

## Agriculture Beginnings in West Africa A Re-Evaluation of the Evidence

### Introduction

There are two schools of thought on the beginning of agriculture in West Africa. The first school is predicated on the idea of diffusion while the other believes that agriculture beginning in West Africa was an independent development.

The former believes that the knowledge of domestication of plants and animals is an 'alien culture' to West Africans hence it invariably got to them at a later date. Scholars as Childe, Clark, Robbins, Coursey, Dalby, Bakker, Suttons and Livingstone had at various times attempted to rationalize the nature of processes through which the idea of domestication of plants and animals spread to West Africa (Wilson 1974, Baker 1980, Clark 1976).

For Childe, agricultural beginning itself has to do with the environmental change which took place in the Near East. To him, the clue to understand agriculture beginnings in human history lay in the climatic crisis that ended the Pleistocene epoch, the melting of the northern ice sheets and the subsequent change of environmental conditions (Ucko and Dibbley 1969: xix).

According to Childe, the Neolithic revolution had taken place in the "Fertile Crescent" which is probably somewhere in the comparatively well watered, comparatively cool mountain slopes that stretch from Palestine north through Syria and then eastward through Southern Turkey and Northern Iraq. It was from some nucleus in this area the Neolithic revolution had spread southward to pre-dynastic Egypt, Westwards to the Danube and across the Eastern side of the Mediterranean and eastward to India (Wilson 1974, Ucko and Dibbley 1969).

In other words, the Fertile Crescent was the centre of domestication of plants and animals and it was from there that the idea and technology spread to all other areas of the world, West Africa inclusive.

Based on Childe's Neolithic hypothesis, agriculture beginning was associated with grinding tools, polished tools, sickles, and adzes or what are otherwise called composite tools. In essence, such tools as sickles axes and adzes were regarded by scholars as characteristics of the tool kit of agriculture practicing communities. A direct fall out of this erroneous impression however was that scholars working in different part of the globe used the presence or absence of the tool kit to infer whether a particular community is agriculture based or otherwise.

A variant view of the diffusionist school however contend that it is the knowledge of agriculture that spread to West Africa not the tools, and the crops and that the stimulus for this came from the Saharan desiccation that occurred after the Middle and 3<sup>rd</sup> Millennia B.C. rather than the wheat and barley growing areas of North West Africa (Andah 1987, Grey 1962).

Livingstone (1958) on his part tends to see the beginnings of agriculture from the premises of biological evidence. He affirmed that the sickle cell anemia could be used to trace food production. In his views, forest clearance, a prerequisite to planting encouraged the breeding of anopheles mosquito

which started the problem of sickle cell anemia. According to him, the people with the lowest frequencies today of sickle cell traits were amongst the last people to adopt agricultural mode of life. (Livingstone, 1958, Andah 1987). The popular belief was that the knowledge of agriculture passed from the Near East (where cereal crop farming probably came from) through the Nile Valley to the Sahara and thence to West Africa.

Meanwhile, the diffusionist school failed to recognize these salient facts:

- 1) That the West African environment is peculiar and this peculiarity ensures that only particular kinds of crops suitable to the environment will survive the vagaries of the weather condition of the region (Hawkes 1969, Harris 1972, Tempany et-al 1958, Andah 1993).
- 2) That domestication of plants and animals was not a sudden phenomenon but rather a gradual relationship between man and the domesticates which manifested itself in various ways (Andah 1987).
- 3) That West African people have been living in their environment for long, hence are capable of noting changes in their environment and how to cope and adapt with such environmental changes (Adekola 1995).
- 4) There is a close interaction between man and his environment in West Africa. This is reflected in various forms of etiquettes which are aimed at protecting the environment from deterioration (Adekola K.O. 1995, Rotherberg 1980).
- 5) Also, there are various forms of agriculture; cereal crop farming which emanated from the Near East cannot be equated with root crop farming which demands more time and attention.

The second major school of thought believes that through a proper scrutiny of the archaeological, botanical and even ethnographical evidences, one will notice that agricultural beginnings in West Africa was an independent phenomenon. This school points out that scholars must pay deserving attention to the roles played by local resources in the development of agriculture. From such indices as the types of crops grown in West Africa, the peculiarity of the environment, the various methods of farming used by West African peoples as well as the specific bodies of customary practices and the systems of land use, It is crystal clear that agriculture beginnings in West Africa was an indigenous development.

### **Features of Agriculture**

There are certain distinct features that have to take into consideration while examining agriculture beginnings in West Africa or in any parts of the world.

#### **a) Agriculture could have climatic characteristics**

There are distinct differences in the major crops and animals reared in different parts of the world because of the differences in environmental factor. For example, a wide range of crops which are grown in the tropics may not be produced elsewhere. (Webster & Wilson 1966) climate invariably plays a dominant role in the kind of agriculture which could be practiced in any parts of the world. The character of the soil also has a powerful influence and is largely determined by climatic conditions since soils derived from identical parents materials may show great divergences according to whether they have been formed under hot or cold or wet climatic conditions.

#### **b) Groups handle their crops in different ways and manner:**

Different groups have different ways of handling their local resources. It is a result of this drastically impossible to use a particular group's method as a yardstick for other groups. In other words, there is the need to find out the specific methods employed by a particular group in raising crops and

livestock. Link to this is the fact that the types of tools used vary greatly from one agriculture community to the other. Whereas cereal crop farming encouraged the use of sickles, adzes and axes; Forde in Gray (1962:83) reported that less than 100 years ago, some "remote groups" of Yoruba in the northern part of the forest region engaged in the intensive cultivation of yams using mainly digging sticks and stone tools. (Grey, 1962; Sowunmi, 1985 Current Anthropology Vol. 26 No.1).

c) Land use patterns vary from one group to the other:

Techniques of farming vary among groups, while some agric practices encouraged the continual use of a particular piece of land others such as shifting cultivation or land rotation involves allowing the piece of land to revert to bush. (Rotherberg 1980 , Tempany et-al 1958). Another crucial issue is the mode of organization. This is a social issue which relates to what types of crops are grown, who grows such types of crops. For example, in the traditional Yoruba setting, tree crop farming is regarded as exclusive preserve of the male while crops as vegetables, pepper, okro are regarded as women crops.

### **West Africa, Climate and its general environmental background**

West African can be defined as the land south of the Tropic of Cancer, West of a line drawn from the Cameroon highlands. The region contains sovereign nation states as Mauritania, Senegal, Guinea, Sierra Leone, Mali, Ivory Coast, Ghana, Benin Republic, Burkina Faso, Togo and Nigeria.

Climate is perhaps the most important factor which has affected subsistence patterns in West Africa. Climate has effect and control on the vegetation, fauna on soil water resources. For example, the marked differences in West Africa can be explained in terms of variation in the amount and distribution of precipitation (Grove 1978, Ojo 1977).

West Africa falls within tropical climate regime which is characterized by a combination of high temperature and abundant rainfall. It's marked by hot dry seasons alternating with warm seasons (Udo 1970). Rain is derived from the South West winds blowing across the Atlantic a result of which the coastal areas thus receive the most rain. Rainfall gradient decreases gradually as we move northwards towards the Sahara.

The dry season is caused by the North East trade winds blowing across the Sahara which is often accompanied by dust, sand and general arid conditions. The Wind Systems (South West Monsoon winds, North East trade winds) are not the only controlling factor on the climate of West Africa. West African climate is also controlled by the variations in the position of the ITCZ is at its maximum Northern limit in July and its maximum southern limit in January (Shaw 1976, Sowunmi 1987).

According to Burke (1972), the South Atlantic had a shape that was very similar today's during the Paleocene hence it seems that the prevailing South West winds in the Gulf of Guinea have hardly changed orientation since the Paleocene.

During the Quaternary however, there were alternating periods of wet and dry climate conditions in West Africa. There is considerable evidence which show recent fluctuations in the West African climate. Data from such areas as the Atlantic Coast, Hodh regions of Mauritania, the Lake Chad Basin, the Niger and Senegal River Basins show that the present Sahara and Sahel were far more attractive in the recent past (Grove 1978, Street and Grove 1976).

The fluctuations notwithstanding, a great deal of evidence from palaeobotanical, Palaeocological and geo-morphological studies from the Neogene (2.6m Y.B.P. till about 3,000 years

ago) show that the climate in West Africa was characterized by alternating wet and dry phases (Sowunmi, 1987). West Africa can be divided into the following environmental zones based on such indices as climate and other ecological factors: (1) Forest, (2) Savannah (3) Sahara.

These are however sub-divisible into intra-zonal habitats on the premises of rainfall, geology, soils gradient, drainage and other physical conditions. Andah, (1987) recognized that these intra-zonal habitats played significant roles on the story of agricultural beginnings in the region. It is interesting to note that hilly terrains like the Futa/Djallon, Guinea highlands, Cameroon Mountain, Bandiagara escarpment, Jos Plateau and the Accra Coastal Plains are however characterized by mild climate owing to local orographic effect. These terrains have well structured soils which are developed from base rich rocks (Andah 1979, 1987).

West Africa is drained by major rivers as Niger, Benue, Senegal, Gambia, Volta and their tributaries. One of the important lakes is Chad which like other could have sustained a rich variety of plant and animal populations.

### Crops in West Africa

Archaeological, botanical and ethnographic evidence have shown that the plants cultivated in West Africa are significantly different from those of the Middle East (purported centre of domestication) in terms of their adaptability. Wheat and barley which are the predominant cereal crops of the Middle East cannot survive in the high temperature areas of West Africa.

Evidences revealed that such crops as Sorghum, fonio, millet, rice, cow pea, tubers as yam, tree crops as oil palm, shear butter, baobab, legumes, geocarpa groundnuts are indigenous to West Africa and that these crops have a long history of cultivation (Coursey 1976, Harris 1972, Andah 1987, Tempany et-al 1958). For example, relying on botanical evidence, Zeven (1964) in Sowunmi 1987 stated that the oil palm is undoubtedly West African in origin, its pollen having been recovered in Miocene deposits of the Niger Delta. (Sowunmi, 1985 C.A. Vol. 26, No. 1). South of 9°N latitude are root and tree crops such as Kolanut and oil palm. These crops require high rainfall which is present in the region. To the North of 9°N latitude are trees as Kapok, Shea butter, baobab, rhizomes and vegetables (Cousey 1976, Andah, 1987).

African rice *O. glaberrima* was first cultivated in the inland Niger Delta areas and was cultivated probably from the wild species *O. breviligulata* (Carpenter 1978). According to Porterers (1962) the inventors of its cultivation may have been Songhai. African rice *O. glaberrima* possessed quite different genetic characteristics from Asian rice *O. sativa* which is perhaps the commonest rice in West Africa today. The Niger Delta was also the secondary centre of potatoes called colens. This region also contains a variety of sorghum. Available in the savannah were large ungulates and predators – gazelles, bulls, barberry sheep, jackal *Canis adustus*, and hunting dog *Lycaon pircus*. Most of these have now been replaced by cattle. Evidence as rock paintings has shown that the Sahara was rich in games in the past. Most of the crops listed earlier cannot be produced outside the tropical environment. Added to this, the different groups in West Africa have varying methods of crops cultivation which were usually a result of cumulative experience of the knowledge of the crops – its soil requirement, their technological know-how and social organization.

As a result of these factors, it is erroneous to assume that cereal farming of Middle East was the basis of farming in West Africa where root cropping is deeply rooted.

### Cultivation of Some Crops

## Rice

Though the Asiatic rice *O. sativa* is perhaps the commonest rice in West Africa today, there is evidence that suggest that rice cultivation have been in existence prior to the advent of Asiatic rice. (Carpenter 1978, Andah, 1987). African rice which derives from wild spp *O. barthi* according to Porterers (1972) are native to the semi arid interior of Lake Chad region and the rice was cultivated as floating rice.

Other than rice, sorghum may also have been domesticated in the Savannah zone of Lake Chad. This is contrary to some views that sorghum is native to Middle East. Pearl Millet is also indigenous to West Africa; it is basic to Tichitt in Mauritania (Buddenhagen et-al 1978). There is also Folio Millet complex in the upland area of Senegal and Niger.

Porterers (1962) suggested that Folio Millet was first domesticated along with rice. It is now known that the hill refugees are among the first area for the cultivation of the Folio Millet. Archaeological evidence from Rim in Burkina Faso suggests a use of refugee hill by the local people. Also, there are remains of cowpea from Kintampo and this attest to a long history of cultivation of the crop however, it is yet to be ascertained which region of West africath crop is indigenous to.

## Yam and Tree Crops

Available ethnographic and archaeological evidence point towards a long history of yam cultivation in West Africa even though there has not been direct archaeological recovery of yam remains. Yams unlike cereals are vegetative propagated and moreover their tubers are not favourable to long term preservation, the principal food yams of West Africa are the related indigenous species *D. cayensis*, *D. rotundata*. The handicaps listed notwithstanding, through such lenses as:

- 1) The ceremonies attached to the cultivation of indigenous yams by the different groups in West Africa. For example the use of certain kinds of implements maybe prohibited during such festivals/ceremonies.
- 2) Presence in West Africa of quite a wide range of wild species.
- 3) There still in West Africa people who collect and re-plant wild yam (Andah 1987).

All these show the great antiquity of yam in West Africa.

The various West African groups have varying methods of tending yams which require more attention than cereal agriculture. Unlike in cereal farming where the determining factor is the viability of the seed, great attention is paid to the suitability of the soil on which yams are to be grown. According to Cogley L.S. and Steele, W.M. (1976), yam is best grown in well drained soils and in areas receiving annual rainfall of between 1,500mm – 1,000mm. Botanical evidence has shown that the oil palm has great antiquity in West Africa. This is based on such lines of evidence as:

- 1) Dependence on oil palm for various purposes today in West Africa (See Dalziel in Sowunmi 1984).
- 2) Archaeological evidence show that the West Africa forest was occupied by L.S.A. people who made use of pottery and ground stone axes sometimes around 5,000 B.C., it suggested that this people probably used the oil palm fruits.

Other than these lines of evidence, there are virtually no other lines of evidence to support the notion of an early protection and propagation of oil palm. However, according to Sowunmi (1984) palynological study of a core area from the Niger Delta has revealed that prior to 35,000 B.P. to just before 2,800 B.P. the oil palm was only a minor component of the West African vegetation. But there was a drastic increase after 2,800 B.P. which was a result of the artificial opening up of forest for farming purposes. (Sowunmi, 1984).

Evidence from such sites as Bosumpra in Ghana, Kintampo in Central Ghana and in some rock shelters in Liberia attested to the fact that the cultivation of oil palm has a long history in West Africa.

### **Farming Systems in West Africa**

The land use patterns in West Africa are quite distinct from that of the Middle East. The methods of farming used in West Africa have been evolved and adapted during many generations so that they suit local conditions and also suit the economic positions of the various groups. The various groups clearly understood the differences in the texture of the soil; they know exactly which crops are suited to any particular type of soil.

### **Shifting Cultivation**

Shifting cultivation is perhaps the oldest form of agriculture in West Africa. This is a system whereby a piece of land is intensively cultivated for a given period; the land is allowed to regain its fertility by abandoning it for certain period.

Rotherberg (1980) recognized that the forms assumed by shifting cultivation are more varied than in practically any other land use system. For example, in some cases, the continual movement of cropping may results in a slow movement of the population. The methods and intensity of shifting cultivation are influenced by land tenure system customs and the settlement pattern adopted by the people. This system enabled the people to create favourable conditions for their crop. That is, they were trying to control nature in such a way that there would not be much damage to it so that it would continue to ensure perpetual food supply.

For instance, Miracle (1967) in Rotherberg (1980) stated that fallow periods may be up to 6 or more years in the bid to restore the fertility of the soil. Allen (1967 page 5) in Rotherberg (1980) writes:

*The shifting cultivator has an understanding of his environment suited to his needs. He has a first hand knowledge of the piece of land suitable for his crops by the vegetation which covers and by the physical characteristics of the soil. He also knows the nutritive capability of the soil as well as how long the soil can sustain continuous cropping, the number of seasons for which it can be cropped with satisfactory results and the number of seasons for which it must be rested before such results can be obtained again.*

### **Mixed Cropping**

Like shifting cultivation, mixed cropping has a long history in West Africa. It involved having more than one crop on a piece of land. It makes room for optimal use of light, nutrient and water. This system for example ensures favourable distribution of carbon dioxide (Suryatna and Harwood 1971), makes nitrogen uptake higher and also gives room for increase in the degree of root impenetration. Other than these, it reduces erosion and surface run off of the top soil. In other words, it helps in maintaining the soil fertility. (Webster and Wilson (1966). Mixed cropping also serves as a sort of security measure. For example, diseases and insect pest damage may be less on a piece of land because of the presence of different kinds of crops. Mixed cropping enables the maximum returns to be obtained for the minimum effort.

Other methods of farming practiced in West Africa are mixed farming – which involves rearing of livestock and growing of crops on the same piece of land, Agro-Forestry and green manuring.

### **Animal Husbandry**

Animal herding was probably carried out under three systems: (1) Wild Pastoralism (2) Transhumance (3) mulching farming.

Evidence from rock art engravings show that early domesticates include barberry sheep, goats, cattle and ungulates like giant Eland as well as Kudu strepsiceros. The Kudu is present today in the North of West Africa.

The rock arts show that goats was common in West Africa and the recovery of cattle skeleton in the Teneran and Air region suggest that the cattle were small were small short horned cattle. Remains of domesticates were also found in the Sahara in the South West Libya. The long horn cattle is probably indigenous to North Africa.

Animals as cattle, sheep and quads were native species to parts of Africa and thence were locally domesticated.

The main Neolithic technological traditions in the Sahel and parts of Savannah region of West Africa which were centres in which domestication of animals occurred are the blade base Teneren and Bel-air-Senegal, Kintampo complex as well as those of Borkou, Ennedi which were characterized by harpoons and fish hooks.

### **Conclusion**

Agriculture traditions of West Africa are different from those of the Middle East in diverse ways particularly in techniques of cultivation and types of crops grown. Whereas seed agriculture (of the Middle East) developed in those areas where suitable seed plants were available and where the ecological conditions for it were suitable perhaps in the northern subtropical mountain belt of the old world, root and tuber agriculture developed in the tropics. Tropical root crops must have originated in areas with distinct wet and dry season because according to Hawkes (1969), the plants must store up in their underground organs sufficient food reserves to tide it over the dry period.

As a result of this, cereal crop farming cannot be used as a determining factor on the story of agriculture beginnings in West Africa. Agriculture developed in West Africa independently and it was a result of a combination of factors, the local resources, the ingenuity of the local populations as well as the peculiar environmental situation of the region.

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