

INTERIM REPORT ON  
VEGETATION SURVEY OF THE JUBBA VALLEY

JESS Report No. 9

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## ACRONYMS AND ABBREVIATIONS

AHT	Agrar und HydroTechnik GMBH
AID	U.S. Agency for International Development
ARD	Associates in Rural Development, Inc.
GSDR	Government of the Somali Democratic Republic
JESS	Jubba Environmental and Socioeconomic Studies
JuDAS	Jubba Development Analytical Studies
MJVD	Ministry of Jubba Valley Development
RMR	Resource Management and Research, Ltd.
spp.	species
SOMAC	Somali Academy of Science
USDA	U.S. Department of Agriculture

## PREFACE

The Jubba Environmental and Socioeconomic Studies (JESS) (project number 649-0134) are jointly funded by the Government of the Somali Democratic Republic (GSDR) and U.S. Agency for International Development (AID). JESS is part of a larger project funded by AID and GSDR, the Jubba Development Analytical Studies (JuDAS) project. Technical assistance and JESS management are being provided to the Ministry of Jubba Valley Development (MJVD) by Associates in Rural Development, Inc. (ARD), of Burlington, Vermont, under AID contract number AFR-0134-C-00-5047-00.

This interim report on botanical investigation in the Jubba Valley is one of many such reports to be produced during Phase II of JESS, a two-year period of intensive project field studies. The author of this report, Mr. Christopher F. Hemming of Resource Management and Research, Ltd. (RMR), was employed on a subcontract basis to assist the JESS ecologist, Dr. Ian Deshmukh, in conducting this work. (See the Appendix for Mr. Hemming's scope of work.)

En route to Mogadishu, the consultant visited Nairobi, where a liaison was initiated with the botanist-in-charge of the Herbarium of the National Museums of Kenya, Ms. Christine Kabuye. It was agreed that duplicate specimens of any grasses and sedges collected in the course of fieldwork would be deposited there and identified as soon as possible. Mr. Hemming arrived in Mogadishu on 13 July 1986 and departed for Nairobi on 27 August to deliver the plants, as arranged.

Mr. Hemming would like to acknowledge the assistance given him by MJVD, AID and ARD. Help rendered in the field by the Jubba Sugar Company, Fanoole Rice Project and Mogambo Rice Project was greatly appreciated. Finally, Mr. Hemming wishes to thank Dr. Deshmukh for his hospitality and many kindnesses and Mr. Bashir Sher Yusuf, whose knowledge of Somali botany was utilized extensively during preparation of this report.

## I. EXECUTIVE SUMMARY

With assistance from the JESS field ecologist, a botanist conducted a two-month consultancy that involved preliminary botanical surveys, the development of recommendations for future botanical studies and identification of botanical specimens. This was the first of two botany consultancies to be performed as part of JESS.

During this consultancy, a contact was established with the Herbarium of the National Museums of Kenya, and two field trips were made to the Jubba Valley between Baardheere and Goob Weyn. On the first trip, a total of 13 sites were selected for vegetation study in the area north of Jilib; on the second, an additional 23 sites were selected in the lower and middle Jubba regions.

At each site, the general ecology was described (including soil information), vegetation measured and plants identified and/or collected. When available, local informants were questioned on such subjects as the flooding regime, grazing practices in relation to tsetse flies, and local names and uses of plants.

A total of 222 plants were collected and divided into four sets for the following collections:

- Herbarium of the National Museums of Kenya,
- Herbarium of the Royal Botanic Gardens at Kew,
- National Herbarium of Somalia at the National Range Agency, and
- National University of Somalia.

The sets of plants for Nairobi and Kew were delivered by Mr. Hemming.

Some 116 pages of field notes were left with the JESS team in Mogadishu to support this report, which is essentially a summary of those pages.

## II. INTRODUCTION

This JESS interim report on botany field studies is part of Phase II, which includes a series of field studies to be carried out over a two-year period (see PHASE I REVIEW AND PHASE II WORK PLAN FOR THE JESS PROJECT, ARD, 31 July 1986). Phase II focuses principally on primary data collection in the Jubba Valley. The objectives of this consultancy were:

- ground-truthing vegetation maps and available aerial photography;
- selecting and establishing vegetation transects for analysis;
- conducting preliminary ethnobotanical surveys and recommending procedures for continuing studies;
- identifying botanical specimens in the field and at the National Herbarium of Somalia; and
- establishing a liaison with appropriate herbaria in East Africa and the United Kingdom.

As just described, the focus of this consultancy was on botanical inventories in the Jubba Valley. Hence, this report is largely descriptive in nature. Phase III of JESS will consist of analyses of field data collected during Phase II and other secondary data. Another botany consultancy is envisioned for June and July 1987. This work will continue the inventory work begun during this consultancy (particularly in the inundation zone above the future dam) and provide more information for development of a long-term vegetation monitoring system. At the end of Phase III, JESS will deliver the following to AID and MJVD:

- socioeconomic and environmental assessments of the Jubba Valley that fit into a process for developing a master plan for valley development;
- a realistic, long-term system for environmental and socioeconomic monitoring by MJVD; and
- river-basin planning and development guidelines for Somalia.

### III. TECHNICAL DISCUSSION

#### A. Ground-Truthing Maps and Aerial Photographs

The physiographic and land-use interpretation prepared by Agrar and HydroTechnik GMBH (AHT) for their dhesheek study, and presented as an air photograph lay-down at a scale of 1:50,000, was used as the basic source for site selection. The quality of the interpretation was generally high. The land units recognized proved highly suitable for this consultancy and saved considerable time. Had these data not been available, much of the consultancy would have been spent in establishing criteria and boundaries for suitable land units, and little progress would have been made in the selection and description of sites.

In only one geographic area was the air-photograph interpretation found to be at fault. A small area near Jamaame was described as "flat floodplain with external drainage," but was, in fact, found to be slightly elevated and gently sloping so that it is never flooded. To the west of Jamaame, there was extensive flooding in mid-August 1986, in an area that the AHT interpretation indicates is rarely flooded, if ever. This obviously requires clarification, and it may be associated with the fact that the 1983 photographs were taken during a dry period. It is recommended that all interpretation differences be brought to the attention of AHT and discussed with them.

#### B. Transects for Vegetation Analysis

A total of 36 sites were selected between Baardheere and Goob Weyn on both sides of the Jubba River. As indicated in Table 1 on the following page, the sites are located in both floodplain and non-floodplain land classes.

Table 1. Vegetation Study Sites

<u>Major Class</u>	<u>Category (AHT)</u>	<u>No.</u>	<u>Site Designation</u>
Floodplain	L=Levee/Bank	7	4,5,8,10,17,32,33
	D=Dhesheek	8	2,6,12,13,15,19,21,28
	d=External Drainage	7	14,16,20,24,25,29,31
	H=Heterogeneous Alluviums	2	27,34
	W=Wadi	2	1,36
Subtotal		26	
Non-Floodplain		10	3,7,9,11,18,22,23,26, 30,35
Total		36	

- Notes:
1. Two sites were on old levees where the river no longer runs.
  2. Since construction of the Fanoole barrage, three dhesheeks have either undergone no flooding or have had much reduced flooding.
  3. Two sites were included to examine the effects of fires on non-floodplain areas.

In addition to recording the plant species found at and around each site, local informants were questioned on a range of issues (when possible), including the following:

- the frequency and season of flooding;
- duration and depths of floods; and
- any changes noted since construction of the Fanoole barrage.

These particular questions may throw light on the types of changes to be expected after completion of the Baardheere Dam. Furthermore, provided that any perceived changes can be correlated satisfactorily with hydrologic and meteorologic records for this part of the valley, these questions may provide useful insights into likely consequences of construction of the Baardheere Dam.

Thus, it is recommended that this possibility be borne in mind for future site selection and an attempt be made to secure more information on local perceptions of changes in the flooding regime following construction of the Fanoole barrage. These changes should then be examined by careful reference to actual hydrometeorologic records.

### C. Identification of Botanical Specimens and Herbaria Liaison

Many plants were identified in the field. However, identification was not possible at some riverine sites where tree species were either very tall (30 meters), making the collection of identifying material impossible or the species were not in flower or fruit. Nonflowering specimens were also collected, but there is no guarantee that all of these items can be identified. Hence, it is recommended that on future visits to the sites, plants should always be collected when found in flowering or fruiting condition.

At some study sites, a high proportion of plants could be identified in the field. For example, at site 35, 21 plants were identified to the generic level, 10 to the specific level and eight collected for identification. A total of 222 plants were collected at and around the 36 sites studied in detail, and a few additional plants of special interest were collected wherever they were found in good condition. For instance, specimens were collected to investigate the identity of the two largest Acacia spp. in the Jubba Valley. Of the 222 plants collected, 35 were grasses and sedges. Since much of the study area consists of grasslands that are flooded seasonally, a knowledge of the more common grasses is important.

The collection was divided into four sets for distribution to the following herbaria:

- the National Herbarium of Somalia at the National Range Agency;
- the herbarium at the National University of Somalia, which will be the working herbarium for this project;
- the Herbarium of the National Museums of Kenya, which contains the best collection of Somali plants in Africa, and where the grasses and sedges collected will be named; and
- the Herbarium of the Royal Botanic Gardens at Kew, United Kingdom, where the other flowering plants will be identified.

To enhance the usefulness of the collection, summary habitat descriptions were prepared for each site, and these will be attached to the appropriate specimen labels. Plant herbarium labels for JESS were designed and printed in Mogadishu. They will be filled out when plant identifications become available.

Mr. J. B. Gillett and Ms. Kabuye agreed to help in naming plant specimens, provided they were in good condition and well labeled. It is recommended that the two institutions they represent (the Royal Botanic Gardens at Kew and Herbarium of the National Museums of Kenya, respectively) be asked to help in future plant identifications, and it is further suggested that they be sent any specimens collected. The National Herbarium of Somalia is gradually acquiring a useful collection, but does not yet provide a comprehensive identification service.

#### D. Ethnobotanical Surveys and Further Studies

A large number of plants are used for special purposes beyond their more common uses, which include livestock forage, building and thatching material, and fuelwood. The fruit of many species are eaten, and large numbers of plants have medical uses--see the survey of traditional medical properties and uses of Somali plants carried out by the Somali Academy of Science (SOMAC).

For this consultancy, the objective was to collect data about all possible uses of all plants, and such information was collected at 22 of the 36 sites. Informants ranged from passersby to guides who helped located specific plants. In one case, the informant was a traditional healer. It is recommended that every effort be made to find an informant at sites where no data on plant uses have yet been collected. Questions to be posed to these informants include:

- what is the Somali name for this plant--the response should be recorded by a Somali team member who is fully conversant with the new orthography, and the spelling should reflect local variations; and
- what is this plant used for.

In asking both questions, interviewers must be careful about the form of leading questions. All plant uses should be recorded even though there will be much repetition. During this consultancy, 151 plant uses were recorded and given to the JESS ecologist, Dr. Deshmukh.

## E. General Recommendations on Site Descriptions

During the course of the fieldwork, a method was developed for describing the study sites. These descriptions consist of 116 pages of field notes that have been left with the JESS team in Mogadishu. The notes cover the site locations and descriptions, plant lists and collection numbers, and results of interviews about ethnobotany and site ecology.

### 1. Site Description

The following general points should be covered in the site description:

- geomorphology and topography (including geology, if known);
- drainage and erosion;
- grazing and browsing pressure, as indicated by the vegetation, track density, dung and animals actually seen (the presence of hippopotamus tracks should be recorded)--because it was clear in many places that grazing and browsing practices are severely controlled by tsetse flies, information on these issues should also be sought;
- human activity (e.g., proximity to villages, infrastructure location, access), proximity of agriculture to the site, wood chopping for fuel or building materials, and charcoal production; and
- other biotic factors--e.g., termites and ants, and the presence or absence of Pila, the large East African water snail, which indicates flooding or extreme ponding, and of Achatina, the giant African land snail, which indicates that flooding is neither deep nor extensive.

A brief description of the topsoil should be made at each site. This portion of the site description should include:

- description of the surface cover by litter, sand, cracks, etc.;
- depth and horizons--only a rough indication of this can be given unless pits are dug, but some clues can be derived from the presence of stones or natural or man-made cuttings at or near the site; the riverine

sites are generally deep, and horizons near the surface are unlikely to be seen;

- structure--ped shape (if any occur), hardness to ax, hardness of peds, and friability of peds, if damp;
- consistency--stickiness and plasticity;
- texture--particle size descriptions using standard terms of sand, silt, clay, etc., and the U.S. Department of Agriculture's (USDA) soil-texture triangle;
- color--use Munsell soil color charts; and
- condition of soil at time of examination as dry, slightly damp, etc.--this is important as it will affect hardness, friability and color.

All species of vegetation seen on or near the study site should be recorded in the following format:

Latin Name: Somali Name: Collection Number:  
Maximum Height: Frequency: Condition

The following terms are to be used to describe frequency and condition:

- frequency--dominant, common, frequent, occasional, rare; and
- condition--leafless, few young leaves, old leaves (for deciduous species), evergreen, pre-flowering, fruiting, post-fruiting, dry.

The vegetation summary should be based on the following terms:

- grassland;
- herb-land;
- dwarf shrub-land (less than 50 centimeters in height);
- shrub-land (50 centimeters to two meters);
- bush-land (two to four meters);
- woodland (four to 10 meters, maximum height to be judged--10 meters is only a guideline); and

- o forest (about 15 to 30 meters or more).

The main group should be chosen from one of these terms (e.g., grassland). If there are numbers of shrubs in the grassland, it should be described as "shrubbed grassland." An indication of the density of plants should also be given (e.g., sparsely shrubbed, tall, dense grassland with occasional trees). Genera should be included in the description where there is clear dominance and field identification is possible--for example, sparsely shrubbed Bhyllanthus somalensis, tall, dense grassland (Sporobolus spp.) with occasional Dobera glabra trees. If there is any clear vegetation pattern, such as arcs, clumps or thickets, this should also be noted.

## 2. Local Information

Much valuable information can be gathered from local residents. It is recommended that every effort be made to obtain such information at every study site (for example, by bringing someone from the nearest village). The questions listed below have proved useful on field trips, but variations will be necessary to suit the ecology of specific sites.

### Flooding Regime

- Does the site flood?
- How often? During which rainy season(s)?
- If both, which produces the most flooding?
- Does the floodwater remain or drain away?
- If it remains, how long does it stand?
- How deeply does the water stand?
- When did it last flood?
- What changes have been experienced in the flooding pattern since construction of the Fanoole barrage?

### Grazing Patterns

- Are tsetse flies ever present?
- Is the area used for graze/browse?

- If so, by whom (e.g., local cultivators, local livestock owners, nomadic herders)?
- When is the area used most heavily?
- What diseases are animals inoculated against or which diseases is their regular prophylaxis for?
- Is the grass burned? Who burns it? When and how frequently is it burned?

APPENDIX

Scope of Work - Phase II - Christopher Hemming

1. The contractor will conduct a 4 week consultancy in Somalia beginning on or about July 14, 1986 for Associates in Rural Development, Inc. (ARD).
2. The general focus of this consultancy will be assistance to the Juba Environmental and Socioeconomic Studies (JESS) ecologist and counterparts in the Ministry of Juba Valley Development (MJVD) for botanical studies.
3. Upon arrival in Somalia, the consultant will hold briefing meetings with USAID project manager and JESS chief of party E. Drannon Buskirk, Jr. to discuss the consultant's scope of work. The consultant will also meet with JESS ecologist Ian Deshmukh. At this meeting, a means for progress reporting during this consultancy will be defined.
4. The consultant will assist the JESS ecologist in the following activities:
  - (a) Ground truthing vegetation maps and available aerial photography,
  - (b) Selecting and establishing transects for vegetation analysis,
  - (c) Conducting preliminary ethnobotanical surveys and recommending procedures for continuing studies,
  - (d) Identifying botanical specimens in the field and at the National Herbarium of Somalia,
  - (e) Establishing a liason with appropriate herbaria in East Africa and the United Kingdom.
5. A draft report of this consultancy should be delivered to the JESS chief of party one full day prior to departure from Somalia. This report should be written in a format which meets guidelines agreed upon by the JESS chief of party and the JESS ecologist. This report should be the basis of a final briefing with the USAID project manager and JESS chief of party. Following revisions to this report by the JESS team, it will be sent to ARD for release as an interim project report.