

Modelling Early Food Production in the Mid Holocene of the Eastern Sahara

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Appendix H – Test Case Study: The Hadendowa of the Beja

H1 Introduction

In 1987 the Red Sea Area Programme (RSAP) began, a project designed to a) improve local food and security and b) to improve the natural ecological base in order to create sustainable production systems (Manger et al 1996, p.9). It was based in the area of the eastern Sudan occupied by the Hadendowa of the Beja, a Bedouin group of pastoral-cultivators who had been hit very badly by the 1984-85 drought and had lost both human lives and herds. The project also had a broader goal, which was to develop improved research techniques for use on future applied projects. The emphasis on gathering data before any attempts to apply solutions to the problems experience in the area was an important one. Their two main focal points were natural and social aspects of Hadendowa life, as these were seen as central to the future sustainability of the groups that made up the Hadendowa. The Hadendowa are part of the Beja, which consists of a number of groups. The Hadendowa are based to the south of Port Sudan from Sinkat to the Gash Delta (Manger 1996d, p.19).

In 1996 the RESAP team produced a book detailing much of their research: *Survival on Meagre Resources. Hadendowa Pastoralism in the Red Sea Hills*. The RESAP team carried out research at the landscape level, covering three climatic types along an east-west axis. Because of the size of the area involved the publication includes many generalizations about Hadendowa behaviour which vary from one group to another. However, the generalizations are based on research into commonalities and are useful for understanding how the Hadendowa managed livelihoods both in their home areas and over larger distances.

Although there are other publications that provide details of the Hadendowa, this case study only uses this one publication (Manger et al 1996), as this was not intended as an analysis of the Hadendowa but an early test of the SRL Model. The full case study was worked through in some detail but has been excluded from the main text of the thesis due to the volume of the output, but a bullet-pointed version is included in this appendix.

H.2 The Livelihood Status

H.2.1 Asset Matrix

Natural Assets

Topography of Hadendowa territory

- The coastal plain
- Red Sea Hills west of coastal plain
- Plains west of the mountains in four key areas: Hadarbab, Gebeit al Ashraf, Summit and Odrus.

Hydrology

- The area is estimated to receive less than 200mm of rain annually, which puts it into the arid category of climatic areas.
 - Highly variable
 - 2 season precipitation regime, summer and winter across the territory
- Climatic variation on an east-west axis, with three different types of climate represented across the topographical range.
 - The Red Sea coastal plain has limited winter rain and depends on surface run-off from Red Sea Hills.
 - The Red Sea Hills receive more winter rain than the coastal plain.
 - The western plains have a drier climate and only receive rain during the summer months.
- Tokar and Gash rivers
- Unlike the Western Desert it is provided with only very minimal water from aquifers, has low groundwater retention and, apart from the Tokar and Gash rivers, the most productive source of water are the seasonal khors (systems of dry river beds)

Temperature

- From highest mean temperature on plains south of Red Sea Hills 32°C to Erkowit in Red Sea Hills 22°
- Hottest months June and July

Edaphic Conditions

- In the Red Sea Hills, aeolian silt, sand and gravel, generally poor fertility
- In khors and wadi beds alluvial soils, which are often fertile, mixed of organic and inorganic detritus
- In river floodplains fertile silts
- In coastal area silt, sand and gravel, saline and of poor fertility

Vegetation

- Wide variety of plant taxa are present in different areas. Arid-adapted vegetation dominates, but varies across the three topographical areas.
 - Along the coastal plain salt-marsh vegetation dominates, with saline-resistant species thriving.
 - In the Red Sea Hills open woodlands, annuals and ephemerals (herbs and grasses) dominate.
 - In the plains and valleys bushes, trees, ephemerals and annuals thrive that are typical of Sahel-type environments.
- In all areas trees under threat from cutting for wood-fuel and charcoal following the 1980s drought

Fauna

- Wild animals are not mentioned – hunting is not practiced.
- Domesticated animals must be drought tolerant and carefully managed to preserve the environment
 - Goats, which browse and graze
 - Camels, which browse
 - Cattle, which graze

Stone, minerals and ores

- Pre-Cambrian Basement Complex rocks
- Volcanic rocks

Physical Assets

Shelter

- Ephemeral campsites formed of structures made of woven goat hair over wooden structures
- Tents, the domain of women. Each wife has her own tent
- Shuffat, the domain of men and visitors

Raw material acquisition

Not specified – would need investigation

Food acquisition and production technologies

Not specified – would need investigation

Craft skills

- Basketry and matting
- Pottery
- Charcoal manufacture

Structures

None, apart from the ephemeral camps mentioned above

Food storage systems

Not specified – would need investigating

Transport

Pack animals

Fuel

- Wood
- Animal dung

Social Assets

Status, roles and social organization

- Patrilineal lineage is of key importance and association with particular tribes and groups helps to confirm territorial rights.
- The main units amongst the Beja are *adat* (maximal lineage), *duwab* (sub-lineages) and *dua* (camp cluster).
- Social organization is egalitarian but there are co-operative leadership roles for administration, justice, and land tenure disputes.
 - Political and military administration is organized by tribal leaders (*weileliab*)
 - Ordinary justice administered by courts (*mejlis*) based on traditional (*urf*) and Islamic law (*shari'a*)
 - Can be escalated to the *galad* (council) of tribal leaders, wise men and *neetural* members outside lineage
 - Religious rulings a mixture administered by *shidobinab*.
- A household usually consists of a man, wife and unmarried children and is the basic productive unit, responsible for the management and distribution of resources amongst family members. Marriage partners are usually selected from close relatives.
- A strict male/female dichotomy always observed.
 - Men herd camel, sheep and goat and milk the herds as well as cultivating crops.
 - Women are confined to the domestic realm.
 - Women live in tents with their families, whereas men congregate in communal dwellings where visitors also stay.

Ideology and Religion

- Islamic with traditional elements
- Important concepts of honour embedded into economic and social life

Rites of passage

- Boys and girls are given livestock by their father on important occasions in their lives.
- When a couple marries the animals are taken from the father's herd and becomes the responsibility of the new husband.
- Male and female circumcision

Tradition and social values

- Primary tradition of importance is a concept called *salif* which is a continuity of tradition, centred on honour, handed down from the ancestors.
 - Honour governs the management of land and resources.
 - Protection of tribal heritage
 - Protection of weak within tribe
 - Incorporates the need to be generous and hospitable
 - Both a collective and individual responsibility
 - Two conceptual systems
 - Badaweit, full membership of Hadendowa honour system based on traditional livelihoods
 - Balaweit, life away from Hadendowa territory, primarily in urban contexts, where different values adopted and the honour system is not maintained. Within Hadendowa closely linked to concept of *ayb*, shame

Management of resources

- Trees are culturally and legally protected.
 - However, after the 1983/84 drought the cutting of trees for charcoal production and sale to the urban sector increased dramatically:

Mobility

- Traditional mobility with livestock
 - Important for exchange of information within tribe
 - Involves meeting people from other tribes and lineage groups
- Modern mobility between traditional livelihood zones and urban areas for wage work, often placing tension on relationships between those who stay, and those who move between the two livelihood systems.

Intra-group relationships of support

- Livestock form the core means of offering support to tribe members who have suffered loss of livestock
 - Dangit, where a man borrows animals and uses only milk and returns animal where crisis is over
 - Tait, where an animal is transferred to a new owner, creating a new bond between the persons involved

Inter-tribe relationships

- Confined mainly to aggregation areas where groups from many different areas converge to take advantage of seasonal resources
- Tribes can have rights to land in other areas, meaning that there are often tensions over land ownership

Subsistence Assets

Data for subsistence activities

Food Production

- The character of the Eastern Desert has become unpredictable in the last few decades, with drought periods, of which the worst was in the early 1980s.
- There are two main productive resources in the Hadendowa system:
 - Livestock (goat, sheep and camels and in some rare cases cattle)
 - Livestock used as a source of milk, butter, cash and also part of a system of social reproduction because used as bride-wealth, and for compensation in instances of crime.
 - Land (for small scale cultivation and grazing). .
 - New opportunities in Port Sudan and Sinkat for wage labour in local industry both during drought and as the demand for newly available goods (e.g. sugar, cloth, coffee) grows.
 - Sale of charcoal to Port Sudan industry is another form of income, but one which is undermining the local ecology.
 - Famine relief aid also enables the Beja to make purchases of essential items during drought periods.

Practice of subsistence activities

- Animal husbandry is a year-round responsibility and carries with it an ongoing need for labour.
 - Movement is required in order to utilize grazing/browsing all year.
- In all areas during the rainy season cultivation is possible on wadi banks and in the wadi bottoms following floods, some plains, and there is a “bund” system to retain water run-off, using branches and sand. Each area has its own particular subsistence strategies.
 - Hadarbab: Plains transacted by five big khors, rich for pastoral and cultivation lifestyles, not much need to move, so when movements of herds in December and June others stayed in the area. Grazing and browsing and rainy season cultivation; June cultivation; December move to winter grazing on coast or to khors.
 - Gebeit al Ashraf transhumance with two movements, in the winter and summer, where rights to land held for both livestock and cultivation activities
 - Summit Agro-pastoral and railway work, the latter meaning it was much less vulnerable when the droughts hit.
 - Odrus grazing and browsing and June cultivation took place during the rainy season, whilst in December there was move to winter grazing on coast or in khors.

The potential for and indications of wage and trade networks

- Local goods markets
- Government cultivation schemes
- Wage labour opportunities in towns

Labour

- Division of labour between economic (men) and domestic (female) realms
- Adult males responsible for camels, teaching young males and livestock milking and sales

- Males under 20 years of age assist with herding and cultivation and milk livestock
- The elderly tend young animals within half a kilometre of tents
- Share-cropping arrangements frequent
- Co-operative labour system when required
 - Agriculture
 - Livestock
- Problems experienced recently
 - Loss of some men to urban centres
 - Retain rights in Hadendowa territory

Information

- Essential to Hadendowa life, formalized in “sakanab” greetings
 - Rainfall and pasture availability
 - Market prices
 - Availability of work in urban centres
 - Activities of other tribes

Mobility

- Transhumant movement between areas is increasingly important, although a wholly migratory lifestyle was pursued in the past.
 - These traditional occupations are now supplemented by activities both outside the region and outside their traditional livelihood in the industrialized zone of Port Sudan,

Land Tenure

- Rights to cultivable land determined by ancestry, membership of a group by descent and by marriage
- Amongst the Hadendowa land is inherited or fought for and is imbued with concepts of honour and heritage.
- Only lineage members can obtain water rights and the right to build a permanent residence
- Non-lineage members can obtain access for grazing but are not allowed to make permanent structures. This allows demonstrations of generosity. Land clearance (removal of trees) may only be done with the agreement of the entire lineage group (*duwab*), irrespective of who holds the original right to the land.
 - If deemed as detrimental to livestock activities then land clearance may be refused, especially where large number of trees are under threat.
 - Conflicts over rights of tenure are frequent and must be resolved by claimant's tribal representatives.
 - Disputes over land are carefully managed, with a tribal council taking part and a way of escalating to higher authority.

Human Assets

Potential nutrition

- Staple food is dhura porridge accompanied by milk
- Meat only consumed on death of an animal or on special occasions

Evidence of physical condition

- Decreased mortality and improved standards of health
 - Due to better health care provision, reduced warfare and increasing sedentism.

Skills and knowledge

- Knowledge and skills communicated from father to son and mother to daughter
- Formal education only introduced since droughts in 1980s, and only available to a few

Demographics

- **Population:** Although there were censuses taken in 1956, 1973 and 1983 demographic information remains poorly understood due to changing district and provincial boundaries.
 - District thinly populated with overall density 8.4 person per sq km in 1983 increased to 9.7 person in 1989
 - Better health
 - No ability to slough off excess members to new areas due to expansion of urbanism and inability to open up new territories
 - **Gene pool:** The Hadendowa prefer to marry close family members.
 - **Gender/age mix:** Although there is a good balance between men and women, there is an increasing tendency for the younger generation to seek work outside the traditional livelihood system, seeking work in urban areas
 - Between 1955 and 1983 the urban population of the Red Sea area has decreased from 53 to 25%

Personal Assets

Individual status

- Although there is no hierarchy within Hadendowa tribes, various positions are available to male members in order to participate in and contribute to Hadendowa life.
- Outside traditional Hadendowa life there are many more opportunities due to the availability of agricultural schemes and urban wage employment
- Although women traditionally have no status, recently the departure of male family members to urban areas has led them to head households, manage livestock and sell produce at truck-stops.

Security

- Since colonial rule in the 19th Century, war has been largely outlawed, although occasional disputes over land may become violent.

- Economic security is in decline, partly due to environmental deterioration and partly due to the departure of younger males into urban wage trades

Ability to influence decisions

- Decision making is an ongoing feature of Hadendowa life, and for men there are options for men to hold positions where they can contribute to individual decisions that support Hadendowa values, honour and ideas of justice.

H.3 The Livelihood Variables

Vulnerability Context

- Increasing aridification and unreliable rainfall
 - Droughts of the early 1980s, which caused serious difficulties for the Hadendowa, and this has been used here as a useful demonstration of the vulnerability context confronting the Hadendowa. The RESAP study identified three phases of disaster response during drought:
 - Phase 1
 - Male animals and unproductive females sold
 - Buy food
 - Reduce fodder requirement
 - Look for ways to diversity income
 - Use of unfavoured wild plants
 - Migration begins, with some family and most possessions left behind
 - Phase 2
 - Female animals sold, putting herd in jeopardy
 - Essential tools and possessions sold
 - Money and goods borrowed from outside kin
 - Increasing dependence on charity
 - Phase 3
 - Mass migration to towns and relief camps
 - Nothing left behind
 - Tribe members becoming beggars and destitutes
 - Human and animal deaths
 - International aid agencies stepped in with short term relief and longer term support
 - Regional differences in response to disaster can be observed in the region occupied by the Hadendowa depending on opportunities available:
 - Hadarbab
 - Droughts hit them severely
 - Lost most of livestock
 - Turned to charcoal production for Port Sudan, at the cost of the environment.
 - Gebeit al Ashraf

- Drought was combated by linkages with relatives and tribal links with relatives in Sinkat (modern industrial) where men were employed as middle-men
- Summit
 - Agro-pastoral and railway work
 - Much less vulnerable due to low dependency on livestock
- Odrus
 - Wide plain with khors for pasture and cultivation
 - But drought has meant reduced livestock and most families don't do the seasonal movements, so plains are under increased pressure
 - Increase in charcoal production, threatening biomass

Opportunity

- Agricultural schemes managed by the government in the southern Hadendowa territories
- Expansion of urban centres, particularly Port Sudan, connected to other commercial areas by rail and tarmac road
 - Male migration
 - New middle-man roles for the young outside the traditional system
 - Wage labour for Hadendowa
 - Increasing independence for women who now head households, tend livestock and sell craftwork at roadsides
 - Sale to urban centres of wood fuel and charcoal
- International aid agencies and NGOs
 - Emergence of new elite with greatly improved strategic position within communities
 - Positions as interpreters and administrators

External Structures and Processes

- International aid agencies and NGOs
 - Short term provision of food to counter impacts of drought
 - Increase of social services, including health and education
 - New work opportunities for young Hadendowa males
- Urban development and connection to road and rail networks
 - Reduction of territory for traditional activities
 - Degradation of natural resources
 - Departure of young males for wage labour
 - Breakdown of traditions
 - Stress on Hadendowa economy
 - Changes in roles of women
 - Imposition of national and regional market trends on local markets
 - Excessive drainage of sub-surface acquirers, depriving rural population of essential resources
 - Heavy demand on biomass for building materials (e.g. dom palm for roofing and any trees for fuel)

H.4 The Livelihood Outcomes

Environmental Impact

- Destruction of trees for wood-fuel and charcoal sales into urban centres has destabilized the environment, reducing browsing options and altering biomass so that pasture is also under threat, confining browsing and pasture to wadis and khors
- Centralized social services improved longevity,
 - Increased population
 - Encouraged sedentism
 - Dry season pasture now occupied on a year-round basis, causing harmful change of biomass and reduction of trees

Economic Impact

- Declining condition of environment
 - Increased economic dependence on government and NGO schemes
 - Increasing dependence on urban work
 - Increasing sedentism
- Increasing urban spread reducing land available for livestock herding and cultivation of dhura
- Fluctuating prices in national and regional markets make it difficult for Hadendowa to forecast whether they will be able to sell livestock and other products at a reasonable price to enable them to purchase grain and optional consumer products

Social Impact

- The demolition of trees in defiance of social and cultural sanctions has undermined traditional laws, values and all-importance concepts of honour
- Appearance of NGOs and aid agencies, as well as government sponsored agricultural schemes has changed the balance of leadership of the Hadendowa
- Centralized social services improved longevity, increased population and encouraged sedentism
- Perception of Hadendowa as increasingly out of touch with modern times, leading to their marginalization

The radar diagram below (figure H.1) is a graphical representation of the current state of the Hadendowa as a whole. A more precise way of understanding the Hadendowa would be to take them geographically and look at how each duwab (sub-section of the tribe) is coping, but that is out of the scope of the thesis. What the radar diagram indicates is that the Hadendowa are strong in Personal and Physical asset categories for opposing reasons. The Hadendowa livelihood strategy requires very little investment in physical infrastructure, so it is easy to maintain. The Personal category reflects new opportunities in urban centres and agricultural schemes, many of which will undermine the Hadendowa way of life, but will enable men to support their families and may give women more autonomy. Subsistence strategies were still sustainable in the 1990s, but were increasingly

undermined by the expansion of urban centres, the undermining of the environment and the growth of population. Human assets are fairly good, but as a result of outside intervention in health and education. Natural resources are increasingly vulnerable, undermining every aspect of Hadendowa life, and placing their much valued Social assets under serious threat.

Asset Category Strengths and Weaknesses

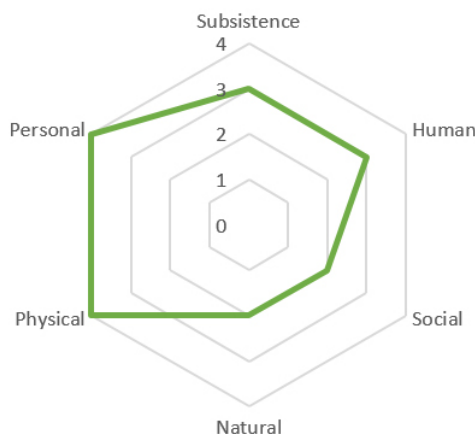


Figure H.1 – Radar diagram for the Hadendowa in 1996

H.5 Top Level Conclusions

The role of this initial test study was to see if the SRL Model could be applied successfully to a modern ethnographic example. The purposes were two-fold: 1) to see how the data conformed when being fitted into a model, and 2) to look for problems with the application of the model to archaeological data. It relied on one publication, so its findings are limited to the data contained within that publication (Manger *et al* 1996).

- 1) The model worked well with the data, even though there were gaps in the published survey. These could have been filled by using other sources, but it was sufficient to identify the gaps and decide upon how they could be filled. The emphasis in the RESAP survey on the Hadendowa as a series of continuities and traditions that were also always in a state of flux allowed external influences and outcomes to be isolated and highlighted.
- 2) It was obvious that certain aspects of modern livelihood management amongst pastoralists, like lineage organization, land tenure arrangements and religious beliefs, might be difficult if not impossible to recover archaeologically. The need to explore archaeological analogues for some of the economic and social structures that might have been employed in present and past was identified as a priority in the thesis.

