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UPPER VOLTA
RURAL WATER SUPPLY PROJECT

FIRST SIX-MONTH REPORT
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INTRODUCTION

The Project Hydraulique Villageoise is USAID/Upper Volta's means for assisting in improving potable water supplies in rural areas with work being concentrated in the region of Bobo Dioulasso. The Project addresses a very serious need in Upper Volta to improve both water quality and quantity in an attempt to combat widespread water-borne diseases. The project expands upon the existing programs and capabilities of the Ministere Du Developpement Rural's Service Puits Et Forages and the Ministere de la Sante's rural health program.

This semi-annual report is prepared for submission in compliance with Article 16 of "General provision for cost-reimbursement-type contracts". This draft is being prepared by contractor employees for submission to the contractor, USAID.

Throughout this report, organizational names will be used in their original language with translations of the French names listed herewith:

- ° Comite Interfricain des Etudes Hydrologiques (C.I.E.H.)-- Interfricain Committee for Hydrologic Studies.
- ° Direction de l'Hydraulique et de l'Equipement Rural (HER)--Bureau of Hydraulics and Rural Equipment.
- ° Forage.-- a drilled well.
- ° Ministere du Developpement Rural.--Ministry of Rural.
- ° Ministere de la Sante.--Ministry of Health.
- ° Organisme Regional du Developpement (ORD)--Organization for Regional Development.
- ° Project d'Hydraulique Villageoise.--Village Water Project.
- ° Puits.--a dug well.

The major contributors to the report are:

Robert C. Vorhis - Chief of DIMPEX party and hydrogeologist.

Scott A. Welch - Equipment specialist with DIMPEX.

Suzanne Plopper - Health-education specialist with Medical Care
Development.

It is our hope that this report will be found to be comprehensive and
useful.

CONTRIBUTIONS TOWARD OBJECTIVES

Hydrogeology

The primary accomplishment has been to set up an office and establish operating procedures for the work. Upon arrival, there was supposedly nothing in the way of data with which to work. Investigation revealed that this was not completely the case. HER has forms to be used in recording and filing data. For the Sous-Prefecture of Hounde, well schedules do exist. These were found and proved useful. However, for most of the areas where wells are scheduled to be put in, there are no data currently on file.

The DIMPEX hydrogeologist assisted in the selection of 26 sites for forages. As these were drilled, cuttings were studied and logged, and for those wells which were test pumped, a figure was calculated for transmissivity.

Well-construction methods have previously been standardized with no thought of adaptation to different geological conditions. Where change seemed desirable, such has been proposed.

The need to know where 620 villages are located developed quickly. Finding them on published maps was in itself quite a problem. Once they were found some method needed to be developed so that they could be retrieved easily. To accomplish this, a program was written for use on the hydrogeologist's personal Hewlett-Packard HP-97 calculator. The program requires input of the map location and size. Then for each village one needs only the east and north measurements, in millimeters, from the west and south edges, respectively. The calculator then prints out the original measurements; the same converted to kilometers and tenths; the latitude and longitude to degrees, minutes, and seconds to the nearest ten seconds; the Universal Transverse Mercator grid coordinates; and the HER number for the 15 minutes square in

which the village lies. These data are being assembled by Sous-Prefecture in tables and also are being recorded on the well schedules.

The location data have been put to use to establish where the village lies on the geologic map. This permits a preview of what one can expect when the forage is drilled or the puits is dug.

The hydrogeologist also provided assistance in the selection of hydrogeological equipment ordered for the project from America.

Equipment

The first major effort of the DIMPEX equipment specialist was in helping to prepare the well-drilling equipment for transport to Bobo-Dioulasso, the headquarters of the project site. A trip was also made to Diebougou and Bobo-Dioulasso in order to inventory the quality and condition of project equipment. A worksheet for Jeep maintenance was designed and a compilation was made of the materials needed to recondition old equipment which will have to be used until the overly overdue new American equipment becomes available. Because tires necessary for the drilling vehicles were not available locally, it was suggested that a trip to Abidjan to purchase the materials would be useful.

In February and March, a temporary garage was established to backstop the field teams. Hand tools and garage equipment received during this period were temporarily stored at the site along with Moyno hand pumps and pipes. The equipment specialist tried to purchase spare parts for Jeeps in Ouagadougou, but none could be found.

In late March, the equipment specialist went to Abidjan to purchase the tires for the drilling and other supplies. In early April, the project moved to another temporary location. The garage and warehouse are currently at this location with the tools and equipment all being moved to this new site. A system of vehicle log book controls was established. Because the Jeep agency's stock of spare parts was inadequate, basic spare parts were specially ordered.

Health

The health component of the USAID Rural Water Supply Project has gotten off to an excellent start, under the very able leadership of its technical director, Dr. Kagone Meba. The staff has further enjoyed very positive support from and collaboration with regional and local governmental officials (prefets, sous prefets and village chiefs) and medical personnel (regional health officers and nurses).

This initial six months has been spent setting up and staffing an office; collecting baseline data and information concerning similar projects; meeting with local governmental officials to discuss the project and begin the recruitment process for village health workers, and with regional health officers and rural dispensary nurses to discuss the development of the village health worker system; preparing a training site and entrance examinations for the first group of itinerant health workers; and developing project plans and a training curriculum for the village health worker training.

One of the two health education specialists contracted for this project arrived at the project site mid-January 1981 and the second at the end of April 1981. The following contributions have been made by the contractors during this reporting period.

- a. Compilation of health data from rural dispensaries serving the project area, for the years 1979 and 1980. Data was compiled at the level of sous prefecture, by number of cases seen per month for the following types of conditions: 1) water-related diseases, 2) communicable diseases (eg measles) whose effects are particularly severe in this region, and 3) other conditions (eg cuts and weaning malnutrition) which the village health workers will be trained to treat and/or work with villagers to prevent. This data will be used, in combination with information gained from village studies, as baseline data upon which to base the village health worker training and later to evaluate the effectiveness of the village health worker program. However, it is recognized

that because the dispensaries do not, in many cases, have the capability to diagnose some conditions with great specificity (for example, intestinal parasites), and some people do not, for a variety of reasons, present themselves at a dispensary when ill, dispensary data provide an indication of the disease pattern in the project area but cannot be viewed as a very complete record.

- b. Orientation of Peace Corps technical trainer for health to goals and activities of the project.
- c. Orientation to other Upper Volta rural water supply projects, village health worker programs and SHDS materials for training village health workers, for the purpose of learning of other approaches, problems encountered and results. Staff of the following project were met: 1) Health Sector 3 training program for village health workers in the Gaoua region, 2) the Dutch-funded rural water supply project in the Volta Noire region, 3) the FED rural water project in the Yatenga and Comoe regions, and 4) the Africare integrated rural development project in Seguenega.
- d. Participation in the design of the questionnaire to be used for the etude du milieu (community study) to be done in each village in which a village health worker will be trained.
- e. Assistance with the formulation of the initial plan for training village health workers.
- f. Participation in the development of curriculum for the health education component of the village health worker training (not yet completed).

PROBLEMS EXPERIENCED

Hydrogeology

A problem that kept surfacing is that USAID and HER have not yet reconciled their differing views of what is expected of the hydrogeologist. The former wants him to be a co-director actively involved in all details of the project and performing relatively little work in pure hydrogeology. The latter wants all administrative matters to be handled within HER with the hydrogeologist concerned almost solely with hydrogeology: inventorying water points, picking well sites, logging well cuttings, mapping water levels, and making interpretation of the data generated from the drilling of the wells and the digging of the pits. The two jobs are poles apart. One requires continual interaction with others; the other requires relatively uninterrupted periods of study and data analysis. To make the problem worse, the project proposal calls for few data to be collected that are needed for interpretation and no provision for collection of field data on water quality or for laboratory analyses of the water from the wells. Lack of data regarding water quality will make more difficult the evaluation of the project. If one does not have some quantitative handle on the quality of water used prior to the project and the quality available from the project wells, it will be difficult to determine whether providing forages and pits have had any significant effect on health.

The disparate nature of some data has also presented some problems. For example, chemical analysis tables for sedimentary rocks have different format from those for crystalline rocks. This makes comparison of the tables needlessly difficult.

Lack of office space for about the first four months made performing work more difficult and less productive. Equipment is still needed.

We have acquired some large prints of the project area obtained from the Space Satellite School at Ouagadougou, but there is no table or drafting table on which to lay them out for study. Calculators were obtained for project personnel, but the instruction books are all in English. Hewlett-Packard has their instruction books available in French so it would have been advantageous if H-P calculators had been obtained. A Texas Instruments programmable calculator was ordered but it has only 38 steps of program memory and the program written is for the HP-97 requires nearly 200.

Equipment

The basic problem in the functioning of the garage is a lack of suitable work and storage space. This problem makes difficult the proper storage of tools, equipment and vehicle parts. It was recommended that a more appropriate alternate site should be rented. A suitable place was found but the proposed lease was rejected by USAID. The need for space has increased greatly, however, and new steps are being taken toward leasing suitable space. Once such space is rented, at least one month will be needed to organize a relatively smooth running garage and to restore equipment on hand.

Establishing a satisfactory Jeep maintenance program has been impaired by spare parts at the local Jeep agency. For several months the agency was unable to obtain its initial supply of spare parts from Customs. Upon release from Customs, difficulties were experienced in setting up an inventory system due to a shortage of storeroom space and the unavailability of clerks trained in inventory control. The agency is constructing a new outlet to overcome the storeroom space problem and a Jeep representative is expected to arrive to train the Voltaic inventory clerks in the Jeep ordering system. After waiting some time for the agency to arrange its inventory, and pressuring the agency into looking for those spare parts needed to complete the maintenance schedule of the fleet, it was revealed that the agency could not fill the requirements. This discovery was made in May and subsequently an order was prepared for the parts.

Many tools necessary to repair and maintain the vehicles still have not arrived. Operations requiring these tools have had to be contracted out making the maintenance scheduling difficult. Many of the existing tools on hand have not been used effectively because lack of suitable storage renders them unavailable for use.

The cumbersome procurement process hindered progress at the garage. To date a "petty cash" fund has not been available, although such a fund is being established. Many purchases are made from small businesses that cannot accept a "bon de commande", the only other purchasing method. Much time and effort have been spent looking for parts and materials and arranging for payment. The process of paying for tax exempt materials is extremely time consuming, cutting down on the equipment specialist's productivity. For example, in mid-April the purchasing of tires was started. As of this writing it is expected that the paper work for this purchase will be finished by the end of May. In addition, tax exemption has been refused for several items, noticeable for tires, fuel and oil. Although many items are purchased without following this procedure, the delays caused by following the procedure are enormous. As of this time, oil ordered in January has not yet arrived.

Health

1. There is no long-term project plan. There appears to be a preference for short-term plans (6-12 months). However, it is necessary to have a four-year development plan if we are to have an adequate yardstick against which to evaluate progress.
2. The village health workers program is emphasizing training in curative/first aid services. More preventive promotive activities should be included.

3. Coordination of wells and health components should be improved. Such coordination must have the agreement of the two Upper Volta technical directors: however, there still is no technical director for the wells project.
4. The programs which involve the training of itinerant health workers and the strengthening of the National Health Education Center are planned in Ouagadougou by MOH staff. There is a need for health project staff to participate in the planning process. Field problems can best be identified and addressed by project staff (Dr. Kagone, Suzanne, Steve and others).
5. Activities aimed at sensitizing villages to the project could be improved. Villages which have been chosen for well construction are obliged to participate in the health component of the project. While this top-down practice may serve some short-term objectives, it may adversely effect village participation once the project has ended.

GENERAL OBSERVATIONS

Equipment

Our equipment specialist has been satisfied with the skill and energy of his counterparts at Hydraulique Equipment Rural. A major responsibility of the Equipment Specialist is to help integrate the American equipment into the H.E.R. structure, and given the high level of ability of the head mechanic and his assistance, it is felt that there will be few problems in achieving that goal. Our equipment specialist feels strongly that the head mechanic (as well as the project and H.E.R.) could benefit greatly by further technical training at Ingersol-Rand.

During this reporting period, only Jeep vehicles have arrived for the project. The rest of the equipment in use has been assigned from H.E.R. to be used until the American equipment arrives. While the DIMPEX equipment specialist has assumed responsibility for maintaining the old equipment, no long term maintenance system has been established. The project is continuing to use the system used by H.E.R. in the past and the equipment will go back to H.E.R. when the new equipment arrives. Much of the DIMPEX equipment specialist's time and effort have been spent rebuilding old equipment and searching for emergency spare parts.

Each of the Jeeps has been assigned to a particular function and the chief of that function is responsible for keeping a log of the kilometrage. On a periodic basis, the equipment specialist has recorded the vehicle kilometrages and determined vehicle usage. The use and control of the vehicle is the responsibility of the heads of the various functions. This policy has been reviewed and approved by the Technical Director of the project. As such, the chief to whom the vehicle has been assigned is responsible for seeing that the vehicle is seen by the garage as the maintenance schedule dictates or when the vehicle needs to be seen during regular maintenance intervals. This system is quite workable and can be controlled by the garage (to see that the vehicles are indeed being cared for), but the disorganization caused by a lack of permanent and adequate garage has retarded the implementation of this system.

Health

1. The first national level supervisory committee meeting, and the first two trimestrial regional coordinating committee meetings have been held, in their respective departments, as scheduled.
2. The health component has achieved full staffing, although one assistant sanitarian has yet to be moved to his post. It is anticipated that this will happen in the very near future.
3. The initial plans for the recruitment and training of village health workers have been developed.
4. Meetings were held with the chiefs of villages in which the project will operate in the three sous prefectures where work is to begin this year. The purpose of these meetings was to 1) discuss the project with the village chiefs, 2) the request that a village health worker be nominated from each village, and 3) the request that a viable health committee be formed in each village to guide the work of the village health worker. In addition to project staff, also participating in these meetings were sous prefets, and on one occasion the prefet, and regional health officers.
5. Baseline health data has been compiled from dispensary records in 7 of the 11 sous prefectures in the project areas.
6. Meetings have been held with rural dispensary nurses who will participate in the training of village health workers in their area in two of the three sous prefectures. The purpose of these meeting was to orient the nurses to the project and their role in training village health workers.

7. The questionnaire for the etude du millieu (community study) has been developed.
8. The site for the training program for itinerant health agents is being prepared and an entrance examination is being developed.
9. The names of 40 village health workers (out of an expected total of 80-90) have been received from two of three sous prefectures in which the project is working this season. The remaining village health workers are expected to be nominated soon.

POTENTIAL RELATIONSHIPS

Hydrogeology

The Association of Geoscientists for International Development (AGID) during the past year has established a regional office for Africa in Nigeria. One of the first projects of the office has been to launch a bilingual quarterly in French and English: West Africa Geoscience Newsletter. The first trial issue was distributed in February 1981. We have made attempts to receive their publications, preliminary to further contact.

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Excellent topographic maps for parts of Tanzania have been made by the Government of Finland. The Finns were delighted to send photo planes to Tanzania during the winter to fly over selected areas from which the maps were made. These maps are at a scale of 1:100,000 with a 10-meter contour interval. The best maps available for Haute Volta are at a scale of 1:200,000 with a 40-meter contour interval, and date from 1954. Perhaps Haute Volta should invite the Finns to come "winter" here!

Surprisingly neither the C.I.E.H. nor the HER have publications of the U.S. Geological Survey on hydrology. USAID may want to remedy this apparent oversight by contacting U.S.G.S. The publication series, Techniques in Water-Resource Investigations, is outstanding in describing current methodology in all phases of hydrology.

The Space Satellite Training School at Ouagadougou has the potential for offering some valuable training to project personnel. In talking with the staff of the school, it seems that one of their major hydrogeologic techniques is the delineation of lineaments for the purpose of locating sites capable of yielding large supplies. With climatic

condition of a rainy season and a long dry season, perhaps emphasis should be put on using such sites to help put water back into the ground rather than taking it out. For the long-term benefits of the country, retention dams located where the retained water can infiltrate to the ground-water supply could keep many puits from drying up. Also, if the reservoir dried up annually, the problem of the development of schistosomiasis could be avoided.

Equipment

Once much of the Ingersol-Rand equipment has arrived and the head mechanic has had a chance to become familiar with it, his participation in an in-depth training session conducted by Ingersol-Rand would prove invaluable. Given the amount of Ingersol-Rand equipment in the project, the benefits of such a session could be significant.

GOALS AND OBJECTIVES FOR NEXT SIX-MONTHS

Hydrogeology

To permit village locations to be ascertained, maps for the Nielle and Banfora quadrangles need to be ordered. Using these and the maps currently on hand, all the villages proposed for project work can be located. From this effort can come an alphabetical list by Sous-Prefecture of the village names. Using this as a frame of reference, a table can then be prepared with the various types of location data, land-surface elevations, and site geology.

With the geologic data from the table, a preliminary evaluation can be made to see if there are any sites where test-drilling should be done to provide answers that may be needed for areas of similar lithology or structure.

Completion of the above during the early part of the rainy season will permit effective collaboration with Mr. Boro Amidou in setting up the well-drilling program for the next campaign. It is intended that many sites be picked before the start of the campaign and that the remainder be picked as soon as possible after the start. This will allow time for the logging of well cuttings, a start on drafting of water-level maps, and extension and/or improvement in the data recording and record-keeping efforts.

Equipment should be ordered to permit the collection of data for those water-quality parameters that can be determined reliably only at the site: pH, temperature, conductivity, and alkalinity (or bicarbonate). The water-quality laboratory of HER is unable to make comprehensive analyses because it does not have the equipment for sodium, potassium, and sulfate determinations. Such equipment should be ordered. Each geologic unit or lithology is likely to have a characteristic quality of water. Some comprehensive analyses are needed both to better understand the water quality and to permit calculating the balance of the anions and cations to make sure the analysis is reasonably accurate. Wells drilled

for two schools, at Matourkou and Dinnderesso, as well as one at Dossiromenso have been dry. We will try to find solutions that will make water available to these three places.

Receipt of a mirror stereoscope will permit stereoscopic examination of air photos. Satellite imagery received from the Center at Ouagadougou is available also. Hopefully study of these materials will yield clues as to where to drill successfully for water.

Equipment

The most important task to be accomplished in the next reporting period is to find a space with electricity that is large enough to accomodate the warehouse and garage. This will permit a smoother more efficient operation. Once all tools are received, a training session on Jeep maintenance will be held to demonstrate procedures to all the mechanics. Maintenance schedules for the drill-rig, compressors, winches and heavy trucks will be established upon their arrival. A maintenance program for the Moyno pumps will also be established (the first pumps were installed at the end of May).

Health

Sixty village health workers will have completed an initial four weeks of training in 1) the symptomatic diagnosis and treatment of benign diseases and injuries common to their region, 2) the evacuation of serious cases, and 3) the maintenance of a work register.

An etude du milieu (community study) will have been completed in 60 villages, providing data upon which to tailor the health education portion of training.

The core curriculum for health education component of training will have been developed.

Village health committees will have been established in at least 60 villages. Demonstration latrines will have been constructed in 20 villages.

ADMINISTRATIVE PLANS

The hydrogeologist took his vacation during the months of June and July. He anticipates that he will be available for work during the coming six-month period.

The equipment specialist expects to remain in Upper Volta during the next report period, except for a short period during which he will go to Abidjan to organize the transport of heavy (Mack) trucks to Bobo-Dioulasso. His plans are to get married during August in Ouagadougou or be married in January 1982 in the United States.

One of the health specialists, Suzanne Plopper plans to take a 2 week vacation during August.