

TRIP REPORT

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NAME G. L. Corey *llouy* TITLE Water Management Specialist DIV./UNIT DS/AGR

PERIOD OF TRAVEL (including dates) November 4 -November 15, 1979

ITINERARY Sri Lanka - Colombo and Mahaweli Project

(Use attachment for details, including time schedule)

PURPOSE Serve as AID representative on the Supervisory Mission in review of Stage II System H Mahaweli Development project.

ORGANIZATIONS AND PERSONS CONTACTED: Mahaweli Development Board
System H. Field Offices
(Use attachment for details.)

RESULTS/ACCOMPLISHMENTS:

- 1. See attached
- 2.
- 3.
- Etc.

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FOLLOW-UP ACTION REQUIRED:

(indicate what, by whom, when.)

Final report from Mission will be prepared by Stan Baker, World Bank.

OTHER REMARKS:

(May include other information, observations, and impressions of general interest.)

Attachments:

(List) Report

Distribution:

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MAHAWELI GANGA SYSTEM H SUPERVISORY MISSION

4 - 15 November 1979

Report by G. L. Corey, Water Management Specialist, AID/W

Introduction

The purpose of the mission was to review overall progress in System H of the Mahaweli Project and to monitor procedures and developments in use in the field and at the Mahaweli Development Board (MDB) headquarters. The previous Supervisory Mission was held during April 1979.

The Mission included: S. Baker, World Bank Team Leader; A. Seager, World Bank; D. Campbell, ODA; H. Saaltink, Y. Pan, CIDA; S. Leenstra, Netherlands; and J. Evans and G. Corey, USAID. The Mission spent three days in the field and five days at MDB headquarters. Meetings were also held with the Director General of the Mahaweli Development Authority.

In general progress since April 79 has been good. When one considers the enormity and complexity of the development process taking place in System H, the development rate and quality of work is impressive. This is not to say that all aspects of the program proceed without problems and on schedule. As in any development effort there are mistakes made and procedures sometimes have to evolve through the learning process. Especially impressive are the dedication, resourcefulness, and morale of the young men in the field who carry the responsibility of actually making the project a success on the ground. These men with not a great deal of prior experience are performing well and accepting responsibilities usually found in more experienced professionals.

Progress

1. Construction of Irrigation Works and Roads

Field work remaining for completion is limited to Blocks H4 and H5. Following is a summary of the progress reported as of October 1, 1979.

Main Channel excavation	95% complete
Main channel structures	75% complete
Branch Canal excavation	90% complete
Branch Canal structures	80% complete
Distributary channel excavator	85% complete
Distributary channel structures	80% complete
Field channels	45% complete

Construction of irrigation channels is about on schedule. The main canal is almost complete and rate of construction of D and field channels will roughly coincide with the planned settlement rate. Road construction has been speeded up greatly during the past 6 months and the quality of work is good.

Erosion problems noted in April 1979 are still present but to a lesser degree. A special program of placing turf on road berms and canal and bund banks has been very helpful and is encouraging. Of course with intensive maha rains it is impossible to control all erosion on new construction. After vegetation is established erosion will be minimal, but there will be some minor gulleying which will need repair.

It was noted that several main canal structures are incomplete. Cut-off walls and gates have not been installed in several cases and in others rip-rap needs to be installed before water is introduced. The workmanship in some of the gate structures appears to be of low quality. Forming for the concrete looked to be very rough.

In one instance, it was noted that main canal excavation was not complete. A rock section had not been removed, reducing the cross section to the point where pooling and a drop effect will be created. This will cause erosion and serious canal deterioration at that point.

It appears that it is the plan to turn water into the right bank canal before it is totally finished. Once the irrigation season begins, it will be difficult to finish some of these works. These rather simple, but important, construction jobs should be completed before water is turned into the main canal.

2. Construction of Social Infrastructure Buildings

There has been little progress during the past six months with construction of schools, health centers, post offices, agricultural buildings, village wells, etc. in Areas H4 and H5.

There is a UNICEF program of well construction on going in Areas H1 and H2. Forty wells have been constructed at a frequency of one well for each four families. Reportedly this type of system is planned for H4 and H5 Areas by determining the unit cost per well and paying the farmers to construct their own well. The open dug wells require no special skills and this system should be satisfactory.

The Mission suggested and MDB agreed to proceed with construction of the yet unstarted large social infrastructure buildings by contracting under competitive bidding. A contractor would be permitted to bid on as few or as many buildings as he wished, within reasonable limits set by MDB and agreed to by the World Bank. This should greatly speed the construction of these major buildings.

3. Equipment

Although very little time was spent reviewing equipment logistics, casual observation leads one to conclude that equipment management, assignment of specific equipment to specific tasks, maintenance, monitoring, etc. is not yet an efficient or effective operation.

The 51 Ford 515s purchased under USAID loans apparently are being used in construction. The 50 David Browns (ODA) are used in hauling (10) and land preparation (40). The 200 4-wheeled farm tractors (ODA) purchased for sale to farmers in the area are not being sold at reasonable speeds. Only 30 have been sold and 50 are being used by MDB in various jobs. The remainder are stationed in the open in Bulnewa awaiting sale, exposed to the weather and theft. Two-wheeled tractors are selling to farmers at a much greater speed. Bids have been received for 90 motor-cycles.

The machine repair shop at Tambuttegama is under construction. Reportedly it will be complete by January 1, 1980. This appears to be an optimistic prediction as a great deal of work is yet to be done and electricity is not yet available.

MDB has recently (September 1, 1979) organized a Plant and Equipment Management Division with mechanical engineers in the Colombo office and the field. Their responsibilities will include repair, maintenance, records, spares and in general be responsible for all equipment. This action should be a great improvement over the existing arrangements.

Several suggestions regarding machinery were made by the Mission in conference with MDB staff. These include:

- (a) Fifty one trailers for the Ford 515s should be purchased from either IDA or MDB funds.
- (b) Special hitches and necessary hydraulic systems for the Ford 515s should be purchased (USAID funds).
- (c) Up to 100 of the 4-wheeled tractors should be sold to anyone living in the project area. The remainder should be used by MDB in construction or for other purposes. The money should be used to purchase 2-wheeled tractors for sale to farmers.
- (d) The ODA specialist for cataloging spares and developing a maintenance system should be requested soon by MDB so his arrival will be timely.
- (e) USAID has agreed to furnish an equipment advisor (Tex Taylor) for the shop at Tambuttegama for 3 months beginning in mid-January. The completion of the shop building should be encouraged so maximum use can be made of his time.
- (f) Needed pre-stressed concrete equipment should be ordered immediately (USAID funds)

4. On-Farm Development

The pre-settlement development of farm units is much better organized than it was in April 1979.

Jungle regrowth is being cleared by the land owner after which conservation bunds are marked out on a 0.2 percent slope and then the land is tilled between these bunds with either a disc harrow or a disc plough.

Forty David Brown tractors are being used in this exercise and they are divided into five working teams. The rate of development during October was 540 farm units. The advisors believe that with present equipment and personnel, the maximum rate would be 7-800 farms per month. It should be noted that this system of land development has only been developed since the onset of the Maha rains. It was found that during the dry season only the crawler tractors could manage tillage because of the hardness of the soil.

There are approximately 11,000 farm units remaining in Areas H4 and H5 which will need on-farm development. It is obvious that the present system will not accomplish that amount within the next 12 month period which is the planned date to finish settlement. Therefore, unless some extra effort is applied to on-farm development there will be 3 to 4 thousand farm units which will not be developed by MDB.

Limitations on development speed include weather conditions, personnel and equipment management. Presently only one tractor driver is assigned per tractor and, although he may "work" 8 hours or more each day, the tractor field operation time averages no more than 4 or 5 hours.

In order to accomplish the on-farm development within the planned time frame some alternatives might be:

- A. Assign 3 tractor drivers to each tractor (there is now only one) and work in two 6-hour shifts.
- B. Assign more personnel and equipment to the operation.

The only other alternative will be to allow the settler to develop his own land. The total effect of this is not readily known but certainly without conservation bunds his fields will undoubtedly be much smaller and it will be much more difficult to improve his water management system later on.

5. Experimental Areas

The Mahaweli Development Board has done an excellent job in facilitating experimentation within the H Areas. Three separate, but related, research efforts are on-going with a great deal of support from MDB. These include the Irrigation Department, USAID assisted, two field channel area in Block

305 of Area H1 near Kalankuttiya; the "Huntings" 116 farm unit of experimentation with alternative field irrigation systems and cropping patterns; and the 400 area semi-automated water delivery system in buried pipe and level channels in Block 404.

All of these projects show promise of obtaining answers to constraining questions of design and implementation. Results will be useful not only to effective settlement of the H area but especially to all new areas under the Mahaweli Development Scheme.

Excellent progress has been made on all of these experiments during the past 6 months. Obviously they are being given the attention they deserve and continued good progress over the next year will start yielding viable useful data to MDB. These studies are extremely encouraging.

(A) Experimental Farm, Kalankuttiya Block 305. - Greater inputs are being given to this experimental area. A new farm manager, an agronomist, has been assigned and in general the experiments look very good. The USAID grant funded contract between GOSL and Chemonics is being amended to include an eighteen month assignment of an expatriate agronomist to overlap for 6 months with the end of the 2 year tour of the agricultural engineer.

Several experiments are being conducted which will lead to precise recommendations on how to grow upland rice during the rainy Maha season using a minimum amount of irrigation water.

During his remaining 6 month assignment the Agricultural Engineering advisor will draft a manual which describes methods of developing and constructing basins for efficient irrigation of upland crops. He will also, immediately after the present rainy season, be responsible for developing the lands of the 12 farmer operated units which also are a part of the experimental area. Among the treatments applied will be i) conservation bunds with tillage in between as MDB is presently supplying the farmer in its settlement program, ii) furrowed basins precisely leveled by a soil scraper and iii) check units where the farmer does all his land preparation by hand without technical assistance. Data from these actual farms together with the controlled experiments should provide invaluable analyses for H area settlement as well as future developments of all areas under the Mahaweli Scheme.

(B) Block 404 Huntings Experimental Area. - This 116 farm unit experimental area is being studied by Huntings to determine the viability of various cropping patterns and field irrigation systems with the view that information gathered will be helpful in the design of System C.

This experiment or series of experiments are progressing rapidly. Some farmers are already settled and growing crops and a great deal of data on farmer attitudes toward the various treatments has already been gathered.

The treatments to be studied will include i) separate irrigation systems for the two main soil types; ii) dividing farms so each one has a given percentage of the two main soil types; iii) dividing farms so each farm has only one soil type; iv) cropping patterns which include only one specific crop during a given season; v) cropping patterns which include a variety of crops and vi) sprinkler irrigation as a technology against waterlogging.

A management system is being used in this experimental area which includes a Block Manager with assistants to provide the farmer with all his extension needs. This system is being used to facilitate the experiment. But it should not be viewed as a viable approach to extension over a wider area. It will work on this experimental basis but one must remember that there are also three expatriate advisors who make up a part of the management system and to assume that this system can be duplicated would be dangerous.

C) Block 404, Pipeline System for Water Delivery. - This 400 acre experimental area will provide a great deal of information on the viability of using buried concrete pipe as a means to carry water to each farmer on the field channel system.

Technically the system will work well and in economic terms should be feasible in many cases where experience drop structures can be eliminated with such a system.

The interesting aspect of this study will be the farmer response to it and the training required to gain his acceptance of it. In my opinion, the 400 acre experiment is far in excess of that needed to prove the technology. I doubt that all the necessary lines will be constructed within the next 2 or 3 years. Presently there does not appear to be enough good quality concrete pipe in Sri Lanka to even construct one field channel. MDB is considering buying a concrete pipe machine in order to provide the necessary pipe.

At any rate, this technology should definitely be tested. In my opinion, if done carefully and presented to the farmer as a tool, rather than a water control device to keep him from getting too much water, it will be successful.

6. Monitoring and Quality Control

Several months ago a quality control unit was established for System H. During the April 79 Mission, the importance of this unit was emphasized. Although this Mission did not specifically review the units progress and present work load, it is apparent that not enough emphasis (time, persons, equipment) is being given to this function. Continued attention should be given to this important area.

7. Technical Assistance

It is encouraging to see that MDB is using expatriate technical assistance where needed and certainly not in an extravagant way.

Long term assistance is being used in the area of (1) farm development and the pipeline experiment, (2) farm machinery operation, and (3) overall project implementation. Short term assistance during the past 6 months has included (1) pipeline design, (2) equipment specifications, operation and maintenance, and (3) irrigation water measurement and monitoring.

These advisors are performing an invaluable service to the project as they are assisting with development of procedures and practices which will be continued during project operation and maintenance.

Summary

System H of the Mahaweli Project is progressing according to schedule. In general, work over the past 6 months has been well done. There are several areas where improvement is possible and the Mission and MDB considered and adopted many suggestions for improvement. This report does not cover all items reviewed by the Mission. I have tried to limit my remarks to those areas where I have experience and knowledge. For example, other Missions members spent considerable time reviewing the agricultural extension situation and their report will be incorporated into the final team report.