PROGRAMME OF WORK TO ESTABLISH GUIDELINES FOR THE EFFECTIVE ADMINISTRATION, OPERATION AND MAINTENANCE OF THE IRRIGATION AND DRAINAGE DISTRICT IN THE BRUMDEC PROJECT

IICA/JAMAICA
MISCELLANEOUS PUBLICATION NO. 305
SERIAL # ISSN-0534-5391

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by

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November 1981

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PROGRAMME OF WORK TO ESTABLISH GUIDELINES FOR THE EFFECTIVE ADMINISTRATION, OPERATION AND MAINTENANCE OF THE IRRIGATION AND DRAINAGE DISTRICT IN THE BRUMDEC PROJECT ST. ELIZABETH, JAMAICA

1. INTRODUCTION

The writer has reviewed the available documentation of the irrigation and drainage system proposed for the BRUMDEC Project. Complete descriptions of the Project area and its potential for development are documented elsewhere. [1,2,3]

This programme of work is submitted in accordance with the Agreement between the Black River Upper Morass Development Company Limited (BRUMDEC) and the Inter-American Institute for Cooperation on Agriculture (IICA). The programme of work aims at establishing whether or not additional water-control structures will be needed to effectively control irrigation and drainage for different types of crops in the Project area, and also for the preservation of the peat soil.

As a part of the Final Report, the writer will recommend an internal organization structure and a budget for the administration, operation and maintenance of the irrigation and drainage system, and set up guidelines for the practical operation and maintenance of the system.

A chronogram of activities is given in Appendix I.

2. OBJECTIVES

The proposed programme of work has as its objectives:

2.1 To establish whether or not additional water-control structures are needed to supplement the proposed irrigation and drainage system for the cultivation of different types of crops in the Project area, and for the preservation of the peat soil.

2.2 To set up guidelines for the practical operation and maintenance of the irrigation and drainage system in the project area.

2.3 To use information generated in accomplishing 2.1 and 2.2 to recommend an internal organization structure for the administration, operation, and maintenance of the system and for preparation of a budget based on that organization structure.

2.4 To train nation . technicians in the supervisory management of the system.

3. STRATEGY

To achieve the objectives during the period of this consultancy the following strategy will be adopted:

3.1 The relationship between water-table, rainfall, level of water in rivers, irrigation canals and drains will be studied to provide data for the achievement of objectives 2.1 and 2.2.

3.2 The infiltration characteristics of each soil type in the project area will be studied to provide data relevant to achieving 2.1 and 2.2.

3.3 The hydraulic sections of drains and canals will be calibrated to relate the discharge with the water level.

3.4 The siltation of drains will be monitored to provide information on maintenance requirements.

3.5 A training course for national technicians will be carried out to highlight the practical aspects of the operation and drainage system.

4. METHODOLOGY

4.1 With reference to 3.1, the water-table fluctuations will be measured by using observation wells. Details of an observation well are presented in Figure 1. Simultaneously, we will also measure drainage discharge, water levels in drains and canals, and rainfall, in order to study the relationship between these variables.

4.2 Infiltration characteristics of the different soils in the project area will be measured in the field using appropriate apparatus to determine cumulative infiltration and the infiltration rate of each soil type.

4.3 The discharge from irrigation canals and drains will be determined by measuring the area of hydraulic cross section and the mean velocity of the flow.

4.4 The bottom level of drains will be measured after appropriate time intervals to provide data for calculating siltation rates. This data will also be used as the basis for estimating drain maintenance costs.

4.5 The budget for the administration, operation, and maintenance of the system will be determined from the data collected during the implementation of this programme of work. The recommendation of a tariff will be integrated in the budget.

4.6 On the basis of the design of the drainage and irrigation system and on any recommendations which the writer may make for supplementary water-control structures, a recommendation will be made for an internal organization structure to provide for the effective operation and maintenance of the irrigation and drainage system.

4.7 The training course will be concerned with the practical aspects of the operation and maintenance of the irrigation and drainage system. The training aids will be the field studies envisaged at 4.1 through 4.4.

5. EQUIPMENT AND PERSONNEL

Equipment and personnel needed for implementation of this programme are listed in Appendix II.

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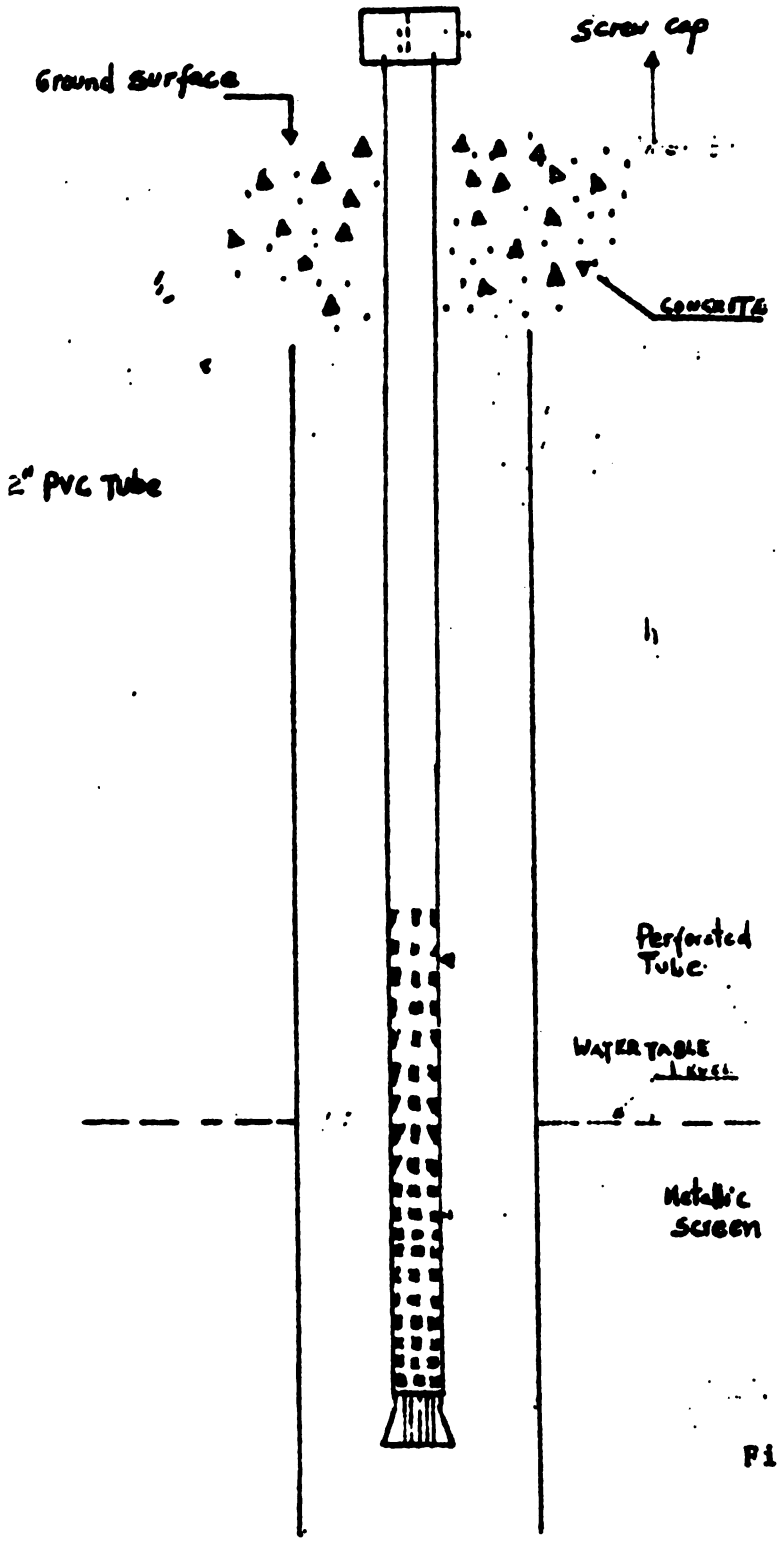
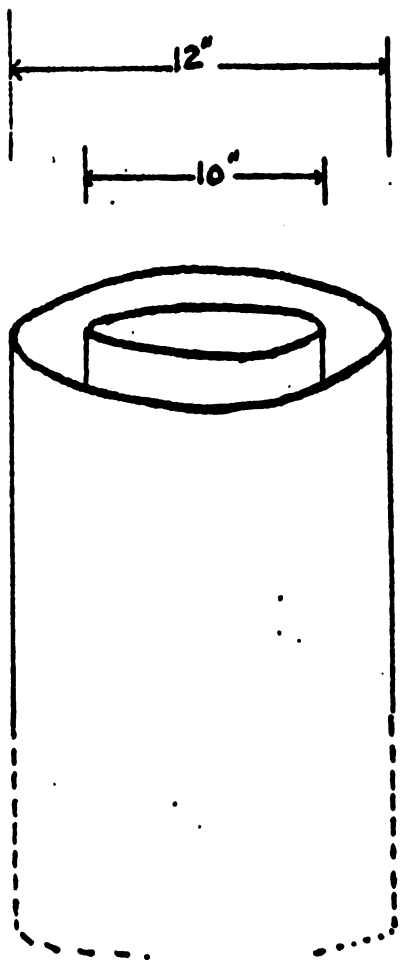
APPENDIX 1

CHRONOGRAM FOR THE IRRIGATION AND DRAINAGE PROGRAMME

ACTIVITY	JUNE	JULY	AUG.	SEPT.
Review of documents relevant to the drainage and irrigation system of the Project, and preparation of the programme of work.				
Recommendation of an irrigation scheme.				
Study of relationship between water-table in fields, water level of irrigation & drainage canals, and rainfall.				
Study of infiltration characteristics of different soil types in the Project.				
Study of discharge rates of irrigation and drainage canals.				
Study of siltation of drainage canals.				
Preparation of budget and recommendation for internal organization structure for the administration, operation, and maintenance of the irrigation and drainage system of the Project.				
Training Course				
Final Report				

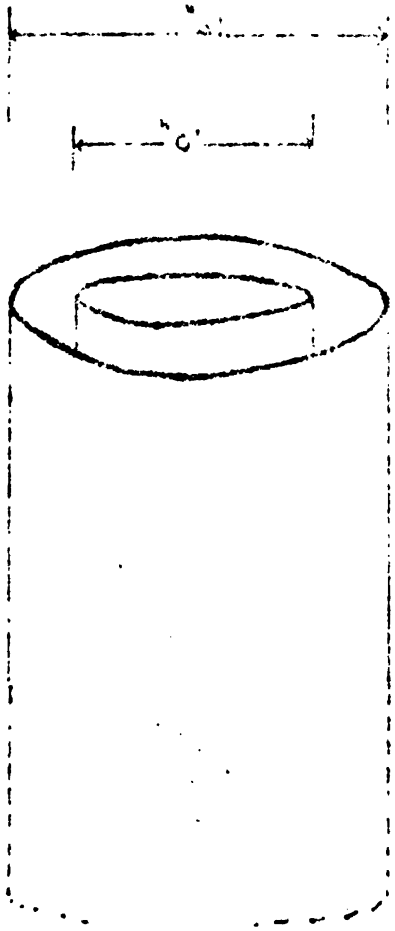
Activity	[illegible]	[illegible]	[illegible]	Status
[illegible] of [illegible] to the [illegible] and [illegible] of the [illegible], and [illegible] the [illegible] programme [illegible]				
Recommendation of an irrigation scheme.				
Study of relationship between water [illegible] in fields, water level of irrigation [illegible] canals, and rainfall.				
Study on infiltration characteristics of different soil [illegible] in the project.				
Study of discharge rates of irrigation and drainage canals.				
Study of situation of [illegible] canals.				
Preparation of budget and recommendation for internal organization, structure for the administration, operation, and maintenance of the irrigation and drainage systems of the Project.				
Training Course				
Final Report				

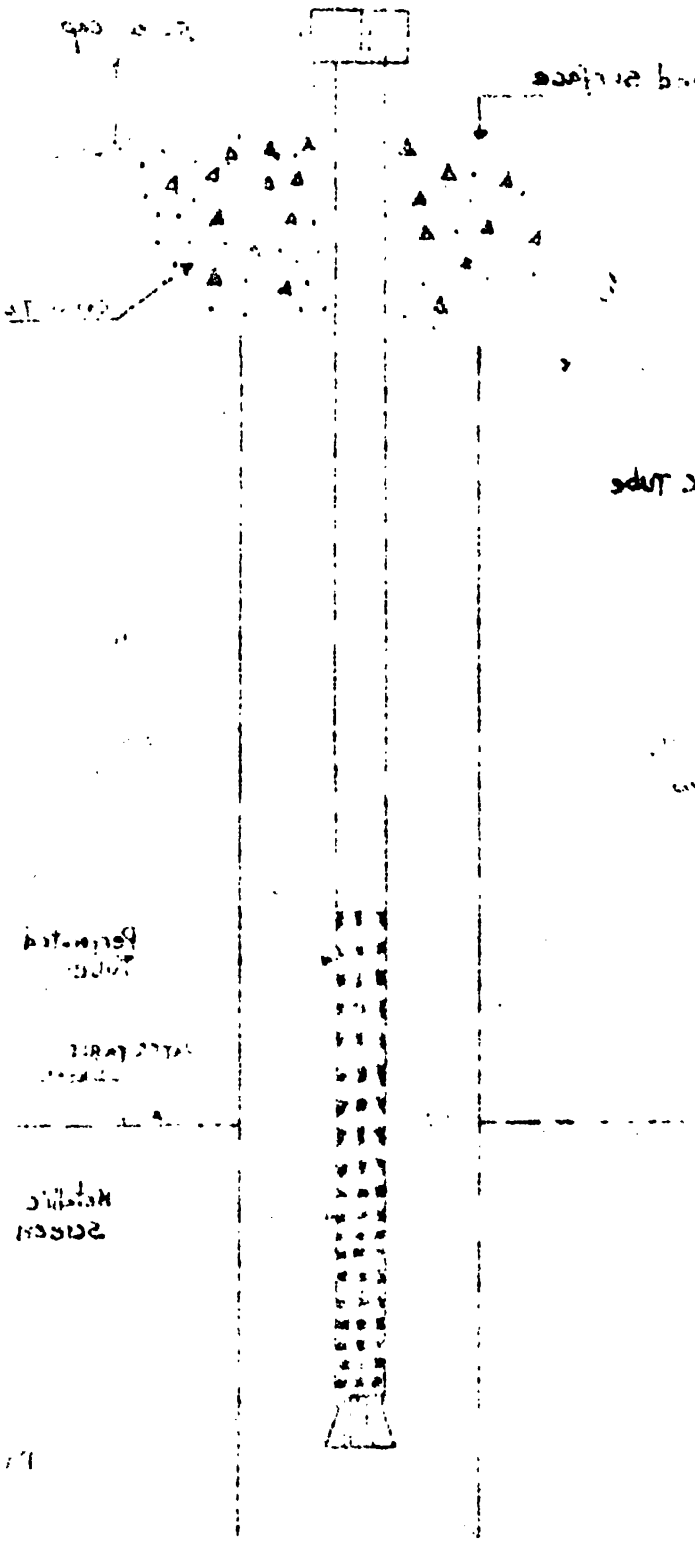




CYLINDER INFILTROMETERS

Figure 1. Cross-section of an Observation Well.





APPENDIX II

EQUIPMENT NEEDED FOR THE IRRIGATION AND DRAINAGE PROGRAMME

1. Engineer level (tripod and rod)
2. 4" (0.10m) diameter auger
3. 500 feet of 2" (0.05m) diameter plastic tube
4. 20 caps for the 2" (0.05m) diameter plastic tube
5. 1 12" (0.30m) diameter iron cylinder 16" (0.40m) long
6. 1 chronometer
7. 1 current meter
8. 2 100 feet steel tapes
9. 20 stakes (1" diameter - 10" long)
10. 10 limnimeters (1.0m long)
11. 2 sets of triangle squares 45° and 30°, 12" long
12. 2 scalemeters, 1 with scales: 10-20-30-40-50-60
    1 with scales: 100-250-300-400-500-750
13. 20 metal cups 3" diameter, 3" deep with caps
14. 1 oven
15. 4 siphons, 2" diameter and 2 siphons 4" diameter
16. 4 concrete tubes 6" diameter
17. 100 feet long electrical probe
18. 1 recording rain gauge (Pluviograph)
19. $20m^2$ of metal screen, mesh size $1mm^2$.
20. 3 flow-meters
21. 2 ten feet metallic tape
22. $5m^2$ of plastic sheet
23. Electrical conductivimeter
24. pH meter

PERSONNEL REQUIREMENT FOR THE IRRIGATION AND DRAINAGE PROGRAMME

1. Two (2) technicians for the topographical survey, water table observations, flow measurements and irrigation and drainage assistance.
2. Four (4) labourers for the field work.
3. One (1) irrigation and drainage engineer (counterpart)

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