

AGENCY FOR INTERNATIONAL DEVELOPMENT
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OFFICE OF THE AUDITOR GENERAL
AREA AUDITOR GENERAL - EAST ASIA

AUDIT REPORT

USOM/THAILAND

WATER RESOURCES PROJECTS

POTABLE WATER PROJECT
NO. 493-11-521-186

LABOR INTENSIVE WATER RESOURCES PROJECT
NO. 493-11-120-206

Period Covered by Audit: Terminal
As of March 31, 1972

Audit Report No. 8-493-73-3

Date Report Issued: JUL 19 1972

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AUDIT REPORT

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WATER RESOURCES PROJECTS

POTABLE WATER PROJECT

NO. 493-11-521-186

LABOR INTENSIVE WATER RESOURCES PROJECT

NO. 493-11-120-206

I. SCOPE OF EXAMINATION

We have performed a terminal audit of two water resources projects, Potable Water Project No. 493-11-521-186 and Labor Intensive Water Resources Project No. 493-11-120-206, both administered by the USOM Office of Field Operations (O/FO). The audit was performed in accordance with the provisions of AID Manual Order No. 793.1, "Audit of Technical Assistance", for the purpose of following project implementation, verifying compliance with agreement terms and applicable AID regulations. The audit included a review of records maintained by USOM and Government of Thailand (RTG), discussions with USOM and RTG officials, visits to various project sites and other audit procedures deemed necessary. We visited a total of 30 RTG offices and establishments located in three major cities (Bangkok, Khon Kaen, Nakhon Ratchasima) and throughout nine chang-wats (provinces): Nakhon Ratchasima, Khon Kaen, Udon, Sakon Nakhon, Nakhon Phanom, Ubon, Yasothron, Roi Et, and Maha Sarakham. The audit covered the periods January 1, 1969, to March 31, 1972 (Potable Water Project) and June 30, 1968, to March 31, 1972 (Labor Intensive Water Project).

Significant matters disclosed by the audit are presented in Section V, Findings and Recommendations. Major findings are summarized in Section III.

II. BACKGROUND INFORMATION

Potable Water Project No. 493-11-521-186

This project was initiated April 27, 1966, for the purpose of assisting the Sanitary Engineering Division (SED), Ministry of Public Health, to develop the capacity to plan, design, construct and maintain a network of potable water systems in the Accelerated Rural Development (ARD) changwats. The project aimed to construct, by 1971, approximately 250 water systems reaching 600 villages and a population to 600,000 to 1,000,000.

Since inception, the project has been administered by three USOM offices: Office of Health and Population Planning (O/HPP), April 1966 through CY 1967; Office of Economic Development and Investment (O/EDI), CY 1968 through the first quarter of 1970; and Office of Field Operations (O/FO), since the 2nd quarter of 1970. U.S. dollar assistance to the project ended with the FY 1970 Project Agreement (ProAg). AID assistance to the project consisted of U.S. advisory services, participant training, commodities, and an AID-financed contract (No. AID-493-14) with Tippets, Abbett, McCarthy, Stratton (TAMS). The AID-financed, cost-plus-fee contract (\$617,626) was executed August 17, 1966, between the RTG and TAMS for the purpose of TAMS providing engineering advisory training to SED personnel, and was completed on August 16, 1969.

The financial status of the project as of March 31, 1972, was:

	<u>Obligated</u>	<u>Accrued Expenditures</u>	<u>Balance</u>
U.S. Contribution	<u>\$ 2,992,253</u>	<u>\$ 2,976,185</u>	<u>\$ 16,068</u>
	<u>ProAg Budget</u>	<u>Withdrawn</u>	<u>Expenditures</u>
RTG Contribution - Counterpart Funds (B20 equals \$1.00)	<u>B42,915,274</u>	<u>B42,646,596</u>	<u>B38,013,025</u>

Exhibit I contains additional financial information on the project.

Labor Intensive Water Resources Project No. 493-11-120-206

This project was initiated on June 30, 1968, for the purpose of assisting the RTG in stimulating the economy of Northeast Thailand by providing irrigation water to farmers and employment to local laborers by constructing and rehabilitating reservoirs and distribution systems. The project objectives provide for the Royal Irrigation Department (RID), Ministry of National Development to construct 12 reservoirs and to rehabilitate 18 reservoirs including distribution systems by December 31, 1972. RID would stimulate employment in these areas by employing approximately 8,300 local laborers.

The project was initially administered by O/EDI through February 1970, at which time O/FO assumed the administrative responsibility. U.S. dollar assistance to this project ended with the FY 1971 ProAg. AID assistance to this project consisted of U.S. advisory services, participant training, and commodities.

The financial status of this project as of March 31, 1972, was:

	<u>Obligated</u>	<u>Accrued Expenditures</u>	<u>Balance</u>
U.S. Contribution	<u>\$1,191,656</u>	<u>\$1,160,340</u>	<u>\$31,316</u>

No counterpart funds were provided to the project. We were informed by RID, however, that ฿56 million (U.S. equivalent \$2.8 million) was contributed to the project from its regular budget. Exhibit II contains additional financial information on the project.

III. SUMMARY OF MAJOR FINDINGS

Audit findings are discussed in detail in Section V. We summarize below those findings which we consider most significant.

Potable Water Project:

The SED has fallen behind in its effort to sustain the potable water systems after the phase out of U.S. dollar assistance (Para. V, A); and legal problems, RTG funding limitations, and SED operating conditions and practices have hampered the usage of AID-financed commodities (Para. V, B).

Labor Intensive Water Resources Project:

Project objectives for constructing and rehabilitating water reservoirs were not met because of RTG budgetary limitations (Para. V, C); and project commodities were not effectively used because of lack of coordination and monitorship (Para. V, D).

IV. FOLLOW-UP ON PRIOR AUDITS

There are no recommendations outstanding from the last prior Audit Report No. 69-12 of the Potable Water Project issued on June 9, 1969, which covered the period April 7, 1966, to December 31, 1968.

There has been no prior audit of the Labor Intensive Water Resources Project.

V. FINDINGS AND RECOMMENDATIONS

A. Continued Operations of Potable Water Systems

SED efforts to sustain the potable water program since the phase out of U.S. dollar assistance have been unsatisfactory. Maintenance and repair problems stemming from a shortage of mechanics; insufficient operating funds, and inadequate support by villagers have contributed to this condition. As a result, numerous water treatment plants were inoperative, minimizing accomplishment of the project objective to provide villagers with potable water for betterment of their health.

Project cancelled ~~by~~ with 71 funding
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We visited 22 water treatment plants and found 11 inoperative, and six operating on a limited basis, see Exhibit III. SED officials in Khon Kaen told us that there were at least another 31 inoperative water plants of the 116 under their jurisdiction. As was the case at water plants visited, mechanical breakdowns and problems in collecting water fees were the prime causes for systems not operating.

The acute shortage of plant maintenance technicians is a factor contributing to the inoperative water systems. In Khon Kaen, SED officials stated that as a minimum, a maintenance team consisting of one technician and one mechanic helper was required for each of the nine changwats under their jurisdiction. Currently, staffing is 55% below the desired level, consisting of only four teams for the nine changwats. Our review at SED Headquarters in Bangkok revealed that SED lost many field personnel when counterpart funding was discontinued after U.S. assistance was ended. Although 17 additional field operations personnel were hired by SED to be funded from its regular RTG budget, 36 field operations personnel previously funded out of counterpart funds were dismissed. Dismissal of engineers, construction technicians, mechanics, mechanic helpers and laborers that are needed in plant operations undoubtedly contributed to the problems of plant maintenance. In this connection, we noted that USOM issued a Staff Notice (No. 71-261 dated April 9, 1971), listing criteria that should be kept in mind by drafters of ProAgs to ensure that a continuance of project activities are accomplished by the RTG after U.S. assistance ends.

Another factor hampering the potable water program is the lack of villager support of the water systems. Failure to adequately pay plant operators and maintain plants continues to plague the program. A limited number of water users and difficulties in collecting water charges, due to poor village economic conditions, have precluded the generation of sufficient revenue to operate and maintain the water plants. In one instance, an operator received no monetary compensation over a two-year period. In another instance, the

amount of an operator's salary payment was dependent upon availability of funds. Villagers also told us that operators have left after breakdowns at water plants because of dissatisfaction with their meager salaries. Maintenance teams told us that their pleas to villagers to purchase lubricating oil, oil filters and other necessary items for preventative maintenance were frequently ignored. As a result, preventive maintenance was unsatisfactory, as evidenced by the excessive amount of inoperative equipment.

There is no easy solution to these maintenance and operation problems of water plants, especially when causes are varied. Nonetheless, there is a need to provide guidance to SED in the area of operation and maintenance of water plants.

Recommendation No. 1

We recommend that USOM/Thailand review, with SED, problems relating to operation and maintenance of water plants for the purpose of advising SED on possible solutions to these problems.

B. Commodities - Potable Water Project

Legal problems connected with payment of sales commission, RTG funding limitations, and SED operating conditions and practices have hampered the effective usage of AID financed commodities totalling \$629,894. Details of problems related to commodity utilization are as follows:

1. ONAN Engines

There were \$348,782 of commodities consisting of 360 ONAN engines, 28 ONAN generating plants, and related parts in storage at a local distributor's warehouse (United Machinery) since March 16, 1970, over a dispute regarding sales commission to the distributor. This situation was reported in our last prior audit of Port Clearance Operations, Audit Report No. 8-493-72-42

issued on September 14, 1971. Our review disclosed that the RTG was preparing the necessary documents for initiating legal action against the distributor to have the commodities released to the project. Meanwhile, SED officials informed us that, the overhauling of over 300 engines has been unduly delayed, since the above distressed engines were intended to be used while old engines were being overhauled, and diesel engines in many cases were to replace gasoline engines for heavy duty service.

Although USOM has been working vigorously on this problem, there has been no significant progress to get the engines released to the project. We were told that the Department of Technical and Economic Cooperation turned the matter over to the Public Prosecutor's Office over a year ago to initiate legal action against United Machinery Co. for possession of the engines. We understand a good portion of the delay is caused by the necessity for translating the bid documents and relevant correspondence, including portions of Regulation 1, into Thai, as this is the official court language.

We further understand that the action, proposed to be taken by the Public Prosecutor's Office in its case against United Machinery, includes the filing of an urgent motion for possession of the engines on grounds of public interest pending resolution of the issues in the main case relating to the wrongful withholding of the engines by United Machinery. This action, if successful, will enable the Thai Government to get the engines immediately upon filing of its suit, rather than await the results of what might be a long and protracted period of litigation. Accordingly, no recommendation is deemed necessary at this time.

2. Water Pumps with Electric Motors

When we visited Khon Kaen in March 1972, 132 water pumps with electric motors, cost \$74,686, had been in storage in Khon Kaen for 15 months or more because of a lack of R7 funds necessary to make them

operational. There were 68 Westinghouse Centrifugal pumps and 48 Westinghouse Submersible pumps in storage since November 1970; and 16 Peerless Centrifugal pumps in storage since December 1968.

This equipment, intended for converting certain deep well pumps from diesel drive to electric drive, had never been used, because local currency funds to purchase necessary transformers to operate the equipment have not been made available. A SED official told us that, approximately ฿30,000 to ฿50,000 (\$1,500 to \$2,500) was required to purchase and set up a transformer, and until such time as RTG provides such funds, this equipment cannot be used.

3. Water Pumps with Engines

Warehouse records showed that there were 175 Peerless pumps with Wisconsin gasoline engines and 77 ONAN pumps with diesel engines, cost \$206,426, stored in Khon Kaen. At the time of our visit, the warehouse was in an untidy condition and we were unable to verify the exact number of pumps stored.

Only 87 of the 262 Peerless deep well pumps that arrived in country on June 30, 1969, have been issued because of the limited use of deep wells as a source of water. SED officials told us that usage of deep well pumps in the future would be limited, since few of the newly constructed water plants use deep wells.

We were told by a SED official at the warehouse that 44 of the 77 ONAN pumps that arrived in country during November 1970, have been set aside for newly constructed water plants and will be used in the near future. SED Bangkok told us that of the remaining 33 pumps, an undisclosed number were not usable as units, because the engine components had been removed to replace broken engines in the field. During the audit we informed O/FO of this condition and O/FO is now investigating the matter in detail to determine the basic cause leading to the condition.

Recommendation No. 2

We recommend that USOM/Thailand review with SED, plans for utilizing pumps in storage identified above and initiate action to have pumps that are not to be used in the near future transferred to another area where they can be effectively used.

C. Labor Intensive Water - Project Objectives

It is unlikely that the Labor Intensive Water Project will meet its goal of constructing 12 water reservoirs, rehabilitating 18 reservoirs, and employing 8,300 laborers by December 31, 1972. Lack of RTG budgetary support has contributed to this condition. The status of the project as of March 31, 1972, was as follows:

New Construction -- Four water reservoirs have been constructed, and are complete except one for which the water distribution system was incomplete. Four water reservoirs were under construction. (Work was discontinued at one site due to communist insurgency.) Work has not started on the remaining four reservoirs.

Rehabilitation -- The rehabilitation of nine reservoirs was considered completed, and work on the remaining nine has not started.

Employment of Laborers -- The objective of employing 8,300 laborers on the project had not been achieved. RID informed us that total laborers hired on the project was about 4,660.

The RTG cost for constructing 12 water reservoirs was estimated at ₱75.7 million (U.S. equivalent \$3.8 million), but funds provided for constructing reservoirs totalled only ₱48 million (U.S. equivalent \$2.4 million). Furthermore, while ₱8.1 million (U.S. equivalent \$400,000) was provided for rehabilitating the first group of nine reservoirs, the ₱10.4 million (U.S. equivalent \$500,000) estimated cost for rehabilitating the remaining nine reservoirs was never budgeted.

Recommendation No. 3

We recommend that USOM/Thailand urge the RTG to sufficiently budget for the construction and rehabilitation of water reservoirs if economically feasible, for the purpose of meeting project objectives.

D. Commodities - Labor Intensive Water Project

Absence of coordination, lack of monitorship of AID financed commodities, and shortage of a soil engineer have resulted in ineffective use of project commodities valued at \$292,350.

Field Construction Equipment -- During our visit to Pakkret, (Bangkok area) in March 1972, we noted the following commodities under the custody of the Mechanical Division that had been in storage 12 to 17 months after their arrival in Thailand.

<u>Commodity</u>	<u>Qty</u>	<u>Value</u>	<u>Arrived in Thailand</u>
Concrete Mixer	15	\$59,339	Sept. & Oct. 1970
Roller flag, steel			
Gallon 3 to 5 ton	1	4,758	Jun. 1970
Disk plow, John Deere	3	3,077	Sept. 1970
Disk harrow, John Deere ^e	3	5,409	Mar. 1971
Rear blade, John Deere	3	953	Sept. 1970
Jack hammer	4	3,516	Aug. 1970
Vibrator, concrete	6	2,721	Oct. 1970
Concrete breaker	1	252	-
Pump Barnes 4"	2)	5,183	Sept. 1970
Pump Barnes 3"	3)		
Pump Gorman Rupp 4"	4	9,061	Dec. 1970
Pump Gorman Rupp 3"	6	2,346	Dec. 1970
Total	51	\$96,615	

The lack of notification to the RTG project implementing office that the commodities were in country was the reason given for the extended storage period.

RID procedures provide for assumption of custodianship of the commodities (after custom clearance and acceptance inspection) by its Mechanical Division. RID's Operation and Maintenance Division (O&M) maintains commodity control records. Project implementation for utilizing the commodities is vested with the RID Northeast Irrigation Regional Office (NIRO), which is under the Construction Division. Although the equipment is AID-financed, NIRO would not receive the equipment without a request to the Mechanical Division in coordination with the O&M Division. O&M Division had not notified NIRO of the arrival of the commodities; thus, no request was initiated by NIRO for the equipment. We were informed by NIRO officials that they could have used the equipment if they had known that it was in country.

Mobile Water Pumps -- Our visit to Rangsit (Bangkok Area) in March 1972, disclosed that usage of ten mobile water pumps valued at \$169,910 had been limited. RID officials informed us that usage of the ten mobile pumps had been limited because RID possessed another 32 mobile pumps which were sufficient to meet the requests for pumps at Rangsit. We noted that there was a need for mobile pumps at six reservoirs in the Northeast area. A RID official of the Irrigation Association Center (IAC), which is under the O&M Division, confirmed the need for pumps in the Northeast area and stated that the ten mobile pumps (which were earmarked for the Northeast) could be used.

Mobile Soil Test Laboratory Van -- A mobile soil test laboratory van valued at \$25,825 has never been used since it was dispatched to NIRO in January 1971 because of the shortage of a soil engineer. NIRO officials told us that soon after the assignment of a soil engineer to the laboratory, the engineer was transferred to another

post. The van was to be used to perform soil tests at potential construction sites for water reservoirs. We believe that USOM and RID should jointly reassess the need of the above van which has been left idle over a prolonged period.

Recommendation No. 4

We recommend that USOM/Thailand review with RID, the use of equipment identified above and determine if this equipment should be transferred to another area where it can be utilized more effectively.

FINANCIAL STATUS AS OF MARCH 31, 1972

U.S. Contribution

	<u>Obligated</u>	<u>Accrued Expenditures</u>	<u>Balance</u>
Personal Services:			
Direct Hire	\$ 88,033	\$ 88,033	\$ -
PASA	59,506	59,506	-
Contract:			
Tippets, Abbett, McCarthy, Stratton	617,626	617,626	-
Other	6,796	6,796	-
Participants	152,096	136,028	16,068
Commodities	<u>2,068,196</u>	<u>2,068,196</u>	<u>-</u>
Total	<u>\$ 2,992,253</u>	<u>\$ 2,976,185</u>	<u>\$ 16,068</u>

RTG Contribution (฿20 equal \$1.00)

	<u>ProAg Budget</u>	<u>Withdrawn</u>	<u>Expenditures</u>
Trust Funds ^{1/}	฿ 3,222,108	฿ 2,953,430	฿ 2,953,430
Project Account Fund ^{2/}	<u>39,693,166</u>	<u>39,693,166</u>	<u>35,059,595</u>
Total	<u>฿42,915,274</u>	<u>฿42,646,596</u>	<u>฿38,013,025</u>

^{1/} To pay local currency support cost of U.S. employed technicians.

^{2/} To pay all approved local currency costs (other than Trust Funds) for the project.

SOURCE: USOM/Thailand financial records.

LABOR INTENSIVE WATER RESOURCES PROJECT
NO. 493-11-120-206

EXHIBIT II

FINANCIAL STATUS AS OF MARCH 31, 1972

U.S. Contribution

	<u>Obligated</u>	<u>Accrued Expenditures</u>	<u>Balance</u>
Personal Services:			
Direct Hire	\$ 33,365	\$ 32,929	\$ 436
Participants	36,406	28,885	7,521
Commodities	1,121,340	1,097,981	23,359
Other	<u>545</u>	<u>545</u>	<u>-</u>
Total	<u>\$1,191,656</u>	<u>\$1,160,340</u>	<u>\$31,316</u>

SOURCE: USOM/Thailand financial record.

VISITS TO WATER TREATMENT PLANTS
During March 1972

<u>Location</u>	<u>Operating</u>	<u>Limited Operation</u>	<u>Not Operating</u>	<u>Comments</u>
Khon Kaen:				
Ban Phra Kue ✓			X	Engine (ONAN) breakdown - March 1972.
Ban Kud Kwang ✓			X	No water - canal embankment damaged - March 1972.
Udon:				
Ban Nakha			X	Cylinder ring broken (ONAN) - February 1972.
Ban Tong		X		Limited water distribution. Main distribution pipes broken.
Ban Nong Swan			X	Crank shafts broken (2 ONAN) - October 1971 and February 1972.
Nakhon Phanom:				
Ban Takor	X			
Ban Na Kok Kwai			X	Pump (Farriman) broken - 1970.
Ban Nong Yang Chin			X	Pump piston ring (Farriman) broken - January 1972.
Ban Kok Swang			X	Engine (ONAN) and pump (Ruston) broken - April 1971. Also, water distribution pipes broken extensively.
Ban Tong -			X	Abandoned - 1971.
Udon:				
Rai Srisook	X			
Muong Samsib	X			
Ban Amnat			X	Abandoned - February 1971.
Ban Kueng Nai		X		Only 45 out of 697 families use this water system. Water salty and yellowish. Needs filtering unit. Village encountering financial difficulty in supporting this system.

VISITS TO WATER TREATMENT PLANTS
During March 1972

<u>Location</u>	<u>Operating</u>	<u>Limited Operation</u>	<u>Not Operating</u>	<u>Comments</u>
Manasarakham:				
Ban Hua Kwang			X	Engine breakdown - March 1972.
Ban Pang			X	No water distribution pipes.
Sakon Nakhon:				
Ban Rai		X		Operating only 1 hour a day. Broken deep well pipe is too short to pump sufficient water.
Ban Tarrea		X		Only 170 out of 1,300 families use this water system. Villagers cannot afford pipe installation costs. 13 public faucets closed since May 1971 due to difficulty in collecting water fee.
Ban Pang Kone		X		Newly opened water system in March 1972. Only 15 out of 250 families were able to afford water distribution pipes. No public faucets.
Ban Yor		X		Only 140 out of 400 families use this water system. Water salty and yellowish. Filtering unit now under construction. Plant operator, a school janitor receives no pay for plant operation.
Nakhon Rajsim:				
Ban Gudjig	X			
Roi Et:				
Ban Klang	X			
Total	<u>5</u>	<u>6</u>	<u>11</u>	