

PD-AAP-721
15/08/84

AURORA
ASSOCIATES INC.

1140 Connecticut Avenue, NW, Suite 1200, Washington, DC 20036
(202) 463-0950 Telex: 440109 AURA UI

The Republic of Guinea-Bissau

Ministry of Rural Development

Department of Experimentation and Agricultural Production

GUINEA-BISSAU RICE PRODUCTION PROJECT
(USAID)
PROJECT NUMBER 657-0009
CONTRACT NO. AID/AFR-0009-C-00-2035-00

TOPOGRAPHIC REPORT

Mohamed B. Barry*

*Mr. Barry's services were provided by
Chemonics International, Washington, D.C.
under sub-contract with Aurora Associates.

August 20, 1984

FINAL REPORT ON THE TOPOGRAPHIC SURVEYS

As part of the American technical assistance effort in the development of rice culture in the Republic of Guinea-Bissau, I arrived in Bissau on January 7, 1983 for a work period of twenty months. During that time I worked closely with the Department of Experimentation and Agricultural Production (DEPA) as a topographer.

The objective of my mission as outlined in the project proposal and re-iterated in my contract with Chemonics can be summarized as follows:

- 1) To train a survey team capable of carrying out DEPA's topographic surveying.
- 2) To assist DEPA in locating and conducting topographic surveys of new perimeters.
- 3) To assist DEPA's staff in performing photographic-interpretations of aerial surveys in DEPA's survey area.
- 4) To perform the tasks of the Interim Head of Mission by coordinating team activities, maintaining communication with management staff of Aurora, USAID and DEPA on managing Aurora's and Chemonics' finances and materials in Guinea-Bissau.

On arrival, I found that a technician, two assistants and several part-time manual laborers made up DEPA's topographic bureau. None of the members of this bureau had received any professional training. The technician was also in charge of the irrigation surveys at DEPA's Contuboel Center.

The Contuboel Center was in possession of Wild instruments of which two were T2 theodolites, a T1 theodolite, a Distomat odometer, two levels, some subtense bars, a few range poles and some drawing instruments. A collection of 500 aerial photographs dating from 1979 which covered the Bafata region were also kept at the Center.

Work Accomplished

My first week in Contuboel was wholly taken up with taking stock of DEPA's resources in personnel and in equipment. It was by this means that, by January 15th, the organization of the topographical bureau and a list of its needs in staff and equipment was submitted to the relevant authorities in DEPA and USAID.

Equipment fallen into disrepair was scheduled for repair, and orders submitted for lacking equipment.

A few small scale topographic surveys performed by the Contuboel Center team enabled me to assess my colleagues' level of technical skill. Accordingly, the training program which followed was oriented towards the following objectives:

At the Office

- o Geometry and arithmetic exercises
- o Staking-out and measuring distances with or without obstacles
- o Map-reading (orientation and scale)
- o The use of topographic instruments (theodolite and subtense bar)
- o Survey by successive stations, precise mapping
- o The calculation of earth volume by division into standardized geometric areas
- o The principles of surveying and keeping a field notebook
- o The calculation of slopes and side slopes
- o The relation of field readings to mapping
- o Plotting a contour line by interpolation
- o Taping a contour line in the field
- o Introduction to aerial photography and the use of the stereoscope

In the Field the following surveys were undertaken:

- o The staking-out and surveying of approximately 76 hectares for a new irrigated perimeter in Diabacunda. DEPA subsequently decided to end this project.
- o The staking-out and surveying of a 10 hectare area to extend an irrigated perimeter in Diabacunda. A map with contour lines scaled at 1:1000 was drawn up.
- o The staking-out and surveying of approximately 4 hectares in Saucunda to extend an irrigated field. A map with equidistant contour lines of 10 centimeters scaled at 1:1000 was submitted to DEPA.
- o The planimetric surveying of a perimeter in Saucunda with an area of approximately 20 hectares.
- o The preliminary surveying of 55 hectares in the Tantan-Cosse valley. A map with contour lines scaled at 1:2500 was drawn up.
- o The surveying of 30 hectares in the Cutame valley. A map with equidistant contour lines at 10 centimeter intervals scaled at 1:1000 is in the final stage of execution.
- o The detailed surveying of a site chosen for the first dam and its surrounding flood area of approximately 10 hectares. The map is in the process of being drawn up.

In the Field

- o The photogrammetric survey of the first tributary from the Cutame valley with an area of 9.5 hectares. The pencil draft of the map scaled at 1:1000 with contour lines at 10 centimeter intervals has been drawn up.
- o The photogrammetric survey of the second tributary from the Cutame valley with an area of 11 hectares. The map scaled at 1:1000 has yet to be drawn up.
- o The survey at 1:500 of the site of the second dam and its surrounding flood area of 4 hectares in the first tributary of the Cutame valley.
- o The staking-out in the field of the run off basin with an estimated area of 40 to 50 hectares at the site of the second Cutame dam.
- o The implantation of protective and regulating dikes at water-level in the experimental perimeter at Sare-Biro with an estimated area of 8 hectares.
- o The outline of an urbanization project for the DEPA Center in Contuboel (new buildings, access roads and drainage lines).
- o The sighting of certain valleys on aerial photographs.

On the administrative level, during the seven months from January 7th to July 31st 1983, I took on the role of team leader which consisted in coordinating the activities of the project in Contuboel, liaising with USAID, DEPA and Aurora in Washington, providing progress and financial reports, and monthly and trimestrial reports summarizing all of the activities of the technical team on the project.

Work to be Undertaken

To date we have not received a list of the valleys which DEPA would like to develop. It is therefore impossible to determine the extent of survey work to be done in the future.

Limitations

- o In matters of personnel none of my co-workers had received training in topography and their level of training in mathematics was an obstacle to an accelerated, in-depth training program.
- o The topographer-assistants, in spite of my recommendations, are still occasional help and the occasional nature of their work made running a continuous training program difficult.

Limitations

- o The number of topographers is still insufficient
- o The condition of the theodolites, levels and subtense bars slowed the start of the surveys
- o The absence of an agricultural engineer or a hydrologist to select the valleys to be surveyed and to indicate the type of topographic surveys necessary was a serious handicap.
- o The long daily trip, Bafata-Contuboel-work site for seven months was also a difficulty.
- o The country-wide gasoline crisis restricted our activities. We were immobilized in Bafata during the entire month of May, moreover, during the twenty months of the project the weekly ration of gasoline was never sufficient.
- o The scheduled surveys in the valleys, which did not begin until June 1983, was halted by the rainy season which rendered these areas inaccessible from August to January.
- o The aerial photographs do not provide any useful information. The topographic map and the mosaic photographs are not to be found. Certain valleys indicated on the photographs are not totally covered.

Recommendations

- o A topographical unit of three survey teams would be necessary to properly undertake the project surveys and those of the Center. A mobile team should be formed to work within the Contuboel Center and the center at Caboxanque and two teams could concentrate on the surveying of the valleys: one could undertake the topographic surveying and the other could undertake the staking-out of the selected sites.
- o If the training program which has been planned for the two most qualified topographers were to take place, it would be essential to recruit topographers capable of continuing the surveying. Contracting the services of a topographic bureau should be examined.
- o Formalizing the status of the topographer-assistants through regular employment and a more encouraging remuneration (they are now being paid in kind, the same as the manual laborers).
- o USAID, who contracted the photogrammetric surveys with a European firm, should do their best to recuperate the missing photographs, the topographic map and the semi-controlled or controlled mosaics which should be delivered together.
- o Considering the importance of the topographic sur-

surveys (the foundation of any agricultural planning project), it would be an advantage if DEPA could accord priority to the topographers in the matter of gasoline rations.

- o It would also be useful if DEPA would draw up a list of the valleys to be developed in order of priority, at the start of each agricultural expedition, while taking into consideration the rainy season and the availability of the topographers.