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WATER RESOURCES SURVEY PROJECT
(Continuation of Consolidated Water Resources Development)

PROJECT NO. 492-11-120-233

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PROGRESS REPORT NO. 50

JANUARY 1, 1971 - MARCH 31, 1971

PREPARED BY
UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

FOR

UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT

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GENERAL INTEREST

Report No. 49, covering the period July 1, 1970 - December 31, 1970 was the last report submitted.

The main item of interest during this quarter was the signing of an amended PIO/T and PROAG for the Water Resources Development Project which provides for a BuRec staff to assist the National Irrigation Administration with the feasibility investigation of the Magat River Project. There is more about this under "Significant Accomplishments".

All members of the team visited the International Rice Research Institute January 29 to become more familiar with the program of the institute. The visit was especially helpful with respect to water requirements, future cropping patterns, and economic analysis of projects under study by the Filipinos. Any visitor to the Philippine Island that is in anyway associated with agriculture should allow time to visit the IIRI. Their work is very impressive, and is obviously of benefit to all rice growing countries.

Several field trips were taken during the quarter on the projects of Upper Pampanga, Magat, Baloc Groundwater, and Water Management of the Angat River Irrigation System. These are covered in more detail under "Significant Accomplishments".

Irrigation Operation and Maintenance Bulletins were requested from the Chief, Division of Water O & M, BuRec, Denver, so that the National Irrigation Administration could supply each of its eight Regional Engineers with a copy. The bulletins were received and arrangements were made with the Chief, O & M Branch of the NIA to make the distribution. The NIA operates and maintains over 100 systems in the country, ranging in size from 130 hectares to 33,200 hectares, so the bulleting are expected to be of help to the engineers in the field.

Visitors to the project office during the quarter included: Jean Vanier, Area representative for Compagne Generale Geophysique to discuss possible geophysical studies that may be required in our studies; Messrs. Kaser and Welker of Harza Engineering to discuss general project planning in the Philippines; and Mr. Van Riper of Wheeler and Gray consultants to discuss Philippine project planning problems and to explain the Amer-Asia Consultants Inc. which is a consortium of U.S. consultants to do work in Asia.

Arrangements were initiated to send a member of the National Irrigation Administration, who is to be in charge of the Magat River

Project investigation, to the U.S. for about 8 weeks to observe the BuRec project investigation organization and system. It is planned to complete arrangements so that travel can be commenced in June 1971.

No changes in personnel occurred during the quarter.

The Project Engineer was appointed to a committee within the National Food and Agriculture Council that is concerned with establishing "Irrigation Cooperatives" throughout the country. The cooperatives are designed to enable a group of farmers to manage, operate, and maintain an irrigation system. One meeting of the committee has been held, principally for organizing and orienting the committee.

An operating budget for FY 1971 was received by the Bureau of Public Works during the quarter which permits the purchase of gasoline and other items, and provides per diem for Filipino personnel for the remainder of FY 1971. That appropriation eases the situation considerably and we hope that now the stream gaging program can be reinstated, aerial photography on Balog-Balog project can be rectified, and other needed work accomplished.

No action has been taken on Senate Bill No. 512 to authorize the creation of a GOP National Water Resources Development Commission. We were requested by the Chief, Water Resources Division, BPW, to prepare comments on the bill. A memo of comments, mostly favoring the bill, was prepared and given to the BPW on January 29, 1971

Weather during the quarter has been generally excellent for field work. Very little rain has occurred and the temperature has been lower than normal.

SIGNIFICANT ACCOMPLISHMENTS

General:

In general the efforts of the BuRec team for the Water Resources Survey Project have been directed toward assisting the Bureau of Public Works on the feasibility studies of the Balog-Balog and the Balintingon projects; stream gaging programs; assisting the BPW, the National Food and Agriculture Council, and USAID Office of Rural Development in the construction of four groundwater wells in the Baloc area of Nueva Ecija province; assisting the Upper Pampanga River Project with land classification of the project; working with the National Irrigation Administration on a plan to make a feasibility study of the Magat River Project; and miscellaneous assignments for USAID and the GOP.

Balog-Balog Study

The proposed Balog-Balog Project is a single purpose irrigation project on the Tarlac River in Tarlac Province north of Manila on Luzon Island. A reservoir with active storage of about 550,000,000 cubic meters (446,000 acre feet) would provide a full supply of dry season water and supplemental wet season water to an area of about 25,000 hectares.

Investigation of the Balog-Balog Project by the BPW Investigation and Design Branch resulted in completion at the end of 1970 of drafts of the Water Supply, Geology, and Designs and Estimates Appendices, and a draft of the report.

A meeting was held on February 12, 1971 with the BPW Chief, Division of Water Resources and the Chief and some staff members of the Investigations and Design Branch to determine what the BuRec team could do to assist in completing the study. We were requested to review the report and the appendix on water supply and designs and estimates which we agreed to do. The appendixes on Water Supply and Designs and Estimates were reviewed, and the report draft was reviewed, and written comments on all three documents were provided the Chief, Project Investigation and Design Branch. Many comments and suggestions were presented to make the report an acceptable document, from our point of view, for feasibility type study. The comments on water supply have been discussed thoroughly and the appendix is being revised. One comment on the Design and Estimate appendix has been discussed, but no other questions have been raised by the BPW personnel. Hopefully our comments will be of some assistance to the BPW in finalizing the report and appendixes. There may develop a need to send the Design and Estimate Appendix to the BuRec Denver office for further review, after the appendix is revised by our comments here.

No land classification has been made and our comments have pointed out the fact that the report cannot achieve feasibility status until the classification has been completed and all other studies made compatible therewith. Funds are now available (since Feb. 1971) from the FY 1971 operating budget to begin land classification of the project. Field surveys have been started to obtain picture point control needed for rectification of aerial photographs which will be used for a semi-detailed land classification. Two SPW survey crews and one Bureau of Lands crew each spent about 2 months in the field. Aerial photography is available. Rectification of the photos will be done, then classification of the project lands can begin.

During this quarter a Land Resources Branch was activated in the Water Resources Division consisting of a senior soil technologist, a soil technologist II, and 2 soil technologists I. Two 1970 graduate soils technologists were hired and reported for duty in February 1971. A third man, a soil technician formerly assigned to another branch, was moved to the Land Resources Branch. Negotiations were started to hire an experienced Bureau of Soils employee to head up the branch, but they had not been completed at the end of the quarter. The newly-appointed personnel were put into a training program which included field work on the Upper Pampanga River Project land classification. Following the training period they will be used on the Balog-Balog Project classification.

Balintingon Project

The BuRec staff did not do any work on this project this quarter. The BPW staff has been preparing an area-capacity table for the reservoir, and has been conducting some other miscellaneous office studies.

Stream Gaging Stations

Limited funds have been available on a quarterly basis since January 1 to operate and maintain key gaging stations only in each of the major river basins of the Philippines. Efforts will be made in the quarter beginning April 1 to install a new gage on the Magat River at Oscariz and at the Magat damsite, and also on the diversion canal of the Magat River Irrigation System near its headworks.

The equipment for rating current meters is being repaired and it is expected the rating program will also proceed during the next quarter.

The program still does not appear to meet the requirements of the country and we have had a few brief meetings with responsible personnel to explore the problem and determine what we could do to help. It was concluded that a training program for field personnel was needed and we agreed to assist in holding a seminar for the 14 area hydrographers, to review their programs, and to instruct them in stream gaging procedures. It is hoped that our services are used before the Project Hydrologist leaves near the end of May (His replacement is expected about July 1, 1971).

Groundwater Study Project

USAID Office of Rural Development (ORD) has been cooperating with the GOP National Food and Agriculture Council (NFAC) on a groundwater study in Nueva Ecija province near Baloc. The program is designed to demonstrate the difference in well types (deep well turbine pumps versus shallow well centrifugal suction lift pumps) by constructing the wells, operating and maintaining the wells, and managing the

available water, all in a comparable manner so the best type of pump can be proven. It is planned by USAID and NFAC that each well will be used to serve a separate area, and detail records will be kept of all elements involved in the operations. The objective is to demonstrate more economical methods of irrigation pumping than are presently in use, and to have the area available to the local farmers to observe and review the research.

The BuRec team has assisted the BPW Groundwater Branch in the design and construction of the four production wells. The four wells have been completed as gravel-packed wells. Turbine pumps and diesel engines have been installed on wells 1 and 3 and a centrifugal pump and diesel engine has been installed on well 2. Well 4 was completed late in February and a turbine pump and diesel engine has been designed and bids received. The pump will be installed in April 1971. This will complete the assignment of the BuRec team on this particular project.

The production wells are expected to yield as follows:

Well No. 1 - 750 gallons per minute

Well No. 2 - 200 gallons per minute

(This well would yield about 550 gpm with a turbine pump but can only yield about 200 gpm in the dry season with a centrifugal pump).

Well No. 3 - 450 gallons per minute

Well No. 4 - 800 gallons per minute

Upper Pampanga River Project

Land classification fieldwork consisted mostly of checking completed field maps for accuracy and completeness. During the quarter about 250 maps were checked, and as of March 31 only about 60 maps remained to be checked.

Flood areas were identified in the field and revisions were made of land classes to reflect flood conditions. It is not possible to visit flooded areas during the flood season, so this was done after flood waters receded. Identification was made by visual observation of flood damage and by farmer interviews.

Field permeability tests were made to support the land classification and to obtain basic data of drainability. These tests, made at 24 sites on representative project soils, were done by approved

BuRec procedures using the "pump-out" method where there is a water table and the "pump-in" method where no water table is present within about 2-1/2 meters of the ground surface.

Laboratory work necessary to support the land classification did not proceed on schedule. The Bureau of Soils and the University of the Philippines were unable to do the work requested of them because of other higher priority work and/or lack of chemicals and equipment to make the tests. The project field soils laboratory at Cabanatuan City, although completed in the previous quarter, began operating only on a very limited scale. Their equipment arrived, but there was a problem in getting proper electrical wiring installed. The BPW central soil and water laboratory in Manila did not begin making lab analyses of soil samples due to lack of equipment and chemicals. (See "Bureau of Public Works Soils Laboratory")

Office work consisted of making hectarage measurements and tabulations and preparation of land classification maps of priority areas specified by the design engineers. Field work and map preparation was accomplished according to these priority areas in order that maps could be furnished to the design engineers to expedite their work.

Other office work included preliminary preparation of a project land classification map suitable for inclusion in the lands appendix report and also preliminary write up to parts of the report.

UPRP Lands Appendix Report, tentatively scheduled for completion and transmittal to the World Bank in July, 1971, fell behind schedule during the quarter because of failure to get soil laboratory testing done as needed. This may result in a delay in report completion. It is believed that a minimum of 3 months will be required to perform the necessary soil analyses.

Bureau of Public Works Soils Laboratory

Under PIO/C No. 492-233-8-90279 dated May 8, 1970, authorized by the FY 1969 PROAG dated May 9, 1969, the BuRec has been acquiring \$15,000 worth of land classification laboratory equipment for the BPW laboratory in Manila. The purpose of the new equipment is to expand the laboratory to a central soil and water quality laboratory capable of performing all soil and water analysis necessary to support water resources planning activities. A majority of the equipment had been received by the end of 1970 and additional equipment was received this quarter. The last report (No. 49) indicated that there may be some possibility that the GOP might want the laboratory equipment installed in the NIA laboratory rather than in the

BPW lab; however no steps were taken by the GOP to make the change so the equipment is being installed in the original intended location at the BPW lab. Very little soils laboratory work was accomplished during the quarter because considerable rewiring and remodeling (some of which was started this quarter) is necessary to accommodate the equipment; the BPW has no qualified soil chemist on their staff, nor anyone with any training in soil chemistry; nor do they have any laboratory personnel with experience or training in operating their spectrophotometer and flame photometer. Preliminary arrangements were made late in March for some training in operation and maintenance of this equipment by the marketing and servicing firm. The Project Soil Scientist learned of the availability of a soil chemist and the Chief, Division of Water Resources was informed of the prospect.

There is a lack of proper chemicals in the laboratory and it appears some difficulty may be encountered in their acquisition. A list of required chemicals is being prepared, and those available locally will be determined. It is planned that the BPW will acquire those available locally from the 8000 peso budget for chemicals, and the remainder will be ordered under the PIO/C for land classification laboratory equipment. It is hoped that the laboratory problems can be resolved and the lab made operable in the near future as the Upper Pampanga Project land classification appendix is dependent to a large extent upon the lab analysis. In view of the delay already experienced in getting the lab operating it is apparent that the UPRP appendix will be delayed.

Magat River Project Investigations

The most significant accomplishment this quarter was the signing on March 24, 1971 of the Project Agreement and the Project Implementation Order that provides for the BuRec team to be enlarged to assist the NIA with the Magat investigation. The documents provide for the continued grant funding by USAID of the Project Engineer and Project Hydrologist, the continued loan funding of the Soils Scientist and a Drainage Engineer, and the new loan funding of a Field Engineer for two years and temporary duty of an economist, geologist, and 3 designers for a total of about 20 months. Recruitment of the Field Engineer and Drainage Engineer has been initiated.

Other progress on the study has been very slow, one reason being that work could not commence on many aspects until it was positive that the GOP would enter into a project agreement. Now that the agreement is signed many parts of the study can be started; however, NIA has not yet had its budget released for the work so no staff has been assigned to the job nor has any equipment been made available.

Several meetings were attended during the quarter, the most important of which was a meeting with representatives of the Central Luzon Cagayan Valley Authority (CLCVA). The CLCVA has been responsible for the Magat investigation up to this time and they possess all of the data and studies, as well as the supporting data for the preliminary report put out in 1967 by a Japanese consulting firm. The meeting was held in an attempt by NIA to obtain those studies and data and to obtain the support and assistance of the CLCVA in making the feasibility study. The meeting did not yield any results, but the way was opened for a meeting between the Administrator, NIA, and the Manager, CLCVA, to discuss the problem. The second meeting has not been held, so the previous studies are still unavailable to the NIA staff and the BuRec team.

The BuRec team visited the Magat Project area February 1 to 4, along with the NIA Chief of the investigation and representatives of the UNDP Soil Fertility Study project. A general survey of the entire area was made, including existing irrigation systems and proposed structure sites. Several soil borings were also made and the water management research test plots were visited and analyzed. Field men that have worked on the project were interviewed and it was made obvious by them that considerable work has been done on the project; so it is imperative that the studies and data be made available to the NIA before new studies are commenced.

Discussions of numerous other details of the study occurred during the quarter, including Filipino personnel requirements, equipment and vehicles, aerial mapping, land classification specifications, etc. A small area (about 3000 or 4000 hectares) is now covered by aerial photography so as soon as funds are available land classification can commence.

In anticipation of the Bureau's participation in the Magat Project feasibility studies the Project Hydrologist spent time reviewing the available data on water requirements of rice and diversified crops, particularly the data collected on pilot areas, operated in connection with the "Water Management Project in the Philippines". On the basis of these data he has tentatively computed the unit daily and monthly water requirements for a 2 rice crop cropping pattern in the project area, and prepared a preliminary draft of the water requirement chapter of the appendix. In doing this, he has collaborated with a BPW hydrologist that will supposedly be the hydrologist on the Magat Study.

Training

Training with the objective of developing land classification capability in the GOP continued this quarter, as in previous quarters in 1970, through on-the-job work on the UPRP reconnaissance land classification. Field checking of completed maps offered the trainees an opportunity to critique their own work and work of others. Excellent cooperation and willingness to learn has been shown by the individual trainees.

Training of engineers in BPW and NIA continued as a part of the regular work program in assisting the Filipino engineers with their studies and reports. No special training classes were held.