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JESS REPORT ON PASTORAL ECONOMY
AND SEASONAL LIVESTOCK MOVEMENTS
IN THE JUBBA VALLEY

JESS Report No. 33

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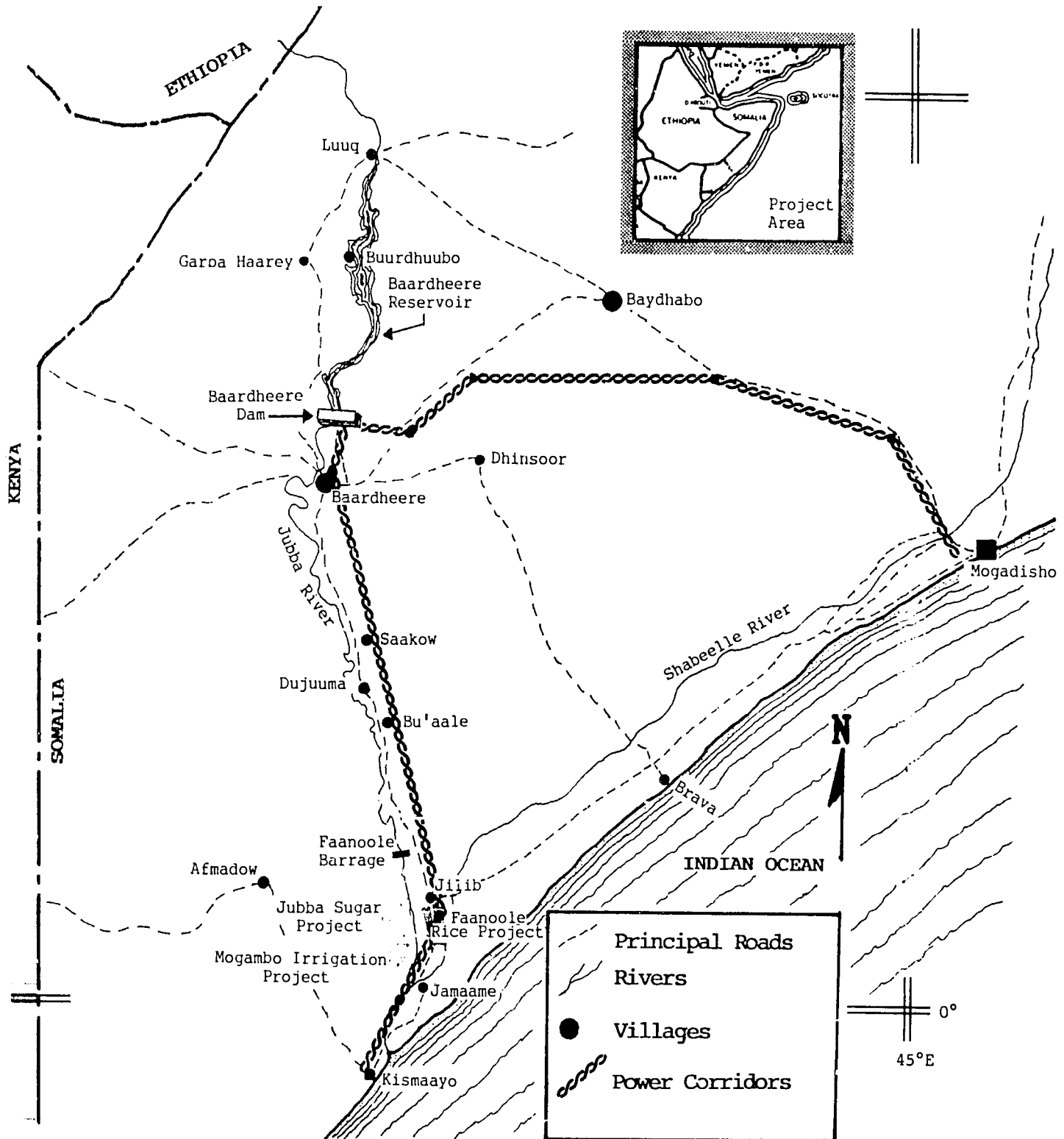
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CONTENTS

<u>Abbreviations and Acronyms</u>	i
<u>Preface</u>	ii
I. <u>Executive Summary</u>	1
II. <u>Introduction and Statement of Problem</u>	4
A. Economic Significance of the Livestock Sector for Somalia	4
B. Scope of Work and Statement of Problem	6
C. Methodology	9
III. <u>Natural Conditions for Livestock-Keeping in the Greater Jubba Valley</u>	10
A. Topography and Landforms	10
B. Climate	10
C. Soils and Vegetation	12
D. Water Availability	13
E. The Tsetse Problem	14
IV. <u>Socioeconomic Structure of the Livestock-Keeping Population of the Greater Jubba Valley</u>	15
A. Demographic and Ethno-Social Characteristics	15
B. Types of Livestock-Keeping	16
C. Livestock Species and Spatial Distribution	17
D. Economic Significance of Pastoralism and Agro-Pastoralism	20
E. Extra-Pastoral Activities and Their Economic Significance	25
F. Socioeconomic Relations Between the Settled Population and Nomadic Pastoralists	30
V. <u>Spatial Migration Pattern of Pastoralists and Agro-Pastoralists in the Greater Jubba Valley</u>	32
A. Traditional Structure and Modern Changes in the Migration Pattern	32
B. Northwestern Greater Jubba Valley	33
C. Northeastern Greater Jubba Valley	37
D. Western Central Greater Jubba Valley	38
E. Eastern Central Greater Jubba Valley	38
F. Southern Greater Jubba Valley	39
G. Southeastern Greater Jubba Valley	40

VI.	<u>Effects of Dam Construction on Livestock-Keeping in the Greater Jubba Valley</u>	41
	A. Major Possible Effects on Livestock-Keeping	41
	B. Recommendations to Minimize Negative Effects	42
VII.	<u>Final Discussion and Perspectives</u>	45
	<u>References</u>	47
	<u>Appendices</u>	
	A. Photographs	A-1
	B. Maps	B-1

Area of the Baardheere Dam Project and the Jubba Valley Development



ABBREVIATIONS AND ACRONYMS

AHT	Agrar- und Hydrotechnik
AID	U.S. Agency for International Development
ARD	Associates in Rural Development, Inc.
EEC	European Economic Community
GJV	Greater Jubba Valley
GSDR	Government of the Somali Democratic Republic
JESS	Jubba Environmental and Socioeconomic Studies
JuDAS	Jubba Development Analytical Studies
MNPJVD	Ministry of National Planning and Jubba Valley Development
SSh	Somali shilling

PREFACE

Jubba Environmental and Socioeconomic Studies (JESS) is a 3-year program of river-basin investigations in southern Somalia. JESS is part of a larger project, Jubba Development Analytical Studies (JuDAS), which is a cooperative effort between the U.S. Agency for International Development (AID) and the Ministry of National Planning and Jubba Valley Development (MNPJVD) of the Government of the Somali Democratic Republic (GSDR). Associates in Rural Development, Inc. (ARD) was awarded a contract by AID (AFR-0134-C-00-5047-00) to provide technical assistance and project management for JESS.

Dr. Jörg Janzen, pastoralism specialist, carried out field investigations in Somalia from 2 January to 24 February 1988. Research included 2 aerial reconnaissance surveys of the Jubba Valley and intensive, on-ground follow-up investigations and interviews with pastoralists in the valley.

The author wishes to express his appreciation to his JESS counterpart field team, Osman Axmed Mucallin, Cabdiraxiim Moxamed Axmed, Moxamed Aden Keynan, and Idris Cali Korow. Without their assistance, field work would not have been possible.

I. EXECUTIVE SUMMARY

This report deals with the importance of nomadic pastoralism in the greater Jubba River Valley in southern Somalia. More than 50 percent of the population of Somalia practice mobile livestock-keeping, partly for subsistence but with a steady transition to semi-commercial activities. They have an estimated 40 million head of livestock.

Pastoral activities are influenced by local and regional soil and climatic factors. Movement is generally north-south, depending on the season, which determines the geographic availability and quality of fodder and feeds. Ephemeral (rainfed), perennial (river), and artificial (man-made) water sources also determine migration routes and concentrations, as well as the locations of livestock markets and services. The tsetse fly is a problem in the riverine environment from the Jubba gorge to the Ethiopian border, preventing pastoralists from grazing their animals in this area.

Droughts in the 1970s and 1980s and loss of livestock export markets have resulted in many pastoralists adopting the more sedentary livelihood of agro-pastoralism.

An evolution of traditional pastoral practices and covenants and recently introduced government-sponsored regulations and development have resulted in changes in the socioeconomic relationships between the settled population and nomadic pastoralists. While these changes are, in general, mutually beneficial and accommodating, conflicts have erupted due to the loss of traditional dry-season pasturing areas, which may be "locked-up" by agriculturalists or charcoal producers.

Three major changes have affected traditional migration patterns, having both positive and negative effects. These changes are:

- formal abolition of clan boundaries and their grazing and watering rights, as well as nationalization (in 1971) of lands not regularly cultivated;
- development of numerous high-capacity deep wells and water catchments (government/development agency-financed and privately/cooperatively owned); and
- expansion of irrigated agriculture along the river and rainfed agriculture in the greater valley.

These changes improve carrying capacity for livestock but lead to overgrazing and overstocking as pastoralists flock to the new

areas. Also, traditional pasturing areas along the banks of the Jubba are being lost to large- and medium-scale agriculture of mainly export-oriented crops. These effects may be exacerbated by the closure of the Baardheere Dam and subsequent development of the Jubba Valley.

The development of the dam and valley will have additional effects on mobile livestock-keeping, including:

- loss of traditional watering points in the reservoir area and downstream;
- limitation of river-crossing points to bridges, as the higher water level will hinder the animals' movement across the river;
- reduced dhesheeg (seasonally inundated depression) watering as a result of flood control;
- reduced access to the river as riverine areas are taken up by intensified agriculture;
- loss of good grassland to irrigated and/or rainfed agriculture;
- increased tsetse, malaria, and bilharzia infestation due to an increase in irrigated land;
- potential loss of fodder with the shift to export-oriented crops;
- more tsetse and biting flies in the reservoir area and increased propagation of crocodiles due to increased habitat; and
- loss of crossing points between Baardheere and Luuq to the Baardheere reservoir.

The following steps are recommended to protect the economy and well-being of mobile livestock-keepers when planning the development of the Jubba Valley:

- construction of riverine watering facilities at strategic locations along the river and in the reservoir area;
- construction of new bridges, based on locations of traditional crossing points;
- preservation of most important dheshheeg watering points by constructing small canals to create "artificial floodings;"

- creation of strategically placed corridors, several hundred meters in width, through agricultural land, to give livestock access to the river;
- creation of dry-season pasture/fodder reserves in selected good grassland areas in the river's floodplain and coastal plain;
- intensification of eradication/control programs for tsetse, malaria, and bilharzia;
- development of a well-planned agricultural mix of traditional staple crops and export crops;
- compensation to agro-pastoralists for land lost to the reservoir; and
- creation of a ferryboat service with the capacity to carry large numbers of livestock across the reservoir somewhere between Luq and Baardheere.

II. INTRODUCTION AND STATEMENT OF PROBLEM

A. Economic Significance of the Livestock Sector for Somalia

Somalia belongs to those countries in the dry belt of Africa where the highest proportion of the population is engaged in mobile livestock-keeping.

According to estimates for 1986, Somalia had about 40 million head of livestock--18.9 million goats, 11.2 million sheep, 6.1 million camels, and 4.5 million cattle (see Table 1). The total number of livestock is slowly increasing.

Livestock-keeping is mainly carried out by herders leading a mobile way of life well-adapted to the arid and semiarid environmental conditions of the Horn of Africa. According to 1987 estimates, based on the 1975 census, approximately 24 percent of the current population of 5.5 million are urban, 45 percent are pastoralists/nomads, and 31 percent are farmers and agro-pastoralists settled in rural areas (MNP 6/1987:2). A high percentage of the settled population own livestock, although their number is smaller than the nomads. This is particularly true in areas away from the river, where some families, having recently settled in villages, lead a seasonal nomadic life with their livestock. According to observations made by the author, the percentage of the population practicing mobile livestock-keeping is still more than 50 percent.

Although the majority of Somali livestock is kept to satisfy the subsistence needs of the rural population, the sale of livestock plays an increasingly important role. Three main factors have led to a more market-oriented production:

- rapid population growth (more than 3 percent annually) combined with rapid urbanization, leading to increased demand for meat on the internal markets of the country;
- a large increase in livestock exports to the Arabian Peninsula, Saudi Arabia in particular, since the mid-1960s; and
- rapid increase in prices for basic foods and simple consumer goods, forcing the nomads to sell livestock to satisfy this need.

While no statistical data are available on domestic consumption of livestock in Somalia, the export statistics underscore the importance of the livestock sector in the Somali economy. Livestock exports represent the main source of foreign exchange for Somalia, with annual revenue during the last 15

Table 1. Livestock Distribution in Somalia (1986)

Regions	Cattle (000)	Camels (000)	Sheep (000)	Goats (000)
<u>Northern</u>				
West Galbeed	164.34	680.06	2671.30	2719.20
Togdheer	49.87	359.10	1091.10	1072.06
Sanaag	83.90	230.05	1809.82	835.50
Nugaal	13.60	173.94	265.34	2636.11
Bari	17.00	269.33	1647.99	769.00
Sub-Total	328.71	1712.48	7485.55	8031.87
<u>Central</u>				
Mudug	385.37	842.78	1351.77	3452.70
Galgaduud	274.09	443.27	699.65	2181.87
Hiraan	192.68	517.33	341.49	1458.35
Sub-Total	852.14	1803.38	2392.91	7092.92
<u>Southern</u>				
Middle Shabeelle	432.97	230.05	386.71	905.96
Lower Shabeelle	433.47	328.80	107.09	251.65
Benaadir	24.93	1.12	7.14	23.90
Bakool	113.34	215.46	94.00	344.77
Bay	289.02	406.24	65.44	241.59
Sub-Total	1293.73	1181.67	660.38	1767.87
<u>Trans-Jubba</u>				
Gedo	598.45	879.81	594.94	912.26
Middle Jubba	414.84	246.84	29.75	905.97
Lower Jubba	975.89	249.13	83.29	159.80
Sub-Total	1989.76	1375.78	707.98	1978.02
National Total	4463.76*	6073.31	11246.82	18870.69

*The national total of cattle including the influx of cattle with the refugees in the late 1970s is estimated to be 5487.00.

Source: MLFR 11/1987:18

years ranging between 70 and 90 percent of total foreign exchange (Janzen 1986c:43). Statistics show goats and sheep are Somalia's main livestock exports. Camel sales have fallen since 1980, and the Somali cattle ban of May 1983 seems to have caused a considerable decrease in cattle exports (see Figure 1).

Due to the significance of the livestock sector for the national economy, the spatial and environmental requirements of the mobile livestock keepers have to be taken into consideration --more than in the past--when dams and large agricultural development projects are planned; and the livestock economy and spatial utilization of the natural resources of the Greater Jubba Valley (GJV) will have to be part of future economic, social, and environmental planning.

B. Scope of Work and Statement of Problem

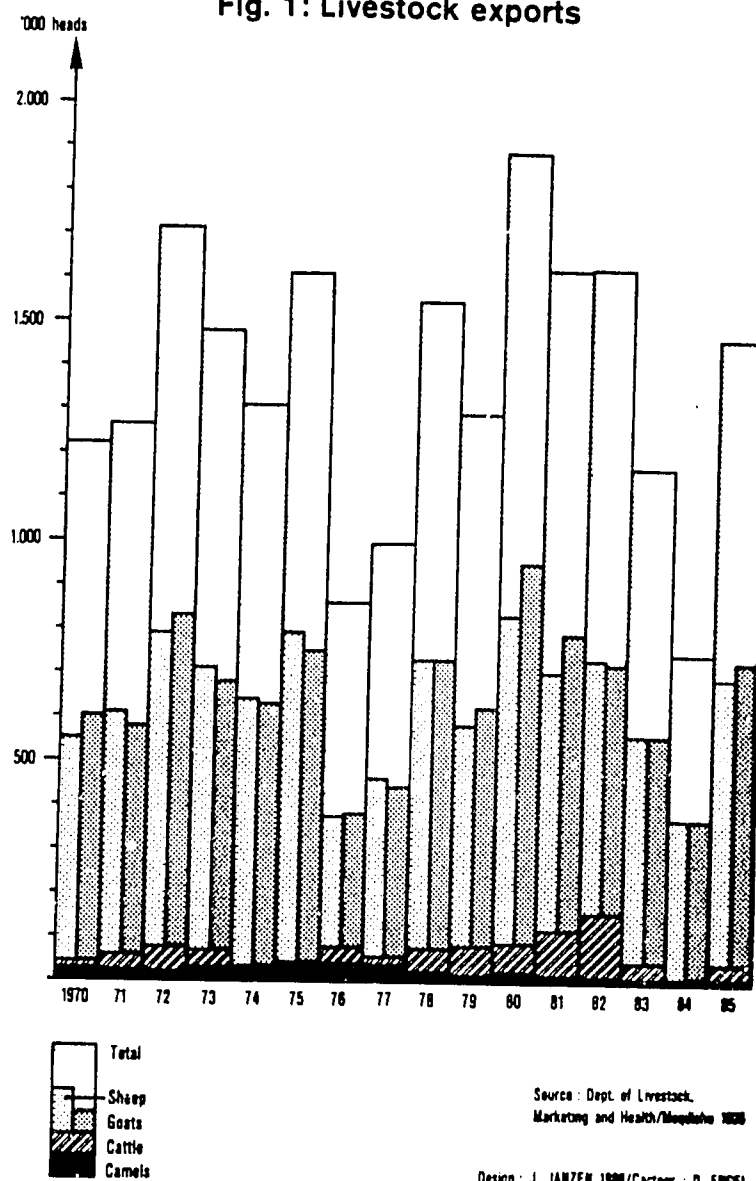
The aim of the pastoral study in the GJV is to assess pastoral patterns and movements in relation to seasonal use of riverine resources. Patterns of pastoral production, their socioeconomic and temporal contexts, and the degree of economic dependance of the Jubba Valley will be clarified. This will build on past studies of pastoralism in the Jubba Valley carried out by Agrar- und Hydrotechnik (AHT), the German Agency for Technical Cooperation, and the National Tsetse and Trypanosomiasis Control Project, among others.

A principal goal of this study is to increase knowledge of seasonal livestock movements and use of the resources of the riverine areas and adjacent zones, as there is very little detailed information on this subject. The traditional forms of economic and spatial behavior, as well as recent changes in the population groups involved in mobile livestock-keeping, are of principal interest.

The study is based on the hypothesis that the Jubba River and the pasture and cultivation areas of the floodplain are a very important sphere of existence for the mobile livestock-keepers of the GJV, since these areas supply water and fodder throughout the dry seasons.

The mobile livestock-keepers' way of life and economy is optimally adapted to the existing natural, socioeconomic, and political-administrative conditions. Any massive external intervention in the existing structures of the Jubba Valley will inevitably lead to major changes in living and economic conditions for all inhabitants, especially the mobile livestock-keepers. The planned construction of the Baardheere Dam, with resulting development projects and their consequences for nature, man, the economy, and society, is such an intervention.

Fig. 1: Livestock exports



Source: Dept. of Livestock,
Marketing and Health/Mogadishu 1988

Design: J. JANZEN 1988/Carogr.: D. ENGEL

For the pastoral economy, hindrance of the existing seasonal migration pattern is a major threat. It should be kept in mind that only maximum livestock mobility allows optimal use of existing resources and maintenance of the ecological balance.

The disintegration or neglect of the mobile livestock-keepers will lead to economic and social disadvantages for this particular group, increasing pressure on the labile ecological balance and causing numerous conflicts with the settled farmers at the river, the governmental executive, and among the mobile livestock-keepers themselves.

Therefore, integration of the mobile livestock-keepers into development planning and consideration of their needs are requirements for the success of the Jubba Valley Development Program.

To verify this hypothesis, the following questions have to be answered:

- when, how, and to what extent do the mobile livestock-keepers use the water and fodder resources of the Jubba Valley;
- what are their migration routes, and where do they live during the different seasons;
- where and what are the names of their main wells, crossing points, and grazing areas;
- what is the structure of the pastoral economy, and of what economic importance are extra-pastoral activities;
- what economic contact is there between the mobile livestock-keepers and the settled population of the Jubba Valley;
- what are the main problems posed to the way of living and economy of the mobile livestock-keepers;
- what changes have taken place in the way of living and the economy of the mobile livestock-keepers over the last 2 decades, what was the origin of these changes, and what consequences to the use of the natural resources have resulted from these changes;
- what positive and negative changes for the pastoral economy of the GJV can be predicted as a consequence of construction of the Baardheere Dam;

- what development planning measures could minimize the expected negative consequences; and
- what potential economic development is there for the mobile livestock-keepers of the GJV as a result of future Jubba Valley development.

C. Methodology

The research work in Somalia consisted of investigations in Mogadishu, including library work, meetings with experts of various institutions, government officials, etc., and preparation of the field trips; and field work in the GJV. Five of the nearly 8 weeks of this consultancy were spent in the field. Taking into account the relatively short study period, the fact that field work was done alone with the help of 3 Somali crew members, and that an area of more than 120,000 square kilometers had to be surveyed to obtain a coherent picture of the spatial pastoral pattern, time-saving methods had to be practiced. In this context, it should be mentioned that the work could not have been carried out successfully without the broad knowledge the author gained from field trips to the GJV in previous years.

During the 2 field-research periods, the following methodology was employed:

Aerial reconnaissance flights were seen as the best method to gain an overall orientation as to herd location, pastoralist concentration, and distribution of watering points.

All important settlements and most of the principal watering points for livestock were visited and informal interviews were conducted. To obtain reliable information, experienced people such as village elders and chiefs, government employees, and older nomads were interviewed.

Supplementary information about the socioeconomic situation was collected by interviewing pastoralists, using a standardized questionnaire. More than 40 such interviews were conducted during the 2 field trips. As the number of interviews and the amount of information obtained are not sufficient for a quantitatively sound result, the standardized questionnaire was mainly used to cross-check information obtained from the informal interviews.

Information on land-use systems of the pastoralists, their spatial mobility pattern, important watering points on the Jubba River and inland, river crossing points, and principal grazing areas, are illustrated in 2 thematic maps.

III. NATURAL CONDITIONS FOR LIVESTOCK-KEEPING IN THE GREATER JUBBA VALLEY

The pastoral land-use system of the GJV can only be understood and explained by taking into account the physiogeographic characteristics of the study area--topography, climate, water availability, soils, and vegetation.

A. Topography and Landforms

As far as topography and landforms are concerned, the study area can be divided into 2 areas, northern and southern, with the boundary drawn approximately at the latitude of Baardheere.

The northern area is characterized by mountainous plateau areas of Jurassic and Tertiary limestone formations, the highest points, in the Qansaxdheere District, reaching about 400 meters above sea level. The Jubba River has cut deep into these sedimentary formations, creating a gorge reaching from south of Luuq to north of Baardheere. The surrounding plateau zones show many large and small tooqa (wadis), mainly pointing towards the Jubba Valley (see Map 1).

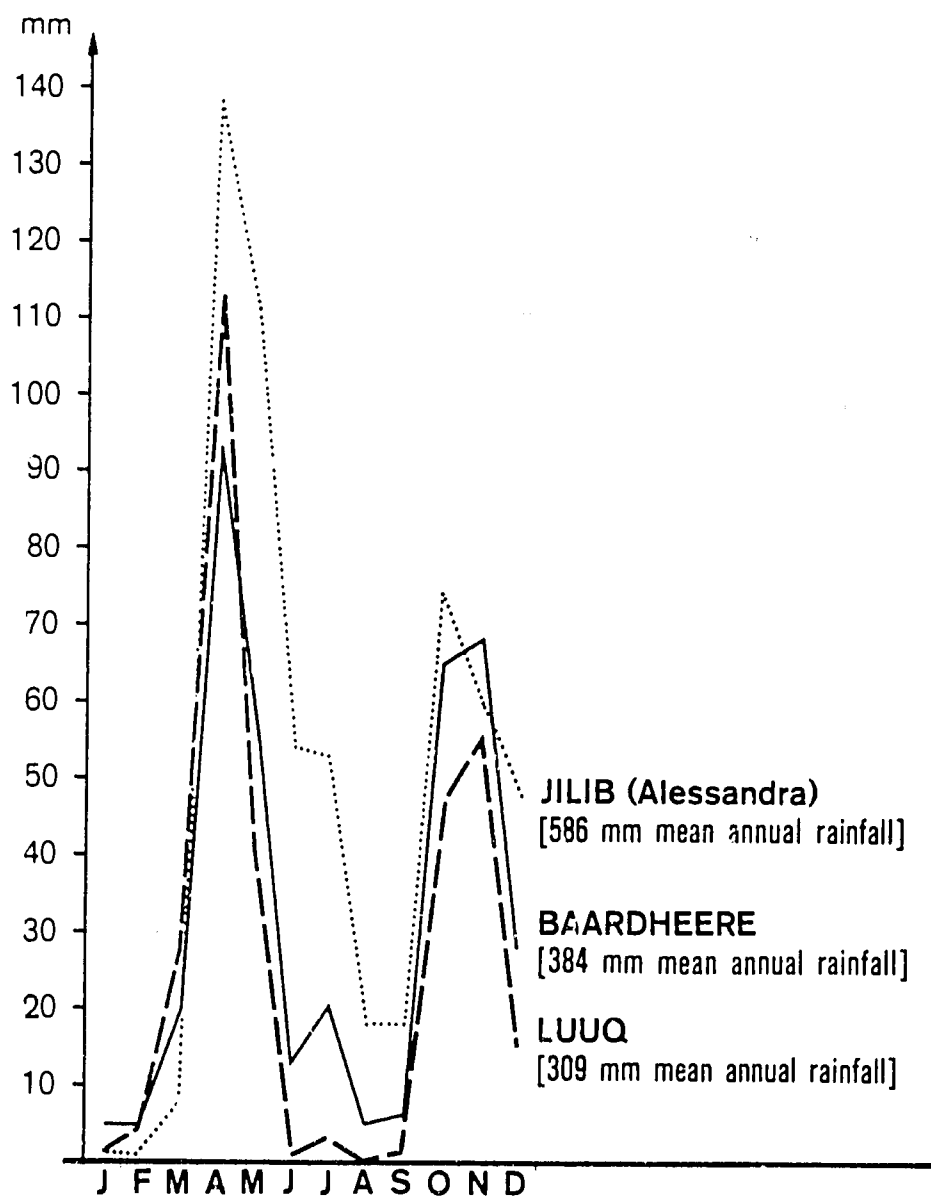
The southern area is characterized by vast plains in the Middle Jubba and western Bay regions, slowly sloping down to the Jubba floodplain and the lowlands of the Lower Jubba Region. The floodplain of the Jubba, narrow between Baardheere and Saakow, widens further to the south, producing numerous dhesheegs.

Near the Indian Ocean, the lowlands are bordered by a ridge of fossil sand dunes partly covered by recent mobile dunes.

B. Climate

The climate of the GJV can be characterized as arid to semi-arid and hot, with mean annual high temperatures reaching 30.6° C in Luuq, 28.9° C in Baardheere, and 27.7° C in Jilib. The mean annual precipitation is 309 millimeters, 384 millimeters, and 586 millimeters, respectively (see Figure 2). The bulk of the rainfall occurs in the Gu' (April to June) and Deyr (October to December) seasons. In Xagaa (July to September), the short dry season, the so-called Xagaa rains prevail in the coastal zone of Lower Jubba, occasionally also reaching the Middle Jubba Region. The long dry season beginning in December and lasting until March/April is called Jiilaal. This part of the year, when there is almost no rain and very little pasture, is the hardest time for the pastoralists and their animals.

Fig. 2 : Mean monthly rainfall in the Jubba Valley



Source: Ministry of Agriculture, FEWSD-Agronometeorology, 1983

Design: J. JANZEN 1985

Cartography: D. ENGEL

C. Soils and Vegetation

In the study area, the population classifies the soils into 3 main types:

- carro gaduud (Dooy)--red soil;
- carro cad/jubey (Bakool)--white soil; and
- carro madow/adhable (Dhoobey)--dark/black soil.

While the red soil contains a high percentage of sand, the dark soils are mainly heavy clay. The white soils show similar characteristics to the dark soils and can often be found in transition zones between the red and dark soils.

Red soils can be found mainly in the Bay Region, in the so-called Dooy area east of Diinsoor to Buurhakaba, as well as from Diinsoor to south of Yaaq Braawe. This soil also occurs in large parts of the Gedo Region, between Faafxadhuun, Ceel Gaddud, and Garba Haarey in the east and the Kenyan border in the west (see Map 1).

White soils can be found in the Bakool Region north of Berdaale, as well as in a transition zone to the dark clay soils south of the red soil areas.

The dark clay soils are concentrated in the floodplain of the Jubba River and the vast alluvial plains of the Lower Jubba and Lower Shabeelle regions.

The red sandy soil areas and the black clay soil areas are used by pastoralists in different seasons and for different animals, depending on the specific characteristics of each soil. This is an important factor in the location of seasonal grazing areas for the livestock. For example, the red soil area, particularly the Dooy area of the interriverine zone, is favored by pastoralists and agro-pastoralists during the wet seasons. Because of the high proportion of sand in the soil, rainwater is quickly absorbed. As a consequence of this high proportion of sand, the soil is not as slippery after rainfalls as the dark clay soils. Therefore, the livestock, camels in particular, do not slip and injure themselves. Also, both man and livestock are far less bothered by insects on red soils compared to black clay soils, since pools, possible breeding places, are found less frequently. Therefore, if possible, during wet seasons fewer cattle and small ruminants are grazed on black clay soils.

Dark alluvial soils, the best-known concentrated in the so-called Dhoobey zone (see Map 1) and the floodplain of the Jubba

and Shabeelle rivers, are the most important dry season grazing areas in the GJV. The advantage of these soils is their abundant grass vegetation, which is due to the high nutritional quality of the soil.

Apart from the grass vegetation, thorn bushes and thorn trees, which cover the largest part of the GJV, are important as a fodder resource for the livestock. The bush and tree vegetation is mainly browsed by camels and goats, providing important complementary grazing to the grass vegetation--the main fodder supply for cattle and sheep. The harvest residues of the sorghum and maize production are of increasing importance as dry season fodder, especially in the rainfed cultivation areas of the Bay Region and in flood recession agriculture zones along the banks of the Jubba River.

D. Water Availability

In the GJV, 3 main sources of water are used by man and livestock--the Jubba River and dhesheegs in the floodplain; groundwater; and surface runoff.

The perennial waterflows of the Jubba River are the most important source of water for the majority of the people and livestock during the dry seasons, the Jiilaal in particular.

Groundwater is another very important source of water, but is mainly used in areas away from the Jubba River. In the tooga of the plateau zone, the groundwater stream constitutes an important source for the pastoralists. They scoop the water from tuur (small holes) which they dig in the sand and gravel of the dry river bed. In the escarpments of the plateau zone, there are a number of additional natural springs.

Water is also provided by a large number of ceel (hand-dug shallow wells). There are fewer in the plateau areas than in the lowlands of the lower Middle Jubba and the Lower Jubba regions. In those parts of the Middle Jubba Region to the west of the Jubba River, where the groundwater table lies very deep, few shallow wells can be found.

Since the colonial period, and especially in the last 10 to 15 years, many new deep wells with motor pumps have been installed by the GSDR and development agencies. They are concentrated in the Gedo Region to the west of the Jubba, in the western part of the Bay Region, and in the western parts of the Lower Jubba Region (see Map 1).

In addition to groundwater, surface runoff plays a major role in water supply for man and livestock. There are thousands of small, private or cooperatively owned wars (artificial water

catchments) in the areas further from the Jubba River. These are concentrated in the western parts of the Bay Region and the eastern part of the Middle Jubba Region. In the Lower Jubba Region, they form the main water source between Afmadow and Diif and Badhaadhe (see Map 1).

Besides these small wars, the GSDR and development agencies are building large wars, providing water for more people and livestock. These are concentrated in the southeastern part of the Bay Region south of Diinsoor, and are found mainly in the fertile, dry-season grazing areas with dark clay soils, the Dhoobey area of the southern Middle Jubba and Lower Jubba regions. These wars make possible the use of the surrounding good grazing areas until the middle of the Jiilaal season, after which the pastoralists have to use water from the Jubba River and the dhesheegs in the floodplain or move to the Shabeelle swamp area (see Maps 1 and 2).

E. The Tsetse Problem

A very important constraint to livestock-keeping in the Jubba Valley is the tsetse fly, whose main habitat stretches along the Jubba River in a zone called Gosha (see Map 1). Gosha can be translated as "dense forest infested with tsetse fly and unsuitable for pasture" and is the name applied to the lower and middle Jubba Valley, from Kamsuuma in the south to around Saakow in the north (see Map 1). However, the tsetse fly is found in other parts of the riverine zone and around Dhesheeg Waamo as well. The tsetse danger is less in the gorge area of the Jubba north of Baardheere and up to the Ethiopian border.

Because of the tsetse fly problem, considerable areas of very good grazing land close to the river cannot be fully utilized. The pastoralists only go there during the Jiilaal season when grass becomes scarce in adjacent areas. An increasing number of nomads are vaccinating their animals to protect them from the tsetse flies.

IV. SOCIOECONOMIC STRUCTURE OF THE LIVESTOCK-KEEPING POPULATION OF THE GREATER JUBBA VALLEY

In order to understand the structure of the pastoral economy of the GJV, insight into the demographic, ethno-social, and historio-political circumstances, as well as knowledge of the ecological conditions, are necessary.

A. Demographic and Ethno-Social Characteristics

According to predictions of the Ministry of National Planning and Jubba Valley Development (MNPJVD), based on the 1975 census, about a fifth of the Somali population--or 1.1 million people--live in the GJV, i.e., the regions of Gedo, Middle Jubba, Lower Jubba, and the most western parts of Bakool, Bay, and Lower Shabeelle. This part of the population is officially divided into approximately 45 percent nomads, 39 percent settled farmers and agro-pastoralists, and 16 percent urban. However, these figures do not convey the fact that the nomadic population in the northern part of the GJV, about 60 to 65 percent, is by far larger than in the south, where nomads make up only 40 to 45 percent (MNP 6/1987:2) of the population.

The ethno-social structure of the pastoralists and agro-pastoralists of the GJV is organized in clans. Descent within a clan is patrilineal, the members of the clan claiming origin from a sometimes fictional tribal progenitor. Traditionally, political matters within a clan were dealt with democratically. During the last 20 years, governmental influence on the way of living and economy of the pastoralists, e.g., nationalization of all pasture ground, the attempt to weaken the power of the clan chiefs, and the extension of infrastructural institutions of the central executive, has increased considerably. However, traditional structures and heads of executives are still of considerable importance.

The population in the GJV can be divided roughly into 3 groups.

First, there are the "noble" nomad clans which have moved from the more arid north to the climatically more favorable south in the recent past. Historically, these clans belong to the Darod clan family. The majority live on the western side of the Jubba River until right into Kenya and in the Ethiopian-Somalian border area. They mainly breed camels but, in the southwest, cattle as well. Historically, they are known to be particularly militant and politically active.

Second is the population of the western interriverine area, mainly consisting of agro-pastoralists keeping cattle. The

inhabitants of this region historically derive from the Raxanweyn clan family and its numerous associated groups.

The third part of the population, although economically highly important, is still discriminated against socially. It consists of a Negroid Bantu farming population and represents the majority of the inhabitants of most riverine settlements south of Saakow.

Consanguinity is almost entirely limited to the first 2 groups, seldom occurring between them and the third group.

The social structure of pastoralists and agro-pastoralists--the latter mostly former nomads who have settled in the recent past--is similar. For the agro-pastoralists, however, there is more division of labor, since cultivation as well as livestock-keeping must be done. Polygamous marriages with 2 or more wives are common for economic reasons. Generally, one wife and her children look after cultivation while another is responsible for livestock-keeping (cattle and small ruminants). According to economic necessity and inclination, the husband stays with a wife for a certain period of time or often engages in extra-pastoral activities such as collection of gums and resins and migrant work. Strong, unmarried young men are in charge of camel-herding. On their long, strenuous migrations, away from their families for several months at a time, they rely completely on themselves.

B. Types of Livestock-Keeping

The livestock-keeping population of the GJV lives closely adapted to the natural conditions and the ethno-social and political circumstances described previously. Their economic strategy is one of "risk diversification" or "risk minimization." It is a strategy of survival, dealing with frequent droughts, animal diseases, increasing prices for basic needs, etc. Consequently, the average livestock-keeping family tries to maintain a large herd, consisting of different species of livestock. Rainfed farming and other extra-pastoral activities provide additional sources of income, strengthening the economic basis of the family.

It is not easy to classify the different livestock-keepers of the GJV because of the many transitional forms between "pure" nomadism and a sedentary life-style. In general, there are 3 major groups.

The first group is pastoralists, who live a highly mobile nomadic life, their animals being their only or most important means of existence. They exclusively use agal (transportable huts).

The second group is agro-pastoralists, who possess a lot of animals and engage in marginal rainfed farming. The majority of members of the frequently polygamous families live a nomadic life, with only a few family members looking after the fields. This type of agro-pastoralism is found at the fringe of the rainfed cultivation areas and around new water points. Other agro-pastoralists who settled some time ago possess fewer animals and cultivate larger rainfed farms, agriculture being their main source of income. They live in mundul (permanent dwellings) and only a few family members lead a nomadic life.

The third group is farmers in the riverine settlements, whose existence is based on flood recession agriculture and/or pump irrigation and often also on rainfed farming, and farmers in the older and larger settlements of the rainfed cultivation areas of the Bay Region. The number of animals, if any, is small and they are kept in the settlement itself or nearby. In larger settlements, gawsaar (paid herders) are hired to herd the animals, mainly on nearby pastures. It is also quite common for farmers to give their livestock to friendly nomads who look after the animals and use the animal products in return for this service.

C. Livestock Species and Spatial Distribution

The 4 main species of livestock kept in the GJV--camels (geel), cattle (lo'), goats (riyo), and sheep (ido), (small ruminants are collectively called ari)--are of different economic values to the various livestock-keeping groups. Consequently, there is a regional pattern in distribution of the 4 species (see Map 2), corresponding with the distribution pattern of the livestock-keeping groups.

Analysis of the animal population of the different degaan (home areas), where the stock stay most of the year, shows that in the dryer northern part of the GJV the camel is economically most important, followed by goats and cattle. Whereas the number of camels has increased, the importance of cattle has decreased in this arid part of the GJV, due to large losses during the recent droughts.

Towards the south, the significance of cattle is increasing. In the Middle Jubba Region, and especially in the agro-pastoralists' production system of the Middle Jubba and western Bay regions, cattle are of greater economic importance than camels and goats. In the Lower Jubba Region, the Afmadow District in particular, cattle are the most appreciated animals. In all parts of the GJV, sheep still play a minor role compared to other livestock, despite their increasing importance. Often, families keep just a few sheep to slaughter for religious purposes.

A further classification of the livestock in the GJV can be made, based on the varying environmental conditions of the regions and the economic needs of the livestock-keepers. Different species of camels, cattle, and goats are characteristic of different regions, e.g., breeds with higher milk production, particularly strong resistance to droughts and diseases, and/or a specific strength for long-distance migration (see Tables 2-4).

Table 2. Types of Camels Kept in the Greater Jubba Valley

<u>Somali names</u>	gaaf	fiil soomaal maay	dacar (dacar gaduud)
<u>Color</u>	white- brownish	white	brown (reddish brown)
<u>Milk production</u>	medium	high	high
<u>Other</u>	very resis- tant to droughts and diseases very hardy on long-range migrations	less resis- tant to droughts and diseases	less resis- tant to droughts and diseases

Source: Interviews with pastoralists at various water points, Jan.-Feb. 1988. Compiled by Dr. Jörg Janzen, ZELF/FU Berlin.

Table 3. Types of Cattle Kept in the Greater Jubba Valley

<u>Somali name</u>	maajaan	lo' gaduud	lo' caddey
<u>Color</u>	brown-spotted	reddish-brown	white
<u>Regional Distribution</u>	Middle Jubba Region Bay Region	Lower Shabeelle	Lower Jubba Region
<u>Size</u>	small	medium	large
<u>Milk Production</u>	small	high	medium*
<u>Other</u>	very resistant against droughts and diseases very hardy on long-range migrations	less resistant than maajaan	less resistant than lo'gadud

*The average daily milk production varies between 2 and 4 shoots (ca. 1.4-3.4 liters) in the jiilaal, and 8 to 10 shoots (6.8-8.5 liters) in the gu' season. Up to 50% of the amount is normally needed for the calf.

Source: Information from pastoralists at various water points, February 1988. Compiled by Dr. Jörg Janzen, ZELF/FU Berlin.

Table 4. Types of Goats Kept in the Greater Jubba Valley

<u>Somali name</u>	dhaga yarre (small ears)	dhaga weyne (big ears)
<u>Color</u>	white	white
<u>Regional Distribution</u>	<u>Dooy</u> (area with red sandy soils)	<u>Dhoobey</u> (area with dark clay soils)
<u>Milk Production</u>	high up to 1 shoot (0.85 l) in the gu', and 0.5 shoot (0.425 l) in the jiilaal season per day	low (ca. half of the milk production of dhaga yarre)
<u>Other</u>	sensible against tsetse fly and other insects heat resistant	resistant against tsetse fly and other insects not heat resistant

Source: Information from pastoralists at various water points, February 1988. Compiled by Dr. Jörg Janzen, ZELF/FU Berlin.

D. Economic Significance of Pastoralism and Agro-Pastoralism

Pastoralism and agro-pastoralism are the 2 main production systems in the areas of the GJV away from the farming riverine zone along the Jubba River. Whereas agro-pastoralism has become the dominant method of production and is still expanding in large parts of the Bay and eastern Middle Jubba regions, nomadic pastoralism is the only economically practical use of the other areas, due to aridity and variability of precipitation.

1. Subsistence Production

For the majority of the nomadic families, providing for subsistence needs is still the main goal. Milk, ghee, and meat are the major goods produced for family consumption. The range of self-produced goods of the agro-pastoralists includes sorghum, sometimes maize, cowpeas, and sesame. Products of the collecting

economy, such as honey and wild fruits, can be added to the daily food supply. Any surplus is sold on the market.

In remote areas, barter (exchange of kind for kind) is still common, mostly milk or livestock for sorghum, while currency is the dominant form of exchange in the larger marketplaces.

2. Market-Oriented Production and Trade

Over the last 2 decades, regular livestock sale by the majority of nomadic families in the GJV has steadily increased. However, this cannot be called market-oriented production, since livestock is sold mainly during the dry periods when feeding large herds becomes particularly difficult. The majority of livestock-keepers hesitate to sell their stock as the animals are generally their only economic guarantee of survival.

The numerous local and regional droughts of the 1970s and 1980s have doubtlessly increased the trend towards livestock trade. Another incentive for animal trade is the high prices received in the marketplace, shown in Table 5.

Table 5. Livestock Prices for Male Animals (SSh¹)

	<u>Camels</u>	<u>Cattle</u>	<u>Goats</u>	<u>Sheep</u>	<u>Donkeys</u>
Beled Xaawo	30-35,000	30,000	8,000	8,000	--
Baardheere	20-30,000	15,000	3,000	5,000	--
Qansaxdheere	25-30,000	10,000	3,000	4,000	7,500
Bu'aale	30-40,000	20,000	3-4,000	5-6,000	--
Afmadow	30-40,000	4-10,000	2-3,000	3-4,000	--

¹SSh: Somali Shilling

Source: Information from Traders and Pastoralists, February 1988.
Compiled by Dr. Jörg Janzen, ZELF/FU Berlin.

However, despite comparatively high prices, changes in the internal terms of trade have had negative consequences for the nomads in recent years. These changes include the high inflation rate and increased costs of imported and local basic foodstuffs, on which pastoralists and agro-pastoralists are becoming more and more dependent. This is especially the case during drought periods. Milk production drastically declines at that time and is no longer sufficient to supply the population, not to mention the young livestock.

Generally, there are 3 types of livestock trade. Livestock is sold directly to settled farming families (tax evasion is frequent), on the open livestock markets, or to gedisley (traders) or dilaal (their middlemen), who are present in all markets and at all important water points, especially during the dry seasons.

Traders normally invest 150,000 to 200,000 SSh to obtain a herd. The traders or hired drovers then take the livestock mainly to Mogadishu and Kismaayo, a journey lasting several weeks. Small ruminants are transported by lorry.

The main Somali livestock markets from the north to the south of the GJV are Xuddur, Beled Xaawo, Luug, Garba Haarey, Berdaale, Baydhabo, Qansaxdheere, Ceel Waaq, Diinsoor, Baardheere, Saakow, Bu'aale, Afmadow, Jilib, and Kismaayo (see Map 1). From the Gedo and Bakool regions, large numbers of livestock are tended through the Ogaden area to the northwestern Somali markets, mainly to Berbera, but also to Djibouti.

Border-crossing to Kenya is common, as prices in the Kenyan markets are generally higher than in Somalia. The trade of Somali livestock in Ethiopia is marginal, since prices are higher in Somalia; the value of Ethiopian money is even lower than Somali currency; the range of goods offered on the Ethiopian markets does not reach the Somali standard; and livestock-keepers strongly disapprove of paying taxes to the Ethiopian government.

Prices for livestock in Somalia have shown a steady increase in recent years. In the mid-Jiilaal of 1988, the price of camels headed the list, followed by cattle, goats, and sheep. In the GJV, prices for male animals ranged between 20,000 and 40,000 SSh for cattle, from 2,000 to 8,000 for a goat, and from 4,000 to 8,000 for a sheep, according to age and quality (see Table 5). Prices for female animals were considerably higher than those for male livestock.

Prices were highest on the markets close to the Kenyan border (see Table 5, example Beled Xaawo), as Somali prices there are forced up by the better Kenyan prices and the high exchange rate for the Kenyan currency on the black market, (1:10 for the SSh in February 1988). At the same time, the lowest price for

cattle was in Afmadow, due to the excessive number for sale during the dry season. Towards the end of the Jiilaal season, prices decline again as fodder supply for the livestock becomes increasingly difficult to find and pastoralists consequently tend to sell more animals.

3. Monetarization of the Pastoral Economy

Although barter is still common in nomadic areas away from marketplaces, monetarization has succeeded everywhere in the 1970s and 1980s. This is understandable since now the livestock-keepers, too, need cash for almost all aspects of life, including the:

- purchase of basic foodstuffs, especially sorghum, sugar, and tea, and items for everyday use, such as flashlights, batteries, and cooking devices (see Table 6);
- purchase of medicine for both people and livestock and payment of medical treatment;
- payment for food and drink while staying in settlements and at water points;
- purchase of crop residues for livestock fodder in the dry seasons;
- payment of taxes imposed on the sale of livestock in the marketplaces (5 percent of the price); and
- payment of comparatively high and often arbitrary charges for the use of government water points, as well as partly private shallow wells and water catchments (see Table 7).

Cash income and expenses are concentrated in the dry period when the major part of livestock trade is carried out and the majority of purchases are made.

Table 6. Goods on Sale and Prices/Shop in the Nomadic Settlement of Faafxaduun (January 1988)

<u>Item</u>	<u>Price in SSh/quantity</u>
Sugar	130/kg
Maize flour	50/kg
Wheat flour	50/kg
Rice	70/kg
Tea	400/kg
Tomato paste	30/75 grams
Washing powder	30/small pack
Smoking-sticks (perfumed)	5/1 stick
Torches	170/1 piece
Batteries	100/2 pieces
Matches	4/1 box
Wicks	5/ca. 15 cm
Razor-blades	5/1 piece
Steel combs	60/1 piece
Needles	5/1 piece
Sandals (made from old tires)	100/1 pair
Men's robes (macuus in Somali)	1000-1400/1 piece
Colored cloth for women	1600/8 m length
Simple white cloth	100-110/1 m length

Source: Information from the owner of one of the larger shops in Faafxaduun, 16 January 1988. Compiled by Dr. Jörg Janzen, ZELF/FU Berlin.

Table 7. Average Official Water Prices at Government Water Points (Jan -Feb. 1988/SSh.)

<u>Kind of water point</u>	<u>1 camel</u>	<u>1 cattle</u>	<u>1 goat/sheep</u>
Deep-well with motor pump (ceel)	2	1	0,5
Large water catchment (war)	3-5	2-3	1

Source: Information from pastoralists at various water points, Jan.-Feb. 1988. Compiled by Dr. Jörg Janzen, ZELF/FU Berlin.

It is mainly the settled merchants who profit from trade with the nomads. They either permanently live at the marketplaces or trade their goods as migrant merchants in remote parts of the nomadic living sphere. As a result, small hut settlements with shops and tea and snack bars have spread at almost all important water points along the Jubba River as well as away from the river. At the larger water points, blacksmiths can be found, forging objects such as axes (to cut branches during the dry season), daggers, arrows, and spears (for defense against an increasing number of lions and livestock thieves) for the pastoralists (see Figure 3).

Table 6 shows an overview of the range and price of goods available. Goods are not always offered for a reasonable price, but frequently are priced high above average. This is a definite disadvantage for the nomads, as they are dependent on these goods.

E. Extra-Pastoral Activities and Their Economic Significance

The main extra-pastoral activities of the pastoralists and agro-pastoralists of the GJV are farming and, particularly in the northern part, the collection of aromatic gums and resins and migrant work.

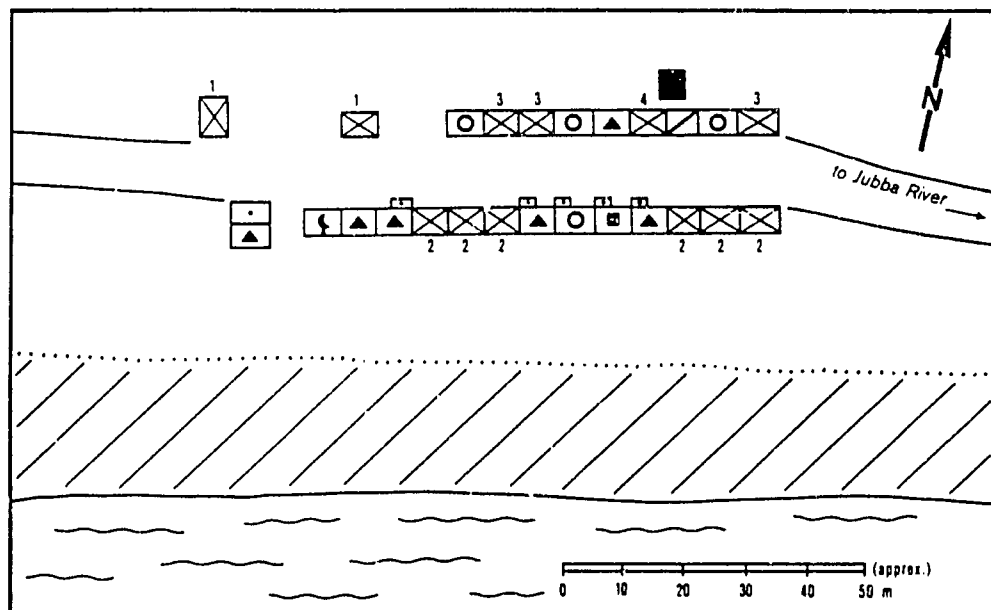
1. Farming

Farming is of increasing importance to the livestock-keepers in the GJV, especially to the agro-pastoralists, and particularly those groups who took up a sedentary lifestyle a few years or even one or 2 decades ago. This also applies increasingly to pastoralists attempting to enlarge their sphere of existence at least to produce more foodstuffs for themselves. The frequently recurring droughts, with resulting losses of livestock (mainly of cattle), and the rapidly increasing cost of living are responsible for this development.

Pastoralists taking up farming choose the areas at the fringe of the already existing cultivation zones and locations in the vicinity of water points. Areas away from the river are used exclusively for rainfed cultivation (see Map 1).

The settlement areas of the agro-pastoralists of the GJV are concentrated between Baardheere and Saakow on the Jubba River in the west and Diinsoor, Ufurow, and Qansaxdheere in the east, extending to the Baydhabo area.

Fig. 3: Dhesheeq Jabi: Dry season market for nomads (Sketchmap/not to scale)



Legend:

inundated depression (dhesheeq)	mosque	tailor
watering place for livestock	temporarily empty	blacksmith
motorable track	shop	blacksmith's sleeping hut
hut made from twigs	tea/snack bar	fire-place/kitchen

Source: Jörg Janzen, 25. Jan. 1988

Numbers indicate traders' direction of migration: 1 to Bu'aale, 2 to Bidi, 3 to Wareeqto, 4 to Leheley

The agro-pastoralists living at the Jubba River in the gorge area of the future reservoir between north of Baardheere and south of Luuq practice a mixture of flood recession and rainfed agriculture. The main crops cultivated under these conditions are sorghum, sesame, cowpeas, and watermelons. A minority of the agro-pastoralists irrigate small fields by means of motor pumps. On irrigated fields, concentrated north of Baardheere as far south of the future dam site as Markabley and near Buurdhubo, onions, maize, tobacco, watermelons, and sesame are cultivated. In some places north of Baardheere, bananas and papayas are grown.

This small-scale irrigated agriculture is normally based on a sharecropping system, in which 50 percent of the yields are for the landowner and 50 percent for the owner of the pump. The pump owners are mainly businessmen from Baardheere or Garba Haarey. The pumpowners draw the largest profit from this system because they normally also buy the landowner's share of the crop for the low local price and sell it for a high profit in the big towns of southern Somalia.

The socioeconomic situation of many agro-pastoralists--more than 40 families in the Buurdhubo area--has become drastically worse because those who allowed their land to be registered in the names of the pump owners have often been cheated by the latter. After the first quarrel, the outlawed agro-pastoralists were driven away from their land by force. The new landowners now cultivate with the help of cheap labor from the Buurdhubo refugee camps. The agro-pastoralists, after being deprived of their land, one of their important sources of income, now live a miserable life based nearly exclusively on the few cows and goats they still own.

Away from the river, the main rainfed crop is sorghum. During the Deyr season, sorghum is cultivated exclusively because of its resistance to drought. During the more humid Gu' season, maize and sometimes cowpeas are cultivated as intercrops in favorable locations, such as fertile depressions. Sesame is grown on smaller areas during the Deyr season.

Grain is stored in underground pits in the settlements and amidst the fields. The grain can be stored in these pits for several years, providing a reserve for drought years.

Yields for sorghum during a normal Gu' season with sufficient precipitation range between one to 2 quintals (loose kernel) and 3 to 5 quintals (with cobs) per square tacab (one tacab equals approximately 1,200 square meters). If there is no rain at the proper time, frequently the fields will not come into ear. In this case, the stalks are used as livestock fodder.

2. Collection of Gums and Resins

World-wide, Somalia leads in the production of frankincense and probably of myrrh as well. Whereas frankincense is mainly produced in northeastern Somalia, one of the largest areas cultivated with geed malmal (myrrh trees) is situated in the northern part of the GJV. The collection of malmal (myrrh) and other resins is carried out by quite a few nomads. Many resins have a function in the lives of the population (see Table 8).

Market-oriented gum and resin collection was developed by the Italians during the colonial period. With independence, there has been a decline in the production of gums and resins in the GJV. In recent years, however, attempts have been made to increase production, one reason being the lucrative export possibilities (see Table 8).

Trade of resins in the GJV is carried out by nomadic collectors and private merchants in the marketplaces. There are a few private gum and resin co-operatives, e.g., in Ceel Waaq and Faafxaduun, where several hundred tons are collected per year, mostly malmal. For the nomads, collection is an important source of income. In the 1988 Jiilaal, producer prices varied between 60 and 280 SSh per kilogram, according to the type of gum or resin (see Table 8).

Production of gums and resins, however, also implies a serious problem--unqualified "tapping" of the trees and production for short-term profit cause overuse of trees in easily accessible areas. For this reason, production has already been limited by the cooperatives after numerous trees were found to be seriously damaged. In future gums and resins collection, ecologically acceptable production methods should be practiced to prevent irreversible damage to valuable trees and maintain an important additional source of income for the pastoralists.

3. Migrant Work

Periodic migrant work is also quite common among the pastoralist and agro-pastoralist population of the GJV. The young men who engage in migrant work are attracted to the large towns of southern Somalia, mainly Mogadishu, and the oil-rich states of the Arabian Peninsula--Saudi Arabia and the United Arab Emirates in particular. Their remittances, either in cash or goods, are a very important source of extra income for their families in the rural areas. Families with relatives working out of the country often start small-scale business with the extra income (see Table 6) and tend to live a more sedentary life-style.

Table 8. Gums and Resins Collected in Ceel Waaq District/
Gedo Region (January 1988)

	<u>malmal</u>	<u>xabaq xagar</u>	<u>xabaq cadaad</u>	<u>xabaq mugley</u>
<u>Purchasing price</u> in Ceel Waaq (in SSh/kg)	280	120	300	60
<u>Selling price</u> in Mogadishu (in SSh./kg)	350	200	350	120
<u>1987 production</u> (in tons)	120	15	80	10
<u>Utilization</u>	traditional medicine for all kinds of diseases	traditional medicine for wounds, abscesses and ticks	traditional medicine for stomach trouble	burned for its intensive and good smell
	burned to get rid of snakes		chewing gum sexual stimulation	
	basic material in the production of modern medicine			
<u>Marketing</u>	mainly for export	mainly for inland markets	export and inland markets	only for inland markets

Source: Information from the "Gum and Resin Cooperative" of Ceel Waaq/Gedo Region, January 1988. Compiled by Dr. Jörg Janzen, ZELF/FU Berlin.

Agro-pastoralists also work as short-term farm laborers in the cultivation areas of the Bay and Lower Shabeelle regions. The relatively high wages for farm laborers during peak seasons represent a profitable source of cash income.

F. Socioeconomic Relations Between the Settled Population and Nomadic Pastoralists

Various relationships exist between pastoralists and the settled population. In the case of different ethnic backgrounds, e.g., the settled farming population along the river and the nomads frequenting the riverine area during the dry season, contact is limited to economic exchange. During the dry seasons, the farmers supply their harvest residues as livestock fodder and grain as foodstuffs for the nomads. In exchange, the nomads provide them with livestock and stock products, such as milk and ghee. More and more, this trade, traditionally based on exchange of goods, is being replaced by trade for cash.

The nomads have to face considerable expenses for harvest residue fodder during the dry seasons. In the Jiilaal of 1988, the nomads had to pay up to 1,000 SSh to the farmers along the river for permission to graze their livestock on a field of one square darab (one darab equals approximately 2,400 square meters). Frequently, the farmers offer sorghum and maize in small bunches, the stalk costing 0.5 to one SSh. As the natural pasture grounds are heavily grazed during the dry seasons, the nomads are highly dependent on crop residues, and the farmers take advantage of this by charging prices high above average.

Relations between pastoralists and agro-pastoralists in areas away from the river are similar, although in addition to economic contact, close social links, often due to tribal relationship, can be found.

The harvest residues are largely used up by the livestock of the agro-pastoralists. Surplus is often given without charge to pastoralists of the same clan. In exchange, during the rainy seasons, the agro-pastoralists' livestock are often grazed with the pastoralists' livestock on their pasture grounds. In this case, the families of the agro-pastoralists benefit from the support and safety given by the pastoralists. This system is optimally adapted to the existing seasonal demands of both pastoralists and agro-pastoralists. This is also true for the relations between mobile livestock-keepers and settled farmers. These interrelations provide an example for future agricultural development planning in the Jubba Valley. As they show, there are few conflicts between the settled and the mobile population groups--contrary to frequent assumptions.

Conflicts do exist, however, occurring to a large extent if the nomads are deprived of their traditional dry-season pastures without an alternative, as happens when cultivated areas are extended. This problem exists throughout the Jubba Valley. At the lower course of the Jubba River, the area to either side of the river has been almost covered with large cultivated areas since colonization. There, land-use conflicts are frequent, especially when the nomadic livestock are driven through the cultivation grounds of the settlers on the way to water and in search of fodder.

There are land-use conflicts of a different kind between the mobile livestock-keepers and charcoal producers. Although charcoal production has already been limited drastically in most parts of southern Somalia, large areas are still used in the region of Diinsoor, Ufurow, Qansaxdheere, and Berdaale. Settlers from other parts of the country, rather than nomads, serve as seasonal workers. The numerous claims, stretching several square kilometers, are a considerable hindrance to use of pasture grounds by the nomads; their migration moves are also hindered by claims and camps. Furthermore, the cutting of the strong acacia trees for charcoal production is followed by a rapid growth of underwood, affecting growth of grass and causing the thorn-tree savanna to become more and more impenetrable for livestock. This causes frequent quarrels between livestock-keepers and charcoal burners.

To reduce potential conflicts, the land-use claims of the mobile livestock-keepers must be considered when planning future regional rural development.

V. SPATIAL MIGRATION PATTERN OF PASTORALISTS AND AGRO-PASTORALISTS IN THE GREATER JUBBA VALLEY

The existing physical, socioeconomic, ethno-political, and infrastructure conditions in the GJV (see Map 1) have led to an optimal migration pattern for pastoralists and agro-pastoralists (see Map 2), who are aware that only a highly mobile way of land-use guarantees the best economic use of the existing natural resources.

A. Traditional Structure and Modern Changes in the Migration Pattern

Traditionally, the economic use of the GJV was based on division of territory into units, each controlled by a clan and optimally adapted to the ecological conditions in its spatial outline. As a rule, the clan territories stretched from the east to the west, with the Jubba River as the eastern or western border. Accordingly, all clans living in the GJV had access to the water of the Jubba River, a necessity during the dry seasons and in drought periods. Only in an emergency, such as drought years, was the river crossed. Today, territorial division of the GJV as described here and the resulting land-use practices underlie considerable changes.

The mobility pattern in the GJV is highly differentiated according to the type of livestock-keeping and the species kept. The migration pattern is water- and pasture-oriented. In the dry seasons the migration routes are more fixed, while in the rainy seasons they vary, directed towards areas where rainfall is occurring. Furthermore, keeping different species of livestock normally means splitting up the family into subunits, each being responsible for one kind of livestock and other economic activities, such as rainfed agriculture.

During the last 20 years, the land-use system as described has been subject to considerable changes. The droughts of the 1970s and 1980s have added to this, increasing the pastoralists' trend towards a more sedentary life as agro-pastoralists. Also, certain judicial and development-political measures carried out by the government have led to considerable changes in the regional mobility of both pastoralists and agro-pastoralists.

Three major changes have affected the traditional migration pattern of the livestock-keeping population groups of the GJV:

- the formal abolition of clan boundaries and exclusive clan grazing and watering rights and the nationalization (in 1971) of all land which has not been regularly cultivated;

- the installation of numerous high-capacity deep wells and large water catchments built by the government and development agencies and the construction, in the last 15 years, of thousands of new, privately and cooperatively owned smaller water catchments in areas with no watering facilities (see Map 1); and
- the expansion of irrigated agriculture in a narrow zone on both sides of the river and rainfed agriculture in large areas away from the river.

As a result of the installation of water points, certain previously waterless areas with good pasture now can be used even during parts of the dry seasons. However, large numbers of livestock, in particular camels from the northern part of the GJV, leave their traditional grazing areas and move to the good pasture land around these new high-capacity watering points in the southern part of the GJV, leading to overstocking and overgrazing and causing considerable damage to the environment.

The closing-up of the riverine zone of the Lower Jubba Region by large- and medium-scale agriculture, mainly export-oriented crops, has led to important grass reserves and traditional watering points along the river being lost to the livestock-keeping population (see Map 1; Table 9).

These changes have affected the migration pattern of the mobile livestock-keepers in different ways. The contemporary migration pattern in the different parts of the GJV can be outlined as follows (see Maps 1 and 2; Table 9).

B. Northwestern Greater Jubba Valley

In that part of the Gedo Region west of the Jubba River to the Kenyan and Ethiopian borders and over to the Faafxadhuun area in the south, the migration pattern is mainly determined by the Jubba River, a few important toogs with a good groundwater stream, hand-dug shallow wells, and a considerable number of new deep wells with motor pumps. During the Jiilaal season, livestock are concentrated in the vicinity of these watering places or in the riverine zone. Small ruminants are normally grazed at a distance of up to 3 to 5 kilometers, the cattle up to 10 kilometers, and the camels up to 30 kilometers around the water points or away from the toogs or the river, respectively.

Table 9. Well-Known Drinking Places and Crossing Points for Livestock along the Jubba River from North to South*

Obow	E	Hilo Kulun	E
<u>Megadey</u>	W E	<u>Hilo Qareeb</u>	E
Barekale	W E	Hilo Dhuur	W E
Jimaale	W E	Hilo Ari	E
Deeraba	W E	Baar Badan	W E (C)
Shiidle	W E	Faanweyn	W
<u>Halbe</u> (near Luuq)	W E (C/B)	<u>Yaxaasow</u>	W E (C)
<u>Araasow</u>	W E	Saanweyne	W E
Bakooley	W E	Markabley	W E (C)
Dhaydheere	W E	<u>Hilo Ari</u>	W E
<u>Marayley</u>	W E	Magdile	W E
Halaga	W E	Mardha	E
Hilo Mareer	W E (C)	Sarinleey	W E (C)
<u>Dhuurole</u>	W E	Baardheere	W E (C/B)
Keligube	W E	<u>Hilo Shiid</u>	W E (C)
<u>Hufey</u>	W E	Mansuur	W E (C)
Buurdhubo	W E (C/B)	Kukat	W E
Dangalmuyow	E	<u>Madhakaji</u>	W E (C)
Gari Dubeyle	W E (C)	Caanoole	W E
<u>Teesow Weyne</u>	W E (C)	Waabo	W E (C)
Teesow Yarre	E	<u>Gaguure</u>	W E (C)
Haduunley	W E (C)	Gesiile	W E
Leheley	E	Kotey	W E (C)
Ceel Baar	W E (C)	Kaysaney	E

<u>Salagle</u>	W E (C)	Hangoodle	E
Diiriye	E	<u>Caanoole</u>	(D) W E (C)
Dhaydheere	E	Gunaafio	W
<u>Naweytu</u>	W E (C)	Kafiinge	W E
Buulo Batuulo	W E (C)	<u>Bidi</u>	E (D) (C)
Gurmeysa	E	Afgooye	E
Saakow	W E (C)	Kaskey	W E
Goolame	W E (C)	Farbiito	W E
<u>Qaboobe</u>	E (D)	Urufle	W E
Sigalow	W E (C)	Qoryaale	(D) W E
Qataa Qori	W E (C)	Raxoole	W
Hakako	W E	Shangaani	E
Kaxaro	W E	<u>Jiilaalow</u>	W (C)
Horogle	E	Geed Ful	W E (C)
Leheley	W E (C)	Manaane	E
<u>Sukeyla</u>	W E (C)	Tarba	E
<u>Wareegta</u>	W E (D) (C)	Kaytooy	W
Goljano	W E	Malenda/Fanoole	W E (C)
<u>Jabi</u>	(D) W E (C)	Qaranrey	W
Dujuuma	E	<u>Garsaale</u>	W E (C)
Tateey	(D) W	Cusmaan Mooto	W
<u>Radille</u>	E (D)	<u>Helashiid</u>	E (C) (CA)
Reebay	W E	Buulo Balley	E
Bu'aale	W E (C/B)	<u>Jilib</u>	W E (C)
Geele	(D) W	<u>Mareerey</u>	(AR) W
<u>Banta</u>	(D) W	<u>Qumtiirrey</u>	W

<u>Duqiya</u>	E	Riqato	(D) W
Arbow	(D) W	Sunguuni	W (X)
<u>Waamo</u>	(D) W	Buulogadund	W
Manamoja	W (X)	Yoontoy	W
Bangeeni	W (X)	Hiloweylod	W
<u>Jamaame</u>	E (C/B)	<u>Goob Weyn</u>	W E

Key:

W = on the western bank

E = on the eastern bank

W/E = on both sides of the river

(C) = well-known crossing point

(B) = bridge/very important crossing point

(D) = dhesheeq

(AR) = artificial reservoir

(CA) = canal

(X) = important drinking place until 30 years ago/seldom used now

Radille = very important dry-season drinking place

*The exact geographical location (N-S sequence) of the drinking places in the northern and central reach of the Jubba Valley cannot always be guaranteed.

Source: Names according to pastoralists' information during the January-February 1988 field trips through the Greater Jubba Valley, from the Ethiopian border to the Indian Ocean. Compiled by Dr. Jörg Janzen, ZELF/FU Berlin.

In the Gu' season, the animals use those pastures more distant from the watering places. The pastoralists also migrate beyond the Kenyan border and even through the military positions into Ethiopia. The migration patterns in the Xagaa and Deyr seasons are similar to those of the Jiilaal and Gu' seasons, respectively (see Maps 1 and 2).

As the main livestock kept in Gedo is the camel, the pastoralists usually undertake long-range migrations south as far as the Middle and Lower Jubba regions, the Afmadow and Bu'aale districts in particular, where pasture conditions are much better during the dry seasons than in the more arid northern part of the GJV. During these migrations, they not only move south on the western side of the river, but frequently cross the Jubba River to the eastern side (see Table 9) and then rapidly migrate to the south in a narrow, approximately 10 kilometer-wide strip along the floodplain of the river. South of Saakow, they either cross the river again and move in the direction of Afmadow or continue to the western Dhoobey area between Bu'aale and Jilib and the Shabeelle swamp area. At the beginning of the Gu' or Deyr rains, the Gedo camel herders slowly move back to the north, far inland from the Jubba. The majority use the western side of the river (see Map 2).

C. Northeastern Greater Jubba Valley

This area includes the eastern part of Gedo, western part of Bakool and northwestern part of Bay regions. The migration system on the eastern side of the Jubba River is similar to that of the western side. But as there are few deep wells with motor pumps here, the pastoralists depend to a higher degree on the Jubba River as a water resource (see Map 1).

As a consequence of close ethnic relationships with the agro-pastoralist population of the Bay Region, the Jiilaal and Xagaa movements are focused on the rainfed cultivation areas around Baydhabo and Qansaxdheere in particular. Here the pastoralists use the wars and crop residues of relatives and friendly families during the Jiilaal and Xagaa seasons (see Maps 1 and 2).

The pastoralists rarely cross the Jubba River towards the west because, in normal years, the grazing conditions are much better on the eastern side. Furthermore, there are only a few ethnic relations with the population to the west of the river.

Especially in the Gu' season, large numbers of livestock migrate to the Dooy area between Diinsoor and Buurhakaba because the red soils of this zone present very favorable grazing conditions during the rainy seasons. There are fewer insects and animal diseases than in the dark clay soil areas and the ground

is less slippery and therefore less dangerous for the camels. During the Jiilaal season, camel herders from the Bakool and Bay regions also migrate down to the very good dark-soil grazing areas of the Dhoobey area in the southern part of the Middle Jubba and in the Lower Jubba regions on the eastern side of the river, as well as to the western part of the Lower Shabeelle Region northwest of Haaway (see Maps 1 and 2).

D. Western Central Greater Jubba Valley

The migration pattern of this area is highly influenced by a lack of inland watering points. Whereas during the rainy seasons the pastoralists use the more distant pastures on both sides of the Kenyan border, during the dry seasons they are forced to stay close to the Jubba River and the flooded dhesheegs, where the livestock is concentrated in a strip of approximately 30 kilometers west of the river. At this time, cattle and small ruminants mainly use the zone 10-20 kilometers away from the water.

A high percentage of the pastoralists--camel and cattle herders--also moves to the south to the Afmadow District, where they use the wells around Afmadow and the numerous small private wars between Afmadow and Diif on the Kenyan border.

In very dry periods, like the 1988 Jiilaal season, crossing the Jubba River to the Saakow, Bu'aale, and Jilib grazing areas on the eastern bank of the river is also very common.

A narrow strip along the western bank of the Jubba River is used by camel herders from Gedo for transit to the south.

E. Eastern Central Greater Jubba Valley

The migration pattern of this area, the eastern part of the Middle Jubba and the western part of the Bay regions, is determined by the water availability of the Jubba River and the dhesheegs; by the many wars and wells in the cultivation areas of the agro-pastoralists around Qansaxdheere, Ufurow, Diinsoor, Xabibayal and Banaada; the toogs between Diinsoor and Yaaq Braawe; and the new government/EEC wars south of Yaaq Braawe and east of Bu'aale.

Furthermore, 2 main grazing zones, the red soil Dooy area around Diinsoor and Yaaq Braawe and the dark clay soil Dhoobey area between Bu'aale-Jilib in the west, the Lower Shabeelle Region in the east, and the Shabeelle swamps in the south, are very important destinations for livestock movements. In the second half of the Jiilaal season, livestock is concentrated in a zone up to approximately 30 kilometers on both sides of the

river. The Bu'aale-Jilib area presumably represents the highest concentration of stock, after the Afmadow District and Dhesheeg Radille, being the most important dry-season watering place in the Jubba Valley (see Maps 1 and 2).

The high concentration of animals during this period is due to the fact that all the wars have been emptied by this time, forcing the herders to move either to the area mentioned above, which offers very good grazing conditions, or to migrate to the south to the dhesheegs of the Shabeelle swamps. Whereas these far-reaching migrations are undertaken primarily with camels and to a lesser extent with cattle, the goats and sheep are mainly kept near the permanent settlements of the degaans around the toogs in the Diinsoor District and near the Jubba River.

In the Gu' season, the large majority of the livestock move to the red soil Dooy area between Diinsoor and Buurhakaba. The livestock of the riverine farmers and agro-pastoralists of the Banaada area use the grazing lands between the Dooy area and the tsetse-infested strip along the Jubba River. Generally, the mobility of agro-pastoralists with agriculture as a main source of income is far less than that of the pastoralists.

In the Xagaa and Deyr seasons, the migration pattern is similar to that of the Jiilaal and Gu' seasons (see Maps 1 and 2).

F. Southern Greater Jubba Valley

In the Lower Jubba Region west of the river, the livestock movements show the following pattern. In the Jiilaal season, cattle--the most important livestock in this area--are concentrated around several new deep wells with motor pumps, hand-dug shallow wells, and thousands of privately owned wars, mainly concentrated in the Afmadow District. Two other areas of concentration are around Dhesheeg Waamo and between here and the cultivation zone of the lower course of the Jubba River. As it is rather difficult for the pastoralists to get access to the river bank to water their animals, Dhesheeg Waamo and the artificial watering places are very important. The high livestock concentration is increased by the immigration of large numbers of camels, from the Gedo Region in particular. If pasture becomes scarce, the pastoralists also cross the Jubba River between Jilib and Bu'aale to the eastern part of the Lower Jubba Region (see Maps 1 and 2).

In the Gu' season, the pastoralists graze their animals in the areas to the north, south, and west as far as Kenya. The riverine pastures of the Gosha are not used during the wet seasons because of the high degree of tsetse infestation. At the

beginning of Gu', the camel herders from Gedo and Bakool move slowly northwards to their degaans (see Maps 1 and 2).

The spatial migration patterns during the Xagaa and Deyr seasons are similar to those of the Jiilaal and Gu' seasons, respectively. However, if there are plenty of Xagaa rains, the animals do not have to stay close to the watering points, as they do during the Jiilaal.

G. Southeastern Greater Jubba Valley

This area includes the lower Jubba Region east of the river as far as the Indian Ocean. The livestock-keeping population consists of pastoralists and agro-pastoralists. The latter live in permanent settlements parallel to the irrigated cultivation zone. The livestock movements of both groups take place in a west-east direction between the cultivation area and the Indian Ocean. The dunal zone along the seacoast, densely grown with trees, represents a very important grazing area, although grazing is officially forbidden because of the danger of soil erosion. The coastal zone is used throughout the year, but especially in the wet seasons. In the rainy seasons, livestock is also concentrated between the Shabeelle swamps and the dune belt. During the dry seasons, the animals are watered at a number of dhesheegs in the Homboy and Shabeelle swamp area and on the Jubba River. In addition, hand-dug wells are used near the coastline (see Maps 1 and 2).

VI. EFFECTS OF DAM CONSTRUCTION ON LIVESTOCK-KEEPING IN THE GREATER JUBBA VALLEY

The evolution of the pastoral economy and the migration pattern of the livestock-keepers of the GJV has shown that every intervention into the livestock-keeping system has led to numerous, often negative, socioeconomic and ecological changes.

A. Major Possible Effects on Livestock-Keeping

The construction of the Baardheere Dam and the resulting high regular water flow in the Jubba River, as well as the expansion of agriculture along the Jubba between Jilib and Baardheere, could have a number of negative effects for the livestock-keepers of the GJV. The following problems can be foreseen for the middle course of the Jubba between Jilib and Baardheere.

- The majority of traditional watering points (see Map 1; Table 9), situated on shallow river banks or on sand banks where the animals can be watered without danger of slipping into the deep water, will disappear.
- Crossing points will be limited to existing bridges (see Map 1; Table 9) because the considerably higher waterflow will hinder the animals ability to move through the water.
- Many of the favored dhesheeg watering points, e.g., Bidi and Jabbi (see Map 1; Table 9), will not receive the same amount of water as before, as there will be no natural flooding from the river. The dhesheegs will be fed mainly by surface runoff from the adjacent marine plains. Consequently, these dhesheegs will become smaller or dry out completely.
- New agricultural cultivation areas could hinder access of the animals to the water if insufficient space is left between cultivation areas, preventing pastoralists from reaching the riverine watering places at the lower course of the Jubba River.
- Extension of the cultivation area into good grassland in the floodplain, an important fodder reserve during the Jiilaal season, will be lost to livestock.

- Tsetse infestation, malaria, and bilharzia will increase as a result of the expansion of irrigated agriculture and will affect pastoralists to a much higher degree than at present.
- A possible one-sided expansion of export-oriented crops other than grain would not contribute to improved fodder availability for livestock during the dry seasons.

In the gorge area where the Jubba water will be stored in a deep reservoir more than 100 kilometers long, a number of additional problems will occur.

- The agro-pastoralists who possess agricultural land within the gorge area will lose an important--for quite a number their most important--source of income. There will be no more riverine cultivation for human consumption, and the crop residues used as additional dry-season fodder reserve for the livestock will be lost.
- The interviewed nomads who use the river in the gorge area for watering their animals emphasized that in the future the livestock will be afraid of the big lake and the deep water, making watering of livestock very difficult.
- The interviewed nomads also expect more insects (e.g., tsetse flies, biting flies) and crocodiles along the banks of the reservoir lake than along the present river.
- Crossing the lake area between south of Luuq and the dam site north of Baardheere will be impossible, causing a long detour via Luuq or Baardheere.

B. Recommendations to Minimize Negative Effects

In accordance with the list of possible negative effects in the previous section, the following recommendations are made:

- At those points where watering in the traditional way is no longer possible because water will be too deep and river banks too steep, the GSDR should construct watering facilities (e.g., level river banks, construct troughs and mechanical facilities for lifting the water).

- The number of bridges over the Jubba should be increased, taking into account the locations of traditional crossing points when planning future bridge construction. It would be advisable to build new bridges at Jilib and Saakow, to at least partly maintain the traditional migration pattern across the river.
- Those dhesheegs traditionally used as watering points, and others which could be used, should be attached to the river by small canals--as at Dhesheeg Radiile--to make artificial floodings possible.
- Between new cultivation areas a sufficient number of corridors of at least several hundred meters in width have to be kept open to facilitate livestock's access to the riverbanks, thus avoiding conflicts between pastoralists and farmers resulting from damage to crops and irrigation canals by the animals.
- A certain number of areas with good grass in the floodplain and coastal plain should be maintained as livestock fodder reserves for the dry seasons.
- Programs for the eradication of the tsetse fly, malaria, and bilharzia should be part of the riverine development program, necessarily including the pastoral population and their livestock.
- A one-sided expansion of export-oriented crops should be avoided. A spatial pattern of mixed cultivation including sufficient staple crops--such as maize, sorghum, and possibly rice--should be the goal.

Along the future reservoir area, the following measures would be desirable:

- The little potential land for cultivation on the plateaus along the reservoir area should be developed to substitute for the loss of arable land on the river banks of the gorge area. Compensation of the agro-pastoralists with new agricultural land further south at the river in the Middle Jubba Region should be considered.
- At favorable places in the bays surrounding the reservoir, adequate watering facilities in shallow water should be constructed and protective measures (e.g., fences) against crocodiles have to be built.

- The reservoir area has to be included in a possible tsetse-eradication campaign, as well as in programs for the abolition of malaria and bilharzia.
- A ferryboat service with sufficient capacity to carry large numbers of livestock should be introduced between Luuq and Baardheere.

VII. FINAL DISCUSSION AND PERSPECTIVES

The hypothesis stated at the beginning of this report has largely been verified, as the description of former development in the GJV shows. External influences on the pastoral system in the GJV have led to numerous changes, which have had positive and negative effects on mobile livestock-keeping.

Furthermore, this report has pointed out the high economic significance of the Jubba Valley for the mobile livestock-keepers of the GJV during the dry seasons. This will continue after the construction of the Baardheere Dam, despite the changes in environmental conditions. The river will continue to prove an essential lifeline for the majority of pastoralists and agro-pastoralists of the GJV, particularly during the second half of the dry season. The same applies to the fodder supply provided by the riverine pastures and crop residues from the cultivation zone along the river. Crop residues in particular will increase in importance with the increase in the number of livestock.

At the same time, however, the economic strain of livestock on the remaining dry-season pastures will increase due to the extension of the riverine cultivation zone. The negative consequences for people, livestock, and the environment will be considerable.

The recommendations given for consideration of the mobile livestock-keepers' needs after construction of the Baardheere Dam should be the basis for further discussions on the socioeconomic integration of pastoralists and agro-pastoralists into the future planning of Jubba Valley development.

A few basic aspects should be emphasized. These will have to be considered after the construction of the Baardheere Dam if socioeconomic development favorable to the mobile livestock-keepers of the GJV and the nomadic community is to be introduced.

- The most freedom of movement possible for the mobile livestock-keepers should be maintained by regional planning measures making optimal use of the natural resources of the GJV, while avoiding too strong a concentration of livestock in small areas, such as the zone along the river and around new watering points.
- In spite of the demand for freedom of movement, it would be advisable to restrict the large-scale, dry-season immigration of camel herds from the north to the south, since this poses considerable ecological strain and introduces many animal diseases to the southern part of the valley.

- A restriction on building new governmental and private wells and water catchments in the main grazing areas should be considered to stop further increases in the livestock population and resulting degradation of the vegetation cover.
- Traditional use and legal claims of the mobile livestock-keepers to areas on the banks and in the floodplain of the Jubba River will have to be considered in future agro-development planning and, in case of loss of claims, adequate compensation for the mobile livestock-keepers should be provided.
- Planning exclusively from "above" should be avoided, since this prevents the direct participation of representatives of pastoralists and agro-pastoralists in decision-making.
- When distributing cultivation ground along the middle course of the Jubba River, preferential consideration should be given to agro-pastoralists, and possibly also to pastoralists from the GJV who are willing to settle.

The mixed economy of the agro-pastoralists, based on cultivation and mobile livestock-keeping, offers a particularly favorable opportunity to minimize the dry-season shortage of fodder by increased feeding with crop residues, but the extension of rainfed farming should be restricted to the physically most favorable areas, e.g., in the arid part of the northwestern GJV, where rainfed farming is very risky, cultivation should not be extended at all.

If these recommendations are considered in the future regional development planning of the GJV, it seems possible to keep to a minimum the negative effects of the Baardheere Dam and future agricultural development measures in the Jubba Valley, for the sake of the mobile livestock-keepers and for the economic benefit of Somalia.

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APPENDIX A



Figure 1. The Jubba River and the Buurdhubo plain. In the background one of the refugee camps and in the foreground irrigated agriculture.

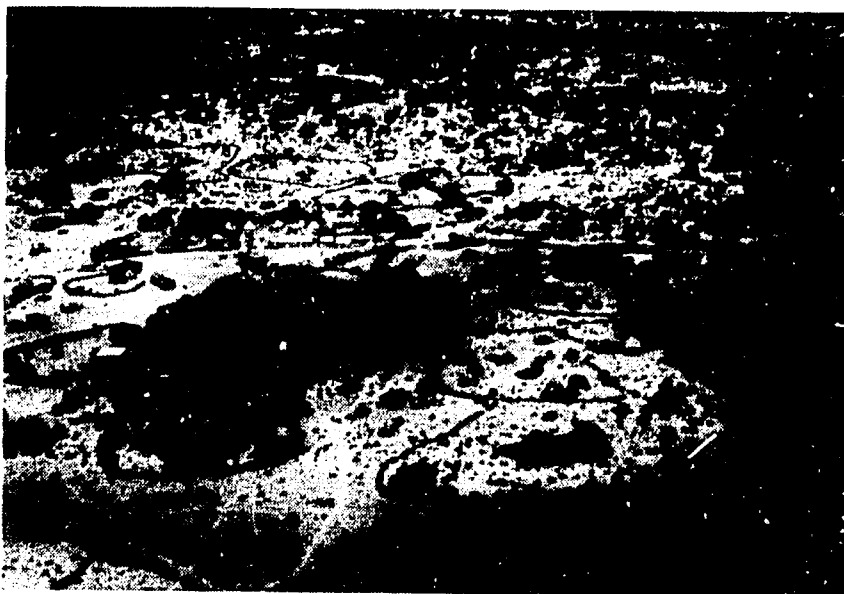


Figure 2. An agro-pastoralist settlement at the western rim of the Dooy area in the rainfed cultivation area of Banaada.

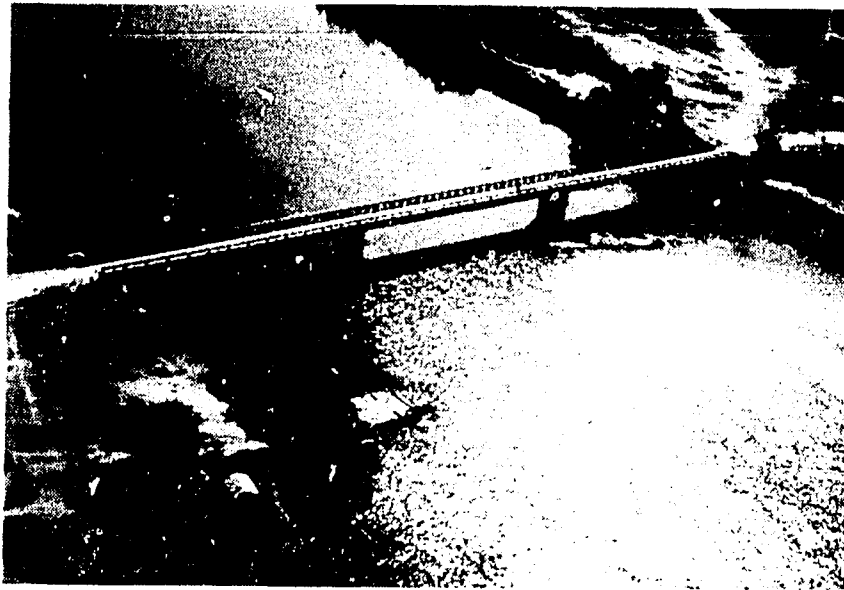


Figure 3. Buurdhuubo Bridge



Figure 4. Between Saakow and Bu'aale--livestock using crop residues of irrigated agriculture in the floodplain of the Jubba River.



Figure 5. Unsi Weyn--important watering place at the Dawa River. The palm trees on the other side of the river are in Ethiopian territory.



Figure 6. Typical Jubba watering place.



Figure 7. Typical Jubba watering place.



Figure 8. A watering place in a dry river bed near Yaaq Braawe.



Figure 9. A watering place at Dhesheeg Cadeyley.



Figure 10. A small, private war in the Banaada cultivation area.

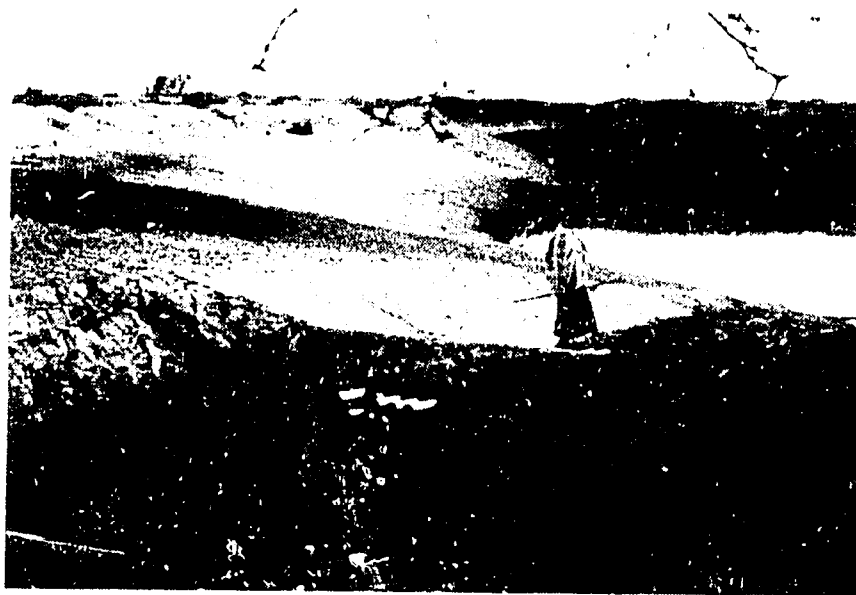


Figure 11. New, large government war northwest of Berdaale. The water in pumped by hand pump from the basin to the troughs.

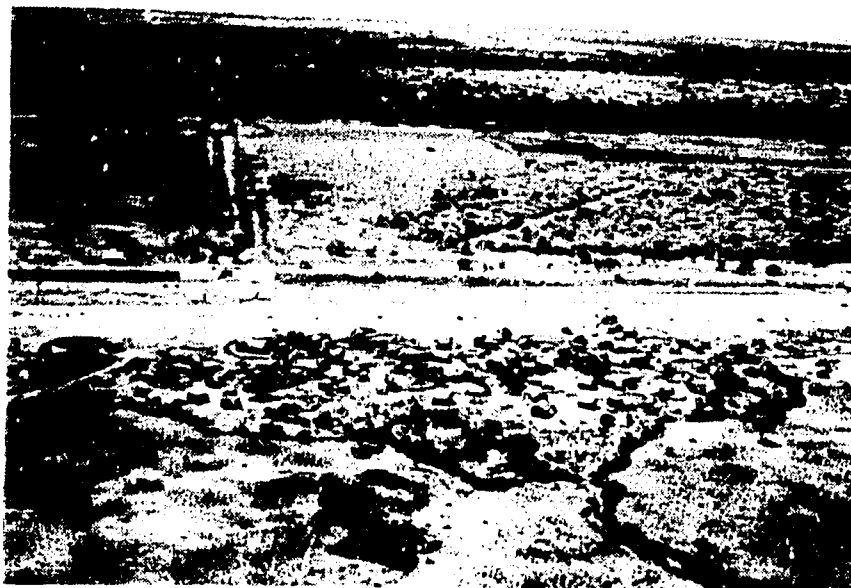


Figure 12. The new nomadic settlement of Helashiid at the irrigation canal to Jilib.

51

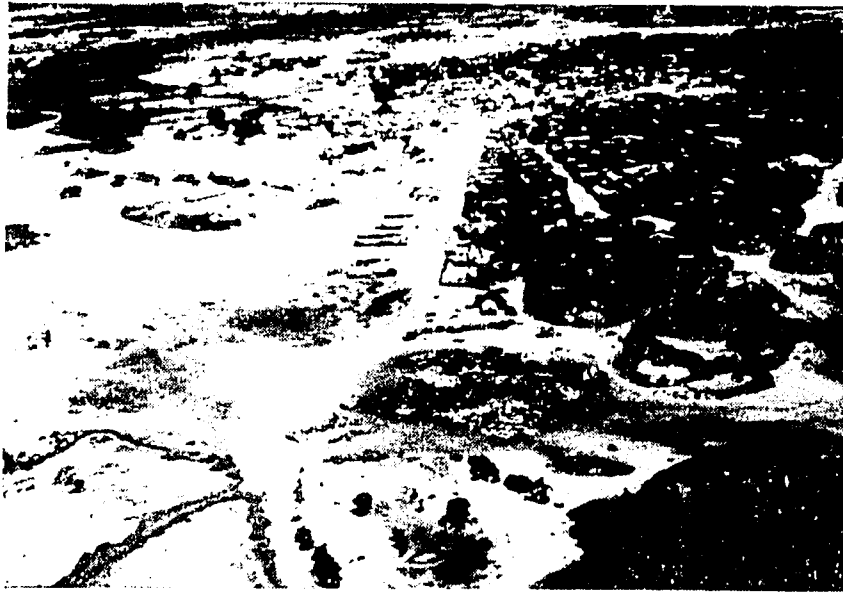
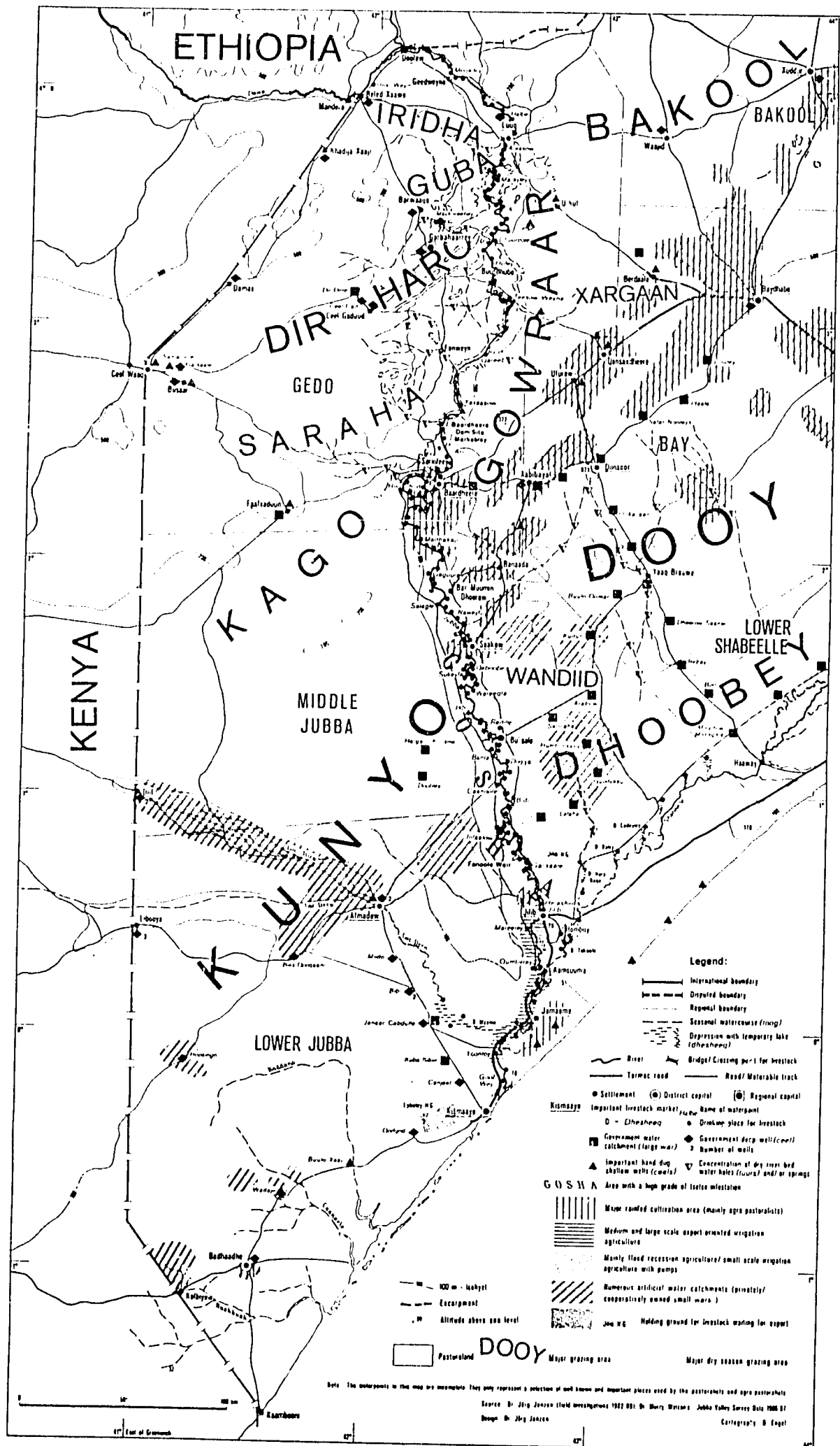


Figure 13. The town of Afmadow--the most important center for the nomads of the southwestern GJV.

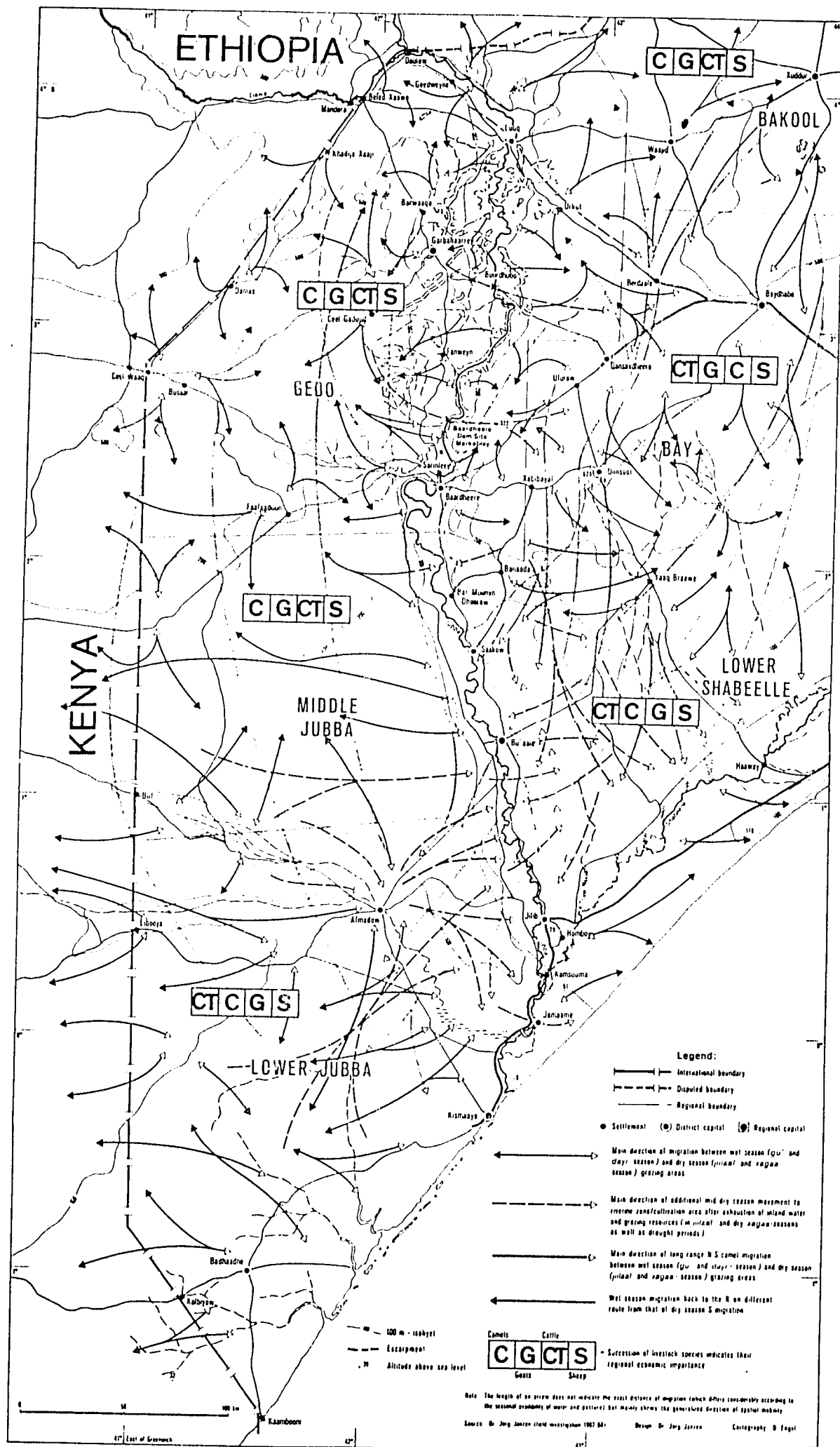


Figure 14. A high capacity deep-well in Afmadow. This well provides sufficient water throughout the year.

APPENDIX B



Map 1: The Greater Jubba Valley - Infrastructure, Land Use and Water Resources -



Map 2: The Greater Jubba Valley - Spatial Pattern of Seasonal Livestock Movements -