ADAPTIVE STRATEGIES IN AFRICAN ARID LANDS
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Edited by
Mette Bovin
and
Leif Manger

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Cover: Four teenagers holding a radio and a ghetto-blaster in the open bush. Surrounded by donkey rider and lizard. Ornament made by pastoral WoDaaBe girl in the arid land of Niger. From a plastic bowl, Mette Bovin Museum Collection.

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Foreword

This collection of essays grew out of a workshop held in Uppsala, Sweden, April 13-16, 1989. The workshop was organised by the Scandinavian Institute of African Studies, SIAS, (Nordiska Afrikainstitutet) and is part of a larger research programme at that Institute called "Human Life in Arid Lands."

The overall theme chosen for this seminar was *Adaptive strategies in African arid lands*, and the general aims set out by the organisers were:

- (1) to delineate the salient features of ecological and socio-economic adaptations in African drylands;
- (2) to discuss the contemporary crisis of traditional forms of adaptations and to isolate agents of change; and
- (3) to analyse the emerging adaptive strategies and coping mechanisms that arise out of the contemporary African crisis.

The best way to go about dealing with such complex issues was thought to be through a combination of specific case studies and broader and more comparative studies. Based on such contributions various issues could be approached like:

- (a) the variability of adaptive strategies and adaptive forms in various ecological zones and in different socio-economic and socio-cultural contexts;
- (b) the impact of the state on traditional farming, pastoral and agro-pastoral systems of production, both through the physical presence of state agencies as well as the contexts of state policies; and finally:
- (c) the socio-cultural aspects of specific adaptations and how the dynamics on this level have affected and have been affected by the various developments hinted at above.

To discuss this scholars met from the Nordic countries Sweden, Finland, Norway, and Denmark, and from Sudan. Representatives from various social science disciplines were invited, the fields represented being social anthropology, cultural geography, political science and resource economy.

As editors chosen among the workshop participants we want to express our gratitude to Dr. Mohamed A.R. Salih for providing this opportunity to meet. His professional as well as social efforts during the days of the workshop made possible fruitful discussions as well as an enjoyable time in Uppsala. Prior to the work-shop Dr. Salih also provided the participants with a position paper on major themes relating to the workshop. The aims of the workshop quoted above is from that paper and as editors we draw on it in our introductory chapter. As we have worked these parts into our
these parts into our own text there is no reference to Dr. Salih and we acknowledge here the usefulness of his paper.

Finally we thank the Scandinavian Institute of African Studies for financial support that has facilitated the work of editing this proceedings. Special thanks are also due to Thelma Kraft at the Centre for Development Studies in Bergen for valuable secretarial assistance.

Bergen/Copenhagen, January 1990

Mette Bovin
Institute of Anthropology,
Copenhagen, Denmark

Leif Manger
Center for Development Studies,
Bergen, Norway
Introduction

Mette Bovin and Leif Manger

The African arid lands extend from the edge of the tropics to the dry deserts. They make up almost whole countries such as Mauritania, Mali and Niger, and Chad and over 60-70 percent of Sudan, Ethiopia, Somalia, Kenya, Tanzania, Botswana and Namibia. Beyond the desert, in North Africa, the drylands cover over 80 percent of Egypt, Libya, and 50 percent of Morocco and Algeria. The general distribution of what is called arid and semi-arid lands in Sub-Saharan Africa is shown in Map 1., but although this map shows a clear zonation it is a fact that none of the African countries is without a region which can be described as arid or semi-arid. The distribution of extremely arid and semi-arid lands within the African countries has been studied by Meigs (1953) in depth, and Map 1 is based on these findings.

The traditional production systems in this zone are arable cropping, pastoralism and agro-pastoralism. Such production systems have evolved in a context of resource scarcity and high risk in the exploitations of such resources. The arid areas are characterised by a very distinct dry season asposed to a rainy season. The rainy season varies in length from two to five months from area to area. There is high variability and unpredictability of rainfall. Evaporation is high, soils are relatively poor with low nutrient content and low in organic matter. Erosion is also a constant problem. In such contexts the adaptational strategies have been sustained due to their high flexibility.

Arable cropping follows the annual cycle of the rains in the South Sahelian Zone with approximately 350-600 mm of rain per year, and the Sudano-Sahelian Zone with approximately 600-800 mm per year. Stagnant technology, poor application of manure and mounting labour constraints due to labour migration, all point to a low productivity. Due to marginal lands it is necessary to clear new plots every few years, to adopt a rotation system and to apply manure from animals, or to make use of certain trees (like accacias) in order to increase soil fertility. In spite of certain methods of soil conservation it is however evident that clearance of new plots is the most dominant practice. Crop farming thus often implied movement of people as well. The main crops cultivated in this zone include sorghum, millet, maize, groundnuts, cotton, sesame, hibiscus and a variety of other minor crops.
Map 1. *Arid lands in Africa.*
From (P. Adams *et al.*, 1978:17, after Meigs).
**Introduction**

*Pastoralism* and *agro-pastoralism* in African arid lands require seasonal movements in response to variations in rainfall and pasture. The type of livestock kept differs with ecological conditions. Cattle and sheep are associated with the "wetter" zone of the semi-arid lands, while camels and goats are kept in the drylands and semi-deserts. Pure Sahara desert sets the northern limit for pastoralism, and the tsetse fly sets the southern limit towards the wetter zones of Africa. Herd management is based on a careful and delicate balance of animal movement in space and time. The system of adaptation becomes even more complicated when agro-pastoral production is practised since the household has to combine herding and farming activities.

But adaptational strategies can not be understood solely on the basis of environmental constraints. It is important to note that adaptive systems in the arid zone have never been completely isolated. Nomads have moved and have been in contact with cultivators throughout history. Barter of grain and animal products has been common and still is. Regional trade systems have also acted as inter-linkages, with traders acting as middlemen. The presence of pre-colonial state formations in Africa has also provided contacts between adaptive groups.

It would be wrong to argue that the traditional adaptational systems outlined above have been in ecological balance or equilibrium over the last centuries. But they have been adaptive to an extent that they have permitted fairly large populations to exploit marginal regions in a sustainable manner. This apparent success has however depended on certain checks on the capacity of the systems to expand beyond levels of carrying capacity within their areas. Drought is one such major factor, warfare is another one, and disease a third one. All three factors have acted as checks on population and animal numbers. General demographic mechanisms like low birth rate and high death rate are also part of this picture. So is a subsistence oriented production which has kept consumption needs low.

Today, however, the same systems are coming under increasing pressure. One important factor is the *nation state* which has systematically favoured the development of agriculture and settlement at the expense of pastoralism and nomadism. The nation state has also meant an increasing demand for grain and animal products, both to feed an increasing urban population, but also as part of the export oriented economies established. Health services for people and veterinary services for animals have brought increases in population and animal numbers, particularly from the colonial days and onwards.

Such new developments have emerged without new cultivation techniques or land use systems being developed. The overall tendency has been one in which traditional activities have expanded. This again has led to a reduction of flexibility which increases pressure on environment and increases the vulnerability of the adaptations to the whims of nature.
The general point here is that the apparent "ecological crisis" in African arid lands, and the falling food production, must be seen as a result of many types of processes like: population increase, expansion of areas for cash crops, urbanization and a subsequently increasing food demand. The problems that face the populations living in the arid zone of Africa today thus turn out to be as much of a political and an economic nature as they are purely ecological ones.

The essays presented in this book confirm this impression and provide material for showing how processes of different kinds and different levels interact. Moreover they show how the manifestations of the problems differ from region to region. Such variations depend on natural environments, particular histories of development, on socio-cultural characteristics, and on the nature of each state power. It is to such types of variation, and to how they affect processes of adaptational change we shall now turn. At this point it is necessary to leave the general level and draw on the particular lessons presented through the essays.

**MAJOR EMPIRICAL THEMES**

**African pastoralists and processes of marginalization**

Three of the essays discuss pastoral and agro-pastoral societies and how such types of societies are affected by various factors ranging from natural hazards to the policies of the nation states to which they belong. The overall trend emerging from all the essays is the increasing marginalization of pastoralist societies in contemporary Africa.

*Mette Bovin* draws a broad picture of the *Fulani people* (or: *FulBe*) of the West African arid lands. Living under different ecological conditions within the Sahel and savanna belts their adaptations ranges from pure nomadic pastoralism to semi-nomadic/semi-settled agro-pastoralism and completely settled agriculture. But these adaptational variations must also be related to the historical developments leading to the spread of Islam and the emergence of pre-colonial FulBe states throughout the area. Hence the variations are also seen on the level of socio-political organization.

The two societies discussed by Bovin reflect both facts. The *FulBe Liptaako* live in northern *Burkina Faso*. They are agro-pastoralists and belong to a stratified class society that used to make up the Emirate of Liptaako. The *WoDaaBe* on the other hand are a nomadic pastoralist Fulani group, moving between parts of *Niger, Nigeria, Cameroun, and Tchad*. They have a tribal organization with clans and lineages, and live in camps, not in villages and towns. An important aspect of this history is their attempt to move away from the influences exerted by emirates or states of the Liptaako type. *WoDaaBe* represent an adaptation of "escape" from states.
Both types of societies are changing due to the developments of recent decades. One important change producing factor is the *drought*, or rather: the *droughts*. Such droughts are recurrent themes of the Sahel and people have names for them. For the agro-pastoral FulBe droughts lead to increased settlement in villages and towns, whereas the nomadic people react the opposite way: by increasing their mobility. But also internal changes can be observed. The class structure of the Fulbe Liptaako is changing as the former aristocrats find themselves as destitutes in an economic sense. For the WoDaaBe the drought has resulted generally in drastically reduced herds, but also in changes in the sharing and redistribution mechanisms that are so characteristic of pastoral societies. One major change is the commercialization of such relationships, i.e. that rich merchants in towns invest in cattle and pay poor (WoDaaBe) herders to herd these for a low salary,—a new trend in pastoral "development" in the Sahel.

Drought is not, however, the only factor that leads to marginalization of the West African pastoralists. A crucial context for the above developments is the state and the state policies within agriculture. Without going into detail Bovin alludes to the fact that the national states of West Africa have encouraged cultivation of millet, vegetables, and cash crops (particularly groundnuts), and the expansion of land under cultivation has clearly worked towards a marginalization of the nomads. Representations of pastoralists as "a problem" can thus only be understood on the basis of an agricultural bias in the societies at hand. Bovin argues that a change from true pastoralism to agro-pastoralism is not *per se* a positive direction of "development". On the contrary for the WoDaaBe nomads of the four countries around Lake Tchad. In the driest areas of arid Africa (of 150-300 mm. rain per year) pure pastoralism can be the most rational "adaptation" - in contrast to "wetter" arid lands (of 300-1000 mm. rain per year) where agro-pastoralism may represent the most rational solution.

*Mohamed Salih's* focus, in the following essay, is also on a Sahel pastoral people being marginalized through environmental as well as politico-economic processes. His case is from the Hawazma, one of the Baggara groups living in Central and Western Sudan.

Although their migration routes have varied historically the pattern for the Hawazma in this century has been rather regular movements from the sandy areas of Northern Kordofan where they have spent the rainy seasons, through the Nuba Mountains in South Kordofan, towards the Upper Nile province and the White Nile where they have spent the dry season.

The change producing factor mainly focused on by Salih is the expansion of mechanised agriculture in South Kordofan (and South Darfur for other Baggara groups). Through this development the Hawazma have lost grazing land and it directly constrains their migration routes. Such factors,
combined with unfavourable prices on animals and animal produce, have forced the Hawazma into settlement in villages and towns, and into becoming wage labourers of different sorts.

For those remaining in a pastoral adaptation this means that they may herd animals belonging to their settled kinsmen, or herd by being paid by richer Hawazma. In both cases the Sudan shows a similar development to the commercialization of pastoralism as described for West Africa.

Changes can also be seen on the level of social organization. The camps (feriq) are now becoming smaller. Such camps are made up of agnates and in-laws who used to coordinate their herding and productive activities. With fewer people labour becomes a problem for traditional pastoralists and the purely economic aspects of herding becomes more central. Also the communal aspects of eating is changing, moving towards a more individualistic pattern.

Ownership to cattle change, particularly in relation to women owning cattle. Women today own less cattle than they did in the past since also the social mechanisms through which they got such animals or rights in animals are changing.

Schooling for children has changed relationships between fathers and sons. Hired herdsmen take over the animals whereas sons go to school to enter the Sudanese society through such channels.

It is evident from Salih’s presentation that the State and its planning ideology play a crucial role in this development. Pastoralists are politically marginal and they can not make themselves heard in competition with big traders and administrators who are the main benefactors from the expansion of mechanised agriculture. Pastoralists as well as traditional cultivators end up as a cheap labour force on such schemes.

An alternative according to Salih would be to develop agro-pastoralism, i.e. through plow agriculture built on the positive links between the livestock sector and cultivation sector. Projects with such aims do exist but the overall dynamic is towards further mechanisation.

Drought has affected this situation, and so has the deteriorating security situation in the areas of mechanised farming. This is related to the Civil War in the Sudan and this factor is to an increasing degree making any kind of productive activity difficult in these areas. The mechanised schemes have stopped, and the nomads are no longer pushing far south. The effects of these changes remain to be seen.

Vesa Matti Loiske in the third essay, deals with pastoralists of the Northern Highlands of Tanzania, the Barabaig. They are primarily a cattle people, but Barabaig also keep other animals, and some of them also cultivate the soil. The natural conditions of their home areas vary. There are differences in availability of water, and rainfall varies from over 1000 mm in the highest areas to 400 mm in the arid parts. This variation is exploited through the pastoralists’ migrations, but it also means that there
is crop cultivation going on in the best areas. Cultivation is practiced by Barabaig as well as members of neighbouring groups, and in more recent years agricultural schemes have been introduced. In addition to such factors the Barabaig have had to deal with natural hazards like drought, and problems like the rhinderpest and the tse-tse flies. Loiske’s paper gives a historical overview of how the Barabaig have been affected by such factors and how they have dealt with them.

From a pre-19th century situation with no tse-tse and no farming, the situation for the Barabaig has changed. First with the rhinderpest and the challenge from Masai groups in the 19th. century, through the spread of the tse-tse fly and the attempted forced stock reduction in the 1930’s and 40’s. Then came the recovery in the 1950’s and finally the period of independence in which the “ujama’a” forced settlement and the introduction in their areas of mechanised farming to increase Tanzania’s food production.

These developments have deprived the Barabaig of traditional pasture land, they have brought neighbouring groups like the Iraqw and Nyaturu as cultivators into these lands. Moreover they have encouraged processes of differentiation through the Government’s encouragement of “progressive farmers.” The failure of all these modern political strategies are really at the heart of the Tanzanian crisis.

Loiske’s paper does not discuss in detail how the Barabaig deal with these external contexts but on a general level he points out the strategies the Barabaig are using to deal with the challenges. He classifies the responses in “traditional” and “modern” ones. Assimilation, migration, cooperation with other ethnic groups, cattle raiding, killings and wars are classified as traditional - whereas participation, negotiation, peaceful demonstrations and involvement are modern ways of responding. But Loiskes point is that they are all made use of in a contemporary context and that they are part of an effort to keep a Barabaig identity.

Comparing the three papers on pastoralists one sees that on a general level East African pastoralists show many similarities to the ones we have seen in the Sahel. Drought is a fact of life for the East African pastoralists as it is for the FulBe and Baggara. And so is the existence of nation states that try to marginalize the pastoral way of life, to control their movements and to bring them into “the modern ways of life”. But there are also important variations between the regions.

The history of relationship between East African pastoralists and the state formations is generally of a newer date than in the Sahel. The FulBe and the Baggara have both been part of and relating to the Savanna states throughout the centuries, whereas the Barabaig first got into this kind of relationship with the European colonial powers in this century. This has also meant that the penetration of Islam that came to the East African
coast was not brought inland to the pastoralists as was the case for the Sahelian groups of pastoralists.

Planning for pastoralists

In the fourth essay Anders Hjort af Ornäs also deals with pastoralists, but he is more directly concerned with how pastoral economies and societies constitute problems for development planning. Such problems follow partly from basic characteristics with pastoralism as a production system, but also socio-cultural elements of pastoralism have proved to be difficult to deal with. Drawing mainly on experience from pastoralist societies in Kenyan arid and semi-arid lands Hjort af Ornäs discusses these problems in the context of specific development efforts.

One basic point is that pastoral systems are not isolated, nor are they homogeneous. Pastoral production is characterised by a variety of animal species being kept within the same communities. This means differences in reproductive rates, mobility and market values. These factors all affect the ways animals can meet the subsistence needs of pastoralists. But the pastoral diet is rarely based on animal products alone. Grain is to an increasing degree becoming part of a pastoral diet. Grain can be obtained by the pastoralists’ own cultivation, but also through barter with other groups, or through purchasing it on the market. Grain and animal prices as well as marketing facilities for livestock become factors that directly affect the ways pastoralists are able to meet their subsistence needs. This fact also influences the process of pastoral rehabilitation, for instance after drought periods. Pastoralists normally sell young bullocks, old cows and animals that are likely to die. Following droughts there is a scarcity of such animals and this may prolong the negative effects of drought.

This complex picture of pastoral economies affect the ways pastoralists respond to development efforts. The author shows how such efforts in Kenya have been directed by specific strategies, e.g. the introduction of group ranches to regulate grazing pressure. These efforts have not been effective, and one reason for this is the sectoral perspective of these efforts, dealing with pasture management in a narrow sense. Pastoralists moved outside their grazing blocks to find pasture for different types of animals, at different times of the year. They developed cultivation within their areas, or let other groups cultivate. The development of individual tenure and agro-pastoralism is one major trend in Kenyan pastoral societies. This trend has added to the environmental problems as people invest surplus from agriculture in animals. More animals stay on reduced pasture land, but as the quantity of animals in such a system is more important than their quality, this is beneficial to the agro-pastoralist. Expanding agro-pastoralism is adding pressure onto the traditional pastoralists.
Introduction

As an alternative to this sectoral thinking Anders Hjort af Ornäs proposes a strategy that is directed towards the needs of the pastoralists themselves. To realize this one has to combine a micro oriented strategy in which the basic problems as faced by the pastoralists themselves are taken into account, with a strategy that also can affect the socio-economic context within which pastoral economies operate. In order to realize such a holistic perspective the author sees a need for a systems approach that can deal with pastoral production as well as management and social considerations. These conclusions are substantiated through a discussion of experiences within the ASAL programme in Kenya.

The role of the state in agriculture

The two following essays discuss how various state policies affect developments in local African communities that are based on an agricultural adaptation. One is an example of a strong state, Ethiopia. The other is the example of the opposite: a collapsing state, Uganda.

Tuomo Melasuo's essays deals with the effects of the wide ranging land reforms in Ethiopia. The essay is partly a general overview of the situation in one particular province with reference to the land reform, partly a discussion of how a research project that Melasuo is starting will approach these issues. As a context for his discussion the author outlines some general trends of changes that the Ethiopian peasants have experienced under different rulers like Menelik, Hailes Selassie and the present regime. His main interest is to show how the rist and gult systems have developed and changed during these changing conditions.

The main discussion is related to the post September 1974 period with the Land Reform of 1975 in which all forms of land-lord systems were abolished and land nationalised. Land was distributed to Peasant Associations. At this level the land reform was fairly successful and positive. The difficulties arose with the forced settlement programmes and villagization.

From this broad context Melasuo goes on to discuss the effects of these policies on peasants in the Wollo Province. Although land has been redistributed, the situation is not only positive for local peasants. The unequal distribution of the means of production other than land plays an important role. Lack of access to oxen for ploughing makes the situation difficult for many and this lack of productive means has not been resolved through the land reform.

In this context the involvement of foreign development agencies in the Wollo region offers particular problems. Melasuo discusses in particular agencies that are involved in afforestation projects. The strategy to close off mountain tops and plant them with trees is criticised as this does not
take into account the local production systems. Different types of fields, at
different altitudes are crucial in the survival strategies of the peasant, in
particular in dealing with drought and frost. The tops of the mountains
that are now being closed off are also important pasture areas, particularly
for people keeping sheep. Sheep farmers are trying to accumulate enough
sheep to invest in a bull for their agricultural work. The development
projects involved in afforestation of the mountain tops may provide an
obstacle for such strategies on the part of the peasants.

Michael Whyte’s case is from the Eastern Region of Uganda, the Bunyole.
This paper does not fall within “African arid lands” proper as we have
discussed it above. The region under discussion is a wet one, of about
1270 mm rainfall per year. But the paper certainly falls within the
problematique of “adaptive strategies in Africa”. It raises the interesting
discussion of what happens to a local production system when the state
structures break down, as they did in Uganda during and after Amin.

Whyte frames his discussion as a comment on contemporary debates
about how environment constrains adaptive forms. His point is that local
environmental facts can not be dissociated from the wider fields of
society, like state structures. We should not seek dichotomizations but
rather see how wider structures become part of local conceptual schemes.

The empirical basis for this discussion is various developments in
Bunyole during this century, particularly with reference to Whyte’s field
visits in 1970 and 1987. In 1970 the Bunyole economy was characterised by
a cotton-cereal system in which cotton represented a cash crop, and
cereals represented subsistence. This system was introduced by the British
to acquire more cash from people. But although cotton was introduced
from outside it soon became an integral part of the subsistence strategies
of the people and conceptualized as a “traditional” crop.

In 1971, with the coming of power of Amin, this local economy disinte-
grated. The context of markets, transport systems, fertilizer availability,
seeds etc. disintegrated and cotton disappeared as an important crop.
Instead, the subsistence crops grew in importance, encouraged by
informal market outlets established by private traders. However, the most
important crop to develop was wet rice, which was cultivated on swamp
areas. This was a locally defined development, based on a Chinese project
for the promotion of rice cultivation. And today, with the restoration of
the Ugandan state, it is rice which is given the state backing which cotton
enjoyed earlier.

In addition to the change from cotton to rice Whyte argues that the
most important change following breakdown of the state is the
*diversification* of agriculture and the *individual specialization* undertaken by
different producers as they adapt to market mechanisms. These markets
are within the informal sector, and relate to the *magendo* (smuggling)
economy. This means a lower tax base for the government, and it is one
major challenge of the state to reestablish government institutions that can change this state of affairs.

The African Green Revolution

Esbern Friis-Hansen focuses on how the introduction of hybrid maize affects adaptational processes within local farming systems in the Southern Highlands of Tanzania. The area is quoted to have a considerable success in the application of hybrid maize, and agricultural production has increased considerably. Friis-Hansen shows in his discussion of maize-farming in the Njombe District that a closer look at how traditional and hybrid maize is fitted into the local farming system reveals that the situation is not entirely positive. The success of hybrid maize in certain areas can not easily be transferred to other places. The discussion thus becomes a comment on the fate of the Green Revolution in the context of African farming system.

From a local farmer’s point of view local varieties of maize are preferable, and can be proven superior because of their adaptiveness to particular local circumstances. Through annual seed selection the farmer can select qualities like type of maize, period of maturity etc. This to meet the needs of the household in terms of consumption needs, labour availability at different times, etc. The traditional maize thus shows a high degree of variety between areas close to each other in space. Such varieties are also highly resistant to pests. Moreover, they show higher yields under traditional management patterns (fallow rotation, intercropping, scattered spacing and minimum weeding). Furthermore traditional maize is well suited to local tastes for porridge and beer, the main local usages of maize.

The hybrid varieties have a lower score along all these scales. Its success in this area must therefore be sought not in its local superiority but in external circumstances. These are: exceptional high prices for maize, the application of mineral fertilizers and pesticides, and the general villagization programme (ujamaa) in Tanzania which helped disintegrate traditional systems of cultivation, thus opening up for changes.

But again hybrid maize yields better only under specific conditions. Only “progressive farmers” manage to get a steady supply of seed as local cooperatives do not work effectively. Furthermore, no research input has been made to adapt hybrid maize to other areas. This lack of locally focussed research is crucial, as this region, as well as much of Africa, is characterised by high variability of natural conditions even within limited areas. The extension of hybrid maize into semi-arid areas with sandy soils may thus also lead to soil deterioration.
Agro-pastoral production systems, intensification and resource management

The general focus in Leif Manger’s essay is on agro-pastoral production systems, i.e. the combination of crop cultivation and keeping of livestock. One major line of discussion is whether agricultural production can be intensified within such agro-pastoral systems at the same time as natural resources are maintained at a level of sustainable productive capacity.

Judging from the failure of agricultural production in arid areas to keep pace with population increase, and the serious ecological crisis in the same areas, one may suggest that the answer is no.

To discuss this Manger sets the development of such production systems into the context of one major problem in African agriculture: the lack of intensification. Two broad positions dealing with this issue are quoted. One is illustrated by Jack Goody who argues that African agriculture lacks intensification because it lacks technological development and therefore has failed to move away from shifting cultivation. Opposing this view Paul Richards advocates a “populist” view saying that shifting cultivation should be seen as a resource for development. The problem, according to him is rather that development agencies are unable to tap the inherent store of ecological knowledge kept by shifting cultivators, knowledge which could be used to increase production in ecologically sound ways. The two positions are used to illustrate positions in debates that are underpinning different conceptualizations of development of African agriculture - one bringing new technology, the other a locally oriented “small is beautiful” approach.

Through a discussion of agro-pastoral systems in the Sahel zone, particularly based on information from the Sudan, Manger argues that it is in the combination of the two views that one should look for solutions. Richards criticism of a non-critical technology transfer approach is valid, and so is his criticism of the underpinning notion of evolutionary stages that is used to justify this type of development. But Richards is running into problems when only local factors are considered. The problem of factors like demography, land tenure systems and availability of agricultural inputs will certainly lead local farming systems into increasing problems - problems that local knowledge can not tackle alone.

To substantiate this view a discussion of general characteristics of agro-pastoral production systems in the Sahel is presented. People possess relevant ecological knowledge of benefits deriving from integrating land and animals and many places this is exploited systematically. However, when seeing the same types of systems in the context of increasing population pressure, reduced pasture areas due to public policies, communal land tenure systems in which pressure is building up on the land and the lack of adequate development planning, Manger concludes that
"local knowledge" may not be sufficient as a basis for further development. Technologies that can help raise production are necessary, and the essay ends with a discussion of necessary improvements of the technology transfer models and the Green Revolution technologies now being applied in African arid lands.

The role of local knowledge and conceptualizations

Several essays discuss how the local ecological knowledge among people plays a role in the ways such local communities are integrated into wider economic and political systems. Two of them take their points of departure in the inspirational work of Paul Richards.

Michael Whyte discusses the relationship between local ecological knowledge and other types of knowledge people need in order to adapt. He warns that focusing only on local ecological knowledge may lead to a perspective that only takes into consideration the immediate relationship between people and land. But when people find themselves engaged in different types of systems, e.g. through labour migration or education, the overall adaptive success may well be dependent on other types of knowledge and skills.

To illustrate this point Whyte uses the example of education. In Uganda of the 1960s and 70s education in order to become a teacher or a civil servant was a common strategy for local kids who wanted a career. This strategy was based on information about the comparative value of different adaptational strategies, particularly the fact that the value of a salary was higher than possible incomes through local cultivation. The collapse of the state reversed the advantages of these salary groups. Inflation has undermined the value of salaries leaving local cultivation a more profitable activity. For the first time in many decades people on salaries are seeking to increase their income from local cultivation. In order to analyse this change of direction it is not sufficient to isolate "local knowledge". It becomes important to see how the state makes itself represented locally, and how people conceptualize this presence. Instead of Richards' adaptionist argument Whyte argues that an analysis based on political economy is needed. Following Lemarchand, Whyte sees cotton as a sign of the earlier "patron state" in Uganda where the crop signifies the tribute-like relationship to the state. Today, the development within local agriculture signifies an independence from the state, and an adaptation to the free market. It is knowledge about the existing possibilities within such broader fields that decide adaptational success.

Leif Manger also discusses Paul Richards' use of local knowledge in relation to people's involvement in large scale systems. Adaptive forms should not only be looked upon as a relationship between local popula-
tions and nature, but as they are emerging from the interplay between nature and the social, political and economic dynamics of larger regions and nation states. Similar to Whyte, Manger argues that skills required may be from other fields than local environment. Viability of local groups must therefore be analysed referring to such wider fields and Manger claims that what is needed is a wider definition of the concept of "system" than what Richards is using.

Esborn Friis-Hansen in his discussion on the cultivation of hybrid maize in Tanzania also takes up explicitly the use of a farming system approach. This has been developed in response to earlier approaches that focused on carrying capacity to determine the possible level of production within a stable ecosystem. One weakness of such analyses is that they see carrying capacity as being related to the natural potential of a certain category of land only. In a farming-system perspective adaptation is seen as an integrated process in which natural resources make up only one limiting factor. Referring to Piers Blaikie he argues that other limiting factors are found within a wider society as well as its socio-economic context.

Relating local knowledge to pastoral societies Mette Bovin shows how West African pastoralists conceptualize drought and ecological problems in general. Bovin compares Western causal explanations stressing climatic factors and man-made factors with local African ways of conceptualizing the same phenomena. All Fulani relate droughts to Allah. The Fulbe Liptaako say drought comes because the Emir of Liptaako (who was expelled in 1964) is no longer there performing the necessary rituals for rain to come. The WoDaaBe also relate drought to Allah and say that the drought is a punishment from Allah because Man is not moral enough. Such local conceptualization relating to the ritual field or a moral field are difficult to combine with the Western scientific model: The clash creates problems and misunderstandings in development programmes aiming at assisting pastoralists and agro-pastoralists in their dealings with drought.

CONCEPTUAL ISSUES: SOME MAIN POINTS

The essays presented in this book all show that local groups are part of larger systems and that the involvement in such systems provide dynamics to local adaptational systems that are not inherent in those systems themselves. Such large-scale systems provide us with a problem of how to deal with the concept of adaptation itself. In this last part of the introduction we shall raise some of the issues that came up during discussions on the last day of the workshop. Our presentation is clearly biased by the anthropological background of both editors, but we have tried to incorporate all main conceptual points brought up by the workshop participants.1
The concept of adaptation

The concept of adaptation signifies a relationship between a given population and its environment. In biology, where the concept originated, it denotes processes by which an animal, or plant becomes fitted to its environment. Encyclopedia Britannica states that "even the simpler organisms must be adapted in a great variety of ways: in their structure, physiology, and genetics; in their locomotion or dispersal; in their means of defence and attack; in their reproduction and development; and in other respects." (Vol 1: 89)

A similar perspective is also found in the use of the concept for human society. Characteristics of a certain society, i.e. its technology, social organization, political system, cultural categories etc. are seen as adaptational mechanisms with which a population is able to exist within the limits provided by a certain environment. There are, however, several perspectives on how to explain the workings of such adaptational groups.

Human adaptation as a functional system

One tradition focuses on studies of small-scale, tribal societies with an immediate relationship to nature. The basic emphasis is on how such groups existed in a synchronic homeostatic equilibrium and in symbiosis. Drawing closely on biological ecology (see e.g. Odum 1971) these studies share a number of assumptions in spite of their internal variation. They all see the social organization and culture of specific populations as functional adaptations which permit the population to exploit their environments without exceeding their carrying capacity. If carrying capacity is exceeded the response will be an adaptational change. In these approaches human populations are believed to function within ecosystems as other populations do, and the interaction of different human populations is like the interaction of different species within ecosystems.

This symbiotic perspective has been criticized along different lines and as some of the points relate directly to the discussion in this book we shall shortly point out some important critical points. First, the inherent functionalism in the perspective presented above, arguing that people exist at or below carrying capacity levels, or else there will be an adaptational change, is clearly not being confirmed by the developments relating to African pastoralists nor to African agriculturalists. Neither the idea of a fixed carrying capacity, nor the argument on a necessary change occurring when carrying capacity levels are exceeded are borne out. African pastoralists, for instance, continue with old adaptive practices, also long after the destructive effects on nature have become evident, and people farm in increasing dry soils.
Secondly, this also shows that e.g. social organization and land tenure systems are not necessarily “adaptive”. Rather than seeing such socio-cultural levels as adaptive mechanisms keeping a society in balance with its resources they must be seen as integrated systems in their own right, with dynamics that are not necessarily related to the reproduction of society within a natural environment.

A third important point found within this theoretical tradition is that adaptive groups are constrained by available energy. It is the energy available which decides population growth and social complexity. On a general evolutionary level this is probably right but, and again referring to the essays of this book, the involvement of local groups in larger systems makes this argument problematic. The local groups are today part of nation states and wider systems of economics, politics etc. One implication of this is that an increasing part of the population is not directly involved in local production and their lives are not directly affected by resource utilization and factors such as land tenure or the yearly cycle of agronomic activities. Secondly, people from local groups participate in these wider systems, thus bringing in incomes and resources from other systems into their own local systems. Many groups, living in different areas are part of the gross human ecological systems because they in one way or another consume the products of energy transformations. How can we show then, that the key variable, which is the social system, i.e. human needs, skills, population etc. all interact with subsistence techniques? To solve this it is not adequate to stick to the local population as a unit of study, which these studies tend to do. We have to develop ways of analysis that open up for the working of supra-local processes, and also the emerging internal differentiation of local systems. Such internal differentiation shows that adaptation is not a group process in which the goals are common for everyone. There are internal conflicts that also give dynamics to the adaptational process. This fourth point also bring us on to a fifth relating to the time scale. To analyse such wider processes may also bridge the gap in these studies between their short-term analysis of local populations being in homeostatic equilibrium, and the long term macro-evolution of new adaptive forms. To do this some form of prosesseual studies are needed.

**Human adaptation as process**

To solve some of the above problems alternative perspectives are necessary on the study of adaptation, looking at adaptation as process and focusing more closely on the mechanisms of change. This implies a shift from a focus on group adaptiveness to a natural environment to a focus on how individual adaptive strategies are emerging within different constraints, natural environment only being one such constraint. Others may be an economic system or a political system and opportunities and constraints
available within them. The focus here is on decision making. But the various contexts for decisions are not given. It is necessary therefore also to examine the workings of such contexts. This may imply a "political economy" type of analysis in which one may find the source of the constraints operating. Different people have different interests and pursue different goals in their choice of adaptation, and they are in different strategical positions to reach their goals. Furthermore this means that one can incorporate conflict into other fields the one relating to the immediate local environment as an element in the ecological analysis. By linking behaviour and environment in such a broad sense one is not constrained by assumptions about equilibrium maintenance.

The question of rationality

This question of the difference between adaptive strategies of individuals and adaptation on a group level relates to the question of rationality. Through field-work one can always find the individual rationality for specific adaptive strategies, depending on the skills, aims, information etc. of a given actor. An individual adaptation may thus be rational and adaptive. On a group level the accumulated effect of all actors pursuing such strategies may, however, be one of systemic maladaptation. Whether this is so or not is dependent on the feed-back mechanisms of the systems. Such mechanisms may be positive feed-back or negative feed-back. The first situation is describing e.g. the African pastoralist situation in which a communal land tenure system keep people on the land, thus increasing pressure creating a communal problem out of all the individual strategies. A negative feed-back would be a system in which a thermostat-like mechanism would be at work to keep balance within the system.

Society and history

The above argument should not be taken to mean, however, that one is moving back into a purely ecological model. As we have argued: the contexts that adaptations operate within are also man-made, and have to be studied within their own terms. Historically oriented studies may show how land has been redistributed between groups, or taken away,—for development purposes. National policies of development, national policies towards nomads and farmers etc. all of course provide contexts for this. The study is thus not on adaptation per se, but on the economic, political and historical events. Some of these events contain the exploitation of local people by native and foreign groups. All this
constrain adaptive processes and must be incorporated in the study of adaptation.

A particular aspect of this is the relationship between the state and a population. Exploitation by the state of its population is not new to the areas under discussion. The old savanna state formations in the arid areas clearly had exploitative relationships to the people living within their boundaries. But the state also had a very clear redistributive function. Although produce was extracted from the people, in times of need the state was obliged to help. Thus there were royal granaries and stores that were kept for the recurrent droughts (see e.g. Kapteijns on the Masalit state of Western Sudan) and people could be helped in times of famine. In the contemporary context of African state formations this redistributive aspect is disappearing and the state is becoming much more exploitative. The basis for legitimacy seen as a “social contract” is thus changing.

**Human adaptation as culture**

Finally, we shall end this discussion with some comments on how adaptations also must be seen as socio-cultural systems, and how those aspects also change. Production is of course not only a technical process but is a *socially constructed activity*. And productive resources are not only providing energy but they are also carriers of *meaning*. Animals among African pastoralists are thus the basis for a number of social relationships and they also symbolize important cultural elements in society relating to cosmologies and identities. Similar aspects can be found among settled agriculturalists relating to land and crops. The utilitarian aspects of the adaptive process must therefore be combined with an understanding of how the same process is a carrier of “culture”, and therefore that adaptive change is also to varying degrees a socio-cultural change.

One important aspect of this is that when local communities enter more directly into articulation with other groups within larger systems they also enter socio-cultural universes that are different from their own. This is particularly true in an ethnically plural setting like the one we encounter in African arid lands. It is mentioned in the essays how knowledge about such larger systems is necessary in order to “be adaptive”, and that this does not only relate to ecological knowledge. This is true, but knowledge about larger systems may not be sufficient. People also need socially acceptable competences in order to participate. To “be adaptive” in this wider context may thus also mean adaptive to cultural change, identity changes as well as ethnic changes. As we have argued earlier, such elements should not be reduced to their narrow adaptive implications but should be analysed as independent variables.
Introduction

The problem of integration

Keeping the above points in mind there was a general agreement among the participants that some sort of system studies are needed. Such studies generate of course from a general systems theory, but in this context it is the heuristic use of such a concept in trying to discover empirical interdependencies within a given system that is of particular use. It is important then to distinguish and describe different types of systems and to link analyses of dynamics at different levels. This relates to the problem of scale and the concept of region was thought useful. It is at this level one may see the articulation of several sub-systems containing with each other.

Many studies exist on how to do this, and different disciplines are approaching this from different angles. The problem of integration within large scale systems thus also provide us with a need for inter-disciplinary studies. It was one of the major conclusions from the workshop participants that further studies on this problem of integration will be an important contribution to improve on the understanding of human adaptation.

BIBLIOGRAPHY


NOTES

1. The presentation of various traditions within ecological studies relate to ecological anthropology and draws heavily on Orlove 1980.
2. This direction goes back to the studies of Julian Steward and Leslie White, and is represented in contemporary anthropology by people like Roy Rappaport, A. Vayda and Marvin Harris.
1. Mette Bovin: FulBe in Burkina Faso and WoDaaBe in Niger.


5. Tuomo Malasuo: Wollo in Ethiopia.


8. Leif Manger: Western Sudan.

Nomads of the Drought: Fulbe and Wodaabe Nomads Between Power and Marginalization in the Sahel of Burkina Faso and Niger Republic

Mette Bovin

ADAPTATION TO DROUGHT

This paper is about adaptations to the extreme arid lands of the West African Sahel. It identifies problems of survival and life strategies used by a true pastoralist and an agro-pastoralist group respectively. The zone is the Sahel between 100 and 500 mm rain. It cannot simply deal with "adaptation to surroundings" of a natural order. It must include a range of other factors, and includes adaptation to "normal" years as well as to "extreme" years—that is, years of drought.

The truth about the Sahel is that "drought" is not "the drought" which can be surpassed. There is not such a thing existing as "After the drought". The recurrent droughts do not come with regular intervals. They are not seven years' plaques. All we know is that they do recur.

The pastoralists and other peoples of the Sahelian countries, have taken this truth into consideration so much as to incorporate what I shall call the drought potentiality into their social and economic systems, in order to survive. The drought potentiality is a hidden ghost, but never forgotten. Even in years of rain and plenty (like the 1988 rainy season suddenly was) it is around, somewhere.

The paper outlines the consequences of the Sahelian drought(s) for pastoralist ecosystems. The cases I take to illustrate the human adaptation to drought and death, are two Fulani sub-groups whom I have studied over a 20 year period, between 1968 and 1989. They are:
- A true pastoralist group, the WoDaaBe, and
- An agro-pastoralist group, the FulBe Liptaako.

The WoDaaBe move in the Niger Republic, northern Nigeria, northern Cameroun, and southwestern Tchad Republic. FulBe Liptaako live in northern Burkina Faso and surrounding areas.
CATTLE FULANI AND TOWN FULANI: FULBE NA’I AND FULBE WURO

The FulBe people have many names. They are called “Fulani” in Hausa and English literature, “Peul” in French, “Fellata” in Kanuri, and “Fula” in Senegal and Guinea. All of them speak the language fulfulde. On the African continent there are 16 million FulBe according to Sow 1979 (note 1.), who call themselves Pullo (singular) cf. the derived French term “Peul”, and FulBe in plural. They live in 16 countries all across Africa, from Senegal in the west to Sudan in the east.

FulBe have throughout history adapted to the wetter savanna zone as well as the semi-arid Sahel zone in West Africa. Far more than half of them have become settled in some way or another. Only minorities live as true FulBe na’i, “Cattle FulBe”, as distinguished from FulBe wuro, “House FulBe”. These are settled people, also called FulBe si’ere, “Town FulBe”. FulBe na’i are also called FulBe ladde, “Bush FulBe”, since their home is the bush, the “wild” (cf. Bovin 1988 b).

The WoDaaBe are the most “cattle Fulani” and “bush Fulani” of them all. WoDaaBe, we have been told, literally means “People of the Taboos” (from mboda: taboo), and they certainly have many taboos in time and in space. The French call the WoDaaBe “Peuls Bororo”, but Bororo is not a term for people, but refers to their red, longhorned zebu cattle. They live entirely from animals, and do not (under normal conditions) cultivate the soil. They wander far in space, their mobility is very high.

The FulBe Liptaako are an agro-pastoral people, where the upper class is completely Town Fulani, and some are cattle Fulani (who nevertheless also have a non-movable house, a settled anchor). The agro-pastoralist FulBe combine cattle-herding and agriculture, growing millet and other crops. They are less mobile and practice transhumance rather than real pastoral nomadism. Often only the young men take the cattle to pastures, while the rest of the family stay permanently all year round.

The term “pastoral production system” is used to describe an economic system in which the herding of domestic ruminant animals on open bush land is the dominant economic activity. 50% or more of the household gross revenue, i.e. the value of marketed plus subsistence production, comes from animals or animal related activities, or where more than 15% of the house food energy consumption consists of milk or milk products, produced within the household.

The “agro-pastoral production system” is a system in which more than 50% of the household income comes from farming, and 10-15% from pastoralism; (in these definitions I follow Swift 1988).

Pastoralism and agro-pastoralism are linked not only with two different “adaptations to natural surroundings” as eco-systems. They are furthermore closely linked with two basically distinct political structural systems. One (the WoDaaBe pastoralist case) is an egalitarian, tribal system with
segmentary lineage opposition in the classical Evans-Pritchian way (The Nuer). The other (the FulBe Liptaako agro-pastoralist case) is a hierarchical Muslim state system, with social classes and castes. Equality is basic to the first system, inequality to the second system. In a way I deal with the classical

TRIBE-VERSUS-STATE problematique

à la Clastres (Pierre Clastres 1974) in comparing the two FulBe types.

The FulBe Liptaako and the WoDaaBe represent different “adaptations” to the West African scene. Originally, in pre-historical times, all FulBe started as relatively egalitarian and dispersed nomads, wandering on foot with cattle and other animals across Africa, when it was humid and different from nowadays. They came in two migratory waves to the Sahel: one wave from North Africa in the 10th Century, through Senegal and eastwards, and another wave from southern Egypt and Ethiopia westwards to the Sahelian zone (Stenning 1959, Azarya 1978).

FULBE AS POWERFUL PEOPLE

It is almost certain that it was FulBe of the TorooBe clan who were the first to adopt Islam as their religion. This happened at the same time as they settled down and gave up the pastoral way of life. They became learned men of Islam and were leaders at the same time, along with learned Soninke, Arabs and Berbers from North Africa, among whom they lived. Far the most of the FulBe people were “pagan”, “heathen”, “non-believers” (kirdi, or arno, in fulfulde) or superficially Muslim. Later, during the Muslim holy wars against the “pagans”, the TorooBe clan members were the first and most active in this political-religious process.

At several times and places in history the FulBe acquired a privileged position and became the aristocrats, in the genesis of the pre-colonial centralized Muslim states. The strategies used were expansion through military skills. FulBe were not only cattle rearers. They became war leaders, administrators, lawyers, priests, and teachers as well. In this process they accumulated new economic wealth. The history of these Savannah and Sahel states is a history of Muslims against non-Muslims with the corresponding dominance over cultural values. It is moreover the history of hierarchization: of an elite against tribal, relatively egalitarian peoples living in the West African periphery. The urban centres created were at the same time political, commercial, religious, and general cultural centres (cf. Azarya 1978). Later on colonialism was added to this history, and played a not insignificant role for the reproduction of the Muslim
Map 1. States of the Sudan and Guinea in the 19th century

(From Clarke: West Africa and Islam, 1982:112)
Map 2. *The Sahel zone, with isohyetes in mm, and the two "field" studies.*
I: FulBe Liptaako, studied in 1982 and 1985-86.
II: WoDaaBe, studied in 1968 and in 1985-89.
states. Lord Lugard’s policy of “Indirect Rule” is well known, and it is not by chance that it was “born” in Sokoto, Northern Nigeria.

One example is the Futa Jallon State (in the present Guinea) which began the formation of the state by nine Muslim FulBe families in 1725. They arranged a jihad (Holy War), and in the year 1770 the Muslim state of Futa Jallon was a reality.

Another example is the Sokoto Caliphate (cf. Map 1) in the present northern part of Nigeria and Adamawa. The formation of the state started in 1804 with a FulBe jihad in Hausaland, led by the famous Usman dan Fodio. This jihad was to become one of the greatest Muslim successes in West African history. In 1810 most Hausa states were under control, and the Pullo Usman dan Fodio gave out flags to his disciples and followers. One of the reasons why Dan Fodio’s jihad was able to spread so fast and effectively, was the support he received from pastoral nomadic FulBe in the bush, and from the talakawa (Hausa peasants) throughout Hausaland. They created together the Empire, or Caliphate, of Sokoto. The FulBe elite settled and became FulBe wuro, but they continued to own cattle, which their clients, FulBe na’i, herded for them. It is in this historical framework that the case of FulBe Liptaako in Burkina Faso should be seen.

THE CLASS SOCIETY OF THE EMIRATE OF LIPTAAKO

The social structure in the Emirate of Liptaako (cf. Maps 1 and 2) in what is now northern Burkina Faso, is a class structure. On top of that there are social castes with different crafts and tasks. The FulBe people are divided into patriclans who arrived at Liptaako at different times in history, which has given them different statuses in society. The JalluBe and TorooBe came first to Liptaako from Maccina in Mali. The FerooBe came later, also from Maccina. The JalluBe have the right to “turban” the Emir, Amiiru of Liptaako, which means to install him on the throne. The Amiiru is always recruited from the FerooBe clan.

The FulBe chased the Gurmanché’s out of the area, since they were “much, much too animistic”, as FulBe in Dori explain nowadays. In 1810 all Gurmanché’s were driven southwards. Liptaako got its flag from Usman dan Fodio, and got the religion from there as well.

In the capital town of Liptaako, Dori, there are seven mosques nowadays. “The first was built in the Muslim year 1229, 174 years ago”, (informants told in 1986).

Aristocratic FulBe are called dimmo (singular), rimBe (plural).

They are from the “pure clans”, and engage in cattle pastoralism, the “noble occupation”. A real dimmo is never a butcher, a blacksmith or a potter. In contrast to the rimBe, the dimaajo (singular), rimayBe (plural) are former war captifs, “slaves”, vassals. The word for slave, machudo, is not
allowed to be used any more, since slavery has officially been abolished. RimayBe are people originating from non-FulBe groups, like the Gurmanché, Songhay-Zerma, Mossi, etc., but fulfulde-speakers like their masters. They are typically agriculturalists and weavers, etc.

Real castes, fedde, are: leatherworker, woodcarvers, griot’s (troubadours and story tellers), blacksmiths, goldsmiths, and magicians/tricksters/“Les invulnerables” (cf. Bovin 1984, the film “Dances in the Sand” from Liptaako). The castes are endogamous groups, even today after the revolution.

The relationships between the rimBe and the rimayBe in Liptaako resemble the relationships between Tuareg nobles and Tuareg “slaves”, called Bella in Liptaako. The roles are reversed somehow nowadays, for FulBe as well as for Tuaregs. The former “slaves” and vassals received modern education earlier than noble sons did. The power changed with that. Many people seen as beggars in the streets of Ouagadougou, Niamey, Bamako, Abidjan, etc. now after the droughts of 1968-84 are “the red-skinned” (i.e. the nobles), lightskinned people.

The last Emir of Liptaako was dethroned and deported in 1963, and he now lives in Canada. But for the FulBe he is still the Amiiru Liptaako, even in absentia.

Many FulBe in Liptaako told me secretly that the reason why there are droughts in the 1970s and 1980s, is because the Amiiru is no longer performing the religious ritual of sacrificing a black bull at the shore of “la mare”, the little lake outside the Amiiru palace in Dori. Such a sacrifice must take place in order to start the rainy season properly.

With the political revolution of Thomas Sankara when Upper Volta became Burkina Faso, the distinction between rimBe and rimayBe was prohibited, and many changes have taken place. “BurkinaBe” means “The free and proud people”, and everybody in the country is “BurkinaBe”. The rimayBe are of course very satisfied with the revolution of Sankara. Although some people whisper that “the rimayBe are still “fidèles a leurs maîtres!” the rimBe.”

THE TRIBAL SOCIETY OF THE WODAAIBE OF NIGER

The second case study concerns the WoDaaBe (cf. Map 2 and Map 3) of Niger and neighbouring countries in the Lake Tchad Basin. WoDaaBe history is one of pastoralist sticking to pastoralism despite pressures to settle. WoDaaBe do not cultivate the soil and do not participate in the centralized states. WoDaaBe history is also the history about escape and flight from centralized Muslim Empires. First leaving the Sokoto Caliphate (cf.Map 1) wandering into Damagaram,a Hausa state north and northeast of Sokoto, and from Damagaram further into the Borno State (Map 3 and Map 4), a Kanuri State. The WoDaaBe nomads I have known since 1968
wander these years in the Département de Diffa in Niger as they used to do, but they wander into the neighbouring countries as well: Nigeria and Tchad, and sometimes into Cameroun as well. In short, on the lands of the old Empire of Kanem-Borno around Lake Tchad.

As opposed to the FulBe in Sokoto and Liptaako, Futa Jallon and Adamawa, etc., the WoDaaBe have an *egalitarian tribal organization*. They are divided into two tribal halves or maximal lineages: the Deggereewol lineage and the Alijam lineage. These are again divided into primary lineages (clans), divided into secondary lineages (fractions) again divided in the small family entities, *wuro* (singular), “house”, “home”, which in this context means *camp* in the bush, and not “house” in the sense of a round or square house. The WoDaaBe live and sleep in the open air.

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<tr>
<th>Tribe</th>
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<tr>
<td>Agnatic maximal lineage *)</td>
<td>Deggereewol</td>
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<tr>
<td>Primary lineage, <em>lenyol</em></td>
<td>Jiijiru</td>
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<td></td>
<td>Suudu Suka’el</td>
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<tr>
<td>Secondary lineage, <em>taarde</em></td>
<td>Siganko’en</td>
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<tr>
<td>Family/house/camp <em>wuro</em></td>
<td>Wuro Bello</td>
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<td>Wuro Gorjo</td>
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`*) My WoDaaBe informants do not use a fullulde term to designate “maximal lineage.”`

The WoDaaBe political system is relatively egalitarian, although there are smaller chieftains, “*Ardo*” (“He who walks in front”), and bigger chieftains, *Lamiido*. These latter were installed after the French colonized Niger, and the nomads themselves do not know more than three generations of *Lamiido*. His main task was, and is, to collect tax among his fellow nomads. No pastoral *Lamiido* has the power of a town FulBe Emir. The *Lamiido* listens to the collective decisions, and the council of old men is extremely
important. The WoDaaBe have no priests (modibbe) or Liman, like the FulBe Liptaako and other Muslim FulBe societies have.

Both FulBe Liptaako and WoDaaBe did well—before the droughts; but the 1968-74 and 1982 and 1984 droughts have hit all of them badly.

FULBE AS MARGINALIZED AND POOR

In this chapter we shall see not the powerful, but the marginalized and poor FulBe and WoDaaBe. This is another but equally true social reality of the Sahel today. I saw the situation in 1968, and again in the 1970s and the 1980’es. Many and extreme changes had taken place with the same peoples. I like the title of Victor Azarya’s book: “Aristocrats facing Change” (about the FulBe in Guinea, Nigeria, and Cameroon). Aristocrats in West African drylands are (since Azarya wrote his book in the 1970’es) not only facing change. They have become aristocrats facing death.

FulBe in centralized states do no longer dominate; and WoDaaBe are no longer “free pastoralists” managing life on their own. They have all become involved in a process of marginalization along with impoverishment and proletarization, sedentarization and agriculturalization. Pastoral values and lives are threatened. The rest of the paper concerns the consequences of the drought(s) for these peoples.

Many FulBe and WoDaaBe still feel like aristocrats, but are hopelessly poor after the years of drought. Many—not to say all—have lost animals. From 20% to 100% of the animals are dead during the past 20 years, (different figures for different départements, and subregions, and families). Statistics are not reliable especially because a pastoralist is very reluctant to tell how many animals he owns. Therefore he does not say either how many animals he has lost. If he pronounces the number of live animals, they may die. This belief is important, and I only trust the figures I have counted myself during fieldworks.

The worst problem for the nomads is: na’i mbaatiil (the cattle has gone, are dead!). A person without animals is called a ngodiijo (“with-no-animals-left”) which is a terrible condition to be in. Economically, socially, religiously, politically,—in every way. A person deprived of animals is a person deprived of kinsmen.

Pastoralists of FulBe and WoDaaBe groups who have lost all or most of their animals, are forced into one or more of the following jobs after the 1970s:

(1) Beggar near roads and in urban centres. (Temporary and unworthy solution).
(2) Jewelry seller (and perhaps also jewelry maker). It is degrading and shameful to sell, since jewelry is only given away traditionally, as gifts of friendship. Many urbanized WoDaaBe stick to this “niche”.

(3) Herbal medicine seller and magician, traveling from the Sahel to coastal urban centres in West Africa. Not degrading.

(4) Petty trader, mai tabur (“owner of a table”) selling matches, biscuits, cola nuts, sweets, etc., in the city streets.

(5) Maigardi (night watchman) working sitting & standing in front of a rich house or shop. Tiring, claustrophobian, psychologically killing many nomads/former nomads. Very normal occupation in cities, for marginalized WoDaaBe.


(7) Hired labourer on a farmers fields. Degradating, but pastoralists do it if they are desperately in need of food.

(8) Cultivator (own small field), rain fed agriculture or “Cultures de contre-saison” work near a well. Only nomads who have lost 100% of their animals will do this. Degradating.

(9) Hairdresser, female, in villages or towns, for settled women. Not degrading; traditionally done.

(10) Repairing calabashes for settled women (female WoDaaBe job especially) in villages and towns. Done traditionally, not degrading.

(11) Housework for settled people, female pastoralists (FulBe and WoDaaBe) pounding millet, etc. receiving either cash or grain in return.

(12) Prostitution (for females only). Very degrading. Some FulBe women practice it in desperate need of food or money. WoDaaBe women do not practice it.

(13) Water carrying, with two or four big cans of water, in towns and villages. For men only. Not so degrading for FulBe, but very hard work. WoDaaBe will not do it.

(14) Worker in the building sector, for men only. Not so degrading, but hard work.

(15) Carrier, carrying heavy burdens in lorry parks and similar places. Very hard work, for men only. FulBe men do it, WoDaaBe men do not.

In all these cases the pastoralist—whether male or female—taking on these jobs more or less permanently, only dream about returning to pastoralism. To go back to the bush and the animals again. They work on this by slowly investing: cash into one goat or one sheep, then two or three sheep, and then, eventually perhaps buying a calf, and then... returning into pastoralism again.

The reason why pastoralists (FulBe and WoDaaBe alike) who have lost all their animals, normally refuse to begin cultivation, is that agriculture
for them is a low status occupation. It is a "secondary occupation", unworthy to deal with for a pastoralist. WoDaBe seen with blisters on their hands after having cultivated a "Cultures de contre-saison" plot (complaining about their "hard hands"), complain more about the psychological difficulties of bending down, than the actual difficulties in working the soil with a hoe. The "Fulani Way", Laawol pulaaku and Laawol fulfulde (cf. Stenning, 1958; and Laya, 1984) is threatened, the very core of "Fulani-ness" if they are forced to give up pastoralism to become agriculturalists.

THE DROUGHTS IN BURKINA FASO AND NIGER-NIGERIA-CAMEROON-TCHAD

Drought and famine are two different conditions for African pastoralists. Drought is called joorgol (i.e.: dry plants) or hokkre (i.e.: lack of rain) in Liptaako, Burkina Faso.

Famine, on the other hand, is called rafo.

Drought is called seedua among the WoDaBe of Niger and other countries in the Tchad Basin, and famine is dollo.

In both societies people distinguish sharply between these two conditions, which I find important. Drought may—or may not—lead to famine and human suffering. History has shown both. It is said that the French in Niger 1911-13 did nothing at all to save people's lives, and did everything they could to collect taxes (as usual) from starving people, (Fuglestad 1983:89-90). After this drought (during later droughts when relief food supplies had begun) the French distributed food to settled people in villages rather than to nomadic people. Just like the British did in Nigeria to the south of the border.

Droughts have descriptive names in the Sahel. They are not labelled year-number-this-and-that as in our part of the World. Droughts are labelled after some situation or special poor food that people were forced to cope with.

Here are the names in WoDaBe dialect of fulfulde, according to my oldest informants between 80 and 90 years of age, in Eastern Niger:

1. "Kangale korri", (1911-14) meaning "The time when the millet grew up a bit, and then dried out and fell to the ground". This drought is remembered as the worst drought, when people as well as animals died like flies. Died of hunger.
2. "Ngongelleeri" (1931-34) meaning "Red fruits of dum palms", since people had to survive on eating pounded fruits from the dum palm trees in oases.
4. "Gayen doya" (in the 1950s sometime), meaning "When we ate manioc flour (and nothing else)".

5. "Seedu arrana" (1968-69) meaning "The drought that went ahead (of other droughts)", i.e. the beginning or forerunner, of the great drought of 1970-74. This drought year 1968-69 I experienced in Eastern Niger, (my millet field was alarmingly dry like those of the Manga cultivators). The WoDaaBe of the Suudu Suka’el in Département de Diffa also call this drought "Ngel-Mongo", because they went to the bush of Monguno town in Nigeria to escape a catastrophe.


   - and when will the next drought appear on the scene??

Of these drought years and drought periods the worst for the WoDaaBe (who are alive in the 1980s and remember the time since 1910 or so) have been: "Kangale korri", and the second worst was "Gandau", third worst "Forno", and fourth worst "Duuna".

Historically there have been droughts before these mentioned by oral information in Niger. Historical sources tell us that there were droughts in West Africa in 1617, 1669, and 1736 (cf. Marty 1985:115; and Thébaud 1988:80). And in the 1890es, and in 1904.

Sometimes with rhinderpest as well.

Lake Tchad which is a big lake on all maps of Africa (area the size of Denmark) is now only one tenth, or one eight, of what it was before the 1968-74 drought. On Niger Republic territory there is no water left whatsoever. 20 years and 15 years ago I went on a piroque on the Lake; now (in 1985-89) I find sea shells and old wooden boats every year on the dry grey sandy bottom of "Lake" Tchad, (cf. the film "On the bottom of Lake Tchad", Bovin et al. 1990).

The Buduma fishermen who used to live on islands on Lake Tchad, and made their living from fishing and cattle herding, have only got a few cattle left on the bottom of Lake Tchad. The fish disappeared when the water disappeared. Now the Buduma compete for the bottom and its natural resources of strange vegetation (at times poisonous for the animals) with Arabs, Shuwa Arabs, Kanuri, FulBe, WoDaaBe, and Tubu.

The droughts have caused increased tension and open conflict between various ethnic groups in the whole Tchad Basin, like in other parts of the Sahelian belt.
CASUAL EXPLANATIONS OF "DROUGHT"

This chapter could also be called: "The drought in the Sahel - climate, human beings, or God???

One of the results of my research during the years 1968-89 in the Sahel has been that I am increasingly convinced that the differences between the local model and the Western model are so different that the "gap" can not be bridged. The Western scientific model includes two main causal factors, the climatic and other "natural scientific" aspects, and the man-made, society-made aspects. The Sahelian model accepts both of these, but adds the most important (to them) of them all: Allah.

Informants say: "You are right in saying that the rain is not what is was before, and you are also right in saying it is "society", man-made. Because human beings are not moral enough. They /we "tell" lies, steal, commit adultery, and we don't "want" our relatives" any more (we don't walk hundreds of kilometers to visit kinsmen often any more, unfortunately). We don't work hard, as we should. We behave badly in general compared with our grandparents and ancestors in earlier times. Allah sees everything we human beings do", so "Allah sends drought to punish us here in the Sahel!" (cf. also the documentary film "The Wodaabe" by L.Woodhead, M.Bovin, et al. 1988, which deals with this subject of morality and drought.)

The two models can be schematically outlined in the following way:

<table>
<thead>
<tr>
<th>MODEL A</th>
<th>MODEL B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Nature, climate, etc.</td>
<td>2) Allah</td>
</tr>
<tr>
<td>2) Humans/Society</td>
<td>3) Nature, climate, etc.</td>
</tr>
<tr>
<td>Leads to drought</td>
<td>4) Humans/Society</td>
</tr>
<tr>
<td></td>
<td>Leads to drought</td>
</tr>
</tbody>
</table>

In Dori, Liptaako, the FulBe say drought is there on earth because the Amiiru does NOT make the proper sacrifice of a black bull at the shore of the little lake, "la mare", in front of the Amiirus palace in Dori. This ritual sacrifice ought to take place once a year—to call the rainy season, and only the Amiiru can perform it. The Amiiru is dethronised and deported to Canada—therefore the droughts in the 1970s and 1980s.
Drought is Allah’s punishment to humanity in the countries where it occurs. In WoDaaBe society, people “do not want their relatives” any longer, and there is laziness, greediness and jealousy and immoral behaviour of various sorts. In Liptaako society people do no longer observe proper rituals.

According to these philosophies, it is logical that what human beings should do is to become more moral, clean, and be nicer towards their relatives, and better, kinder and more honest in general. The Model B held by WoDaaBe and FulBe (as well as many other Sahelians, I believe) does on the other hand not prevent people from understanding, and being conscious of, the socio-economic processes and realities. I am thinking about the implications like for instance the system of jokkere and proletarization, as a case in point (cf. below).

HUMAN ADAPTATIONS TO DROUGHTS

What happens during a drought in the Sahel? (Cf. also Laya 1979: “Mort de la brousse”):
- It rains less, and the distribution in time and space of rain is bad.
- Vegetations gets poorer.
- Animals loose weight.
- The milking capacity of cows diminishes, and disappears.
- Animals get ill, because they are weakened.
- Animals die, and are lost in various other ways (theft, diseases, etc.).

These processes again mean that the worst tragedies happen: some human beings die.

Furthermore, drought have some social and economic consequences and changes, which are all responses to the “drought potentiality”:
- New migration routes and destinations are chosen. Change from transhumance (bartol in WoDaaBe language) to long-distance migration (perol) implying movements into another country altogether, or several countries (cf. Map 3 and Map 4).
- New social groups are created, a splitting up of family entities into smaller ones is common, in order to spread the herd in several smaller herds. An adaptation to insecurity.
- Animals are redistributed, circulate even more than in normal years, in the clan- and lineage group, to save relatives from starvation and death. (Among the WoDaaBe, not among the FulBe Liptaako).
- Many animals (which would never have been sold in normal years) are being sold, before they die. Sold at prices disfavourable to nomads in years of crisis.
- Agricultural products (millet especially), have to be bought in larger quantities than in normal years, and the prices are high in years of drought. (A shocking case from one of the former drought in Niger is that of pastoralists getting one five hundred’th of the price for an animal when selling, to purchase millet; compared with what they get in normal years).
- Since food is not available in sufficient quantities, human hunger means that food habits and diets change. For instance wild fruits and wild animals are sought again, like in older days. The shift in diet takes place drastically: from milk to millet porridge as the stable food ingredient in hungry years (cf. Bovin 1988 a).
- Human beings get weaker and weaker, and illness and disease flourish in the wake of drought.
  The worst phase is when human beings die, as a consequence of one or more of the above mentioned causes. The disaster has occurred, and family members must take drastical new steps to secure survival for animals and human beings.
- Some pastoralists become salaried herders, and the process of proletarization of pastoralists has accelerated alarmingly in the Sahel since the 1960s.
- Some pastoralists sedentarize either the whole household or some of the family members, either temporarily or permanently.
- Some people change their economic occupation altogether, temporarily or permanently.
- Conflicts between people from different ethnic groups increase in years of drought and after. Conflicts between nomads and farmers especially, but also internally within groups, even within families.

These many consequences do not necessarily follow one after the other in the order I have listed them. Furthermore some effects happen simultaneously during years of drought.

An essential point is that most animals during drought years do not die of thirst, but of hunger! That is especially from lack of sufficient and good grasses.
Map 4. The WoDaaBe lineage studied. (1) north-south transhumance in normal years. (2) migrating into "Lake Tchad and (3) into Nigeria in years of drought.
DEATHS

The drought period from 1968 to 1974 in the Sahel killed between 50,000 and 250,000 human beings (according to CILSS and Club du Sahel), and 3.5 million cattle died (Grainger 1982/1986:3).

FAO estimates that 39% of the cattle died and 10% of the sheep died in Niger during the years 1970-74. In 1972-73 alone FAO estimates that 20%—50% of the cattle died in Niger and Mauritania, the two countries mostly hit by the droughts. During the same year Burkina Faso only lost some 10% to 20% of the cattle. (Source: FAO).

The losses of animals during the 1982 and 1984 drought years were even worse for the pastoralists than 1973-74 had been, because proportionally people lost more cattle, since the herds were down to a minimum. On top of that cattle diseases kill lots of animals, and sometimes it is extremely difficult to trust statistics—precisely because of several factors playing together to make the situation a real crisis.

Here we shall study just one case of losses. It is a representative (neither very rich nor very poor) WoDaaBe family I knew in 1968 and again from 1985-89.

Case 1). A, old man, 85 years, with two sons, B. and C.

The migration routes in normal years and in years of crisis, of the family in case, is shown on Map 3 and Map 4.

A was 8 years old when the worst drought “Kangale Korri” ravaged the Nigerian Sahel during the years 1911-14:

“My father lost animals at that time. Lots of animals. We had more than 100 cattle ... but only 13 cattle survived. Of these my father had to sell two bulls, and three cows. So the number of remaining animals was 8. These 8 animals became the foundation of our herd, it reproduced later, slowly, and became my herd, and the herds of my two sons. The herds of B and C, and my nephew D, since his father (my brother) died. When I was a child there were no wells of the new cement type, or boreholes. No, we were digging the wells ourselves with a calabash.”

The three men, A and his sons B and C owned together, when I first met them in Niger 1968, approximately 300 heads of cattle. It was near Maïne-Soroa in Département de Diffa, in the bush. They had so many sheep and goats that they could not count them.—Now (in 1989) A does not own one single cow! He had one cow in 1985, called “The Red One”, but it was not his own, he had borrowed it from a relative. Its calf, on the other hand, became A’s calf (according to the borrowing system called nanga-naayi) when the owner came one day and took the cow back to his own camp.
The sons B and C are both married and have families, so they have divided the herd, but all animals are taken to pasture and well together, since A, B and C live together in the same wuro. All animals are individually owned, whereas pasture and water is collectively used.

During the “Gandau” drought the family and some of the herd managed to survive by migrating westwards as far as the bush of Guidiguir (Map 3). They lost animals like everybody else, but did not loose human lives.

During later droughts in 1982 and 1984 they had to walk southwards into Nigeria in order to survive. There was simply no grass in Niger for the animals (see Map 3 and 4 for the routes). But the family always returns to Niger when the worst is over.

A was born in Western Niger, near Maradi, and his parents came “from Sokoto the famous place”. A explains that “the grass is better up north, in Niger, than in Nigeria... more nourishing for the cattle.”

B (oldest son of A and now the household head) has the following animals during the winter 1985-86:
3  zebu cattle of his own.
10  zebu cattle, borrowed (nanga-naayi).
  1  donkey of his households own.
  4  donkeys borrowed (nanga-naayi)
15  sheep.
  0  goats (they all died in “Lake” T Chad in 1984.)
  0  camels (the only one B owned was stolen by Tubu nomads from the north in 1984.)

B owns 11 calves of his own. B’s wife E owns a few sheep, but no cattle. Women normally do not own cattle among WoDaaBe. The 8 children are not going to get very many cows each, when they grow up. Reproduction takes a long time. They will never again have 200 or 300 heads of cattle in the extended family (unless a miracle of rain appears).—According to estimates made by the family themselves, they (husband, wife, 8 children, and 1 old person) need between 15 and 20 adult heads of cattle and 100 sheep to survive and live properly. There is also a few other relatives who come and go, so they are normally more than 12 for a meal in the camp. If B had not borrowed the 10 cows from kind kinsmen, his family would have perished.

There is a proverb among the WoDaaBe saying: “Mbaali sulla na’i”: “Sheep are the trousers of the cattle”.

This again means that one does not sell off cattle, if one can avoid it. Sheep, on the other hand, are “loose capital”, like the “clothes” which can be sold off in order to save the “body”: the cattle, which is the most valuable.
Case 1) is a typical WoDaaBe family of Niger. They struggle every day to survive, physically as well as mentally. They do everything they can to survive on 3 cattle of their own, and some borrowed ones, but always remember the times when they had 300 cattle.

Systems of redistribution/circulation of animals, WoDaaBe

The following four systems exist among the WoDaaBe of the Lake Tchad area, concerning ownership of animals:

I. Hallalji. These are animals owned by the pastoralist himself/herself, and it can be animals of any age, sex, stock. The owner has got complete rights over the animals (to sell, slaughter, give away, etc.). The animals are obtained by inheritance or gift.

II. Nanga-naayi, which are animals borrowed from a relative, a milking cow (or several) that is in your herd temporarily. When the cow has been with you and has given birth to two calves, times come when the owner (or his son) will turn up shily to claim the mother cow back. But you are entitled to keep the two calves (if they have survived) as your property. The borrower and lender are normally close kinsmen. With nanga-naayi animals (calves) a poor herder has a chance to build his herd up again, slowly, after a severe drought.

III. Diillaayi, or "milking-a-cow for a season". Always a time limited loan. The owner will claim the cow back again at any time he wants it. The one borrowing the cow has got the right to the milk only. The cows are not yours like in the case of nanga-naayi animals. The people borrowing and lending are normally close relatives.

IV. Jokkere, animals of all sorts (cattle, sheep, goats, camels, etc. etc.) herded for an owner in absentia (normally persons from other ethnic groups, town people, rich merchants, Alhaji's or civil servants, who invest in animals). The herder only has the right to the milk. The herder does not necessarily get a salary for his work herding. The animals can be claimed back by the owner at any time.

Drought always causes death of animals. Some families loose more animals than others. The tribal structure which the WoDaaBe have dictates a norm about distributing animals to the benefit/survival of the whole fragment of the lineage—the agniclatic family groups will help each other mutually, exchanging animals for services and help, loyalty or labour. Uncles, cousins, brothers-in-law, grandfathers, etc. will all help people who have lost, if they themselves have animals left. The levelling mechanisms are a sort of "indigenous development aid system", whereby WoDaaBe are saved collectively. If these redistributive systems did not exist, the pas-
toralists would have been dead a long time ago, I presume. Especially the nanga-naayi and diilaayi systems do save many a nomad in need.

To give animals as loans is a moral help to poorer relatives, but also to ease the pressure on labour in one's own household, and to "distribute the risk" (in case of drought and death). Animals are given to relatives not only by richer nomads, but also by people who are short in labour (sons to herd and/or daughters to milk). Thus the triangle of resources is the following:

water human

labour

grass/vegetation

It is between these three resources that we shall see the number of animals kept, and the choices of lending/borrowing.

WoDaaBe do not only "keep the cattle" within the fraction or the secondary, or at least the primary lineage group, rather than to give to the other WoDaaBe maximal lineage group or to other ethnic groups. They do also "keep the women" within the fraction or the secondary lineage, if they can, through classical arranged Father's Brother's Daughter's marriages as the preferential one (Bovin 1988 c: "Mariages de la maison" et "mariages de la brousse"...). Economically as well as socially the WoDaaBe are "closed" and close-kin-oriented. The ethnic boundary between WoDaaBe and non-WoDaaBe is to them simultaneously a racial boundary. Settled FulBe in the six countries I have met them (Nigeria, Niger, Cameroon, Tchad, Burkina Faso and Mali) tend to marry within the sedentary Muslim community generally (marrying FulBe as well as non-FulBe).

Consequences of droughts and cattle diseases, epidemics, etc. are that the WoDaaBe herds contain fewer and fewer animals (hallalji) that really belong to the herder. Most animals in years after droughts are of the categories II and III above, "the borrowed cows". The problem is that more and more animals are herded by WoDaaBe of the category jokkere. Especially after the 1974 drought (cf. also White 1987:8; and Bonfiglioli 1985) many jokkere animals are taken into the herds (small herds) of the WoDaaBe. The jokkere system is likely to jeopardize the pastoral way of caring for cattle. Maliki Bonfiglioli (1985) has described this process convincingly for the WoDaaBe of central Niger, where the situation is perhaps even worse than in eastern Niger concerning jokkere animals: It
Mette Bovin

means more careless herding, leads to bad resource management and bad livestock productivity for the herder who himself does not own enough animals to have a viable household/herd balance. There are too many male animals in a jokkere herd, compared with an ideal herd composition. Moreover the cattle owners in absentia do sometimes want to keep an eye on their animals, which again means that the herder is forced to stay too close to cities or towns, and markets and boreholes, rather than bush wells which are healthier for the animals. Mobility is reduced. Degradation of pastureland a greater risk. All in all, the jokkere does develop a decline in pastoral techniques, management, rewards, viability and pastoral culture. Milk is often the only salary offered to the herder, who has taken on the job because of poverty. In short jokkere represents a proletarization of poor WoDaaBe herders. These are likely to become really marginalized, (socially as well as resource-wise, ecologically and economically marginalized). Other people of their kingroup are unlikely to give animals in nanga-naayi or diiiaayi to a relative who has taken in jokkere animals. That is because one knows that the animals in such a herd will be tended less well. The jokkere system of herding is an evil circle, and represents direct exploitation of the poorest strata of the pastoralists.

Cultural adaptations

Most FulBe in the 16 countries they inhabit in Africa, are religious Muslims. Piety has become a central element of especially settled Fulani identity, but also of agro-pastoral Fulani identity. The FulBe Liptaako are devoted Muslims, like most other FulBe.

WoDaaBe, on the other hand, react to the total situation with "non-adaptation to the norm" in comparison to the "well-adapted" FulBe. WoDaaBe react by wearing:
- leather trousers instead of cotton trousers;
- black instead of white clothes;
- feathers, tattoos, and painted faces as a contrast to the Muslim unpainted face;
- long hair (for men) instead of baldness,
- brass jewelry and cowrie shells instead of silver and gold, and other specific WoDaaBe nomadic dichotomizing elements.

In short these are clear manifestations of what I shall call "archaizing cultural elements"—symbolizing a pre-Islamic and non-islamic way of life. The "archaizing" culture of the most nomadic of the FulBe pastoralists (WoDaaBe), is a clear form of cultural resistance. Of ethnic resistance. But resistance to what? I believe their cultural resistance is not so much to Islamic culture (which they belong to on one level) per se, as it is a
resistance to State Culture and stratification of the larger society and to the settled and agricultural life of the majority.

Coranic schools and Western/government schools are frequented eagerly by FulBe children. WoDaaBe children are deliberately kept away from schools (by their own WoDaaBe parents and elders)- away from Coranic schools as well as government schools. This is not by mere chance. Rather it means collective, normative WoDaaBe adaptation through “flight” and escape from “the state”.

Ibn Khaldoun (1967) and Owen Lattimore (1967) have—each in their own way—marvellously described the situation of nomadic pastoralists and their dependence on sedentary, “civilized” society. At the same time as they wish to stay “bedoin”. The two are one society: bedoins and cultivators in towns. Nomads are never isolated, they become even more dependent on the “tied people” (HaBe in fulfulde) who are the sedentary towns people, in times of drought. So the paradox is that: the more the droughts hit, the more pastoralists wish to be “free” and move in space, but the more dependent they become of grain, etc. from these same settled people, because their own milk (“the best food in this World”) is insufficient. This is a constant dilemma for nomadic peoples today, as it was in the past. In the Sahel as everywhere in the arid and semi-arid zones of the World.

SEDENTARIZATION AND NOMADIZATION

The two main ways of surviving in severe times of drought and hunger in the Sahel are through increased nomadization, which has been touched upon in the chapter above, and increased sedentarization, which shall shortly be described here.

The FulBe people of Liptaako Emirate do—as agro-pastoralists—choose a different strategy of survival from the one by the true pastoralists (WoDaaBe). Fulbe Liptaako do, in years of drought, settle even more than they did before. Agro-pastoralists become completely sedentary agriculturalists; and people from bush houses go to villages, and people from villages go to towns, and further to cities. The process of sedentarization and the process of urbanization go together (although the two can also be separated) in Liptaako.

Some Liptaako herders did also (in 1983, 1985 and 1986 when I was in Burkina Faso) choose long-distance migration, and some went as far south as Togo and northern Ghana and Benin with the herds—in order to survive on better pastures in the south (like the WoDaaBe going to Nigeria and Cameroon i harsh years). But the families did not follow. Only young men and middle aged men follow the herds. Old people, children and women stay at home and cultivate the soil. The men return
home when the first raindrops fall; they are back, for the sowing. And 3 months later they return again: for the harvesting of the millet.

Unfortunately the old systems of redistribution ("borrowing-a-cow") have died out in Liptaako. People herd for other people, the system of salaried herders is very normal. For one cow to be herded the owner pays the shepherd 100 CFA francs (equivalent to 2,50 Danish crowns) per month in the villages outside Dori.

FulBe Liptaako practise sedentarization out of their free will. There is a "sloghing off" like in other nomadic societies in Africa and Asia (cf. "afskalning", Barth 1964) of the richest and the poorest FulBe. Only the "middle layer" remain FulBe na'i, cattle Fulani.

ON OVERGRAZING

Sandford distinguishes between a "conservative strategy" and an "opportunistic strategy", contrasting two extremes. A "conservative" strategy is one "in which a constant number of livestock graze an area through good and bad years alike", and an "opportunistic" strategy one in which "the number of livestock grazing is continuously adjusted according to the current availability of forage." (Sandford 1983:38). In reality pastoralists use both, in different mixtures. If we were to use Sandford’s distinction on our two case studies, the FulBe Liptaako and the WoDaaBe, the finding would be that the FulBe use a rather conservative strategy and are less mobile in space, whereas the WoDaaBe use a rather opportunistic strategy concerning cattle herding and livestock numbers and using mobility in space extensively.

Rather than saying "overgrazing is the problem of the Sahelian zone" we could also talk about "the problems with "overgrazing"—because the truth is that overgrazing is not "the problem in Sahel today", as some ecologists, agronomists, and politicians claim. A much greater problem is the overcultivation in the Sahel (cf. the “peanut-and-profit”-system, Franke and Chasin, 1980). The agricultural colonization of the Sahel has been—and still is—very serious, caused also by demographic pressure in the savannah and southern zone of the Sahel. This process has squeezed the pastoralists further and further north (even within their pastoral zone), into more and more marginalized areas and poorer and poorer (and narrower) pastures. In the Niger Republic I have seen new millet fields as far north as 80 kilometers from the "border" between zone sedentaire in the south and the zone nomade to the north. Rainfed farming has extended into pastoral areas without asking pastoralists, whereas pastoralists have to pay to cultivators if an animal should go into his field.

If we say "The problem in the Sahel is overgrazing done by nomads with too many animals" we are just continuing to "victimize the victim".
The obvious problems of overgrazing in many areas are too often explained in terms of the *pastoral value system* rather than "the need for each individual household to keep large herds of domestic animals" (Dahl and Hjort 1976). It neglects the productive aspects of herds, and the problem of *security for drought years* and *epidemics*. Sometimes overgrazing can be caused by too little mobility, if the area which is available for grazing has been limited. And in Sahel it has been. Agro-pastoralism need NOT be the best form of "adaptation" to the increasing arid lands of Africa. Specialization in agriculture on the one side and pastoralism on the other and an increase in conscious interaction between herders and farmers, and a strengthening of the market facilities and price controls, may be better solutions in the future than "to make everybody agro-pastoralists. Give each nomadic family a millet field, and give each farming family a few animals", which some Sahelian governments prefer these years. This strategy will only increase the problem of overgrazing around settled villages and it will not eliminate ethnic conflicts.

What is needed is not a mingling of agriculture and pastoralism in all families, but rather a development of the traditional exchange systems between the two sectors. A specialization if fortunate and wise, if the northern pastoral zone is to be used rationally. Extensive pastoralism is the only adaptive mode, since intensive pastoralism and agro-pastoralism not to mention agriculture, has too often failed.

![Diagram](attachment:diagram.png)
CONCLUSIONS

1. The Sahel is a *vulnerable zone*. Crisis and difficulties are "normal" factors in life. People of the Sahel take the *drought potentiality* into their socio-economic systems, though in different ways.
Two main "adaptations to drought" appear in the West African Sahelian zone: (1) *Increased sedentarization*, and (2) *Increased nomadization*. Both are strategies for survival during and after years of drought, hunger and death.

2. A change from true pastoralism to agro-pastoralism is not *per se* a positive "development". On the contrary for the WoDaabe and other nomads of the four countries around Lake Tchad. In the driest areas of arid Africa (150-399 mm rain per annum) pure pastoralism can be the most rational adaptation—in contrast to "wetter" arid lands (of 300-1000 mm rain per annum) where agro-pastoralism with a hyphen may represent the most rational solution.

3. Of Sandford's two pastoral strategies, the "opportunistic strategy" is better suited than the "conservative strategy", if we consider survival of the people and the preservation of the environment. "Opportunistic grazing" causes less degradation of the milieu.

4. This paper has, perhaps surprisingly, dealt with "Adaptation to drought and insecurity" and "Adaptation to states" rather than "Adaptation to natural surroundings" in an ecological way, which is often understood by "adaptation". But adaptation implies not only choosing one or the other *economic occupation*. It is also a matter of *political choice*. The FulBe agro-pastoralists and WoDaabe pastoralists adapt to grass and water, but always also to potential and real natural hazards and disasters in the way they organize their society.

The WoDaabe continue to live as true pastoralists, choosing also the strategy of "escape from the state", its structure and hierarchies. They reproduce an *egalitarian tribal principle* and a philosophy of "rather being poor in the bush away from centres, than being richer in a tied system".

In the case of the agro-pastoral FulBe, and the completely sedentary town FulBe, the choice is that of *a state structure* with its stratification, social classes, sedentary village and urban life, higher degree of specialization, participating in the pan-ethnic Muslim universe.
Agro-pastoralists adapt to richer (wetter) areas, with combined agriculture and animal husbandry/herding.

Instead of settling down, the WoDaaBe respond to drought and resource crisis by *new migrations* further south, and a revival of former *redistributive systems* in difficult years of drought and hunger. In the case of the WoDaaBe we see a revival of various systems of "borrowing-a-cow".
5. Fulani are nomads between power and marginalization. They have a "proud history" of political, cultural, and economic dominance over other peoples in West African pre-colonial states. The Fulani are nowadays facing marginalization rather than holding power. Droughts have done a lot to accelerate this process. Pastoralists are also squeezed between a new power and marginalization: the power of the national states of today. The states wish to change the pastoralist production system: from a subsistence system (milk animals) into a "modern national economic system" with increased contribution in the form of deliverance of more cattle-beef for export (meat animals).

6. To practise forced sedentarization of pastoral nomads is the worst possible "solution" to "the Sahelian problem". There is not enough agricultural fertile land in the Sahel for this. The agricultural colonization of zone pastorale is already threatening the ecological and social balance. Removing cattle and pasture-water from a pastoralist is like removing social relations and kinship. And that is a serious matter.

7. Arid lands are well suited scenes for plays of opposition and conflict between nomads and agriculturalists. Nevertheless, symbiosis is also present, and the systems of exchange between agricultural and animal products could be facilitated instead of "eliminating the differences between nomads and agriculturalists by making everybody agro-pastoralists". Specialization in pastoralism and agriculture respectively is rational and should be continued and encouraged, with better market facilities etc. provided, and grazing areas secured for pastoralists, together with cattle paths in agricultural areas, so that the animals do not destroy crops.

8. The changing structures of livestock ownership to herds, the jokkere system of salaried herders, is an unfortunate "development" in Niger and neighbouring countries. It causes decline in animal care, a decline in the balance vegetation-animal-man threatening environment, and it causes marginalization and proletarization of herders from the WoDaaBe society.

9. Culturally true pastoralism practised today is nowhere in the Arid Lands of Africa, nor the Arid Lands of Asia, a sign of just "survival of archaic culture" only. Pastoralists as minorities in large agricultural majority societies, create new culture. It is an "archaizing culture" constantly being renewed. Pastoralism is a constant "negation" of the state structure, the state which they oppose and whose social network and economic contribution the pastoral nomads depend largely upon. Ibn Khaldoun in medieval times and Lattimore much later were both right. So is Clastres, but with the Levi-Straussian (1958) modification of the possibility of REGRESSION.
Mette Bovin

The paradox is that nomads, who wish to have freedom, become more and more dependent on the sedentary society (which they reject) in times of drought.

BIBLIOGRAPHY


Bovin, M. 1984. Danses in the Sand. A meeting between Europe and Africa. (Liptaka, Burkina Faso). Mette Bovin Film Production, Helsingør, Denmark, and distributed by Statens Filmcentral, Vestergade 27, Copenhagen, Denmark. 16 mm film, 44 minutes Danish, English, and French versions.


Stenning, D.J. 1959. Savanna Nomads. A Study of the WoDaaBe Pastoral Fulani of Western Bornu Province, Northern Region, Nigeria. London: OUP.


White, C. 1987. Poor pastoralists are poor herd Managers: Changing animal ownership and access to land among the WoDaaBe (Fulani) of Central Niger. (Mimographed paper, 17 pp. Massachusetts, USA).

NOTES

1. According to Alfa Ibrahim Sow 1979 there are around 16 million FulBe in all, living in 16 countries in Africa: Mauritania, Senegal, Gambia, Guinea-Bissau, Sierra Leone, Guinea, Liberia, Mali, Burkina Faso, Benin, Togo, Niger, Tchad, Republique Centrafricaine, Cameroun, Sudan.

2. I thank Professeur Dioulédé Laya for his excellent comments to the present paper in July 1989 at CELHTO in Niamey, Niger.

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Agro-Pastoralists Response to Agricultural Policies: The Predicament of the Baggara, Western Sudan

M.A. Mohamed Salih

INTRODUCTION

Pastoralists are generally described as susceptible to agrarian change such as the introduction of new technology and the expansion of the land under cultivation. In its simplest form a land gained by cultivators is a loss of pasture and other landed resources for pastoralists. However, pastoralists adaptability to such agrarian change depends largely on the available resource base and whether appropriate plans for resource utilization were formulated at the initial stage. Incoherent agricultural policies usually intensify conflicts between pastoralists and cultivators as well as with other systems of land use.

There is also the more optimistic proposition that agro-pastoralists are resilient to agrarian change and that they usually develop new strategies to cope with new situations. However, this implies that ecological pressure may bring about new career patterns in addition to the already existing ones. Such career patterns include the acceptance of the values environed in the marked economy, wage labour, rural/rural and rural/urban migration, agricultural intensification and others. Although such developments are important to shield the agro-pastoral systems of production from total collapse, they may be detrimental to the continuity of the traditional social organization and its accompanying values. Furthermore, these developments may deprive the agro-pastoralists of some the vital resources on which they depend to earn their living.

The most dominant postulate in the Sudanese case is that agro-pastoralists are under continuous economic and ecological pressures and that they were largely neglected when the national policies for agricultural development were formulated (see Ahmed ed.1976, Håland ed.1982, Sørbø 1985). This very neglect is also seen as a source of serious misgivings, notably the manner in which pastoralists and agro-pastoralists are negatively affected. Hence, it is important to note that the stated agricultural
policies in the Sudan have induced changes within the agro-pastoral systems and jeopardized their viability as a desired economic activity.

There is also the need to trigger off a balance between food crops and pastoral production as more people are leaving agriculture to the urban centres. This makes a call for an integrated livestock/agricultural system an urgent necessity and the demand for a serious change in the state agricultural policies a prerequisite to the success of any pastoral development strategy. However, the importance of an integrated livestock/agricultural system can be better understood in terms of the producers' perception of the objectives of production, consumption and distribution of animal products rather than the planners projection of a highly desired development model. An integrated model has the antagonisms may develop between the pastoralists and the farmers. Such conflicts are usually mediated by competition over scarce resources, and land. In both ways, it seems that the state policies take side with the farmers.

The answer to the growing food problem in the Sudan during recent years and despite huge investments in the modern agricultural sub-sector implies that agricultural intensification is the only answers to the shrinking landed resources. It may be suggested that the new forms of sedentarisation which have been adopted by pastoralists is one form of intensive livestock production. More pastoralists are getting more and more interested in having a small number of good milking cows rather than a large number of the traditional zebu breed. Kenana type cattle have recently been introduces by settled pastoralists. Manure is more in use especially in the house gardens and many pastoralists are more aware today about the positive effect of manure on farms. There is also an increasing awareness of the importance of storing crop residues such as ground nuts and sorghum to be used during the dry season.

It is unfortunate that this process of intensification has not been matched by the agricultural polices devised by the state. Expansion of areas cultivated rather than intensification is still a public policy. The integration of livestock and crop production in the arid lands has not been officially acknowledged or experimented with. Instead of encouraging the use of animal draft and ploughing, tractors are still perceived as the only viable method for agricultural development. However, it is the use of tractors without any consideration to their impact on the small producers both peasants and pastoralists and without any notion of how to incorporate livestock production into the large-scale mechanized schemes that the disintegration of crop and livestock production has occurred (Elbadawi 1987, Wohlmuth 1987).
Map 1 The expansion of large-scale irrigated and rainfed agriculture in the Central rainlands.
(Adapted from A. M. Ahmed, 1987, p. 135.)
M. A. Mohamed Salih

THE BAGGARA PASTORALISTS AND THE CENTRAL RAINLANDS.
THE CASE OF THE HAWAZMA OF SOUTH KORDOFAN

The Baggara constitute the second largest group of pastoralists in the Sudan after the Dinka. They are scattered throughout the area from the south western parts of Darfur and South Kordofan to the banks of the White Nile in the east. They comprise tribes such as the Missiriya (Humr and Zurug), Ta’aisha, Beni Helba, Hawazma, Ma’aliya, Rizigat and Kennana. The name Baggara does not denote any ethnic homogeneity apart from the historical reference that they belong to Arab migrants of Juhyina origin who intermarried with African groups across the Sudanese Chadian borders (Henderson:1939, MacMichael:1967). According to Henderson (1965:26), the Baggara moved into J.Mara in the 18th century and that they owe their origin as tribes to the great Arab revolt in Egypt in the 13th century. They left to the West and then moved south forming tribal units as the centuries went by. They lived alongside Bahr el Ghazal river, acquired negro blood and distinctive dialectic, distinctive habits, a characteristic long spear with a leaf-shaped blade, and the wide-sleeved dervish jibba which distinguishes them from the jellaba and the jammala (camel men, Cunnison, 1966:6) points out that, the Baggara have probably followed the same pattern of migration before they have finally settled in Kordofan and Darfur Regions. However they share three main characteristics: first, they are all cattle herders and their very name Baggara is derived from Baggar (i.e. cattle). Second, they are all Muslim Arabic-speaking, although very few of them adhere to Islam and very few of them practice it. Third, they live almost within the Savanna belt and with intensive interaction with the semi-desert in the north and the woodland rich savannah in the south. This makes them very susceptible to fluctuations in rainfall and pasture on which they depend for the maintenance of their animals (Cunnison op.cit.).

The Hawazma, the subject of this study, have followed the same migratory routes before they settled in their present homeland in the central parts of South Kordofan province (Cunnison ibid.). Like other Baggara groups they think of themselves as gabila or tribe although they are also divided into sections also called tribes or gaba’il (sing gabila). For example, the Hawazma divide themselves into Rawawga, Abdel Ali and Halafa and each of these sections is called gabila. Like other Baggara groups they keep cattle, sheep and goats. They also cultivate sorghum which is the main staple crop and sesame, groundnuts and cotton as the main cash crops, although sesame and groundnuts are used both as cash and food crops.

The rains extend from as little as 200 mm in the North to over 800 mm in the southern fringes of the Baggara belt. The rains decrease northward and increase southward in a relatively short rainy season which extends from
June to mid-October. However, although the actual start of the rains is unpredictable and varies from one year to another. The Baggara response to these main climatic features in the middle and northern drier zones has been described by Haaland as follows; “in the south are the Baggara cattle herders who typically move between Bahar al-Arab in the south, where they spend the dry season, and their homelands on the more sandy soils (goz) further north, where they do some cultivation, and still further north to the low rainfall savannah where they prefer to keep their cattle in the rainy season” (1982:4). It follows that the Baggara adapt their livelihood to fluctuations in the rains and pasture so that they move from one ecological zone to another according to seasonal variations in the climate and other landed resources.

There are two impediments to the Baggara pastoralists. First, in relation to the ecological restrictions imposed on them by planned agrarian change in the central rainlands. Second, in relation to the ongoing war in Southern Sudan as the Baggara are continuously squeezed between the semi-desert in the north, the large-scale mechanized agricultural schemes in the south and the current war between the Government troops and the Sudan Peoples Liberation Army (SPLA). Although the Hawazma shared peaceful relation with the Dinka and other Southern ethnic groups, the militarization of tribalism has meant that they are equally affected by the war situation (Salih 1989 a). This issue, however, is not within the scope of the paper.

It is, therefore, very interesting to understand the implications of the Hawazma problem for groups with similar predicament since the Baggara belt is seriously affected by the expansion of large scale mechanized schemes. Being in a continuous move from the central to the southern parts of Kordofan means that they are under constant pressure if any interferences with the prevalent ecology are commended. The mechanized agricultural schemes have, therefore, upset the traditional eco-system and as such denied the pastoralists the use of vast and rich grazing lands.

AGRO-PASTORALISM AND THE MECHANIZED FARMS IN THE CENTRAL RAINLANDS

The pastoralists and agro-pastoralists represent 14.3% of the 22 millions; total number of the population of the Sudan. It is also estimated that there were 49.0 million livestock units in the country in 1983, mainly cattle (17.8 million), sheep (15.4 million), goats (13.1 million) and camels (2.7 million). According to the 1986 Economic Survey, livestock exports contributed about 40.5 million dollars which was over 25% of the hard currency earnings from exports.
However the livestock sector is largely neglected in the development plans since the colonial times. The colonial agricultural policies from 1913 to 1956 concentrated in the expansion of large-scale irrigated schemes, mainly the Gezira scheme (1913), which is known as the largest irrigation scheme in Africa with over 2 million acres of land under cultivation. Toker and Gash delta schemes were implemented in Eastern Sudan since 1924. By 1945 the colonial regime gave expanded its agricultural activities to the rainfed sector in Gardarif, Eastern Sudan and large areas of land were seized from the traditional farmers and pastoralists and allocated to share cropper and big merchants.

After independence in 1956, the subsequent national Sudanese Governments continued with the same pattern of agricultural development. The Gezira scheme was expanded (Managil extension) and new large-scale irrigated schemes were established during the 1970s in New Halfa, El Suki, the Rahad in additions to a number of sugar cane plantations in Gunied, Kennana, New Halfa and Sennar.

Post independence also witnessed the expansion of large-scale mechanized rain-fed agriculture in the central rainlands. The history of the development of large-scale mechanized schemes in the central rainlands of the Sudan has been depicted by Adam et al (1983) and Mohamed Salih (1987). Three phases are outlined: first, 1945-1953 during which state farms were implemented in Gardarif, Eastern Sudan. Second, 1953-1968 the private sector was involved due to shortage of public capital finance. Third, the final phase which continued until today witnessed the expansion of large-scale mechanized farms in the Blue Nile, South Kordofan, Kassala and Upper Nile provinces.

Elbadawi quoted the official agricultural development policies in saying that, "with vast untapped land resources in the country, the horizontal expansion of agricultural production holds promise for a quick and an economical increase in production" (op.cit.:14) This view has been a constant feature of Sudan agricultural policies within the overall plans for Socio-economic development. Consider for example, the Ten Year plan 1960/1970 which has completely neglected the nomadic population and allocated only 0.65 percent of capital investment to livestock development. The Five Year plan, 1970/1975 projected an increase in livestock production by 75.5 percent without any proper allocation of financial resources to this important sector. The same applies to the Six Year plan 1977/1983 which made an attempted to give more attention to crop/livestock integration. According to Ahmed (1987:134) the neglect of pastoralists in national planning is symptomatic to the Government policies. He made the remark that, "despite the major role of the nomads in the national economy, the livestock sector has not been given the attention it deserves by the government".
The result of this policy is that large areas were appropriated from pastoralists (Hawazma and others) and cultivators who began to feel the intrusion of mechanized farms into their lands. It has also affected their traditional adaptive strategies as their seasonal migration between the dry and the wet season pastures has to be readjusted to suit the new circumstances. The macro level impacts of the expansion of large-scale mechanized agriculture on the adaptive strategies of the Hawazma can be summarized as follows:

1. Northward movement from the permanent settlements begins in June, i.e. with the first showers of rain. As the animal routes pass through the large-scale farms, this period is very critical since it marks the beginning of crop planting. Traditionally the Hawazma pastoralists used to spend longer period of time (at least four weeks) to cover the whole distance. They used to stop for 3-5 days in one camping place before they proceed to the next. Their re-adjustment to fast movement is important to avoid damaging the agricultural crops in the mechanized schemes. It has created new demands on the household: first, women tend to spend longer period of time establishing and putting down the tents instead of attending the laborious milk processing. Second, it means that they now cut more trees for thick fencing. Today the Hawazma keep their cattle in kraals at night to prevent them from damaging the crops in the schemes.

Southward movement connected with more taxing problems emanating from, at least, two factors: first, the end of the rainy season (mid-October) in the semi-desert in the north is marked with a steady decrease of water and pasture. There is the need in this period to move faster without damaging the crops in the large-scale mechanized schemes which they cross on the journey to the southern grazing lands. Second, the herders have to join the main households in the permanent villages in the south and assist with harvest which occurs at a time when huge herds are assembled around the villages and there is always the fear that they may damage the crops. A shortage of labour in the pastoral sector can easily be induced either by involving more household members in the farming sector or by using more labour to monitor the herds and prevent them from damaging the crops in the local courts are instructed to pass higher fines in the incidence of crop damage when the crops are ripe and ready for harvest. It also means that the classically known labour extensive pastoral production is becoming more labour intensive.

Therefore, as a result of the expansion of the large-scale mechanized schemes in the intermediate grazing lands and across some of the animal routes, many sections of the Hawazma are concentrated in one or two narrow routes. Consequently, the herders have to cross about 200 Km. in less than two weeks and at times without being sure of the availability of finding water ahead for themselves and their herds. This is militated by the fact that very narrow corridors are left for the pastoralists and their
animals to pass through. According to the official policies, at least 2 Km. wide corridors should be left open for the pastoralists to pass through. In practice most of these corridors are planted by the merchant/farmers in order to increase their holdings. All magistrates are instructed to pass heavy fines on any pastoralists who's animals may cause any damage to the agricultural schemes.

The shortening of the period of the south/north movement means that more labour is required to look after the herds: first to prevent the animals from damaging the large-scale mechanized farms and second, to monitor the herds during grazing as more animals are squeezed in smaller animal routes. In other words, the abundance of pasture which was one of the main attractive aspects of taking up agro-pastoralism as a viable means of livelihood, in the central rainlands, is no longer there. There are increasing signs of over-grazing and over-stocking in the areas surrounding the large-scale mechanized schemes. Another concern for the pastoralists is that animal concentration of herds than in the past when smaller groups were migrating in separate routes.

2. Since more labour is drawn from the household to attend the newly emerging demands created by the expansion of the large mechanized schemes, there is today less labour available for the agricultural activities. A common complaint by pastoralists today is that they have to devote a considerable proportion of their income to purchase grains. This in effect has a negative impact on household viability and its ability to produce its own food. Some households found a way out in hired labour either from the farming communities or from poor pastoralists. Nonetheless this possibility is available only to rich pastoralists who can make ends meet even if some of their income from livestock could be utilized in hired labour while maintaining a viable off-take. The commercialization of agriculture has been followed by a partial commercialization of the pastoral economy and has a result created a local market for labour. This reveals that the pastoralists respond quickly to changes in ecology and economy and hence change their adaptive strategies to accommodate the new situations.

3. The Hawazma found themselves in the paradoxical situation that they have to depend more and more on livestock sales for herd building. In other words, in the past, the proceeds from the sale of the surplus grain were re-invest in the purchase of cattle. However, today they resort to either the conversion of small ruminants into cash and then the conversion of cash into cattle or depend on the remittances made by migrants relatives or agricultural labourers to purchase more cattle. The second category is very small and cannot be counted as a major shift in savings from local production to dependence on labour migration.

The Hawazma agro-pastoralists have also been affected by the fluctuation of grain prices due to the fact that the owners of the large-scale
mechanized schemes usually glut the market with huge amounts of grain during the beginning if the harvesting season. The market mechanism usually determines that the small producers should sell large quantities of grain in order to finance their immediate needs and household requirements. A few months later, as their granaries dry-up, they begin to use their hardly earned savings to purchase the same grain for higher prices. It is clear in this situation that, the small producers and the agro-pastoralists in particular cannot either compete with the owners of the large-scale mechanized schemes or produce sufficient crops to sell on the market in order to re-invest in cattle. The tendency now is to purchase small animals which reproduce faster and sell some of them during the rainy season when animal prices are relatively higher.

Although the Hawazma agro-pastoralists have suffered considerably from the expansion of the large-scale mechanized schemes, they have not completely surrendered to their unpleasant man inflicted interferences. The three adaptive strategies which I have outlined, so far, reveal a tremendous resilience and resolve in encountering hardships. Nonetheless there are certain limitations to how far their resolve can persist and maintain its utility in the face of the increasing ecological and economic pressures?

It is also important to note that the general adjustments which the pastoralists have succeeded in making at the macro-level have been accompanied by other series of adaptive strategies at the micro-level. These include the invention of new patterns of allocation of labour, disposal of livestock and above all the readjustment of their perception economy and ecology in order to fit into the new emerging socio-political mix. The most significant aspect, for instance, is the manner in which old cultural traditions are giving way to mute manifestations with little if any relevance to the social organization that supported pastoralism through the years.

THE SOCIAL ORGANIZATIONAL ASPECTS OF ECONOMIC AND ECOLOGICAL ADAPTATION

The Baggara have been subjected to many external intrusions; notably the colonial administrative policies which used the tribal structure as a base for the Native Administration System 1921. According to that system various Baggara tribes were administered under a Nazir, the sub-tirbe under an omda, and the large lineages and groups of extended families were federated under a shaikh. The end result of this according to Cuninison (1966:147) is that, "the establishment of power positions at the top level of an agnatic lineage system has meant a rigid structure; a growing association of lineage with place; and intensive rivalry for the
new positions available. At the lower levels, in the structure and politics of the Omodiya where the administrative influence is slighter, the system is more fluid”. This system of local administration was abolished in 1972 although its most prominent figures are still active in the running of their tribal affairs, mediating in dispute settlement and other political activities.

In discussing the impact of the market economy on the Baggara, it is important to mention that the Native Administration System (1921/1971) spearheaded the penetration of the market economy through the collection of crop and poll taxes. The final incorporation of various tribal groups in the cash economy was accomplished with the introduction of cotton as a main cash crop during 1923 and after the First World War. The colonial system changed the Closed District policies and allowed Northern Sudanese traders known as jellaba to operate from the southern parts of the Baggara belt as early as 1937. The jellaba have accelerated the incorporation of the Baggara into the market economy through the introduction of manufactured goods, lorries for modern transport, flour mills to replace manual grinding of grains and hired labour by establishing large farms. The process was essential in inducing economy in change and bringing the Baggara right into the grips of the market economy on which they became more and more dependent for the purchase of manufactured goods and the sale of their products (Salih 1985).

After independence in 1956, the national Governments continued with the same attitude left behind by the colonialists and designed an ill-planned policy which facilitated the expansion of large-scale mechanized schemes without any due consideration to the pastoralists and their mode of livelihood. The larger synthesis of the impact of the large-scale mechanized schemes on the Baggara and the Hawazma have already been outlined. The task now is to proceed with this general note on the background and attempt to identify the impact of economic and ecological change on the social organization of the Hawazma since it is not feasible to depict such changes among all the Baggara tribes.

The organization of pastoral production was traditionally based on the nuclear family as the basic unit of consumption and production. However, the extended family is the most common type of residential, production and consumption unit usually mediated by a close co-operation between relatives and neighbours. The Baggara use the Arabic word bait (i.e. house) to denote both the nuclear and extended family even though it might have some other connotations. The use of the phrase khashim bait indicates a wider reference and includes a whole number of agnates who can trace their descent to the same grandfather. The labour of such units is usually split between agricultural and livestock production activities with the clear tendency of young men been associated with cattle. Cultivation and small animals rearing are mostly attended by married men and women. The household budget is controlled by women although the marketing and
purchase of cattle is dominantly a male activity. Married men manage the cultivation and the disposal of large quantities of grain, while women sell small quantities to satisfy the household immediate needs from grocery and food items.

Groups of 6 to 9 khashim baits constitute a farig or a camp who’s members use the same animal route, assist each other in watering, herding and protecting their cattle. They are also known as a dia paying (blood compensation) group and as such they share the expenses of any damage inflicted upon other’s lives or property by any of their members. Men of the same farig eat their evening meal asha in the dara and they can join in whether their wives have cocked any food or not.

Traditionally, the Hawazma women are expected to help their immediate neighbours regardless of whether they are relatives or not, although in most cases they are related to each other by consanguinity or affinity. Women helped each other in milking, shopping, firewood collecting, building of tents, and darangal making. Darangal is a large bed situated in the middle of the tent. Two changes have resulted from the new situation:

a) the number of the households which constitute one farig has decreased considerably. It is now quite normal that one or two extended families move together with their animals which indicates a decline in the traditional forms of co-operation to which people resort in order to execute labour intensive activities (Manger ed.1987). This, however, is not the case with the Hawazma who occupy the southern most parts of South Kordofan who form larger groups to defend themselves and their cattle from the Dinka tribes who largely form the SPLA/SPLM forces (Salih 1989). The Hawazma themselves would express their fear that people are getting more individualistic to the extend that they now chase each other to get access to pasture and water at the expense of others. This type of behaviour was considered shameful and was used to attract serious social criticism and defamatory songs in the past.

b) very few wealthy Hawazma households still adhere to the dara institution. Those who have plenty of grain tend to bring smaller quantities of food during famine and extreme shortage of grain than what they used to in the past. Many Hawazma would secretly tell you that their wives keep the best food for them to eat after they had come from the dara. In other words, solidarity which was expressed in sharing or eating from the same bowl as a basic feature of the Hawazma social life is giving way to new individualistic values. This occurs simply because people are more aware of the economic value of food and very few can afford to offer it freely to others. An increasing economic pressure and two consecutive famines in 1972/1973 and 1982-1985 have affected the Hawazma among other nomadic groups. Many people have consequently changed their attitude towards food offerings and hospitality. This has signalled a shift in
the perception of food from a source of prestige to an economic commodity of specific monetary value.

In this type of traditional social milieu, husband/wife and sibling/parents' perception of livestock ownership is also undergoing serious changes. I have observed in 1986 that there are almost no women, in my village, with a clearly defined ownership over cattle. Nevertheless, I do remember that during my early youth that there were many women who owned cattle herds which they entrusted to their brothers or husbands to manage on their behalf. By 1973 there was only one woman who owned, a herd of about 30 head of cattle. There is no such women among many Hawazma sections today. This in effect indicates that women are increasingly excluded from livestock ownership despite the fact that women are the main controllers of the food budget through the processing and selling of milk and clarified butter, furssa. Milk sales, in some animal camps, may contribute up to 60% of the household expenditure in food and about 20-30% of the expenditure in clothes, shoes, education, medicine and other household requirements and social obligations, The rest of the household expenditure is met by proceeds from the sale of animal and surplus grain.

The Hawazma attribute the decline of cattle ownership among women at least to two reasons: first, at time of hardship they first resort the sale of the cattle owned by men and then to those owned by women. When the hardship is over, men can always borrow cattle from their well to do agnates or make savings from grain sales which can be able to converted into cash and cattle. Any new herd that a household may be able to build is considered the husband’s property since the wife herself is considered part of the man’s ial or awlad (literally means children or nuclear family). The property accumulated through husbands and wife labour during marriage, therefore, belongs to the husband and such property is not strictly divided between husband and wife. Men are the controllers of the household property and are, therefore, entitled to dispose of all or any part of it with or without the consent of their wives or other dependents. Another point is that women use the little savings that they may make from milk sales to purchase food and other household necessities. There is usually little to be invested in small animals or gold as they used to do in the past.

As regard parents/sibling relationship, education has brought about several changes in the status/role relationship since children participation in herd management is decreasing. Wealthy pastoralists usually hire labourers to herd their animals while their own children attend school. A second solution, to the loss of child labour, is to shift-over to sedentary pastoralism. This denotes that the labour saved by adopting sedentary pastoralism is transferred to agriculture. The latter solution is a sign of a decrease in the herd size since the optimum number of cattle to sustain a household is increasing relative to the continuous devaluation of the
Sudanese pound. On one hand the households cannot keep a large number of cattle if they settled while the situation demands a large herd size to cope with the pressures exerted by the national economic crisis. A small herd, therefore, has to be supplemented by intensive cultivation in order to be able to survive or maintain bare subsistence.

It is, therefore, obvious that the ability of the Hawazma social organization to withstand the shocks exerted upon it by the accelerating ecological and economic pressures is in doubt. It seems that the resource base which supports the present system of pastoral production is due to reach the limits where the very existence of the prevailing system of adaptation is no longer viable. This also points out that the resource base is becoming more and more inflexible and incapable to cope with the new situation simply because it requires new resources to compensate the lost ones.

DISCUSSION

The contribution of large-scale mechanized schemes to food production in the Sudan cannot be denied. Agricultural statistics have shown an impressive increase in grain production and exports during 1982/1984 which coincided with 1983/1985 famine it is, however, surprising that at the time when the war has ravaged the Southern parts of the country which requires massive food aid, Sudan has already exported 300,00 tons of grain in 1988/1989 with more than 700,00 tons of grain awaiting export. All this grain mainly is grown in the large-scale mechanized schemes. The dilemma here is one of perception of goals and objectives of an expanded agricultural production without alleviating famine or improving the standards of living of the lower strata of the population. The disastrous impact of the large mechanized schemes on the pastoralists and peasants would have been justified if their standards of living had improved. Yet the need for food whether from livestock or agriculture is a matter of priority to any country, Sudan is not an exception.

The pastoralists perception of their resource base and how to utilize it has always been attacked by the planners whose objective is to supply low priced livestock products to the politically conscious urban consumers. It is, therefore, no wonder that any sign of a decline in the standards of living of the urban population is immediately felt by pastoralists whose income from livestock is very much dependent on the real value of the earnings of the urban dwellers. But again, the politically conscious urban dwellers can always pressurize the government by political unrests and protests to keep the prices low to the detriment to the pastoralists and the farming communities. This is, unfortunately, occurring at a time of great hardship for the pastoralists as well as the urban dwellers due to the present economic recession. It is also a time when the traditional systems of pastoral produc-
tion is undergoing severe ecological pressures which forced them towards sedentary pastoralism and more contacts with the urban centres. The paradoxical situation here is that the dependence of the pastoralists on the urban centres for marketing their products is also a source of further relegation to lower standards of living and poverty. It could as well be that the sedentary pastoralists (who are usually described as poor pastoralists) would eventually be dependent on the large-scale mechanized schemes to collect fodder for their animals and secure jobs for themselves. The symptoms of this new pattern are emerging as more pastoralists are taking up jobs from the peasants in the large-scale mechanized schemes. These new career patterns indicate that there is an increasing competition not only over landed resources, but also over jobs in the agricultural sector between poor peasants and poor pastoralists.

However, the material which I have presented so far has at least four dimensions as regard the Hawazma agro-pastoralists response to the agricultural policies in the Sudan. These dimensions are interrelated and hence provide a linkage between the effect of the national policies on the local milieu.

The first dimension questions whether there are any new emerging economic opportunities to compensate for the increasing pressures exerted upon the Hawazma by the market economy and the expansion of large mechanized agricultural schemes? It is obvious that two negative processes have been going hand in hand and both have led to the marginalization of pastoralists:

a) as a producers of primary products, livestock prices have been decreasing relative to the increase in the prices of manufactured goods. In other words, more livestock units are needed today to support the household needs. In other words there is a gap between the income and the immediate needs to be bridged by sale of more livestock to support the same household size today than ten years ago. Hence to maintain the previous status-quo they have to either decrease their consumption of the manufactured goods (i.e. lower their standards of living) or increase the numbers of their livestock in order to be able to increase off-take and obtain more cash to finance their increasing household budgets.

b) this dilemma is coupled with another negative aspect in terms of a deteriorating pasture as a result of the expansion of large-scale mechanized agricultural schemes. This in itself sets the limit for the realization of a feasible adaptive strategy and a noticeable increase in poverty as many pastoral households are forced out of the pastoral system and sold their remaining animals to finance their immediate needs.

The second dimension relates to the contradiction between acquiring large herd size to minimize the risk of animal husbandry in an unpredictable environment with fluctuating rain and pasture. It is paradoxical that more animals are needed to reduce the risk and to bridge
the gap between livestock prices and the prices of the manufactured goods at the time when overgrazing is occurring in the areas around the large-scale mechanized schemes. The rationale behind large herd size is more on the side of "safety first" mechanism than accumulating cattle as mere social status symbol. The principles of adaptation in this sense have changes from free grazing over open pastures to a very limited area which requires new consciousness of the importance of resource maintenance and an appropriate system of range management. Such knowledge has to be combined with basic research and a clear understanding of the uses and the abuses of the traditional pastoral production system.

The third dimension stems from the changes in the pastoralists attitude to livestock and its economic role. This has required series of adjustment in the social organization of production; mainly in the search for economic savings at the expense of social solidarity. It is also paradoxical that the traditional systems of coping began to erode as the economic hardship began to hit harder. The traditional perception of cattle as a social capital and a source of prestige and esteem is disappearing. Cattle are now being used as an exchange capital although their social significance cannot be negated. The concentration of livestock in fewer hands is an indicator of an increasing differentiation between poor and rich pastoralists and an increasing poverty among the majority of the pastoralists. The exclusion of women from cattle ownership, on the other hand, is a sign of an increasing male dominance over the means of production and reproduction (i.e. land, cattle, labour and women).

The fourth dimension is based on an increasing acceptance of new economic careers. The pioneer scholars in the study of pastoralism in the Sudan (Cunnison op. cit., Asad:1970) have observed that nomadic societies used to refrain from migration to towns. For example, the Baggara and the Kababish pastoralists are said to have used to undervalue manual work or working for others. This picture indicates that the pastoralists were semi self-sufficiency during the late 1960s and early 1970s. As they have lost self-sufficiency, they can no longer depend on small numbers of livestock for livelihood. Hence they have been forced to venture into new economic career to reduce the accelerating decrease in animal numbers by death during drought or by huge sales to bridge the gap in the household budget.

It appears from the outset that the future development of agro-pastoralism in the Sudan will certainly depend very much on the ability of the existing large-scale mechanized schemes to open up new possibilities for their survival. One such area is the provision of labour and fodder for the herds of the increasing numbers of the sedentary pastoralists. There is a pressing need to accommodate those who are forced by economic and ecological pressures to settle around the large population centres and the large-scale mechanized schemes. There is also an increasing dependence
on milk sales (Mohamed Salih 1985) and an increasing number of pastoralists who are ready to start some form of sedentary pastoralism (Khogali 1982, Sammani 1985). Although these responses are products of ill-planned agricultural policies, they seem to have prompted the agro-pastoralists to change their possibility of affecting an integrated agro-pastoral system among those who settle and found some benefits from the mechanized agricultural schemes.

Analysing the current situation on these terms is useful in addressing the impact of the external pressure on the pastoralists and the reaction of their social organization of production national agricultural policies. However, since the national policies for socio-economic development represent the interest of the dominant political groups in the country, it is obvious that the poor representation of the nomads in the national planning apparatus is one of the reasons behind their neglect and predicament. If planning is a political decision, then it is not surprising that the agricultural plans have catered for the interest of the wealthy farmers at the expense of the nomads and the traditional cultivators. The complexity of the problems of adjustment and adaptation may be partially solved when both the planners and the urban consumers realize that the pastoral societies are at their door steps striving for their rights and basic needs. This could occur as soon as they have gained the political consciousness which makes them a stronger partner in the political institutions of the country. Only then can they become a political force capable of fighting for its share of the national budget (see e.g. Salih 1989 b).

The migration, to town, of thousands impoverished pastoralists who lost their animals and means of livelihood may invoke the planners to respond to the problems of agro-pastoralism in the Sudan in more responsible manner. The reaction of the state organs so far is based on the use of coercive measures to repatriate the victims of the ill-planned agricultural policies and the mal-formed distributive mechanism adopted by the state. This in turn suggest that since the traditional systems of adaptation cannot be practised fully today, then they have already been replaced by short term survival strategies instead.

BIBLIOGRAPHY


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El Sammani, M.O. 1985. Kordofan Resource Inventory by Rural Council, Institute of Environmental Studies, University of Khartoum, Sudan.


Mohamed Salih, M.A. 1985. "Pastoralists in Town: Some recent trends in pastoralism in Northwest Omdurman District", in Pastoral Network Papers, No. 21, Overseas Development Institute, UK.


NOTES

Political Adaptation; The Case of the Wabarabaig in Hanang District, Tanzania

Vesa Matti Loiske

INTRODUCTION

Pastoral groups are often subject to marginalization. Agriculture expands due to increased population densities and development projects initiated by aid-agencies and governments. Pastoralists have, generally, a weak political and economic position. Governments consider the pastoral mode of production as "backward" and try to "agriculturalize" pastoralists. The possibilities for pastoralists to have a say in development issues is subsequently limited. In many parts of Africa this has increased the marginalization of existing pastoral societies and caused a shift from pastoral to agro-pastoral modes of production. The adoption of agro-pastoralism has further limited the possibilities to keep a pure pastoralist mode of production. These changes may result in cultural genocide. On the other hand great external pressure may force pastoralists to adopt new ways to keep their ethnic identity.

One of these traditionally pastoral groups, the semi-nomadic Wabarabaig of the Northern Highlands of Tanzania, have been subjected to marginalization and have been adopting agro-pastoralism during the past 50 years. The aim of the paper is to shed some light on these changes, with an emphasis on the adaptation of the Wabarabaig to new political requirements. They have protested against negative changes in different ways, and their political strategies have changed considerably during the last 30 years. The conclusions of the paper are that the political strategies of the Wabarabaig are changing due to external pressure and that their political strategies are rational. To analyse the changing political adaptive strategies of the Wabarabaig it is necessary to examine their society since pre-colonial times.
Barabaig area

- Approx. borders for the Barabaig area
- Small commercial centre
- Roads

BARABAIG Ethnic group
Basolu Village

120 km

78
ORIGINS

The Wabarabaig are a group of a larger ethnic community—the Datoga. The Datoga consisted of twelve groups which were scattered over central and northern Tanganyika in the 19th century. Today many of the subgroups have been assimilated by neighbouring Bantu groups. The Wabarabaig, though, have kept their cultural identity as Nilotes and are linguistically related to the Kalenjin in Kenya. (Wilson, 1952, part 1 and Ehret, 1971).

The Datoga was probably the first pastoral group to enter Tanganyika (Ehret, 1971). The Wabarabaig group of the Datoga was created some 200—250 years ago. The word Wabarabaig means literally “those who kill with sticks”. The reason for this violent name is, according to oral tradition, that the first group of Wabarabaig killed all the members of a smaller sub-group of the Datoga simply by hitting them in their heads with sticks.

The conditions for pastoralism in Tanzania were favourable in pre-colonial times. There was good, tse-tse-free grazing land and little resistance from the agricultural groups that inhabited the area (Kjekshus, 1977). Hence the Datoga expanded rapidly during the 17th and 18th centuries. The Datoga area was limited by Ngorongoro and Lake Eyasi in the north, the Singida lakes in the west, the Bubu river in the east, and Bahi Swamp in the south (Ehret, 1971).

From the 1860s to the 1890s Wamaasai cattle raiding increased in the area. In terms of numbers and military organization the Wamaasai proved to be superior. At the end of the 19th century the Wabarabaig had lost all their cattle to the Wamaasai. The Great Rinderpest of the 1880s and the Wamaasai attacks caused famine in the Wabarabaig area. Many Wabarabaig were forced to settle among the neighbouring Wairaqw and Wagerowa for protection and cultivation. The Great Rinderpest and a small-pox epidemic put an end to Wamaasai expansion—it has been estimated that the Wamaasai lost 90% of their cattle. The Wabarabaig households moved out from their clustered settlements and started to disperse again (Talle, 1974).

The agro-pastoral Wairaqw people, who had been contained in a small area, Kainam, during the Wamaasai wars, started to expand into the Wabarabaig areas. The contacts between the Wabarabaig and the Wairaqw during the Wamaasai wars led to trade and inter-marriage between the two groups (Thornton, 1981). From now on the history of the Wabarabaig is inseparable from that of the Wairaqw. The impact of Wairaqw expansion into Wabarabaig areas was a serious threat to the pastoral mode of production, however.
THE COLONIAL IMPACT

The first German military expedition to the area came at the turn of the century. The aim of the expedition was to collect taxes, conscript labour and collect provisions for the German troops. The people in the area resisted the German colonisation and a rebellion broke out in 1908. The leader of the rebellion was Gidamowsa, a famous Datoga leader from the sub-group Gisamajenk. The Germans managed to put down the rebellion and sent a punitive expedition to the Basuto area. They hanged twelve of the rebellion leaders, among them Gidamowsa (Wilson, part II, 1953).

The Wabarabaig reacted by avoiding direct confrontation with the Germans. They moved out from the German-controlled areas and became even more dispersed. German efforts to collect taxes among the Wabarabaig largely failed. The dispersal of the settlements made it difficult for the Wabarabaig households to keep contact with their clans and lineages, however, and the traditional leveling system which prevented social differentiation was undermined (Kjaerby, 1979).

The British colonialists, from 1918, did not meet any military resistance. By peaceful means, “divide and rule”, taxation and labour conscription the British could extract a surplus from the pastoral and agro-pastoral peasants. The British policies infused a new dynamic into the peasant economy. The result was an increased influx of Wairaqw settlers into the Wabarabaig areas (Kjaerby, 1979).

The British administration created “Native Authorities” in the area in 1925, among them the “Barabaig Chiefdom” and the “Iraqw Chiefdom”. Tax collection and labour conscription became more efficient, specially among the sedentary Wairaqw. The Wabarabaig moved to the periphery to avoid taxes and labour conscription. This opened areas for an Wairaqw expansion that was supported by the colonial administration. The British established trading posts and built roads, something that further encouraged Wairaqw expansion. The colonial authorities saw Wairaqw expansion into Wabarabaig areas as a means to civilize the “ungovernable” Wabarabaig (Kjaerby, 1979).

In 1933 the British tried to gain administrative control over the Wabarabaig area. The village of Giting, on the northern side of Hanang Mountain, was administratively moved from the Barabaig Chiefdom to the Iraqw Chiefdom. The move was motivated by the administration with the high percentage (90%) of Wairaqw settlers in the village. Protests from the Wabarabaig forced the administration two years later to return the area to the Barabaig Chiefdom (Talle, 1974).

In the beginning of the 1940s the agro-pastoral Wanyaturu began to move into the Wabarabaig area from the south-west. Hostilities between the two groups became very violent. The administration had to stop cattle
raiding and wars between the groups several times with police and military forces (Kjaerby, 1979).

A physical hazard which influenced the Wabarabaig in the 1930s and '40s was tse-tse enchroachment. The Barabaig Chieftdom had been tse-tse-free until 1924 when the first flies were observed in the Basuto—Haidom area. Another tse-tse push turned up from the south and nearly reached Katesh at the foot of the Hanang Mountain. There was a risk that the western and southern tse-tse areas would join near the Hanang Mountain, thus preventing agriculture and grazing and restricting cattle movements. The Wabarabaig were squeezed together with their cattle on the western mountain slopes and the Gehandu area. Their retreat was stopped by densely populated areas, in the north Wairaqw and in the south-west Wanyaturu (Schultz, 1971).

The tse-tse enchroachment during this period was probably an effect of the Great Rinderpest in the 1880s. Large tracts had become unpopulated, with bush enchroachment as a result. The specific trees and bushes that form breeding ground for tse-tse flies were established, hence the invasion of the flies (ibid).

The colonial administration observed the problems, which hit the Wabarabaig hard due to their dependence on cattle. A tse-tse reclamation plan was implemented in the area in 1947. The so called "Mbulu Development Plan" had three major objectives: stock reduction in the overutilized Mbulu Highlands, provision of expansion areas through tse-tse clearance and rehabilitation of eroded areas (Talle, 1974).

Stock reduction was implemented in Iraqw Chieftdom, where an agreement was reached between the native authorities and the administration of destocking quotas for every household. The Wairaqw were severely affected by the decline in soil fertility and the alternative given by the administration—a compulsory culling—was considered as more negative for the Wairaqw households than the voluntary agreement. There were many ways to get around the voluntary agreement, one of them was to "export" cattle into the Barabaig Chieftdom. Another positive aspect for the Wairaqw was the clearance and opening of expansion areas which allowed further expansion into Barabaig Chieftdom (ibid).

The stock reduction proposal was totally refused by the cattle dependent Wabarabaig. They had not experienced the same degree of soil erosion as the Wairaqw, and their dependence on cattle, both as a means of existence and for social status, made voluntary agreements impossible. Another factor, which also was taken into the plan, was the increased penetration of cattle markets in the area. From now on did the Wabarabaig have the opportunity to sell cattle to the market (Kjaerby, 1979).

The Wairaqw benefited most from the Mbulu Development Plan. They were encouraged by the administration to move into the expansion areas.
They became more dependent on the market not only for paying taxes but for buying goods which had been internalized into the Wairaqw households. The Wabarabaig sold cattle to the market to be able to pay taxes, but became economically more marginalized due to Wairaqw expansion.

The Mbulu Development plan was partly successful. The Wairaqw became dependent on the market economy and increased their production. The destocking campaign seemed successful in the beginning of the plan, but a later evaluation showed that stock densities had actually increased in the Wabarabaig areas. The tse-tse eradication plan was successful and opened vast areas for further Wairaqw expansion. The losers were the Wabarabaig who lost their native land to Wairaqw agriculture. The Wanyaturu became another menace for the Wabarabaig. The government supported Wanyaturu expansion into Barabaig Chiefdom. Land conflicts in the south-west increased, with violent confrontations between the two groups as a result.

The 1950s was a period of recovery for the Wabarabaig. Their herd sizes increased, even if the agricultural expansion limited the possibilities of herd growth. The herds did not increase as fast as the human population and the Wabarabaig became dependent on an exchange economy. Cattle prices were high due to the world market boom in sisal and coffee and the Wabarabaig managed to barter their cattle against grain grown by the Wairaqw (Kjaerby, 1979).

THE POST-INDEPENDENCE PERIOD

The pre-independence period was characterized by land loss for the Wabarabaig and agricultural expansion by the Wairaqw and Wanyaturu, coupled with Government support to “progressive farmers”. New impacts after Uhuru was the development of mechanized large-scale farming. The new government was concerned with increasing African production of food and crops. Their aim was to decentralize and equalize land tenure and credit rights. The “progressive farmers,” who had local economic power, managed to profit from their position. The result was increased differentiation despite the aims of the new policy. In Barabaig Division (former Barabaig Chiefdom) large tracts of land were found to be suitable for wheat production. The colonial administration had observed this and the new government decided to start large-scale wheat production on the dry season pastures which had been very important for the Wabarabaig. The local government started to allocate land to individuals in 1962, mostly to those Wairaqw who had resources to grow wheat (ibid).
Tractor cultivation expanded rapidly, and the richest farmers acquired land illegally. In the beginning of the 1970s a land tribunal was created by some local TANU-leaders who wanted to stop illegal land transactions. The land tribunal did not manage to halt the situation, however. The rich farmers managed to argue their case successfully (*ibid*).

Many farmers argued that some elements of the local governments were associated with the rich farmers. This forced the less competitive farmers to move to marginal lands in the Wabarabaig areas. The land alienation process among the Wabarabaig continued at a higher pace.

Another large-scale development during the 1960s and 70s was the introduction of seed bean companies. The Arusha based Dutch seed bean companies managed to get leaseholds on land in the Basuto and Barabaig plains. The seeds were grown directly by the companies in the early 1970s but after villagization more and more of the production was contracted to settlers, missionaries and farmers. Most seed bean farmers were Wanyaturu or Wairangi—less often Wairaqw or Wabarabaig (*Kjaerby, 1979*).

The fertile land, especially around Hanang Mountain, was concentrated into the hands of the tractor owners and when the villagization programme was announced in the area much grazing land was allocated to the new villages. This meant a new and intensified influx of agro-pastoralists to the Wabarabaig area.

The cultivated area in Hanang District (former Barabaig Division) has increased considerably during the last thirty years. In the 1920s the whole Barabaig Chiefdom was controlled by the Wabarabaig. But in the mid 1970s they inhabited less than half (*Kjaerby, 1979*). Due to the reduced grazing areas the poorest Wabarabaig started to adopt an agro-pastoral mode of production. In the mid 1970s 80% of the Wabarabaig cultivated maize and beans beside their traditional keeping of cattle (*ibid*).

**STATE INTERVENTION AND AGRO-PASTORAL INFLUX**

The most striking example of state intervention in the lives of the Wabarabaig was the villagization process during the 1970s. In the beginning of the 1970s the so called Operation Hanang was imposed on the Hanang area (*Daily News* 17 Feb., 12 Apr., 15 June 1973). A voluntary villagization drive had been launched by the government, and government officials got credit when they managed to villagize their local area efficiently. The pastoral Wabarabaig, however, refused to move to villages and “Operation Hanang” failed. Hanang District was not unique—it was difficult to carry out the villagization programme in many parts of the country (*Daily News, 11 Feb., 23 Dec. 1974*). The local leaders in Hanang
tried to villagize the Wabarabaig in many different ways. Two examples of this from Daily News:

On 7 November 1975 seven people were killed in Kidogwi and Singa villages in Famba District (Daily News, 11 July 1975). The killers were probably Wabarabaig. The answer from the authorities was to villagize people living “in the bush” by military force (Daily News, 19 July 1975).

On 8 January 1976 some Wabarabaig youngsters attacked a group of Wanyaturu unloading a lorry in Kihonda village (Daily News, 8 Jan. 1976). 21 people were killed. This event started a lively debate about “uncivilized tribes” in Daily News. The police arrested 376 Wabarabaig on 21 January (Interview, 1989). By May the total number of arrests had been risen to 941 (Daily News, 13 May, 1976). All those arrested, except 21 youngsters who admitted the killings, were released in May against a promise that they would settle permanently in villages (Interview, 1989). Many of the Wabarabaig households in the south-western part of the District got 20 head of cattle confiscated in connection with the killings. The official motivation was that the households did not live in villages (Daily News, 15 May, 1976). In addition, many Wabarabaig youths were sent to National Service Camps in other parts of the country (ibid).

The Wabarabaig attitude was that the authorities had refused to give famine relief to those who did not live in villages. The lorry had been loaded with relief maize seeds to the Wanyaturu. The Wanyaturu were killed because the Wabarabaig needed the maize seeds, as they had consumed all the maize of the previous season (Interview, 1989).

In order to avoid similar events in the future, the Wabarabaig elders tried to strengthen the central organisation of the group. The elders, who are the traditional leaders, negotiated with the neighbourhood groups and the police. They managed to identify the 21 persons who were responsible for the killings. To avoid further collective punishment the elders, on behalf of the whole group, agreed to settle in villages. But the Wabarabaig had lost much of their confidence in the government (ibid).

The first NAFCO (National Food and Agriculture Corporation) wheat schemes at Basuto was established in 1968 without the consent of the Wabarabaig who did not have any representatives in the local authorities. The same happened when the Setchet farms were established in the beginning of the 1970s. People who inhabited the wheat scheme area were forced to move without any compensation (ibid). The Wabarabaig had to leave the best dry season grazing lands. The Wabarabaig protested violently, one Canadian was killed by a Wabarabaig youngster in the end of the 1970s. He was caught and brought to trial. The military and the police defended the investments on the farms successfully, and the Wabarabaig realized that the military and police was to strong to defeat with violence (ibid).
A second villagization attempt was launched in the area in 1978 and was called "Operation Barabaig". The operation covered four regions, Arusha, Singida, Shinyanga and Dodoma. The settlement programme was a serious step to incorporate the Wabarabaig in the mainstream of development. A total of 21.6 million Tanzanian Shillings was allocated to develop 44 villages in the four regions. A series of meetings was held about the implementation of the plan, attended by Wabarabaig elders and government and party authorities.

The plan was to provide water, veterinary centres, cattle dips, roads, tse-tse clearing, schools and dispensaries as well as housing for teachers, medical and veterinary assistants and village managers (Kjaerby, 1980). The Wabarabaig agreed to live permanently in villages provided that infrastructure was available. The plan failed, however—only two villages in Hanang District were provided with some of the planned facilities. Operation Barabaig, which at first seemed promising did not have the expected sedentarizing effects (Interview, 1989).

In 1980 some 2,000 Wabarabaig planted maize on the newly harrowed wheat fields on the Basuto Wheat Scheme. They wanted to protest against the loss of grazing land and that the wheat was not for local consumption. This was the first peaceful demonstration made by the Wabarabaig to give prominence to their demands (ibid).

The economic crises that hit most third world countries at the end of the 1970s affected Hanang District in a number of ways. A parallel economy was built when the national economy collapsed. The rich farmers in Hanang made huge profits on the black market. State interventions more or less disappeared due to lack of capital (Kjaerby, 1987). The aid-supported wheat schemes, on the contrary, expanded in the beginning of the 1980s (Interview, 1989). The conflicts between the state and the Wabarabaig continued. The Wabarabaig and the Wairaqw, whose land had been confiscated by NAFCO, started a legal proceeding against the company. They won in the local and regional courts, and NAFCO was sentenced to compensate the evicted peasants. NAFCO appealed to the High Court and managed to win the case. The peasants had to pay the court costs and did not get any compensation for the loss of their shambas and grazing lands (Shivji & Tenga, 1986).

In 1984 the Wabarabaig sent a delegation to President Julius Nyerere to argue their case. They demanded a greater influence over their area and that Hanang District should be divided into two districts, one dominated by the Wairaqw and Wagorowa in the east and one dominated by the Wabarabaig in the west. The five man delegation walked from Katesh—the main town in the Wabarabaig area—to Dar es Salaam, a distance of about 800 kilometers. They were well received by the President and managed to reach an agreement which among other things gave them an own district. The new district was established in
September 1985, with one of the members of the Presidential delegation as District Commissioner (Interview, 1989).

The Government wanted to increase the acreages of the wheat schemes in 1986. They sent a representative to a meeting in Katesh. The Wabarabaig elders did not accept an increase of the wheat schemes, and the state representative had to go empty handed back to Dar es Salaam (ibid).

The Wairaqw migration into the Wabarabaig area has continued even after the division of the former Hanang District. It is a slow and silent process which is difficult or perhaps impossible to stop. Relations between the Wairaqw and the Wabarabaig have been friendly due to historical cooperation against the Wamaasai and the colonialists. But in December 1988 competition over land led to a serious clash between the formerly friendly groups. About 2,000 Wabarabaig were fighting against about 3,000 Wairaqw. The police and military had a hard job, and had to mobilize anti-guerilla helicopters to end the fighting. After two weeks the military gained control over the area, and the Wabarabaig and Wairaqqw started peace negotiations. The negotiations ended with a traditional ritual peace marriage between individuals of both groups (ibid).

CHANGING POLITICAL STRATEGIES OF THE WABARABAIG

The history of the Wabarabaig society gives examples of many different political strategies.

Traditional strategies

Assimilation

Many Datoga subgroups were assimilated by other Bantu tribes during the 19th century. Assimilation is a negative strategy by the assimilated group because it means a total cultural suicide. It may, however, be the only option for social and economic survival of the individual households. The Wabarabaig survived as a cultural entity due to their strong lineage/clan system and their great number.

Migration

Migration is a very useful strategy among the pastoralists due to their high mobility. The decision to move was traditionally made by the lineage/clan leaders. In times of warfare or environmental collapse big groups would migrate. Migration is sometimes positive if it keeps the
lineage/clan culturally together. On the other hand it may be negative, as in the case of the German punitive expeditions in 1908, when migration of the Wabarabaig led to a very dispersed settlement pattern making it more difficult for the households in the lineage/clan to communicate.

**Cooperation between ethnical groups**

The Wamaasai wars at the end of the 19th century pressed the Wabarabaig to get settled and to cooperate with the Wairaqw and Wagarowa. Friendly relations have been maintained until today. Cooperation during the Wamaasai war was both commercial and defensive. The Wabarabaig helped the Wairaqw to defend themselves and learned how to cultivate crops from the Wairaqw. The cultivation of crops was a necessity when all cattle had been stolen by the Wamaasai. Many Wabarabaig men marry Wairaqw girls who cultivate maize on small shambas for subsistence.

**Cattle raiding**

Cattle raiding is used by the pastoralists for two purposes. To enriching themselves and gain access to physical resources like grazing and water. It is an effective strategy against pastoralists and agro-pastoralists who are more or less dependent on cattle. The Wabarabaig use it frequently against the Wanyaturu in the south western part of the area.

**Killings/Murders**

Killings has a double function in the Wabarabaig society. It is, of course, a way to struggle for resources but it is a way to get rich as well. Traditionally if you kill an “enemy of the people”, irrespective of if it is a human or an animal, your relatives should provide you with cattle. The Wabarabaig youths who are poor usually doesn’t have any other possibility to build a herd than to kill an “enemy of the people”. If a Wabarabaig man do not have a herd he is not considered as an adult and he is not allowed to marry. Today, according to Kjaerby 1980, the rewarding of murder has been stopped by the elders—no one gets any gifts for killing a human being.
Vesa Matti Loiske

War

Wars in the sense we know it, with great numbers of participants, was fairly uncommon. Most warfare was undertaken by small groups and combined with killings and cattle raiding. The war between the Wairaqw and the Wabarabaig in 1988 and the rebellion against the German colonialists in 1908 are examples of the war strategy.

Modern strategies

Participation

The first step in a modern strategy is to participate in the planning of changes imposed by outside forces. The elders participated in the planning of the 1978 Operation Barabaig as well as in the development of the new District in 1985.

Negotiation

Negotiation is a useful strategy if you have reason to believe that your demands are listened to by outside forces. An example is Operation Barabaig, where the Wabarabaig offered to move into the villages only when the promised infrastructure existed. Another example is the walk to the President when the the delegation demanded a separate district for the Wabarabaig.

Peaceful demonstrations

It is not possible to treat the state as other ethnic groups. It is impossible to win a war against the military forces and the police. There have to be other forms of struggle. The example of the Wabarabaig who planted maize on the newly harrowed wheat fields shows that the Wabarabaig has adopted a new peaceful strategy which can be an efficient method to protest against grievances.

Involvement

Involvement is the highest level of modern political strategies. It is not sufficient to participate in planning, making demands or staging peaceful demonstrations—it is necessary to get politically involved in order to get
a say in the decision making bodies of a modern national state. The creation of a new district with Wabarabaig in positions of authority is the most advanced strategy. As we can see, this level has existed since 1985.

Changes in political structures

The traditional strategies needed a central body where political decisions concerning the group was made. The lineage/clan functioned as the central body. When the lineage/clan lost its functions, due to dispersion and assimilation of its members, it was replaced by the neighbourhood on a lower hierarchical level. This meant that the struggle for resources and cultural survival lost its central decision-making body and there was no coordination of the struggle. This was the situation among the Wabarabaig during the British colonial period until the late 1970s. Since the late 1970s a new central political decision-making body is emerging. It is not rejecting the old traditions, it cooperates with the elders as well as with politicians on the national level, finding new ways to get sufficient influence to secure cultural, social and economic survival of the group.

CONCLUSIONS

As we have seen the Wabarabaig use a whole set of political strategies to keep their cultural, economic and social positions in the area. This paper has shown that the Wabarabaig have a capability to change their political strategies when needed. Furthermore their adaptation is rational when considering the dual set of strategies they are using today. It is as rational to use traditional strategies against other ethnic groups as it is to use modern strategies against the State and the Party. The political dualism will continue for quite some time until new alternatives present themselves. There are many changes that the Wabarabaig do not wish—but the struggle for a cultural identity keeps the Wabarabaig a Wabarabaig.

BIBLIOGRAPHY


Vesa Matti Loiske

Kjaerby, F. 1987. Villagization and the Crisis, Agricultural Production in Hanang District, Northern Tanzania, CDR Project Papers No D 87.4, Copenhagen.


Production versus Environment? Planning Resource Management and Ecological Adaptation in Kenyan Drylands

Anders Hjort af Ornäs

INTRODUCTION

This paper consists of reflexions on research and development projects in the arid and semi-arid Kenyan lands over the period 1973-89. I seek to raise some major issues for a decent life in drylands and place them in the planner’s context. The main thesis is that an environmentally balanced development can only occur if food production is such that people experience a secure situation. Security should then be seen in food production terms rather than military strategic ones.

My purpose is to identify some of the measures against bottlenecks in today’s situation for pastoralists. The kinds of problems I am thinking of are grouped around a shrinking and less reliable resource base. The paper concerns ecological adaptation, and thus the major issue how soil and water conservation relate to current production activities. The first part highlights livestock based production systems, their capacity and vulnerability. Of special interest are the supplementarity of farming and herding, seasonalities in herd management, and the tendency towards part-time farmers (herders) through town-based systems.

The second section addresses the land resource side; the needs for proper soil and water conservation in arid and semiarid lands. It builds of the significant case of Kenyan development and administration of the so-called ASAL.

LIVESTOCK AND GRAIN: PRODUCTION AS ECOLOGICAL ADAPTATION

When we speak about environmental degradation we should not become too technical and leave out living conditions of human beings. In development planning we are, after all, to a great extent concerned with a poverty kind of situation. This is to me one reason why an extended version of security can be so helpful.
In the Kenyan drylands, providing most of the empirical evidence for this study, extensive livestock herding is a major undertaking. It is important for our own conceptualization of the situation to make note of the fact that those resources which people manage are often family herds prior to pastures. This does not mean that pastures as common property are not managed. The "tragedy of the commons", i.e. when "private" herds are kept on collective land, is a common notion associated to nomadic pastoralists. It is, however, often too shallow, and rather like those of carrying capacity, stock units, overstocking or the like. Commonly, the tragedy is not at hand until a development policy or other change has altered an authority structure.2

The general management features of nomadic pastoral systems consist of a preoccupation with household security through proper herd management (prior to land management). Production is livestock oriented. This fact is an argument, when it comes to soil and water management, to presuppose more attention to proper food production measures, and to conservation measures in this indirect way. In actual reality, however, most pastoral households benefit from considerable food supplement of grain. The nutritional and food production argument goes that a mixed production strategy is optimal. This section is therefore to some extent concerned with food production and consumption in Kenyan arid and semiarid lands from a nutritional point of view. One purpose is to test the logics of pastoralism, and also to highlight the supplementarity of grain production.

Pastoralism needs to be seen in a regional perspective, including the context formed by neighbours and the state. The days are gone when pastoralism could be treated as an isolated production system. When we wish to understand the changes in the living conditions of pastoralists, we have to include global systems along with local ones. World market prices on grain, just as well as veterinary precautions on livestock marketing, are phenomena which have a profound impact on a local situation. The general tendency is such that local or regional subsistence activities have rapidly become part of much larger production systems based on exchange and specialization. To understand pastoralism, one must look at all options available to obtain non-pastoral products.

The nature of the interface between pastoralism and other economic systems is ultimately formed by the marginal position of the pastoralist in the national political system. First, concern for politically important groups in the big urban centres governs the national goals for production in arid and semiarid areas, especially production of cheap meat. Second, the pacification of insurgents on countries' borders makes pastoral development seem important from a strategic point of view.
Pastoral production

The purest form of pastoralism is an economic system in which all food for the household is produced from domestic herds. Of course, few pastoralists depend solely on their livestock for food production. They supplement milk, meat, or blood output from their domestic herds with grain consumption, sugar, berries, etc. The degree of dependence on farm products varies as do the forms to obtain them; directly through farming pursuits or indirectly through trade. Even the Maasai in Kenya and Tanzania or the Samburu in Kenya, peoples who have been used as examples of pure pastoralism, rely to a considerable extent on farm products. Therefore, analyzing pastoral food production solely in terms of production from family herds is but a first step towards formulating an interplay between livestock and grain for sustainable food production.

Also for anthropologists it is nowadays conventional wisdom to analyze the different production regimes rather than concentrating on specific groups of people. These regimes have to be more specific than merely regional systems of production labelled pastoralism, agriculture, crafts, trade, etc. For instance, we must distinguish between different production systems also within pastoralism, depending on the species of domestic animals. The characteristics of the four different milk-producing animals predominant in northern Kenya differ widely and have contrasting economic implications. I am thinking particularly of species-bound rates of reproduction, the requirements for mobility, the bulk of meat produced at each occasion of slaughter, the continuity and frequency of lactation, and finally, the market value. For example, subsistence on mobile camels and small stock requires activities which are significantly different from those for relatively sedentary cattle and small stock, and camel pastoralism is similar to farming in that the family herd, like land for the farmer, is a fairly constant resource.

The production systems in drylands are geared largely toward subsistence production. It is therefore logical to depart from some of the biological restrictions on pastoral produce, i.e. those limitations that are inherent in rates of reproduction and levels of expected production, and in the temporal patterns of herd demography and seasonal production profiles. A few major points have to be raised in this perspective before moving into the substance matter of interaction between farming and herding.

Let us assume (as in Dahl and Hjort, 1976) a reference family consisting of 4.9 adult equivalents. This means for example a father around 30, a pregnant mother of 25, two children of three and eight, and two related youngsters, one boy of 18 and one girl of 15. If such an average household were to subsist solely on its domestic herd, and if this herd were average in age and sex composition, the household nutritional requirements would be
approximately 318 g protein and 13 800 kcal/day. If the household were to subsist solely on cattle herds without upsetting regrowth, a herd of 64 animals would be needed. An equivalent for camels in southern Somalia is estimated to be 28 animals (Hjort af Ornäs and Mohamed Ali Hussein 1988). The herd sizes of course vary with different breeds; yet, they indicate the magnitude of required herd sizes. Variations among small stock are even greater.

These figures are based on averages as if seasonal fluctuations would not exist. But they do, and this complicates the picture, even more so outside Kenya in areas with one rainy season. A seasonal perspective demonstrates the importance of the combination of large and small stock for three reasons. (1) Generally, the peak of meat consumption occurs when the consumption of cattle milk is low. Small stock are commonly more easily slaughtered than are large stock: Because of their small size they can be consumed immediately after slaughter within the household, and no major storage or sharing issue occurs. Furthermore, because of their fast reproduction the lost animal is soon replaced. (2) Second, the seasonal lactation pattern of small stock frequently complements that of cattle. Camels maintain a seasonally steady and high milk production level. (3) Third, and for the same reason as for slaughter, small stock are ideal for marketing and are an important resource for exchange for grain.

Role of grain

An economy based on livestock products is very efficient in fulfilling human requirements for protein. In the case of Kenya, a herd of as few as 28 heads of cattle, or of 40 goats and 16 cattle, would be enough to meet the protein needs of a household. In contrast it takes a considerably larger number to meet caloric needs. This is a fact that in itself immediately suggests the contribution of grain and sugar to the diet. Grain is a seasonal replacement for milk for the nomadic pastoralist, but it may also be a regular supplement or ultimate reserve for bad years. Pastoralists may also find it worthwhile to feed their livestock with grain at times. This is maybe more the case in neighbouring Sudan. It is, for example, the only way to ensure herd survival for the Amar‘ar Bedawiet of eastern Sudan who sometimes have to keep large numbers of camels and small stock stationary and feed them on durra, either produced by the household or purchased at the market. As for sugar, East African pastoralists are reputed to rank among the world’s greatest consumers in per capita terms. As much as one fifth of the needed calory intake comes this way. In passing we should also note the seasonal importance of fruits and berries; it is clearly significant in northern Kenya even though I have not seen any
proper calculations on the nutritional contribution which such consumption has.

Even the driest areas of Africa usually provide some physical opportunities for riverbed or rain-based "take-a-chance" cultivation. Frequently, however, the possibilities are limited by health hazards in areas with permanent water and by labour constraints that may not allow any family labour to stay at a cultivation camp. "Take-a-chance" cultivation of sorghum or maize at a well-watered spot along the transhumance route is the simplest and least labour-demanding form; the practice does not allow for a complicated crop selection but favours grains that do not demand much attention between planting and harvesting. Although the grain adds to the dry-season diet, it is rarely a food reserve, because successful harvests are most likely to occur in years of good rainfall when there is also milk.

There are many cases of barter between pastoralists inhabiting drylands and farmers in better-watered areas. A few examples from Kenya are the Turkana who have traditionally bartered small stock for maize (or formerly millet) from neighbouring Marakwet; Rendille and Borana, from the Meru farmers in the Nyambeni Hills; and Maasai from Kikuyu farmers. All over, such trade seems to have been significant, even if it has been obscured to outsiders because of simultaneous hostile relations between the groups concerned. In some cases, the actual exchange may have been carried out by special groups.

The general trend is probably that farm surplus, earlier bartered with pastoralists, is now to a greater extent sold on the national or international market. The regional integration into these markets has caused both an increased emphasis on cash cropping, and a shift in local trade from barter to cash exchange. One effect for pastoralists is a decreased availability of grain. Even if price relations do not change on the local market, frequent shortages mean that there simply may be no grain available, whatever the price. In such a situation there is little point in selling animals in order to obtain cash. In spite of improved transportation systems that provide the pastoralists with access to grain, the marketing structure of agricultural products contradicts an improved standard for the pastoralists. In general terms, this means that production tends to be exported to areas with higher buying capacity even in times of shortage within the local region. Not only does this structural change mean that food is re-channeled away from pastoral areas, but also it frequently implies a whole re-orientation of agricultural production in adjacent farming areas from subsistence crops to cash crops such as cotton, coffee, or tobacco.
Livestock marketing

The expanding monetary economy is felt not only through changes in the local availability or price level of grain but also through changed facilities for marketing of livestock. Pastoralists have a reputation for being reluctant to sell their animals, cattle in particular. Several partial explanations have been suggested. Historically, the market structure has not been beneficial for pastoralists. The purchasing policies of the main buyers of livestock favour the activities of intermediaries who decrease the profit of small producers and manipulate the timing of sales and auctions (Hjort 1979). The general policy has been based on political considerations to provide cheap meat for the urban population, a fact that tends to keep prices too low. There are technical constraints such as long trekking routes to markets, infrequent markets, quarantine restrictions, etc. It has also been suggested that most pastoral livestock are needed within the pastoral production system, including oxen that provide a live store of meat and even blood for dry seasons. Only during droughts when animals are dying, are slaughter stock sold on a large scale. Under such circumstances the meat is of poor quality, and prices are low.

The majority of cattle for slaughter in a northern Kenya family herd is made up of young bullocks, followed by old females with low reproduction, and old bulls whose services have become less efficient (Dahl and Hjort 1976). These categories of animals for immediate slaughter make up about 8% of the total herd on average at any particular time. This compares well with reported annual offtakes. Another 8% of the total herd die natural deaths or are killed in emergency slaughter.

An owner who foresees an animal’s death may prefer to market it; this becomes a particular issue in times of disaster such as due to a prolonged drought period. Then the choice is between trading weak animals with a low return or gambling on their survival.

The effects of droughts are by no means limited to the actual drought period. Because of the mortality distribution (high among old and very young animals) and because of fluctuations in reproduction (no reproduction during a drought and unusually high immediately afterward), a drought may be felt for many years (see Dahl and Hjort 1979 for a discussion of such long-term effects). Typically, in a post-drought situation, no older male stock or old cows are left. Also young males are nonexistent due to the cessation of reproduction during the drought. Hence, a shortage follows for at least 4-5 years of marketable animals and, particularly, of mature oxen that may be favoured on the market by price conditions. Some animals can come to the market two years after the end of the drought when prices are likely still to be high. However, people commonly prefer not to sell, a fact that has been labelled “a perverse supply-response”. From the pastoralists' point of view much labour has
been invested in young bullocks but little extra is needed to fatten them
for sale when they are fully grown. Only if the pastoralists have
immediate cash needs will they sell, because it costs them practically
nothing to keep the animals. The risk, of course, is that by the time the
bullocks are ready for the market, prices will have gone down. This risk is
often too real, especially because the high prices are related to a general
shortage; once pastoralists start to sell on a large scale, prices come down.
In other words, the explanation for refusal to sell may not be as simple as
a non-correlation between stock prices and pastoral supply or the
numbers of marketable livestock in the pastoral herds.

A "stratified livestock production system" is one in which the arid
pastoral areas are used as pastures for immature stock, while ranches in
the better-watered areas are pastures for later fattening. Large-scale
commercial ranches that depend on wage labour frequently buy
immatures from the pastoralists because this is cheaper than hiring labour
to provide intensive care for newborn calves and their mothers. The most
labour-consuming part of beef production is the care connected with calf
birth and the rearing of young calves and their mothers until weaning.
The pastoralists do this work all the time; in fact, their dependence on
milk demands a close relation between milch dams and their milkers. In
the pastoral system, immature oxen are almost a by-product of work
oriented to the production of milk and of reproductive stock that can
ensure future food.

Agro-pastoralism; an environmental friend or foe?

Although grain is becoming less available in many regions because of
attractive prices elsewhere, the dependency on grain is not decreasing nor
is the need for money to buy grain. Circumstances commonly force
pastoralists to sell their stock prematurely.

It is not surprising, then, that agropastoral systems expand also in
Kenya. We witness today an increased competition over grazing resources
between pastoralists and agro-pastoralists. By agro-pastoralism I mean a
system where the main basis of food production is cultivation but where
farm surplus is invested in livestock, only later to be reinvested in
agriculture (cf. Brandström et al 1979). Cattle are the dominant means of
expanding one's labour force, thereby increasing the cultivated area and,
consequently, the surplus, and so on. In agro-pastoralism, food production from
cattle is less important than is their value as wealth. Agro-pastoralism
may be an implicitly expansive and eco-destructive system, because it en-
courages a husbandry oriented toward a maximization of numbers rather
than of quality as is necessary in milk-based, pure pastoralism. In a
competitive situation, the agro-pastoralists exploit pastures more than do
the nomadic pastoralists because they are content with merely keeping the livestock alive. They maintain the largest herd that the land will support. Hence, the two are vastly different production systems. Integrated in a growth oriented Western economy, agro-pastoralists spend cash crop earnings on increasing their livestock herds and expand into areas formerly monopolized by nomadic pastoralists, creating a double impoverishment for nomadic pastoralists who experience competition for the limited pastures and can no longer obtain food within the region.

Competition for dry-season land, however, is not just between pastoralists and agro-pastoralists but occurs regularly between pastoralists and agencies wishing to utilize the land for other development purposes, connected with wildlife, tourism, commercial ranching, and irrigated farming.

With all the complications, the combination of livestock and grain production in northern Kenya seems to offer just about the only road towards improved household security. The crucial issue for planners is what the combinations look like. Surely, some are outright destructive to the environmental capital. The planning process has to involve both outlining production systems and how they are ecologically adapted, as well as seeking to support those which promise improved production. a “green conditionality” has to be at hand. However, the greening of Kenyan drylands is not a selfevident goal, as the following section argues.

NATURAL RESOURCE MANAGEMENT FOR ENVIRONMENTAL PROTECTION OR HOUSEHOLD SECURITY?

The interest in arid and semiarid parts of Kenya has grown gradually among planners since the early 1970s. Also Kenya has experienced the drought periods of that decade. This was one of the causes behind the relatively early interest in the arid and semiarid lands (ASAL). Also other factors contributed, not least the so-called Livestock Development Project of the late 1960 and the 1970s, and its extension into drylands. Included in “the package” were the group ranches along with other more technically specific activities such as dips, water and disease control.

All these development activities had a production orientation. An informal but important aspect must also have been to protect neighbouring high production areas from in-migration of cattle and from livestock diseases. Of growing importance was the environmental considerations, especially after the 1972 Stockholm Conference (the UN Conference on the Human Environment in Stockholm 1972). In the planning process, Kenya was among the first countries to set up a separate body concerned with environmental matters. The National Environmental Secretariat (NES) was accordingly established in 1972. It was placed in the
Office of the President in 1974 as an indication of its significance, and became part of the new Ministry of Environment and National Resources when this was established in 1979. It was not until then that the environmental issues were given significant attention in the five-year plans (1979/84, and even more weight in the subsequent plan). The current high priority given by the administration is underlined by the setting up of a new ministry in May 1989; the Ministry of Reclamation of Wastelands and Arid and Semi-Arid Lands.

Thus a situation has emerged where environmental considerations gradually became more profound. Environment and development became an issue earlier in Kenya than in most developing countries. The UN Conference on Desertification took place in Nairobi in 1974, and UNEP was established here. These are events which most likely contributed towards the growing concern in Kenya over soil erosion and desertification. The profound studies undertaken in the late 1970s led to the formulation of a special ASAL programme in the early 1980s.

The focus on soil, and later also water, conservation proved topical for donors. Both governmental ones and NGOs pushed strongly for cooperation with Kenya in the field. The end result is one of rather fragmented undertakings with strong donor influence in various districts. The complex picture has been one where at times environmental considerations were to stand against economic development in various conceptions of the real situation. As a matter of fact 1986 saw the production of two official documents, “Sessional Paper No 1 of 1986 on Economic Management for Renewed Growth” and “Kenya’s Efforts to Conserve Soil, Water and Forests 1985”.

The “Sessional Paper” brings up three key issues which should always be paramount, also in environmental projects; to improve the standard of living (for the ASAL people in our case) through (a) increased food production, (b) improved levels of income, and (c) increased employment opportunities. The idea is to follow suit in the international call for sustainable development through “built-in” environmental considerations rather than “added-on”.

The context and its impact

The move towards group ranches according to the Livestock Development Programmes (nowadays of the past) was motivated by traditional collective land rights but also by the need to maintain or re-establish ecological balance on pasture lands. Thus the ambition to establish viable units of group ranches, intermixed with private and commercial ranches. A long debate followed, whether the units could ever
become viable in ecological terms or in social/managerial. Physical and social boundaries were questioned.

The process of registration went on. Today's members face the crucial issue of establishing individual rights instead of collective ones. Whether this process towards individual land tenure is fulfilled through political decree or a gradual shift by herdless members claiming individual rights, is not a matter for discussion here. We may take it as a matter of fact that ASAL will be considerably more privatized in the future.

We should also assume that such a process leads to an increased number of water points. Thus a contextual point of departure has to be that the ASAL will continue to exhibit an uneven wear on the vegetation cover, be it for crop or livestock production. The recommendation from the group ranch days to seek sustainable development through striving for an ecologically balanced situation seems far away today.

Samburu District, as well as Kajiado and Narok, today exhibit large scale wheat farming on land leased on short-term contracts from group ranches by non-locals. From what I have heard and seen in Samburu, there is well-founded worry about "soil mining"; that tenants get most out of wheat production without properly restoring the nutritional quality of the soil.

A tendency in Maasai area is for land owners to regain their land, so that wheat farms eventually give way to "shamba"s on individual tenure. The alternative is continued wheat farming with a collective store of machine equipment.

These recent events add to the tendency for pastoral extensive range utilization to loose the best pasture lands. The process has at least two sides; the total area of accessible rangelands decreases, and the vulnerability of the pastoral production system increases since dry season and reserve pastures are lost. These may not be large in size but are key resources for the sustainability of the system.

The tourist industry, with game parks, game in vast number which contribute to overgrazing and complicate the disease picture, the growing number of herdless and landless rural inhabitants, clustering of people around growth centres, small towns and the like for food or for social services are all examples of processes of change which may be external to the communities of concern for an ASAL soil and water conservation project. Nevertheless they are significant for the comprehension of the total situation.

The messages from this flow of events in ASAL are (1) individualization of range lands continues, especially in medium potential areas; (2) an expanded crop production occurs, carried out not least by the worse-off population strata: (3) the uneven livestock distribution will continue with concentrations around water points, permanent settlements, and the like; (4) the overstocking issue is complex and involves different
species, domestic and wild, with varied grazing and browsing needs; (5) more water points will be established as individual land tenure increases; (6) a shift to new species will occur, such as the Samburu to camels with positive ecological effect, but also concentrations on small stock.

Among the range of possible conclusions for soil and water conservation would be: (a) land rehabilitation of specially frequented sites, such as pans or permanent settlements; (b) proper water conservation measures; (c) production of building shrubs etc. for mobile “manyatta”s; (d) management of free range through reseeding, tree planting or the like; (e) partial change to appropriate domestic stock (in particular camels for vast areas) as a soil conservation measure.

These are all activities which can really not be brought from the outside. Without popular participation the measures will have limited impact.

Community or sector focus

Some features of soil and water conservation stand out in the problem formulations by personnel within ongoing ASAL projects. The complexity of the situation is often emphasized. This concerns the technical and land management side, where worries are expressed that improper establishment of water points, for instance, could do more harm than good. One position is that no more water points should be established since they all contribute to an uneven wear on the land and thus rapidly deteriorating pasture resources. The message in this perspective is that soil and water conservation must go hand in hand with, and even be subordinated to, supportive measures for crop and livestock production.

Another dimension of the complexity is given by the difficulties to mobilize a population. Women groups in Embu seem to participate actively and consistently. Moran groups in Samburu seem to do so more for the sake of survival through cash and food for work. The pattern is, that the drier circumstances and heavier livestock emphasis, the more difficult is the participation in crop production and tree planting. This reflects a traditional herding/farming hostility, but it could also reflect an agricultural bias in outlook on the planners’ side in the search for sustainable development.

A third set of complexities is given by the social set-up of the situation. Communities are socially stratified. One principle is gender; women do much of the farming and tree planting also under pastoral circumstances. Another principle is that herdless people tend to settle, wanting a share of the collective pasture land to be utilized for farming. Yet one is a migration or drift towards small towns. The list can be made long.
Thus, at least three aggregates can be seen; production, management and social conditions. This is why one should emphasize a systems approach. At first glance this points at a conventional integrated approach towards community development.

Some projects in Kenyan ASAL have such an approach. In Laikipia District, inputs build on a range of already ongoing, very small-scale, activities. They were preceded by water and social baseline studies. The project seems to have been successful with community development and training activities. It has, however, hardly succeeded when it comes to production and management. Water resources, especially, are evaluated quite differently by various sections of the project. And as for management, the project seems to operate independent of Government extension.

Another project with a community development ambition is one located in Wamba, Samburu District. Also this one seems to have operated in the past in some isolation from Government extension. That situation has improved. Both cases hint at an administrative communication problem.

The Wamba project is claimed to be concerned with food security but stresses increased market involvement. The mobilization to farming and tree planting seem patchy and costly. One might fear that a stand-still would follow at the end of the project period, had it not been for the fact that project plans emphasize the need to phase out project employments in time. The best example of how this should be done out of those projects that I have seen is the approach in Embu.

After having read about these ASAL projects, both in the academic and the development texts, one is struck by the fact that the level of activities is so low, and that the prospects for long-term effects, i.e. sustainable development, are so modest. We are not talking about a district or even division scale. The number of people concerned by ASAL projects does not seem to exceed 30,000 in any of the cases I saw in early 1989 (Embu, Meru, Laikipia, Samburu). Reading this fact against the background of budget levels and the poor prospects for a “spread” effect, I want to conclude that the approach is inappropriate; that the integrated approach with community development currently operates in such a fashion that the return on efforts is low.

The sector approach, on the other hand, typically reflected in a set-up of ministries, has to be clearly rejected in the complex situation an ASAL project would face. A concentration on one dimension at a time of rural life; water, agriculture, livestock, social services, etc., will not be appreciated.

The problem faced is thus how to formulate a systems approach, other than on community level, to crop and livestock production in ASAL if we are to propose sustainability through ecological adaptation. Involved in the approach is primarily production, but also social considerations and
management. The prime question is what soil and water conservation measures can be recommended which have a positive input into the lives of dryland inhabitants. Some conclusions can be made:

1) A project should operate through regular government channels. Even if this might lead to a difficult administration it is the proper way towards sustainable development. Any other form of extension work of a long-term character is difficult to envisage.

2) Popular participation is a key notion. The grassroot perspective should be the one integrating sectoral activities. A first step is of course to express the perceived local needs. From there on, dialogues will formulate other inputs to meet demands such as ecological balance in production, improved food production, national needs for increased off-take, or the like. Soil and water conservation in ASAL becomes a corollary in this perspective.

3) This is not to say that there is not room for sectoral inputs geared specifically towards soil and water conservation. Given the situation in ASAL there is ample need for such inputs. They would tend to be livestock, not crop production oriented in most of ASAL. For one thing, we may speak about water points and other infrastructural localized areas where soil erosion is likely due to high pressure on land. For another, and in a further away perspective, we could mention open range conditions and discuss tree production, even sand-dune fixation plants and the like.

4) Before coming up with proposals along sectoral lines we must have enough information "how the system operates". This calls for rapid smallscale studies along with literature review on all three levels mentioned earlier; production, management and social. Added to these should be ecological (soil, water, vegetation) studies. This analysis taken together accounts for an integrated approach and identifies what sectoral inputs that are required.

AN INTEGRATED APPROACH: PEOPLE, ENVIRONMENT AND SECURITY

The paper has so far dealt with resource use and ecological adaptation. Obviously, there is both an environmental and a social concern. We may speak about security when striving to integrate the perspectives in the search for sustainable development. Risk spreading for the pastoralist in arid and semi-arid areas can thus be seen as one general principle of social behaviour. The effect of an ongoing exchange of animals is increased security in food production for the individual person. The ways in which the circulation takes place exhibit cultural and social differences. And the social prize for risk spreading seems to be high in that it involves a great
degree of "networking". The practice also means a non-growth situation with little economic return.

I want to maintain that the food security of the individuals living in arid and semi-arid tracts should be a point of departure for discussions on improved soil and water management. I have tried to focus on times of ecological stress and political conflict in order to highlight individual security. Departing from a local perspective and seeing how problems appear for an individual is one way of formulating a holistic view; the one "offered" to a person actually "living in" a development process. What I seek to illustrate by paying attention to a micro level such as the situation of a household, is the complexity of production or survival systems. They must be understood, at least in outline, for proper planning. There seems to be no way around establishing a certain competence at the macro level about micro situations.

The concern is with a perspective. It touches on the difficulty of incorporating people and their problem formulations into current development research and practice. Facets of the environmental and rural development debate, in particular maybe, exhibit a division between problem formulations founded on sectoral approaches and those of a more holistic character. The former are often based on technical or natural science formulations. The latter are found in a social science tradition. Yet, the division in outlook does not directly reflect one between university faculties. It is rather a more fundamental one between perspectives. The more holistic approach argues for a problem formulation better in line with how the "victims" of a development process experience their situation. The holistic view is made coherent by departing from local problem conceptions.

The contribution from social science concerns problem formulation and proposals for measures to alter a situation. For instance, a point of departure may be the question "What kinds of constraints exist for a poor peasant?" with the follow-up: "What can we as researchers do to improve the situation?". In focus might then fall food or firewood production, or generally the qualities of present subsistence systems.

The next step in the problem formulation would then be how production is organized, and why it is changed. Special attention might be given to local knowledge, and possible gaps due to the introduction of new technology.

These are the kinds of issues which need to be raised, and which require contributions from a perspective placing problem formulations on par with local conception. In the present case the conclusions may form a list of problems which are identifiable by the pastoralists or the peasant. For instance: non-availability of land; decreasing or varied production; seasonal labour shortage, e.g. of young people; lack of money; poor quality schools, hospitals and other social service; migration to towns and cities;
increased cash crop production increases women's dependency; malnutri-
tion due to (female) time shortage; seasonal fluctuations; risks with "bad
years".
This list of examples concerns problem formulations in the peoples'
perspective. Having organized such lists in the specific cases, time for
analysis and recommendations. For instance:

1. Depart from current systems of subsistence;
2. Build on earlier experiences from change and development, if
   possible through controlled comparison.
3. On land's carrying capacity: Production must be based on this
   notion, and then consider great local variations as well as seasonal
   ones. Where is the absolute limit due to a carrying capacity located?
   (3). Where are the different sustainable capacities located under
different production forms? (4) Such discussions have to consider
"worst case" and not averages. They are contextual and a social
science contribution is required.
5. The culturally given "rationality" of man varies with attitudes, his-
torical experience, and the like.
6. Control over land and other political and economic factors influence
an "optimal" land use or management. Which are the local con-
sequences, such as access to farm land, pasture, water, ownership
structure, etc?
7. How can land's sustainable carrying capacity be improved in ways
acceptable to a local population? For instance, introduce supplemen-
tary activities or improve current ones (mulching, nitrogen fixation,
fodder production, agroforestry, etc).
8. Active change most likely leads to alterations of entire farming
systems. What are the pro's and con's of for instance rotational
grazing, controlled water-holes, surface and subsurface dams, stall
feeding?
9. Which are the contextual conditions for such drastic change?
10. Hydrological circumstances and how to obtain more water.
11. Forms for sustainable natural resource management.

This list illustrates issues within rural development generally, where a
social science perspective has a contribution to make, either in its own
capacity, but more often in cooperation with other disciplinary ap-
proaches. The major contribution is to my mind in the latter sense; social
science as an integrative force, through it contribution with a problem
formulation and contextual perspective.

On the applied project level, we need to seek a "bottom-up" approach
in order to convince the people concerned (and by implication also
ourselves) of the soundness of a development project. The method? In
essence to depart from people's common sense. Extension and interaction are emphasized, for instance through:
- demonstration villages, livestock extension centres, and other illustrative activities,
- extension activities adapted to local circumstances.
In relation to current development research activities a few obvious conclusions for the need of social science are:
- "state-of-the-art" essays are commonly needed, providing an integrated picture, linking together both sectoral approaches and providing a greater time-depth than other research may do,
- "workshops" of extension character should be highly frequent and emphasize participation of both people concerned of a particular project and administrators and even scholars from the concerned Third World country;
- formulation of topics for further investigation should be in local perspective, albeit considering also global aspects.

SUMMARY

We may note some contradictory trends for livestock rearing on free range in Kenyan drylands today. One is a tendency towards ownership concentration, with employed herdsman on a salaried basis. Production focus is often in this case on meat, also for an international market. The system that emerges is fairly labour extensive, the trend being away from the highly domesticated milch animals.

A second tendency is towards a number of specialized ranching systems to which pastoral areas represent the fringe. The ranches may capitalize on the labour intensive pastoralism in combination with low market prices. We may think of "cow-calf systems", "back-feeding" and the like; production systems designed to make use of low labour costs (cf. Hjort af Ornäs, in press).

Thirdly, the combinations between farming and herding, be it agro-pastoralism or some other form, seem to indicate just about the only way ahead, apart from increased specialization on milk products for marketing. This is a sphere where labour intensity could be maintained.

Livestock based systems are in ecological terms highly suitable for utilizing dryland resources. The paper has two general conclusions for a sustainable interplay between production and ecological adaptation. (i) A combination of farming and herding provides the most efficient food production (for domestic consumption) in terms of nutritional returns. (ii) Soil and water conservation development inputs in the arid and semiarid parts of Kenya should preferably consist of supportive measures towards sustainable pastoral or agropastoral production. Thus, there is a case in a
planner's perspective for ecological adaptation of the current livestock based systems, with an eye on "back-ups" in terms both of improved marketing and selective grain production. The paper argues for a perspective within the planning process: Strive towards household and environmental security through an integrated approach, involving a local population in the process.

BIBLIOGRAPHY


NOTES

2. We may think of the case of the "40 days route". The "tragedy of commons" has been generated in this instance by planning and development: Not until established principles for pasture utilization were abandoned was overgrazing a fact. A similar argument for Somalia is found in Shepherd 81(1989) and for Kenya in Lane and Swift (1989).
3. This section is written after the Kenyan/Swedish mission in April 1989. It should be seen as an effort to indicate some lines for supporting positions stated in earlier chapters. The prime source of information comes from a tour of different ASAL projects in Kenya.
4. The intellectual content of most of the points in this chapter were formed during a workshop I led at a SAREC meeting on "Environment and Forestry", in March 1989.
Development Projects and Peasant Associations in Wollo, Ethiopia

Tuomo Melasuo

INTRODUCTION

Nowadays more or less 90% of Ethiopia’s population is living in rural areas, mostly as peasants. In Wollo this figure is 94%. That is why most of the problems of today facing the Ethiopian society are dominantly the problems of the rural world.

Since the second half of the 19th century the peasant life, especially in the central Highlands of the country, has changed dramatically. Old structures in economic, social and cultural but also in political sectors have gone through significant mutations and, in most of the cases, the living conditions of the peasant population have deteriorated in many ways.

In the southern part of the country, the expansion realized by the Emperor Menelik II was a real conquest and meant the annexion of the area to the modernized Ethiopian empire. After Menelik II, Emperor Haile Selassie I managed, (though often with significant difficulties), to keep the Ethiopian modern state together. Along with the Italian attack and invasion in the 1930s, but especially since the Second World War, the problem of Eritrea in the northern part of the country has developed in a more and more serious direction. Since the early 1960s different liberation movements have been fighting an armed struggle for the liberation of Eritrea. From the point of view of the Ethiopian government the situation has worsened since the armed liberation movement emerged also in the province of Tigray.

In 1974 a revolution started in Ethiopia and Emperor Haile Selassie was overthrown by the military forces which were backed by the peasant population and the student movements. In the spring of 1975 the military authority issued the Land Reform Proclamation which was intended to be a really deep and radical change in the country’s more or less “feudal” rural system.

But today the Land Reform has been applied in such a way that it has not brought any significant change in the Ethiopian country-side. In some cases, the ways by which the Land Reform and some other reforms have been realized, have caused new and sometimes even more serious problems to the rural populations. Furthermore natural calamities, first of all the drought and, in the case of Wollo, the frost, both followed by very dramatic famines especially in the early 1970s and in 1984–1985, have been
among the main factors causing the obstacles for the Land Reform. These difficulties in realizing a positive transformation in the Ethiopian countryside has meant that the government is today facing new problems and even a new kind of opposition. One of the predominant signs of these problems can be seen in the difficult military situation in 1989, and in the fact that the different liberation movements are now fighting even together. They fight not only for the independence of some of the "provinces" but also for basic changes in the regime itself. This situation was dramatized during the unsuccessful attempt of a military coup d'etat in May 1989.

Our concern in this paper is the situation of a peasant population, more precisely: that of the small localities in Wollo, in the northeastern region of Ethiopia, and their relations to the development projects which are carried out among them. These projects and programmes are run by foreign aid agencies as well as by the Ethiopian government. The paper is based on work undertaken to plan and prepare a socio-economic study connected to these projects in the small peasant communities. The socio-economic study is just in its beginning and this paper is on the one hand, reflecting some ideas expressed in order to concretize the research plan. On the other hand it reflects some thoughts by the author on the general problematic of rural Ethiopia, especially that of Wollo.

In the Wollo case our aim is to discuss what kind of impacts the different outside interventions have on the life of the populations of the project-area. How do they influence each other? Are they competing with, or complementing each other? What is the relationship between the government's rural policy in the area and that of the aid agencies? With such questions in mind we would like to approach the peasant societies in order to understand their adaptive and survival strategies. In our approach we try to focus on the interplay of five different components which are interdependent: There are the ecological environment and peasant societies with their own development processes and trends. Then there are the state's rural and agricultural policies, and also the intervention of the foreign aid agencies. The results of their interventions is very much influencing the ecological environment's and peasant societies' possibilities to develop and to adapt. The fifth element that we would like to emphasize here is the historical dimension of each of the four factors mentioned.

With this kind of approach we like to understand how the peasant societies adapt to different, and often contradictory impacts. What is happening in the peasant society internally when development projects are introduced? Are people in some sectors coping more easily than others with the challenges of the outside world? How are the animal husbandry sector, the agricultural or the mixed farming sectors able to adapt to the
combined impacts of changing environment situation and outside “aid” policy?

CHANGES IN THE GENERAL LAND USE SYSTEM: HISTORICAL BACKGROUND

In the Abyssinian Highlands the most common systems regulating rural life were the so-called *rist*- and *gult*-institutions. To simplify we can say that the *rist*-system meant that every man descending from a certain group within a given geographical society, in practice almost everybody, could claim a piece of land to cultivate to cover the needs of the family.

The *rist*-system did imply a significant, and equal distribution of productive resources within the society. At the same time it ensured the reproduction of the whole society without major and unsolvable difficulties. The *gult*-rights which were imposed on the *rist* society worked in some ways like a feudal system and were in many cases reported by European visitors to be identical to the European feudal system. Land was owned by the local community. The usufructuary rights were in the hands of peasant families, but the *gult*-landlord had a right to a share of the land’s production. He had rights to a part of the crops but not the land. Traditionally the *gult*-landlord also had many social obligations to his people, so usually his share of the crops was returned back to the society in one way or another.

The transformation of this “harmonious” *rist-gult*-system took place during the reign of Menelik II and was related to his efforts to build up a centralized and expansive modern Ethiopian empire. The *gult*-landlord became a civil servant of the Menelik state. He was no more politically and culturally dependent on his peasant society as before, and he could move to live in town where he was closer the central power. In town he started to consume imported commodities financed from the extraction of his peasants still living in a *rist*-system.

The changes outlined here in a most simplified form actually modified very dramatically all the rural societies in the Ethiopian Highlands. We should also notice that the building up of the centralized state of Menelik took place during the period when European colonial powers were having their “scramble of Africa”. Thus the outside pressure on Ethiopia was increasing. In some ways it can be said that the country did not have any other possibility than to build up a strong and centralized state system in order to face the threat of European colonialism. But this building-up process signified a very basic change in Ethiopian rural societies.

First of all land became, little by little, a commodity that one could sell and buy. Secondly, the only group who could accumulate cash resources were the *gult*-landlords who, now living in towns and urban centers, sold a significant part of the crops they extracted from the peasant villages.
And with this money they bought land, thus becoming real landowners themselves.

But for the majority of people it meant that a traditional "equilibrium" disappeared and that their living conditions constantly became more difficult. The share of the landlord was often increased from the traditional one-third to half the crop. All along the population growth put more pressure on land with the result that the peasants had increasing difficulties providing food for their families.

The era of Haile Selassie did not bring many changes to these unsatisfactory developments started in rural Ethiopia. Furthermore the brutal military invasion and the occupation of the Italian fascists as well as the effects of World War II did not improve on the situation. On the contrary, the possibilities of individual peasants to improve their condition became continuously more difficult.

In the 1940s and in the 1960s Haile Selassie tried to modify the land owning and land using systems, but without much success. Because of this difficult and constantly worsened situation in rural areas, combined with the famine in 1973-1974, the Ethiopian monarchy was overthrown by revolution in September 1974. In March 1975 the Land Reform was proclaimed. All kinds of landlord systems were abolished and land was nationalized. The peasant population was grouped into newly created Peasant Associations (PA) and the land was given to these Peasant Associations. There were 20 gasha (about 800 hectares) of land for each PA approximately. The Peasant Associations were then supposed to distribute the land among their member families.

On this level the Ethiopian revolution and the Land Reform were mostly positive. The difficulties started to appear when the land reform was to be extended. Following the difficult Wollo and Tigray famines in 1984-1985 the government started to apply resettlement programmes. These were originally initiated and planned by the Americans already in the 1950's. Unfortunately, at least a part of these resettlement programmes were carried out by the use of very authoritarian methods, without considering human suffering. The programmes caused a significant loss of human lives. Besides, the areas in the Southern Ethiopia, which were to receive settlers from the northern provinces, were not at all prepared for this "development". There were significant conflicts of interest between the new and old populations.

During the last years the government has reduced the speed of the resettlement but is actively opting for villagization. The idea is to regroup into villages all the Ethiopian peasants now living dispersed in the country-side, close to their fields. The idea is to give them more easy access to all the communal and municipal services provided through such "new villages". However, it may well be argued that the health and food situation might be expected to deteriorate very rapidly. The real cause
behind the strategy is rather that the population is much more easy to
govern and control in this new situation. It seems also clear that the
production might decrease significantly when people are no more living
on their own lands.

These quite authoritarian transformations in the country-side are also
undertaken due to the fact that the new revolutionary government for
political reasons must feed the urban population. When the landlords
disappeared with the Land Reform, the peasants started almost automati-
cally to produce less because they were no more in need to feed the
parasitic class. In this situation the government introduced production
quotas known as the AMC-quotas after the Agricultural Marketing Cor-
poration. It sometimes happens that the peasants must buy cereals from
the free markets at three times the price in order to be able to fill these
AMC quotas. If I have understood it correctly, these AMC quotas have
decreased in volume during last years.

Another attempt to improve peasant production has been the creation
of the Producer Cooperatives. Usually membership of a Cooperative is
voluntary. But sometimes only the young and wealthy can join them.
Sometimes only the members of the Producer Cooperatives can benefit
from certain technological innovations and financial facilities offered by
the government. Therefore it is not at all certain that the social and
economic equality will increase in the long run in the Ethiopian coun-
tryside. If so, it is not exactly due to the principles of the Land Reform and
the revolution but more to the ways in which they are applied in practice.

PEASANT COMMUNITIES IN WOLLO PROVINCE

Wollo is one of Ethiopia’s 14 provinces. Its capital Dessie is situated in the
southern part of the province with a population of 70–80,000. The
province is divided into 12 awraja’s and they are each divided into two or
three woreda’s the number of which is 36 in Wollo. The total number of in-
habitants in Wollo is about 3.4 million people.

The basic organizational unit in Wollo, as elsewhere in Ethiopia after
the Land Reform started in 1975, is the Peasant Association, the PA.
According to statistics from 1987 the total number of such PAs in Wollo in
the early 1980s was 1,194. Today the number of PAs has probably been
reduced by at least one-third in some of the awraja’s by regrouping the
smaller ones. The members of the PAs represent 83% of rural population
consisting of more than 2.8 million people, which is around 661,000 Wollo
families.

The PAs can form Service Cooperatives and Producer Cooperatives.
According to recent information the number of these cooperatives in the
whole province of Wollo is 287 Service Cooperatives and 259 Producer
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Cooperatives. The area covered by Producer Cooperatives was 2% of the cultivated land in 1984 and 10% in 1987, and they regroup 4% of the rural population. In spite of their relatively small number, compared with Producer Cooperatives, the Service Cooperatives are more represented in rural Wollo. They are formed by 1,035 Peasant Associations regrouping about 448,000 families representing 56% of the rural population.

Due to the power struggle to strengthen Emperor Haile Selassie's position during the first three decades of this century the development of Wollo is said to have been neglected during several decades. During the last 30 years the province has gone through four severe famines. In many awraja's an average PA lost about 10–80 families during the 1984–85 famine. In spite of the fact that only a little more than 40% of Wollo's peasants were tenants before the land reform, the burdens on the whole population were so extensive that for many decades no surplus of agricultural production remained that could be invested in development of the area. Rather, the regional economy was stagnant and declining.

A little over 94% of the area's inhabitants are farmers and only under 6% of them have additional incomes. When rainfall is favorable there can be two annual yields, especially in the southern part of Wollo. There are two rainy seasons, the minor "belg rains" in the spring and the major "meher rains" in the autumn. The "meher rains" are the most important rains but a big number of the peasants also cultivate during the minor rainy season. As late as around 1979 a part of the Wollo peasants still used to go to the province of Kaffa in southern Ethiopia to work some part of the year on the coffee plantations and to transport and sell coffee. There were often 60–70 men from each of the PAs in southern Wollo leaving for Kaffa every year. On the provincial level they also took part in the trade and transport of grain with their mules and donkeys. Nowadays, these extra incomes are no longer gained.

Traditionally a significant number of Wollo peasants owned at least a part of their agricultural land, but still the development of the land-ownership relations has been negative for them during the whole century. As late as in the 1960s lands of the farmers and cattle herders were given to the private owners for cultivation, mostly to the state's and the emperor's servants. After the Ethiopian revolution the land reform was launched in 1975 and accelerated at the beginning of 1980. The nationalized land was given to the PAs which distributed it to the families. When the number of families increases the land is distributed further. The land reform has not only improved the situation of the peasants. According to some scientific studies the burdens on people may be even more heavy today than before the revolution. Besides, the unequal distribution of the means of production other than land, the privileged position of the Producer Cooperatives and the government's obligatory grain quotas and taxation, have increased inequalities among the peasants. So, the peasants
are still living on the edge of minimum subsistence. Today Wollo is able to produce only 61% of the minimum amount of food per capita recommended by the WHO.

THE PROBLEM OF DEFORESTATION

One of the most widespread forms of development cooperation involving development agencies is to fight the deterioration of the natural environment, particularly the deforestation of the mountain tops. To deal with this such areas are being closed for pastoral use. Cattle raising is however an important part of agriculture, particularly for the poorest peasants in Wollo. The strategy will then influence the development prospective of cattle raising. The area of enclosed mountain tops has been about 82,000 ha in Wollo during the recent years. Wollo still produces a significant amount of the slaughter cattle sold both in Addis Ababa and Ashmara.

The deforestation in Ethiopia as a whole has been dramatic in this century. The loss of forest surface is estimated to be from 40% to 14%. In Wollo it has decreased down to less than 2% of the total area. To cope with the problem the first forestry authorities in the country were founded in the 1950s. Later these authorities have gone through several reforms. The deforestation of some areas close to Dessie town is said to have started during the Italian occupation in the 1930s. The Land Reform declaring the nationalization of the land accelerated this process very strongly. Since the 1960s forest plantations have been introduced in Wollo. There are at least 30 state nurseries in the province at the moment. In Dessie Zuriya woreda lies one of the most important state forest plantations of the province, covering an area of 3,000 ha at the mountain of Yegof where, in addition to the plantation, map making, evaluation and different administrative practices are being developed in this pilot area. About 60 million seedlings are produced in the province yearly. This number of seedlings could cover about 25,000 ha of land. Partly because of the big loss of seedlings the real quantity is much lower. Altogether there is about 46,000 hectares of state forest and 44,000 hectares natural forests in Wollo and, furthermore, about 50,000 hectares must be added as community forests mostly planted by the people in the PAs. So the total size of the forest in Wollo is about 140,000 hectares which represents only about 1.5% of the total area of the region.

Apart from the forestry activities there is quite a large number of different development projects going on in Wollo, especially in the awraja's close to the province capital Dessie. It is a specific and problematic task to coordinate these projects so as to serve the harmonious development in the whole area.
RESEARCH PROBLEMS

The main targets of the planned socio-economic research programme are the rural communities composed of the PAs, especially in the southern part of Wollo. The purpose of the research is to get a structured conception of the general situation of the PAs as well as the trends and problems affecting their normal life. In order to do this the research problem is divided into three main categories: Firstly, the more or less "autonomous" processes of change should be studied, i.e. how the project area develops itself. The second objective is to understand the impacts of the external interventions in the area and its development processes. This is primarily a question of Ethiopia's official rural policy and its efforts to realize structural changes in the area. Furthermore other external development efforts in the PAs studied are part of the second objective. Thirdly, the research programme will study how the projects which this research is concerned with will be integrated into other development processes in the area and what their direct impacts are on the social life and on the adaptive strategies of the population.

The autonomous development of the rural community

In order to get a clear picture of the present state of the area it is worthwhile to carefully study the background of the present processes, especially the formation of PAs as well as the history of land tenure and of land use. It is equally necessary to become familiar with the traditional social, political and religious organizations of the area. This kind of historical perspective is important in order to understand how these factors still affect today's PAs and the social processes in the area. The ethnic and religious characteristics, the household division of labor and the organizations regulating public life will be taken into consideration.

From the religious point of view, Wollo is mainly an Islamic area, about 58% of the population being Muslims. There is a traditional, but very loose Islamic organizational network covering the area with zaouias, i.e. Islamic fraternities, mosques and Quranic schools of different degree. The rest of the population is mainly Christian.

As far as the PAs and especially their economic possibilities are concerned the following questions will be studied more carefully. How much land do they have for agricultural use? How is it divided between different soil types? How many families are living in the area? How much land is available for each family? How was the Land Reform carried out? How many times has the land distribution been repeated? How much and what kind of land is reserved for pastoral use? Which kind of services
do the PAs offer for their members? What kind of impacts do frost and drought have on the area?

The main focus of the research is the general economic and productive life of the area. What kind of possibilities exist for additional incomes beside agriculture? How has agricultural production developed? What is the structure of production? How much of it goes to the state, to own consumption and for sale? Which are the ecological, economic, political and technical problems limiting the development of production? What are the development prospective of the other means of production apart from land? How does the situation relating to the availability of oxen develop?

The research program will also do a basic survey of the general quality of life in the area. What is the average size of the family, children’s access to school, food situation and health care prospective in the project areas?

Based on the above the research program one should be able to formulate a comprehensive conception of the project area’s own “autonomous” development processes so that the main characteristics and problem areas can be elucidated.

External influence

The second part of the research consists of the analysis of external pressures and interventions in the project areas. The single most important factor is the state’s rural policy in the project areas. The state has affected Ethiopia’s agricultural development by declaring the Land Reform which has meant the transfer of the landownership to the PAs. The state has had a great impact on the formation and development of the Service Cooperatives and especially of the Producer Cooperatives in the countryside. How can these reforms be seen in the project areas? What kind of problems have these processes induced in the research area?

The second important way in which the state affects the agricultural development is through taxation and the Agricultural Marketing Corporation’s (AMC) policy with defined quotas. What are these quotas, both in the area’s production and that of the family? How does the grain purchase quotas with fixed prices affect the development of the area? Do they change the structure of land use and production?

How do the villagization programmes affect the area? In which ways have the villagization operations succeeded? Will the project area be the object of the villagization programmes in the near future? How does this affect farming and the well-being of people? Does the resettlement policy play any role in the project area? Does it strengthen the production potential of the area? What is the quality and quantity of the services offered by the state in the project area? Do the local representatives of the Ministry of Agriculture and other Development Agents work effectively
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and do they take into the consideration the needs of the local people? According to one research result in certain woreda's only very few peasants had ever had any contact with the state's Development Agents. Are the measures taken by the state sufficient to solve the above mentioned basic problems of the project area or do they only strengthen them and create new ones?

The role of foreign aid

The research programme includes a study of the activities of other development organizations in the area. In which areas and sectors are they involved and what kind of impact do they have on the area? In 1987 the total number of different foreign aid agencies operating in Wollo was about 27 and many of them had several development projects going on.

The research programme should evaluate the negative and positive, quantitative and qualitative effects of the development projects in question. The purpose is to point at negative effects, to strengthen the positive ones and to draft a proposal for necessary extra measures which should be taken in order to maximize the positive effects as well as to eliminate the negative ones.

A number of these projects are found in the forestry sector and the working of these will be a special concern. The most immediate practical effect of the projects working in the field of ecology and reforestation will probably be the loss of land used earlier by the PAs. What kind of possibilities are there to manage and to compensate for this land loss? These projects are said to be carried out on the tops of the mountains too steep for agricultural use. In fact the reality is more complex than that. Traditionally, and even today, a peasant family cultivates at least in two or even three different altitudes and on different kinds of plots. This distribution of the cultivation enables the cultivator to utilize a diversity of crop varieties so as to deal with the unpredictable weather situations. Both drought and frost are common phenomena, the latter being Wollo's most difficult problem. These factors affect plots in different altitudes in different ways, depending on topography the fields at higher levels suffering less from frost than those at lower levels. The concentration of the cultivation on one plot will therefore increase the risk of crop failure. In this context, what are the peasants' attitudes to the loss of land caused by reforestation and ecological conservation projects?

The loss of land on the mountain tops also affects the conditions for livestock and its grazing. A great deal of cattle used to graze on the slopes and mountain tops especially during the rainy season. Also sheep belonging to the poorest peasants use to graze in the high areas. The raising of sheep is often their only possibility to "get some butter on the bread" and
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to produce some surplus which can be invested in cattle and later perhaps in an ox. And in Wollo an ox is an indispensable precondition for effective agriculture.

The closing of the mountain tops have often been criticized since the areas have usually been closed for an undefined and unlimited period of time. A closing period of 1–2 years would be enough and reasonable given the aim of restoring the natural environment through wood plantations. Although the local population is allowed the possibility of gathering the fodder on closed mountain tops, its transport from the plantation area is not popular because it is considered to be far too timeconsuming and hard work. Besides, fodder must be gathered during the busiest period of the agricultural calendar, at the beginning of autumn. So, the loss of this land also means increasing pressure on remaining pastoral land at the lower altitudes which again affects the ecology there and constrain the agricultural use of the area.

The research programme should be able to evaluate the structural, quantitative and qualitative consequences the loss of land will have for each PA. Especially, as far as the pasture is concerned one should try to find out some sustainable ways to compensate for the loss of land. The loss of land is not only a quantitative question but also a structural and qualitative problem. What was the function of the lost land in the survival and adaptive strategy of the population? It seems that the loss of the land requires a concrete and comprehensive compensation programme. To overcome these negative effects of the land loss the implementation of these kind of projects should very carefully take into consideration the traditional social and economic characteristics of the peasant communities in the project areas.

In addition to the loss of agricultural and pasture land the projects will also have a certain effect on labour. Since the agricultural calendar is very dependent on the beginning of the rains and as the ox situation effects the ideal realization of this calendar, the different working phases of the projects should be planned in such a way that they will not disturb the very sensitive and vulnerable agricultural calendar. Before the Ethiopian revolution, two-thirds of the peasants did not have enough means of production for rational cultivation. The lack of oxen is the most serious problem. The borrowing of an ox retards the agricultural calendar's realization which has an immediate impact on the harvests and on the choice of plants. The famines of the recent years with their consequences have made the peasants reduce the number of cattle. This goes for oxen as well. Could the forestry projects support the realization of the agricultural calendar, especially during the peak seasons?

During the planting phase the afforestation projects make up a very important source of additional incomes for local people within the project area. This may partly compensate the loss of land. But how can one make
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sure that this does not distort the normal economic life of the areas? How can it be ensured that the projects will continue to employ a good number of local people also in the near future?
The Process of Survival in South-Eastern Uganda

Michael A. Whyte

INTRODUCTION

Adapting to the demands of rain and sun and soil, as many of the chapters in this volume confirm, assures neither cultural nor individual survival in today's Africa. Even where climatic conditions are most extreme, local strategies for survival are also clearly shaped in response to many factors, including government policy, market relationships and the availability of goods and services obtained from the larger world (Mohamed Salih 1988). Were it only a matter of dealing with the environment things would be a lot easier, but environment, economy and politics tend to coalesce and very little that is done in order to survive is without a broader cultural meaning. It is the particular concern of this paper to examine the ways in which strategies are shaped by cultural practice, by the meaning which specific forms of agriculture and husbandry have for the people themselves.

My contribution is based on material from Bunyole, in southeastern Uganda, where I have carried out research in 1969-71 and again, briefly, in 1978. Bunyole is by no means an arid region. Although situated in the rain shadow of Mt Elgon, rainfall is normally an ample 1270 mm and droughts so rare that they are named and remembered for generations. In recent years the process of survival in this part of Uganda has involved coping with the consequences, not of environmental catastrophe but of state collapse. Two years ago I returned to Uganda to work briefly in Banyole. I found a great many changes: most obvious in infrastructure and agriculture, most significant in terms of a new cultural definition of the political economy. The experiences of Banyole (the people who live in Banyole) suggests that models based too firmly in the environment may well be less useful for planning and for carrying out plans than models which take their inspiration from a more cultural anthropology.

I begin the paper with a section devoted to the Bunyole, to what has occurred since the last days of Obote's first regime, in 1970. I found a great many changes in 1987, most obvious in infrastructure and in the pattern of agriculture. In their attempts to cope, Nyole have radically altered their system of production, abandoning the staple crops of the last three generations in favour of a variety of alternatives.
In the balance of the paper I explore the significance of these changes, arguing that this process of coping involves more than an adaptation to new circumstances. For over three generations, a significant aspect of Nyole cultural identity has been expressed in the process of making a living. The political economy based on cash cropping connected local communities to the idea of the state as well as to its reality. Current survival strategies, based on the free market and the informal economy, make new cultural demands. Bunyole is still dependant on its agriculture, but that agriculture is far more than merely an the product of environmental adaptation. The natural environment, at any rate in Bunyole, is not a single phenomenon, outside of society, culture or politics. It is rather a space created by the interplay of all three, and as such appropriate strategies are inevitably politically, socially and culturally constructed.

**BUNYOLE: A CASE STUDY**

**History and social organization**

The Banyole are one of a number of “small” ethnic groups inhabiting Tororo District in Uganda’s Eastern Region. They speak a Bantu language closely related to the western Luyia languages of Kenya, but also to the languages spoken by their neighbors in Uganda—notably the Bagwere, the Basamia and Bagwe and even the eastern Basoga. In pre-colonial times Banyole did not share the Interlacustrian pattern of state organization; their political system was acephalous, focussed on named neighborhoods and articulated by the activities of regional leaders who were not hereditary chiefs and who seemed to be particularly important in mobilizing their regions in conflicts with neighboring ethnic groups (Padhola, Bagisu).

Banyole, then as now, prefer to live in dispersed homesteads, surrounded by close kin. Descent is patrilineal, and there are over two hundred named, totemic Nyole clans, all of which are exogamous. Despite some tendency towards regional concentration, all Nyole clans are themselves dispersed throughout Bunyole; they are perhaps best regarded as categories, rather than social groups. On the ground, the relevant and usually co-resident descent group is called ehida (stomach, womb) and normally includes all those heads of household (and their children) who are descended from a common grandfather. Residence after marriage is still viri-patrilocal. In 1969-71 there was a certain amount of subsequent migration (primarily due to land-shortage) and it is clear that the migration of families and individuals was even more common in the past (the most usual reason given for migration in pre-colonial times was insecurity).
For Banyole the colonial era began at the end of the 19th century. The power of the Baganda State was being extended into Busoga, across the Mpologoma river, and by 1896 the great Muganda general Semei Kakungulu had established himself at Bugerere. Four years later, with the backing of the British presence in Kampala, Kakungulu had carved out a principedom in Bukedi (the old Luganda name for the district), with headquarters first in Naboa just to the north of Banyole, and later in nearby Budaka. During the next few years a political organization based on appointed chiefs was created; although Kakungulu himself was eased out of his conquests in 1902 by a British presence keen to reassert itself in the aftermath of the Uganda Mutiny, the structure which he had established remained in place (Gray 1963:40–46). Indeed, this particular version of "Ganda sub-imperialism" persisted in administrative terms right up to the eve of the Second World War, when the first local man was appointed to a County (Ssaza) Chiefship in Bukedi District. Twaddle has argued that tribal identity in Eastern Uganda was "stimulated" by the presence of Baganda administrators (Government Agents) and the bounded, territorial units over which they ruled (1969:195–7). In any case, it is from the turn of century that the peoples of Bukanedi District, conceived in terms of a series of tribes, enter into the historical record.

Cotton and Millet

The story of Bukedi—and the Banyole—became quickly linked with the development of cotton as a cash crop. The first trials were carried out in 1904 and "by 1909 the industry had obtained a firm hold on the native cultivators" (Wallis 1920:53). In 1916 a ginnery was built in the north of the district (Ker 1967:7) and another was added at Busolve, in Banyole County, some ten years later. In 1916 about 1300 kg of seed cotton was exported from Bukedi—mostly northwards via Lake Kyoga; in 1939 the export of lint from Bukedi had reached 27,200,000 kg (Wallis 1920:54; Ker 1967:7).

Cotton cultivation was fitted into a pre-existing system of bush fallow in which millet, peas and oil-seeds were rotated from season to season. The resulting mix, a variant of the cotton-cereals farming system which predominated in northern and eastern Uganda (Hall and Belshaw 1972), was still universal when I carried out my first field research in 1968-71.2

Cotton opened the land, followed by millet, which does particularly well on the fine seed bed which is a result of the previous season's labor on the cotton crop. Depending on the fertility of the land, and the needs of the household, this pattern could be repeated in the next year—or other crops (such as ground-nuts, beans or peas) could be introduced. Plots were usually kept under cultivation for five or six seasons, then allowed to
rest for four years or more. Cassava, widely grown and treated as a perennial, closed the rotation on a given plot and remained in the ground during much of the fallow period. Cotton and subsistence cultivation were thus thoroughly integrated at the level of field management.

Subsistence cultivation, however, was primary, basic to family reproduction. Right from the beginning, cotton was produced because it could be part of the subsistence cycle, not as an alternative to subsistence cultivation. Over the years, cotton production—measured in tons collected—had varied greatly, but in the years from 1941–62 total production of lint from the Mbale cotton zone (Bugisu, Bukedi, Bukedea) never again equalled the figure for 1939 (Ker 1967: Appendix C). During this period, Langlands suggests a rate of annual population increase of about 2% overall (1971:29). In Bunyole, for example, density increased from 184 to 296 persons per square mile from 1931 to 1969.³ It seems clear that the need to feed an increasing population, using increasingly overburdened land, absorbed the energies of most local farmers. Cotton was a basic part of the agricultural cycle, but it did not dominate.

Younger Nyole—in 1971—earnestly explained to me that cotton was one of their “traditional crops”. Such a statement is, on the face of it, remarkable; my young friends were quite aware that cotton was an introduced crop, a part of the history of Uganda they were taught in school. Tradition was being used here not to refer to history, the things of long ago (ebito ebyo khaale), but rather to habitus, the things which are done (ebito ebyoholewa). Cotton, in 1970, was part of life, a cultural as well as an agricultural or even an economic fact.

Yet for all this, from the point of view of an individual farmer, single-minded devotion to the cultivation of cotton was simply not rational. The local economy, ostensibly based on cash from cotton, in fact was far more complicated. Alternative (non-cotton) cash producing strategies were necessary—not merely to supplement gross income (cotton) but also to spread cash income throughout the rest of the year.⁴

However necessary the informal economy was to individual strategies, indeed, to the reproduction of families, it remained—in cultural terms—a kind of “non-economy”, visible, yet discounted by nearly everybody. Looking through my notes from the period, I can see how difficult it was to get details of the various strategies—not because people were reluctant to reveal them, but simply because they were bored, or even embarrassed that something so trivial could/should be discussed so thoroughly.⁵ Alternative cash producing strategies—and in particular the various agricultural alternatives which confused the distinction between cash crops and food crops—were necessarily ambiguous, out of place in the clear categorical world of the cotton-millet agricultural system in 1970.
The transformation of the cotton-millet system

A few years after the Amin coup of 1971, this entire picture began to change as the private and state structures which supported the collection and processing of cotton, as well as its cultivation, began to fail. Fertilizers and insecticides became difficult to acquire, the lorries which transported cotton to the ginneries began to suffer from poor maintenance and lack of spares. From the middle of the seventies onward, the marketing structure (co-operative unions and local growers' societies) effectively ceased to function; there was no cash to pay for the crop.

Under these new conditions, Nyole reacted in a number of ways. At first, some reverted to nearly “pure” subsistence agriculture, selling animals to meet cash needs. Soon, however, many began to explore alternative cash crops. A thriving “grey” market in food crops grew up; groundnuts, beans, maize, cassava and even bananas and millet were exported to urban areas as far off as Kampala. The demand for food crops both within Uganda and in neighboring Kenya has continued to increase and an extensive network of private traders was in place by 1987. Competition among traders is keen, and payments are always cash on delivery. Marketing Boards are still moribund. For probably the first time in fifty years Nyole farmers find themselves centrally placed within a sellers market extending from Western Kenya to Kampala and even, they claimed, Northern Tanzania. That seemingly marginal, unstressed, “alternative” agriculture which had existed alongside cotton for so many years has become explicit, visible and significant—culturally as well as economically.

The most dramatic aspect of this transformation is the rice boom which has developed during the 80s. Although some rice had “always” been grown on swamp fringes (Ker 1967, Rusoke 1984), large scale cultivation of wet rice began with the establishing of a Chinese-run development project in the mid-1970s. By 1980 rice from this scheme was being sold for premium prices. Plots on the scheme (over 800 in 1987) were soon all taken up and other Nyole began to explore the possibilities for extensive rice cultivation in the many seasonal swamps which are present in the county. These swamps had been cultivated to a very limited extent before this; their principal role was to provide dry season grazing. Now, suddenly, they became a kind of Virgin Lands, and more and more men and women took up rainfall, or seasonal, cultivation of wet rice. In 1987 the Chinese-run scheme was still in many ways the flagship of the county; it is soon to be expanded by the resident team of Chinese experts. However, significantly more rice is being produced from swamps outside the scheme these days and new swamps are being drained and cultivated.
Agriculture becomes diversified

The expansion of swamp acreage (and the eagerness to see the Chinese-run rice scheme extended) reflect today's need for a reliable cash crop to replace cotton. Yet it is important to realize that the greatest agricultural transformation to have occurred in this part of Uganda is not to rice cultivation, but rather in the recognition of and emphasis on diversity.

The old distinction between cash crop and subsistence crop, between cotton for cash and millet for food, has disappeared. Some cotton is still grown, and even sold; however its cultivation is no longer universal. Something approaching market-specialization is beginning to occur: in maize or beans or cassava, the latter promoted to the status of annual crop. Others, those who cultivate rice on the scheme or in the swamps, have in fact abandoned bush fallow cultivation entirely. Such diversity is now a fact of agricultural life in Bunyole.

Land and labor have been freed from the tyranny of the cotton-millet rotation and, perhaps more important, the imaginations of many Nyole cultivators have also been freed. At any rate, that is how I would interpret the excitement with which Nyole cultivators discussed their experiments with one or a combination of crops. As I moved from interview to interview I tended to carry along some of the previous session's participants; indeed it was often these men who brought me to the house or fields of another man who "was doing something you will be interested in". It was not unusual to find my own interview in competition with one being carried out at a far more technically competent level by someone who had been merely accompanying me. To some extent I was able to eavesdrop; information on marketing, or potential, or hoped for markets was being given. Cropping strategies were also discussed, combinations of crops which had proved to go well together when planted on a larger scale. This kind of information was sought after (though more normally by keeping one's eyes open when out visiting!) because few if any of today's cultivators had experience with the extensive cultivation of the food and oil-seed crops so popular and necessary today. The crops themselves were all well known but many had only been grown in small quantities, a sideline to the dominant cotton-millet regime. The problem was how best to manage in a new agricultural context with quite different demands of timing and labor plan cultivation.

Adaptive Strategies, Real Knowledge and Rationality

What is happening in Bunyole these days? At one level, it would appear that the Banyole are enjoying a kind of agricultural renaissance, no longer constrained by the levies, disincentives and plain bad management of the
various arms of the Ugandan state. The general point, that marketing boards, by monopolizing the export of crops and at the same time setting producer prices low, generate revenue for the state and middlemen at the expense of the primary producer, has been made countless times. The cotton-millet economy in Bunyole was the result of the imperatives of colonial finance and, later, state economic policy. The system was self-limiting. I called it blocked development in an earlier work because the combination of marketing boards and export levies assured that producers were tied to the subsistence sector; the capital for “modern farming”—in 1970—could not be generated from subsistence-plus-cash-crop farming (Whyte 1978-79, Jamal 1987:128-35).

At another level, Bunyole is exciting simply because of its rice and its food surpluses. Because so much of this agricultural transformation has come about without the direct assistance of official experts, it would appear to be a case of market-inspired, did-it-themselves development.

In the past few years a number of excellent studies have examined development issues in Africa. One focus has been on understanding the rationality, the detailed knowledge and the capacity of local people to plan and adapt and experiment. Paul Richards in particular has put the case for “ecological particularism” with great skill and insight. In *Indigenous Agricultural Revolution* he examines closely the dynamics of two West African farming systems in order to demonstrate that “a peasant-focused, decentralized approach to research and development ... is an option worth serious consideration because it is appropriate to the region’s environmental circumstances” (1985:162). His cases include rice cultivation in inland swamps in Sierra Leone and food-crop farming in the forest zone of western Nigeria. In both examples, local agriculture is inventive and effective—and ignored and misunderstood by both development agencies and the earlier colonial agricultural service. Richards stresses—as does Robert Chambers—the “invisibility” of much of the really effective peasant agriculture. The gap between the expert (wealthy, urban-based, motorized, male) and the producer is often too great to allow for understanding (Chambers 1983: especially 76-82).

Paul Richards work is inspirational; my fifteen-year-old field notes from Bunyole took on new meaning as I tried to reanalyze what I had observed of Nyole agriculture as a “particularistic” system, adapted to local microenvironments and even experimental within those environments. By the time I returned in 1987, I was ready to see more—and, as described above—I did indeed see something of the experiments and the imagination that was going into rice and vegetable cultivation. A longer field research project would surely have revealed still more “local knowledge,” yet I am not altogether convinced that the most useful contribution anthropology can make to development these days is to focus exclusively on local knowledge and local adaptations.
Too much stress on local knowledge can lead one to ignore other kinds of knowledge—about, for example, the “urban” world. This was the major problem of my first fieldwork in Uganda (1969-71) where I felt that it was necessary to show my solidarity with “my” people—conceived then in limited and romantic terms as real Banyole—by systematically restricting all connections with the world and the affairs of those bureaucrats and businessmen who moved regularly beyond the local, Bunyole County territorial framework. In so doing—more accurately, in so trying, for I never succeeded in cutting off the larger world—I was able to demonstrate to local people that I respected their traditions, their knowledge, their language. The result was rewarding but also disturbing, increasingly so as fieldwork drew to an end and I realized more and more clearly that even the local language I had so painfully acquired was an historic product, heavily overlain with Luganda and marking Nyole adaptation to a national cultural and political framework.

In the concluding essay in a recent volume on famine and drought in Africa, the authors note that:

Many researchers now suggest that a primary cause of the agrarian crisis has not been a lack of skill on the part of the African peasants (farmers or herders). On the contrary, the resilience of traditional modes of production (and livestock management) can be seen as a testament to their relative success. While prescriptions differ among researchers, there appears to be a general agreement that a key constraint on agricultural production is the lack of production incentives for many African rural producers. The potential of African smallholders has been constrained by the broader social context in which they operate and, therefore, the removal of such constraints represents a hope for an end to Africa’s agrarian crisis (Payne et al. in Glantz 1988, my emphasis).

In other words, local knowledge and skill, apparent in the “resiliency of traditional modes of production”, is constrained by what Chambers has called “integrated rural poverty” (1983). On their own, they would have made it.

ADAPTATION AND THE “BROADER SOCIAL CONTEXT”

My problem is in separating the “broader social context” from the “African smallholder”. The political arena, be it colonial or modern, is not merely something tacked onto the “real” mode of production. On the contrary, integration into a larger system seems most likely to change once and for all the local context in which local skills and local knowledge may be expressed.

It is not simply that there is a relationship between local community and state, but rather that the local only exists these days in terms of the state. Culturally and economically it is part of the whole. Terms such as
"constrained" or "restricted" are inappropriate, for they suggest an autonomy which can no longer exist; local cultural reproduction, local identity, local physical reproduction are all conditioned by the larger context, the expanded scale of the state. Withdrawal is impossible without a time machine.

Cotton, history and the culture of a political economy

Clearly, this will be the case where agriculture is fully market oriented. In such "proper farming" the producer follows adaptive strategies which reflect—in the best case!—an equal concern for the demands of the market and the land. Local knowledge, here, is a matter of knowing enough to get along in the marketplace as well as out in the fields. The "half-way" case of cash cropping combined with subsistence cultivation—the cotton-millet system in Bunyole, for example—is especially interesting precisely because the practice of this kind of agriculture involves more than "the skill of the African peasant". Cotton, universally cultivated in 1970 and destined entirely for export, marked a degree of integration with the state.

Cotton loans, Local Growers' Society politics, school lessons about proper spacing of cotton, the exhortations of chiefs and agricultural assistants about early planting, careful weeding and thorough picking, the worries about the price per kilo this year and the uses to which the money will be put—all this linked the farmer to a wider world. Millet (and the rest of the subsistence economy) marked a degree of self-sufficiency vis a vis the state. Cotton and millet followed each other on the same plot, forming a system in which adaptive strategies were never merely to local conditions.

In Bunyole, the special nature of the cotton millet system as an idea is captured in a Nyole story which I call the Myth of the D.C.'s Contract. The story tells of a man from Bunyole who went away to Kampala to work and who returned with something new and wonderful—a bicycle.

The man rode up and down on the paths visiting friends and relatives and giving people rides. Everybody was delighted at how quickly and easily one could travel. A local tinker (omubotti) looked carefully at the bicycle and decided to make one for himself. He did so, using metal and wood and banana fibers to tie pieces together. Also his bicycle was wonderful and he rode around visiting and again people were delighted. Then the tinker made another bicycle, and still another, to sell to Nyole who had requested them. But then one day the D.C. (District Commissioner) arrived in a Land Rover with some local police. The police broke up all the newly made bicycles and took the tinker off to jail. The D.C. told the people that, should they want bicycles, they must cultivate cotton and earn money and buy the bicycles from Asian traders.

The myth describes the construction of the political relationships which obtained when I carried out fieldwork. Although the events themselves
are (one presumes) allegorical, they can nonetheless be placed into history, given dates. The first bicycle to reach Uganda was ridden up from the coast by the missionary George Pilkington. He passed some ten to fifteen kilometers south of present-day Bunyole on the 7th or 8th of January 1897 (Harford-Battersby 1899:307-8).

Cotton, as we have seen, was established in Bukedi District after the First World War. Yet even as late as 1920 the cotton-millet system is not yet in place. The Handbook of Uganda describes a far more flexible cropping system:

In Bunyuli (sic), bananas, though extensively planted, do not do well, the soil being too sandy. Large crops of groundnuts ... (cow peas and beans) ... and sim-sim (sesame) are raised. Wimbi (millet), Indian corn, and potatoes are also grown in large quantities. ... Sugar cane is plentiful near Buteleja. ... Chillies are grown in some quantity... Several varieties of rice are grown in the plains and a large area is devoted to this crop particularly in Bunyuli, where the conditions are very suitable (Wallis 1920:53-54).

The Handbook goes on to note that “very large areas of ground” had been devoted to ground-nuts, sesame and peas/beans, which were sold locally and exported from the district. The war curtailed this trade, but “a recovery may be expected on a return to normal conditions” 1920:54). In the event, it was cotton cultivation which expanded and by 1935 it was “the crop of incomparably the greatest economic importance” (Thomas and Scott 1935:124).

The myth is thus about the time between the establishment of colonial polity and the establishment of the colonial economy, based on the export of cotton. It is about articulation. Before this time Banyole were free, free to wander as clan histories recount, free to create—even bicycles. The universe was not yet hierarchical, the direction of exchange not yet determined, the state not yet invented. The Nyole bicycle was just as good as the imported machine; the difference between Bunyole (which was not yet fully defined) and Kampala/England (the sources of bicycles) was not yet determined.

In this reading, the myth is about the creation of a periphery and a center. Before the imposition of the D.C.’s contract, it is not clear which is center and which is periphery. Relationships are apparently symmetrical; both can build bicycles. After the imposition of the contract, asymmetry is established—and cotton is the mark of this asymmetry. The idea of contract, the definition of Bunyole as periphery, the role of cotton in mediating the relationship between Bunyole and the outside—these are all basic to a Nyole perception of what we might call the political economy of cash cropping.

It will be remembered that cotton is not merely grown in order to obtain cash and bicycles; it is also one element in a complex rotation of
food crops. Everyone grows both cotton and millet, whatever else they may cultivate. Subsistence enmeshed in cash cropping, and, as both activities involve higher orders of relationships, many different economic, political and cultural contexts are joined when a plot of land is opened with cotton.

Cotton, until the collapse of the economy in the 1970s, focused everybody's attention on a particular definition of the relationship between state and periphery. Local strategies, local adaptations to local conditions, included cotton and thus, automatically, they included something of the "broader social context". Indeed it seems to me that an understanding of Nyole practice is not helped by conceiving the cotton, state-controlled economy as a constraint, something external and somehow added. For Nyole, just as cotton had become "traditional" so too had their peripheral role within Uganda; Nyole poverty (in Chambers' sense) had become a culture of poverty.

This is not to say that a concept of adaptation (which is a model about relationships of autonomous entities, about mutuality) is irrelevant. It is just that here too we must avoid reifying. The state, which is part of the environment, is also in Bunyole itself, it is part of the cultural and technical apparatus from which Nyole draw their adaptive strategies.

The collapse of the public sector

The collapse of the cotton-millet agricultural system served to disconnect Nyole from their accustomed center, but that center was also disintegrating in its own right. Because this disintegration has a very great bearing on the future, it is important that we explore it—very briefly and with respect to Bunyole. I focus on prices and wages, on the consequences of hyper-inflation for the new elite which had expanded so remarkably since the 1950s.

By 1970 one clear way to do well, to enjoy life and display the signs of success, was to be employed in the public sector. In Bunyole itself the bulk of these "salaried" jobs were in primary school teaching, but there were also significant numbers of highly visible health, agricultural and veterinary workers. The holders of these jobs were for the most part Nyole.6

Recruitment to the salariat came through the school system, the proof that education paid. Qualifications were gained in courses of study which were carried on in the "outside" world, in boarding schools and training centers in other parts of Uganda. In one sense this required absence reinforced the perception that progress came from outside—or even perhaps that it was outside. Certainly it was not in agriculture in Bunyole, not in 1970.
Michael A. Whyte

When I returned to Uganda in 1987, all this had changed. Inflation has undermined purchasing power at a rate which can best be expressed qualitatively: I had bought a good used automobile in Kampala in 1970 for 26,000 shillings, the price of a medium sized bunch of cooking bananas in January, 1987.

Most Ugandans I met in 1987 had their own favorite measures of fiscal collapse. I was shown a new hotel where a room was reputed to cost 150,000 shillings a night; the man who pointed out the hotel earned 19,000 shillings a month—officially. More typically, people used the price of food when trying to explain inflation. Town dwellers might stress cooking bananas while country people were more apt to speak in terms of oil and salt. For both, the price of sugar seemed to have a special significance. 7

Table 1 illustrates the magnitude of the problem, contrasting two series of prices gathered at the Busaba Market, Bunyole, sixteen years apart. 8 The effect of this hyper-inflation has been to transform radically the relationship between cultivator and salarit, not just in Bunyole but throughout Uganda.

What the table shows, however crudely, is not merely the effects of inflation on government employees. More important is the relative change which it reveals. For the first time in the history of Uganda local cultivators are relatively, and significantly, better off than salaried officials.

In Bunyole of course cultivators are—in absolute terms—less well off than they were in 1971. Everyone is poorer than they were in 1971. The prices of very nearly all manufactured items, imports as well as one-time local products, have risen faster than food prices. Indeed, some desired things are periodically unavailable for money alone (good quality cement, iron roofing sheets, veterinary medicines, Raleigh bicycles to name a few). Nonetheless, agriculture, perforce with hoe and ox-plough for most cultivators, is one of the few paying propositions in Bunyole these days. In 1971, agriculture was an “extra” for the salarit, who could if they chose invest some of their wages quite profitably in this cash- and capital-starved sector. Today, agriculture is still a part of salarit life, but now it is commonly the prerequisite for holding a job. The headmaster and the medical officer are both dependant upon cultivation, and not merely for food. 9

The meaning of collapse

Recent events in Bunyole have to be understood as transformations and not simply as changes. The significance of what has happened is that underlying relationships have been altered. As Banyole murmured, bemusedly, “there are no cash crops any more”. “Traditional” agriculture—based on cotton and millet, expressed a political and economic position. This position had certain consequences, both cultural and

132
Table 1: Inflation in Bunyole 1971-1987  (Prices in Uganda shillings. Data from Busaba Market, Bunyole)

<table>
<thead>
<tr>
<th>Item</th>
<th>1971</th>
<th>1987</th>
<th>avg. increase in group value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group 1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>millet (kg)</td>
<td>0.80</td>
<td>1000.00</td>
<td></td>
</tr>
<tr>
<td>groundnuts (kg)</td>
<td>1.10</td>
<td>5000.00</td>
<td></td>
</tr>
<tr>
<td>beans (kg)</td>
<td>2.00</td>
<td>1500.00</td>
<td></td>
</tr>
<tr>
<td>cow peas (kg)</td>
<td>0.65</td>
<td>1000.00</td>
<td></td>
</tr>
<tr>
<td>rice (kg)</td>
<td>4.00</td>
<td>3500.00</td>
<td></td>
</tr>
<tr>
<td>plantain bananas (medium stalk)</td>
<td>5.00</td>
<td>6000.00</td>
<td>x 1328</td>
</tr>
<tr>
<td><strong>Group 2</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>gomasi, Nytil (woman’s gown, Ugandan manufacture)</td>
<td>28.00</td>
<td>45,000.00</td>
<td></td>
</tr>
<tr>
<td>man’s cotton trousers</td>
<td>25.00</td>
<td>35,000.00</td>
<td>x 1509</td>
</tr>
<tr>
<td><strong>Group 3</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>sugar - kg</td>
<td>0.65</td>
<td>10,000.00</td>
<td>x 15,384</td>
</tr>
<tr>
<td><strong>Group 4</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>primary school teacher</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>salary p.m. (apx)</td>
<td>600.00</td>
<td>19,000.00</td>
<td>x 32</td>
</tr>
<tr>
<td><strong>Group 5 (median figures)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>porter/day laborer</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>wages per day</td>
<td>5.00</td>
<td>3500.00</td>
<td>x 700</td>
</tr>
</tbody>
</table>

Group 1 in the table represents crops which are staples in the local diet and which have in addition become cash crops. The increase in value shown should be compared with the prices in group 2, clothing, which of course must be purchased. Price rises in this group are clearly of far greater significance for the salariat, represented by group 4, than they would be for cultivators who plan on selling their produce. The latter come out very nearly even while the former have seen their purchasing power drastically curtailed. Group 5 is given with some hesitation; most casual labor in Bunyole is negotiated as piece work, the price depending on the nature of the job and the time of year. Such labor - at any rate for cash - was far less common in 1971 than it is today. The differences in the orders of magnitude of the increases in groups 4 and 5 is what is significant. Porters have done, relatively, far better than civil servants in the last 16 years.
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economic, which in turn made certain strategies appropriate. Banyole had developed a series of adaptive strategies based both on this “traditional” political situation and on their perceptions of it. The salariat strategy—upward mobility via education—was appealing because of its economic rewards, but also because these rewards signalled success. To some extent, the prestige hierarchy of a larger world had become “traditional” as well. Yet it would be wrong to stop here—to see Nyole activities as merely directed towards achieving economic goals, or towards coping with another, external system. Certainly, Banyole made decisions in terms of their expectations about externals—about possible government policy or the chances for rain. But at least in the case of government, there is a paradox. The very structure of the Nyole relationship to the Ugandan center and the ideas which were located there was based on conjunction as well as disjunction. The D.C.’s Contract can mark a potential schizogenesis—Bateson’s term for progressive differentiation (1935)—but it also marks what came to be a broader community of interests, defined by new ideas and values, which included at least some Banyole, some of the time. Obvious examples are the religious communities, at once inspirational and fascinating. A more mundane community of interests—and field for conflict!—was professional. Europeans and Ugandans served together—albeit at different levels—in schools, the agricultural and veterinary services or in hospitals and health services. As Gluckman has pointed out with reference to South Africa (1958), the links which were forged through such cooperation had the same capacity to fascinate and to provide an alternative, valued identity.

POLITICAL CRISIS AND DEVELOPMENT PRACTICE

The crisis in Uganda as a whole has been discussed extensively (see for example the collections by Hansen and Twaddle, and Wiebe and Dodge, as well as the last chapters of Stephen Bunker’s study Peasants against the State). The extent of the collapse of the formal economy for Uganda as a whole is well documented. Vali Jamal confirms that the salariat is in relative decline not just in Bunyole but generally throughout the land: “what is going on in Uganda is a massive redistribution of income in favor of the farmers” (1987:132). Urban migration, according to Jamal, has also clearly declined, “even changed direction” (1987:129), a pattern also visible in Bunyole. Finally, both Jamal and Firimooni Banugire discuss the enormous expansion of the informal economy which, by definition, is not directly recorded. Its impact can be approximated however by comparing current wage levels in the formal sector with current prices; in 1986 for example the ratio of formal sector wages to basic needs for low income
(urban) workers was 1:90; for the middle income group it was 1:24 (Banugire 1987:139-40).

As the economy declines, so also the state. Indeed, at least in Uganda, the consensus has it that state decline began long before the economic crises of the Amin and Obote periods. To mention just one example, Stephen Bunker shows how the long-standing struggle between the Bugisu Cooperative Union and the state deteriorated into an outright power struggle between state and local/producer interests even before the Amin coup. Subsequent, more violent, attempts at suppression were a sign of increasing weakness and desperation in Kampala: “when the state suppresses local organization for political reasons, it ultimately undermines its own economic base” (1987:12).

This long slide into dysfunction, this “decline of state capabilities” is taken up in a chapter by Rene Lemarchand in the collection entitled The Precarious Balance: State and Society in Africa (1988). His text is the paradox formulated by Elbaki Hermassi: “L’étatisation de la société mène a la privatization de l’état” (1988:156). Lemarchand describes a kind of evolution which begins with a political order characterized by “tribute”—by relationships which are based on expectations of reciprocity and generalized exchange. In tribute-based systems (traditional, but also in some sense colonial) and in the more modern forms of patronage which develop with political autonomy, Lemarchand stresses the importance of shared values and trust—at least at the Mauussian level of an obligation to return the gift. The modern politics of patronage are based on expectations of reciprocity and the perceived ability of the patron to allocate resources, to “work the machine”. But the machines themselves break or run out of control, to be shut down by soldiers and bureaucrats, thus introducing prebendal politics. In both patronage and prebendal systems state resources are appropriated; in the former the goal is power, whilst in the latter case the motive is personal gain (1988:151-3).

Most important, Lemarchand shows how the descent into prebendalism is linked with the spread of the parallel or informal economy in Africa:

Parallel economies are not new to Africa. As precapitalist enclaves they persisted and flourished in the interstitial spaces of the colonial state. Their recent expansion and growing significance as an informal exchange system, however, cannot be properly grasped unless attention is paid to the weakening of state institutions that has accompanied the shift from patronage to prebends... The important point to stress is the thoroughly negative impact of prebendal policies on rural producers. To the extent that prebendal states have enough authority left to initiate and implement policies, these are primarily intended to increase the volume of prebends at the center, to the detriment of the countryside. Thus, overvalued exchange rates, high taxes on agricultural exports and the subsidization of food imports are standard policies associated with prebendal states, to which must be added the inefficiency and corruption which normally attends the operation of marketing agencies and parastatals. The result has been the placement of
enormous burdens on the producers of cash crops and food crops; selling or smuggling though informal networks is the most rational course to avoid economic strangulation. In addition, where the prebendal state proves incapable of generating the fiscal resources needed to pay the salaries of civil servants and military men, it is likely that the latter will be heavily involved in smuggling and black-market activities. They may even take the initiative in priming the pump of the informal economy. (161).

Lemarchand manages to connect economic collapse and political collapse in a convincing way. In the political science tradition he is concerned with connections between levels and with long term implications. In this case, the implications are dismal: the prebendal state, connected as it is with all the hypocrisies of the informal economy, has a constant problem with legitimacy. In terms of the Nyole example, the D.C.s Contract reflects back to a period of tributary relationships, an era of mutual trust—however limited. This basic order persisted, enshrined in the economic order which was its symbol, well into the era or party/prebendal politics. It was totally dismantled only when the underlying economy itself collapsed.

Today in Bunyole, and in many peripheral areas in Uganda, there is very little trust and very few expectations of reciprocity. Again and again, I was told that any aid to come from Denmark (or anywhere else) must be channeled directly to its source by the donors themselves. It must not stop in Kampala, nor even Tororo, for there it would surely “be eaten by the ones who sit in the Government offices”. Aid ought to be relevant as well, but that was not an essential requirement. Useless things (such as spray pumps for the cotton people no longer grow) have been delivered, accepted, and entered into the magendo (smuggling) economy, to end up in Kenya.

This informal economy has its uses and, in certain respects it is a highly popular development. No farmer in the countryside, for example, was interested in a return to marketing boards and fixed prices for produce. On the other hand, chronic inflation, shortages and sharp dealing in an economy which was a fast-moving entrepreneur’s paradise, made people wary of magendo. It was good when it worked but it was also symptomatic of the disorder local people sought to control—and to understand. Lemarchand notes that the free market extravaganza which is the informal economy looks very different from the apex of society (by definition, the capital city?) where it appears to offer the scant relief of a known, if dismal future as a class-based society. From the bottom, the point of view of the “rural masses”, class does not predict action and ethnicity and clientalism are significant. (This is where we need to listen hard, where local knowledge and locally accepted cultural categories are our keys to understanding.)

Lemarchand is not optimistic: he foresees “conditions of profound and permanent inequalities in African societies” and this possibility certainly
exists in Bunyole. However, it seems to me that other possibilities also exist. The Polanyi nightmare of an African "great transformation" which would reduce Nyole society to a slave of unrestricted market forces is not inevitable—but it is certainly not impossible. For Bunyole as for Uganda, nothing is yet resolved. The guns of the Amin and Obote periods had masked the sound of paradigms collapsing, but indeed they have, and in the new—relative—stillness which Museveni had ushered in it is important to listen for the sounds of new construction. In this final section I want to compare in very general terms some of these "constructions" as a way of speculating about the future and the role of development aid—our role—in this future.

Bunyole 1987: guide to a future?

In January 1987 I had the opportunity to discuss development issues with a large number of local people in Bunyole and neighboring Bugwere. I draw on material which ranges from formal interviews to informal chats with men and women I knew sixteen years ago supplemented by my own observations and contrasted with notes and my own memories of conditions as they were before the Amin period. This involves a certain lack of precision; I do not know, for example, the actual extent of food production, nor even which sectors of the rural population are most active. Yet in one sense this very lack of precision reflects current conditions in Uganda far more truly than any amount of tabulated facts ever could. Ugandans—also those in Bunyole and Bugwere—are confused; they are in the process of coping with economic and political chaos. They are, I believe, also in the process of creating new kinds of order—which is my reason for stressing their ideas and plans as well as their perceptions of problems.

The future—everyone agreed—is to be constructed on the basis of intensive agriculture—the rice, food and oil-seed production of today. To this, will be added local processing industries (oil extraction, pottery, poultry-raising and piggeries, tailoring, dairying, brick-making). Only one man, an agricultural entrepreneur with access to land and labor, expressed an interest in cotton. The basic idea is to invest the profits of local agriculture in all levels of local development. I was told of plans to buy small oil extractors to process local soya or sunflower seed in order to insure a local supply of cooking oil, create a modest local export of oil and a supply of oil cake which could then spark off a dairy industry based on zero-grazing of hybrid cattle bought from Kenya.

Such practical plans are in fact already being implemented by private individuals and, in the last few years, by locally organized cooperative societies. The plans themselves were down to earth, based on available
skills and familiar markets. It was striking that many of them were being realized, with funds collected locally. The grandiose had little interest—and no one suggested involving the government.

Indeed, although few are pleased, many seem to have accepted the effective privatization of any government service for which there was a demand. It has not gone unnoticed that these days there are more doctors and more pharmacies in Bunyole and Bugwera than ever before. Trading and marketing of food crops is, of course, another area in which private initiative has paid well in the past years.

The new future which is coming into being is not however based on a retreat into purely parochial concerns. Indeed, one of the paradoxes of Uganda is that as Kampala has become progressively more remote, Bunyole has become more centrally placed, connected more clearly to the rest of the world. This was brought home to me on my first night in Bunyole. I had spent the afternoon and early evening meeting old friends and catching up on events. Before going to bed I went off with my host on a tour of Busolwe, now a town with a population of some 2000, instead of the dusty trading center I remembered. We passed a number of bars, small groups sitting by the light of a paraffin candle sipping locally distilled liquor. Then we came to the community center, which was holding its weekly video evening. Another evening each week was devoted to a disco.

Such goings on are not unique. In another trading center which was also on the way to becoming a small town, a local cooperative society had nearly completed construction of a two-storied hotel with accompanying bar and social center—complete with snooker table.

Disco, snooker and video-machines are in fact important. They represent another reversal from the seventies, a bringing of city lights to the countryside, a pride in being locally modern. Disco and local industrial development go together; both are symptoms of the radical recentralization which has occurred here. Reentralization is used advisedly—for both culturally and industrially the one-time periphery has become re-oriented, directly and literally plugged into an international system. As contacts with Kampala become more fragmentary, contacts with West Germany (a source of medicine), or Liverpool (a church group which helps a specific primary school) are barely more difficult to maintain or even to expand.

What is emerging in Bunyole is a consciousness of being part of a new order. This consciousness inspires the plans which Nyole are making and the strategies which they are adopting. I use the term consciousness advisedly, for it seems to me that what has always been most important about the economy in Bunyole was that it was cultural, related to perceptions rather than being merely the consequence of events. I have argued that the cotton-millet system of the past was part of another
consciousness, one which dates back to the original colonial enterprise. As an economic model, this system had the curious property of never really describing what actually happened in Bunyole. Despite the best efforts of generations of agricultural officers, Nyole never became modern farmers in the accepted pattern. They refused to give up their millet and their cow peas, even though they had been forced to accept the government's cotton as their own. Survival in economic terms was always based on more than merely cash cropping and subsistence cultivation.

Put into another framework, events have demonstrated that what Paul Richard has called "indigenous agricultural revolution" can proceed under certain circumstances without even the aid of populist development programmes. But it would be a mistake to concentrate too much on the indigenous agricultural knowledge, the local knowledge of local agriculturalists. It is true that this capacity—ignored by the experts before the Amin coup—is being put to good and evident use today. But the difference today is that Banyole farm in a context which allows more of their own effort to be visible, not least to themselves. In this sense the adaptive strategies which are emerging are in response to a new awareness of possibilities, a new political economy.

Market production of food crops and the extensive cultivation of rice are adaptations, but not merely to environment or climate.

CONCLUSIONS

Paul Richards, who draws our attention to the knowledge, skills and experimental procedures of local farmers, has been taken to represent one focus of this essay. He reminds us that farmers are best studied as subjects, actively engaged in creating experience, and not simply as objects of inquiry. This approach is essentially local and adaptationist: the key relationship is that which obtains between the local community and its environment, the local cultivator and her plot of land.

The political science tradition from which Rene Lemarchand works emphasizes, on the other hand, super-local phenomena, government and governance (see Hyden 1988). The key relationship here is that which obtains between society and the state, but it is the latter which is the focus of analysis.

I have been looking at events in Bunyole and in Uganda in terms the space between these two kinds of models, a space which can be seen as a kind of cultural political economy. In these terms, my difficulty with a focus on local knowledge and local adaptation is that it can come to over-represent the significance of the physical environment—and under-represent the importance of culture in physical reproduction. Certainly there are more Banyole in the county these days, and shorter rotations
have reduced the fertility of the soil, but neither population pressure nor environmental pressure has determined the direction in which Banyole are moving. Although a new kind of agriculture is emerging these days, Banyole today are not better farmers than they were fifteen or twenty years ago—nor have they acquired more local knowledge.

In the future, for Banyole, lurk the familiar environmental and ecological catastrophes. Population continues to grow, and swamp cultivation will not provide a long term solution to land shortage, much less to rural poverty. Yet environmental degradation is not just a problem, it is also a consequence. From the perspective of the larger, Ugandan system, the real challenge is political: to create institutions and relationships which will allow development to continue. In Crawford Young's words, "the hegemonic impulses which ... flow from the logic of the first construction of the colonial state seem impossible to sustain" (1988:60).

The unfettered expansion of the market which most Banyole seem to welcome is one basis for the world which is emerging, but it is a two-edged sword. Until recently the D.C.'s Contract sheltered Banyole; cotton, the cash crop for the outside, had as its necessary complement millet, the subsistence crop which marked Nyole cultural identity—the inside. Yet, as we have seen, model, state and cotton have all very nearly disappeared. Today, agriculture as a way of relating to the outside world has taken on an entirely new set of meanings—and focuses on new relationships between new units. Diversity is the rule—a real diversity of crops and a potential diversity in organization of production, for already some men have begun to expand into an agriculture dependant on wage labor for much of the agricultural season. This diversity may continue to increase, and Banyole, so long exploited by the colonial and the post-colonial state, may set about exploiting one another in the familiar idiom of owner and laborer.

On the other hand, it is also possible that new political relationships will be created, based in part on the residue of hegemony: the universalist values—religious, national, cosmopolitan—which no small number of Banyole have come to cherish. The center, Kampala, has become more remote, more peripheral. The bright lights are at home and so are the skilled one-time salariat, working in their gardens. Some of them are even working directly for local cultivators, teaching their children and using medical skills in private dispensaries. The teachers who continue to teach, dependant upon fees for "extra" tuition or the use of a plot of school land or the nurse's aid who would like to have been paid, but who was most upset because he had never been given the opportunity to be taken on an up-grading course are a testament to the value which continues to be placed on maintaining a meaningful relationship with the wider world.
BIBLIOGRAPHY

Langlands, B. W. 1971. The population geography of Bukedi District, Occ. paper No. 27, Dept. of Geography, Makerere University, Kampala.
Michael A. Whyte


NOTES

1. The opportunity to return to Uganda was made possible thanks to a research grant from the Danish Research Council for Development Research; the original research was supported by a research training grant from the United States Public Health Service (NIMH-CUAN). The Embassy of Uganda in Copenhagen was of great help in arranging many practical details: I thank in particular Mr. J. Wamai.

In Uganda I was aided by a great many people. In Kampala Dr. Dan Mudoola, Director of the Makerere Institute of Social Research, and his research and administrative staff were as helpful and knowledgeable in 1987 as they were in 1968-71. In Bunyole my old friends Mr. and Mrs. Silvester Musimami allowed me to stay with them: I thank them for their kindness, hospitality and patience. Gombolola Chief Tefiro Wamudanya (ret.) and his family—which is also my family in Bunyole—once again overwhelmed their person with help and generosity.

Both the material and the arguments I deal with here have been presented to my colleagues at the Center for African Studies and the Institute for Anthropology, University of Copenhagen; I acknowledge my appreciation for the comments and suggestions I received from them. I am—as ever—deeply in debt to one colleague in particular. Susan Reynholds Whyte and I have been talking about Bunyole since 1968; the good bits can be traced back to these conversations.

2. Sweet potatoes and plantain bananas are two important food crops which stand outside this rotation.

3. Population growth in southeastern Uganda appears to have been continuous, despite a high mortality rate, since at least the 1920s. The Bukedi region would have been densely populated—relative, say, to Busoga—during this period. Eastern Uganda as a whole was subject to a series of famines as well as sleeping sickness epidemics from 1880 to 1910, though the matter is best documented for Busoga (Nayenga 1979).

Since the beginning of census records in 1921 Bukedi, despite shifting boundaries, has been among the most densely populated regions in Uganda. It was ranked 4th in 1969, 3rd in 1959, 2nd in 1948 and in 1931 and 1921, 1st (Langlands 1971:3). Bukedi is characterized by a high birthrate (50 per 1000 in 1959) and, in the same year, the highest death rate in Uganda (30 per 1000) as well as the highest rate for infant mortality (200 per 1000, the same as Madi District in West Nile) (1971:29) Langlands continues:

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It is apparent that Bukedi has a very even population density, which compared to the environmental conditions of the district is already placing a heavy demand upon the land. Except perhaps in the southern sub-county there are few areas of unused land within the district waiting to be brought into agricultural productivity. There are no lands available for large-scale ranching and forestry at present occupies a negligible area. Given an environmental condition which is conducive towards the annual cultivation food crops and cotton, rather than permanent crops, the pressure upon the land must already be deemed to be high. Already by 1959 the provision of fallow lands equivalent to the length of cultivation (e.g. a ratio of 1:1 rest to cultivation) was impossible to achieve in much of the district, and the position has worsened further since 1971:30.

4. Groundnut cultivation for sale in June and July was the most common agricultural strategy. But it is misleading to speak of an alternative, for in fact they were legion. Livestock and poultry could be sold or traded; craft production for local and regional markets was a regular activity throughout the year; services proliferated, and included barbers, bicycle repairmen, builders and carpenters, butchers, brewers and distillers, diviners, herbalists, tailors, tinkers, and traders. Incomes from such activities were seldom significantly more than was earned from cotton. Rope-making might keep old men in cigarettes; younger men bought clothes—and goats—from the proceeds of bicycle-taxis. But trading in hides did send one man to Mecca on a jet plane and a small number of Nyole businessmen had become wealthy, owners of town trading plots, lorries and the like.

5. This was not merely the case with crafts or trading. In many households food crops were grown in order to be sold, yet even here it was very difficult to collect quantitative information. Some people were suspicious of this line of questioning (I might report the sale of scheduled food crops to Asian traders, which was illegal), but many simply did not remember. This was a selective amnesia; the same men and women were able to tell me precisely how many pounds or kilos of cotton they had sold, and at what price, and what they had bought with the money, for the past five years.

6. Compared to ordinary cultivators, the salariat were doubly rich. A primary school teacher had a disposable income as much as greater or fifteen times greater than the simple cultivator. The salariat were consumers—of new, 'city' clothes, of radios and record players and watches, of iron roofing and carpenter-built furniture. They were also providers—of school-fees to younger relatives and help and gifts to older ones, of information about and contacts in the wider world.

7. This may have been simply because its price has risen more sharply, by my reckoning some 15,000 times in sixteen years (as opposed to a general price rise of about a thousand-fold). But it is also clear that—for many Ugandans—the fate of sugar bears some relation to the fate of their country. Tea with milk and sugar was the affordable luxury of the pre-Amin period. A pound—or kilo—of sugar in its brown paper bag was an appropriate gift from a visitor, an industrial product which was available in town and countryside and which perhaps served to bind together rural and urban, cultivator and elite. In addition, sugar was grown and refined in Uganda by large Asian-owned corporations; they and their plantations are, too, a thing of the past and, it would seem, of the future. At any rate the industry is being re-established and in the meantime the government barters beans for sugar with Cuba and tries to bring prices down. And in Kampala and in Bunyole people complain about the price (10,000 shillings a kilo in 1987) and the quality (it is said to be too grey) and the failure of Authority to provide.

8. Prices of commodities in eastern Uganda have been rising even more steeply since the beginning of the Amin period. The following table incorporates my own data from
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Bunyole (1971, 1987) and price data from Mbale, a large town further to the east (1981, 1984).

Table 1. Inflation: Mbale and Bunyole (prices in Uganda shillings)

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>maize flour (kg)</td>
<td>1</td>
<td>40</td>
<td>250</td>
<td>1000</td>
</tr>
<tr>
<td>plantain, bananas (medium stalk)</td>
<td>5</td>
<td>60</td>
<td>2,000</td>
<td>10,000</td>
</tr>
<tr>
<td>beans, mixed (kg)</td>
<td>2</td>
<td>15</td>
<td>200</td>
<td>1,500</td>
</tr>
<tr>
<td>salt (kg)</td>
<td>nd</td>
<td>25</td>
<td>400/500</td>
<td>1,500</td>
</tr>
<tr>
<td>meat, boneless (kg)</td>
<td>3.50</td>
<td>50</td>
<td>800</td>
<td>5,000</td>
</tr>
<tr>
<td>enguli (33 cl)</td>
<td>3</td>
<td>3</td>
<td>600</td>
<td>1,000</td>
</tr>
<tr>
<td>(locally distilled spirits)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mwenge (50 cl)</td>
<td>0.40</td>
<td>2.50</td>
<td>70</td>
<td>300</td>
</tr>
<tr>
<td>(banana bear)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>cigarette (each)</td>
<td>0.10</td>
<td>5</td>
<td>50</td>
<td>nd</td>
</tr>
<tr>
<td>gomasi, Nytil</td>
<td>28</td>
<td>250</td>
<td>5,000</td>
<td>45,000</td>
</tr>
<tr>
<td>(woman’s gown, Ugandan manufacture)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>trousers, cotton</td>
<td>25</td>
<td>1,200</td>
<td>5,000</td>
<td>35,000</td>
</tr>
</tbody>
</table>

(source: own data and Machyo W’obanda 1985. In January 1987 $1 bought ca. Ushs. 1,200 officially but Ushs. 10,000 unofficially.)

In 1984 the Obote government raised civil service salaries on average 300-500%, and established a minimum monthly wage of 6000 shillings, about $18 at the current exchange rate (African Research Bulletin 31.7.1984:7348b). Machyo W’obanda notes that basic expenses—in 1984—for a family of four in Mbale, earning the minimum wage, amounted to 60,000/-, ‘to just barely survive a month’. A civil servant at the top of the scale earned 92,000 and needed 500,000/- a month ‘just to maintain a standard of living befitting his socio-economic status’. Eighteen months later the Obote and Okello governments had fallen, and so had the shilling—from 327/- to 1190/- to the dollar; the black market rate was reported at 2000/- to 2500/- (af. Res. Bul. 22:31,12.85). By January, 1987, the black market dollar rate ranged from from 9000/- to 12,000/- shillings.

In Bunyole, where most people have access to land, things are somewhat easier. The rural salariat, even in 1971, was largely self-sufficient with respect to food; housing was generally assigned or available independently of one’s monthly salary. Nonetheless, that salary has fared no better in Bunyole than in the rest of Uganda. A secondary school headmaster earns the cash equivalent of five kg of sugar each month; a trip to the nearest town to collect this salary costs him about one fifth of this. A bicycle tire is two months’ salary. A nursing aid earns far less, about 18,000/- per month; he is provided with modern housing. One such man, with two wives and two children, reckons that it would cost him 1500-2000/- a day if he were to buy maize or millet and vegetables for himself and his family. This is seldom necessary; he is a local man with land nearby. Tea, milk and sugar are luxuries he cannot afford. Five months’ salary will by the cheapest traditional gowns for his wives; two months’ salary pays for a pair of cotton trousers; one month buys him a kilo sugar and two loaves of bread.

9. The headmaster, like most teachers, is forced into farming for both cash and subsistence in order to be able to teach. One acre of rice can bring in two or three mil-

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lion 1987 shillings—enough to make life possible, to buy necessary clothes, repair a bicycle, pay school fees. Enough to make it possible to go on teaching.

As for dispensary staff at all levels, the privatization of medicine appears to have become well established in Bunyole (and in the rest of the country). Paying clinics and dispensaries staffed by government personnel were pointed out to me throughout my trip. The very existence of, and acceptance of, private dispensaries, suggests that a great number of 'ordinary' rural people are in a position to buy the services of members of the former salariat.

In effect, the dispenser, nursing aid, nurse or doctor functions today in one important sense at the level of a traditional specialist. He or she is as dependent on local patients and their payments as they in turn are on specialized skills and knowledge. This mutual dependence is new and, I believe, of considerable importance for the future.
A Case Study of Peasants' Adaptation to Hybrid Maize in Semi-Arid Tanzania

Esbern Friis-Hansen

INTRODUCTION

This paper is based on information and experienced from a research project conducted during 1988 in the Southern Highlands of Tanzania. The areas studied are semi-arid (rainfall less than 600 mm. per annum) and the main problem discussed is that of introducing hybrid maize in a traditional local production system in the Njombe District.¹

THE CONCEPT OF ADAPTIVE STRATEGIES

Geographers have a long tradition for analyzing the relation between man and environment. Early studies viewed the physical conditions as determining for agricultural production, and this approach has been termed environmental determinism. This approach formed the basis for many of the colonial policies devoted to eliminating soil erosion and overgrazing and saw the environmental problems as distinct from, rather than interrelated with, the social context.

The concept of carrying capacity was developed by biologists and geographers to determine the possible level of production within a given stable ecosystem. Applied analyses often only relate to the natural environment and lead to an oversimplified analysis and predetermined solution. If the number of people and livestock exceed the carrying capacity, then the grazing and arable land is over-utilized and the solution is de-stocking and birth control or resettlement. The above analysis misses the important point that carrying capacity is not only related to the natural potential of a certain category of land, but its utilization under some specific farming system.

In opposition to this, the adaptationist approach developed, which analyzed how local communities through their farming system adapted themselves to the physical environment. A major result from these studies has been an extensive documentation showing that the local farming systems are logical and resource efficient in responding to the needs and priorities of the community.² Local knowledge has been shown to build
on a holistic strategy viewing the role of resources as integrated elements of the production system. Food security has high priority in local farming systems and the significance of some resources is particularly evident in periods of environmental stress.

In the wake of the recent report from the World Commission on Environment and Development, new attention has been devoted to what has been termed the environmental bankruptcy in Africa. Governments and aid agencies are increasingly involved in environmental programmes seeking to stop resource degradation, often in areas where the situation is threatening to undermine the resource base for production. Calls have been made for sustainable methods of production as the basis for an ecologically sound development.

The full implications of this call in terms of both technological choices and resource management and its wider socio-economic conditions are far from fully realized. An increasing number of local farming systems in Africa have shown themselves unable to cope with the increasing pressure of production on resources. This has shown that the concentration on relations between society and the physical environment is inadequate as explanation, and proven a need for an analysis of the dynamics within the society as well as its socio-economic context.

ADAPTATION OF LOCAL COMPOSITE MAIZE TO PEASANT PREFERENCES

It is difficult to determine the diffusion of the different local maize varieties as no statistics exist. The common picture today is that not more than two or three local varieties are cultivated in the same village or by the same household. It is in a way quite surprising that the varieties found in one village can easily be different from the varieties found in the neighbouring village. A possible explanation might be found in the fact that trade in local maize is very limited. Plant populations are maintained by individual peasant households, who through mass selection secure high gene variation.

Through yearly mass-selection of seeds from the previous year’s harvest, local varieties are in a process of continuous change. The actual selection of seeds for the coming season is made by the peasant from his local storage after harvesting is completed and before the cobs are shelled. Only the large regular cobs are selected for seeds, and only the corn from the middle part of the cobs is used.

In practice, a peasant chooses his seed from desirable individual plants or cobs. The seed from these is composited and planted en masse to produce the following generation. This is done by practically all peasants who select their own seed. Mass-selection is effective in increasing gene frequencies for characteristics which are easily measured such as plant
type, dates of maturity, grain characteristics etc. It is therefore easy for a
peasant to select for large cobs, early maturity and other easily recog-
nizable characteristics.

Mass selection, however, is not effective in modifying characteristics
such as yield, which is governed by many genes and cannot be recognized
by appearance of individual plants or cobs. Mass selection takes place on
the basis of phenotypic characteristics. These only to a limited extent
reflect the genotype for the yield-components and mass-selection is there-
fore not an efficient breeding technique for increasing yields.

The local maize cultivated in eastern and southern Africa stems from
several hundred varieties of seed. In Njombe District, maize is not an
indigenous crop, but can be traced back to before the German colonial
period. A number of local varieties of maize thus exists and is in use to-
day in Njombe. There is quite some differentiation among the househol-
ds concerning management and knowledge of maintenance and develop-
ment of the local seeds. Some households may mix the different local
varieties by simply placing all the harvested maize in storage and
selecting seeds from there. These households, therefore, cultivate only one
local maize deriving from a mixture of the existing local varieties. Other
households go to lengths to maintain the genetic purity of the different
varieties. There is a clear tendency toward social differentiation in relation
to use of local maize. The more commercialized the village or peasant is,
the less local maize he cultivates.

In the following wee will look upon how peasants in Njombe have
adapted composite maize varieties to the local environment and to specific
local methods of cultivation and end-uses.

Early maturity

Local varieties have a period of maturity varying from 85 to 120 days from
planting to maturity, which is short in relation to hybrid varieties.

If planted in the beginning of the rainy season, maize will mature while
the rainy season is still at its height. This enables the peasants to harvest
the crop fresh, little by little, as needed for household consumption. The
local seeds play a crucial role in the traditional food system based on
supply of fresh food yearround.

In the semi-dry areas characterized by a short rainy season, local maize
varieties constitute an important element in minimizing the risk of total
crop failure. Even if the rains stop early, local varieties will not be reduced
as much as hybrids, and in such years, the yield of the locals may easily
exceed that of hybrids.

In the early eighties, the early maturity of the local varieties was
utilized in a new manner. The exorbitant record-high prices of maize on
the parallel market led to an increase in the production of maize. The area of maize was expanded by planting the local maize after finishing planting the hybrid seed, thereby extending the period of planting.\textsuperscript{6}

**Sustainability under conditions of unstable rainfall pattern**

The open-pollinated varieties are characterized by high genetic variation. Acland\textsuperscript{7} describes the open-pollinated (composite) varieties, grown in Tanzania as seeds of "higher variability and stability" than the hybrids and "better adapted for cultivation under variable climatic conditions". Experiments at the agricultural research stations dealing with the issue of drought resistance are very limited. If natural selection of composite has taken place in the development of local composites, the genotypes will adapt themselves to the total sum of environmental factors such as rainfall pattern, plant diseases etc. As such, they will perform better than the existing hybrids if adverse conditions occur. This is confirmed by the peasants interviewed in the semi-dry areas who clearly stated that the absence of rain in some years for a shorter period caused serious damage to the hybrids while having little effect on the local varieties.

**Resistance against pests**

Pest is a major problem for maize production in the Southern Highlands and pesticides are frequently used on the crops to combat insects like stalkborer and grain weevils such as the larger grain borer. There are significant differences in how vulnerable the maize is to pests which depend on characteristics of the cultivated variety. The hybrid varieties are more vulnerable to pests than local composites and application of pesticides is a pre-condition to achieve high yields. The situation is somewhat different for the local open-pollinated varieties. The husk of these varieties is harder which generally prevents grain weevils from eating more than a few percent of the grain, even without application of pesticides. The magnitude of stalkborer is also less for the local maize compared with hybrid varieties. This is only to a minor degree related to the characteristics of the seed, but possibly more important to differences in methods of cultivation, e.g. less dense spacing, use of fallow rotation etc.

Also post-harvest crop loss because of pests has reached a serious level in the Southern Highlands. The local composites seem to be more resistant to attacks from pests than the hybrids. A recent CIMMYT report concerned with the status of agricultural research in Tanzania states:
Varieties which have a floury grain (hybrids) allow a faster build-up of the insect population, as compared to the flint-type (local composites) grain. However, no varieties have grain which is completely resistant to storage insect attack.8

This was confirmed during fieldwork in Njombe District. Peasants in Ilunda Village stated that if no pesticides were used on storage, then 100% of the hybrids would be eaten while only 50% of the local composites would be affected (which is still very high!).

Ability to yield when cultivated in shifting cultivation, without fertilization

The local varieties are developed by the single household and thereby adapted to its specific methods of cultivation. The local seeds are both cultivated traditionally (e.g. with fallow rotation, intercropping, in ridges, scattered spacing, minimum weeding), and in rows with application of chemical inputs. The hybrid varieties are nitrofile9, and set a number of specific demands to management of the crop. They are therefore not suited to cultivation where f.ex. fallow rotation is used instead of mineral fertilizers.

A peasant from Mamongolo Village planted H 614 in fallow rotation as an experiment, and stated that “even if hybrid seeds are planted as first crop after clearing of fallow vegetation, they need application of nitrogen fertilizer to produce a reasonable yield. The local varieties will yield higher than the hybrids if no external chemical inputs are applied.”

The local varieties are superior to the hybrids when hybrids are cultivated under conditions of so called bad management, e.g. low input of plant nutrients, minimal weeding etc. This information, gathered through interviews with Njombe peasants, can not be verified scientifically since no variety trials have been conducted with the purpose of testing the performance of hybrid as compared with local composite varieties under conditions of fallow rotation only.

Exchange relation between input of plant nutrients and grain (response to fertilizer) is better for the hybrid than for the local varieties. The local seeds tend to stop responding to the increased mineral fertilizer at a lower production level than the hybrids.

Consumption end-uses

Selection and development of local maize varieties are done with reference to end-use. Each different local variety has its specific end-use and preferences over the others.
The primary end-use is flour for cooking porridge. A bright white coloured variety is specifically cultivated for the purpose of making porridge. That maize has a high density so that the porridge can be as heavy as possible. A meal of such heavy porridge can sustain a whole day of hard labour in the field. The husk of the grain is hard and when pounded manually, it breaks in two and can easily be separated from the kernel when cast into the air. In comparison, the husk of the hybrid maize grain is fragile and breaks into pieces when ground manually. It is therefore difficult to separate the husk from the kernel and only half of the maize is left as pure flour. Furthermore, the hybrids tend to be lighter in density resulting in a less heavy porridge. All in all, hybrid maize is less desirable for porridge.

A secondary end-use of maize is brewing local beer. The maize used, does not have to be of any special quality and often small and deformed cobs are used. Still, two local varieties are cultivated especially for brewing pombe. They are multicolored and of high density resulting in a strong and tasty pombe. Those varieties can also be used for porridge, but because of the multicoloured kernels, the ugali will be less white, and for many less desirable. Hybrid maize is used commercially and often simply sold i bags, and not by weight or by quality, and it is therefore less important whether the maize is fragile or penetrated by holes from insects. Yet another local variety is cultivated especially for roasting.

PEASANT ADOPTION OF HYBRID MAIZE

Diffusion of hybrid maize in the Southern Highlands

Parts of Tanzania have experienced a high growth in marketed agricultural production over the last decade, which has otherwise been one of economic stagnation and crises. The Southern Highlands have particularly been termed a success story, because of a remarkable increase in production of maize. From a subsistence economy with regard to maize, the Southern Highlands have turned into a surplus area, with a total marketed production of approximately 250,000 tons in 1983.

Commercialization in the Southern Highlands has historically taken place in limited areas with ecological conditions favourable for cultivation of high priced export crops; tea and coffee in lower altitudes and pyrethrum in the high altitudes. For large areas, including Njombe District, the production of maize for marketing in the late 1970's was in fact the first major push for commercialization since the introduction of tax during the colonial period.

Three factors contributed to the dramatic expansion of maize production as a cash crop:
1. High and rising producer prices for maize. The disadvantages for the Southern Highlands of poor soils and long transport, were removed in the late 1970's by the introduction of pan-territorial prices and subsidization of fertilizers. The rocketing parallel market prices for maize during the early 1980's, further added to the incentive to produce maize.

2. The combined use of hybrid maize, mineral fertilizers and pesticides made it possible to increase yields.

3. Villagization, in the mid 1970's, intensified the land use pattern leading to a break-down of the traditional systems of cultivation, based on fallow-rotation. Villagization therefore imposed a strong incentive for peasants to alter their systems of cultivation.

The adoption process

The prime reason for adopting hybrid seeds is that they potentially can out-yield the local open-pollinated varieties by two to four times. The potential yield of the local composites does not exceed 2.5 tons per ha, while the hybrid varieties potentially yield 10 tons per ha. A detailed study, which included a household survey in 6 villages, conclude:

The average maize acreage stood at 4.5 acres in the sample, with very little difference between users and non-users of hybrid seeds. Thus a family using local seeds got an average total harvest of some 16 bags of maize, while the household using hybrids on average got 31 bags. The users of improved seeds planned to utilize 15 bags themselves versus 10 for the users of local seeds.

There is a clear differentiation in use of bio-chemical inputs. The adoption process is gradual, especially for fertilizer and insecticides, while there is a tendency that peasants using hybrid seeds are those who use high amounts of other bio-chemical inputs. Very few follow the recommended packages and many farmers begin with small amounts on one field and later, if successful, increase the usage. What is the best rate of application will vary from field to field, depending on both physical and socio-economic circumstances.

Close to all the farmers in the survey used insecticides, which gave the biggest 'return to investment'. For 70 Tanzanian shilling, one acre could be protected against stockborers, which otherwise could inflict losses up to half of the expected harvest. The reason why farmers are slower to adapt seeds than fertilizer and pesticides are that they can only benefit from the seeds if they apply them in combination with the other farm inputs. Furthermore, most of the farmers who used hybrid seeds also used local composite seed and had separate fields with different type of seed.
Peasants access to high yielding seed

The marketing infrastructure in Njombe District for bio-chemical inputs, including hybrid seed, has undergone successive, turbulent changes over the last decade and is therefore weak and underdeveloped. A number of constraints limits the production capacity for hybrid certified seed. According to the National Seed Act, TANSEED is responsible for both production and marketing of certified seed. Hybrid maize seed production fall clearly short of supply, and the total national sales is less than 10% of the theoretical demand. In Njombe district, which is better of than other areas as the TANSEED processing plant is situated here, there is a estimated demand for 2–3 times more seed than supplied.

The task of marketing has only to a very limited extent been undertaken by TANSEED, and chiefly through sale of seeds directly from the factory go-down or from a recently established shop in Njombe town. Marketing of certified seed at the village level has been undertaken by a number of changing organizations over the years, including CRDB (earlier TRDB), NMC, TFA, The Cooperative Union, private or village shops and local government institutions, in cooperation with different foreign donor organizations.

Close to two-thirds of the certified seeds were in 1986/87 sold directly from the factory go-down or TANSEED retail shop in Njombe town. This sale has been bought by individual peasants who have traveled by bus, lorry, bicycle, ox-cart or on foot to Njombe to buy seed for self-consumption. This large proportion of the supply of seeds is sold by TANSEED despite the fact that it does little or nothing to promote and market its products. The remaining half of the supply is largely distributed by the District Cooperative.

Progressive farmers prefer to buy their personal needs of hybrid seeds directly from the TANSEED go-down or retail shop, instead of waiting for the cooperative to bring it. They accept the extra trouble and cost of traveling to town to buy seed, as this is the only way in which they are certain to get their seed. Another explanation on the high proportion bought directly from the go-downs, is that farmers living in villages located close to Njombe can save the commission and transport fee charged by the Cooperatives.

There is a large differentiation in the distribution of seed among the primary cooperatives in Njombe District. The Njombe District Cooperative distributed 66 tons of seed during the 1986/87 season, so that all primary cooperatives at least received some seed. Most primary cooperatives received far from their actual needs.
The insecure, erratic and insufficient supply of seed through the cooperatives combined with an overall deficit production of seed, is likely to result in a social differentiation in access to seed. It is the progressive and well-off farmers who travel to Njombe to buy seed for their own need, along with farmers living close to town, that get the major part of the seeds available for Njombe. For the poor farmer situated in a remote village, the chances of getting access to hybrid seeds through the cooperative is poor and certainly very insecure.

The common strategy to follow for those farmers who do not have access to the limited supply of certified seed every year, is to cultivate second or later generation of hybrid seed combined with local composites. The hybrids will not only decrease considerably in yield (though the yield of a second generation hybrid may still be higher than for the local composites), also other genetic characteristics will deteriorate, such as its 'original' resistance to pests.

The use and dependency on hybrid maize in Njombe, where the seed supply and marketing conditions are far from sustainable, thus increase the vulnerability of food production.

The appropriateness of hybrid maize for peasant production in semi-arid areas of Njombe District

The hybrid maize seed used in the Southern Highlands is developed in either Kitale Agricultural Research Centre in Kenya or at TANWAT in Njombe. Both institutions are located in areas with long rainy seasons and reliable and sufficient rain pattern. The three hybrid varieties available and suitable for the Southern Highlands (see section 3.1) were all developed to take full advantage of the long rainy season and no hybrid varieties were therefore developed for less potential areas with shorter and less reliable rain patterns. The research agronomist at TANWAT explained as follows:

For developing new varieties the Government Research Institutions are responsible, and if we develop our new varieties, we just do it in the interest of commerce—we want better yielding... The H6302 was developed here and nothing else has come from Government in terms of hybrid maize.14

The priorities of research and development which have gone into the hybrid maize varieties available to the farmers in the Southern Highlands are adapted to benefit large-scale commercial farms in high potential areas. This has serious consequences for the adaptability of the hybrid varieties to peasant resource conditions.

The prime reason for adopting hybrid seeds, is that they potentially out-yield the local varieties by a factor of two to four. Since hybrid maize
Esbern Friis-Hansen

is the most advantageous cash crop (and in many locations the only cash crop), its diffusion has extended into the semi-dry areas which it was not bred for, given its long season of growth. The use of hybrid maize in the semi-dry areas has increased the risk for crop failure and thus increased the vulnerability of food production.

The increased response to mineral fertilizers by the hybrid seed are given as the explanation by the farmers interviewed, on why they shift to use of hybrids from the more drought-tolerant local varieties. A more coherent analysis may be that the long-term benefits in terms of higher yields exceed the occasional drought induced losses. The hybrid variety used in the semi-dry areas of Njombe is usually H 614, which takes 170 days from planting to maturity, or approximately the duration of the rainy season in the "medium dry intermediate agro-ecological zone". Even if the hybrid is optimally planted in the very start of the rainy season, the cultivation is still related with considerable risk because of occasional periods of deficient supply of water. These dry spells occur when the potential evapotranspiration exceeds the actual rainfall. A survey conducted in Ngamanga Village in the 1984-85 season concludes:

The variations in yield with time of planting are considerably higher for the hybrid than for the local seeds. Late planting of hybrid maize gives lower yields than local maize. The hybrid maize is in other words more vulnerable to variations in the rain pattern than the local varieties. In order to secure at least some production if the rain fails, the peasants have deliberately not fully adopted use of the hybrid maize. This is part of a strategy of production which combines a 'high risk but high yields' strategy with a 'high security but not maximum yields' strategy. Because of the higher risk for crop failure using hybrid maize, the peasants of Ngamanga continue to grow some local maize to ensure some food security.\(^{15}\)

The lower drought tolerance of hybrid compared with local composites, is not only a question of the period of maturity, but it has also to do with ability to survive dry spells during the rainy season. Even though tall strong plants need more water than low plants, this question properly relates more to the method of cultivation applied than to genetics. Local composites are f.ex. most often intercropped which is known to reduce the actual evapotranspiration, while hybrids f.ex. more often are applied mineral fertilizers which may have damaging effects during dry spells.

ENVIRONMENTAL SUSTAINABILITY OF MAIZE PRODUCTION

Land degradation

Soils are sensitive to structural degradation under continuous cropping and use of agricultural tools. Large areas, especially those located close to the village settlements, have been cultivated continuously for 10 to 15
years. In most of Njombe, maize has been the dominating crop cultivated year after year, and thus not rotated with other crops. Since no organic material is replaced when mineral fertilizers are used continuously, the soil structure is deteriorating. Lowering the content of organic material in the soil reduces its nutrient holding capacity. In the typical sandy loams of Njombe District, this implies that an increasing amount of the mineral fertilizer applied to the fields will be leached and thus not obtained as nutrients by the maize plants.

At TANWAT, routine soil analyses have been carried out on the soil types for Ph, available phosphorus and organic carbon determination. Although soil analysis has mainly consisted of bulking samples from large sampling blocks to provide general information about large areas, a certain amount of analytical work has been done concerning variations within these large areas. Direct comparisons have been made between bedrock derived soils and volcanic ash derived soils, and results suggest that the poor soil areas do represent areas of bedrock derived soils.

Continuous cropping, without cultural practices which maintain organic matter in the soil, may result in a significant decrease in the soil’s organic matter. The organic matter on TANWAT soils have declined 15% over a 16 year period (1970:3.3%, 1986:2.8%) for low fertility soils. For high fertility soils, organic matter declined 46% over the same 16 years period (1970: 5.8%, 1986: 3.1%).

It is not easy for farmers to assess the effect of declining soil structure in terms of household production, since yields depend on a large number of other factors as well. Despite the difficulties, we asked a group of peasants in Itulike village, located in a wet and high potential area of Njombe District, to do so. After some discussion they agreed on an estimated reduction in the average yield from 15 to 8 bags per acre since villagization, for fields cultivated continuously with maize and with a rate of application of two bags of mineral fertilizer (TSP/Urea) and 10 kg of hybrid seeds per acre. Progressive farmers have increased the rate of application of fertilizers from 2 to 4 bags per acre in order to maintain the previous yields.

To determine the deterioration in soil structure we measured the content of organic matter on two fields of sandy loams which border on each other, but with different farming systems. The first field had been in extensive fallow rotation and only cultivated three years since villagization. The organic content was approximately 3.5% in an A-horizon measuring 40 cm. The second field had been cultivated continuously since villagization and the organic content was approximately 2.0% in an A-horizon on 40 cm. Assuming that the fields were in similar condition (both under extensive fallow rotation) before villagization, the rate of deterioration between the two methods of cultivation is approximately 0.1% yearly.
In Nyumberanitu village, located in the semi-dry area of Njombe District, two neighbouring fields of sandy loam with an A-horizon of 40 cm were compared. Both fields were cultivated continuously with hybrid maize and applied with fertilizer since villagization, but the second field (estimated one acre) received an additional application of organic manure from two oxen and one pig. The content of organic matter was determined to approximate 0.4% on the first field and 2.8% on the second. Yet another field was measured, in order to confirm the very low level of organic matter found on the first field. This field was cultivated continuously for 6 years with no organic manure applied. The content of organic matter was measured to approximate 0.5%. When peasants that follow the advice of the extension service and cultivate continuously with no crop rotation or additional application of organic manure, the result is a rapid deterioration of the soil structure and in the foreseeable future a transformation of arable land into sand.

At many places in the semi-dry parts of Njombe District, dominated by sandy loams, soils have well developed plough pans which affect root development, and which again affect soil aeration and water infiltration.

Peasant adaptation strategy to combat soil degradation.

A build-up of organic matter from the natural decomposition of litter, roots or direct application of farmyard manure and compost, might ameliorate the physical and thus the plant growing conditions of the soils in these areas.

For sustained crop production, crop practices such as rotation between maize and other crops are essential. Finally, incorporation of crop residues into the soil and inclusion of leguminous crops in the cropping system as green manure, should have a positive effect.

It is common knowledge in the villages that mineral fertilizer alone is insufficient to regenerate soil fertility. A number of resource constraints limit the availability of manure for most peasants, and this is the major reason why the process of degradation has been allowed to develop as far as is the case for Njombe. In the following, we will briefly examine these constraints.

Both in Ilunda and Ngamanga villages, farmers who own livestock apply farmyard manure as a supplement to mineral fertilizer. Transport of the manure is a major constraint for application on distant fields and use of manure is therefore limited to fields located in the vicinity of the household. Only three of the richest peasants in Ilunda village own ox-carts with pneumatic tyres and average owners of oxen solve the transport problem by using a simple wooden sledge. The fact that only few households own more than two oxen is another constraint for applying
sufficient manure to maintain the soil structure, since only very limited quantities are available. Finally, it can be added that the effectiveness of applying manure could be considerably improved by compostation but here, knowledge of the technique seems to be the bottle-neck.

BIBLIOGRAPHY


EEC 1987. The Tanzanian seed industry, Brussels, EEC.


SADCC 1988. *Regional seed production and supply project - Tanzania*, Copenhagen, DANAGRO.


NOTES

1. The research project was undertaken by the Centre for Development Research, Copenhagen. See for instance Esbern Friis-Hansen: Seeds of Wealth, Seeds of Risk? - Vulnerability of Hybrid Maize Production in the Southern Highlands of Tanzania, (CDR Project Paper A 88.3, Copenhagen 1989).


5. The genetic base for local varieties thus dates some 50-100 years back and their potential yield is 2-4 times less than the high yielding varieties existing today.

6. This practice of sequence-planting has unintentionally increased genetic erosion as it made the periods of flowering for the long season hybrids and the short season local composite overlap.


9. The hybrids demand high levels of nitrogen to produce high yields, but the exchange relation between plant mutants and grain are among 'good' farmers likely to be higher than that of the local varieties. Personal communication with EEC mission of the Tanzania seed industry, August 1987.

10. The porridge would be of higher nutrition value if the husk was milled along with the kernel, as in the commercial maize flour, but people have generally preference for the white flour.


17. During the village survey 1987, the organic matter content of similar soils, but different cropping pattern were measured. The estimate of -0.1% decline in organic matter come from comparing fields (of similar soils) under continuous cultivation since villagization in 1974 with fields not cultivated since villagization. The difference in organic matter was divided with the timespan of different cultivation practice.
Agro-Pastoral Production Systems and the Problem of Resource Management

Leif Manger

PERSPECTIVES ON AFRICAN AGRICULTURE

The African agricultural crisis relates to the inability of African farmers to produce enough food for an increasing rural and urban population. This part of the African crisis has become a major issue in contemporary development debates on Africa, often leading on to a more general discussion about the problem of how societies can achieve agricultural growth in general, i.e. the discussion of intensification of agriculture.

Although the literature on agricultural intensification is quite substantial (see e.g. Geertz 1963, Boserup 1965, Netting 1968, 1974, Brookfield 1972, Barlett 1980, Burnham 1980, Burton and White 1984, Dow 1985) there is no common definition of what intensification means. It has been used to denote production systems using plough or irrigation techniques, but also for systems in which methods like terracing, green manuring, use of animal manure, transplanting and use of animal traction are being used. Boserup (op.cit.) uses the concept for the shortening of fallow periods by any method, and Burton and White (op.cit.) use it for any process that increases yield per hectare. I shall not dwell on any of these definitions, they all point at important processes in the development of intensive production systems. Summing up with Burton and White we may say, however, that if we hold land as a constant, agricultural intensification is a result of labour intensification, capital intensification or technological change.

One view of why African agriculture lacks such intensification is that it lacks technological development. An example of this view is found in Jack Goody’s “Technology, tradition and the state in Africa” in which Goody concludes that Africa failed to match “the developments in productivity and skill, stratification and specialization, that marked the agrarian societies of early medieval Europe” because Africa lacked a Feudal, “intermediate” technology, based on the wheel and plough. This lack is according to Goody “of critical importance in the developments of the present day” (see Goody 1971:76). This is so because among the effects the plough has are 1) it increases the area of land cultivated by a person, thus makes possible a rise in productivity, 2) it stimulates the move to fixed holdings,
away from shifting agriculture, and 3) it increases the value of arable land. An important developmental implication of this view is that the extensive agricultural systems so common on the African savanna are regarded as a problem for development. A lot of development effort has therefore been directed towards developing alternative systems which are not based on innovations of the farmers but rather on inputs based on scientific advances. Such alternative systems have consisted of technological packages like mechanization and irrigation agriculture or biological packages containing fertilizer or new crop varieties, assuming that African agriculture is underdeveloped and that Africa has been unable to move to higher levels of agricultural technologies.

Against this view of the shifting cultivation techniques in Africa Paul Richards (1983,1985,1986) argues that this type of cultivation is a resource for development and that views as mentioned above represent "evolutionary" misconceptions about indigenous African agriculture. Against this Richards maintains that "agricultural development programmes should put aside 'evolutionary' assumptions when dealing with unfamiliar agricultural practices, seek out the principles upon which these practises are based, and aim to assist further development of their implications." (1985:43) Agricultural practices like mulching, ridging, heaping, tilling and intercropping that are so typical of African cultivation systems should thus be regarded as practices with a development potential, and that the knowledge African farmers have about such practices should be made relevant for such developments. To seek intensification by building on local practices and knowledge would be more fruitful than depicting African agriculture as backward, or emphasise the low level of development of productive forces.

Much of this discussion relates to Esther Boserup's thesis (1965) about the evolution of farming systems. Based on historical experiences around the world she argues that population growth and increasing population density inevitably lead to improved levels of technology. Increased density leads to intensification of land use, mainly through a shortening of fallow periods, which in turn leads to soil degradation and to conditions favourable to changes in technology, such as a shift from hoe to plow. The change in technology reverses the tendency towards declining yields due to soil degradation. Shorter fallow periods also makes it possible to cultivate more land and the total output can increase. Thus, according to this influential thesis, through increasing pressure on resources there are built-in, farmer generated, mechanisms for agricultural intensification.

Richards is also sceptical to this position and the way it makes use of Boserup's thesis. His main problem is not with farmer induced innovation but with what he calls the underlying evolutionary assumption of her arguments. Boserup's cultural evolutionist perspective, combined with a marginalist argument about labour productivity, lead to the evolutionist
assumption that farming systems have developed in stages, from forest fallow through bush and grass fallow to mixed farming and annual cropping (Richards 1983:4-6). Richards claims that what is needed is not an evolutionary "stage approach" but rather a "systems approach" through which one can see how people have been combining agricultural techniques, some of which have been intensive in character, others extensive. People have been moving back and forth along this continuum depending on other factors, particularly the one of risk aversion (ibid:5), as Richards' examples from West African agriculture show. There the farmers' combination of upland shifting cultivation, valley bottom flood-retreat cultivation, animal keeping and hunting and gathering must be seen as risk spreading devices and adaptations that utilize seasonal variability and labour availability. Such organizational complexity should not be reduced to universalist labels like shifting cultivation or intensive agriculture.

THE ARGUMENT OF THIS PAPER

My position in this paper is that the tendency to put up the two positions as mutually excluding alternatives is an unhappy one as each one has merits that the other does not have and thus have important contributions to ongoing development thinking. I agree to Richards criticism of the first position's lack of appreciation of existing agricultural knowledge in Africa as well as it's perspective of agricultural development as a process of developmental stages insisting that we need a systems approach in which other factors than the technological ones are made relevant. I think however that Richards insistence on agrarian populism in which local knowledge and solutions are emphasised become problematical when one follows his general prescription for systems analysis. This is so because local cultivation systems, when seen in a context of population increase, ongoing commercialization and being squeezed by public policies (be they on pricing of agricultural products or allocating land to schemes) may not be viable in such a "systems context" whatever use one makes of available local knowledge.

Concentrating on agro-pastoral integration in Africa I shall pursue these points by discussing how environmentally sound practices develop and change in different contexts. Domestic animals have always been important for African farming systems and the links between animals and land have important implications for soil productivity and thus represent examples of ecologically sound practices that, according to Richards, should be understood and developed further. However, my conclusions about the future for indigenous practices shall be a bit more pessimistic than Richards' "populist" view. This is not because the practices are problematic in themselves, but rather as stated above that when we look at the
practices in a wider context they might not be viable any longer. This is so because agricultural practices are specific combinations of technologies, types of crops and labour inputs that are viable within specific economic and socio-cultural contexts. They are also a result of resource control and systems of land tenure that touch on relations of power both within and between groups. They are also affected by market mechanisms as well as public policies. Finally, the emerging agricultural practices that develop over time must be seen within the context of population growth. We should not therefore look at agricultural practices, including the agricultural knowledge they are based on, in isolation but as they are emerging from the interplay between nature and the social, political and economic dynamics of an area. The empirical developments of agricultural practices in space and time will depend on the carrying capacity, i.e. soil types and quality and rainfall, of an area and we will of course expect regional differences to emerge. What I shall have to say in the following will thus apply to the Sudanic and the Sahel zones of Africa, and will depend in particular on my understanding of these processes from working in Western Sudan. But first a few more words on the perspective.

Since we are dealing with people’s use and reproduction of their assets, the concept of viability is central. A unit can persist only as far as it is able to reproduce itself, i.e. be viable. The same perspective can also be made use of in understanding the maintenance of total adaptive forms, or production systems. Reproductive activities at different levels take place within an environment that is structured by ecological, economic and political factors. Different production systems articulate with each other as participants in a regional economy. We need to know what institutions are there to mediate this contact, such as the market, or political institutions; and also whether such contact results in the emergence of dominant groups. Such an adaptive process may be shown in the following diagram, adopted from McCown et al. (1978: 321).
The authors give the following comment on the figure:

...behavioural solutions are selected with reference to how satisfactory they are as strategies of value maximization, given the preference and skills of the producers and the limitations imposed by the conditions under which they operate. The economic and political environments are of dominating importance in determining the viability of the chosen solution (A,B,N). These solutions have feedback effects on the economic environment, in the sense that they affect the scarcity of goods and services, and on the political environment, in the sense that they affect the distribution of power. The effects on the natural environment are long-term, and are manifested in decreasing return to land and labour. The structure of the cultivation system is of vital consequence for the kind of behavioural feedback this ecological change stimulates. The feedback may be positive, e.g. a response that reinforces the trend, or negative, e.g. a response that tends to reverse it. Feedback can be mediated by supply and demand mechanisms, by political mechanisms such as warfare or restrictions on the people’s access to resources, or by the mechanisms of learning, i.e. the cognitive reevaluation of the underlying cultural premises as their behavioural consequences are experienced. Such understanding of the strains on adaptation is a stimulus to change, but it is not effective unless people have the organizational opportunity to take action on the basis of their knowledge. (McCown et al. 1978:325).

One important aspect of this model is the fact that there are different types of viability in the different “environments.” What is a viable adaptation within one environment, e.g. the political, may not be viable within other environments. There may be internal contradictions. What was a viable adaptation on a political level, e.g. the pastoralists being stronger militarily than other groups, favoured certain economic forms which could not be sustained once the political context changed. The development away from pastoralism towards settlement and cultivation in the
area can thus only be understood when seen in such a wider context in which the dynamic interplay between a political and an economic level is taken into account. And furthermore, what has emerged as the dominant adaptive forms in the area, may certainly be a profitable way of using resources, but it may also prove to have negative effects on the natural environment. The effect on the natural environment by a certain adaptation is thus dependent on factors that may have nothing to do with agricultural practices or peoples ecological knowledge. It is in this broader understanding of "systems analysis" that I think some of Richards' populist conclusions become problematical.

THE PROBLEM OF AGRO-PASTORAL INTEGRATION

In Africa, in the Sahelian-Sudanian savannas, crop-livestock or agro-pastoral production systems denote land use systems in which animal husbandry and cropping exist either as divided activities pursued in different management units, but in geographical proximity and functional association, or as closely related activities within the same management unit, implying some sort of mixed farming (Allan 1965, Morgan and Pough 1969, McCown et al. 1979, Ruthenberg 1980, Jahnke 1982). Empirically, the first situation implies integration between ethnic groups. One of the characteristics of the adaptations on the savanna is that various ethnic groups have specialized in one productive system. There are camel nomads, cattle nomads and mixed farmers who combine crop production and the keeping of animals. These different adaptations contain different ethnic groups, and they are found throughout the entire savanna and sahelian belt (Stenning 1958, Cunnison 1966, Asad 1970, van Raay 1975). Apart from the situation in which livestock and cropping exist in different management units, belonging to different ethnic groups, there is also the problem of integration within the management unit itself, i.e. integration on the household level. On the savanna the productive units cultivate their crops in the rainy season, keeping a number of animals either close to where they live or send them on longer seasonal migrations. The potential links between the two types of activities can schematically be presented as below:
The nature of the agro-pastoral integration is what is contained in the different arrows of the figure and may be summarized in the following way

In agro-pastoral economies farming and stock raising form a dialectical unit, therefore one can be understood only in relation to the other. The economy is most effective when it can integrate the two modes of production by taking maximal advantage of the supportive elements and by reducing to a minimum the inconveniences resulting from conflicting factors. (Vincze, 1980:399.)

In the situation on the savanna in which this agro-pastoral integration is found in different management units there is an ecological integration going on between nomads and farmers in which the nomads on their migrations let their animals graze on the harvested fields of the sedentary farmers and thus having the positive environmental effect of manuring those fields. But at the same time there is also a resource competition in which relative political power of each group will decide access to land. Traditionally this has meant that pastoral groups have dominated sedentary ones, but with the coming of the nation states this relative advantage has changed and now the sedentary cultivators are extending their cultivation supported by the state. Finally, there is an exchange linkage between the two, in which pastoralists and farmers exchange products, either directly or on local and regional markets. People in the two systems can also make investments that cross the boundaries, pastoralists buying land or farmers investing in animals. Such investment patterns are also affected by public policies and incentives provided by the state. The
ecological linkage should not therefore be seen in isolation, but as it develops in the context of the other ones.

The same applies to the situation when we look at agro-pastoral integration within the same management unit. On the ecological level there may be positive effects of integrating land and animals by using plough or to use manure systematically. Again, however, the integration between the two activity systems may produce resource competition. Cultivated fields have to be protected against the animals, and units involved in agro-pastoralism always have to make decisions on whether land should be cultivated or left as grazing areas. Another competitive factor is seen on the level of labour usage. The ideal integration of farming and stock raising thus presupposes the use of intensive farming techniques (Vincze 1980). However, in societies like those we meet in the Sudan-Sahelian belt the cultivation of food crops (by crop rotation) that implies seasonal peaks of labour, leave no extra labour for the diversion of areas to fodder-crops, which is essential in a stable integralational system. The solution to this is the extensive system, in which labour is divided between cultivation and herding, a solution that only allows for a low degree of integration between land and herd. Stock is forced to seek food supply in open pastures, and only rarely are animals herded in a systematic way in order to manure certain areas. Unlike an intensive mixed farming system, in which this integration is systematized, the savanna displays an integration that is not well developed and in which the relation between herd and field is accidental rather than planned. Under such circumstances there is a need for fallow periods between cultivation periods. The length of such fallow periods will vary according to local variation in soil types and productivity as well as rainfall, types of crops etc. The general picture is however that the production systems on the savanna are extensive rather than intensive in their traditional forms.

A further note should also be added on the common organizational aspects of the savanna production systems. A general characteristic is that land is either free or communally owned, transferred through descent lines. Belonging to such groups can therefore secure automatic access to land for cultivation. Secondly, labour has been mostly based on household labour, supported by the communal work groups for peak agricultural activities. Livestock, however, has been privately owned and has been a commonly used investment target.

CHANGE PRODUCING FACTORS

According to Richards, the development potential of improving already existing practices like the ones sketched out above should be explored further. I think however, that his views on the possibility of finding
solutions to the food problem within African extensive cultivation systems does not give consideration to how viable such systems are under different types of contexts. In the following I shall discuss what impact such contexts have had on these practices.

**Population pressure**

The first factor to be considered is the population increase. As we said earlier about Esther Boserup’s thesis, which is also supported by more recent evaluations of evidence (e.g. Pingali and Binswanger 1984), history shows that farmer-based innovations are possible and that these examples also show the positive relationship between population density and intensity of farming, thus strengthening Boserup’s thesis. One important point is, however, that population growth during these historical developments were much lower than today. Continuing high fertility and reduced mortality has lead to an unprecedented post-war population increase of from two to four per cent. Looking at the West African Sahel region (for which I have information, World Bank 1985), the population was in 1980 about 31 million people, with an average density of six persons per square kilometer. In the year 2000 the population will be 75% higher, i.e. 54 million whereas in 1961 it was only 19 million. Urban populations are increasing by 5% per year. Estimates of carrying capacity for this region shows however that such a population can not be carried on the existing types of resources and existing production systems. Based on production combining cultivation and animal keeping the carrying capacity was set at 36 millions whereas if one includes peoples need for forestry products also the potential carrying capacity drops to 21 million. Regional variation should also be included in this picture. With contemporary rates of population growth farmers’ own methods of technology discovery and land-investments have not been sufficient to accommodate modern growth in demand. The Sahel-Sudanian zone is already over-utilized with its present population, and the soil qualities of that zone does not permit further intensification.

**Processes of commercialization**

With the increasing attachment to the money economy that has happened on the savanna (for the Sudan see e.g. Håland 1980, O’Brien 1978, Manger 1981) through cash crop production and labour migration the market link has increased in importance and is today a most important one, also producing impacts on the other links, especially the one related to ecology. The reasons for this are the following (see e.g. Håland 1980). As
the traditional savanna land use system is extensive in which no fodder crops are grown and land is not systematically manured, the land requires fallow periods in order to preserve productivity over time. Population increase will increase pressure on resources since the land is communally owned and people can not be excluded from the land. Traditionally there were checks on the size of area one could cultivate, primarily through limited possibilities for mobilizing labour. But with labour as a commodity people can expand their cultivated areas more drastically than before. With the building of systems of communication many areas have been brought closer to the market resulting in incentives for such an expansion of cultivation. Examples of this may be the expanding cultivation of groundnuts in Western Sudan after the bringing of the railway in the early 1960s. Land, however, is in most places still communal and not a general commodity. In such circumstances animals become one of the main investment targets, and their numbers increase faster than ever. The general situation is therefore: expanding cultivation due to population increase and commercialization, increasing animal numbers on decreasing areas of land. Given the adaptational techniques pointed out above the only solution to this general development is to reduce the length of fallow periods.

This particular process of intensification has not resulted in the introduction of farmer initiated new technology, or of improved land management techniques that could counteract the negative environmental effects. Rather, the result of this ever-increasing pressure on the land is declining carrying capacity and a process of desertification (e.g. Mustafa Babiker 1988; Håland 1980, Manger 1981) Rather than getting new technology, or improved agricultural techniques the general pattern is one of involution, in which an increasing population must work harder to maintain the product they need for their survival. Thus, one of the major problems faced by the savanna population today is that of environmental degradation, and this again is related to the ways agro-pastoral communities are organized internally, especially in relation to the integration between livestock and cultivation, and how these internal problems are related to people’s involvement in modern economic activities and population pressure.

The environmental effect of these processes will of course vary with regional variations in soil types, vegetation and rainfall. Going back to the West African Sahel we have said that the Sahelian-Sudanian zone is already overexploited and in the process of degradation. Also in the Sudan-Guinean zone to the south, with better soils and rainfall, the process is appearing. People cultivate using traditional techniques, and they have no incentive to intensify their cultivation. Due to lower population pressure in this zone they can solve their problem by expanding area of cultivation (World Bank 1985). The same pattern is
found in Western Sudan. On the sandy soils of Northern Kordofan, around El Obeid, 37% of the arable land is being cultivated. FAO estimates that given soil and weather characteristics only about 20% should be cultivated. Fallow periods have thus been reduced from 15-20 years to about 4-10 years. The result is depletion of soil fertility due to overcultivation, leading to yield declines. Also in South Kordofan, in the Nuba Mountains there is an increase in cropping period and a decrease in fallow. Here, on the more fertile clay soils, this has not yet reached the point where yields are declining. Although such soils would be suitable for the introduction of more intensive technologies this happens to a very limited extent. We shall return to this point, only end here by saying that also in this region farmers have no incentive to do so.

In drought periods, such as the Sahelian drought in the 70s and the African crisis in the 80s, this state of affairs led to human disaster (Swift 1977, Timberlake 1985). The problem also exists under less dramatic circumstances, and it presents the governments of the savanna nations with the most crucial planning problems: how can production systems be organized in such a way that they provide people with the possibility of reproducing themselves, at the same time being sensitive enough to react to declining yields in a way that leaves the productive base intact. From our discussion so far it seems that local innovations by people may not solve the problem. The introduction of technological changes may be necessary. Secondly, and most importantly it seems that also other factors need to be changed. These include organizational changes in land tenancy arrangements and labour use, and the development of markets for new inputs (such as fertilizers, ploughs and draft animals) as well as old inputs that are now becoming scarce (i.e. land and labour) (for discussions on this see Birdsell n.d., Ho 1984. Also Hayami and Ruttan 1972,Binswanger and Ruttan 1978; quoted from Pingali and Binswanger, ibid).

**EARLY INTENSIFICATION**

When trying to find solutions to the above problems we do well in consulting indigenous African examples of societies that have managed those changes. There are cases of certain areas in which adaptations have developed that have enabled people to maintain themselves within a fixed area over long periods, thus having solved the problems of resource maintenance. Examples are found in the Ukara Island (Ludwig 1968), the Cameroon Highlands (Allan 1965, Burnham 1980), the Jos Plateau (Netting 1968) and the Kano Closed Settled Zone (KCSZ) (Hill 1977). In addition there are the Sudanese cases of the Kheiran Area (Manger 1981, 1987), the Nuba Mountains (Nadel 1942, Roden 1972, Manger 1987,1988)
and the Jebel Marra (Allan *op. cit.*). In these places we find agricultural systems that show a higher level of integration between the pastoral and agricultural sector than what we have described for the extensive savanna systems. These intensive systems have shown a higher degree of stability since productivity is preserved on a satisfactory level. In principle then, such systems can serve as examples of a way out of the rather disastrous situation on the African savanna. And a major advantage is of course that they represent systems that have developed in a "traditional" African context. An effort should therefore be put into understanding how these systems came about and how they are being maintained.

A very important lesson from these systems is that they seem to have developed alternative systems of land tenure from the extensive ones. Land in these systems is often transferred by inheritance, not through descent lines as was the case with the extensive one. Such a "privatization" led over time to smaller plots that had to be worked more intensively in order to keep up production. Rules of inheritance that allowed for the transfer of plots from relatives both on the father's side and the mother's side made it possible for any individual however to get land from a wide range of relatives, thus providing a pragmatic solution to land access. (Nadel 1947, Goodenough 1955, Manger 1987, 88).

On the level of cultivation techniques one characteristic of such systems is the use of *animals*. (e.g. Allan 1965, Morgan and Pough 1969, MacCown *et. al.* 1979, Ruthenberg 1980, Vincze 1980, Jahnke 1982.) We have shown that in the traditional savanna adaptations there is a low degree of integration between crop farming and animal keeping, and that the relation between the two is accidental rather than planned. Thus pastoral nomads migrate in areas with cultivation but only in a few cases do we see any conscious attempts to regulate movements so as to maximise the fertilizing effect on land. Similarly, animals kept by cultivators are rarely used to benefit cultivation. In more intensive systems this link has developed further, and animals are used for traction, manure may be systematically applied and fodder might be grown. In such systems the animals are used in a purposeful way creating a more complex system of inter-relationships than what is commonly found on the African savanna. There is thus a complementary relationship between field and herd. However, the relationship may also be one of competition, e.g. when traditional pasture is reduced by expanding cultivation, or when the keeping of animals and agricultural work put strains on the labour force of a household. This leads us to a key point about such systems; that more labour has to be put into their maintenance, than is the case with the more extensive ones. Because of this fact no mixed farming system seems to develop without any form of pressure on the traditional system.

We now assume that populations will adopt the system which offers the best average return for their inputs consistent with the principle of least effort: since a
shift to a higher technology involves additional effort, at least initially, and will always involve difficult reorganization through the need to fit more pieces into a system of constant size, we may also assume that the simpler choices will be selected first, and that movement up the hierarchy will encounter increasing resistance. (Brookfield 1972:34-35.)

Judging from the African experience this labour argument seems to be of importance to the development of intensive systems. The extensive system is characterised by high return to labour and low return to land. Any intensification increasing productivity from land is paid for by decreasing marginal returns to labour, and people will not enter into such a situation without being exposed to some kind of pressure. One type of pressure is the demographic one, as argued by Boserup. Through population increase, and lack of possibilities for out-migration, a situation develops in which people have to give priority to increasing productivity from the land and take less notice of labour productivity. The argument is valid on a general level, but it can not by itself explain the empirical situation in Africa. There the general situation is characterised by rather low population density and the people have to a large extend had access to new land. The fact that certain areas developed higher population densities than others can not be explained by general population increase but has to be seen in a historical-political context. The areas mentioned above were all, except the KCSZ-zone, refuge areas for populations that were threatened by slave raids and who lived in general insecurity due to stronger neighbours. There are thus specific historical developments that have brought about these adaptations, involving relationships between groups of unequal military strength and also the position of the various groups within the pre-colonial savanna states. One example that indicates the importance of the above factors is that of the Kofyar and the Tiv in Nigeria’s central belt. The two groups are neighbours and were exposed to similar external influences and pressures, but whereas the Kofyar reacted to pressure on the resources by intensifying agricultural practices, the Tiv, due to their segmentary organization and military strength, solved the problem by expanding their territory. (Burnham 1980.)

The situation on the savanna is today different. One major factor contributing to this is the general pacification of the areas. The states can now guarantee the safety of the inhabitants, and groups, like the Nuba, can move into areas in which they can start a more expansive cultivation again (Roden 1972). The present trend is therefore for the intensive systems to be left and for people to move into a more extensive system as described earlier. The above discussion of the intensive production systems gives us the clue to why this is preferred by the people, one major factor being the use of labour.
INTENSIFICATION THROUGH "DEVELOPMENT"

We know from the development experience that governments and agencies have tried to change production systems by introducing new technologies. But the results from all these projects have been disappointing. Whether the new technology has been tractors or oxploughs, or consisted of "Green Revolution packages" people have only to a limited extent participated in the new development schemes and only to a limited extent has the new technology solved the integrational problems in crop-livestock systems. The following table gives an expression of the fate of the technological packages.

Table 1. *The Importance of Animal Draught, Tractors and Hand Labour in Meeting the Labour Requirements of Crop Agriculture in Lowland Tropical Africa 1975. (Jahnke 1982:125)*

<table>
<thead>
<tr>
<th>Labour Region</th>
<th>Draught share (%)</th>
<th>Tractor share (%)</th>
<th>Hand share (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western/Central</td>
<td>4.1</td>
<td>4.8</td>
<td>91.9</td>
</tr>
<tr>
<td>Eastern/Southern (excl. Ethiopia)</td>
<td>13.1</td>
<td>10.9</td>
<td>76.0</td>
</tr>
<tr>
<td>Total (excl. Ethiopia)</td>
<td>9.9</td>
<td>7.9</td>
<td>82.2</td>
</tr>
</tbody>
</table>

This table indicates that little has been achieved in changing the existing production systems, and that traditional methods and adaptations are still dominant. This is particularly true for our areas within the Sahelian-Sudanian zones. For ordinary farmers then, a solution still has to be found in order to involve them in development. We know that they are involved in modern activities through cash crop cultivation and wage labour, but we have also seen that this involvement has not transformed local production systems. People find themselves in a dual economy situation in which they do not participate fully in the modern economic pursuits that bring the highest returns, a situation which help broaden the income gap between the traditional and modern sectors. Similar results can be found when looking into the fate of projects introducing new crop varieties or fertilizers, what is called "the Asian Solution" (see e.g. Richards 1986).

This lack of success has lead to a strong disillusion with technology transfer models. People now argue for the ecological and regional speci-
ficity of agricultural development problems, and the need to mobilize local initiatives in solving these problems, i.e. the "farmer-first-and-last" approach (ibid:1). But as I have tried to argue, the development experiences of traditional methods and farmer based innovation also makes dismal reading. There are many exceptions to this but the question is whether such local cases of change happen quickly enough, and are replicable on a scale that can affect the overall production crisis in Africa. My feeling is that we have no choice other than continue searching for ways to introduce such technologies. Not for their own sake but to improve productivity in African agriculture.

One problem is then how to move from hoe to plough agriculture. The plough could help improve labour efficiency and restore soil fertility on the savannas. Then why is it not taken on? True, there are areas like the sandy plains of North Kordofan where soil qualities reduce the gains from such a technology transfer. But what about the Nuba Mountains? There, on the clay plains the gains could be considerable, but still people are reluctant. M.A. Mohamed Salih (M.A. Mohamed Salih 1987) has shown that this can partly be explained by development policies favouring tractors, a technology which needs much more capital and much more organisational skills to benefit from than a plough. More recent projects trying to introduce the plough can show some success, for instance an increase in cultivated areas by about 80% as well as reducing labour input per unit area (ibid:119). The plough, and draft animals, also fit into the agro-pastoral system. People's willingness to take on such a technology may therefore depend less on local factors and more on external factors deciding the cost of the technology. The immediate problem is the overhead costs of the new technology, i.e. the cost of draft animals, including training them, feeding and maintaining them through the year, and the cost of land clearance. These are partly costs that need capital, but also labour input. And it is the increased labour input which may provide the biggest hindrance. This is so as long as there is land available for expanding areas of cultivation, rather than intensifying within a given area. This problem may again be solved through institutional changes like leaving communal access to land for a more private access. Another problem is the building up of support systems for the new technologies, like small scale craft-industry to supply or repair ploughs etc. A major problem in the attempts at intensification through technological change has been that they have introduced ill-adapted technologies and that they are tied up to political and economic interests that lead to inputs that require import of input-factors. By using national political power to protect the development of local innovations and entrepreneurs in these sectors may prove to have important long term effects.

The second option for agricultural development is the biological packages from the Green Revolution institutes and this type of technology
put a different set of problems for development. Chemical inputs like fertilizers, pesticides and herbicides will not be attractive to farmers if they are too expensive or if they do not fit local conditions. But a larger problem in the long term is the lack of local research and training institutions. Chemical innovation does not come through local innovators but rather in the big, capital demanding laboratories. But the usefulness of this type of technological development is of course dependent on local factors. And among such local factors are not only skills or capital available among local farmers, but also agricultural research institutions that can transform high-tech. solutions into local environments.

In both cases of science based agricultural change the role of government will be crucial. No country has been able to benefit from such technologies without having an agricultural research system capable of doing both basic and applied research. Donors would do well to support such systems alongside their attempts at directly transforming local production systems.

In conclusion we may then return to our introduction in which two views on African agriculture was presented. One interesting dimension of this academic difference is that they serve as underpinners of development strategies. The first position, focusing on the lack of technological development is common in World Bank documents and lead to a rush for technological change. The second, populist one, seem to lead to an NGO view on development, i.e. that the solutions are there in the local community and if we know the local conditions well enough we can solve the problem. I have put myself in an “in-between” position which may be dull, but which I think is necessary in order to avoid ending in oversimplified solutions. The question is not whether Africa needs more effective technologies in agriculture. Particularly in the long run in order to reduce the part of the population engaged in agriculture in order to develop other sectors of the economies. On the other hand, I do not believe that simple technology-transfer is sufficient. The local dimension is crucial. Not only local farmers’ knowledge and practices, but also local institutions and local policies that should provide the context in which new solutions should be made to work. My basic position is then that there is no short-cut to progress in the sense that there exist short-cuts bypassing local constraints and contexts. The only viable long-term solution is therefore a situation in which the countries and their inhabitants themselves handle the problems. In the aid environment in which discussions like the one presented in this paper thrive this seems to be less and less the case.
BIBLIOGRAPHY

Cunnison, J. 1966. *Baggara Arabs*
Hunting Technical Services Ltd. 1980. *South Kordofan Central Districts Indicative Development Plan*.
Leif Manger


- 1986 Coping With Hunger.

Roden, D. 1972. "Down Migration in the Moro Hills of Southern Kordofan", in SNR, LIII.


List of Contributors

Mette Bovin, Social Anthropologist, Institute of Anthropology, Frederiksholms Kanal 4, DK-1220 Copenhagen K, Denmark.

Anders Hjort af Ornäs, Social Anthropologist, Scandinavian Institute of African Studies, P.O.Box 1703, S-751 47 Uppsala, Sweden.

Esbern Friis-Hansen, Geographer, Center for Development Research, Ny Kongensgade 9, DK-1472 Copenhagen K, Denmark.

Vesa Matti Loiske, Geographer, Department of Human Geography, University of Stockholm, S-106 91 Stockholm, Sweden.

Leif Manger, Social Anthropologist, Centre for Development Studies, Strømgaten 54, N-5007 Bergen, Norway.

Tuomo Melasuo, Political Scientist, Tampere Peace Research Institute, P.O. Box 447, SF-33101 Tampere, Finland.

Mohamed M.A. Salih, Social Anthropologist, Scandinavian Institute of African Studies, P.O. Box 1703, S-751 47 Uppsala, Sweden.

Michael Whyte, Social Anthropologist, Institute of Ethnology and Anthropology, Fredriksholms Kanal 4, DK-1220 Copenhagen, Denmark.