PD-AAR-742 1 ~~4920~~ 23300 5306

Project Completion Report

Project Title : Water Resources Survey

Project Number : 492-11-995-159

Project Duration :

Planned: Fiscal Years 1962 through 1967

Actual : Fiscal Years 1962 through 1968

ISN=24931

I BACKGROUND SITUATION:

Serious flood losses in Central Luzon occurring in August 1960 prompted the President of the Philippines to request external expertise in planning a GOP flood control program. Accordingly, Harold E. Hedger, an ICA short-term flood control consultant, was called upon to conduct a pilot survey in the Central Luzon Basin. Hedger's scope of work was subsequently expanded to cover aspects of water utilization other than flood control not only in Central Luzon but also in five other major river basins in the Philippines.

Hedger's findings highlighted the fact that past GOP water utilization activities were, by and large, single-purpose undertakings. Lacking was a comprehensive multi-purpose approach fo water resources development which would inter-relate hydro-power, irrigation, flood control, domestic and industrial water supply, water-based recreation and fisheries development.

Hedger established the need for a water resources survey to be conducted by a qualified team of experts. From this survey, development plans for the major river basins in the Philippines could be drawn up. Hedger cited the need for more and better basic hydrologic data and the correction of the uncoordinated and wasteful involvement of GOP agencies in water resources planning. He recommended an evaluation of existing GOP reports, data and activities in the area of water control and development prior to the conduct of a water resources survey.

Hedger's recommendations were favorably endorsed by the GOP Department of Public Works and Communications and the National Economic Council. Accordingly, USAID assistance was sought in providing the technical services for a water resources survey. In turn, USAID entered into a participating agency Service agreement (PASA) with the U.S. Bureau of Reclamation (U.S. BuRec) whereby the latter would provide a water resources survey team and other consulting services required under this project.

Best Available Document

II PROJECT TARGETS AND GOAL PLAN OBJECTIVES:

The purpose of this project was to formulate plans for river basin development and prepare comprehensive reports outlining plans and recommendations for multi-purpose development of the seven river basins investigated. In the process, GOP capabilities in comprehensive planning and development of Philippine water resources were to be developed.

The team of consultants provided by the U.S. Bureau of Reclamation was to review and evaluate existing GOP data, studies and activities on water resources development; undertake reconnaissance surveys of, and recommend a comprehensive action program for, each of the seven river basins included in the project. Where available data permitted, the team was to initiate and if feasible, complete detailed investigations towards the formulation of comprehensive river basin development plans. The river basins to be surveyed were the Pampanga, Agno, Cagayan and Bicol in Luzon; the Agusan and Cotabato in Mindanao; and the Ilog-Hilabangan in Negros.

In addition, the BuRec team was to prepare a manual of principles and procedures for GOP agencies involved in the planning and development of the country's water resources. Lastly, the team was to recommend legislative and administrative changes towards the systematic planning and execution of GOP water development programs.

III RESOURCES EMPLOYED:

Total Project Financial Expenditures:

U.S. Dollars	$1,824,245
U.S. Owned Local Currency	-
Operating Country Cash Contribution	-
Philippine Counterpart Funds (₱3.90-$1.00)	2,402,926
Other Donors	-
Total	$4,227,171

USAID financial contribution to this project amounted to $1,824,245 and was expended for technical services ($824,416), for commodities ($561,294), for aerial mapping ($350,000) and for the participant training program ($88,535). Philippine counterpart funds estimated at $2,402,926 covered the costs of the ground control surveys, damsite drilling, geologic mapping, the establishment of additional and the improvement, servicing and maintenance of existing weather, evaporation,

sediment and stream gaging stations, housing and local travel of the BuRec technicians and the international travel of twenty Filipino trainees.

IV APPRAISAL OF RESULTS:

Under this project, seven major river basins in the Philippines namely, the Central Luzon (Agno and Pampanga), Cagayan, Bicol, Cotabato, Agusan and Ilog-Hilabangan River Basins were surveyed. The findings, including an evaluation of related GOP data, studies and activities and a recommended action program were contained in the individual reports published as a result of the survey.

Inadequate or non-existent basic engineering, hydrologic, geologic, soils and economic data precluded the formulation of a comprehensive basic plan for the Cagayan, Bicol, Cotabato, Agusan and Ilog-Hilabangan River Basins. The reports on these five river basins were therefore, limited to basin inventories. The five reports, specified potential dam and reservoir sites that merited further investigation and delineated potential areas for irrigation, fish conservation and water-based recreational facilities. In addition, a systematic program for stream gaging, groundwater exploration and mapping was recommended for each basin so that if properly implemented by the GOP, the required basic data for the multi-purpose development of these river basins would be available in the future.

The report on the Central Luzon Basin proposed eleven interrelated but separate multi-purpose water storage and regulation projects. Compared to the reconnaissance-grade reports on the other five river basins, the Central Luzon Basin report contained more substantive technical findings and recommendations but, except for the Upper Pampanga River project, would still require feasibility-grade refinements prior to GOP implementation. The Central Luzon Basin when fully developed, was projected to provide year-round irrigation to nearly 300,000 hectares of land and supply municipal and industrial water requirements of the area through year 2010. Additionally, the basin would provide facilities for flood control, hydroelectric power generation, fish conservation and water-based recreation. Based on 1965 prices, the cost-benefit ratio of the overall plan of basin development would be 1:1.86, according to the report.

The Upper Pampanga River project report contained sufficiently detailed technical and economic data to establish the project's feasibility and projected a construction schedule, along with priorities. The facilities, if constructed would provide water for irrigation, municipal and industrial use, electric power, fish conservation and recreation, in addition to some control and regulation of floods on the Pampanga River. The project was estimated to have a cost-benefit ratio of 1:4.5. As the proposed plan for the Upper Pampanga River

project was of feasibility-grade, the Philippine Government initiated negotiations for financing with the IBRD in 1967. While the World Bank has committed a $34 million loan for the irrigation phase of the project, other phases of the development plan are pending future GOP loan negotiations. Ongoing GOP activities towards the implementation of the Upper Pampanga River development program are the construction of an access road to the damsite and the initiation of pre-construction surveys of the damsite and other project features, resettlement studies, and finalizing the engineering plans.

In addition to the reports made on the seven major river basins, the U.S. BuRec team prepared a manual of principles and procedures to guide GOP agencies in the multi-purpose planning and development of the country's water resources. Moreover, legislative and administrative changes required for the effective implementation of these principles and procedures were recommended.

Filipino technicians from the flood control and hydrology divisions of the Bureau of Public Works were given on-the-job training and conducting investigations towards the scientific planning and evaluation of water resources development programs. Under the participant training program, twenty Filipino engineers and geologists were sent to the United States for specialized training in engineering surveys and field investigations, engineering geology, flood control, surface and groundwater hydrology, river basin development and engineering works design. Project funds were also used to purchase hydrologic equipment, instruments and supplies required in the surface and groundwater investigations conducted in the seven river basins.

The Philippine Government, on the other hand, provided counterpart personnel, ancillary equipment and topographic maps; established and improved a number of weather, evaporation, sediment and steam gaging stations; and financed the ground control surveys. These GOP inputs, however, were provided at a slow pace, due primarily to inadequate funds. Specifically, delays both in the damsite mapping done principally by the Philippine Bureau of Coast and Geodetic Survey and in the ground control surveys commissioned to Filipino private contractors affected the project's over-all progress. Changes in Scope of Work and unfavorable weather conditions were also factors contributing to delay.

On balance, the U.S. technical, training and commodity assistance given to this project achieved the purposes for which they were intended. The Philippine Government provided the necessary inputs for the completion of this project but has yet to implement fully the recommendations resulting from this six-year project. With the loan commitment from the World Bank, prospects for the eventual development of the Upper Pampanga River Basin are bright. On the other hand, the development of other potential projects in the Central Luzon and those in the other five river basins under this project should be continued as substantive technical data

warrant and funds are made available for feasibility-grade surveys of these river basins.

V NAME, TITLE, AND PARENT AGENCY/COMPANY OF:

Chief U.S. Project Officer:

John B. Delaney, Chief, Public Works Division, USAID

Other U.S. Project Officers/Technicians:

Donald R. Burnett, Project Engineer and Team Leader, US BuRec

Daryl L. Roberts, Deputy Project Engineer and Hydroelectric Power Engineer, US BuRec

Henry M. Seipt, Jr., Irrigation Engineer, US BuRec

Carl J. Hoffman, Design Engineer, US BuRec

Murray J. Athearn, Geologist, US BuRec

Wayne V. Halliday, Hydrologist, US BuRec

William W. Fager, Agriculturist, US BuRec

Henry L. Lumpee, Administrative Officer, US BuRec

Major Philippine Officials:

Cornelio Balmaceda, Chairman, NEC

Brigido Valencia, Secretary, Department of Public Works and Communications

Alejandro B. Delena, Director, Bureau of Public Works

THIS PROJECT COMPLETION REPORT IS HEREBY APPROVED:

For USAID/Philippines:

Signature: Charles W. Terry

Name: Charles W. Terry

Title: Acting Director

Parent Agency (NOT INITIALS):

United States Agency for International Development

Date:

For the Republic of the Philippines:

Signature: Gerardo P. Sicat

Name: Gerardo P. Sicat

Title: Chairman

Organization (NOT INITIALS):

National Economic Council

Date: 6/11/71

Clearances: USAID/Philippines:

Office of Industrial Development: William C. Larson, Acting Manager

Date: 3/3/71

Office of the Controller: Grover S. Robinson, Controller

Date: 3/5/71

Program Office: Roy L. Wagner, Program Officer

Date: 3/8/71