

**Ministry of Juba Valley Development, Somalia**

**United States Agency for  
International Development/Somalia**

**JUBA DEVELOPMENT ANALYTICAL STUDIES**

**(Project 649-0134)**

**MIDTERM EVALUATION**

**TAMS  
Mogadishu  
April 1987**

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**EXECUTIVE SUMMARY**

## EXECUTIVE SUMMARY

In this evaluation of the Juba Development Analytical Studies Project, the project's objectives, the outputs and the inputs are assessed to determine progress to date and define eventual changes.

The project was designed to contribute to the creation of a Master Plan for the Juba Valley by MJVD. The project's objectives and outputs are clearly defined in the PP, ProAg, and related project documents. They are still valid and do not need to be changed. The project objectives will essentially be attained if the inputs are provided as planned. At this time indications are that inputs can and will be provided on a timely basis.

USAID inputs involve technical assistance and institution building. Technical assistance consists of three components:

- Reconnaissance Water and Land Resources Studies - BUREC
- Advisory Support - NAS
- Environmental and Sociological Assessment - ARD

### Water and Land Resource Studies

BUREC produced a draft final report and maps in April 1987, the final report is due in July 1987. The draft report and maps do not meet the requirements of BUREC's agreement with USAID. It was concluded that no further field work is required, but that data needs to be integrated and presented in a more logical and careful way. This is particularly true in the irrigation suitability classification, a key part of BUREC's work. Major problems concern the inadequate and incomplete definition of suitability classes based on physical land characteristics and the lack of consideration of economic factors in the suitability classification. These and other issues can and should be corrected prior to publication of a final report in which BUREC is to present an unambiguous classification of irrigable land in the Juba Valley.

### Advisory Support

The Juba Valley Advisory Panel of the NAS serves a useful function in advising USAID and ARD. The composition of the panel ought to be modified to: (a) provide more support to the physical resource studies now being carried out by ARD, and (b) provide panelists experienced in the management of development projects, in addition to the current emphasis on academic research.

## Environmental and Sociological Assessment

ARD is to conduct both the environmental assessment and the socio-economic assessment in three phases. Phase I was to be a review of literature and existing conditions and to design a plan of work for Phase II. Phase II involved the collection of field data required for preliminary assessments of dam development. Phase III is for final analysis and assessment of environmental and sociological impacts of irrigation and dam development.

At this time, ARD is mid-way in Phase II.

The evaluation of ARD's environmental work revealed a Phase I with virtually no background documentation for the development of the Phase II Work Plan. Notwithstanding the weaknesses of the first phase, Phase II is progressing well. Data collection appears to be progressing on schedule and in a professional manner. As much as can be judged without the information that should have been provided in Phase I, the data collected is relevant to the assessment of environmental impacts for the development of a Juba Valley Master Plan. It is recommended to immediately analyze data as collected so the transition into Phase III is natural and efficient.

The evaluation of ARD's sociological work also showed a Phase I characterized by delays. Although scheduled research was carried out, results were never reported satisfactorily. It is not apparent how Phase I affected the planning for Phase II. Phase II is dominated by the Socio-Economic Baseline Study (SEBS) which is currently behind schedule. The sample of the SEBS is quite large and the questionnaire is long. It was not possible to assess the survey in the field, but it appears that less taxing techniques could have been successfully used given the level of planning decisions to be made. Synthesis of data needs greater emphasis now and will have to be begun well before the start of Phase III. Few of the shorter studies in Phase II have begun, but indications are that they will be well carried out on schedule prior to commencement of Phase III.

## Institution Building

Development of MJVD as an effective coordinating body for planning was scheduled through long- and short-term out-of-country training and through classroom and on-the-job training in Somalia. USAID kept the former task and delegated the latter to ARD by contract. One recipient of short-term training and one of long-term training completed their studies and returned to Somalia. Another trainee was terminated from long-term studies and one on short-term training disappeared.

Four other candidates are now involved in graduate studies in the United States. A number of other candidates have been identified.

Counterpart training was not well thought out in project design. The ProAg with MJVD specifies certain counterpart assignments. The contracts with ARD and with BUREC do not specify that counterparts will be assigned with exception of lab technicians for BUREC. BUREC was in fact assigned a group of qualified counterparts but they had no mandate for training. ARD has a mandate for training but no contractual assurance that they will be assigned counterparts.

USAID should reexamine the training component of the project and establish a rational plan for meeting project objectives.

## 1. INTRODUCTION

This report presents the results of the midterm evaluation of the Juba Development Analytical Studies Project. The location of the Juba Valley is shown in Figure 1.

The purpose of this evaluation was to check on project progress to date and to determine changes/adjustments that would enhance the progress.

The Evaluation Team consisted of three persons:

- Dr. John Buursink  
Team leader/Land Use Planner
- Dr. Niels L. (Roy) Martin  
Ecologist
- Dr. A. Eric Manzardo  
Anthropologist

The team leader and the ecologist were assigned by TAMS under contract IQC PDC-0000-I-07-4103-00. The anthropologist was assigned by Checchi & Company/Louis Berger International, Inc. under IQC PDC-0085-I-00-6097-00.

The evaluation was carried out in the period of March 22 to April 15, 1987. Prior to arrival in Mogadishu the Evaluation Team participated in a two-day team planning meeting in Nairobi. The meeting facilitator was Ms. Claudia J. Liebler. A fourth member of the Team, Mr. John Kimani, agronomist/river basin planner, took part in the Nairobi meeting but was unable to join the team in Somalia. He is therefore not responsible for the contents of this report.

In Somalia, the Team made a brief field trip to the Juba Valley. This trip focussed on the Lower Valley and was to familiarize the team with field conditions and ongoing project operations in the Valley. A BUREC soil classifier accompanied the team in the field. Unfortunately, no other project scientists were available during this trip. Upon return from the field on March 30 and 31, the Team continued and finalized its work in Mogadishu. A detailed list of persons met is contained in Annex 1.

The USAID project manager, Ms. Sally Patton, provided full support to the evaluation. Ms. Patton organized and herself participated in the Nairobi planning meeting and in the field trip to the Juba Valley.

The Water and Land Resources Studies component of the project was finalized in April, 1987 as far as work in Somalia was concerned. The evaluation of this project component, therefore, constitutes a final rather than a midterm evaluation.

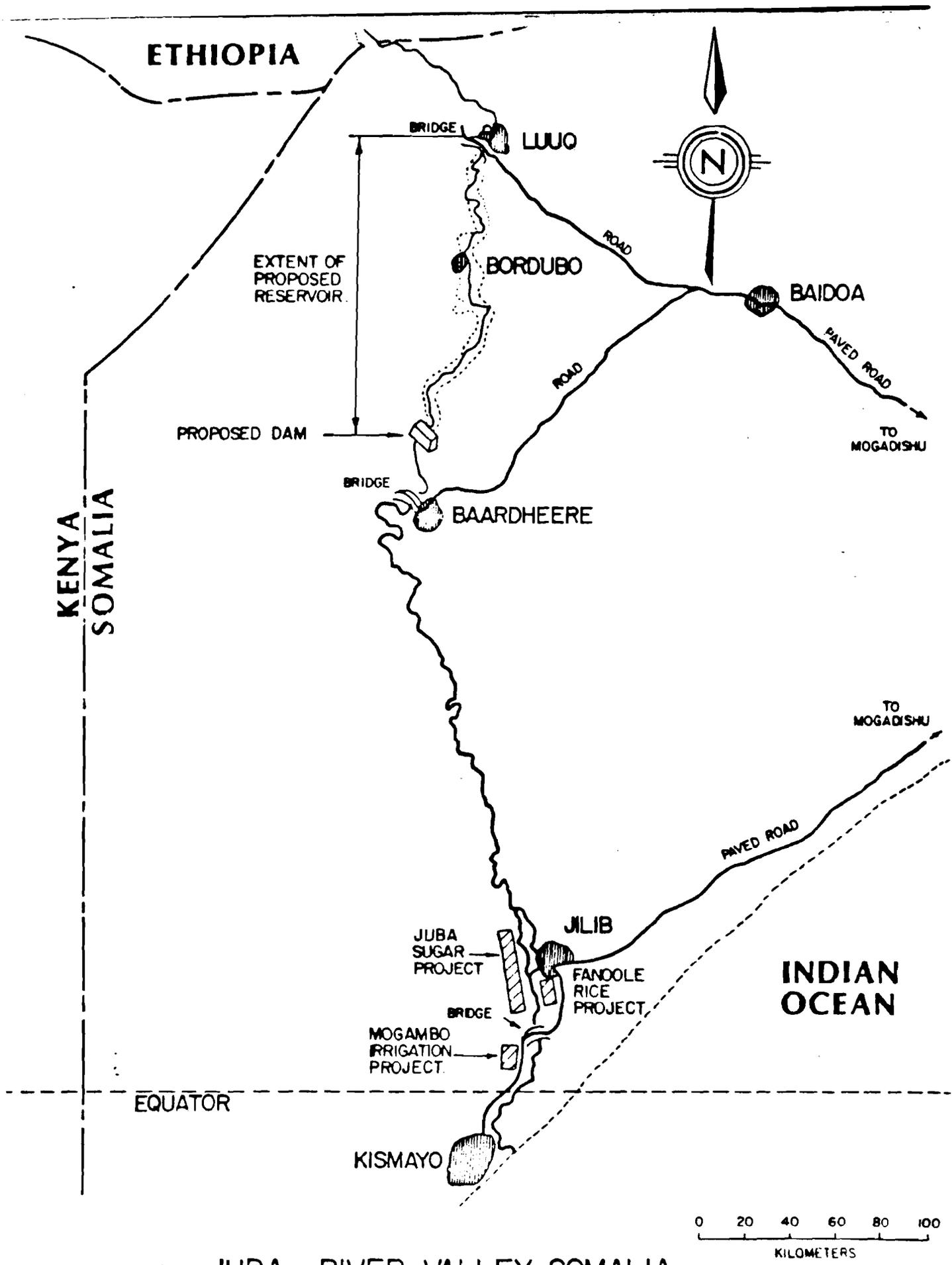


Figure 1. JUBA RIVER VALLEY, SOMALIA

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**2. JUBA DEVELOPMENT ANALYTICAL  
STUDIES PROJECT**

## 2.0 JUBA DEVELOPMENT ANALYTICAL STUDIES PROJECT

### 2.1 Basis of Evaluation

The PID was drafted on Sept. 8, 1983 (Cable Unclassified Mogadishu 07237). The Project Paper was authorized on Sept. 28, 1983. The Project Agreement became effective on Sept. 29, 1983.

The Project Paper was reviewed in mid 1985 and the revised version was approved on June 2, 1985. The ProAg was amended accordingly on June 30, 1985 (Amendment No. 2).

The PACD was subsequently set at Sept. 30, 1988.

In the revised (1985) Project Paper the goal, purpose and outputs as originally defined in 1983 remained unchanged. The revision primarily involved a realignment of the inputs.

This evaluation was made in relation to the 1983 PID and the 1985 PP. The project objectives and outputs are discussed below and the project inputs are assessed in detail in subsequent Chapters 3 and 4.

### 2.2 Project Goal

The overall goal to which this project is to contribute is "the creation of a Master Plan which will optimize resource uses in the Juba River Valley." The Master Plan itself is to be developed by the Ministry of Juba Valley Development (MJVD) with assistance provided by a German advisory team (GTZ/AHT) of planners. Development of the Master Plan will assume the construction of the Baardheere Dam in the Upper Juba Valley in Somalia.

The development of the Master Plan is as important now as it was when this project was originally designed. Construction of a dam at Baardheere and development of the Juba Valley are among the highest priorities of the Somali Government. Preparations for master planning of the Juba Valley have reached the point where the planning can soon begin. GTZ/AHT has submitted a proposed plan of operations to MJVD in February 1987 and is awaiting the Ministry's approval for go ahead. Also, indications are that the World Bank considers a Master Plan essential for Juba Valley development.

It appears therefore that the project goal is still eminently valid and should remain unchanged.

### 2.3 Project Purpose

The immediate purpose of the project is "to provide the necessary information on soils/land use, social and environmental effects for incorporation into the Master Plan." In addition the project is "to provide support to the MJVD (help

build MJVD's planning and monitoring capabilities)."

The definition of this purpose limits the USAID contribution in Juba Valley development to precise areas. As it is, USAID will provide certain building blocks for planning but not participate in the planning process itself. The project will have achieved its purpose if the required information is delivered to MJVD.

MJVD then is to ensure incorporation of this information in the Master Plan. At this time all indications are that the project will achieve its purpose and deliver the information. However, it is critical in Juba Valley Development that the information is delivered on a timely basis. Data on soils, land use, social and environmental conditions are all essential elements for river basin planning, but needs to be available in time.

We assume that it is the intent of the project to deliver in time. This is evidenced by the fact that the USAID Project Manager is fully aware of the requirements of MJVD and the German advisory team, and has participated in a pre-planning meeting in Essen in January, 1987. We are confident that with current project management, this project will deliver in a timely fashion and successfully attain its purpose.

Redefinition of the project purpose to emphasize the timeliness of the achievements is not necessary.

#### 2.4 Project Outputs

Four outputs have been defined for the project. They are:

1. Classification of soils and land use.
2. Identification of environmental and socioeconomic constraints.
3. Development of the MJVD as an effective planning body.
4. Incorporation of the environmental assessment in the planning stages.

At this point, 90% of Output 1 has been achieved. A draft report and soil maps have been submitted to USAID. It is expected that Output 1 will be completed by July 1987.

As for Output 2, the identification of environmental and socioeconomic constraints, it is unfortunate that this output only stresses the constraints and omits the environmental and socioeconomic benefits (of dam construction). In the planning process both elements are needed. The project inputs are more broadly defined and will result in an assessment of both negative and positive impacts. Output 2 involves a wide range of specific inputs. It is important for this output to

remain on target and individual inputs must be prioritized.

Output 3 is considered beyond the competence of the evaluation team. The institutional development of MJVD and its role in planning is determined by the Somali Government. At this time a World Bank-funded study of Somali governmental institutions is being carried out by Price Waterhouse to address this issue. USAID is making a sustained effort to train staff of MJVD, this undoubtedly enhances the planning capabilities of the Ministry and provides support to the MJVD. The training aspect of MJVD institutional development is assessed in Chapter 4.

Output 4 has not been achieved because the environmental assessment is not done yet. The assessment is scheduled to be done in 1987/88 and all reasonable expectations are that it will be incorporated in the planning stage.

In summary, it appears that the Project's goal, purpose and outputs as currently defined in existing USAID documents remain relevant, valid and adequate. All efforts should continue to be made to complete the project by its scheduled PACD of Sept. 30, 1988.

## 2.5 Project Inputs

Two key inputs - Technical Assistance and Institutional Development - were defined in the 1985 Project Paper to achieve the above outputs.

USAID is providing technical assistance to MJVD through three different contractual arrangements as follows:

- a Participating Agency Service Agreement (PASA) with the Department of Interior, Bureau of Reclamation (BUREC), for the execution of reconnaissance water and land resource studies.
- a Cooperative Agreement with the National Academy of Sciences (NAS), to provide advisory support to the project.
- A Contract with Associates in Rural Development (ARD), for the execution of the environmental and sociological assessment.

Figure 2 presents an overview of key technical assistance inputs.

The total budget for Technical Assistance and Operational Support is 6.4 million dollars per ProAg Amendment #3 of April 1986. The three technical assistance contracts are for the following amounts:

BUREC contract amount - US\$2,172,140

FIG. 2 TIME FRAME OF PROJECT INPUTS

	USAID/MJVD	BUREAU OF RECLAMATION	NATIONAL ACADEMY OF SCIENCES	ASSOCIATES IN RURAL DEVELOPMENT
1983	9/29: ProAg Effective 11/9: Amendment No. 1			
1984		2/15: Contract effective Nov.: Arrival team leader in Mog		
1985	6/30: Amendment No. 2	Apr: Arrival team in Mogadishu 7/17: Amendment No. 1	8/7: Contract Effective	9/13: Contract Effective 9/19: Amendment No. 1 Nov.: Arrival team in Mogadishu
1986	4/16: Amendment No. 3	Feb: Interim Rep. Mar: Ahn Eval'n. 10/23: Amendment No. 2	Feb.: WSh I Somalia Apr: WSh II, USA Sept: WSh II, Kenya	Apr: Phase I completed Start Phase II
1987		4/7: Draft final rep. 4/15: Departure team 7/31: PACD/Final Report	May: WSh IV, USA	
1988	9/30: PACD		July: WSh V 9/29: PACD	Phase II Completed Apr: Start Phase III 9/30: PACD

NAS contract amount - US\$375,000

ARD contract amount - US\$3,137,750 (now obligated \$1,137,750).

The use of three different teams to provide technical assistance seems cumbersome and is not necessarily the most effective way to implement a project. One team provided by one main contractor, if necessary supported by subcontractors, would have certainly facilitated project management and coordination tasks. It takes considerable management capabilities for the USAID project manager to coordinate the efforts of three contractors with such diverse responsibilities, mandates and interests.

In Chapters 3, 4 and 5 are detailed assessments as to how each of the three contractors has performed its assigned duties. This assessment comprises (1) an evaluation of the progress of the work called for (the extent to which specific studies and assessment activities have been performed), (2) an evaluation of the appropriateness and effectiveness of the methodologies used, and (3) suggestions that may lead to improved project implementation or corrective actions. In each case, the assessment is based on the scope of work of the contractors concerned and its amendments were applicable.

In Chapter 6 is a discussion of Institutional Development, which is mostly concerned with training inputs.

**3. RECONNAISSANCE WATER AND  
LAND RESOURCE STUDIES**

### 3.0 RECONNAISSANCE WATER AND LAND RESOURCE STUDIES

#### 3.1 Scope of Work for BUREC

The Bureau of Reclamation was "to conduct reconnaissance-grade water and land resource studies for the Juba Valley and the Lower Shebelli Valley." The BUREC's contract specifically calls for carrying out "(1) an irrigation suitability classification, (2) a study of water suitability for irrigation, (3) an investigation of drainage requirements, (4) a present land use survey, and (5) to report on the findings."

"Based on these findings, a scope of work will be prepared for feasibility investigations of priority basin projects."

A detailed three-page Scope of Work and detailed instructions on the format of the final report are contained in the BUREC's contract with USAID.

In Contract Amendment #2, BUREC's scope of work for soils investigations was somewhat revised.

#### 3.2 Progress of Work

The work done by BUREC has progressed to the point where a draft report and maps were submitted to USAID/Mogadishu on April 5, 1987. This was in line with contract Amendment #2 in which the deadline for submittal was extended from February 28 to April 15, 1987. The deadline for submittal had originally been February 28, 1986.

On April 7, 1987, the BUREC team presented its findings officially to MJVD, USAID and GTZ staff and to ARD project colleagues.

The Bureau of Reclamation will edit the draft report and maps in Denver, Colorado and has indicated that the final version will be delivered to USAID by July 31, 1987.

#### 3.3 Evaluation of BUREC's Work

This evaluation is made by comparing the work elements called for in BUREC's scope of work with the draft report and maps produced by BUREC. Five major work items listed in the BUREC scope of work (see 3.1 above) are discussed.

Our comments tend to emphasize the negative aspects, they highlight discrepancies or inconsistencies or question certain points so that corrections can be made in the final version of BUREC's Juba Report. With the imminent departure of the team from Somalia no further field work is possible nor necessary. Improvement can and should be made in the presentation of the final report and maps. In general, data should be presented in a more logical way allowing for a

better understanding of the land evaluation by prime users of the report - those persons who will develop a Master Plan for Juba Valley development.

### 3.3.1 Irrigation Suitability Land Classification

BUREC was to perform "an economic land classification survey adapted to local conditions of the Juba Valley and the Lower Shebelli River to establish the extent and degree of suitability of lands for sustained profitable crop production." The land classification was to be reconnaissance grade. Irrigation suitability was to be evaluated through economic studies, land drainability assessment and soil characterization. Results were to be compiled and presented as reports including general land classification maps.

The original scope of work further contains suggested guidelines for soil characterization in terms of density of observations, mapping scale, soil description, and sampling. In Amendment No. 2 of the PASA Agreement these guidelines were revised - the observation density was decreased, the scale of field maps for soil classification was set at 1:50,000, and the scale of the soil maps in the final report at 1:100,000. This change in observation density is discussed in detail in Ahn's midterm evaluation report and is wholly appropriate.

Chapters in the draft report that are directly relevant to our discussion are:

- 1.0 General Description
- 2.0 Lands
- 4.0 Land Classification
- 7.0 Agricultural Economics

The available maps are comprised of field maps (topographic sheets) at 1:30,000 on which various land units have been delineated and observation points marked. Also, a draft map at 1:100,000 was produced which shows the distribution of land which is now irrigated, four classes of land suitable for irrigation, and land not suitable for irrigation. This map is referred to as the Land Classification map.

In Section 1-5 a brief discussion is presented of previous investigations. Although 1.5 is part of the General Description of the Valley it lists and summarizes soils studies only. It would be better to list/discuss only those major studies on the Juba Valley that were used extensively by BUREC in producing its report.

The listing of soils reports incidentally fails to mention an important study financed by USAID and published by Geosurvey in 1984 under the title: "Landsat Interpretation Atlas of the Jubba Valley Region". This study provides a set of interpretation maps at 1:200,000 scale on drainage, geology, groundwater, soils and land use. All information is highly

relevant to BUREC's work.

All previous investigations will be listed by BUREC in a forthcoming List of References. It is suggested that ARD's "Bibliography for the JESS Project", 1986, or an updated version be consulted in preparing BUREC's final List of References.

In Chapter 2 the Lands of the Juba Valley are discussed. The Soils Section 2.2 basically restates findings of FAO/Lockwood (1968) and Hunting (1977). It describes some characteristics of some soils of the major geomorphological units mapped in the previous surveys: alluvial floodplain, mantled limestone plain, eluvial plain, marine plain and beach remnants.

The Results of chemical analyses performed by BUREC are given for one or two typical soil profiles in each geomorphological unit. It is not possible to judge how representative these soil profiles are. The presentation would be more clear if the location of the various geomorphological units was shown on a map, if each of these units were clearly defined and if an overview was given of the various soils occurring in each geomorphological unit, as originally mapped and named. Obviously, where BUREC soil chemical data contributes to existing knowledge it should be prominently presented. A precise description of the findings of others helps instill confidence in BUREC's additional findings.

The subsequent Drainage Section 2.3 discusses soils, in terms such as "residual upland soils" that are not defined and confuses the reader; new terminology should be explained.

Section 2.4 on Salinity and Sodidity provides practically no information and could presumably be discarded. The degree of salinity and sodicity of Juba Valley soils is of great importance in future agricultural development and requires a better analysis than given here. Little use seems to have been made of BUREC's own chemical analyses done in Afgoi and Denver.

In Chapter 4, BUREC presents the procedures and results of the land classification.

Field observations were recorded on soil data sheets and located on 1:30,000 topo sheets (enlargements from 1:100,000 maps). Key soil characteristics were recorded for each site, where necessary samples were taken for lab analyses. Then each site was assigned a land class symbol (1, 2, R1, R2 or 6) according to the land classification specifications given in Table IV 1 and 2, and the different land classes were delineated. This was done in the field. After data on soil reaction, salinity and sodicity was received from lab analysis, the mapping of the land classes was adjusted accordingly.

Less observations were made on non-arable lands and

on lands already under irrigation, the former for obvious reasons the latter for no obvious reason.

Discussions with the soil classifiers in the field and in the office confirm the conclusion that the lands were classified on the basis of the land characteristics listed in Table IV 1 and 2. In the field this meant a classification essentially based on surface and subsoil texture, even though considerably more soils information was recorded. It is important that BUREC clarify on what basis the delineation of land class units on the 1:30,000 field maps took place. This is particularly important since no systematic air photo interpretation was carried out of soils or lands.

In the formulation of the land classification specifications, the preliminary specifications of a 1984 inspection team were basically adopted. This resulted in the recognition of 5 land classes as follows:

Class 1 and 2 lands representing lands highly suitable and suitable respectively for diversified upland crops when irrigated. The primary distinction between Class 1 and 2 lands is the increased salinity and sodicity of Class 2 land.

Class R1 and R2 lands apparently representing lands highly suitable/suitable for paddy rice only (when irrigated).

Class 6, non-arable lands. This the only class of land that is clearly defined at the bottom of Table IV-2.

It is noted that another class of land appears in Table IV-3, i.e., Class 2 (E1), where E1 refers to Eluvium. No further information on this class, which is about three times the area of regular class 2 land, was found in the report.

In the draft report, no clear justification is given for the distinction of the two riceland classes. From Table IV-2, it appears that the difference with Class 1 and 2 lands is primarily one of soil drainage. The R lands are believed to have poor drainage and to be favorable for flooding and thus for rice production. However, it is also stated that under rainfed farming, "surface drainage is more than adequate providing for good crop production".

It appears that the R-rated lands generally are characterized by Vertisols. Vertisols can be moderately well drained or poorly drained depending on their position in the landscape and their origin. In standard soil surveys, soil color is used as an indicator of drainage conditions of Vertisols. In the Sudan, these soils and related soils have been under irrigation for up to 60 years (in the Gezira) and a wide variety of crops is grown but hardly ever rice.

It is recommended that BUREC review all R-rated land, to either clarify the current classification or to reconsider the suitability of these soils for rice only. If other crops can well be grown, then a separate R class is no longer

meaningful, and consideration should be given to reclassification of this land. It is noted that in the Agricultural Economics Chapter of the draft report, the crops and cropping patterns selected for the R lands are not limited to rice but include 50% of soybeans and sesame (Table VII-2).

On the basis of the 1:30,000 field maps, BUREC produced its irrigation suitability land classification map at 1:100,000 scale. This latter map shows the extent and distribution of the four land classes suitable for irrigation, one class unsuitable, plus all irrigated land. It is better to show irrigated land on a separate existing land use map. On the land suitability map these lands need to be ranked according to their suitability for irrigation.

BUREC also needs to produce a set of field maps at 1:50,000 as required per the PASA Agreement. It would be best to use the photomosaics at 1:50,000, or an overlay as the basis for this map. Even though it is a working document, the CTZ/AHT advisory team has expressed a keen interest in the use of these maps in future planning work.

With two key chapters, nr. 2 on Lands and nr.4 on Land Classification presented the way they are, it is not possible to understand or verify the relationships (which undoubtedly exist) between geomorphological units, soils, and the land suitability classes. With a more logical presentation the land classification itself may become more convincing.

Table IV-3 of BUREC's report summarizes the findings of the land classification based on an assessment of soil characteristics. The table lists 344,622 ha as arable land.

Arable land is defined as land which will provide sufficient income to warrant consideration for irrigation development (Chapter 9.1.8).

Irrigation suitability classification requires an assessment of the land in economic terms.

At this point it is important to note that BUREC's scope of work repeatedly stresses the fact, and rightly so, that the land classes are to be defined in terms of economic parameters. The economic aspects of irrigation development are critical in land evaluation and the Bureau of Reclamation system integrates economic considerations better than any other system. The BUREC system was developed to assess lands for irrigation in the western United States, and the system is increasingly applied elsewhere, usually with some modifications.

The essence of the BUREC report is to be the determination of irrigable land. Defining the irrigable area is the final step in the land classification process. According to BUREC's own definition the irrigable land is that portion of the

arable land subject to irrigation service under ultimate development (of the Juba Valley).

Irrigable land is determined by a consideration of any limitations imposed by water supply, cost of facilities and service to specify tracts, and of the land required for additional rights-of-way and other non-productive purposes (BUREC Chapter 9.10).

Chapter 7 - Agricultural Economics, provides an initial economic assessment through a detailed analysis of net farm income. It clearly describes basic assumptions, crop selection, yields, cropping patterns, and crop budgets to arrive at net farm income per hectare for each of five land classes as follows (see Table in 7.7)

Class 1	US\$ 600
2 Alluvium	435
2 Upland Plain	445
R-1	460
R-2	330

The economic assessment does not support the initial land classification based on physical land characteristics of Table IV-3. The economic assessment indicates that a suitability classification in three classes of land with three distinct payment capacities might be more appropriate than a separation of five classes. In other words, on the basis of its agricultural economic assessment, BUREC should consider regrouping the land classes in three basic categories (and change the maps accordingly):

Class 1  
Classes 2 + R1  
Class R2

Also, in Chapter 7 a further analysis is given of the negative effect which the present rainfed production (without project) has on the net irrigation benefits. In view of the different crops grown in the Upper and Lower Valley, the negative monetary effects differ as follows (Section 7.9.3):

Upper Valley rainfed production: SoShs 6,490/ha  
(US \$65)  
Lower Valley rainfed production: SoShs 16,610/ha  
(US \$165)

These are substantial amounts in relation to net farm income under irrigation. BUREC's land classification does not reflect the importance of present land use, i.e., dryland crop production.

At this point an evaluation of BUREC's draft report

becomes more complicated. This is because BUREC decided to select potential projects in the Juba Valley (reported in Chapter VIII). A total of 26 potential areas were selected covering 200,295 ha. The selection of this land is not specified, no selection criteria are given. The land is called "irrigable". In Chapter 8.2 is stated that these 200,295 ha do not include all the possible irrigable land. "Not included were the present irrigation projects with their proposed areas of expansion, proposed irrigation projects in the planning stage such as Homboy and the deshek areas, the Banana Farm areas or areas which have been in bananas", etc. Other arable areas were excluded from the potential projects for a number of reasons which are mentioned in 8.2. The problem is that the 200,295 ha therefore is not the total presumed irrigable area in the Juba Valley, there is more but no definite statement is made as to how much more.

The second problem arises with the economic analysis of each of the 26 potential projects (Table VIII-2). When taking into account the construction costs of irrigation facilities and the without project production, the rate of return of only 10 project areas is positive. These ten BUREC areas are listed in Table III-3, they total 34,104 ha of irrigable land.

The economic analysis clearly demonstrates that there is a wide range in construction costs. The costs are listed on a per hectare basis in Table VIII-1. The key difference is the construction cost of 6,100-11,600 US\$/ha in the Upper Valley compared to 4,900-6,900 US\$/ha in the Middle and Lower Valley. This difference is determined by a distinct difference in elevation of the lands above the river in the two parts of the valley, and by the distance between irrigable land and the river. In other words the higher construction costs in the Upper Valley seem to be caused by the physical position and accessibility of the land. This difference in construction cost is an important feature in the development of a Master Plan for the valley, and should be highlighted in BUREC's final report.

Position and accessibility of the land are topographic characteristics. It is suggested that BUREC recognize this in the final design of the land classification system for Juba. In other words include this topographic aspect with the land characteristics of Table IV-1, if feasible.

BUREC's engineering analysis (Chapter 6) includes layout, preliminary design and cost estimates of the 26 projects and demonstrates the engineering feasibility of the project areas. BUREC's economic analysis of the same 26 projects in Chapter 8 includes an economic ranking from negative rates of return to up to 6.5. It would be useful to see which of the 26 projects meet the economic justification requirements of BUREC. In other words how much of the land does BUREC consider irrigable.

### 3.3.2 Water suitability for irrigation

BUREC was to determine "the suitability of the anticipated water supply for irrigation by integrating the land and water factors."

Chapter III - Water, reports on the quantity and quality of water available with and without Baardheere Dam. Information on the sources and supply of water is mostly based on work previously presented by Electro consult. The water quality is rated satisfactory for irrigation use as a result of the mixing actions of the proposed Baardheere reservoir operation. BUREC based its water suitability analysis on existing data published by ICA (1961) and AHT (1984).

It is suggested that in the final report reference be made to ARD's test results on water quality of the Juba river. For agriculturally oriented readers, it is helpful if the quality of the irrigation water is also classified on the basis of salinity and sodicity hazard according to criteria of USDA Handbook 60 (Diagnosis and Improvement of Saline and Alkali Soils).

A thorough analysis of average annual salinity at various points on the Juba river and quality of return flows under future full irrigation development completes this well-written chapter.

### 3.3.3 Drainage requirements

BUREC was to determine "subsurface drainage requirements for the planned cropping and method of irrigation and design and estimated costs..."

Soil drainage, drainage requirements, drainage design and cost estimates are dealt with in Chapters II (2.3), V (5.3) and IV (6.2 and 6.3) respectively.

Chapter 2.3 gives a general discussion of drainage conditions of major land forms or soils. It is not clear which one of the two is meant. Tables II 17 and 18 provide the results of limited field tests. It is suggested that the data be grouped by land form or by soil or in any other logical order. No conclusions are presented here concerning the drainability of various land classes.

Chapter V supposedly addresses water and drainage requirements. The water requirements are very clearly and satisfactorily determined, but no conclusion is reached on the drainage requirements. The Engineering Chapter VI does give comprehensive information on surface drainage (also providing for initial subsurface drainage), drainage requirements and costs.

The analysis of drainage requirements could be made more clear by better defining what to present in Chapter V and what in Chapter VI.

### 3.3.4 Present land-use survey

BUREC was to determine "present land-use in the proposed system and within impacted areas associated with the project."

The terms of reference clearly describe the methods to be used - interpret air photos, measure land use, field verification, photo overlays, tabulation of results, and report. A present land use survey normally implies the production of a map showing the distribution of different land use categories.

The determination of current land use, and current agricultural, forestry, or livestock production in Juba Valley lands is important in irrigation suitability classification. In an economic sense, placing currently productive lands under irrigation results in lower net irrigation benefits.

Present land use is briefly discussed in two places of the BUREC draft final report - in Section 2.5 and 7.9.2. In Section 2.5 - Present Land Use - it is stated in one paragraph that three land uses were categorized in the process of mapping the soils. These were cultivated (122,500 ha), bush (197,000 ha) and irrigated land use (25,500 ha). This section also contains a paragraph on vegetative cover taken from a 22 year old Soviet study. It is suggested that where a brief description of the vegetation is required, the ecological data base accumulated by ARD project colleagues be used instead.

In Section 7.9.2 - Present Juba Valley Land Use - a summary is provided of the results of the two land use surveys made in the Juba Valley by AHT/GTZ teams. One study on "Deshek and small and medium-scale irrigated agriculture in the Juba Valley" was published in Sept. 1984. The other on "Rainfed Agriculture in the Juba Valley" was published in 1986. The maps contained in both reports are at 1:50,000 scale, using mosaic sheets of air photos as a map basis.

The two AHT studies provided an adequate basis for BUREC's subsequent economic analysis of without project condition.

BUREC staff still intends to produce a land use map at 1:100,000 for inclusion in the final report. At this point it seems superfluous to do so, as no new data will be made available.

It is recommended to drop land use mapping from the BUREC scope of work, with the understanding that land use data

required for irrigation suitability assessment and subsequent master planning are already available from and published by AHT.

#### **4. NAS SUPPORT PROGRAM**

#### 4.0 NAS SUPPORT PROGRAM

##### 4.1 Scope of Work for NAS

The immediate objective of NAS/NRC services to the project is "to provide the AID Mission, MJVD, ARD and other interested parties with an independent source of objective, authoritative advice on the scope, conduct, direction and outcome of the environmental/sociological study."

The Juba environmental and sociological assessment is discussed in Section 5 of this report. For a detailed description of the type and purpose of the NAS work one is referred to Attachment 2 of the NAS contract.

##### 4.2 Evaluation of NAS' Work

In order to carry out its program NAS/NRC appointed the Juba Valley Advisory Panel (JVAP). The members of this panel were selected for their experience in river basin development, particularly in analysis of social and environmental consequences of dam construction, impoundments of large bodies of water and development of irrigated agriculture. The JVAP operates under the guidelines of NRC and is responsible for the conclusions and recommendations of its reports; the JVAP is not responsible for supervision of or for the quality of ARD's work. BOSTID was assigned to carry out the day-to-day work of the cooperative agreement, including the organization of the conferences.

The JVAP consists of the following members:

Dr. Thayer Scudder, California Institute of  
Technology, Anthropology  
Dr. John M. Hunter, Michigan State University,  
Geography  
Dr. Peter Rogers, Harvard, Engineering  
Dr. Claudia J. Carr, University of California Santa  
Cruz, Environmental Studies  
Dr. Berket Habte Selassie, Howard, Law

Formerly, the following were JVAP members:

Dr. Lee Cassanelli, University of Pennsylvania,  
History (Somalia)  
Dr. Charles W. Howe, University of Colorado,  
Economics

It seems that the JVAP is weighted toward the social sciences. In view of the ARD scope of work, it is felt that the panel should include more physical and biological resource scientists. Also, the ARD field team could benefit from guidance in project management or as it is called in NAS' scope of work, "authoritative advice on conduct, direction and outcome" of project work. This would mean a JVAP panel more oriented to project implementation rather

than academic research.

The most evident JVAP activity was the organization of a series of Workshops held in various locations relevant to environmental and social impact problems of the Juba Valley. These workshops are carefully defined in the Cooperative Agreement and three workshops have been held to review and find solutions for technical problems foreseen or encountered in the course of the study.

The three Workshops held so far stressed different project related themes: Workshop I in Mogadishu and the Juba Valley: the project area and the need for the project; Workshop II in Burlington: the draft Phase II Work Plan and research priorities; and Workshop III in Nairobi and the Tana River area: the experience of a neighboring country in river development planning. A fourth Workshop is to be held in Coolfont, West Virginia in May to review, progress thus far. The conference is to include AID/Washington, AID/Mogadishu, ARD, the World Bank, GTZ/AHT and the MJVD, thus bringing together groups presently concerned with Juba river development planning.

Workshop reports were produced which provide a record of the content of the workshops themselves. These reports also provide comments on the current state of research and suggestions for future directions. The Workshop recommendations have often been quite good, but it is apparently difficult for panelists to find the time to monitor the project and see that their advice is followed. For example, JVAP recommendations include comments on the absence of an ARD Phase I report, a comment on the lack of information on sondeo results, and a concern on the lack of a clear allocation of effort among various activities in the Phase II Work Plan. As noted elsewhere in this report (Section 3.4), ARD nor JVAP have followed up in any of these problems although the comments were made a year ago.

As a means of providing access to a broader pool of information, JVAP could identify needs for short-term consultants to assist ARD, AID or MJVD with information and/or specialized expertise essential to project progress. So far, no short-term expertise was provided.

As an outgrowth of the activities of the Workshops, there was some correspondence between USAID, the ARD home office and field team and the JVAP. The files of USAID/Mogadishu and ARD were consulted, but not those of either BOSTID or ARD/Burlington. The files consulted seem incomplete. The most frequent letters on research matters found in the files were between members of the JVAP and ARD Burlington staff. There is no evidence of a consistent flow of information on project research matters from JVAP to USAID/Mogadishu, the two parties to the NAS support contract (with copies to ARD). The first priority of JVAP should be to keep USAID informed on the guidance and advice that needs to be given to ARD.

In summary, it is felt that NRC has followed the Cooperative Agreement as closely as practicable, and that the result was largely successful. The use of NRC as an advisory board is a good idea given the wide scope of subjects required to be developed in a limited time. NRC's inability to provide steady, ongoing research advice has somewhat limited its success. One of the most important limiting factors has been the eminence and experience of the JVAP itself. Each is a well-known member of the academic development community with extensive responsibilities at their universities, in research and with ongoing development projects, and therefore have little free time. Since JVAP board members are not paid, outside of Workshop per diem and occasional trips; work for the JVAP and advice to ARD seems to be given on ad hoc basis.

We emphasize the tentative nature of our findings concerning the NAS support effort. We have not been scheduled to visit the offices of NRC, nor do we have NRC's perspective on views presented in this report. Our assessment is entirely based on files in Mogadishu, which were probably incomplete.

## 5.0 JUBA ENVIRONMENTAL AND SOCIOLOGICAL ASSESSMENT

### 5.1 Scope of Work for ARD

ARD's work has the following objectives:

(1) Provide the GSDR with timely information to be used in formulating a socially and environmentally sound Master Plan for the Juba Valley, and to provide the GSDR with guidelines to be used in formulating future projects which are socially and environmentally sound.

(2) Identify and evaluate the interrelated sociological and environmental effects which will be caused by development of the river Valley; and to further describe procedures and development activities that will mitigate adverse impacts and enhance beneficial impacts.

(3) Provide the GSDR with a realistic plan for the monitoring of environmental, social, land use and agriculture parameters of the Juba River Valley so that national development decisions can be made based on sound, current data.

(4) Develop institutional strengths in the MJVD through classroom and on-the-job training.

The work is divided into Environmental Investigations and Sociological Studies, to be carried out in three phases:

Phase I: ARD shall review available data, literature, existing conditions, ongoing and proposed development activities in the Valley, and others outside the Valley which could have impact on the proposed developments in the Valley. At the end of this phase, ARD shall submit a report which will include ARD's findings and recommendations for activities to be undertaken in Phase II.

Phase II: ARD shall collect field data and preliminarily formulate certain anticipated impacts and related mitigating proposals. The work Plan for this phase must allow for interim reports timed to provide data and provisional recommendations that might have an impact on the master planning process. At the end of this phase, ARD shall submit a comprehensive and detailed report, including annexes, of data collected and an outline of the perceived potential environmental and social impacts of various development scenarios which will be assessed in detail in Phase III.

Phase III: ARD shall analyze and assess environmental and sociological impacts of proposed development projects and submit a final report that will recommend mitigating and enhancement measures and will contain a plan for continuing with environmental and socioeconomic monitoring to be carried out by MJVD after the contract is completed.

## 5.2 Evaluation of ARD's Work

At this time the ARD team is involved in its Phase II program. In 1986 ARD produced a report called "Phase I Review and the Phase II Work Plan for the JESS Project". This report does not fulfill ARD's obligation to produce a report of Phase I findings on existing data and conditions, ongoing and proposed development activities in the Valley and others outside the Valley which could have an impact on the proposed environments in the Valley. The absence of a comprehensive Phase I report has left ARD without a strong basis for organizing and integrating its work in Phase II.

The Phase II Work Plan does present a program of interrelated environmental and socioeconomic baseline studies to be carried out by the ARD field team. The Phase II Work Plan was finalized by July 31, 1986, based on the recommendations of NAS Workshop I.

USAID/Somalia has approved ARD's continuing to work according to the Phase II plan. It was recommended that the Work Plan be taken as a rolling plan, which would allow ARD to change it as new directions in research proved important. So far, ARD has not written a clear timetable for its research which outlines individual tasks and the deliverables expected from each. This has resulted in a certain vagueness of the team's idea of how and when work is to be accomplished and integrated in all cases.

At the same time, the GTZ/AHT Master Plan team is still working on their plan of operations and their data needs are still not fully clear. Despite that ARD work is already well into its second phase.

The data requirements, per early 1987, of the GTZ/AHT planning team are shown in Figure 3. Further clarification has to be made. Since ARD is contractually required to produce data required for the Master planning process, it is essential that ARD meet with the German Team as soon as possible to clarify the link between ARD products and GTZ/AHT requirements.

Few formal meetings have been held between ARD staff and members of the GTZ/AHT planning team. Informal meetings have been held, but there is no record of what was discussed. The USAID project manager met with GTZ/AHT in Essen to discuss data needed from the USAID project for the master plan process. ARD did not attend the meeting and its field staff was not aware of what was discussed, although the former ARD project manager was briefed on the Essen meeting.

FIG. 3: ARD PRODUCTS EXPECTED BY GTZ/AHT  
FOR INCLUSION IN JUBA VALLEY MASTER PLAN

<u>Achievement</u>	<u>Final Delivery Date</u>
* Data on water and sanitation available	March, 1987
* Weekly water quality data (including sediment load and salinity) available	April, 1987
* Disease risk with dam situation	July, 1987
* Land tenure situation clarified and assessed	September, 1987
* Forestry data available (Inventory and classification of forest areas)	October, 1987
* Data on livestock distribution available	January, 1988
* Daily salinity data available	April, 1988
* Demographic data available	April, 1988 (?)
* Preliminary data on various topics of environmental studies (Phase II and Phase III) available	September, 1988
* Expectations of target population assessed	September, 1988

(Source: Masterplan Plan of Operations, GTZ/AHT, Mogadishu, January 1987)

ARD is collecting a massive amount of data through surveys, aerial photo analysis, in-depth research, short specific studies and other techniques. There is no comprehensive work plan to show how each element of research will link up to attain output goals. By establishing its research requirements, at this time, ARD would be able to simplify and prioritize the research projects still to be carried out. Instead of collecting a huge data base and later selecting what is needed, it is easier to collect only what is needed from the start.

ARD has been working with a rolling plan. Such planning is necessary when a project has to produce data to support a project phase still under evolution. Rolling planning, however, requires adequate documentation of change and frequent production of detailed work plans so that changing activities can continue to be coordinated and staff understands what outputs are expected of them at all times. ARD needs to be more detailed in its planning.

It would therefore be better, to get out of this "rolling planning" mode. One half of the project period is over and clear end-of-Phase-II and end-of-Phase-III accomplishments can now be defined; a rolling plan is no longer required and a concrete plan can be instituted.

ARD reports that logistical difficulties were a major problem in the first phase of the project. There were shortages of essential supplies, such as fuel, and difficulties in getting timely release of local funds from the Commodity Import Program (CIPL). ARD encountered management problems in its own team as well. The project has recovered from each of these problems and is operating smoothly now.

The following sections 5.3 and 5.4 present a more specific discussion of the environmental and socio-economic studies carried out by ARD.

### 5.3 Environmental Work

The purpose of this study is to provide environmental data input to a Master Plan for the development of the Juba Valley. The Environmental Study is divided into three phases, each succeeding phase to be built upon information collected in the previous phase. The phases are discussed below.

#### 5.3.1 Phase I Activities

Phase I was designed to be a period of compilation of existing data and a review of literature about the Juba Valley.

Conceptually very important to the project, this phase was not used to its full potential. It appears that weaknesses were:

- o logistical problems
- o loss of time involved in language training
- o lack of technical cooperation with BUREC
- o lack of discussions with ecologists and others experienced in area

Logistical Problems. As with any new development project, a great deal of time was used in working out unforeseen logistical problems. This should have been better anticipated with more time allowed or an administrative assistant hired who had knowledge of the local situation and the ability to work with the system to handle most of the problems. The project has been able to overcome most of these and is now able to function well, but was adversely affected during Phase I.

Language training. Although learning the local language is a commendable goal and it would be desirable for all of the permanent staff to be conversant in it, the time allocated to conducting technical work in the first phase did not allow for a heavy time commitment in language training. In the end, the staff members did not learn enough of the language to benefit their work and a substantial amount of Phase I time was lost to more essential tasks.

Technical Cooperation with BUREC. Since the BUREC technical team had been in-country for approximately 6 months prior to the arrival of the ARD team, there should have been a real effort to work with BUREC to become familiar with the environmental factors that they were studying. This association should have continued throughout the overlapping periods of the two contracts. Instead of technical cooperation, it appears that each team went on its own way, cooperating on logistical matters but not sufficiently sharing technical information, for example, in the conduct of water quality studies. Cooperation early in Phase I would have given both teams information that might have strengthened the project.

Ecological discussions. The team ecologist noted that he did not have discussions with ecologists and other technical specialists who were familiar with Somalia early enough in the project. This contributed to the slow beginnings in Phase I but seems to have been rectified at this time.

The weakness of Phase I is reflected in the Phase I report which devotes approximately one page to all activities of the phase. The remainder of the report outlines a plan of work for Phase II without the benefit of a well-directed technical effort during Phase I. The activities of Phase I did result in the production of a fairly comprehensive bibliography.

### 5.3.2 Phase II Activities

The second phase is progressing well. A broad

approach is being used in some areas of study as a result of the lack of focus that might have been provided by Phase I. Some activities might have been eliminated or narrowed because of low importance in the Juba system or because the subject was already covered by other studies. Other activities might have been expanded as they would have been given greater importance as a result of Phase I studies. With the absence of Phase I report, it is very difficult to judge the appropriateness of the various studies planned for Phase II.

Subjects listed in the Work Plan for environmental studies in Phase II include:

-Environmental Baseline Studies

- o Geology/Seismic Hazards
- o Hydrology
- o Sedimentation
- o River Scour
- o Water Quality
- o Soils
- o Vegetation, Range and Forestry
- o Wildlife
- o Biological Conservation
- o Fisheries and Aquatic Resources
- o Health
- o Climate

-Specific Environmental Studies

- o Construction Site Environment and Workers
- o Health Implications of Dam Design and Reservoir Operation
- o Watershed Management
- o Reservoir Sedimentation and River Scour
- o Forestry
- o Ethnobotany
- o Disease Vectors
- o Reservoir Ecology
- o Estuarine Ecology
- o Livestock and Wildlife Migration
- o Fishery Development

The Evaluation Team ecologist reviewed the interim reports and interviewed consultants and team members available during the team's stay in Somalia. The following is an evaluation of the current status of the studies called for under Phase II.

Phase II Studies were not planned for Geology/Seismic Hazards as it was established that the project could not make any substantial contribution beyond previous work documented in the literature.

Very little in the way of field observations are deemed necessary for climatological data due to the short time period covered by the project. Any such data collection would be of very limited value.

Studies that are completed or are nearing completion include: hydrology, water quality, construction site environment and workers, health implications of dam design and reservoir operation, disease vectors, reservoir ecology, and estuarine ecology. No serious problems were noted with these studies.

The baseline and special studies dealing with sedimentation and river scour have been initiated but require further data collection on sediment load and related scour characteristics of water relieved of sediment load as would be the case downstream from the dam. It is recommended that regular integrated sampling be conducted as planned.

Vegetation, range and forestry, wildlife, biological conservaton, fisheries and aquatic resources, and ethnobotany studies are in progress and appear to be progressing on schedule with no major problems.

Health studies related to waterborne vectors associated with irrigation developments have been conducted up to a point but further studies including an epidemiological survey are necessary to identify relationships between diseases and sources.

Watershed management studies are of very limited value since the vast majority of the catchment is outside of the country and there is no possibility of controls or management. A predictive model based upon satellite data is proposed to correlate remotely sensed identification of a flush of vegetation growth in the catchment basin in Ethiopia with river flow. This study has not yet been started and the evaluation team questions the value of even the limited study planned.

A special interdisciplinary activity using aerial survey methods made substantial contributions to the Phase II effort. A set of 1:10,000 scale B&W photographs taken specifically for the project is also a valuable aid in data collection and interpretation. The team is commended for making these valuable contributions to the data base.

When the Evaluation Team made its field visit there were no ARD team members available to illustrate field techniques so they had to rely upon verbal description and written reports. In as much as it was possible to judge without field observations the ARD team appears to be using appropriate methods in data collection.

### 5.3.3 Phase III Activities

Data collected in Phase II are to be analyzed in this

phase. This activity should be started as soon as data can be compiled and not wait until the last six months of the project; it should be immediately synthesized into usable products. Also, more attention should be given to the development of maps, tables and analyses so that current information is provided to planners in MJVD. The diverse efforts of the ARD team will then also be focussed into a coherent, final report, containing "an action plan for all approaches for mitigation".

#### 5.4 Sociological Work

The socio-economic studies have as their objectives the generation of a data base that can assist the GSDR in the formulation of strategies and plans for basin development, which relate to the circumstances, and are responsive to the needs of the populations who live in, or periodically make use of, the Valley's land and water resources. They will provide information concerning social institutions and patterns of agricultural production and resource management that currently exist in the Valley.

ARD is to address the following topics, which relate to the social issues likely to be of concern in the development of Juba Valley:

- Describe existing water and land-use practices, productive systems, and the socio-political organization of the different occupational groups who make use of Valley resources.
- Assess direct, indirect, and short-and/or long-term impacts of specified activities proposed for the basin, and of differential effects on different categories of people. Special attention shall be paid to the effects of relocation and resettlement on the affected population.
- Conduct a critical analysis and propose steps which might be taken to increase socioeconomic benefits to affected groups, and increase participation of local institutions in measures to minimize or mitigate clearly detrimental sociological effects.
- Provide benchmark information essential as a basis for accurate and meaningful measurement of the socioeconomic benefits of Valley development.
- In addition, recommend procedures for maximum participation of local populations in the planning, monitoring and evaluation of development activities that will effect them.

Populations to be studied include, but are not limited to: persons to be displaced; Valley residents along the river; people based elsewhere (e.g., agropastoralists and pastoralists), who enter the Valley periodically to graze or use water resources; people who enter the Valley for wage labor on agricultural schemes; and the labor pool for dam construction or new irrigation schemes.

The sociological assessment like the environmental studies has been arranged in three phases.

#### 5.4.1 Phase I Activities

The design for the methodology of data collection in Phase II was to have been based on an overview of the situation in the Valley which was to come out of a literature search and a review of existing conditions to be carried out under Phase I. The review of the Valley was carried out by means of a "sondeo", which is a sort of systematic rapid reconnaissance, meant to yield qualitative indicators for isolating key issues prior to the construction of the baseline questionnaires. The sondeo was to establish the distinctive features of social structure, livestock, land use patterns, health and land tenure issues, as well as generate a set of hypotheses to be tested through the quantitative data gathering of Phase II.

The literature search was carried out and a simple bibliography was produced by ARD.

The sondeo was done, but could not be completed until the project was already into the second phase, and therefore, it had no part in the Phase II research design. Moreover, no report on the sondeo or its results has ever been produced, other than a collection of field notes, even though it represents several months of ARD's research time, and would provide an overview of conditions in the Valley at the time research was carried out.

ARD was required to submit a comprehensive report of general findings in the first phase and based on these findings recommend activities for the second phase research. It was important that an initial synthesis of the field situation be produced, to help focus the direction of work for subsequent phases. The synthesis was never done.

Although it is not possible to turn back the clock, AID should have insisted that ARD carry out the synthesis, either through a Phase I report or a report of the results of the Sondeo. AID should now insist on on-going and timely reports indicating the present state of data collection in an integrated fashion. Synthesis and analysis of data collected must be an ongoing part of ARD's work.

#### 5.4.2 Phase II Activities

The socioeconomic research in Phase II consists of three parts:

- (a) Socio-economic Baseline Study (SEBS)
- (b) In-depth Studies
- (c) Special Socioeconomic Studies

(a) Socio-Economic Baseline Survey - This survey is meant to generate a large data base for the Juba Valley and to collect demographic data called for in the contract and requested by GTZ. The sampling design of the SEBS and much of the questionnaire closely resembles that used for the Socio-Economic Baseline Study of the Bay Region done for USAID by the University of Wyoming in 1984. The questionnaire has been redesigned by ARD to improve ease of data entry.

The SEBS appears to be running behind the schedule in the Work Plan. It was begun in January 1987, after three pretests in September, November and December, 1986. Data collection is scheduled to be completed by October, 1987, but data processing is expected to run later than this, leaving only approximately four months for final analysis and reporting of Phase II research results. GTZ/AHT has requested data delivery by April 1988.

The SEBS survey sample now consists of one thousand households (125 households in each of eight districts in the Juba) divided into 500 settled village households, 250 nomadic households and 250 households in the district centers. The ARD team estimates that this one thousand households represent a one percent sample of the population of the Juba Valley. This one percent sample is believed to be representative.

There is, however, some question concerning the statistical validity of some of the sample. Nomadic groups, for example, with their structured absences cannot be adequately studied using point specific survey techniques. Looking at these populations through this kind of survey is a little like counting one's laundry while it is still being run in the machine. Since 25% of the SEBS sample is nomadic or semi-nomadic, one questions the statistical validity of these results.

We question whether large baseline surveys in general, given their difficulties and their high costs, are the best way to collect data to help make planning decisions for development. The large sample of the SEBS makes it a difficult research exercise, especially considering the rigors of operating in the Somali bush. These surveys can be replaced through aerial surveys and smaller samples depending on the level of accuracy required. Since ARD and the GTZ/AHT have not yet agreed on the research objectives, it is difficult for the Evaluation Team to suggest alternative research methodologies.

Priorities for research need to be set before work progresses much further. Once a massive survey has begun, it is difficult to call it off, but it can be trimmed (using smaller samples) or modified (by changing and/or shortening the questionnaire) once these research objectives have been agreed upon.

It is difficult to assess the quality of data being produced by the questionnaire as ARD field operations could not be observed. The SEBS, a major portion of ARD's socioeconomic research effort, has been evaluated only in terms of reports and Survey Team accounts. Looking at the questionnaire itself, it was noted that it has eight separate elements, with over 290 questions. Questionnaires are edited in the field for gross entry errors and enumerators are sent back to households when such errors are found. Although not all of the questions are asked in each household, the interview is quite formidable, with interviews reported to be taking from forty-five minutes to over three hours for each household. This does seem an excessive amount of time to ask of subsistence farmers and pastoralists.

The questionnaire's length is excessive. This is attributable, in part, to what is known as "Christmas-treeing", where researchers are pressured to tack additional questions onto a survey for reasons other than those for which the survey has been planned. While AID has added questions on health, for example, ARD has added questions of its own to collect data for consultants expected to take part in later phases of research, so some of the problem is self-created. The real problem, however, is the lack of clear research objectives already noted above.

In addition to the SEBS, the ARD Team organizes (1) village meetings, structured as open-ended discussions, addressing village concerns such as: access to water, grazing rights, land tenure, community organization and the adjudication of disputes, (2) key informant interviews, (3) women's studies, (4) marketing study, and (5) ongoing more traditional forms of anthropological observation in villages and nomad camps. The ARD Team feels that this allows them to get at the same information in several different ways, providing a means of cross-checking and further guaranteeing the accuracy of their results. One wonders, however, if this is not a sort of research "over-kill".

This again points to the need for setting research objectives and trimming what is not needed to reach planning goals.

While highly accurate and all-inclusive research is desirable it should be remembered that development-oriented research should be pragmatic. The degree of confidence required need only match the level of planning decisions which have to be

made. ARD researchers must therefore spend more time with the GTZ/AHT planners to determine the degree of accuracy necessary for their tasks at hand.

In our opinion the socioeconomic team is underestimating the amount of time it will take to analyze data and prepare reports in the form called for in the scope of work. ARD has yet to compile data, analyze it and translate it into the anticipated impacts of Juba Valley Development. Some synthesis will have to take place before the beginning of Phase III.

(b) In-depth Studies - Once the SEBS has been completed, a six month field study period will commence. According to the Work Plan, this research is to begin in September, 1987 and extend through April, 1988.

Based on the findings of the SEBS, the research team will select 5-10 representative villages, which characterize various resource user-producer groups (RUPs). The characterization of each selected RUP will come out of the SEBS analysis. The purpose of this exercise is to do time-series studies and further expand on the data from the SEBS, particularly in increasing the data on production and land use systems, social organization of production and local institutions and their organization.

These in-depth studies also ought to provide a forum for carrying out the contractual requirement for consultations with the study populations. According to the ARD Contract, "The preliminary conclusions of analysis shall be taken by the Contractor to a number of study sites, and discussed with the populations under study. This will allow feedback on the correctness and adequacy of the data, and ensure initial participation of the affected populations in the design and management of their own development".

(c) Special Socioeconomic Studies - These studies include several smaller-scale studies, to be carried out by long- and short-term ARD staff, as well as subcontractors, which address the research requirements of the ARD contract. Only preliminary work for the land tenure and cultural heritage surveys have actually been carried out so far, so there is no basis for assessment and no way to predict the quality of the work to come. Several of the researchers contracted, however, are known to consistently produce good quality, professional work.

#### 5.4.3 Phase III Activities

As discussed in 5.3.3, Phase III is to emerge from the results of the studies in Phase II.

The analysis and synthesis called for in the contract has yet to begin. Both the NAS oversight committee and the Evaluation Team feel that this should be an ongoing part of ARD work and should not be left until too late in the project. The effect of the lack of a synthesis of the Phase I findings has already been discussed. ARD must now begin to assess and display (through maps, interim analyses and other forms) the data collected so far. There is a danger that a rolling plan, such as the ARD's Work Plan, allows more difficult tasks to be put off.

## 6.0 INSTITUTIONAL DEVELOPMENT

### 6.1 Training Requirements

As with most USAID projects, institutional development including training of host government personnel is an important part of this Project.

In fact, the largest component of institutional development is long-term and short-term out-of-country training. The other component is in-country participant training/development seminars.

Advanced degrees were to be offered in management of ecosystems and natural resources and soil science. Short-term training was to be directed toward water resources, water management, soils lab management, resource management planning and study tours. A series of in-country participant training/development seminars were to be organized to "enhance the capacity of the Somali counterparts and other Somali staff in working with the technical assistance teams, and reasonably sustaining the economic development efforts of the MJVD." The requirements for training are only defined in qualitative terms and limited by available funds. No specific number of students or years of study were identified.

Training requirements in both the contract with ARD and the PASA with BUREC are very limited. The ARD contract specifies "Team members .... will be required to train MJVD staff in some aspects of environmental/social data gathering and monitoring" and ... "help to improve the skills of MJVD counterparts and technical staff through both classroom and on-the-job training." It further states that "All work is to be performed in cooperation with assigned Somali counterpart staff...."

The PASA with BUREC specifies no training. It is stated that "All participant training required in conjunction with this agreement will be implemented through Mission generated and funded PIO/Ps...."

### 6.2 Counterparts

Under the original ProAg, the MJVD was to provide the following experts to support the project activities:

- Civil Engineer
- Water Resources Engineer
- Agronomist
- Soil Scientist
- Livestock Specialist
- Economist

The ProAg was later amended to add a sociologist to the list of support staff provided by MJVD.

Under the ARD contract, no counterpart staff was assigned. The BUREC team was promised by the PASA the services of three qualified laboratory technicians, plus laborers, cooks, drivers, etc. but counterparts other than lab technicians were not specified. This lack of specified counterpart assignments to the individual project components left this task in the hands of the USAID project manager.

Actual assignment of counterparts by MJVD to the project were reported to be as follows:

BUREC Somali Counterpart Staff

<u>Name</u>	<u>Profession</u>
Abdirahman Islaw Mahadalle	Agronomist
Hassan Aden Mohamed	Agronomist
Rukiyo Ali Kulmiye	Agronomist
Duaale Hassan	P.S. Agronomist
Gulaid Abdulkadir Artan	Civil Engineer
Ali Ahmed Gulaid	Civil Engineer
Abdi Jama Samater	Accountant & Manageme
Abdirahman Mohamed Mudey	Economist
Nasir Abman	P.S. Geologist
Cumer Mohamed	Lab Assistant
Kaha Mohamed	Soil Scientist

ARD Somali Counterpart Staff

<u>Name</u>	<u>Profession</u>
Abdulkadir Haji Ibrahim	Agronomist
Omar Aliwan Farah	Data technician
Abdulkarim Sheikh Abdi	
Roda Mohamed Abdullahi	Secretary
Abdisalam Mohamed Ali	

In addition, ARD hired some 35 Somali support staff in order to do their contracted work.

It appears from this that most counterparts were assigned to the BUREC team which had no training responsibility. ARD was to do all of their work in cooperation with assigned Somali counterparts and yet they had almost no counterparts assigned. In order to carry out the other terms of their contract, the environmental/sociological studies, ARD had to hire large numbers of non MJVD Somali staff. The on-the-job training received by this non-counterpart staff will not develop the institutional capabilities of the MJVD.

6.3 Training

6.3.1 In-country training

To fulfill the requirements of their contract for classroom training, ARD has conducted seminars for MJVD

personnel. There was an attempt early in the contract to hold seminars on a weekly basis. Because of a reported lack of interest by the audience to whom these seminars were addressed, they were later held only on special occasions such as reports from short-term consultants upon completion of their studies. This latter approach seems to be functioning well.

### 6.3.2 Out-of-country

Training outside of Somalia is not clearly defined in the ProAg and related documents therefore it is difficult to evaluate the project in this area. Only one candidate for degree training has completed his course to date and was killed after an automobile accident immediately after his return to Somalia. One other person completed a two-month short course. Four candidates are currently enrolled in graduate programs and all other candidates are just proposed for training programs.

Following is a listing of candidates in training and proposed for training under the project:

#### A. Completed Training

<u>Student</u>	<u>Institution</u>	<u>Type of Training</u>	<u>Projected End Date</u>
Aways H. Yusuf	Harvard	2 mo. Course, Proj. Investment Appraisal and Management	9/86

<u>Student</u>	<u>Institution</u>	<u>Type of Training</u>	<u>Projected End Date</u>
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#### B. Terminated Without Completion

A. Islaw Mahadalle	N.M. State	MS, Soil Science Was not able to sustain degree program	1-1/2 yr.
Nasir A. Abdi	Utah State	4 mo. Course Drainage Eng'g	Left course Whereabouts unknown
A. Sheikh Muktar	U. of Penna	MS, Regional Planning	Deceased

#### C. Currently Enrolled in Training

Mohamed Ali Mohamed		Texas A&M Integrated Pest Management	PhD, 6/88
Du'aale H. Abdi	Utah State	MS, Irrigated Farming Systems	7/87

Mohamed Nur Qabile	Arizona	MS, Natural Resource Mgmt. funded AMDP	6/87
Ali A. Warsame	Int'l Univ. in Nairobi	MA, Organizational Management	2/88
<u>Student</u>	<u>Institution</u>	<u>Type of Training</u>	<u>Projected End Date</u>

D. Candidates for Proposed Training

Ali M. Gulaid	Cal. State Davis	MS, Drainage Eng'g	8/89
Roquia A. Kulmiye	BUREC	6 mo Lab Mgmt Trg.	6/88
Mohamed Hassan Aden	Pending TOEFL	MS, Environmental Planning	6/89
Abdulkadir H. Ibrahim	Pending TOEFL	MS, Environmental Planning	6/89
Abdi A. Moallim	Study Tour	2 mo. Water Mgmt.	7/87
Yassin Nur Osman	Cornell	MS, Reg. Planning with outside funding supplement	6/89
Ahmed M. Ali	U. of Wyoming	BA, Applied Social Research	6/89
A. Mohamed Mudey	Unknown	1 yr. directed work Ag Economics	8/88
Rhoda M. Abdullahi	Nairobi (?)	Data Processing	
Qamar A. Ali	Pending Eng. Training	Data Processing	
Omar A. Farah	" "	" Data Processing	
<u>Student</u>	<u>Institution</u>	<u>Type of Training</u>	<u>Projected End Date</u>
Hussein A. Hussein	" "	" Accounting	
Faduma K. Hanaf	" "	" Management	
Mana B. Nur	" "	" Management	
Ilhan A. Kahin	" "	" Management	

28 candidates for English Training

11/87

It is unclear whether training of all the proposed candidates is warranted or if more should be trained. It is left to the USAID project manager to make these decisions by default rather than through any documented mandate.

At least one of those proposed for training is a non-MJVD employee of ARD. How his training will fit into institutional strengthening of MJVD is unclear. There is no documentation assuring that he will be given a position within MJVD upon completion of training nor of any obligation on his part for governmental service upon his return.

A written training strategy for the project would be worthwhile so that resources will be used in a rational and organized manner.

## 7.0 RECOMMENDATIONS

As a result of the evaluation effort, recommendations for improvement were made with the intent of enhancing the value and progress of the project. Following are the major recommendations.

### 7.1 General recommendations

o Lower Shebelli Studies. Because of the proximity of the Juba Valley and the apparent irrigable soils of the Lower Shebelli system, it is recommended that this area should not be eliminated from the assessment. Some reasonable boundary must be selected to limit studies in the Lower Shebelli. It is recommended that only that part be included which is required for planning the Juba Valley developments. There should not be a lot of extra effort put into this but at a minimum information should be extrapolated from the studies along the Juba and these should be checked with overflights and/or aerial photography. Some limited ground data collection may be warranted. The Lower Shebelli should be included in maps produced from the studies.

o Training - USAID should develop an out-of-country project training program that 1) identifies the type of trained personnel needed by MJVD to strengthen its planning capabilities, and 2) defines an approach to getting them trained to meet that objective.

Since ARD has contractual obligations to train counterparts, USAID should encourage in-country training by facilitating the transfer of BUREC counterparts to ARD.

### 7.2 Recommendations Pertaining to the Bureau of Reclamation

The recommendations concerning BUREC's work are made on the basis of the Draft Final Report. It is recommended that BUREC in its Final Report:

- 1) Substantiate the basis for its physical land classification. BUREC should show the relationship between geomorphological units/soils as recognized in previous studies and BUREC's land suitability classes.
- 2) Improve the description of salinity and sodicity conditions of major soils recognized in the various land classes.
- 3) Clarify why R-rated land was separated from Class 1 and 2 lands and clarify what lands are included in Class 2 (E1).

- 4) Reconcile its findings on the payment capacity (net farm income per ha) of the land classes (which suggest division in three classes) with the classification on the basis of land characteristics alone (which recognizes four or sometimes five classes).
- 5) Explain why 26 potential project areas were selected, on what basis the selection was made, and why considerable economic and engineering investigations were allotted to studying these project areas.
- 6) Determine, report on, and map the number of hectares of land in the Juba Valley that is irrigable in specific classes (suitable for sustained profitable crop production) under specific economic assumptions.
- 7) Cancel further efforts to produce reconnaissance grade land use maps, since land use maps at 1:50,000 have already been produced by GTZ/AHT.

7.3 Recommendations Pertaining to National Academy of Sciences

o Juba Valley Advisory Panel. The current composition of the panel is biased toward the social sciences. It is proposed that physical and biological resource scientists be included on the panel to expand its expertise. It is also recommended that the panel become more active in keeping abreast of the project and in monitoring implementation of its advice. Also, since the ARD field team would benefit from guidance in project management, the JVAP panel should include members more oriented to project implementation and less to academic research.

o Technical advice. Correspondence of an advisory nature should be shared by all principle parties -- NAS, JVAP, USAID, and ARD.

7.4 Recommendations Pertaining to Associates in Rural Development, Inc.

- o Deliverables
- o Timetable
- o Cooperation and coordination
- o Record keeping
- o Fisheries Development
- o Soils Study
- o Forestry
- o Aquatic Wildlife
- o Epidemiological Study
- o Sediment Sampling

- o Socioeconomic Survey Management
- o Data analysis
- o Small Scale Irrigation Economics
- o Bibliography

Deliverables. ARD should immediately initiate a formal meeting with GTZ/AHT to establish the expectations for the final products of its work. It is critical that the ARD team establish what these deliverables will be and what will be produced as part of the final report. Inasmuch as it is practical and in view of the requirements for master planning, subjects treated by the project should be displayed as map themes. If possible, these maps should be produced at 1:50,000 scale to correspond to the scale of the mosaics and maps already developed by AHT/GTZ for MJVD.

Timetable/Flow Chart. A project timetable should be organized as a supplement to the plan of work. This should establish target dates for important elements of work and show how each will contribute to the deliverables. An associated flow chart will show functional relationship among the various tasks. This will help ensure timely completion of the project and will help avoid data gaps.

Cooperation and Coordination. A formal liaison for the regular passing of information and the coordination of activities needs to be formed between the ARD Team and the GTZ/AHT Master Planning Team. Minutes of these meetings need to be kept.

Communications between ARD Burlington, ARD Mogadishu and NAS need to be improved.

Similarly, relationships need to be formalized between ARD and other teams doing research in the Juba Valley (e.g., SARSA and LTC).

Record keeping. Better records and memoranda need to be kept concerning crucial decisions affecting project progress. Particularly decisions involving choices of research alternatives or agreements to change the plan of work need to be recorded.

Fishery Development. It appears that the development of a viable fishery in the proposed reservoir could be of great economic importance to the development of the Juba Valley. With preliminary estimates of over 1,000 kg. of fish biomass per hectare in river samples, there are possibilities that a reservoir fishery could contribute substantially to the economic viability of the region.

It is recommended that the fisheries consultant be given additional time to search the literature for successful African reservoir fishery development and that he be directed to select one or two sites to visit that could be comparable to the

Baardheere reservoir. He should use this additional information to identify applicable fishery management techniques and to project the economic importance of fisheries to the development of the Juba Valley.

Soils. Although soils studies downstream from the dam were conducted by BUREC as part of their contract, no studies were conducted in and around the proposed reservoir. Since displacement of small farmers will occur from the area to be inundated by the reservoir, a soils study should be conducted to identify arable lands in that area to assess loss of arable land as well as to identify areas above the proposed high water line of the reservoir which can be cultivated. This should, however, only be done to a reconnaissance level suitable for planning. The ARD team should examine other studies such as the World Bank "Resettlement and Compensation Plan for Inundated Reservoir Areas" for possible areas of coordination and cooperation.

Forestry. Since most of the forestry-related studies are being conducted by the team ecologist, the additional two months of time allocated for a forester is more than is necessary. One forestry consultant with recent East African field experience working with fuelwood problems for a period of four or five weeks should be adequate. He should assist the ecologist in collection and analysis of data relevant to harvesting fuelwood from the reservoir area and on production and management of native forests and proposed forest/agroforestry production to meet the development needs of the valley. The ecologist should plan the work and direct the efforts of the forester for the most efficient use of his time.

Aquatic Wildlife. Since the dam and proposed irrigation developments will likely increase the distribution of crocodiles and hippos, methods of management (such as harvesting of surplus crocodiles for their hides) should be investigated. ARD should establish what the procedures for international marketing of crocodile skins are and inform MJVD.

Epidemiological Survey. One of the major possible impacts of the proposed reservoir and irrigation development is the spread of vector transmitted diseases. It is recommended that ARD cooperate with the Ministry of Health to conduct an epidemiological survey to facilitate an understanding of the extent and spread of these diseases in the Juba Valley.

Sediment Sampling. Because so much depends upon a knowledge of sediment characteristics of the river, MJVD hydrology technicians should be trained and equipped as needed (the Ministry may already have the required integrated sampling device) to carry out regular and routine sampling and to conduct laboratory analysis of the samples. This should become a permanent monitoring of river sediments.

Socioeconomic Survey Management. The timetable of

the socioeconomic baseline survey needs to be carefully watched. Research priorities need to be set based on decisions made with GTZ/AHT.

The ARD team has contemplated points of early closure or modifications of data collection and/or sample adjustments to permit the baseline survey to be speeded up with little loss to the analysis. It is recommended that eventual modifications be formalized.

Data Analysis. Integration and synthesis of data needs to be carried out as data becomes available and cannot be left for the Phase III period as currently scheduled. Already in Phase II data synthesis should be reported in interim reports and, if appropriate, lead to provisional recommendations for master planning.

Small Scale Irrigation Economics. Since so much of the irrigation in the Juba Valley is currently being done by small holders, there should be some treatment of this subject. The ARD and USAID team should confer with GTZ/AHT advisors to MJVD in view of the previous GTZ study on the subject to determine what and how much updating is needed. Then if found to be necessary, a broad treatment, suitable for the purposes of the Master Plan should be conducted.

Bibliography. The "Bibliography for the JESS project" produced by ARD should be revised to include annotations and should be divided by subject to improve its usefulness. Its title should be changed to alert potential users that the bibliography concerns the Juba Valley in Somalia.

## ABBREVIATIONS

AHT	Agrar und Hydrotechnik GmbH.
ARD	Associates in Rural Development, Inc.
BOSTID	Board on Science and Technology for International Development (NRC)
BUREC	Bureau of Reclamation (United States Department of the Interior)
GTZ	German Technical Assistance Agency
IQC	Indefinite Quantity Contract
JVAP	Juba Valley Advisory Panel
MJVD	Ministry of Juba Valley Development
NAS	National Academy of Sciences
NRC	National Research Council
PACD	Project Agreement Completion Date
PASA	Participating Agency Service Agreement
PID	Project Identification Document
PP	Project Paper
ProAg	Project Agreement
SEBS	Socio-Economic Baseline Survey

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ANNEX 1. LIST OF PERSONS CONTACTED

Ministry of Juba Valley Development

Abdi Ali, Permanent Secretary  
Mohammed Hassan Aden, Minister's Special Assistant  
Aweys Haji Yussef, Director of Planning  
BUREC and ARD Counterpart Staff (see Section 6.2)

USAID/Somalia

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Deborah Prindle, USAID/Washington  
Dan Vincent, Chief Engineer

Bureau of Reclamation

Earll Dudley, Teamleader  
Dick Pond, Agricultural economist  
Willie Forest, Soils classifier  
Dewayne McAndrew, Soils classifier  
Richard H. Ives, Chief, TVA Branch II, Washington, D.C.

National Academy of Sciences

none

Associates in Rural Development, Inc.

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Jim Merryman, Anthropologist  
Nancy Merryman, Administrator  
Katherine Craven, Socio-economist  
Ian Deshmukh, Ecologist  
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Eric Rump, Photo-interpretation consultant  
William Jobin (BNA), water quality consultant  
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GTZ/AHT

Heiko Brunken, Team leader  
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Others

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John Bruce, Director, Land Tenure Center, University of Wisconsin,  
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Michael Cullen, Agricultural Economist, SARSA Rural/Urban Migration  
Project  
Peter Little, Anthropologist, SARSA Rural/Urban Migration Project  
David Winfield, Price Waterhouse Associates