Palaeoenvironmental Changes in the Northern Swahili Coast

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Introduction

This paper addresses the geological and ecological backgrounds of the northern Swahili coast in an attempt to show their potential role in understanding the evolution and development of, among other things, Swahili dietary behaviour. The paper is based on archaeological research findings from two northern Swahili sites of Ungwana (Abungu 1987) and Shanga (Horton 1984).

The main argument is that as is the case in other parts of the continent, knowledge of geological history and palaeoenvironmental changes of the post-pleistocene are of great relevance in understanding cultural changes on the Kenyan coast. East Africa was, in general, one of the areas which was greatly affected by changes in climate during the Pleistocene.

Although the climate of the region was stable during the Holocene, there were slight fluctuations which. together with geological and climate changes in the Pleistocene period, affected the economic strategies of the people and, as such, their dietary behaviour.

Geological Background of the Northern Swahili Coast

Almost the entire northern Swahili coast is covered by Quaternary and recent deposits which are composed of estuarine, sand, clays and coral limestone; it has also been suggested (inconclusively) that some miocene deposits underlie the Quaternary deposits to the northeast of the region (Natural Resources Inventory: n.d.). The region can be divided into eight different Quaternary and Holocene deposits: The first, sand dunes which are categorised into two and determined by age parameter. Here we have the Mundane range sand dunes and the Coastal sand dunes. The Mundane range are made up of former Pleistocene sands which due to ferric oxide staining have turned reddish in colour and rise up to 75m high. While the Coastal sand dunes are made up of mainly yellow or off-white sand and are only up to 35m high. In areas where there has been no vegetation cover the dunes have been disturbed. In general, the dunes are thought to be younger than the Holocene period (Jaetzold 1981).

Second, the undifferentiated Quaternary sands consist of Pleistocene and Pliocene sands which cannot easily be distinguished from one another. They are both of lagoonal origin and are lithogically very similar. The sands are greyish or yellowish in colour and poorly cemented. They were probably deposited in low energy lagoonal conditions behind dune fields or barrier islands (Jaetzold, 1981). At the surface clay pans occur along the flood plains and their local relief hardly goes beyond 10m. Third, the near surface coral limestone underlies the surface/Quaternary deposits in over much of the area. It consists of raised coral reef of a maximum thickness of 100m but are more commonly between 30-50m thick. The coral beds form ridges which dictates the southwest flow of creeks like the Dondori, Mongoni and Wange. It is believed the reef was formed during the middle Pleistocene (see Table 1) (Kusimba 1993).

Fourth, Beach deposits which overlie either the Quaternary sands or coral. They were made up of clays, sands and coral breccia. Some are loosely cemented while others are not. But in general, they are characterised by low ridges which often control the local drainage pattern. Fifth, the alluvial deposits found on top of the estuarine deposits and consist mainly of fine grained clay to sand deposits. These are common around the Dondori creek, and the water underneath may be saline. (Matheson 1963). Sixth, contemporary estuarine deposits are clay sand deposits similar in composition to the Quaternary sands. They were formed as a result of recent erosional and depositional activities and are characterised with brackish swamp ideal for the growth of mangroves. Seventh, deltaic deposits are contemporary clay deposits which occur along the Tana flood plain. Lastly, offshore coral and the barrier island complex is made up of the present beach deposits formed as a result of the lateral growth of coral breccia and sands.

The alluvium, vast sand dunes and cemented beach sands dominate the northern Swahili coast's geological features which formed during the Holocene (Table 1). The geomorphological features along the coast including creeks and raised beaches were formed during the Quaternary as a result of fluctuations in sea levels (Ojany and Ogendo, 1973). For example, the present creeks in the region are actually drowned rivers. The fall in sea level enabled rivers to cut deep channels which reached their maximum extent in the then sea level (Kusimba, 1993). During the Holocene when the sea level rose, the older river courses were drowned to form the present creeks such as Dondori, Wange, and Mongoni etc. Abandoned cliff-lines, stacks, raised platforms, and raised beaches indicate that sea levels were higher in the past (Ojany and Ogendo, 1973; Table I).

Ecological Background of the Northern Swahili Coast

The lithology and distribution of Quaternary sediments along the northern Swahili coast enables the understanding of the palaeogeography of the area and how it has influenced its ecology and human survival. The northern Swahili coast is ecologically diverse, offering a wide range of basic resources that have attracted different cultural groups and productive modes. For this paper, the region has been divided into major ecological land units, in which the major ecological land units and the major combinations of climate, soil and topography are isolated and equated with their basic vegetation types to indicate its ecological or land potential. There are three main rangeland units: semi-arid savannah, lowland moist savannah and evergreen thicket onto which has been superimposed six ecoclimatic types. (Natural Resources Inventory, n.d.).

The lowland moist evergreen forest and derived savannah is found in the areas around Witu and much of Lamu District. The vegetation and land unit consist of forest and derived bushlands and grassland and the potential is for forestry or intensive agriculture. Grazing can also be carried out in dry season on the seasonally flooded grasslands. However, grazing next to the forest and thicket bush could have been in the past restricted by wild animals and tse-tse fly (Ylavisaker, 1982). But veterinary services have allowed the keeping of mostly goats for milk and meat production in the settlements around and within the region.

In much of the coastal strip and offshore islands there are lowland evergreen thickets. It is an area of agricultural potential, one only needed to clear the bush and the thicket around. It could have also been possible to keep small livestock like goats and sheep in this zone. The lowland moist savannah supports a variable vegetation cover of moist woodland, dense bush and savannah near its coastal limits becoming increasingly drier inland. The area was in the past put under shifting cultivation and the practice continues to date. But generally a high agricultural potential is possible, depending on the soil type and availability of water.

The west and north of Lamu District has a marginal agricultural potential supporting a natural vegetation of dry forms of woodland and savannah. This area has been extensively cleared by burning giving way to fairly good grazing pastures. The woody shrubs dominating the vegetation can be utilised by both wildlife and domestic stock (Ylavisaker 1982).

The coral reefs and littorals bear rich fishing grounds. Inland from the coast, the island savanna has poor soils but there is adequate fresh water supply from the sand dunes formations close to the sea-shore. The coastal strip contains mangroves which besides being an important source of timber provide excellent fish breeding grounds (Kusimba 1993). The lowland wet forest along the coastal strip supports large animals, including elephants and rhinoceros. In addition, the soils in this strip are well watered and fertile (Ylavisaker 1982). The riverine woodlands south of the Lamu archipelago in the Tana River area have green, well-watered forests and fertile soils (Miller 1989).

In general, the northern Swahili Coast appears not to provide a particularly good basis for livestock development. The many constraints included insufficient water supplies in the dry season, prevalence of tse-tse fly and abundance of dense bush thickets and woodland in contrast to extensive grasslands or parklands. Therefore, it is possible that the people who inhabited this area could have harvested livestock in the overstocked hinterland. Poultry keeping was popular in the area and appeared to be good supplement for the peoples diet.

A wide variety of crops can potentially be grown in this area. These include maize, sorghum, finger and bulrush millet, dolichos bean, green gram, cow-pea, sweet potato, sunflower, sesame, soya bean, groundnut, cotton, tomato, eggplant, kale, Chinese cabbage, chilli, sweet pepper, pumpkin, onion, water melon, cucumber; with pigeon pea and rice in the areas of intermittent lakes (Ylavisaker 1982).

Crops that can be grown throughout the year round include mango, cashew nut, papaya, avocado, cassava, guava, senna, castor, coconut, citrus fruit, pineapple and banana. Much of the area suffers from flooding, therefore, crops like rice which can be grown in submerged clay soils can benefit from the flooding. Sorghum, sweet potatoes and chick peas are reasonably tolerant to short term flooding and hence could be planted in places with less risk of flooding (Ylavisaker 1982).

Conclusion

This paper, based on a summary of a number of works, has shown the geological areas which comprise diverse ecological zones that have offered a variety of opportunities. The coastal plain and offshore islands offered marine resources and access to trade routes. The bushland and forested areas were habitats to wild animals including elephant, rhino, leopard, lion, which provided a source of important raw materials for trade goods in the long distance maritime trade in which the Swahili have taken part since the first century A.D. The mangrove swamps, which provided timber, were also suitable fish spawning localities. Thus, the Swahili coast's attractiveness to human settlement made it an inevitable area for competition for settlement and exploitation of local resources.

Archaeology, when investigating palaeoenvironment, seeks to understand the animals and plants of an area. However, there is little in terms of floral evidence from the sites; until this area is developed, no a comprehensive palaeoenvironmental picture can be drawn. On the other hand, it is difficult to apply the ecological requirements of present populations to those of the past with sufficient precision by using game mammals as a primary source of environmental data. Although a few correlations can be drawn, as modern populations still have their ecological needs, optimum habitats and limitations which can be investigated and compared to some of those ancient populations.

It is always difficult to interpret the ecology of an archaeological deposit, since the character and content of the deposits are not always representative of the species present, their abundance or even geographical distribution within a given area. Ecological interpretation of archaeological deposits, however, does help in understanding the available resources exploited by humans at any given time over a specified period. It does indeed contribute to our understanding of the past environment, especially when used together with other investigative methodologies.

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