Forms

S/N	RIM FORMS	QTY	PERCENTAGE
1	Pots	8	80
2	Bowls	1	10
3	Jug	1	10
	TOTAL	**10**	**100**

5.5.5 Surface finishing

Surface finishing is the technique or final retouch potters normally adopt in order to give pottery wares a surface luster. This involves a variety of procedures when the pottery vessel may be partially dried or partially rewet (Rice 1987). Some of the finishing methods include trimming or fettling to cut away excess clay imperfections when the ware is at leather hard stage, scrapping to thin walls and remove surface imperfections especially from potteries constructed through coiling system and burnishing which entails rubbing back and forth with a smooth hard tool like pebble, bone, seeds or any other tool that can rightly serve that purpose. One of the hall marks of burnishing is that it leaves its signature on the vessel in terms of back ward and forward streaks.

The potsherds collected from Mahurum hilltop abandoned settlement site shows evidence of burnish finishing through horizontal strokes as observed on the potsherds. Out of the one hundred and twenty (120) potsherds collected and analyzed, burnished decorated potsherds numbered twenty (20) while burnished undecorated are forty (40). Unburnished decorated numbered fifteen (15), while unburnished undecorated numbered forty five (45)

Table 5: Summary of surface finishing

S/N	SURFACE FINISH	QUANTITY	PERCENTAGE
1	Burnished Decorated	20	17 %
2	Burnished Undecorated	40	33 %
3	Unburnished Decorated	15	12.5 %
4	Unburnished undecorated	45	37.5 %
	Total	120	100%

5.5.6 Decorative motif

These are surface embellishments which can be designs, impressions or additions made on pottery vessels when they are at leather hard stage. Some scholars see difference between decorations, impressions and motifs (Joukowsky 1980). Joukowsky describes impression on pottery as indentations created by pressure. Decorations on pottery vary according to cultures and functions of the vessel. Sometimes, the decorative nomenclatures are used interchangeable (Joukowsky 1980; Price 1987). There are several types of pottery decorations which can be achieved through the use of different tools and techniques. Some of the decorations includes roulettes which can be carved roulettes, string roulette, cord roulette twisted fibre roulette among others which are usually achieved by carving an impression , plaiting/weaving a fibre or using a mat which will be rolled on the pottery at leather hard stage; incisions which are achieved with the use of any sharp object, grooves which can be achieved with the use of an object with a blunt point, punctuates which involve punching of a vessel at a leather hard stage with a hollow tool, stamping which is normally achieved with a bunch of objects especially sticks, brooms and a host of other decorations inter alia.

From observation, the most common decorations on the potsherds found in Mahurum are roulettes, incisions, grooves and punctuates. Out of the 35 decorated potsherds, 16 (45.7%) have single motifs and 19 (54.3%) have multiple motifs.

Table 6: Summary of decorative motifs

S/N	Nature of Decorative Motif	Quantity	Percentage
1	Single	16	**45.7**
2	Multiple	19	**54.3**
Total		**35**	**100%**

Single Decorations

Roulettes: Majority of the potsherds discovered with single decorations were roulettes numbering 14.Some of the roulettes are presented below:

Motif 1- Roulette Type 1: This motif is that of braided roulette. (Plate 35)



Plate 35 : Braided roulette.

Motif 2- Roulette Type 2 : This motif is that of carved wood roulette. (Plate 36)



Plate 36: (Carved wood roulette)

Motif 3-Roulette Type 3: This motif bears the impression of a net roulette (Plate 37)



Plate 37: Net roulette

Motif 4-Roulette Type 4: This represents twisted cord roulette (Plate 38)

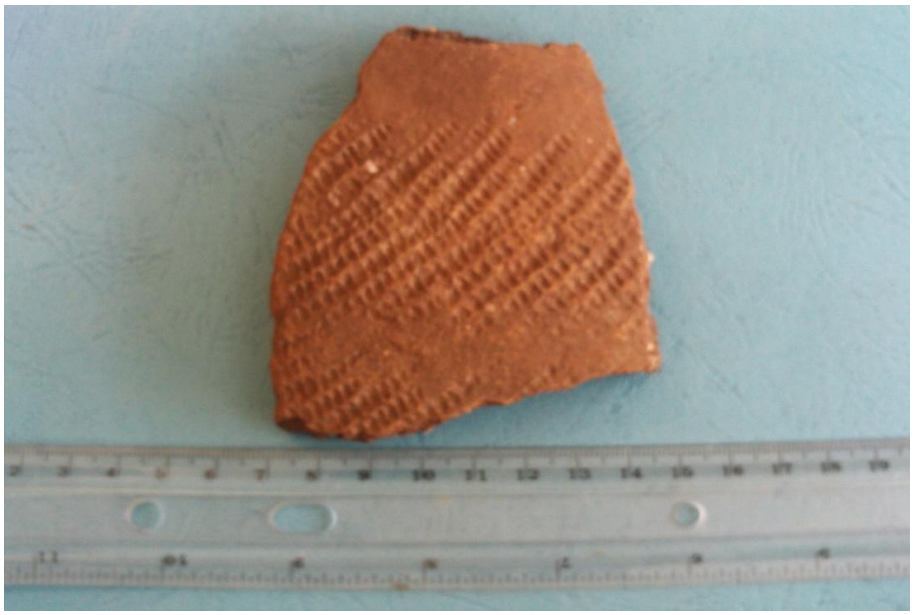


Plate 38: Cord roulette

Grooves: Grooves were present in the single decorations inventory as presented below;

Motif 5-: This motif is that of banded grooved impression (Plate 39)



Plate 39: Grooved impression

Table 7: Summary of single decorations

S/N	TYPE	QTY	%
1	Braided roulette	**4**	**25**
2	Carved ridges roulette	**1**	**6.25**
3	Net roulette	**5**	**31.25**
4	Cord roulette	**3**	**18.75**
5	Grooves	**3**	**18.75**
Total		**16**	**100**

Multiple Decorations:

Most of the multiple decorated potsherds have roulettes and other motifs. The prominent ones are discussed below:

Roulettes and other decorations

Motif 1- Type 1: These multiple decorations are oblique grooves interspaced by fine string roulette on a ridge. (Plate 40)



Plate 40: Oblique grooves with string roulette on a ridge.

Motif 2 Type 2: This motif is horizontal banded grooves interspaced by vertical strip roulette underlain by knotted cord roulette. (Plate 41)



Plate 41: Banded horizontal grooves with horizontal strip roulette and cord roulette

Motif 3- Type 3: This motif is banded grooves and twisted cord roulette (Plate 42)



Plate 42: Grooves and twisted cord roulette

Puntates and a ridge:

Motif 4: This motif is that of punctates executed on a ridge. (Plate 43)



Plate 43: Punctates on a ridge

Table 8: Summary of multiple decorations

S/N	TYPE	QTY	%
1	Oblique grooves with string roulette on a ridge.	**3**	16
2	Banded horizontal grooves with horizontal strip roulette and cord roulette	**7**	**37**
3	Grooves and twisted cord roulette	**4**	**21**
4	Punctates on a ridge	**5**	**26**
	Total	**19**	**100**

CHAPTER SIX: INTERPRETATION

6.0 Introduction

Interpretation involves meticulous effort to deduce cogent meaning into ancient people's behaviour as it relates to the material remains they left behind, the environment which the cultural materials were found, the people that made the materials and their relationship with the environment (Price 2006; Hodder 2006). Interpretation is present at every stage of archaeological research which gradually builds up to a more cohesive picture of the past and is normally achieved through description and explanation by correlating material culture with a specific identity of either manufacture, period of manufacture, function, area of manufacture among others (Sharer and Ashmore 2003).

Suffice to say that in the attempt to make a proper reconstruction of the ancient iron smelting technology of Mahurum, interpretive emphasis was given not only to the tangible and intangible aspects of iron smelting, but also finds and features on Mahurum abandoned settlement site and the settlement history of the Ahurum are also on focus in this interpretation.

6.1 Socio-Religious life of the Ahurum people

The Ahurum people can be said to have had an organized Socio-Religious system presided by the Mi-Kochok who are council of elders and cabinet. We can also infer that though the religious leaders also served as the political leaders, the leadership of the Ahurum had separation of powers based on the fact that different masquerades were mostly from different families and were saddled with different functions that even cut across gender. For example, Mangam was mainly for protecting the people and placing of charms in different areas, Andong and Anjakawa were for circumcision, Munja was for entertainment during festivals and celebration of a new

harvest period, Ukuk was female and the only messenger during circumcision and initiation rituals among others. This arrangement was meant to reduce power struggle among the families. It has been observed that the Ahurum do not worship a particular object but where involved in ancestral worship using different mediums like the masquerades. But each clan maintained a sacred groove as a separate identity where rituals associated with health problems are carried out thus showing that despite the general control from the Mi-Kochok through the Kama, some control measures were detailed to family or clan heads in which every family was expected to handle some aspects of their problems.

6.2 The Ahurum and their natural environment

The natural environment of Mahurum seemed to have highly influenced the cultural cum technological development that evolved in the area. This is so when we look at the nature of the environment vis-a-vis the array of cultural materials that were identified in the course of this research. From observation, the ancient people of the area had a vast knowledge of their environment and this is reflected in their utilization of the natural resources they could find which they harnessed into cultural materials especially the ore used in smelting iron, the understanding of the durability of the rock surfaces for refining of bloom used as anvils, the mud used in constructing furnaces, the stones used in building their houses, the understanding of the fertility of their soil for cultivating certain crops, among others. Again, the people had five seasons defined by variations in weather conditions in a (12 months calendar year). Thus, this indicates they had knowledge of their environment.

The Mahurum area must have had a major attraction to the people before they chose it as a permanent place of abode. The hilly nature of the area was a good criterion for a place of abode based on security needs (Smith 1977). Mahurum abandoned settlement site was said to have

been the safest place as claimed by oral tradition that people in the whole Manguna area once ran to the hill when attacked though no name of the attackers was mentioned. But security needs could not have been the only consideration because other factors like arable land for cultivation, games to hunt and closeness to water source always go pari-passu with other factors when it comes to the reasons for choosing settlements hence all these might have been found in the Mahurum area. Therefore, the cultural, social, economic and religious needs of the Ahurum necessitated consciousness of their environment which they harnessed from time to time.

6.3 Pottery

Potsherds collected from Mahurum abandoned settlement site were analysed and the result of the analysis shows that pots were the major vessels which points to the fact that the pottery from the area were probably mostly for storage and cooking.

Oral tradition has it that the Ahurum never produced pottery nor did they have people from other areas that had the knowledge of pottery making sojourn amongst them. According to oral tradition, pots were purchased from Nafaf which is a term used to refer to areas around Wamba especially the Mama area which is to the west and later from Mangar and Sura which are to the east and south east respectively. The pots also indicate aesthetics because amongst the potsherd collected, there was a particular vessel that is well decorated and from analysis carried out, the rim form belongs to a jug thus they people valued items like the jug not only for their utilitarian value but also for aesthetics purposes (See Jug Form, Fig 14 pp. 89). Thus, the Mahurum pottery represents a trade item between the Ahurum People and their extended neighbours in ancient times.

6.4 Stone Hammer (*Mute Ayii*)

Seven stones were discovered which were said to have been used as hammers for pounding to detach slag from the bloom. These stones are indicative of Ahurum iron workers choice for specific lithic materials that are effective in serving particular purposes which they utilized as tools. The stones are navy blue in colour and are basaltic volcanic hard rock. We can deduce from the choice of these rocks that the smelters knew the geological composition of rocks in the environment of Mahurum out of which they chose the best for their resilience and effectiveness. The wear and tear on the rocks shows the possible contact or stress areas that formed during the pounding of bloom.

6.5 Lower grinding stones (*Fufunash Aduk*)

Two grinding stones were discovered within the north-eastern part of settlement cluster two. The grinding stones according to oral tradition are said to have been used for grinding a soup recipe called *Mia* (Dargaza in Hausa). Perhaps, the stones might have been used for grinding of a combination of local seasoning and not *Mia* because of their sizes. One major observation is the fact that considering the size of the abandoned settlement, the population that might have lived on it and the types of crops that are said to have been cultivated by the people especially Acha (*Digitaria exelis*) among others, only these two grinding stone were discovered during the survey of the area. Therefore, it can be inferred that the Ahurum might have utilized the abundant rock surfaces for grinding. Thus, some of the rock hollows could have served dual or multiple purposes of both refining of bloom and grinding of grains inter alia. The lack or paucity of grinding stones point to the fact that there were alternative means of achieving the same aim of grinding with the utilization of rock surfaces as has been observed in other societies by Sassoon (1962), David (1998) and Mangut and Mangut (200). Also, as suggested by Aremu

(2014 Pers. Comm.), many of those who abandoned the site might have carried away some of the grinding stones to their new locations.

6.6 Furnaces (*Mulesh*)

Evidence of furnaces in Mahurum indicates that iron smelting took place in the area. The Mahurum furnaces bear resemblance to free standing none-slag tapping shaft furnace (Anozie 1979). Thus, this possibly makes the Mahurum furnaces represent a more primitive stage of West African iron working just like that of Taruga (Tylecote, 1975 in Jemkur 2004). Another attribute of the Mahurum furnaces is their twin nature because some were joined (Plates 5 and 10 pp 35 and 40). Hence, this indicates how unique the iron metallurgy of the area was. It is the opinion of this researcher that the twin furnaces were constructed in that manner for one person to bellow the two furnaces at the same time instead two people bellowing the two furnaces. Furnace 2 in site 'B' stretches up 1.8 meters. The unusual structure of this furnace may have been as a result of a faulty furnace that broke in the process of smelting and spewed its molten content (Plate 7 pp 37). But this opinion would have to await further research for us understand to understand why they smelters constructed the furnaces joined together in that manner. It is also the opinion of the researcher that the ancient Ahurum might have carried out the smelting of iron and the refining of bloom as claimed by oral tradition considering the fact that precise information about smelting sites and names for different aspects and objects associated with iron smelting were given (Appendix 11, pp 125), and also rock hollows and slag heaps which were said to be from refining of bloom were identified on the Mahurum abandoned settlement site.

Also, as earlier pointed out in literature review (pp 2-5), Ahurum people might have developed iron technology independently or they acquired the knowledge from elsewhere considering there is semblance of shaft furnaces found in Mahurum and those discovered to the

north of the area in Birom land which are in close proximity to Nok and by extension Taruga which has been dated to 500BC, and Lankan district and Ngasland to the east (Daze, 1981; Jemkur, 1998; Longkat, 2007).

6.7 Rock Hollows (*Mumwai Aduk Mwan*)

According to earlier studies by Sassoon (1962), Shaw (1978), Jemkur (1989) and David (1998), some rock hollows are products of refining of bloom. The rock hollows found during this research were said to have been also shaped during the processes of refining of bloom through pounding. This assertion is supported by the presence of slag from refining of bloom found in association and in proximity with the rock hollows, and this discovery has been corroborated by oral tradition. It is obvious that in the absence of iron anvils, stone boulders and hard rock surfaces automatically became alternative platforms for refining bloom.

Though rock hollows were formed gradually over time during refining of bloom with the continuous pounding, it could be that the formation of the rock hollows in Mahurum probable has its beginning in the type of furnace that was constructed. From observation, the Mahurum furnaces could be non-slag tapping furnaces hence it is natural that the extracted bloom after smelting will come heavily laden with slag hence it must be fired and hammered to remove the slag impurities especially the carbon and slag that mixed with the bloom. This opinion was earlier postulated by Crew (1996:1) that *" Blooms produced from bog ores in a non-tapping furnace would have had more entrapped slag and would have needed more refining than the cleaner blooms made from an ore which could be smelted by slag tapping".*

Therefore, the Mahurum rock hollows are indirectly, products of the type of furnaces that were used in smelting hence necessitated refining the bloom obtained from the smelt. We can also infer that the different sizes and depths of the rock hollows may be due to the fact that the

people that refined the bloom also varied in size and strength and also that the duration of refining and technique were not the same. It is also possible that some of the rock hollows were natural and might have been incorporated in the refining process.

Presently, the rock hollows in Mahurum could be important to archaeologists in two major ways; Once rock hollows are proven to have been formed through refining of bloom, they automatically become indicators of past human technology and if the area is properly searched, it could reveal evidence of habitation or camp of the smelters which may not be far off from the rock hollows as the case of the research in the Mahurum area has proven.

6.8 Slag from smelting - (*Fii Amulesh*)

Only a small quantity of slag from smelting was discovered during the research in Mahurum considering the high number of furnaces that were discovered which numbered 21. Debris of iron slag was only discovered close to designated furnace clusters 'A' and 'C', and lumps of slag were discovered on top of Mahurum hill in addition to slag on furnace linings especially in furnace clusters 'B' and 'C'. Thus, the amount of slag from smelting discovered in the whole of Mahurum during the research does not commensurate with the number of rock hollows in the area and the heaps of slag from refining of bloom. This may not be an indication of low level of iron content in the ore used in smelting in the area; rather, it could be an indication of the type of furnaces that were used in smelting. It is rational to assume that slag from smelting is always scarce in iron smelting sites where non tapping furnaces were used because the slag would be attached to the bloom until it is pounded out leaving only the dusty traces like the ones that have been discovered close to rock hollows in Tahang and Ahurum abandoned settlement sites.

6.9 Slag from Bloom Refining

The slag from refining of bloom shows an intricate and complex method of iron working in Mahurum. What the smelters could not achieve during smelting in terms of separating slag from bloom by adopting the slag tapping furnace technology, they made it up in refining because the bloom must be refined to produce forgeable iron stock.

The bloom refining also shows the Ahurum smelters combined smelting and refining unlike in the Nsukka area where the bloom was refined by the smiths after purchasing it from the smelters (Anozie 1979). Also, refining of bloom in the Mahurum area indicates that iron smelting technology in the area was crude considering the fact that more advanced furnaces were used in other parts of West Africa (Anozie 1979; Okafor 1995; Schmidth 2006). But this opinion will await further research that will involve dating the materials from the site to confirm this assertion.

The numerous heaps of slag discovered in the Mahurum area might have formed due to accumulated discarded dust from bloom refining. The accumulation of the heaps might be due to an intense refining of bloom that took place in the area. This has been corroborated by oral tradition and the number of furnaces that have been discovered. It can be said that the number of furnaces that have survived up to this moment are but a minimal number of the furnaces that might have been used. Thus, the slag from refining of bloom also point to the people's deep knowledge of smelting and the numerous heaps point to the intensity of both smelting and refining.

Furthermore, the end products of refined bloom were iron bars that were later fashioned into iron implements. It was observed that iron bars have the same name with money in the Shagau dialect of Manguna which is *Chef*. It could be that Iron bars were used as money

(Manilla) in ancient times by the Ahurum and when coins were introduced in Nigeria by the colonial government, the coins being of the same iron-like nature the people normally worked. They easily linked it with the *Chef* (iron bars) they were using before hence they named money (chef), a name which is still in use till today.

6.10 Footpaths *(Tarash)*

The three major footpaths leading in and out of Mahurum abandoned settlement site have been able to tell us much about certain aspects of the ancient people's behaviour and day to day activities. For example, the south eastern pathway which is the easiest route to climb or descend the hill is said to have been mostly used when taking cattle out for grazing. The northern pathway was the most difficult to ascend or descent because of its sloppy nature but was still occasionally used leaving the south-western pathway as the most traversed by the people. Three conditions could have informed the reason why the south western pathway was the most traversed. First, the south western pathway is closest to a stream the people used as the source of water hence they had to be travelling through the pathway every day. The second is that most of the industrial sites especially furnace cluster 'A' and the bloom refining complex are located west and southwest respectively. The third is the fact that as at the time the abandoned settlement was inhabited, the Ahurum people only had neighbouring villages like Manguna to the east, Hurti to the south and Talla Dambwash to the south west which invariably means going to any of the areas mentioned with the exception of Manguna entails taking the south- western route.

6.11 Monolith (*Achef*)

Generally, monoliths have socio-religious significance in the Mahurum area because they are always erected at the entrance points of hilltop abandoned settlements and charms are placed beneath them by Mangam masquerade (Mangut 1986; Maram 2008). But for the one discovered on the Mahurum abandoned settlement site, it was claimed to have been used for butchery (Akamang 2012 Pers. Comm.). Thus the monolith studied shows that the Ahurum had some customs associated with how and where they specifically butchered wild games caught during hunting in addition to choice of the materials (Monoliths) the people used for butchering. Also, it was only wild game like Lion, Hyenas, and Buffalos among others that were butchered on the (standing) monolith hence it indicates that killing of big games was a prestigious act that attracts societal recognition.

6.12 Elders sitting area (*Mareh*)

The elder's sitting and relaxation area shows that stratification existed in the area based on age differences which translate into sitting arrangements. One curious thing about the elders' relaxation area is that it was only found in settlement cluster one. This area was said to have been first occupied by the Pwol family who migrated from Mangor and the second migrants to Mahurum hill (pp 20-23). Similar sitting arrangements for elders have been reported in Daffo and other Ron areas (Iheanach 1985; Mangut 1986). Thus, the Mareh could be a cultural practice common to only Mupun migrants where as it is absent in the culture of the earlier settlers in settlement cluster one occupied by the Angbong clan who may not be Mupun.

6.13 Settlement pattern

The settlement pattern of Mahurum Abandoned settlement site includes evidence of house foundations which is an indication that people settled on the hill especially the people that are

presumed to have smelted iron in the Mahurum area in the distant past and this has been highly corroborated by oral tradition. The evidence also shows that the area was planned according to particular activities that used to take place on the hill. We can see evidence of coordinated planning as reflected in the settlement pattern from rock hollows and the slag heaps which are found to the north west and south west of the hill, the butchery area as represented by the monolith is found in the western area, the forge was closest to the rock hollows than the houses, the rock crevices and overhangs which are rubbish discard areas for broken pots are located further southwest of the hill on the descending path among others.

Also, the lay-out of the abandoned settlement reflects family ties. During this researchers verification exercise, he was shown three different compounds spread out in a way that reflects settlement hierarchy and economic status and this was corroborated by oral tradition. The Angbong family are said to have been the first to occupy the hill hence they chose a very vantage position which is in the north-west. The second clans that arrived were the Pwol who were joined by the Angai kikim, Kuju and Ahwel clans, and were nestled in the south corridor because they could not afford to pay one horse to stay with the Angbong clan in the upper settlement. The last clan that was said to have come was the Ahang Abwoi. Thus the ancient population that occupied the hill at a particular period was an amalgamation of several families that fused into one. Again, the settlers on Ahurum abandoned settlement had farms on which they were able to cultivate crops like cocoyam, beans and garden egg.

The presence of round stone structures in the three settlement clusters said to be relics of both house and house/granary foundations point to the fact that the people had diverse architectural needs; while their house foundations indicate that the people were settled, their

granary foundations point to the fact that the people practiced agriculture which necessitated the need for storage.

6.14 Economy

The economy of the Ahurum can be said to have depended on iron smelting. This is because iron smelting was the major industrial activity that used to take place in the area. Though there is paucity of evidence on whether it was the whole people of the area that took part in iron smelting, it can be assumed that iron smelting activity was quite extensive based on the evidence from the number of furnaces, rock hollows and slag heaps from refining of the bloom.

Another evidence of the economy of Ahurum people is the economic relationship between them and their distant western neighbours in the Mama Area in terms of trade in salt, pottery, mia (which is a soup condiment) and *Wanjang-Ti-Gamat* a soup seasoning as claimed by oral tradition. Thus, this shows that the Ahurum had trade links with several people outside their area. Oral tradition points to the fact that the Ahurum used to trade in iron bars with the Sha and Karfa people to the south-west for palm oil. The Sha people do not produce palm oil but they have neighbours who are the Kulere people to the south West who produced palm oil and to the west the Mama people. Thus, a form of trade involving middle men which has been observed between Daffo – Kulere- Mama People called *Matyer* as observed by Mangut (1986) might have been in existence in the area. Refined iron bars were also used as currency in paying bride price or redeeming slaves.

6.15 Symbolism in iron smelting of Mahurum.

Symbolism is an integral part of African iron working (Schmidt 1996). Symbolism can be inferred from the study of iron smelting in Mahurum especially through the names of the

smelting apparatus; the furnace (Mulesh) is viewed as a living organ that breaths and excretes, the tuyere (Atin-a-Mulesh are) considered as nostrils through which the furnaces takes in air, the slag (Fii-A-Mulesh) is considered as faeces and also the whole period of smelting was associated with a period of sexual purity and women especially the ones on menstruation were forbidden from visiting smelting sites. (Duk-Nguni) (Akamang Mafulul, Ufo Akamang, Pers. comm., 2012).

Also, symbolism was observed in the names of the settlements' clusters one and two called Talaf-A-Nahai meaning upper shrine and Talaf-A- Jinik meaning lower shrine but literarily meaning the first and second settlers on the hill.

CHAPTER SEVEN: SUMMARY, CONCLUSION AND RECOMMENDATION

7.0 Summary

This research was embarked upon in Mahurum with the intention of solving a research problem which is to understand the ancient iron technology of the area through material and non-material evidence. An attempt at solving the aforementioned problems was made through a set of objectives that included identifying, studying and documenting evidence of iron smelting, garnering information on the processes of smelting through oral tradition, studying the relationship between bloom refining and rock hollows in the Mahurum area and also the link between the ancient Ahurum people and the evidence of ancient iron smelting in the area including producing maps of the studied sites.

Therefore, in order to achieve the objectives, highly conceived methodological approaches were employed. The first methodology employed was consultation of written materials which was done in libraries, private collections and archives. This process helped in providing background information especially on the iron smelting, geographical location of the study area, climate and weather, geology and soil, drainage, vegetation inter alia. Consultation of written materials also revealed a lot of literature on iron smelting which provided a platform for writing a literature review on iron working in Nigeria.

The second methodology utilized was archaeological survey. During the survey, finds and features were discovered and their measurements taken. The evidence includes numerous furnaces in three different areas which were designated as furnaces clusters A-C. The second discovery was rock hollows which numbered 57 and are spread across 11 clusters in two different areas which are Tahang extant settlement and on Mahurum hilltop abandoned settlement site. The discovery of rock hollows on the Mahurum hilltop abandoned settlement

was made along with numerous house foundation ruins spread across three major compounds. Also, during the survey, three major footpaths were discovered leading to and out of the abandoned settlement. In addition, monolith, stone hammers, stone embankment and potsherds were also discovered.

The third methodology that was adopted was oral tradition. Oral tradition provided the necessary information that led to the discovery of most of the rock hollows and some of the furnaces. Also, it was during oral tradition that the processes of ancient iron smelting, how furnaces were built, how smelting was carried out, the rituals that were involved, how fuel was procured including the exhibition of some of the trees that were processed into charcoal, how refining of bloom was carried out and the eventual forming of rock hollows, names of several items and places in the Manguna dialect and the historical background among others were revealed.

In addition, as part of the research, the methodologies led to the gathering of data, its classification and eventual analysis. The classification and analysis of the data helped us understand the classes of the material evidence, the structures and in the case of pottery, the types, form, and constituent of potsherds.

The interpretation in turn revealed the interaction of the ancient Ahurum people and their environment which resulted in the emergence of several cultural practices like iron smelting, trading, furnace construction, rituals, socio–religious systems, bloom refining among others.

7.1 Conclusion

The information that has emerged from this research, to an extent, has shown the contribution of archaeology not only to the reconstruction of the ancient iron technology of the Ahurum but also to other aspects of the people's culture. The research has shown that iron was smelted in the

Mahurum area possibly by the Ahurum using non-slag tapping shaft furnaces which are similar to that of other areas within central Nigeria and also their iron technology involved processing of the bloom obtained from the smelting which might have out-rightly created or modified rock hollows.

It can also be observed in the research that iron bars obtained from smelting were an essential trading commodity for the Ahurum who traded it by barter especially with palm oil and other items they needed with people in the Mama area, Sura, Mangar, Sha, Daffo, Gwande, Karfa and probably with other areas that were not captured by oral tradition. We have also seen the fact that despite the abundance of potsherds on the abandoned settlement, the Ahurum never produced pottery hence this indicates trade with the Mama and the Sura people. In addition, the evidence of trade implies that the Ahurum were in contact with other societies at a period dating far into antiquity.

In addition, Mahurum abandoned settlement reflects an organized society with functional socio religious leadership characterized by some level of gender roles especially in the ritual aspects. They also shared ritual responsibilities as reflected in the masquerades and the families had individual responsibilities for some of their rituals. Thus, the research shows how the Mahurum people interacted with their natural environment by exploiting natural resources for their economic and socio-religious challenges.

7.2 Recommendation

Though the research on evidence of iron smelting in Mahurum was extensively carried out, the research is far from been exhaustive. This is because no excavation was carried out nor dating of either the furnace remains or potsherds to establish the chronology of the technology in the area hence there is the urgent need for further research in the area.

It is hoped that in subsequent researches, rock hollows found in the area will be dated. This will help us to establish a comparative chronology of the rock hollows with other iron smelting residues and cultural materials like the furnaces, slag from refining and potsherds from Mahurum abandoned settlement site. Perhaps, this will help in establishing the cultural material's contemporaneity hence to justify or otherwise, the claim by oral tradition that the Ahurum people carried out the smelting and that the settlements on Ahurum hill are located according to clan hierarchy. Furthermore, the slag from refining of bloom could be dated because it might have high content of charcoal considering the fact that the bloom was obtained from non slag tapping furnaces. It is also hoped that further research will be directed into other aspects of the iron technology of Mahurum especially through experimental studies in order to understand more deeply the relationship between rock hollows and bloom refining.

Also, there is the need to fence all the areas with iron furnaces especially those of Kase cluster 'C' so that the furnaces can be turned into a tourist attraction and an on-site research centre. This will help to protect the cultural heritage for many more generations to come

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GLOSSARY

Achef - - - - -Monolith- - - - - -60
Afe- - - - - -Gruel-- - - - - -54
Agiri- - - - - -Acacia- - - - - -64
Aharja- - - - -Phoenix Reclinata- - - - -16
Akungom- - - - -Iroko- - - - - - -16
Alaang- - - - -Large Clay Pot- - - - -24
Ale- - - - - -Stream/River-- - - - -27
Alee- - - - - - Body Marks/Tattoo- - - - -31
Amarak- - - - -African millet- - - - -14
Ambok- - - - -Phicus Sycamorose- - - - -14
Amboree- - - - -Pepper-- - - - - -14
Andong- - - - -Masquerade for Circumcision/Initiation- -22
Andurumbuan- - - -Oracle for summoning people- - -22
Ang''gaa- - - - -Charcoal- - - - - -64
Ang'garau- - - - -Jentropa- - - - - -16
Angirem- - - - -Beans- - - - - -14
Anjakawa- - - - -Masquerade for Circumcision/Initiation- -22
Aroll- - - - - - Tree for production of Charcoal- - -64
Asher- - - - -Tickseed- - - - - -16
Asho- - - - - -Garden Egg- - - - - -14
Atinin A Mulesh- - - -Tuyere- - - `- - -67
Atirin- - - - - -Carrandas Plum- - - - -16
Avat- - - - - -Livingstone Potato- - - - -14
Bukam- - - - -Grass used in Making Brooms- - -26
Burukutu- - - - -Local Brew- - - - - -25
Chef- - - - - -Iron/ Coin- - - - - -104
Dambu- - - - -Peeled and dried sweet potato- - -53
Dungulun- - - - -Thunder Bolt Stones-- - - -27
Faht- - - - - -God, Sun- - - - - -22
Fellel- - - - - -Bunch of Hay- - - - -69
Ashel- - - - - -Hay- - - - - - -64
Fii Amulesh- - - - -Iron Slag- - - - - -102
Foo- - - - - -Acha- - - - - -14
Fufun-A-Duk- - - - -Grinding Stone- - - - -54
Fuwil- a- Bing- - - -October-November Season- - - -13
Fuwil-a-fell - - - - -September Season- - - - -13
Harkil-- - - - -Oracle used for Punishment-- - -24
Humbil- - - - -May to June Season- - - -13
Iroko- - - - - -Akugum- - - - - -14

Makama- - - - -Traditional Cabinet Member- - -22
Mangam- - - - -Most senior Masquerade- - - -22
Mareh-- - - - -Meeting Place for elders- - - -57
Mia- - - - - -Soup Recipe- - - - - -53
Makochok- - - - -Titled Elder- - - - - -22
Muar- - - - - -Cocoyam - - - - - -13
Mulesh- - - - -Furnace- - - - - - 66
Mumuai ADuk Muan- - - -Holes from iron Smelting- - - -101
Mundja- - - - -Masquerade for festivals- - - -22
Muor Rai- - - - -Title taking Ceremony- - - -22
Mute-A-Yi- - - - -Stone Hammer- - - - -99
Nguni - - - - -Tick Seed- - - - - -14
Puk-A-Duk-Muan - - - -Workshop for Smithing- - - -60
Rawul-Ti-Nafal - - - -Sweet Potato-- - - - -14
Saf-A-Tarmuash- - - -Chief Priest- - - - - -22
Shukwa- - - - -Leg bangles- - - - - -23
Taafy- - - - - -Rainy Season (July August*)* - - -*13*
Talaf-A-jinik- - - - -Lower Shrine- - - - -19
Talaf-A-Nahai- - - -Higher Shrine- - - - -19
Tar- - - - - -Pathway (Tarash Plural)- - - -56
Tumwat- - - - -July to August Season- - - -13
Ukuk- - - - - -Female Masquerade- - - - -24
Un'gwal- - - - - Round Scar/Tattoo- - - - -27
Wanjan- - - - -Soup seasoning from Habiscus- - -53
Wanjan-Ti-Gamat- - - -Soup Seasoning- - - - -107
Yisum- - - - - -Oracle for feeding Warriors, great hunters- -24

APPENDIX 1

Structured question guide

In order to conduct an effective oral tradition during the research, a structured question guide has been formulated. The questions will be asked across sex, age, occupation and clan. The following questions among many others as presented bellow will be asked.

Questions on the informants

1. Can you tell me your name?
2. How old are you?
3. What is your occupation?
4. From which village are you?

Questions on Iron Smelting

5. Do you know what iron smelting is?
6. How was it done?
7. What was used in smelting?
8. How were the material used in production procured?
9. Do you know what furnaces are?
10. How were the furnaces built?
11. What type of trees was used for charcoal?
12. How was the charcoal produced?
13. Were there rituals associated with the smelting?
14. Which people did the smelting?

Questions on Rock Hollows

15. Do you know what rock hollows are?

16. How were they made?

17. By what activity were they made?

Questions on Slag from Bloom Refining

18. What are these substances (slag) close to the rock hollows?

19. How were they made?

20. How did they get here?

21. Which people did what created them?

Questions on Settlement History

22. Which people settled on Mahurum abandoned settlement?

23. When did they settle on this site?

24. Where did they come from?

25. Who was their leader?

26. Why are the compounds separated?

Questions on Socio-Religious Structure

27. Who were your leaders?

28. How did they normally ascent those positions?

29. How were they buried?

30. Where were they buried?

31. Did they have norms guiding them?

32. Did they have masquerade(s)?

33. What are the names of the masquerades?

34. What where the functions of the masquerades?

Questions on Pottery

35. Did you ancestors produce pottery?

36. From where did they get it?

37. With what did the purchase the pots?

APPENDIX 2

List of oral Informants

S/N	Name	Village/ hamlet	Age	Occupation	Information	Year
1	Adamu Mallo	Mahurum	62	Farming	History of Origin/Rituals	April 2012
2	Ajoro Kating	Mahurum	82	Farming	Iron Smelting/ Rock Hollows/Masquerades	April 2012
3	Akamang Mafulul	Mahurum	84	Farming	History of Origin/ Iron Smelting/pottery/Rock Hollows	April 2012
4	Amallam Kamu	Manguna	85	Farmer	History of Origin	April 2012
5	Balla Umaru	Mahurum	36	Farming	Iron Smelting	April 2012
6	Bitrus Ezekiel	Mahurum	48	Teaching	Iron Smelting	April 2012
7	Garba Iliya	Daffo	87	Chief Priest	Iron Smelting/Trade	June 2012
8	Habila Christopher	Mahurum	40	Farming	Masquerades	May 2012
9	Joel Mallo	Mahurum	30	Painter	Iron Smelting	May 2012
10	John Sila	Taggai	45	Banker	History of Origin	May 2012
11	Julius Adamu	Mahurum	24	Farming	Iron Smelting	May 2012
12	Kevin Joshua	Mahurum	42	Farming	Iron Smelting	May 2012
13	Luka Iliya	Mahurum	52	Farming	Iron Smelting	April 2012
14	Madung Achuwang	Taggai	80	Farming/Fishing	Iron smelting/Rock Hollows	April 2012
15	Mahan Mangam	Mahurum	70	Farmer/Hunter	Iron Smelting/Rock Hollows	April 2012
16	Manasseh Sila	Taggai	56	Teacher	Iron Smelting Rock Hollows	April 2012
17	Maren Agbangau	Mahurum	65	Farmer/Hunter	History of Origin	April 2012

18	Monday Akamang	Mahurum	48	Farming	Iron Smelting	April 2012
20	Saf Andong Adake	Taggai/Manguna	57	District Head	History of Origin	April 2012
21	Sale Agbangau	Mahurum	60	Farmer	Iron Smeltin/History of Origin	April 2012
22	Saraya Maram	Mahurum	62	House wife	Climate	April 2012
23	Shekarau Mallo	Mahurum	58	Farming	Iron Smelting/Rock Hollows	April 2012
24	Ufiyat Maikudi	Mahurum	56	Farming	Iron Smelting/Rock Hollows	April 2012
25	Ufo Akamang	Mahurum	65	House Wife	Iron Smelting/ Rock Hollows/ Body scarification	April 2012
26	Uhan Daudu	Kashish	74	House Wife	Iron smelting/Trade	June 2012
27	Uvwat Mallo	Mahurum	80	Farming	Grinding/pottery	April 2012
28	Prof David Aremu	Zaria	60	Lecturing	Grinding stones	February 2014