

PD-AAA-965-D1

## MONTHLY ACTIVITY REPORT

AUGUST 1976

PROJECT: 521-15-190-069

THE J.G. WHITE ENGINEERING CORPORATION  
HAITI Irrigation 4792I INTRODUCTION

The expatriate staff was reduced by one with the departure of Dr. Roger Peebles, Geohydrologist, on 31 August 1976.

Dr. Peebles made final trips to Jean Rabel to examine certain material qualities, ie, sand and gravel, available for construction purposes in the area. He also investigated the sea-side spring at Baie de Honne during this trip to the Northwest. On a later visit to the Dubreuil project he investigated a series of springs located in the main canal channel which were causing some concern during the design stage.

[The Jean Rabel Feasibility Study, TASK B, was completed during August, releasing all expatriate personnel for field assignment at Dubreuil.]

With the most helpful cooperation of DARNDR and USAID, the various problems concerning assignment of personnel and the transfer of operating funds, were settled early in the month.

[Actual physical rehabilitation work on the Dubreuil Irrigation System started on 12 August 1976.]

A shortage of personnel transportation was alleviated by the transfer of two 4-wheel drive vehicles to the Dubreuil motor pool. It is planned to transfer one more vehicle early in September plus a platform truck, later in the month.

## II GENERAL ACTIVITIES

A visit was made by Dr. Roger Peebles to Jean Rabel and Baie de Henne on August 4, 5 and 6. During a visit to the proposed diversion dam site on August 4 there was evidence that the river had recently carried a large flood, similar in magnitude to the flood that occurred just prior to a previous visit on July 9. Changes in channel morphology and erosion of streambanks were associated with both floods. [It is clear that considerable effort must be made to anchor the proposed diversion dam and to prevent erosion of streambanks if the dam is to last for a reasonable period of time.]

[The Ravine Prunier, a tributary of the Jean Rabel river was visited on August 5. This is an ephemeral stream with wide boulder and cobble strewn floodplain and it is probably the best source of construction material in the Jean Rabel area.]

On the return trip to Port-au-Prince on August 6 a brief stop was made at Baie de Henne to examine a large spring along the coast. The spring discharges at or beneath sea level where the beach join the outcrop of reef limestone east of the town. Discharge is unknown but it is sufficient to create a pool of fresh water in the sea water.

The spring water apparently flows from the reef limestone that are exposed at this point. The permeability of these limestones is very high and they cover large areas surrounding Baie de Henne. This precludes interception of spring flow at a higher elevation in order to prevent its loss to the sea. Some of the spring water might be brought into the town using a low lift wind driven pump for drinking water and possibly irrigation of small garden plots.

The pump would be placed at the point of spring discharge and a small sea wall might be built to prevent mixing of the salt and fresh water.

During the week of August 15, Dr. Peebles visited the Dubreuil System. [The purpose of the trip was to examine an unlined reach of the main canal at Dubreuil where numerous springs are found and to discuss with the Haitian engineers assigned to the project the best way to carry a lined section through the area.

Proper management of the Dubreuil system requires an accurate measure of the quantity of water that moves into the main canal. This will not be possible unless the unlined reach is lined or by-passed as the amount of water added or lost in the reach is not predictable.]

A large quantity of water was flowing from the springs at the time of the visit. The intake to the main canal at the river had been closed for a week and the canal was dry to the point where the springs are located. At the end of the unlined reach, which is a channel about 3 to 4 meters wide and 200 meters long, spring water was flowing into the lined main canal at a rate estimated to be at least 100 lit/sec. The variability of flow from the springs is not known. It is possible that they may cease flowing at times of drought causing irrigation water to be lost in the reach.

Being unable to predict the behavior of the springs in the reach requires the construction of a lined section of canal to bypass the springs. It was suggested by the Haitian engineers that a masonry section or pipe section could be placed on top of the bank on either side of the reach.

This solution is feasible only if the banks are stable. There is evidence that at times of heavy spring flow during the rainy season, the banks become saturated with spring water which could make them unstable. Other alternatives include a flume or a buried section of pipe.

The spring water can either be used in the system as it is now or a drainage canal could be constructed to carry the water to the Aoul river, which is located about 400 meters to the Southwest. [It is recommended that the spring water be allowed to continue to flow into the main canal and that a gauge be placed to measure discharge. The water from the upper main canal should be carried beyond the point where spring flow is gauged in order to have an accurate measure of total discharge in the system.]

[The rehabilitation work on the Dubreuil Irrigation System started on 12 August 1976. Three groups of 10 men with one leader each started at the barrage site working their way down the main canal, removing rock, accumulated trash and cutting brush along the right-of-way.]

[Organization and engineering plans of work were completed during the month by The J.G. White Engineering Corporation personnel working in cooperation with the assigned DARNDR counter-parts. The general organizational plan as reported previously was agreed upon. The engineering plan of work is attached to this report.]

[A program of extension methods to be used in contacting and motivating leaders in the Dubreuil area was developed.] A copy of the program is also attached to this project.

[Background information for orientation of local lay-leaders was developed and will form the basis of educating and motivating the leaders. Details of the orientation material is being prepared and will be used in group training sessions scheduled to start early in September.]

We are extremely pleased to report that [group leaders are responding very favorably and little or no antipathy to the project has been shown by any of the system farmers.]

[Existing groups with their respective leaders have been identified and locations charted on the System map.] To further develop knowledge of the area's inhabitants an accurate population of the 23 Habitations within the Dubreuil System is underway.

[A questionnaire has been developed to determine the socio-economic status of the farmers currently operating in the Dubreuil System. A ten-percental sample will be contacted by a trained survey team during the month of September. The results of this survey will provide in part a basis for planning the socio-economic training requirements. The survey will also present a valuable opportunity for the team to establish personal contacts and to further orient farmers to the complexities of interfacing of government and farmer responsibilities related to the Dubreuil System rehabilitation.]

[As had been planned, one workday meal is being provided to the work crews. The immediate reaction of the workmen was most favorable.] Any increase of productivity from the added caloric input will of course not be immediate noticeable but should be identifiable within a period of 2 to 3 months.

On 23 August 1976 2 additional teams each of 10 workers and a leader were added to the canal cleaning operations. The following day two more typical teams were added, these are to stock pile rock for masonry and to screen river aggregates for sand and gravel.

The director of DARNDR for the Southern Region has, telegraphically, been authorized maximum autonomy for the Dubreuil Project operation relative to local DARNDR personnel involvement and G.O.H. expenditures on the project. The previous lack of autonomy had been a delaying factor. With this serious problem now resolved to the complete satisfaction of all persons involved and the resulting surge of activity is indicative of the spirit of cooperation between DARNDR personnel and the USAID contractor.

## DUBREUIL REHABILITATION PROJECT

### ORGANIZATION OF CONSTRUCTION WORK

#### I. Organise Topographic Teams:

- Team chief, G. Josaphat
- 1 assistant topographer
- 2 chainmen
- 1 - 2 helpers attached to the survey team.

#### II Land Survey Plan:

- name the canals (local names - see N. Claude and S. Adonis)
- survey of canal alignment, elevations, profile and cross sections.
- develop a numbering system for survey books - books #1, #2.
- turn in books for maps and design.

#### III Stock Construction Material along River Banks:

- rocks, gravel and sand.

#### IV Design:

- assign additional topographic team as soon as plans come from design section.
- as the topographic team lays out work according to plans, workers, masons etc can be hired.

#### V Organization of Responsibilities at the Local Level:

- procedures for hiring/firing employees.
- payroll preparation
- weekly inventory
- daily record of project progress
- supervision of work brigades (foremen)

**VI Maintain Explanatory Diagrams of Progress on:**

- each canal
- material stocks
- work brigades
- costs, inventory, etc.

**At Present it is Possible to:**

- clean main canal
- improve access roads
- stock and sort material

## DUBREUIL REHABILITATION PROJECT

### EXTENSION METHODS FOR INITIATION OF PROJECT

#### **I Individual Visits (Community Leaders):**

- Aims:**
- Become acquainted with and establish good relations with leaders.
  - Obtain information on community problems
  - Provide information about the rehabilitation project
  - Plan and arrange meetings
  - Train leaders

#### **II Meetings (Members of existing groups or groups being formed):**

- Aims:**
- Provide information on project
  - Encourage exchange of ideas
  - Obtain information
  - Promote the participation of everyone in carrying out the project.

#### **III Excursion (to Chalette and Welsh):**

- Aims:**
- To let the Dubreuil know the good results obtained at Chalette and Welsh on small irrigation systems constructed by EDAPS and DAINDR.
  - Encourage an exchange of ideas between the group members at Chalette and Welsh and those of Dubreuil.
  - Permit the group members from Dubreuil to widen their field of experience and encourage them to take action.

#### **IV Radio:**

- Aims:**
- Reach all farmers in Dubreuil to give them information on the project. The weekly program "Flambeau Paysan" of the Cayes Agricultural District will be used.

## REHABILITATION OF THE DUBREUIL IRRIGATION SYSTEM

### Background Information (Orientation of Leaders)

Many irrigation systems have been built and restored during the past several hundred years in Haiti. Most of these systems were built by foreign companies who, soon after construction was completed, left Haiti without training local people to operate, maintain, repair, and manage these systems. As a consequence, the systems deteriorated over the years. Some reasons for this deterioration include : floods, hurricanes, lack of organized maintenance and repair, and shortage of funds to effect maintenance and repairs. Taxes collected from water users were not generally made available for repair and maintenance and the systems served fewer people each year. As a result, the small farmer received less production from his small parcel of land and had to work harder and more hours per day to feed, clothe, and maintain a bare subsistence for his family. As the farmers received less benefits from the irrigation systems, they felt less inclined to spend their time and effort to maintain and repair the system. Without an organized group approach and no funds, the irrigation systems continued to deteriorate, until many became completely non-functional.

The Government of the Republic of Haiti came to the realization that something must be done to restore the irrigation systems to a condition capable of serving all possible farmers within the various systems. In cooperation with USAID/Haiti, a study was made of the Dubreuil Irrigation System in 1975. The purpose of the study was to develop the following data:

1. The manpower, money and materials required to restore the Dubreuil Irrigation System to its original condition, and to extend the canals so that every possible farm could be irrigated.
2. The kind of organization of water users required to manage the restoration of the system, its operation, repair, maintenance, and administration.
3. The benefits and costs to farmers and the government following rehabilitation.
4. The responsibilities of the water users and government following rehabilitation.

The study answers some, but not all, of these questions in detail. Many of the answers came from farmers and leaders now living in the Dubreuil System.

The study indicates that direct construction for rehabilitation will amount to \$249,000. Materials and equipment will cost an additional \$179,000 and unforeseen expenses another \$58,000. The total cost not including foreign technical advisers, using 1975 costs will be \$486,000. A portion of this money and some materials are available in Aux Cayes for the start of the project.

The study also shows that if the people of the Dubreuil System are to be depended upon to restore, maintain, repair, and administer their system, they will have to be convinced that the system is theirs. To achieve this objective, the study recommends that the various agricultural groups which presently exist in the Dubreuil System should form an association of water users to be called an Irrigation District. This Irrigation District would be made up of all water users within the Dubreuil System and would have a Board of Directors composed of representative leaders from each agricultural group in the System. The Irrigation District would elect its own officers and administer all of the business necessary to restore, operate, maintain and repair the Dubreuil System.

The Irrigation District would require the full support of DARNDR Agricultural officials and foreign advisors, to assist in organization, training, rehabilitation, and management of the project. DARNDR has already assigned agronomes, engineers, technical assistants and others to assist the people of Dubreuil to organize an Irrigation District and to rehabilitate the system. Advisors from The J.G. White Engineering Corporation working with USAID/Haiti are also prepared to give technical assistance support in organization and rehabilitation. In addition, efforts are being made to see that water taxes collected by the Bureau des Contributions are returned in part to the Irrigation District for repair and maintenance of the system.

The study shows that construction and rehabilitation of the Dubreuil System will have many benefits and some costs to water users of the system. The proposed system rehabilitation will include repairs to the diversion dam to reduce losses of water, repairs to the main canal, the construction of proportional weirs (distribution boxes) for the equal distribution of water, and the masonry lining of 16 km of lateral canals. A great many lateral canals will have to be extended so they can serve parcels not now receiving water. For the entire Dubreuil System, the study shows that there will be increased income of \$118,000 per year from improved crop culture and \$171,000 per year from increased livestock production, amounting to an increase in income of approximately \$100 per hectare to the farmers.

During the construction phase of the project, many people will benefit directly in wages. It is estimated that 200 local Dubreuil System residents will be employed the first year of the project, 300 during the second year, and 150-200 in the third year.

Indirect benefits will include improved health facilities, more schools, and a dependable supply of water for domestic uses.

Taxes for water use will have to be continued to provide operating funds for the Irrigation District. It is estimated that these costs will be approximately \$2,500 per year to provide for the Irrigation District's share of responsibility for their system.

To be successful, the rehabilitation project for the Dubreuil system must have the cooperation of all government officials, farmers, farm groups, and foreign advisors. Government officials and foreign advisors are responsible for assisting with financing, materials, equipment, and training. DARNDR will be responsible for training agricultural leaders in water management, conservation, and the cultural practices necessary for maximum production from the irrigated land. Government is also responsible for repairs to the system which the Irrigation District with its limited assets cannot physically or financially handle. These repairs might be such natural disasters as floods or cyclones.

On the other hand, farmers and farm leaders will have the responsibility of working together as an Irrigation District to insure proper and equal distribution of water, maintenance, normal repairs, and proper administration of the system. Farmers served by a particular lateral canal must work together to insure that their section of the canal is kept clean, repaired, and maintained. Farmers served by other sections of canals must do the same. Farmers will be expected to participate in the Soil District, for only by such active participation can the organization be effective and successful. Farmers and farm leaders must actively participate in training sessions arranged for them. They must learn how to irrigate effectively, use improved cultural practices, grow crops adapted to their soils, and effectively participate in their Irrigation District activities.