

# Access to water, pastoral resource management and pastoralists' livelihoods

Lessons learned from water development in selected areas of Eastern Africa (Kenya, Ethiopia, Somalia)



Nathalie Gomes

2006



**FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS**

**Livelihood Support Programme (LSP)**

An inter-departmental programme for improving support for enhancing livelihoods of the rural poor.



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This paper was prepared under contract with the Food and Agriculture Organization of the United Nations (FAO). The positions and opinions presented are those of the author alone, and are not intended to represent the views of FAO.

## The Livelihood Support Programme

The Livelihood Support Programme (LSP) evolved from the belief that FAO could have a greater impact on reducing poverty and food insecurity, if its wealth of talent and experience were integrated into a more flexible and demand-responsive team approach.

The LSP works through teams of FAO staff members, who are attracted to specific themes being worked on in a sustainable livelihoods context. These cross-departmental and cross-disciplinary teams act to integrate sustainable livelihoods principles in FAO's work, at headquarters and in the field. These approaches build on experiences within FAO and other development agencies.

The programme is functioning as a testing ground for both team approaches and sustainable livelihoods principles.

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## Access to natural resources sub-programme

Access by the poor to natural resources (land, forests, water, fisheries, pastures, etc.), is essential for sustainable poverty reduction. The livelihoods of rural people without access, or with very limited access to natural resources are vulnerable because they have difficulty in obtaining food, accumulating other assets, and recuperating after natural or market shocks or misfortunes.

The main goal of this sub-programme is to build stakeholder capacity to improve poor people's access to natural resources through the application of sustainable livelihood approaches. The sub-programme is working in the following thematic areas:

1. *Sustainable livelihood approaches in the context of access to different natural resources*
2. *Access to natural resources and making rights real*
3. *Livelihoods and access to natural resources in a rapidly changing world*

Water development in the African pastoral dry lands of Africa has always been a priority for humanitarian and development agencies and for governments. However, over the last decades, scientists have become increasingly concerned about the numerous adverse unforeseen effects of water policies. This study, based on a literature review and field experiences among the Somali pastoralists in North-eastern Kenya, North-eastern Ethiopia and Southern Somalia, analyses the causes and effects of the growth of permanent water points on the livelihoods of the herders and identifies some of the best preventive and mitigating practices.

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## Abbreviations and Acronyms

ACF	Action Against Hunger
AEA	Annual Environmental Audit
ALRMP	Arid Lands Resources Management Programme
ASALP	Arid and Semi Arid Land Programme
CAP	Community Action Plan
CDA	Coast Development Authority
CEFA	Somalia European Committee for Agricultural Training
EMCA	Environmental Management and Coordination Act
EIA	Environmental Impact Assessment
ENNDA	Ewaso Nyero North Development Authority
ENSDA	Ewas Nyero South Development Authority
DFID	Department of Foreign and International Development
DNPSDASLK	Draft National Policy for the Sustainable Development of the Arid and Semi-Arid Lands of Kenya
DSG	District Steering Group
ENSRS	Ethiopian National Somali Regional State
GTZ	German Agency for Technical Assistance
IDPs	Internal Displaced Peoples
ICRC	International Committee of the Red Cross
IFRA	French Institute for Research in Africa
IUCN	International Union for Conservation of Nature
IWM	Integrated Water Management
KANU	Kenya African National Union
KVDA	Kerio Valley Development Authority
LBDA	Lake Basin Development Authority
MOLD	Ministry of Livestock Development
MOWD	Ministry of Water Development
MSF-B	Doctors without Borders
NEMA	National Environmental Management Authority
NGO	Non Governmental Organization
SACB	Somali Aid and Coordination Body
SALF	Somali and Abo Liberation Front
SNM	Somali National Movement
OLF	Ogaden Liberation Front
OXFAM-GB	OXFAM Great Britain
PIC	Participatory Integrated Community Development
SNWP	Somali National Water Policy
SWALIM	Somali Water and Land Information Management
TARDA	Tana and Athi River Development Authority
UNHCR	United Nations High Commission for Refugees
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WASDA	Wajir South Development Association
WESCOORD	Water Sector Coordination (Kenya)
WDWSAM	Wajir District Water Sources Assessment and Mapping
WHO	World Health Organization
WSLF	Western Somali Liberation Front
WSISC	Water, Sanitation and Infrastructure Committee
WUA	Water Users Association

## 1. INTRODUCTION

This paper represents part of an area of work which analyses the linkages between rights to land and water. An initial scoping paper explored the interface between land and water rights (LSP Working Paper 10: Hodgson, S. (2004). “Land and water – the rights interface”). It is complemented by two regional analyses: this Working Paper and LSP Working Paper 25: IIED. (2006). “Land and water rights in the Sahel: Tenure challenges of improving access to water for agriculture”.

Water development in pastoral dry lands of Africa has always been a priority for humanitarian and development agencies and for governments. However, over the last decades, experts have raised an increasing concern about its numerous adverse effects as illustrated below.

Thébault (1990:25)

*“The pastoral hydraulic is seriously contested by the donors, more and more reluctant to develop infrastructures which are potential sources of problems, and by the Sahelian governments who revise their strategies in this sector.”*

Prior (1994:31- 45)

*“Water source developers have repeatedly ignored the sociological significance of water and its critical influence upon pastorals decision making. Often, this lack of understanding has resulted in bloody and fatal conflicts, destruction of pumping equipments and the degradation of the surrounding land.*

*“While there has been a gradual, though belated, recognition among policy-makers of the environmental folly in indiscriminate development of permanent watering points, development agencies continue to be attracted to this form of intervention.”*

Scoones (1994: 35)

*“Water development should continue to be a priority in areas where water is a limiting factor (...) However, the development of water points should be carefully planned in terms of density (risk of irreversible degradation, loss of eco-system resilience) and in terms of access to tenure of resources and changes to these which may be induced by the new development.”*

Bruce & Mearns (2002: 15)

*“The literature is replete with examples of misguided World Bank and other donors support projects. Examples include borehole development in Botswana and group ranches in Kenya, both of which have exacerbated conflict over resources and contributed to elite capture of higher-value, better-watered land, uncontrolled privatisation of common pastures and severe environmental degradation.”*

### ***Trends and missing links***

Pastoralists' access to water, for both human and animal consumption, is a major element of their livelihoods and of the management of pastoral natural resources (water, pasture, land, trees). It is basically determined by infrastructure/investments and technologies (for physical control of and access to water) on one hand, and by institutions (rules in use, power relationships, cooperation/coordination, and/or competition) on the other.

It has been observed that change in water tenure (i.e. water rights) and in the concrete physical control of access to water has often induced changes in the appropriation of pastoral land. i.e. de facto appropriation of pastoral land surrounding those water resources by the groups or persons controlling and appropriating water.

The following trends have been observed: 1) environmental degradation and induced displacements involving conflicts and exclusions; 2) enclosures and conflicting appropriation of the new water resources and the surrounding grazing areas; and 3) new practices of private trucking and marketing water resulting in de facto exclusion of vulnerable groups from their access to water that were previously managed as common property.

The linkages at work in these processes are complex and play a major role in the competition for scarce resources in pastoral dry lands, especially considering the frequent negative socio-economic impacts of hydraulic infrastructures (e.g. boreholes, underground cemented cisterns, canals). Understanding and addressing these linkages adequately is a major challenge for sustainable livelihoods and poverty reduction in pastoral areas.

### ***Aim of the study***

As defined in the terms of references, the study aims at filling knowledge gaps by reviewing the lessons learned regarding the implementation of pastoral and hydraulic projects in specific regions of Eastern Africa and more particularly:

- In the Haud in Ethiopia: the proliferation of underground cemented cisterns;
- In North-eastern Kenya: the multiplication of boreholes;
- In the riverside area of Southern Somalia: the pastoralists' access to rehabilitated irrigation canals.

The specific objectives of the study are to identify and selectively review relevant literature and analyse the information as much as possible within the framework of sustainable livelihood approaches with regard to the following key issues:

- What are the effects of pastoral and hydraulic projects on the appropriation of water, and consequently land, in pastoral land and in dry lands agriculture areas?
- What are the main trends in the appropriation of water and riverside lands (private appropriation by farmers or specific pastoral groups) that modify the patterns of movement and the access to pastoral lands (formerly used as common property resource by transhumant pastoralists)?
- How are the customary institutions and rules evolving in relation to control of/access to water, and access and ownership of pastoral land?

- How effective are the new formal institutions (water users' association; pastoral associations) established to manage pastoral resources?
- Is the trend toward more private water investment and privatized water management a general and structural trend in pastoral areas, or are there forms of collective water management and collective pastoral land management that can adapt to the new constraints of pastoral production and modern technologies for water-control (irrigation, tube wells, private motor-pumps etc.)?

Special attention will be paid to the following linkages:

- What are the main linkages at work and their implications (consequences) for various categories of stakeholders? The interactions between formal (State) interventions and customary institutions will be discussed in this regard. The linkages identified should be particularly discussed as they impact the livelihoods of the poorest groups within rural communities and on gender (depending on available information).
- How are the linkages addressed by various groups and stakeholders in pastoral projects and in the context of the new water infrastructures built during the last decade: (i) water infrastructures and technologies institutions; (ii) access to water control of pastures and land?
- How did the different stakeholders react to the implications, constraints and opportunities created by the projects, policies, new technologies and infrastructures impacting on water access?
- What type of methods (preliminary integrated assessment: social impact assessments of the water/land, infrastructure/institutions linkages) and legal procedures could allow to better address the linkages and their possible adverse effects?

The study will also identify needs and opportunities for future normative or field research to address the gaps in current research on the subject.

### ***Study area***

Kenya, Ethiopia and Somalia host a significant population of pastoralists. Somalia and Ethiopia rank third and fifth respectively of the largest grouping of pastoralists in the world. In Kenya, the Arid and Semi-Arid Lands (ASAL) occupy over 80 percent of the country and sustain about 10 million people. In Ethiopia, pastoral areas cover about a third of the country's landmass and produce about 33 percent of the livestock population.

These areas have the lowest development indicators and the highest incidence of poverty. In Kenya, over 60 percent of the Arid and Semi-Arid Lands' (ASALs) inhabitants live below the poverty line (subsisting on one dollar per day. The ratio of livestock to human population continues to decline; droughts, conflicts and household food insecurity are common features in these areas (DNPSD for ASALs K, 2004: VI).

## 2. CONCEPTUAL FRAMEWORK

Perspectives that are critical to the mainstream paradigms of modernisation can be called “alternative development thinking”. This study addresses the debate ground one of these perspectives: *pastoralists' management of their natural resources, especially water*.

### 2.1 The tragedy of the commons

For many years, much of the literature has depicted pastoral production as economically irrational and nomadic livestock management systems as environmentally destructive. The old orthodoxy (Lane and Swift, 1989) the dominant approach in terms of pastoral development (Stanford, 1983), described herders as individuals without economic rationale using harmful land tenure systems. They were inspired by the famous “tragedy of the commons” developed by Hardin in 1968. This theory, which influenced many policy-makers in Africa, can be summarised as follows:

- In pastoral areas, the herds are owned individually and the trekking routes (*parcours*) belong to everybody and thus anybody;
- The pastoralists suffer from “the cattle complex” (Herkovits, 1926) and irrationally accumulate herds for social and religious purposes rather than for economic purposes. This benefits the individuals and all the users assume the cost of over-grazing;
- The pastoralists are not able to create their own management institutions;
- The resource privatisation is necessary and should be imposed from the outside.

Hardin’s assumptions about free access land tenure regimes in pastoral areas were drawn from the “Game Theory” and most specifically from “The Prisoners’ Dilemma”: *“If two users in competition for the same common good have the choice between two strategies: conserve or degrade the resource, each of them will choose the latter assuming that if one of them conserves the resource, the other will cheat and use the caution of the other to maximise his profits. In his study he qualifies the second type of users as free riders”* (Morehead and Lane, 1994:426).

In fact, Hardin confused the common property regime, defined as a collective property, with the free access regime where common property is a *res nullius* (a thing that does not belong to anyone, a public property) and which he characterised, in the pastoral context, by the absence of rule regarding the use of the resources and the absence of institutions able to impose sanctions and enforce them (Lane, 1996:15). This confusion legitimated the imposition of modern range management systems such as the grazing blocks among the Somali of Northeastern Province of Kenya (Helland, 1980) and even privatisation of rangelands amongst the Masai of the Kajiado district in Kenya (Rutten, 1992).

This paradigm has been seriously questioned and is now recognised as the wrong base from which to establish future development for pastoral areas (Moorehead and Lane, 1995, p 421). New approaches, the school of property rights (Benkhe, 1985) or the

approach of the insurance problem (Bromley and Cernea, 1989), insist on building on customary resource management institutions.

## 2.2 Customary pastoral land tenures

Since this shift, many recent studies have tried to understand the pastoralists' customary land tenure systems, defined as collective rules governing land occupation and land distribution. In fact, these rules usually apply to a vast range of resources beyond the soil and the land alone from surface water and systems of access to underground water (shallow wells, hand-dug wells and modern deep water points), fauna and herbaceous or ligneous vegetation, crops, mineral, wild-gathered products (Thébault, 1995a: 3).

Yet, only few studies have unveiled the crucial role of access to water in pastoral natural resources management. For Danièle Kintz, any study on pastoral land tenure should *considerer water as much as land, as an important issue in the thought and the practice of the pastoralists* (Kintz, 1991: 39). In fact, dry seasons herds can only access pastures located in a radius of permanent water points and thus the water point is not a wealth in itself but a mean to access the true wealth pastures. This also means that water access management can regulate the influx of animals and control the of pasture consumption (Thébault, 1995b: 46).

This network of permanent water sources used in dry seasons represents a clear “land tenure web”(trame foncière). Amongst transhumant pastoralists, Bourgeot identified specific transhumance patterns (“space economy”) with seasonal movements of herds and flocks accompanied by herdsmen along more or less fixed trekking routes to wet season grazing areas returning to their sedentary base where the rest of the families live permanently in the dry seasons (Bourgeot, 1994: 69).

The pastoral communities' territories are closely associated to their permanent water point. Brigitte Thébault also differentiates the large “territories of transhumance” (wet grazing areas) from the more restricted “territories of anchorage” (dry grazing areas), which enclose strategic resources such as permanent wells and riverside grazing and specific areas bearing palatable salty species. The resources, found in dry grazing areas, representing secure areas of withdrawal, are subject to more defined access rights, which give priority to a restricted community and can even evolve toward individual appropriation (Thébault, 1995a:51). These dual pastoral territories are constituted by different types of groupings depending on the social organization of each pastoral community. For example, they are patrilineal descend groups among the Somali. However, the physical and even social boundaries of these territorial groupings are flexible enough to adapt to climatic aridity as well as natural disasters such as droughts or floods.

## 2.3 Disruptive factors

Even if these new analyses can be considered as the right step in the right direction, they have often underestimated the adverse effects of modern water development on customary pastoral resource management.

Brigitte Thébault observed that the *maitrises foncières*<sup>1</sup> of the herders have been affected by the lack of recognition of the indigenous access rights and by the adverse effects of the modern pastoral hydraulic. In fact, the implementation of new water tenures disrupted customary forms of grazing management: “*Because of their public access, cemented wells fuel-driven boreholes have contributed to dismantlement of the space management tools of the pastoral communities*”(Thébault, 1995a: 51 and 1990). Daniel Kintz explains in more details these changes induced by modern water tenures: “*The appropriation (by drilling, sale or allocation of ground water is individual, for a family or for the use of a restricted group, especially in dry areas. Only the wells and boreholes drilled by outsiders (administrative services or NGOs, for example) are not subject to any explicit allocation. However, this trend is changing. These wells and boreholes are now distributed by name to specific groups, in order to limit the influx of herds and over-grazing in the vicinity of these water sources* (Kintz, 1991:40).

This trend has been aggravated by unclear statutory land tenure legislations. In Kenya, for example, the collective appropriation of the pastoral land is not recognised. The Trust Land Act of 1939 applies to 95 percent of the arid districts. Trust Lands are vested in County Councils (elected local assemblies) who hold the land on behalf of the residents. However, under the Trust Land Act, rights and interests of local communities under customary law are irremediably extinguishable at will through the use of statutory laws. In Kenya the trend of giving away Trust Land piecemeal through local adjudication processes and continual allocation of chunks of land to individuals or government institutions has been observed (DNPSDASLK, 2004:34).

In fact, the linkages between pastoral land tenure and governance have recently been explored (Médard, 1996, Oxfam, 1996, Gomes, 2001). In Kenya, violent ethnic conflicts arose in 1991, during the process of return to multi-partism. The government (Kalenjin) chose a territorial electoral strategy and established electoral constituencies physically cleansed from the voters favouring the opposition. As Claire Médard recommends: “*Instead of separating land tenure conflict and electoral conflict, it is important to explain the link between land and territory in the politicians view and its consequences in the practices of power: the exclusion by the mean of the territory*” (Médard, 1996:63).

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<sup>1</sup> The concept of “*maitrises foncières*” has been developed within the Le Roy’s model of tenure relations. It is used in anthropology in an all embracing sense, to describe all forms of appropriation, powers of management and social control over land, including customary or contractual forms and not only private ownership as recognised under the official laws (IIED Land Tenure Lexicon, 2000)

### **3. FUEL-DRIVEN BOREHOLES DEVELOPMENT AND DESERTIFICATION IN NORTH-EASTERN KENYA**

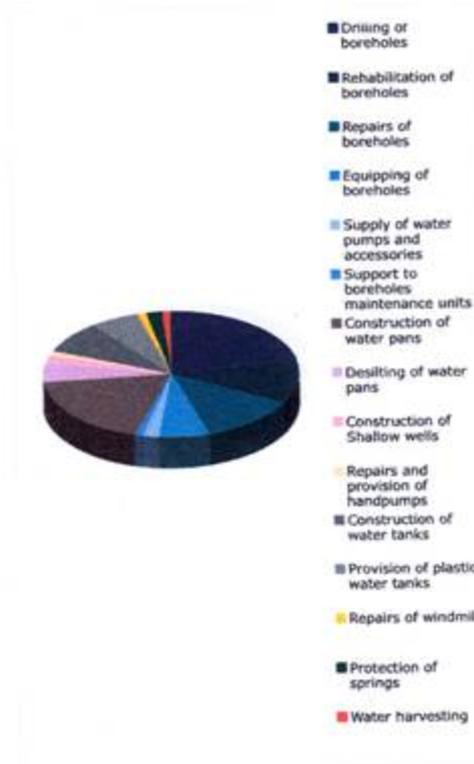
The development of fuel-driven boreholes in the arid district of Wajir in North-eastern Kenya is a relevant example of the adverse effects of water development on Kenyan-Somali pastoralist livelihood (see Map 1 at the end of this chapter). The four major permanent water points (old wells) that existed in the area the 1940s have increased to 75 in 1996. The availability of water throughout the year encouraged permanent settlements of the pastoralists and the emergence of trading centres. In conjunction these settlements grew from 4 to 45.

Twenty-six deep fuel-driven boreholes (100-250 m) have been drilled since the 1970s, quite a number of them in previous grazing areas only used in rainy seasons (see Map 2 and 3 at the end of the chapter). Several international organizations have been involved in this development:

- The World Bank/USAID funded Range Water Management Project between 1972-1978
- The EEC funded Arid and Semi-Arid Lands Project (ASALP) in 1979-1993
- The UNICEF Drought Preparedness Intervention and Recovery Programme in 1992 to present
- The UNHCR “Host community assistance programme implemented by UNICEF from 1994 to 2003 in a radius of 100 km around Dadaab refugee camps (40)
- The World Bank funded Arid Lands Resources Management Programme (ARLMP) since 1996

In 1997, a team of independent consultants (RANTCO) advised the Arid Lands Resources Management Programme (ARLMP) about the consequences of past borehole policy: *“Despite the already important number of water sources, the project of the government is to increase them. The effect of this policy on the pastoralist livelihood will be destructive and the environment will become hostile. The proliferation of permanent water sources decreased the productivity of the herds more subject to diseases. The Somali pastoralists are more vulnerable today than in the past. Their food security declined. Some permanent water points should be closed and those deteriorated should not be rehabilitated”* (ARLMP, 1997:9).

UNICEF and ARLMP activities have deliberately steered clear of water development so as to avoid contributing to sedentarisation and land degradation (UNICEF, 2004, John Bruce and Robin Mearns, 2002:46). However, in 2004, ARLMP spent 52 percent of their drought management funds (around 0,6 million euros) on water development and more than 50 percent of their water development budget on fuel-driven boreholes at the expense of low cost and more environmentally friendly technologies.



### 3.1 Adverse impacts on the environment

#### *The disruption of grazing patterns and the decrease in forage availability*

Somali pastoralists practiced transhumant pastoralism. In dry seasons, households and herds units (camels, cows, sheep and goats) assembled in and around villages where permanent water sources were available. Cows and goats, which need to be watered every 4 days and can only graze in a radius of 30 km while camels, watered every 14 days, can be taken more than 100 km away. When the rains started and surface water sources catered the water requirement of the stocks, the herders dispersed in vast wet seasons grazing areas, where they established seasonal mobile encampments. This regular seasonal alternation of pastures (wet and dry grazing areas) was essential to allow vegetation recovery. Pastoralists released the pressure on vegetation around permanent water points by widely dispersing in different areas during the rainy seasons in order to use both surface water, resulting from the rains, and the subsequent green pastures (Shazali, 1999).

The shift from periodic to more permanent grazing, in the wet grazing areas where the new boreholes were drilled, reduced the availability of the most palatable perennial grass and browse species consumed by the herds (OXFAM, 1996: 23 and OXFAM, 2002:27), which have been replaced by annual species relying on unpredictable rainfalls.

#### *Deforestation*

Production of fuel wood and charcoal for permanent settlements also contributed to the decline of key species (Lair, 1996). Deforestation is especially severe around the

three refugee camps established in the district of Garissa by UNHCR in 1993, which rapidly doubled the local population (Gomes, 2001:64). This observation led to the UNHCR to provide imported firewood for the refugees.

### ***Lowering of the aquifer and the threat of salt-water intrusion***

The proliferation of boreholes can lower the groundwater table (MOLD, 1992:17) and the deeper they are drilled the more the mineral contents are found. However, a recent study on the Merti Aquifer revealed the impact was still negligible (UNICEF, 2004). Moreover, the over-exploitation of fresh ground water could easily give rise to intrusion of blackish and saline water, thus contaminating the potential high water zone (ENNA, 2002:17).

Issar and Golany concluded their assessment with this ironic note: “One can foresee the time, that big stretches of this district (Wajir) can be proclaimed as natural reserve for desert wildlife. In such reserves, the development of water resources for wildlife can be considered as a positive environmental action plan (Issa and Golany, 1990:2).

### **3.2 Adverse impacts on animal and human health**

Range degradation is suspected to affect milk productivity of the herds and thus the health of the Somali pastoralists. However, we must point out that this impact has not been well documented. It is associated to the erosion of the Somali customary social support system to the poor: collection of milk (*hirsi*) and provision of milking animals (*hirmansi*) to the destitute.

Moreover, contrary to the general perception, the water quality from a number of deep fuel-driven boreholes is low. In Wajir district out of 130 boreholes drilled in the past, 70 were abandoned due high salinity. The majority of the operational boreholes exceed EC values of 2000 mmhos/cm and thus far exceed the 780 mmhos/cm limit recommended for water destined for human consumption (ENNDA, 2002: 17). In addition, there are a number of cases of nitrate chemical pollution. For example, the Borehole C 3899 located in Dambas has been sampled with 354 mg/l of NO<sub>3</sub> in 1973 while WHO standard is 50mg/l for drinking water (MOLD, 1992:88). These levels are high enough to justify the immediate closure of some wells (MOLD, 1992: 75).

Pastoralists associate salinity with high blood pressure and increase frequency of miscarriages. Nitrates are suspected to act as carcinogens (ENNDA, 2002: 75). In Kenya, the Ministry of Water is responsible for testing the water. When the water quality is found below their standards, boreholes are allocated to livestock.<sup>2</sup> Of course, in periods of water scarcity, nothing prevents human consumption (Daniel Maina, ALRMP, 2004).

### **3.3 Borehole management**

In the Wajir district, fuel-driven boreholes are used 22 hours per day for 8 months per year to cater both domestic and animal water requirements and thus affected by frequent breakdowns. In 1990, out of the 26 fuel-driven available, 7 were out of order.

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<sup>2</sup> Interview ARLMP water engineer, Nairobi, 07/02/2005

Many stories account for death of herds due the “domino effect” of water pumps breakdowns in dry seasons.<sup>3</sup>

From the late 1970s to 1992, the government of Kenya was responsible for boreholes management, with operation and maintenance being undertaken by the Ministry for Water Development (MOWD). Day to day borehole operation was undertaken by MOWD pump attendants, under the direction of the area Chief, with a few hand picked elders performing duties covering water scheduling, revenue collection, water by-laws and conflict resolution. Initially, the Kenyan government met all the running costs, but the communities were later expected to meet their fuel costs (WDWSAM, 2003).

Borehole water committees began to be formed and trained from 1992. In 2000, in the Wajir District, 13 of the wells were managed by these pastoral associations (Pas). Communities were told that they would eventually be responsible for their operation and maintenance. The associations began collecting money from users to buy fuel (40 liters of diesel, 18 000 ksh to fill the cistern) and later the water itself to cater for repairs and servicing. Unfortunately, the membership of the borehole committees has been based on clanship and clan loyalties. Issues such as patronage, clan divisions and politics became obstacles to successful management, creating a strong sense of clan and lineage ownership and hindering revenue collection. Proper attention has not been given to matters pertaining to sustainability, transparency and accountability. Consequently, the borehole water system was not able to generate resources for its sustainability (WASDA, 2004).

Water trucking from Wajir town, practiced as a coping strategy, introduced a water market that increased the expenditures of the households (Gomes, 2001:109). For example, a herd of 60 cattle, which must be watered every two days or 15 times on month for 8 months will cost 14400 ksh in water over the year that is the price of a 6 years bull.<sup>4</sup>

### 3.4 Local conflicts

Control of new boreholes and the surrounding pastures exacerbated clashes between Somali clans and lineages. The more notorious conflicts affected the Daagoodia and the Ajuuraan for the political and administration control of Wajir West constituency and its natural resources. The Ajuuraan clan and their Dagooodia clients (*sheegad*<sup>5</sup>) used Wajir West grass plains as a wet grazing area. The drilling of boreholes allocated to Daagoodia lineages enable them to settle permanently in the territory of their host. In North-eastern Kenya, the clan grazing areas established during the British colonisation been abolished in 1969, after the failure of the Kenyan-Somali irredentism movement aiming at joining the newly created Republic of Somalia. The new land tenure system, the Trust Land Act<sup>6</sup>, does not recognise clan territories and

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<sup>3</sup> Interview UNICEF representative, Nairobi, 07/06/2005.

<sup>4</sup> Interview WASDA representative, Nairobi, 6 February 2005.

<sup>5</sup> Small lineages can be allowed to settle in the territory of another community and incorporated as *sheegad* (from Sheegasho meaning using for yourself the eponyme of your host instead of your).

<sup>6</sup> The Trust Land Act of 1939 applies to 95 percent of the arid district in Kenya, Trustlands are vested in County Councils who hold the land on behalf of the residents. However, under Trus Land Act, rights and interests of local communities under customary law are irremediably extinguishable at will through

the Ajuutaan had no alternative to defend themselves from the Daagoodia territorial expansion from Wajir East to Wajir West other than contesting the election of a Daagoodia fellow as a member of the Parliament in 1979, 1983 and 1992 and the consecutive cooptation of Daagoodia chiefs and sub-chiefs to administrate the contested area (Gomes, 2001). The failure of this alternative strategy led to violent clashes between the two communities. The government of Kenya responded by carving Wajir West into two new electoral constituencies: Wajir North for the Ajuuraan and Wajir West for the Daagoodia before the 1997 general elections. The Ajuuraan conserved their national representation in the Parliament but lost control of their wet grazing area (Gomes, 2001).

The new permanent water sources drilled in Wajir West also fostered inter-ethnic conflicts between the Somali of North-eastern Province and the Boran of Eastern Province. Range degradation around the new boreholes increased the need for migration across the provincial border where concentration of livestock and water points are less, where more defined patterns of wet and dry seasons grazing still exist and where Somali pastoralists can find less denuded areas (*haaluf*) and more fresh grazing (*usub*) (OXFAM, 2002: 27). The increased seasonal migrations of the Daagoodiya into Boran territory led to violent clashes between the two communities (the Bagalla massacre) in 1998.<sup>7</sup>

### **3.5 Political instrumentalisation of a territorial anchorage**

The Kenyan-Somali elites (politicians and administrative personnel) encouraged the proliferation of permanent water sources. Provision of boreholes for permanent settlement and “territorial anchorage” became the heart of clans and lineages politics and unfortunately participated in an electoral bargain (OXFAM, 2002:25).

The Water and environmental sanitation project officer of UNICEF is well aware of this driver: *The drilling of boreholes replied to political demands for permanent settlement, access to food relief, politico-administrative representation at the district and national levels (councillors, MPs, chiefs) and education rather than real needs for water*.<sup>8</sup> As Robert Walker outlined, in Kenya, the administrative divisions inside the districts (divisions, locations, sub-locations) are usually created by the Office of the President through formal recommendation by the District Development Committee (DDC) after consultations with the district leadership and analysis the need. The trend has changed as procedures have been largely flouted through the political influence of sitting MPs in conjunction with clan and lineage leaders. The MPs are pressuring the Provincial Administration to push for the establishment of new locations and sub-location for the purpose of distributing positions of Chiefs and Assistant Chiefs for certain clan/lineages in specific areas of their constituencies.

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the use of statutory laws. There has been a trend in Kenya, of giving away Trustland piecemeal through local adjudication processes and continual allocation of chunks of land to individuals or government institutions (DNPSDASLK, 2004:34).

<sup>7</sup> On Saturday 24<sup>th</sup> of October 1998, over 500 armed men from the Boran and Gabbra community in Moyale backed from the members of the Oromo Liberation Army from Ethiopia, staged a 48 hours ambush on Daagoodia living in villages located at the Wajir-Marsabit district borders. 300 people were killed and 17 000 heads of cattle stolen.

<sup>8</sup> Interview UNICEF representative, Nairobi, 7 February 2005.

Additionally the new locations benefit from the position of an elected councillor (Oxfam, 2002:11).

The Kenyan government never opposed borehole development in the Province of North-eastern Kenya that participated to an enclosure from the rest of the country. The memory of the short-lived secession of the Somali in the Northern Frontier District (NFD) of Kenya at independence (Shifita war, 1963-1967) is still fresh. Followed by a state of emergency which was partially lifted only in 1991, it paved the way for marginalisation of this irrendist pastoral area (Perouze de Montclos, 1992:297. Borehole development and the sedentarisation process of the nomads aimed at preventing Somali expansionism inside the country, especially since 1991 after the fall of Siyyad Barre and the civil war in Somalia, which increased the influx of Somali refugee into Kenya via the North-eastern Province (Gomes, 2001: 67). In addition, in 1997, with the return to the multi-party system, the Kenyan African National Union (KANU) needed to secure the votes of the largest Somali clans of Northern Province in order to stay in power.

### **3.6 Preventive and mitigations strategies**

Preventive strategies appeared amongst the pastoralists and have recently been acknowledged by both the development agencies and the Kenyan government.

#### ***Pastoralists's awareness/protectionism***

In 2000, the Arbajahan Pastoral Association opposed the drilling of a new borehole in Garse Qolfu located 15 km SE of Arbajahan by ICRC to assist the internal displacement peoples (IDPs) from the Bagalla massacre (Map 4 at the end of this chapter).

*“We the pastoral association in conjunction with the community of Arbajahan wish to petition the drilling of borehole at Garse Qoftu sub -location of Arbajahan location. We strongly believe that this is an unnecessary and unworthy project, whose end result shall breed catastrophe rather than its intended noble goals. Underscored here are some but a few of the reasons why we rejected the project:*

- *The grazing block has enough water with the existing borehole and the newly drilled contingency borehole and Basir borehole in place. An additional borehole means additional population in term of both human and livestock population thus exceeding the block's grazing capacity and subsequently leading to depletion of grass as it has happened in other areas, notably around Wajir town, Griftu and Leheley of Wajir South*
- *The site is a grazing land for Arbajahan livestock hence its proximity to Arbajahan borehole makes the drilling of this borehole unnecessary*
- *It is an undeniable fact that much of insecurity problems in the northern region come from shifting population in search of water and pastures, with this in mind, Arbajahan community feel that our security will be put at stake if this borehole is drilled. It is our humble view that our land will in the end not be able to carry more than the existing livestock population and Arbajahan being a broader point, some of our population and of*

*course emigrants from elsewhere will be compelled to cross over the neighbouring districts read, Marsabit, Isiolo and Moyale districts, hence fuelling the already existing tribal feud*

- *In line with our Government policy, any development project should be passed and have the blessings of the community at the grass-root. It should be proposed, discussed and passed by the pastoral associations and the community at large. It is unfortunate that this project did not go through this process,*
- *In view of the foregoing, we regret to say, this is an onslaught to finish our animal population and eventually us, as this is our livelihood. We therefore affirm our stand not to support any person, organization, association or group in support of the said project. It is our advice, your association makes a second thought on this project”<sup>9</sup>*

The borehole was drilled despite these concerns with the approval of the Kenyan authorities: “*We were told when the Pastoral Association was established: you have the right to decide what you want. We said we don’t want the new borehole but it still came*” (Arbajahan, PA) and ICR drilled two additional boreholes in Adhi Bohol, 12 km SE of Garse Qolfu and Basir (see map 12). In fact, the request for an additional borehole in Garse Qolfu arose from a competition between two closely related sub-clans amongst the Dagoodiya, the Gelibleh and the *reer*<sup>10</sup> Matan, for the use of Arbajahan borehole. A Somali businessman, recounted the in-depth story:

*“After the carving of Wajir West constituency into two new electoral constituencies, Wajir North for the Ajuuran and Wajir West for the Daagoodia, Ahmed Khalif the Daagoodia MP, who is from the reer Mohamud sub-clan believed that Wajir West belonged to his sub-clan and that all other Daaagoodia sub-clans should leave the area. They displaced people. The Jibrail went to Ceel Das, the Fardano went to Tura Tura.*

*Wajir West was Ajuuraan before and the Gelibleh section of the Daagoodia has always been very closed to the Ajuuraan since the colonial times and even during the war between the Ajuuraan and the Daagoodia. The Gelibleh started having problem to get water from Hadado and Arbajahan boreholes. They were forced to queue for days and denied water. Inside the Daagoodia, we don’t kill each other, but we can beat and harass each other. The Gelibeh, with other marginalised daagoodia sections, the reer Samatar and Moho, decided to migrated in Isiolo District to settle amongst the Boran in a location called Kom. Unfortunately, after the Bagalla massacre, when Boran raiders massively attacked Hadado and Arbajahan villages, the Gelibleh were chased from Isiolo district, their houses burnt and their livestock captured by the Boran. The destitute resettled in Wajir town, Griftu village and Garse Qoftu. There, the community (around 96 households) raised funds to do a small pan and a shallow well.*

*The MP Ahmed Khalif was again the resettlement of the Gelibleh in Garse Qoftu because he knew that they could stand against the reer Mohamud and elect a Jibrail to replace him. However, they stay and a Jibrail MP was*

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<sup>9</sup> Petition written by the Chairman of the Arbajahan Pastoral Association, 09/08/2000.

<sup>10</sup> *Reer* means extended family in Somali.

*elected. When Adan Keynan won the seat, he supported the request for a borehole from the Gelibeh to ICRC The NGO also helped to construct a large dam for animal water consumption. Now, the borehole of Hadado has collapsed and the reer Mohamud from Hadado relies on Arbajahan borehole. There are some tensions since 5 reer Mohamud have been arrested because they said that the Gelibleh should move out of Garse Qoftu".<sup>11</sup>*

In the case of Garse Qoftu, the demand for a new borehole was not driven by water shortage but denial of access rights to existing infrastructures. Access to boreholes is controlled by water users associations whose membership has been captured by numerically and economically strong sub-clans and lineages at the expense of the others. An informant noted that "*Between, Arbajahan, Hadado, Griftu and Ceel Das, there is only one Gelibleh member of the borehole association*". Water users committees found other strategies to control the access to water. They can also increase the price of the water in order to 1) exclude outsiders from the borehole access in dry seasons, and 2) preserve the surrounding grazing area.

Developers rarely consider this local competition for power, associated with the control of management systems of water users associations. Communities are perceived as homogenous entities and the different groups of interests are rarely ever assessed.

### ***Environmental Impact Assessments***

Since 1985, the European Commission has promoted the realisation of Environmental Impact Assessments (EIA) defined as: "*The identification, description and assessment of the direct and indirect effects of a project on: human beings, fauna and flora, soil, water, air climate and the landscape, the interaction of these factors and on material assets and the cultural heritage*" (Directive 85/3337/EEC of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment).

The Kenyan government has also acknowledged the need for more environmentally sound water development projects. The draft national policy for the sustainable development of Arid and semi-arid lands states that: "*Water availability, its appropriate development and use are key in the development of the ASALs. The drilling of new boreholes and their equipping with high maintenance pumping equipment such as generating sets will be only undertaken with thorough environmental impact assessments and consensus reached and agreed upon the communities and the relevant stakeholders. Emphasis will be laid on rehabilitating and make operational already existing boreholes as opposed to drilling new ones*" (2004: 32).

Beside this new policy, an Environmental Management and Co-ordination Act (EMCA) has been enacted in 1999. In 2002, a new institution, the National Environmental Authority (NEMA), has been mandated to administrate compulsory Environmental Impact Assessments (EIA) for all new development projects and Annual Environmental Audit (AEA) for all existing development projects. Environmental impact assessments and audits regulations were gazetted in 2003.<sup>12</sup>

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<sup>11</sup> Interview Nairobi, 10 March 2005.

<sup>12</sup> Kenya gazette supplement, n°56, 13<sup>th</sup> June 2003.

### ***Investment in environmentally friendly technologies***

The draft national policy for the sustainable development of arid and semi-arid lands recommend the development of seasonal surface water sources: *“The development of surface water through appropriate community-owned water harvesting structures such as pans and dams will be emphasised while ground water will be developed based on social and environmental sustainability criteria”* (2004, 32).

### ***Drought contingency boreholes and range management***

OXFAM-UK funded by DFID played an important role in raising the awareness of the environmental impact of the drilling of additional boreholes, proposed the creation of drought contingency boreholes to be drilled in areas meant to be grazing “reserves”, only used in times of drought.

In fact, DFID also opposed the creation of the above mentioned borehole of Garse Qolfu because the organization had planed to drill a contingency borehole in Arbajahan: *“During another monitoring visit to Wajir in 22-25 August 2000, our team passed two of ICRC potential borehole sites at Garse Qoftu and Adi Bohol. Both of these locations are within the grazing range of an existing Arbajahan borehole and Arbajahan will benefit from the development of a contingency borehole (limited use) under the DFID intervention”*.<sup>13</sup>

In 2000, an agreement with the local community of Wajir South was reached upon the use of the new contingency borehole drilled by OXFAM-UK/DFID in Harat Khot Khot. It stipulated that:

- *When the drought ends the borehole would close as it was in the heart of the grazing area for livestock from different part of Southern Wajir;*
- *The management would be handled by the committee responsible for running the ASAL borehole in Habasweyn;*
- *The pump and the engine would be returned to ASAL after the closure of the borehole;*
- *In future droughts, the borehole should be opened subject to an assessment and recommendations of a team sent by the District Steering Group (DSG) representing NGOs and government officials (OXFAM, 2002:47).*

However, these new types of boreholes have been operated as permanent rather than contingency boreholes against the communities, the NGO’s and the DSG commitments (OXFAM, 2002:24). This example outlines the difficulty of managing the new infrastructures immediately appropriated by numerically and/or politically strong lineages that are not ready to be deprived of the economic opportunities derived from the new water source.

The idea of drought contingency boreholes was to preserve grazing areas. In fact, a number of mitigation strategies emphasise monitoring pasture quality. Some researchers recommend a simple fallow, which can assist in the vegetation recovery. However, this requires strong livestock movements planning. Experiences both in

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<sup>13</sup> Head of DFIDEA, 21 September 2000.

Eastern Africa and Western Africa have revealed the limits of this approach (grazing blocks policy in Kenya, 1970; code pastoral in Guinea, 1997).

Moreover, in Eastern Africa, increased dependency on annual grassland species because of overgrazing occurred simultaneously as an intensification of climatic aridity. Drought periodicity decreased to 4 years. Somali pastoralists now evolved in non-equilibrium ecological systems in which livestock populations and vegetation dynamics are only loosely related and density-independent factors such as rainfall explain a higher amount of variation in the pattern and evolution of grassland and forage species (Scoones, 1994). Tracking fodder availability usually through mobility is a typical pastoral management adaptation to such spatial and temporal variability. In this context, flexibility in pastoral land use and resource access should be supported (Niamir-Fuller, 1999).

Others recommendations include multipurpose agro-forestry programmes, re-vegetation, reforestation and afforestation. In Kenya, conservation initiatives started under the RESCUE project implemented for the UNHCR by GTZ. These initiatives are still rare and their scale limited.

### ***Pastoral institution building***

Local water management institutions are crucial not only to ensure proper operation and maintenance of the infrastructures but also for conflict prevention and resolution. Community based management systems have recently been encouraged. The challenge is not only to ensure their economic viability but also to preclude monopolistic uses. In Kenya, the draft national policy for the sustainable development of Arid and semi-arid lands in Kenya stipulate that: “ *In remote areas where privatisation may not be feasible, community group will run water facilities with Government providing back-up services, especially during emergencies (2005:32).*”

Privatisation of borehole management has started to be discussed. Yet community management has not been developed to its full potential. Studies proved that boreholes could be sustainable if well managed by the communities. USAID recently supported a local NGO (WASDA), to provide training in borehole management in Northeastern Kenya: “*In North-eastern Kenya, it is evident that the boreholes are used 7 to 8 months in a year and on average, there are about 5,000 (minimum) heads of cattle that drink every day. If all the animals that drink the water were charged, then an average of 10,000/= can be raised daily. Assume 60 percent is their daily expenditure and other mismanaged revenues (6,000/=), on average each borehole should be able to save 4,000/= per day, this is 120,000/= savings per month. This should give a savings of 840,000/= per year. But the average reported monthly savings is about 12,000/= (10 percent of the expected savings). If the collected revenues are collected as expected, each community would be able to generate enough revenue within three years to replace borehole or drill one for stand-by whenever, the need arises and have money to invest in other development activities (WASDA, 2002).* However, due to the strategic importance of the boreholes during droughts, a management system that provides a high reliability of services is required and different boreholes and communities may require different management strategies” (WDWSAM, 2003).

On the other hand, the new registration of the water users associations under the Registry of Society makes their by-laws enforceable under the Kenyan laws and in case of mismanagement (for example water denial), their leadership can now be taken to Court (Water land Act, 2000). Besides water management committees, WASDA also recommended the creation of council of elders (*hiriga*). This council, consisting in 7 members including a religious leader, a head teacher, a women leader, a councillor, a chief, a peace elder and a youth representative, would be responsible for tariff setting, enforcement of by-laws and conflict resolution (WASDA: 2003).

### ***Integrated Water Management (IWM)***

Another shift in Kenya has been the deconcentration of water development management and the use of hydrological boundaries rather than administrative boundaries as a unit for key decision-making unit. In Kenya, six River Basin Development Authorities have been created under the Ministry of Regional Development Authority: Kerio Valley Development Authority (KVDA), Lake Basin Development Authority (LBDA), Ewaso-Nyero North Development Authority (ENNDA), Ewaso Nyero South Development Authority (ENSDA), Coast Development Authority (CDA) and Tana and Athi River Development Authority (TARDA). These institutions are developing recommendations however, once again, enforcement is the issue.

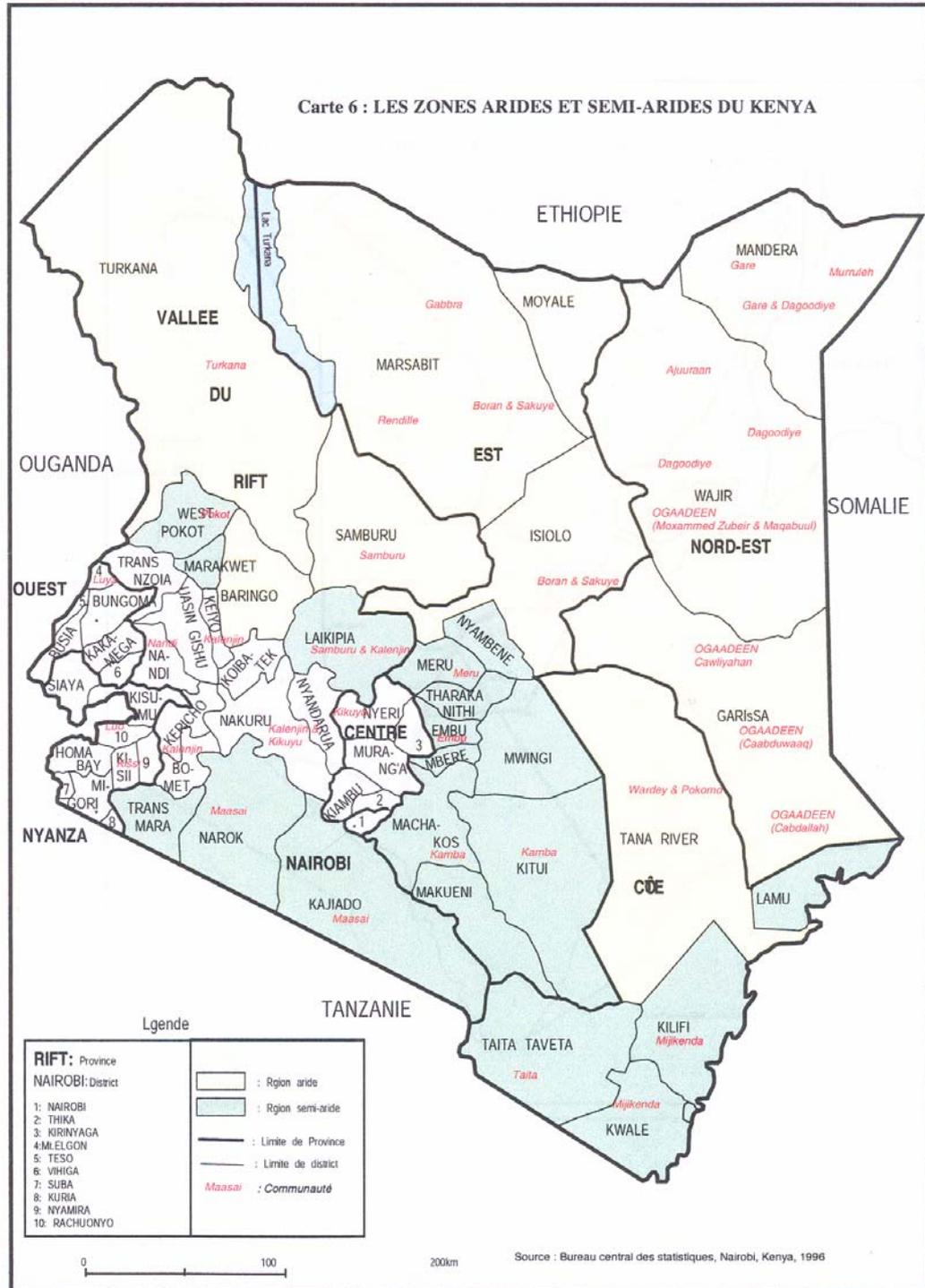
The Ewaso Ngiro North River Development authority recognised the adverse impacts of the borehole policy: Borehole development normally causes over-utilisation of resources mainly vegetation within immediate vicinity resulting in over-grazing. Borehole development is also know to attract permanent settlement and has often been used as an incentive for sedentarisation. The permanent settlement expose new sites to over-exploitation from suppling material for building shelters and for household energy which exposes the fragile site to the forces of soil erosion. Measures should be taken to control range utilisation within the vicinity of boreholes sites (ENNDA: 2002: 17). The question of implementation of the policy is again an issue.

On the other hand, pastoral associations under these new authorities are still very weak in opposing development projects that are likely to interfere with their livelihood with the alienation of dry grazing lands near rivers. For example, in the Tana River Delta, the herders 's opposition to the sugarcane and livestock projects has been raised by the pastoralists Parliamentary committee, who recently filed a suit.<sup>14</sup>

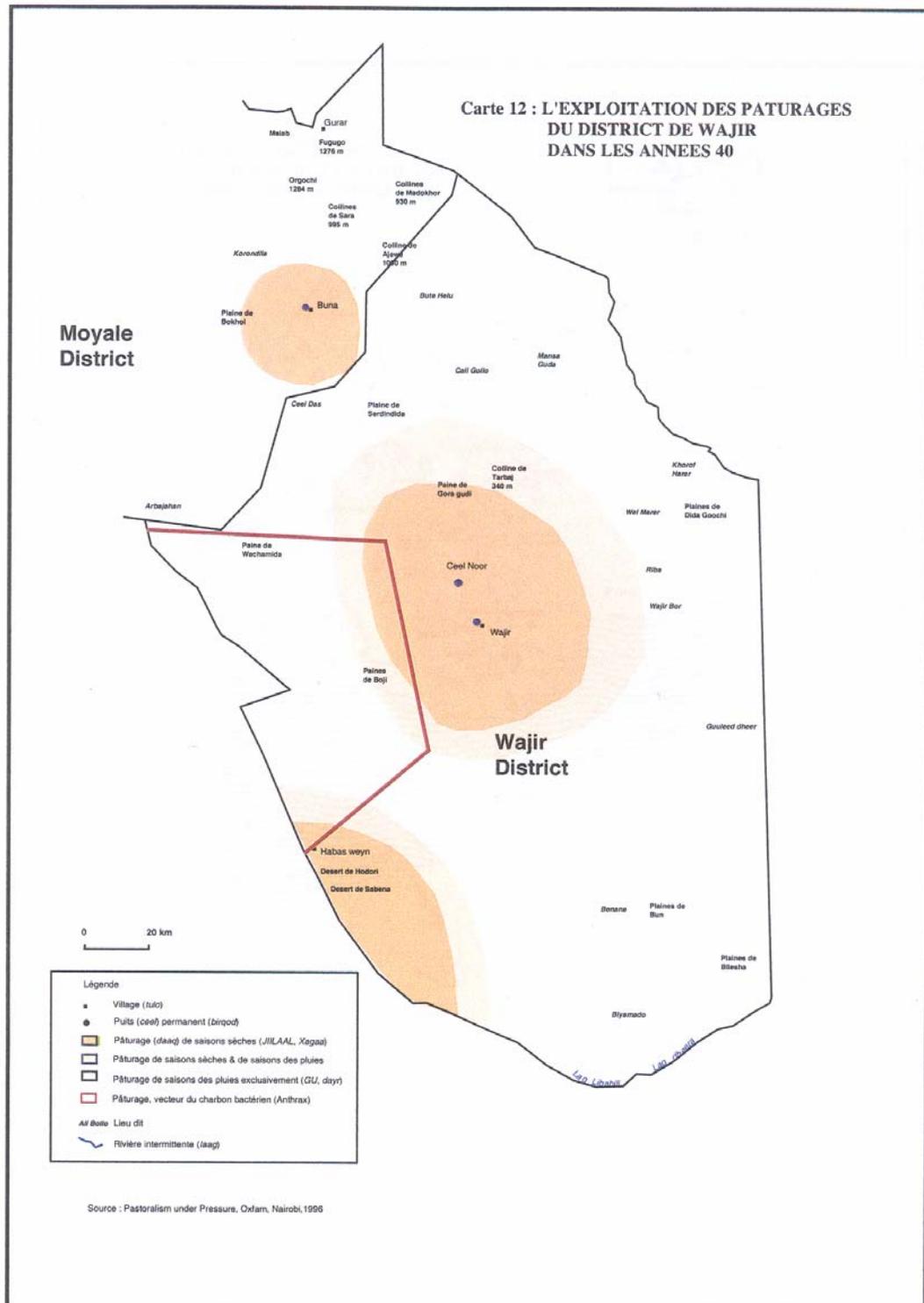
Borehole development in North-eastern Kenya has had the same adverse effects as those observed in other pastoral areas of Africa, on the environment, on intra and interethnic relations, and on the health of the pastoralists. After several decades of interventions, the living generations of Somali herders have started to measure the consequences of proliferation of permanent water sources and oppose it. However, despite encouraging new legislation, the government and the donors still operate with a supply focus, which is politically manipulated for sedentarisation purposes both by the central powers and the new sedentarised Somali elite (politicians, administrative personnel, trader) under pressure from their lineage/sub-clan.

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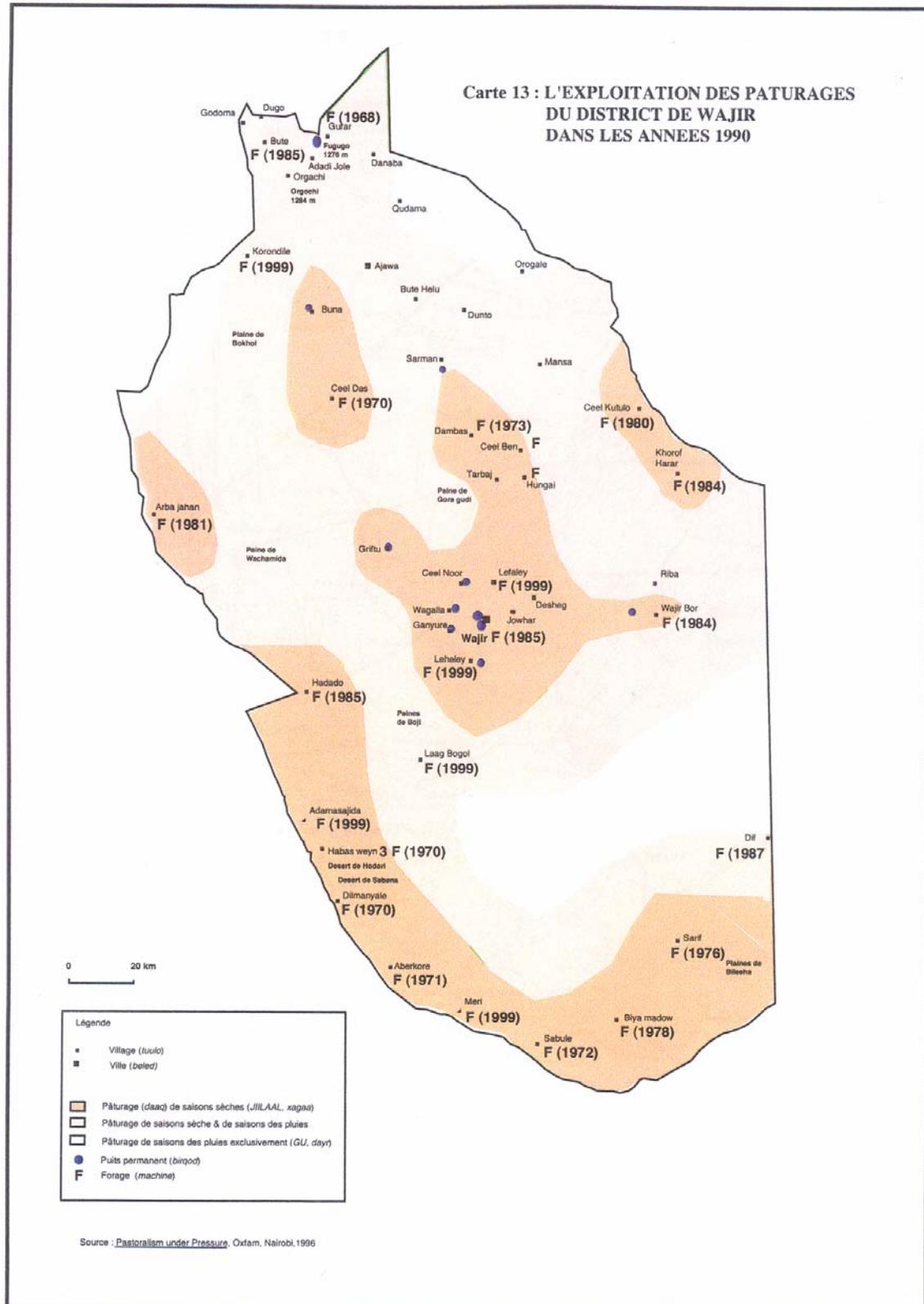
<sup>14</sup> Daily Nation, 29<sup>th</sup> March 2005.



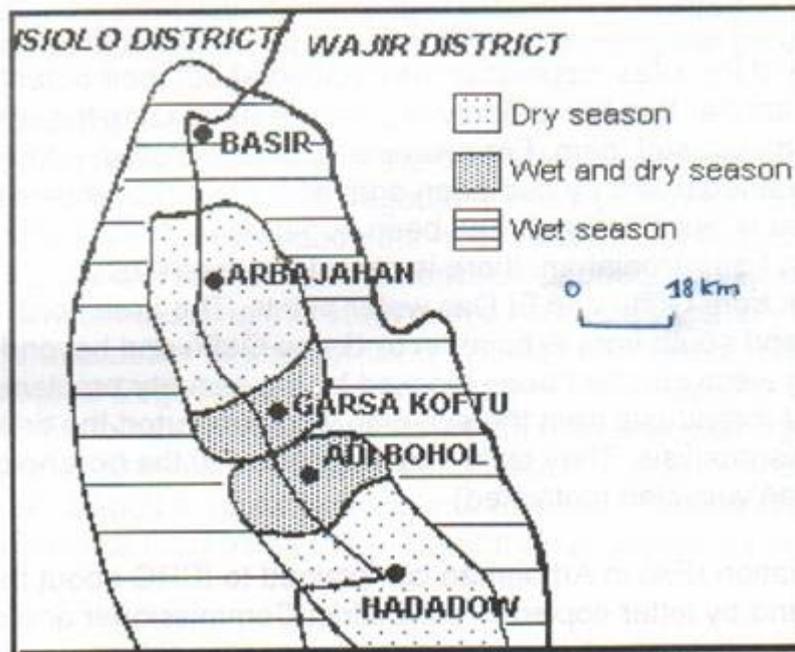
Map 1



Map 2: Grazing patterns in the 1940s



Map 3: Grazing Patterns in the 1990s  
Source, Gomes, 2001



Map 4 : The Borehole of Garse Qoftu  
Source, OXFAM (2002:23)

#### 4. THE *BERKADO* BELT AND THE SCRAMBLE FOR THE HAUD IN ETHIOPIA

For centuries, the Haud plateau, in the Jijiga, Dhagax Buur and War Dheer zones of Ethiopia, was used and shared by two Somali family-clans (Isaaq and Daarood) as a wet grazing area and the sole water supplies available were seasonal surface water (pans and dams) (see Map 5 at the end of this chapter). In the 50s, the Isaaq pastoralists, whose dry grazing areas are located in Somaliland, started to settle more permanently inside the Ethiopian plateau thanks to the development of a new water catchment system of an average of 70-150 m<sup>3</sup> : the *berkad*, inground cistern, often in cement which harvests and stores surface runoff and rain harvested water (Map 6 and 7 at the end of this chapter).

According to Cossins, the Isaaq pastoralists built themselves the first concrete water reservoir (*berkad*) in Somalia in 1952 and in the Haud in 1956. The initial builder brought the idea from Aden (Yemen). At Harshin, Mohamed arrived with 100 gallons of drums. He dug a dam (*harr*) and sustained himself meantime with a bush coffee shop, then built the *berkad*. The town grew around it. Within two years, there were 30. In 1971, the anthropologist estimated the number of *berkado* between Harshin and Aware at 910 (the *berkado* belt) (Cossin, 1971:42). The Daarood also adopted this new technique to settle in the Haud. *Berkado* were built in Araarso, Dhagax Buur and Dusmo in 1973. In 1998, they respectively counted 100, 4 and 40. The construction of *berkado* in Mermesame and Dikrile is more recent (1981,1991).

The Ethiopian government also supported the construction of public *berkado* in the Haud for health centres and communal *berkado* to be collectively used by villagers. However, most of these infrastructures have been neglected and abandoned due to mismanagement. Mismanagement was linked to the lack of community participation in their construction (cost-sharing) and lack of capacity building of community management institutions such as cooperatives of groups of families.

Development agencies (MSF-B, ACF) and humanitarian organizations such as UNHCR and ICRC financed the construction/rehabilitation of *berkado* in the entire Somali region of Ethiopia (Ethiopia National Somali Regional State, ENSRS). With the Somali civil war, in 1989, UNHCR established three camps (Caam Abokor, Rabaso, Daroor), for 79 389 refugees and a number of large *berkado* in the Haud. These do not include the refugees self-settling in villages, which created a demand for water and fuelled the unplanned growth of new water points (Walker, 1998:14).

In Afdheer zone, for example, the development of *berkado* was introduced in 1999, with the Go Usbo community seeking ICRC support in the form of tools for the excavation of a large *berkad*. After the drought of 2000, ICRC financed the construction of the first *berkad* in the region at Malkasala. This experience triggered the interest of other communities and NGOs. Beside communal *berkado* constructed with NGO support, by 2002, some 10 small *berkado* had been privately build in Go Usho. The owners purchase water, which is brought by water tanks, which is thereafter sold to the community (Frélehoux, 2002:80). Once again, development agencies feel that they responded to a demand for water from the local communities.

#### 4.1 Adverse impacts on the environment

Meant to be seasonal water supplies and to primarily cater for domestic use<sup>15</sup>, in the Haud, the *berkado* have been converted into permanent water storage tanks earmarked both for human and animal consumption. This development is associated with the introduction of water trucking. Filled up with water taken from permanent water sources located in Somaliland (Jijiga, Hargeysa, Burco, Laas Anood), the *berkado* can now function almost perennially and allow permanent settlement with once again dramatic ecological impacts. As Matt Bryden observed, pastoralists are no longer obliged to migrate in search of water during the dry months, and often choose to remain static. This evolution of the transhumant migratory patterns towards a more settled, stable model has a tremendous impact on social, economical and political arrangements within the pastoral communities, inducing new and intolerable pressures on the local ecosystem and populations (human and animals), which depend on it (Bryden, 1994).

Farah pointed out that the development of the *berkado* and the attached settlement encouraged further diversification of the traditional husbandry. In addition to camels and small ruminants, *berkado* owners start raising water-dependent cattle in this otherwise traditionally waterless camel land. The cattle husbandry creates additional advantages (milk, purified ghee and adult cow for sale) to the wealthy owners of *berkado* in an average year. However, this has the effect of increasing livestock population in an already populated region and puts additional pressure on a shrinking resource base. The vicinity around the settlements have become overgrazed by cattle belonging to the villages, thus driving the poorer nomads raising camels and small ruminants in the eternal search of pasture and water (Farah, 1997:4).

#### 4.2 Impacts on animal and human health

Range degradation and the decrease of key forage species affects the milk productivity of the herds and thus the livelihood and health of the Somali pastoralists. However, it must be indicated here again that this impact has not been documented enough.

Moreover, the water quality of the *berkado* is low, both for animals, and human consumption. The herds of the Haud are said to suffer from mineral deficiency leading to a disease called Shimbir of which weakness and apathy are the main symptoms. Blocks of salt have to be added in animal troughs. Human palatability of the water harvested in the *berkado*, is also questioned and rarely assessed. The following types contaminations have been observed (Gomes, 1998):

- “Algae” proliferation;
- Bacteriological contamination with the presence of the water near direct sources of contamination spreading **water washed diseases** (conjunctivas, trachoma, scabies, skin infections, louse born typhus) and **oral-faecal diseases** (diarrhoea, dysentery, cholera, typhoid, hepatitis A, poliomyelitis);

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<sup>15</sup> A 200 m<sup>3</sup> a seasonal *berkad* can cater for the domestic consumption of 30 to 40 families and their small stock for 2 months (interview COOPI representative, Nairobi, 3 March 2005).

- Impute of diesel. Since the *berkado* tend to become breeding grounds for mosquitoes, it is a common practice to add a slick of diesel (*naafto*) to the water's surface.

### 4.3 Impacts on livelihoods

The impacts of the development of *berkado* on the pastoralists' livelihood are linked to the introduction of water charging and the rise of agriculture.

#### *The impacts of water charging*

In the Haud, the construction of a *berkado* has been identified as an individual and private enterprise along with its maintenance. Most of them suffer from accumulation of silt and cracks. The cost of repairs has been estimated at 800 birrs (100 kg of cement 100 birrs). These expenses are recovered with the introduction of water marketing both for animal and human consumption. The price of the water increases during the long dry seasons (*jiilaa*) to recover the cost of water transportation. As Farah explains, the *berkad* acts at first as a safety net supplying regular water to the family members and the herds during the critical dry seasons. Second, investment in *berkado* is a lucrative commercial enterprise earning the family a significant income from the sale of surplus water to nomads during the dry seasons.

Many private investors have constructed drought-resistant "*berkado*" from which they sell water at high prices in times of scarcity. In the early 1970s in the Haud area, it used to cost, in dry years, the price of a whole sheep to water 175 sheep once (Sandford, 1983:10). In normal years, *berkado* water is 6 birr per 200 liters barrel, but in early 2000, this price rose to 15birr, a price that drought stricken pastoralists can ill afford (World Bank, 2001: 5). On the other side, possession of a *berkad* has been identified as a crucial element of promoting stratification among kinsmen in the grazing region of the Haud. Availability of permanent water allows *berkad* owners to further diversify and raise cattle and ultimately become rich elders keeping large stocks produced partly for export. All this happens to the detriment of the non *berkado* owning herders and places further pressure on the fragile nomadic ecosystem (Farah, 1997: 3-4).

However a recent study, conducted by ICRC in Somalia, contests the purely private ownership of the *berkado*: "*In Galgaduud and Puntland, berkedo are owned by groups of families (10-50) forming unofficial cooperatives. Therefore, the ownership of these berkado is neither purely private nor purely communal*" (ICRC, 2005). Moreover, in Puntland, a number of the communities came together as a whole to pay for water trucking and in both regions certain individuals were allowed to access the trucked water free of charge, irrespective of whether they were part of the group purchasing the water (owners relatives, caretakers, guests, travellers but also people with no stock, stray animals and orphans). In the Central region of Somalia, a tax or charge (*balaash*) is levied for storing trucked water in the *berkad* (from 3 to 13 percent of the storage capacity) and used for the water given to individual free of charge (ICRC, 2005).

This apparent variety and complexity of *berkado* ownership and management systems definitely deserves further investigation.

### ***The impacts on land uses and land tenure***

The growth of the *berkado* and the introduction of water trucking, especially in the belt between Aware and Dikrile (the Haud) has allowed herd owners to stay year round in what were formerly wet season grazing areas only. This has, in turn, resulted in some of these herd owners turning to cultivation to supplement pastoralism (Hogg, 1997: 106). The shift towards rain-fed or spate agriculture is associated with land privatisation and physical enclosure. In response, rangeland enclosures (*seere*) also sharply spread in the Haud: “As more and more land has become fenced for farming-and thereby effectively privatised, there is less land for communal grazing. This has led to increasing resentment on the part of the nomadic livestock herders who depend on communal access to the range. In some areas, livestock owners themselves have taken to fencing large areas of land as dry season grazing reserves in order to prevent the area to becoming farmland “(Hogg, 1997:118).

#### **4.4 Local conflicts**

The appropriation of the wet grazing area of the Haud with the construction of *berkado* and the introduction of water trucking generated clashes between the two Somali clan-families (Daarood and Isaaq) who were using it as wet season grazing area. Conflicts also arose between closely related lineages amongst the Isaaq, for example between the *reer* Liban and the *reer* Samater in Harshin. The *reer* Samater was forced to migrate to a new location (Darbiga) as the result of the appropriation and fencing of the rangelands after the introduction of *berkado* in Harshin

#### **4.5 Instrumentalisation of a territorial anchorage**

The Ethiopian government has always favoured the settlement of the Isaaq community in the Haud. Part of the Haud has being reserved to this clan-family by the British from 1944 to 1958.

The scramble for the Haud, between the Daarood and the Isaaq, was stirred up by the civil war in Somalia. The northern Isaaq disappointed by the southern Daarood domination formed the Somali National Movement (SNM) and staged operations against the Somali Army from bases in Ethiopia granted by Mengistu. This enmity from the Ethiopian government against the Daarood clan family dates from the violent Ogaden secessionist movement still in operation in the Somali region. As in Kenya, in 1960, a sporadic local Somali guerrilla waged war against the Ethiopian Empire led by the Ogaden Liberation Front (OLF) triggered an open international war between Ethiopia and the new Somali Republic in 1963-1964. The irredentism reappeared in 1969 after the “coup d’Etat” in Somalia. The Republic fell under the leadership of Siyyad Barre who promoted national unification. Two politico-military parties were set up in 1976: The Western Somali Liberation Front (WSLF) recruiting members from the Ogaaden Somali and the SALF (Somali and Abo Liberation Front (SALF) incorporating islamised Oromo elements. In summer 1977, the regime of Mogadishu decided to deploy its own troops. The Ethiopian counter attack, supported by Russians officers and Cuban troops, began in spring 1978. The decay of the pan-Somalism was set in April 1988, when Siyyad Barre and Mengistu Hayla Mariam signed a peace treaty.

Inter-lineage conflicts among the Isaaq have also been triggered by the civil war in Somalia.: “*Both reer Samatar and reer Liban supported the SNM in its fight to liberate Somaliland. But the reer Samatar feeling cheated by the new government came to oppose the President. Although coexisting in Harshin for years, they became embroiled in the politics of Somaliland, where they belonged to opposing factions. When the fighting broke out between the two in June, SNM forces were sent across the border to support the reer Liban against the reer Samatar*” (Hogg, 1993:113).

#### **4.6 Preventive and mitigating measures**

In Ethiopia, preventive and mitigating measure arose from the local communities. It appears that the Ethiopian government has not reacted yet.

##### *Pastoralists' awareness*

In the Haud, the pastoralists' awareness about the long-term environmental consequences of the *berkado* development is on the rise. Three types of local agreement (*xeer*) are emerging:

- Agreements limiting the creation of new water sources around existing settlements;
- Agreements prohibiting the creation of new water sources in common wet grazing areas (Gomes, 1998:61, World Bank, 2001:5) not only to preserve grazing ground but also to agree on new clan territorial boundaries or buffer zones;
- Agreements prohibiting pastoral enclosures.

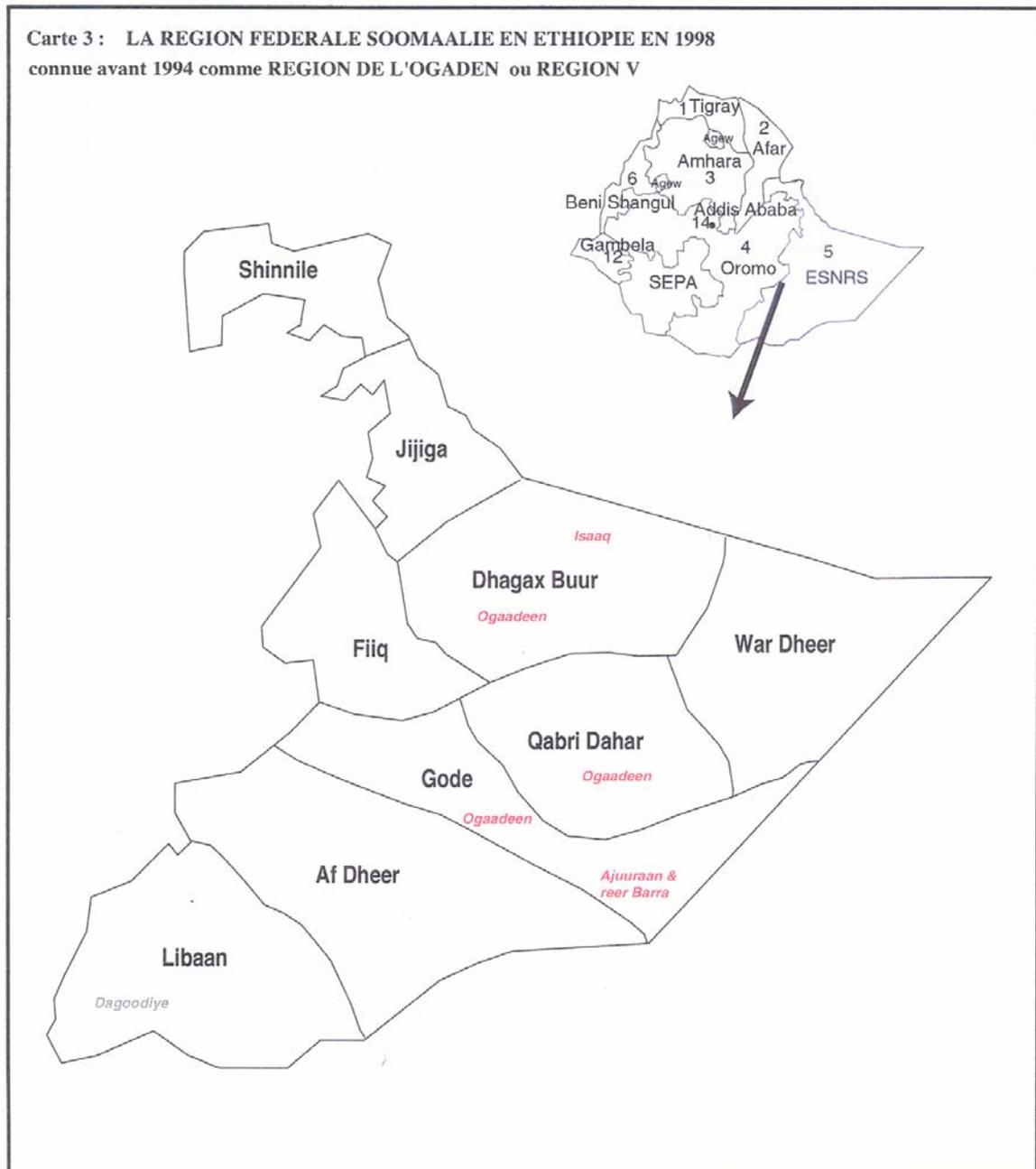
Somali society is a segmentary-lineage society; it is non-centralised (acephalous) and divided into agnatic descent groups. Each male ancestor, recalled in individual genealogies, is a potential level of collective identification, although the Somali usually refer to 7: The clan-family (*tol*), the clan confederation, the clan (*qolo*), the clan section (*laf*), the lineage (*jilib*), the lineage section (*jiffo*) and the extended family. The Somali use a kinship frame to explain alliance and division, expressed by the proverb: “*me against my brother; me and my brother against my cousin (patrilateral), me, my brother and my cousin against the world*”. Evan Evans-Pritchard and Ioan Myrdin Lewis conceptualised this ideology in term of structural distance or genealogical depth between individuals or groups. *Xeer*, concluded by elders refers to political alliances or agreements set up between groups structurally distant in the genealogical charter.

For example Rober Walker mentions a *xeer* concluded in 1985 between two clans, the Garhajis and the reer Isaaq, belonging the two Somali clan-family scrambling for the Haud (the Isaaq and the Daarood). The agreement forbids the construction of *berkado* between Aware and Rabaso settlements and between Aware and Daroor settlement, inside Suguma grazing area. Following clashes in Dabaroble and Ahiqat, a similar *xeer* has been concluded between the Habar Yonis and the reer Isaaq to avoid the creation of new permanent settlements between Moholin and Nustariik: “*They have an agreement stipulated that Danod, will be their border and each clan could only construct 16 berkado there. In the Haud, north of Danod to Cali Jama controlled by*

*the habar Yonis and the south of Danot, controlled by the reer Isaaq, no berkado should be constructed. This was in order to maintain the area as prime grazing area for the camels and also establish a buffer zone between them*”(Walker and Sugule, 1998:20-21).

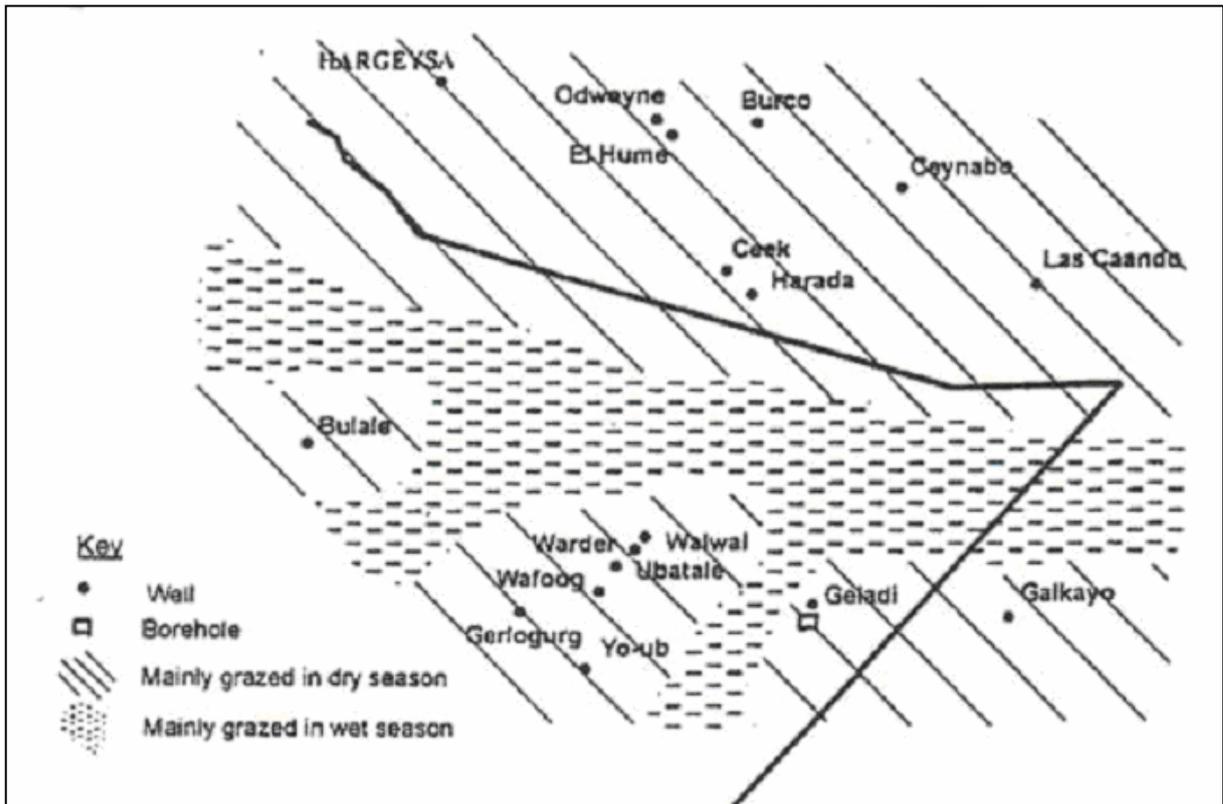
Richard Hogg gave another example: “*In Harshin, the farmers/ pastoralist tensions was addressed by the elders with a decree prohibiting farming and enclosures in the area*” (Hogg, 1997:119).

Transformed in permanent water supply with the practice of water trucking, the environmental adverse impacts of the development of the *berkado* are quite similar to the borehole’s, although, this technology developed by the pastoralists themselves as been associated, in some cases, with more affordable and lucrative private commerce suspected to be detrimental to the poorest. The fact that long lasting verbal customary agreements are reached between Somali family-clans regarding the limitation of their proliferation to preserve grazing areas is a significant sign of social control and represents an important precedent.

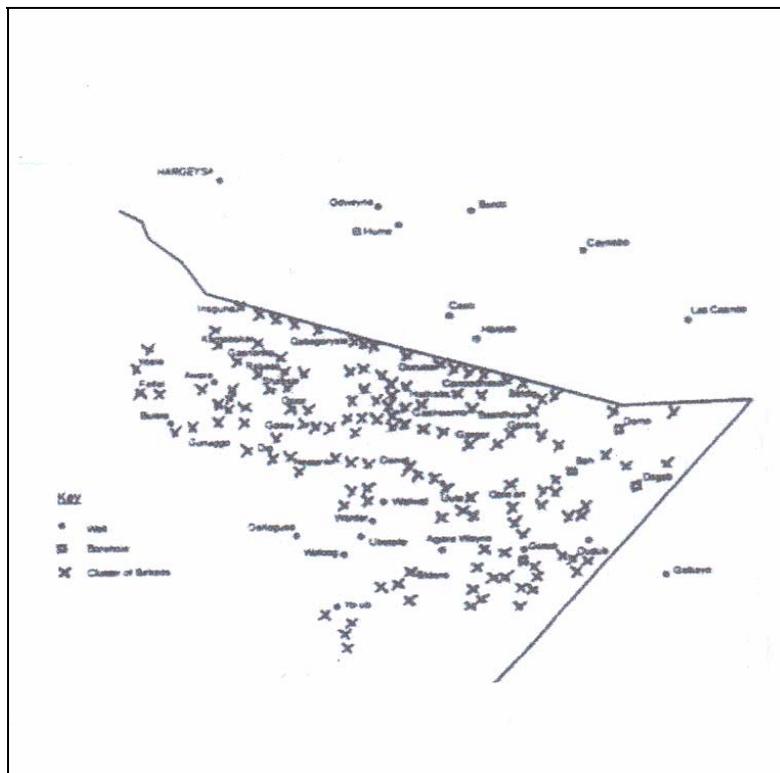


Source : UNDP-EU information section, revue par N.GOMES, October 1998.  
Le dessin des zones (*awreja* en Amharic, *gobol* en Soomaali) faisait l'objet de négociations.

Map 5



Map 6 : Permanent water points in the 1960s



Map 7: Proliferation of *Berkado* in the 1990s

## 5. PASTORALISTS' ACCESS TO THE WATER OF THE SHABELLE RIVER IN SOMALIA

Pastoralists' changing access to the Shabelle River in Southern Somalia reflects both the impacts of the inland water development and the effects of the nationalisation of land and water management in the breadbasket of the country (Map 8 at the end of this chapter).

The farming corridors of the Shabelle and Jubba rivers in Southern Somalia have been cultivated for generations by Bantu language speakers whose history is contentious: Are they indigenous or former slaves (*addoon?*). Conflicting versions are reported both in oral traditions and writings archives and this issue is particularly sensitive regarding the past and future legislations on land and property rights in the breadbasket of Somalia (Declich, 1995, Besterman, 1996, Cassenelli, 1982). They are nicknamed from their physical features: *jareer* (strong curly hairs) in opposition to the Somali (*jileyc*, soft hairs). Whatever their origins, these communities are now part of Somali society, although they occupy a low position in the Somali social stratification ("*bah iyo boqor*", the subjects and the kings" or the commoners and the aristocrats) associated with a strong endogamy. Economically, the Bantu Somali were and still are in a patronage relationship with the Somali pastoralists (Declich, 1995:100). Competition, between powerful Somali pastoral groups for access to prime agricultural land along the banks of the river or for securing over-lordship over the minority farming communities, has always been a source of conflict (Farah, 1995: 3).

### 5.1 The Somali agro-pastoralists and the Shidle agriculturalists in Jowhar District

The territory of the Shidle starts in Madaweyn, in Jowhar district and extends south into Balcaad districts. Scattered in 30 villages of around 1000 peoples, this community has centuries of experience in gravity-fed irrigation. Each village, located on the riverbanks, has jurisdiction over a land and several hand-dug canals that irrigate small private plots of 0.5 to 10 ha. For example, the villagers of Bayaxaw cultivate on 12 canals, the villagers of Barrey on 7 canals and the villagers of Maandheere on 19 canals. Maize, sesame, fruits and vegetables are the most common crops.

The water users of a canal (*keli*) and its distributaries (*far*) are organised in customary associations of water users called *madda*. The *madda* inform the gatekeepers, *YarsinYar* at the distributary level and *Yarsin Weyn* at the canal level, about their individual water requirements. The *Yarsin* then organise seasonal schedules for water allocation. The *Yarsin* are also local technicians who control the water discharge with the operation of the gates and allocate maintenance and repairs duties to the *madda* members. Twice a year, every farmer has to desilt by hand a section of the main canal and a section of his distributary (*mari*). Anybody who fails to perform the work is fined (4 litres of sesame oil, 25 kg of maize/3kg of rice). Witchdoctors protect every sections of the river under the jurisdiction of the villages. The *Baxaar* (owner of the crocodiles) are known for their power to scare away the crocodiles, especially during the repairs of the main gates. Many stories account for their hereditary ability to communicate with the reptiles. The *Baxaar* also arbitrate conflicts between the *madda* members and the *yarsins*. When they cannot settle a dispute over water, the matter is

taken to a specific council of elders called the *masarweyn*. The *masarweyn* represents landowners elected from the *madda*. Some members of the *masarweyn* are also members of the village committee. This political organ is in charge of land issues and deals with the pastoralists. The village committee allocates specific intakes for their herds to be watered (*ceela*) and the *Baxaar* must also to protect them from crocodiles.

## 5.2 Borehole policy in pastoral inlands and disruption of grazing patterns

The creation of boreholes in pastoral areas of Southern Somali was undertaken during the former regime. The new permanent water sources reduced the pastoralists' dependency from permanent wells and also from the river, in dry seasons. Prior to their installation, the pastoralists used to take their herds to the river at specific intakes (*ceela*) chosen by the Bantu villages committees. Nowadays, these intakes are only used in the case of a breakdown of the boreholes. This new pattern affected the nature of the relationships between the pastoralists and the farmers. Previously, they exchanged organic manure against fodder. Nowadays, organic manure is obtained free of charge from the cattle/camel camps but fodder is commercialised.<sup>16</sup>

Apparently, in areas not affected by borehole development, Somali pastoralists still completely rely on the river in dry seasons and negotiate customary rules and regulations to manage their inter-actions with the Bantu farmers: *"During cultivation, they can't come near the farms. After harvest, they come and use the fields, graze in the fields. They pay 100/200 for one field. The elders come here and negotiate. How to avoid the destruction of the crop on the passage of the herds? How to avoid the herds to eat sim-sim? We tell them where and when they can graze. In case of problem, they say verses of the Coran (fatah) or they pay compensations (farasar)"*.<sup>17</sup>

## 5.3 Failure of the government resettlement programmes

Three resettlement schemes were launched in 1975. The Dujuma Resettlement Scheme (6 000 ha) was set up on the Jubba River while Sablaale (6 000 ha) and Kurtun-Wareey resettlement Schemes (6 000 ha) were established on the lower Shabelle. According to Mohamed Said Samatar, these schemes, which aimed at converting the pastoralists affected by the drought of 1973-1974 to agriculture, have not been able to reach that goal and most of the pastoralists returned to their former livelihoods (Samatar, 1990).

This trend is not specific to Somalia. Rain-fed and irrigated agriculture has always been a mean of sustaining pastoralism. Developers present it as an alternative to pastoralism. As Anderson, mentions for Kenya, *"Where the agencies who established the resettlement schemes hoped to encourage destitute pastoralists to become agriculturalists and invest in the technologies, skills and tools required for cultivation, those herders who settled on the schemes have other ideas. Most seek to reinvest into pastoralism. They see the irrigation scheme as mean of re-establishing the capital necessary from herding and not as a viable alternative to herding"* (Anderson, 1999: 247-248).

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<sup>16</sup> Interview with elders, Caarmole, 17 April 2003.

<sup>17</sup> Interview Bayawo village committee, 18 July 2003.

#### **5.4 Relative success of the spontaneous diversification of the pastoralists into irrigated agriculture**

In the 60/70s, a large number of inland Somali agro-pastoralists started acquiring riverside agricultural land as a diversification strategy, through different methods. First, some newcomers obtained the right to use a plot with the provision of gifts (one goat) to the Bantu owners. Some became part of the village community by slaughtering a cow. Some simply rented or bought a piece of land.

More manipulative ways appeared with policy of land nationalisation. Most of the Shidle did not register their land under the 1975 law. The statutory land policy leitmotiv became: "*the land belongs to those who cultivate*". In absence of visible use, the State considered riverside pastoral dry grazing areas belonging to no one and that the needy could add value to them. Vast tracks of bush located at the end of the existing canals and used as dry grazing, were cleared and registered by the Somali for rain-fed and/or irrigated agriculture. The right of occupancy started to prevail on other forms of land tenure. Moreover, under Siyyad Barre, some land was allocated to politically connected individuals. When most of his clansmen fled in 1991, the new groups of occupants, who took control of the area, simply replaced them. During the apex of the civil war, some Shidle villages, such as Maandheere, fought hard to preserve their land from the Somali. Before the establishment of the local administration of Mohamed Dheere in 2001, they use to fight every season with his clansmen, the Abgal, especially the Mohamed Mussa sub-clan. The new administration provided them with security against other militias but also set up a system of taxation on the markets.

However, the relations between the Somali newcomers and the Shidle are not systematically conflicting and new forms of co-operation are emerging. Some Somali agro-pastoralists agreed to contribute financially to the costly mechanical maintenance of the canals they use and comply with the Shidle customary management authorities in order to secure their water rights. Since they have no experience in irrigated agriculture, they also offer the Shidle employment opportunities as casual labourers.

#### **5.5 The impacts of the State water management**

In Somalia, the land law reform n° 73 of 1975 nationalised all agricultural land and encouraged medium and large-scale commercial production. The maintenance of the rivers (the government canals constructed on Shidle alienated land and the enlarged old Shidle canals) became a State responsibility and the *Yarsin* and *Baxaar* were exempted from one of their customary responsibilities.

Since 1991, the chaos of the civil war suspended all maintenance work resulting in the accumulation of silt in the Shabelle river, the breakdown of its embankments, the collapse of all flood control and diversion systems and to the obstruction of 80 percent of the irrigation canals, especially the canals dug and enlarged by the government. Crop production under irrigation in the breadbasket of Somalia decreased by more than 50 percent.

## 5.6 Prevention and mitigations strategies

Only the new unrecognised State of Somaliland developed a water policy. However, in the other parts of the former Republic of Somalia (with a new government in exile in Kenya) development agencies have tried to comply with the donors environmental directives.

### *Environment Impact Assessments*

In Somaliland, the government also recognised the adverse impacts of water development: *“The concentration and the construction of water systems in a given area can lead to attract too many people and livestock that can endanger the natural environment. In the harsh environment of Somaliland care is to be taken not to disrupt the delicate ecological balance. In many areas, grazing takes place for only a number of months each year - as long as water sources are available. The movement of livestock away from the area provides a period for vegetation to recover. Concentration of water supply facilities in a given area may result in a huge influx of people and livestock with associated environmental degradation. Current livestock levels are already putting the long-term tenure of the rangelands - and thus the livelihoods of the nomads - at a significant risk”* (SNWP, 2004:5).

The Ministry of Pastoral Development and Environment has been mandated to provide technical guidance for Environmental Impact Assessments required by the Ministry of Water and Mineral Resources and will provide them with Environment Impact Assessment reports for all water development projects that require permitting (SNWP, 2004:15). As far as livestock watering is concerned, the Ministry of Livestock has been mandated to coordinate with the Ministry of Water and Mineral Resources in order to assess the demand for livestock water needs, in a way that allows local governments to plan infrastructure and for the central level (MWMR) to approve or amend such plans in order to mitigate the possible land utilisation conflicts as well as the negative environmental impacts (SNWP, 2004:14).

In the guideline provided by IUCN for Somalia, EIA only applies to medium and large projects (IUCN, 2000: 8). According to the water development officer for the EC-Somalia, they only apply to boreholes.<sup>18</sup> Another type of environmental assessment, performed at a larger scale for more accuracy, is currently performed in Somalia: the strategic environmental assessments. In Somalia, private Kenyan based companies (such as Repcon Associates and Earth Water Ltd) have been contracted to conduct these new types of assessments. Examples of possible mitigation measures to address water development environmental impacts have been recently suggested (IUCN, 2000:16). These recommendations need to be better articulated and illustrated by case studies outlining lessons learned. Earth Water Ltd provided a more elaborate table. However, it appears to be a disorganised shopping list rather than scientifically constructed recommendations derived from a livelihood analysis. In both cases, a methodology has not yet been specifically developed for pastoral environment and production systems.

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<sup>18</sup> Interview with EC representative, Nairobi, 8 February 2005.

### ***Investment in environmentally friendly technologies***

In Somaliland, priority is given to extraction of groundwater for domestic consumption. Surface water is recommended for other uses (livestock watering, agriculture irrigation, house cleaning, industrial production and sanitation (SNWP, 2004: 9). In Somalia, a number of development agencies, such as ACF funded by USAID to operate in the Wajid district of Somalia, have deliberately opted for the rehabilitation of traditional wells to improve water quantity and quality, while providing maintenance training to the owners of the wells.

### ***Pastoral institution building***

Since the 1980s, there is a growing trend of advocating “small irrigation scheme” development as an antidote to the visible failure of “large scale” schemes. However, as Adam outlines: “*There seems little reason to suppose that scale is the key factor in the development of irrigation schemes. In general small scale irrigation does not offer Africa a different kind of development, but simply the usual thoughtless bureaucratic large scale development in little chunks*” (Adam, 1989: 534).

In Somalia, since 2003, NGOs, such as CEFA funded by the European Commission, experimented with a new approach to improve irrigation management based on the participation of the farmers, named Participatory Integrated Community Development (PICD). CEFA published a training manual on canal management based on a Community Action Plan (CAP) derived from a Participatory Rural Appraisal (PRA). In a consultative meeting, the villagers of Bananey indicated the need for training on organization, operation and maintenance. CEFA undertook training on canal management. After an inventory of the existing organization structures, roles and responsibilities related to irrigation management, of the current operational practices such as water distribution and of the traditional rules and regulations, the interviewed farmers came with a detailed fee collection plan to ensure proper maintenance.

Irrigated agriculture requires a very high level of human or financial care. Old canals were collective property and so were their seasonal maintenance. The old canals were manually excavated by the farmers and maintained by hand by the associations of water users. NGOs are introducing collection fee practices for mechanical maintenance. In Jowhar district of Somalia, the cost of manual excavation of 20 metres is 40 000 Ssh per farmer. The cost of hiring a machine was evaluated to 40 000 000 (60 hours) that is 140 351 Ssh each (40 000 000 divided by 285 members of the water association (*madda*). The Rice farmers agreed to pay more than the maize farmers (160 000/ha against 80 000/ha) since they have higher water consumption. However, the pastoralists are not involved and are not included in the water users associations. Mechanical rehabilitation is more expensive but considered as an investment for some farmers since it reopens land for cash crop production. In Jowhar, when the old canals were excavated manually, rice cultivation was impossible. As CEFA outlines: “*A hand digging not only reduces the canal capacity, but also (compared to a full rehabilitation by machine) causes water to enter during a shorter time of the year*” (CEFA, 2002:7). On keli dherre (see Map 9 at the end of this chapter, during the long rainy season (Gu), maize was inter-cropped with cowpeas and in addition a small percentage of vegetable. During the short rainy season (*dhery*), farmers grew roughly 60 percent of sesame and 40 percent of maize.

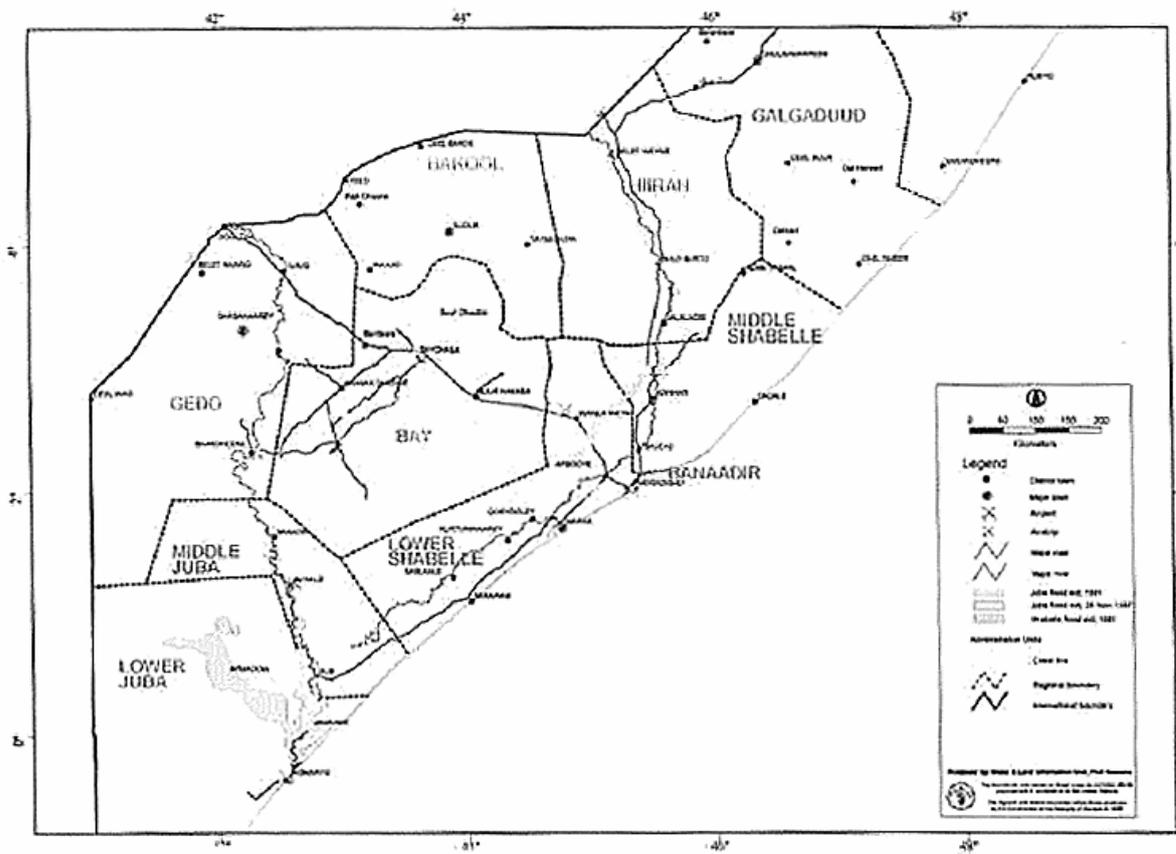
Last *dhey*r season, 61 percent of the land was used for maize, 21 percent for sesame, 17 percent for rice and 1 percent for vegetables (CEFA, 2003). However, even after excavation, the canal still suffers from water shortages from February until April and from June to August and in January. To respond to water scarcity in June and November, the village committee requested to be supplied with a large irrigation pump, which would also require proper management.<sup>19</sup>

However, the new management structures tend to replace the customary institutions of the Shidle with a more restricted membership and without the representation of the pastoralists interests (Gomes, 2004). Therefore, their access rights to the River and the canals are no longer secured.

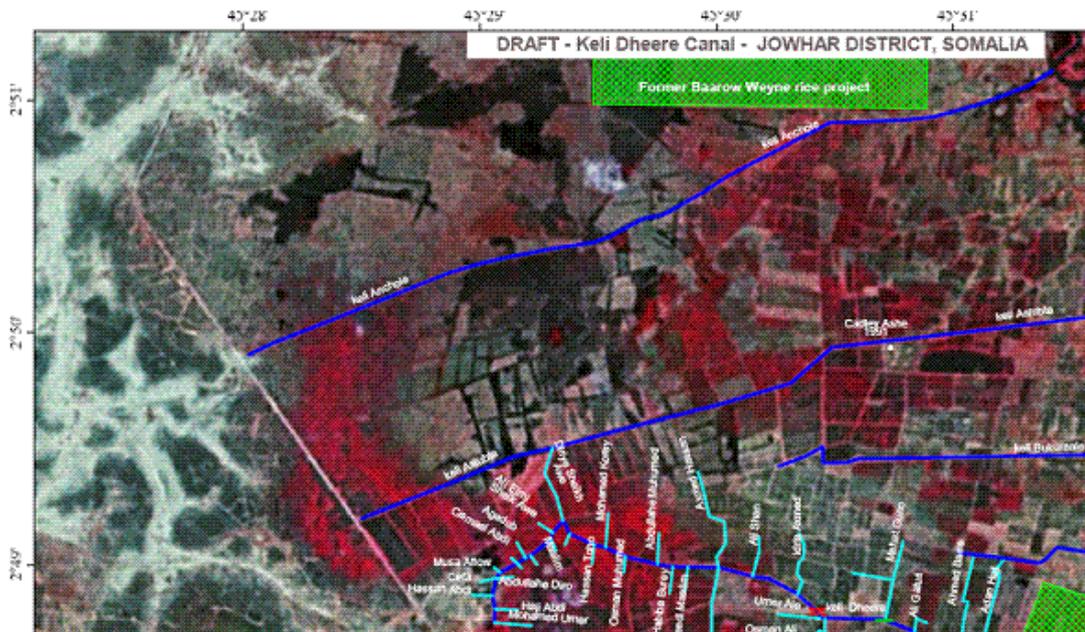
In Southern Somalia, the multiplication of irrigation canals in the last 30 years encroached on the pastoralists' dry grazing pastures. However, it reduced the distance to the source of water since they can use the ponds located at the end of the canals. Moreover, fodder is bought or exchanged against manure or directly produced by pastoralists that have adopted irrigated agriculture as a diversification strategy. However, canal management both on shared Shidle canals and government canals remains an issue. Community-based approaches still lack a clear understanding of the local customary institutions and the local stakes between different groups of water users.

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<sup>19</sup> Bananey village committee, 18 August 2003.



Map 8 : Southern Somalia, Juba and Shabelle Basin



Map 9 : Satellite view of Canal Dheere, Jowhar district, Middle shabelle Region, Somalia

## 6. CONCLUSIONS

Pastoralist livelihoods have always been exposed to the vagaries of climate and harsh environmental conditions. However, in the recent years, pastoralists have faced increased competition for water and pastures in a context of decreased rangeland access.

In the absence of clear national policies for the development of the arid and semi-arid lands for the countries of Eastern Africa, unplanned water development represents a threat for pastoralism, even if the process of sedentarisation around new permanent water sources offers to a minority of the population complementary or/and alternative livelihoods with the development of agriculture and access to education.

### 6.1 Effects of hydraulic projects on customary pastoral water/land management

Exogenous water development in pastoral areas of eastern Africa lacked a comprehensive approach of mobile pastoral production systems and disrupted the pastoralists spatial economy (Bourgeot, 1994: 69). The linkages between this disruption and the livelihood of the pastoralist have not been entirely addressed. Below are the main general trends analyzed in this study summarised.

#### *Impacts on the environment*

Following the increasing human and animal pressure around the traditional wells, policy-makers and pastoralists promoted the deconcentration of hydraulic networks with the drilling of new water sources in wet season grazing areas to enable the herds to stay longer, without considering the long-terms impacts. Technical prescriptions such as determining an appropriate distance between boreholes (20-30 km) did not prove efficient to prevent the negative effects of overgrazing resulting from these more numerous and “open access” new water resources.

Grazing around the new water points, especially boreholes, transformed into dry grazing grounds, and very few pastures remained exclusively used in wet seasons. Localised over-grazing expanded, and more important, perennial palatable plants began to disappear and were progressively replaced by annual species dependent on low and erratic rainfall.

The reduced quality of pastures affects milk yield and has important health consequences. This is suspected to increase vulnerability to famine and malnutrition. In some instances, the longer separation of the household from its herds has weakened children’s health status as they are deprived from regular provision of milk (Fratkin and al., 1999). This range degradation has increased local competition and the need for inter-regional migrations in search of fresh pastures.

These trends did not only have an effect on grazing patterns but also on settlement patterns. Every new water point became a permanent human settlement. Firewood collection and charcoal production, not only for domestic consumption but also for

export to urban centres, increased as a lucrative generating income activity detrimental to the local environment.

### ***Local conflicts***

In pastoral areas, most of the local conflicts are linked to natural resources, especially in times of scarcity. Traditional wells and their surrounding pastures have always been a collective property held by a community (tribe, clan, lineage), who dug and/or maintained it. However, access rights for other groups were rarely denied except water scarcity. Surface water sources and wet grazing land were not subject to any appropriation and several communities peacefully intermingled.

Appropriation of new water infrastructure, and their management organizations, have been source of violent local conflicts. Many stories account for Somali clans and lineages disputes and clashes for access rights over fuel-driven boreholes, even resulting in their destruction.

In addition to access to water, the appropriation of permanent water points provide a territorial anchoring, which is associated with the following economic opportunities:

- 1) Control to access to rangeland around them;
- 2) Diversification of previous pastoral activities: agriculture, charcoal production;
- 3) Access to social services (schools, health centres).

In other words, water development has promoted a competitive sedentarisation process for individual and collective economical prosperity among and within pastoral communities, even between closely related lineages.

### ***Changes in land uses/tenure***

Appropriation of communal rangeland due to the drilling of permanent water sources, especially wet dry areas and riverside dry grazing areas, has become the focus of conflicts between competing forms of land uses: pastoralism and agriculture (Behnke, 1988; Hogg, 1997; World Bank, 2001). Diversification into agriculture, around new infrastructures, has been associated with physical enclosures of rangelands by a wealthy minority. When the self-fulfilling logic of enclosure gains momentum, even individuals who do not want to enclose their kind are forced to do so to prevent others from expropriating all communal lands (Behnke, 1988:7). In addition, the pastoralists start to fence rangelands as reserved grazing areas to prevent agricultural encroachment.

### ***Technical constraints***

The above stated adverse effects of the water development are counter-balanced by the fact that almost 1/3 of the new water supplies, weather boreholes, *berkado* or irrigation canals, are not operational due to management difficulties. This problem is often due to the choice of unsuitable technologies requiring high qualifications and financial investments for maintenance. Neither the governments nor the local communities have the capacities to ensure the proper operation and maintenance of such infrastructures. The introduction of water charging did not prove very successful

for fuel-driven boreholes. However, it opened a lucrative business for rich herders, the owners of *berkado*. The introduction of fee collection for mechanical maintenance of irrigation canals seems a viable option.

### ***Water development and governance***

Even if the general argument to create permanent water developments in pastoral areas resorts to a response to the “increasing population and stock pressure”<sup>20</sup>, other political goals are at stake. Water development is highly politicized, as it has been pointed in the three case studies. Sedentarisation of pastoral communities within specific territories can be used to refrain migrations from war-torn countries, curb irredentist movements and win general elections.

The absence of specific national policies for water development in pastoral areas has allowed unplanned interventions, especially from the humanitarian organizations (ICRC, UNICEF, UNHCR), which operate in emergency situations with a public health rationale (Prior, 1994; Oxfam, 2002) although international standards for water quality seem difficult to achieve. The situation has been further complicated by the fact that existing inter-agencies’ water sector coordination bodies did not have the mandate to establish common operational guidelines.

On the other hand, the experiences of State land and water management in riverside lands did not prove efficient. This policy has been associated with alienation of indigenous agricultural land for inefficient cash crop production schemes or resettlement schemes for destitute pastoralists, which did not achieve their goals. The transfer of irrigation canals maintenance duties to administrative services disrupted the customary management institutions. Finally, the nationalisation of the riverside dry pastures promoted land appropriation of the commons by a minority of wealthier pastoralists, as a diversification strategy.

In the absence of a legal framework, the newly created pastoral associations are not in a position to contest any water development intervention<sup>21</sup> and their participation in the planning process has been weak. The new consultative bodies, such as the district steering committees in Kenya, created to monitor drought contingency boreholes lack enforcement mechanisms.

## **6.2 Preventive and mitigation strategies**

The most efficient preventive and mitigation strategies have been initiated by the pastoralists themselves, as indicated above. Later on, donors, development agencies and governments have also designed new directives and policies aiming to limit the negative impacts of ill-planned or unregulated water supplying infrastructures.

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<sup>20</sup> In Wajir, the population has been multiplied by 4 between 1948 and 1979 (from 32 500 to 136 697).

<sup>21</sup> In Kenya, registered under the Social Service Department at the District level, their by-laws are not enforceable under the Kenyan law.

### ***Local awareness***

Proliferation of permanent water sources is driven by a local demand for alternative livelihood and economic and political autonomy. However, Hardin's famous 'tragedy of the commons' (1968) arguing that pastoralist (free riders) are unaware or discount the land degradation they are causing, especially on common wet grazing areas is seriously challenged by the recent initiatives of a number of groups to refuse additional permanent water sources. This awareness emerged in the form of petitions to the development agencies and governments as a protectionist strategy from already settled pastoral communities against groups wishing to have their own settlement. The conclusion of inter-ethnic agreements between newly settled communities is less contentious and demonstrates of an attempted consensual social control.

### ***The limitations of the new environmental directives and policies***

The principles of the international drinking water supply and sanitation decade (1980) set standards with an emphasis in low cost technologies, cost recovery, community participation and the need for an integrated approach. On the other hand, one of goal of the 2000 United Nations millennium declaration is to decrease the proportion of people without sustainable access to safe drinking water and sanitation by 2015. Donors, development agencies and governments have recently recognised the adverse effect associated with the growth of permanent water infrastructures in pastoral areas. However, preventive and mitigation strategies are new and have not adapted to pastoral contexts.

## **6.3 Lessons learned**

Water development has often focused on water supply and quantity to the expense of water quality. Moreover, despite recent initiatives, the planning of new permanent water infrastructures is still erratic and not integrated; as a frequent result, effective participation of the local communities in the management and maintenance of these investments remained absent or insufficient. There is, for example, a very weak or absent participation of most of the recently promoted newly created water users associations even within the new integrated water management approaches.

New approaches, such as the ex-ante environmental impact assessments of hydraulic infrastructures include a preventive and critical examination of the effects of a project on the environment, can be useful. Nevertheless, these assessments still lack specific methodologies for pastoral areas. Such methodologies should include:

- a) Land use and land tenure analysis, especially mapping of the transhumance patterns, and the likely effects of new infrastructures on these patterns;
- b) Study of the vegetation cover, and the likely effects of new transhumance patterns on vegetation;
- c) Local stakeholder analysis from a socio-anthropological approach (i.e. including power structure and dynamics, and how these are related to the mobility patterns).

Management difficulties of the water infrastructure often compromise their sustainability. The recent creation and training of water users associations is facing serious challenges including:

- a) Need for relevant and equitable membership based on existing institutions and on other criteria than kinship and ethnicity (common use of rangelands and existing water points);
- b) Need for training in operation, maintenance and transparent fee collection.

#### **6.4 Recommendations for further studies**

One of the millennium goals is to increase access to “safe drinking water”. However, little quantitative data is available on access to water (quantity and quality) in pastoral areas of Eastern Africa. All the statistics provided by WHO and the World Bank present general country profiles on access to “improved water source” and not “safe drinking water” (Kenya, 43 percent, Somalia 14 percent, Ethiopia 4 percent). In fact, WB/UNDP socio-economic survey for Somalia reports that 20.5 percent of the population had access to safe (treated) water in 2002 against 29 percent before the civil war. However, this applies to only 4.1 percent of the rural population against 53.1 percent in urban areas. A specific quantitative assessment focused on pastoral areas would provide useful and interesting data.

If the long-term adverse environmental impacts of water development are well documented, the indirect effects of range of degradation on animal and human health, especially children also deserve better analysis. For example, the country profiles of the World Bank indicate a slight decrease in child malnutrition ( percent under 5) in Kenya, Ethiopia and Somalia between 1990 and 2001. However, once again these figures are not specific to pastoral areas.

Finally, the variety of ownership and management systems for the controversial *berkado* in Eastern Africa deserve further analysis and proper mapping of these infrastructures, which are intensely expanding.

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## Further information about the LSP

The Livelihood Support Programme (LSP) works through the following sub-programmes:

### **Improving people's access to natural resources**

Access of the poor to natural assets is essential for sustainable poverty reduction. The livelihoods of rural people with limited or no access to natural resources are vulnerable because they have difficulty in obtaining food, accumulating assets, and recuperating after shocks or misfortunes.

### **Participation, Policy and Local Governance**

Local people, especially the poor, often have weak or indirect influence on policies that affect their livelihoods. Policies developed at the central level are often not responsive to local needs and may not enable access of the rural poor to needed assets and services.

### **Livelihoods diversification and enterprise development**

Diversification can assist households to insulate themselves from environmental and economic shocks, trends and seasonality – in effect, to be less vulnerable. Livelihoods diversification is complex, and strategies can include enterprise development.

### **Natural resource conflict management**

Resource conflicts are often about access to and control over natural assets that are fundamental to the livelihoods of many poor people. Therefore, the shocks caused by these conflicts can increase the vulnerability of the poor.

### **Institutional learning**

The institutional learning sub-programme has been set up to ensure that lessons learned from cross-departmental, cross-sectoral team work, and the application of sustainable livelihoods approaches, are identified, analysed and evaluated for feedback into the programme.

### **Capacity building**

The capacity building sub-programme functions as a service-provider to the overall programme, by building a training programme that responds to the emerging needs and priorities identified through the work of the other sub-programmes.

### **People-centred approaches in different cultural contexts**

A critical review and comparison of different recent development approaches used in different development contexts is being conducted, drawing on experience at the strategic and field levels in different sectors and regions.

### **Mainstreaming sustainable livelihoods approaches in the field**

FAO designs resource management projects worth more than US\$1.5 billion per year. Since smallholder agriculture continues to be the main livelihood source for most of the world's poor, if some of these projects could be improved, the potential impact could be substantial.

### **Sustainable Livelihoods Referral and Response Facility**

A Referral and Response Facility has been established to respond to the increasing number of requests from within FAO for assistance on integrating sustainable livelihood and people-centred approaches into both new and existing programmes and activities.

For further information on the Livelihood Support Programme,  
contact the programme coordinator:  
Email: [LSP@fao.org](mailto:LSP@fao.org)

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