U. S.

ECONOMIC AND TECHNICAL ASSISTANCE TO THAILAND

UNITED STATES OPERATIONS MISSION
THAILAND

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U.S. ECONOMIC AND TECHNICAL ASSISTANCE TO THAILAND 1950 TO DATE

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General Information

NATURAL RESOURCES

Climate and Topography: Over most of Thailand, a warm wet southwest monsoon lasts from May to November and is followed by the relatively cool and dry northwest monsoon. February to May is the hot, dry season. In the southern peninsular region, it is rainiest during the dry season of the rest of the country. The country can be subdivided into four regions. Central Thailand, which is drained by the important Chao Phya River, is the geographic and economic heart of the country. In the mountainous forested Northern region agriculture is largely limited to the fertile valleys of the Chao Phya tributaries. Farming is difficult in the flat rolling terrain of the Northeastern region because of water supply and soil fertility problems, yet one-third of Thailand's people live in this region and farm at little more than subsistence level. The small elongated Southern region has several sizeable coastal plains as well as a mountain chain running northwest which at times borders on the sea. Thailand is bounded on the north and west by Burma, on the northeast and east by Laos and Cambodia, and on the south by Malaya. It has a long coast line on the Gulf of Thailand and, in the South, on the Indian Ocean.

Area: 198,000 square miles, about the size of Spain, three-fourths the size of Texas.

Agricultural Land: 15 percent of the land area, about average for the Far East. Per capita agricultural land of about 0.9 acres is also about average for the area. The climate and topography favor rice growing which accounts for three-fourths of the cultivated land. Average size of farm is 10 acres; farms in the North are less than half the average for the country. In order of highest average net farm income are the Southern, Central, North and Northeast regions; average net farm income in the Northeast is usually only one-quarter that of the Southern region. More than 80 percent of farmers own their land.

Principal Crops: Rice is by far the largest crop, and Thailand is one of the world's largest rice exporters. Rubber, a major crop, is growing in importance. Cotton, peanuts, fruits, sugar cane, coconuts, tobacco, castor beans, corn, peas cassava, and various fibers (kapok, kenaf, etc.) are also grown.

Forests: About 63 percent of the land is forested (world average 29 percent), but much of this is scrub timber. Teak is the most important forest product.

In the north, lac output is valuable. Much wood goes into charcoal for home consumption. Resins and oils are also extracted from forest trees.

Fisheries: Both salt and fresh water fishing are important in Thailand, as fish is an essential part of the diet and fisheries are the second industry in extent and value. The rivers, canals, ponds, rice fields, and irrigation tanks are good breeding grounds.

Minerals: Tin reserves amount to about 16 percent of the free world total; tungsten reserves are also important. Relatively small deposits of gold, manganese, molybdenum, antimony, asbestos, lead, zinc and copper are found. Limestone, gem stones, and marble are exploited on a small scale. Very large deposits of salt and gypsum are known, and several deposits of high-grade iron ore have been found.

Fuels: Woods, lignite and rice husks are used as sources of energy. Household fuel is mainly charcoal. A large lignite deposit is being worked in the North (Mae Moh) and smaller deposits occur elsewhere in the Kingdom. Thailand's growing requirements for petroleum products are met from imports.

River Resources: The most important river and canal networks are concentrated in the area around Bangkok. There are few sites suitable for power near Bangkok but there are many small potential sites in the North and South. The Yan Hee multipurpose project being developed with World Bank assistance is a major long-term project to exploit the Chao Phya River. The Mekong is being surveyed from the standpoint of regional development. It is one of the world's last unexploited river basins with vast hydro-electric power potentials.

Distribution of GNP: Gross national product is about $93 per capital (compared with $154 for Far East region $2,400 for U.S.). Agriculture contributes about 44 percent of the GNP; trade, finance, commerce and transportation 17 percent; and government and other services 14 percent.

HUMAN RESOURCES

Population: Estimated at a little over 22 million (1947 census showed 17,442,689). About three-quarters of the people are of Thai stock. About 14 percent are of Chinese stock, important in banking, commerce and mining. Persons of Malayan descent amount to 3.5 percent, and there are large minorities of Cambodian, Laotian, and Vietnamese descent, with many Indians in the cities. Annual population growth is a little over 2 percent. Density 110 per square mile, below the Far East average (U.S. 57 per square mile). Major

concentration is in lower plains of central region, minor concentrations in middle of northeast, in portions of southern regions, and in middle of north. People are mostly Buddhist (85-90 percent) with many Muslims, mainly in south. Bangkok, the only major city, has nearly one and a half million people. Male and female populations about equal. Birth rate is about 35 per 1000, death rate about 9 per 1000.

Labor Force: Roughly 85 percent of the people are engaged in activities related to agriculture, forestry, and fisheries, and all but 14 percent of these are rice farmers. Of remainder of labor force, 8 percent are in commerce, 3 percent in services, 2 percent in manufacturing, and 2 percent in others. About 86 percent of population over 14 years old are included in labor force, and 48 percent of labor force are female, mostly in agriculture.

Education: Educational facilities are expanding, and the current literacy rate of about 60 percent is rising. Four years of school attendance was made compulsory in 1932, over 90 percent of children of "compulsory school age" are in school, and four years is the maximum that most children have received. There is an average of one teacher per 200 population (US, one per 120 population). There are about 21,500 primary and primary extension schools, 950 secondary, 200 technical, 35 teacher training and 8 special schools. Five universities have a total enrollment of over 12,000 regular students. The 1947 census showed less than 6,200 college graduates in the Kingdom, but 1,491 graduated in 1956 alone. Students comprise about 16 percent of population (US 20 percent), with over 3.5 million in primary and secondary schools. The growth in school enrollments in Thailand since 1951 has created a demand for trained teachers that far exceeds the supply. Not only is there a shortage of teachers but those already employed are inadequately trained. At least 70% of the teachers have had no formal training for teaching, and of those who have had formal training the majority have had only one year beyond grade 7.

Health: Life expectancy is about 48 years for males, 52 for female. There is an average of one physician to about 700 persons in Bangkok, and one to about 20,000 in the rest of the country. There is an average of one hospital bed to about 290 persons in Bangkok and one to about 5,100 in the rest of the country. In the past eight years 54 hospitals have been built. Per capita daily caloric intake, mostly from polished rice, is adequate, but there are many nutritional diseases because of lack of sufficient vitamins and proteins. Malaria, formerly the main disease problem and No. 1 killer, is now in third place and a program for its eradication is underway. Diseases caused by poor sanitation (dysentery, typhoid, hepatitis, etc.) and internal parasites are prevalent and are now the chief cause of illness and death. Infant death rate is about 56 per 1000 live births, maternal death rate about 5.5 per 1000 live births.

TRANSPORT, POWER AND INDUSTRY

Railroads: About 2200 miles of track radiate to all major regions from Bangkok, making connections with principal Thai cities as well as with Cambodia and Malaya and to the Mekong river near Vientiane, Laos. Carrying about 45 percent of total rail, canal and highway freight, the system is about adequate for current needs although there is large unfilled demand for rolling stock and new construction.

Highways: While roads carried 20 percent of all rail, canal and highway freight in 1956, the 6000-7500 miles of highways need considerable improvements and connecting roads. Roughly 60 percent of total are all-weather roads but few permit carrying heavy loads long distances. Most freight use of roads is to connect with rail and water carriers. A fine modern highway, 148 kilometers long between Saraburi and Korat has been completed by American contractors, shorting the haul from Bangkok to the Northeast by half a day. Hundreds of reinforced concrete bridges are replacing rickety wooden structures on all main highways.

Waterways: River canals carried 20 percent of all rail, canal and highway freight in 1956. The four main canal systems, all in the central plain, are heavily traveled. Great deal of freight moves on Chao Phya River and its tributaries.

Ports: Bangkok is the only large port, opened (by dredging) to ocean-going vessels in 1954.

Air Transportation: Bangkok has a modern air terminal capable of handling modern heavy aircraft and is well served by many international air carriers. Major towns of Thailand are connected by government-owned Thai Airways.

Electric Power: Thermal and diesel power facilities (there is no hydroelectric power) meet minimum needs of Bangkok and larger provincial towns. Per capita output is low despite recent increases in generating capacity. By the end of 1962 the Yan Hee multipurpose hydroelectric project will add 140 MW to generating capacity and will ultimately develop 560 MW as well as provide Thailand with an integrated power system.

Manufacturing: Thailand's small-scale industrial base, devoted to processing rice, rubber and forest products and manufacturing cement, textile bags, textiles, paper, sugar and light consumer goods, is expanding. Lack of power has been large factor in holding back development. Policy of Revolutionary government is to encourage private investment and numbers of foreign manufacturers are showing interest in Thai branches.

Mining: Output of tin and tungsten is of major importance. Iron, gold, and manganese are produced in small quantities. There are important lignite deposits in Northern Thailand and a gypsum mine has recently been developed.

FOREIGN TRADE PATTERN

Exports: While Thailand used to have a large trade surplus, in the last few years exports have about equaled imports and have remained relatively constant. The country is one of the largest exporters of rice. Of total exports, rice accounts for 46 percent (has been as much as 66 percent), with rubber, tin, and teak next in importance. The U.S., Malaya, Singapore, Hong Kong, and Japan are Thailand's best customers.

Imports: Since 1950 imports have shown a strong upward trend due to larger imports of chemicals, fuels, manufactured goods, and machinery and transport equipment. Principal sources of supply are Japan, U.S., Malaya, Singapore, Hong Kong, and the U.K.

GOVERNMENT

The King of Thailand is a constitutional monarch. His Majesty King Phumipol Adulyadej is the ninth King of the Chakri dynasty, which has reigned over Thailand since the establishment of Bangkok as the capital of the Kingdom in 1782. Until 1932 the King had virtually absolute powers. Following establishment of the Constitution, the King exercised his legislative power through the National Assembly, his executive power through the Council of Ministers, which must have the confidence of the National Assembly, and his judicial power through the Courts, which are independent in the administration of justice. Since the peaceful revolution of October 20, 1958, the Kingdom has been covered under an interim Constitution and an appointed Assembly (which is to draft a new Constitution), while the Supreme Commander of the Armed Forces (Field Marshal Sarit Thanaraj) has plenary executive powers under a Royal Decree of Martial law.

The responsibilities of domestic administration are vested in the Ministry of Interior in a highly centralized system, approximately like that of France. There are 71 changwads (provinces) in Thailand, each headed by a governor appointed by the Ministry of Interior. Each changwad is divided into amphur (districts), each headed by a nai amphur or district commissioner. Below the district level there are locally-elected officials. For these purposes each district is divided into tambol (communes) and headed by a gamnan or commune headman; and each commune is divided into muban (hamlets) headed by a puyai-

ban or hamlet headman. In addition to these government units, there are also municipal government units given local autonomy, the degree of which is based upon a concentration of population in the municipal area. The major municipalities, such as Bangkok, Thonburi, and Chiengmai are headed by lord mayors and have as their legislative body a municipal assembly.

PEOPLE

The Thai people originally lived in southern China and centuries ago gradually emigrated into the fertile plains of the Chao Phya and Mekong rivers. They drove a wedge between the Mons on the west and the Cambodians (Khmer) on the east. Groups of these people and a number of those of other races and tribes remain in Thailand to this day. Towards the middle of the 13th century the Thai founded the Kingdom of Sukothai, and the Thai nation has existed with its own kings uninterruptedly for 700 years.

The culture of Thailand, as expressed in the religion of the people -- Buddhism -- arts and literature, social system, habits and customs, shows strong general affinities with their neighbors, the Mons, whose homeland is Burma, the Cambodians, and in some areas the Malayans, but with special characteristics that have developed over the course of centuries. The cultural influence of ancient India is strongly evident.

LANGUAGE

The national language is Thai, similar to the language spoken in Laos and in the Shan States of Burma. It has its own alphabet, quite unlike the Roman. It is basically a monosyllabic language and it involves five tones, different tones giving different meanings to words. English is the second language of the country. Most educated Thai have some degree of fluency in English, which is taught in all schools beyond the fourth grade.

WEIGHTS AND MEASURES

The metric system is in general use, though various traditional measures are used for simple trading. Kilometer is about 0.62 miles, kilo (kilogram) is 2.2 pounds, meter is about 39 inches, and liter is 1.06 liquid quarts. Traditional measures are widely used in local trading: One rai is 0.395 acre (0.16 hectare), one standard picul is 132.28 pounds (60 kg.), and one standard kwien is 528 U.S. gallons (20 hectalitres).

CURRENCY

The unit of currency is the Baht (Tical), which has been fairly stable in recent years at slightly over 20 Baht to the US Dollar. One hundred Satangs equal one Baht. The largest denomination of coin is one Baht, the largest banknote 100 Baht. Thailand has a free money market and there is generally little difference between the official (Bank of Thailand) rate of exchange and the money-changers' rates.

USOM
and its
OPERATION

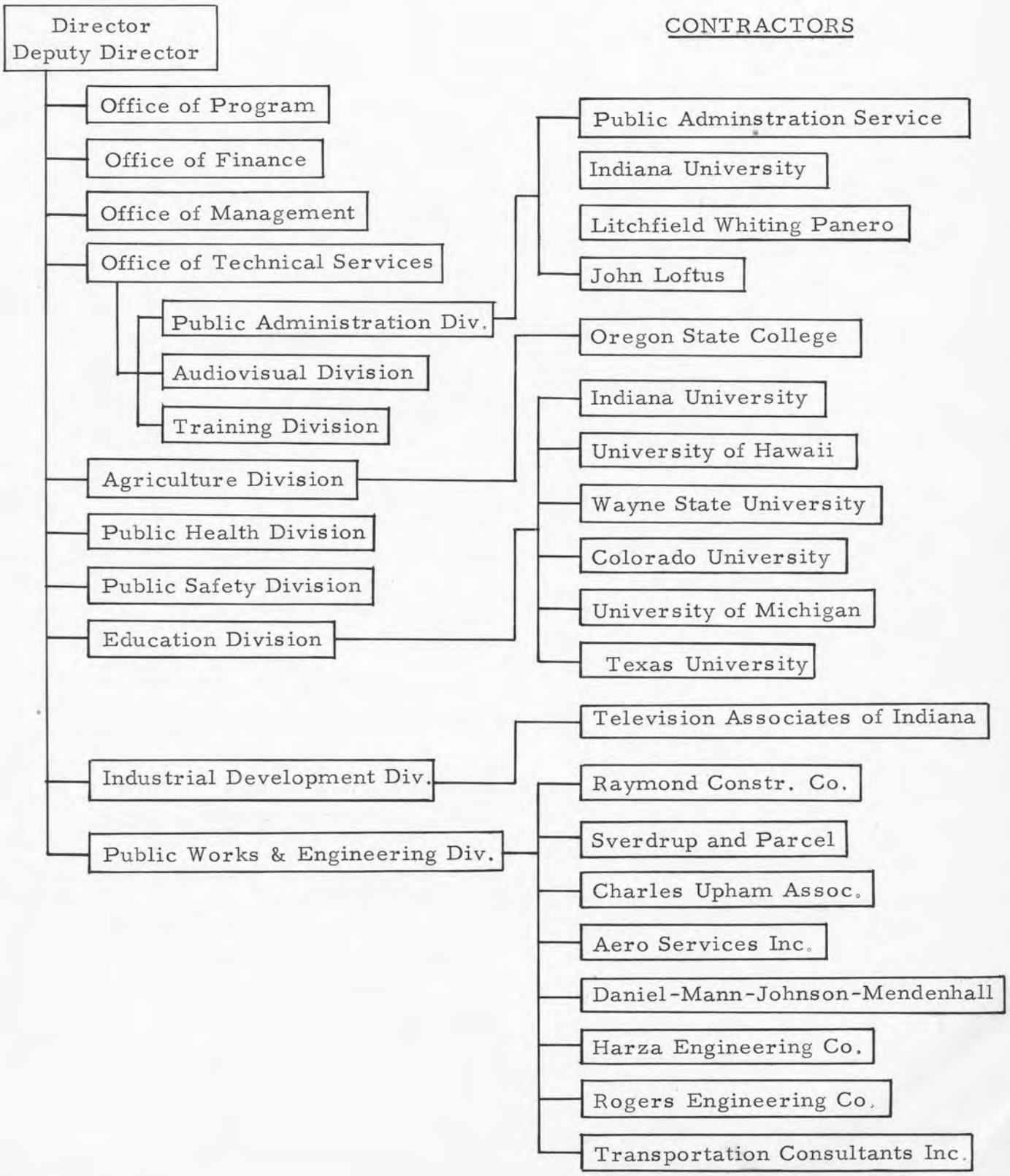
USOM

UNITED STATES OF AMERICA

OPERATIONS MISSION TO THAILAND

BANGKOK

ORGANIZATION OF USOM THAILAND



USOM DIVISIONS AND FUNCTIONS

Office of the Director - Responsible for the overall technical, administrative and policy direction of the United States Operations Mission to Thailand.

Office of Management - Responsible for formulation of management policies and objectives to, and in support of, Mission programs; provides administrative support to Mission operations, i.e., Personnel, Procurement, Communications and Records, Property Management, Building Maintenance, Travel and Transportation.

Office of Program - Responsible for overall program planning and evaluation; economic analyses in conjunction with Embassy Economic Section; advice and guidance to technical divisions of the Mission and Thai Government regarding program planning, development, documentation and implementation

Office of Finance - Responsible for interpreting, directing, and executing the financial aspects of the Mutual Security Program as it relates to USOM; development of budgetary and fiscal polices and standards for the Mission; implementation and management of the accounting, end-use and audit functions.

Office of Technical Services - Provides coordination for certain Mission activities which cut across all programs of the Mission, i.e., Public Administration, Audiovisual, and Training.

Public Administration Division - Provides stimulation and technical guidance to various Ministries and Agencies of the Thai Government in improving their organizational structures, administrative practices and procedures.

Audiovisual Division - Responsible for the development and implementation of programs for full and continuous use of informational and audiovisual media to advance USOM and Thai Government objectives.

Training Division - Advises and assists USOM Program and Technical Divisions and cooperating country officials in the planning, development, and evaluation of training programs; assures proper Mission administrative arrangements to implement training projects.

Agriculture Division - Responsible for technical advisory services and assistance to the Ministries of Agriculture and Cooperatives in the fields of agricultural research and extension, resources management, agricultural economics, credit and marketing, livestock development, and agricultural education.

Education Division - Provides technical advisory services and assistance to the Ministry of Education in the fields of teacher training, elementary, secondary, and vocational education; professional advice and guidance to institutions of higher learning through contract arrangements; and advisor for regional projects.

Public Health Division - Provides technical advisory services and assistance to the Ministry of Public Health in public health administration, education, environmental health, local health services, medical and nursing education, and malaria and filariasis control.

Public Safety Division - Provides technical advisory services and assistance to the Ministry of Interior in country-wide civil police administration, including training, organization, administration, criminal investigative work, border police operations, etc.

Public Works and Engineering Division - Provides technical advisory services and engineering assistance to the Ministry of Communications and other Ministries, in the fields of transportation, electric power, aviation, telecommunications, highways and water supply; administration of engineering and construction contracts

Industrial Development Division - Supports the Economic development of Thailand by encouraging both domestic and foreign private investment; to achieve maximum effective use of all aid to private industrial enterprise; to furnish policy guidance and technical assistance in the establishment of the IFC; and to act as liaison with the DLF and IGF.

Office of the Special Assistant for Regional Telecommunications - Coordinates the individual country telecommunication programs to insure compatibility of the various systems with each other with emphasis on the system management, maintenance and procedures, uniformity of design and construction standard and performance requirements.

STATISTICS ON USOM AND CONTRACT EMPLOYEES
AND LOCAL EMPLOYEES AS OF JUNE 30, 1959

USOM DIRECT	American	Thai
PROGRAM	115	221
ADMINISTRATIVE	24	41
CONTRACT		
AERO SERVICE	0	0
COLORADO UNIVERSITY/CHULALONGKORN UNIV.	0	0
DANIEL, MANN, JOHNSON & MENDENHALL	10	168
HARZA ENGINEERING INTERNATIONAL	6	5
INDIANA UNIVERSITY/COLLEGE OF EDUCATION	9	38
INDIANA UNIVERSITY/THAMASART UNIVERSITY	11	40
LITCHFIELD-WHITING PANERO ASSOC.	8	8
LOFTUS/MINISTRY OF FINANCE	1	1
OREGON STATE/KASETSART UNIVERSITY	2	1
PUBLIC ADMINISTRATION SERVICE	5	9
RAYMOND CONSTRUCTION COMPANY	113	1765
ROGERS ENGINEERING COMPANY	19	35
SEATO/UNIVERSITY OF HAWAII	11	2
SVERDRUP & PARCEL	26	47
TELEVISION ASSOC. OF INDIANA	13	2
TEXAS UNIVERSITY/CHULALONGKORN UNIV.	4	5
TRANSPORTATION CONSULTANTS INC.	3	8
UNIVERSITY OF MICHIGAN/REGIONAL ENGLISH PROJECT	8	3
UPHAM ASSOCIATES	12	21
WAYNE STATE UNIVERSITY/TECHNICAL INSTITUTE	9	9

THE PARTICIPANT PROGRAM

The training of foreign nationals is one of the major aspects of all ICA assistance programs and must be an integral part of specific projects which are developed as part of the country's overall economic development program. The purpose of training foreign nationals abroad is to provide them with the opportunity to acquire knowledge and technical skills which are not available in the home country.

The term "participant" is applied to those foreign nationals jointly selected by the host government and USOM to be trained abroad under the ICA program. Individuals are selected on the basis of professional qualifications, English language proficiency and suitability. They must either be employed within organizations which enable them to apply their training effectively in furthering the project and overall program goals, or at the completion of their training employed in the project for which they have been selected for training. While the ICA participant program is not limited to government officials and encourages private enterprise participation, it has been the practice in Thailand to select almost entirely government officials and employees.

Participant training is project-centered; it is not a scholarship program. To attain project objectives, the training may be classified as follows:

1. University enrollment, which may or may not lead to procurement of an academic degree.

2. On-the-job training, such as road construction where a participant would be programmed in actual construction work.

3. A combination of academic or institutional study with on-the-job training. This type of program requires study in theory, techniques or laboratories before undertaking on-the-job training.

4. Observation and Visits. These are short-term programs designed for high-level or mature government officials whose programs are usually arranged through Federal or State government facilities.

5. Workshops. Two to four-week regional programs of group participation, such as the Far East Rural Youth Workshop Meetings.

Almost 50 percent of the Thai participant program has been university enrollment.

At the inception of ICA's participant program, all training was limited to the U.S. At that time the U.N. was providing training in the various U.N. member countries. However, as a result of a better understanding of the needs and cultures of the less developed countries where the technical assistance program was in operation, and with the expansion of the participant program, it was recognized that other countries could make a valuable contribution to ICA programs. The first ventures were U.S. training combined with short periods of supplemental training, principally in European countries. As the program expanded it was apparent that still other countries had a great deal to offer, and in environment and stage of development were more akin to life and conditions in the countries requiring participant training. Thus evolved third-country training as it is practiced today. Third-country training may be in a single country or multiple countries. Principal third-countries utilized by Thailand are Japan, Taiwan, and the Philippines. Small numbers have been programmed in Ceylon, India, Korea, Pakistan and England. All Thai third-country training has been observation and visits, usually in multiple countries, and Workshop type with the exception of 10 Education participants programmed for academic study in the Philippines.

The participant program in Thailand began in FY 1951 with 78 participants, all trained in the U.S. In FY 1956 Thailand had 28 participants programmed in third countries. The participant program has steadily grown and FY 1959 program estimates are 344 to the U.S. and 187 to third countries. The number of Thai participants who have been trained or are in training in the U.S. plus the FY 1959 current program totals 1902; third country, computed on the same basis, totals 347.

There are three major fields of activity in participant training which cover one or all of the classifications mentioned previously. The following table shows the total member of Thai trained, in training or to be trained abroad from FY 1951 through FY 1959 (i.e., from 1959 funds) according to fields of activity:

FIELD OF ACTIVITY	U.S.	3rd Country
Agriculture and Natural Resources	350	160
Industry and Mining	112	1
Transportation	179	24
Labor	14	-
Health and Sanitation	361	11
Education	547	93
Civil Police Administration	55	10
Public Administration	223	41

FIELD OF ACTIVITY (Con't)	U.S.	3rd Country
Community Development and Social Welfare and Housing	3	2
General and Miscellaneous	58	5
	1902	347

TRAINING OF THIRD-COUNTRY NATIONALS IN THAILAND

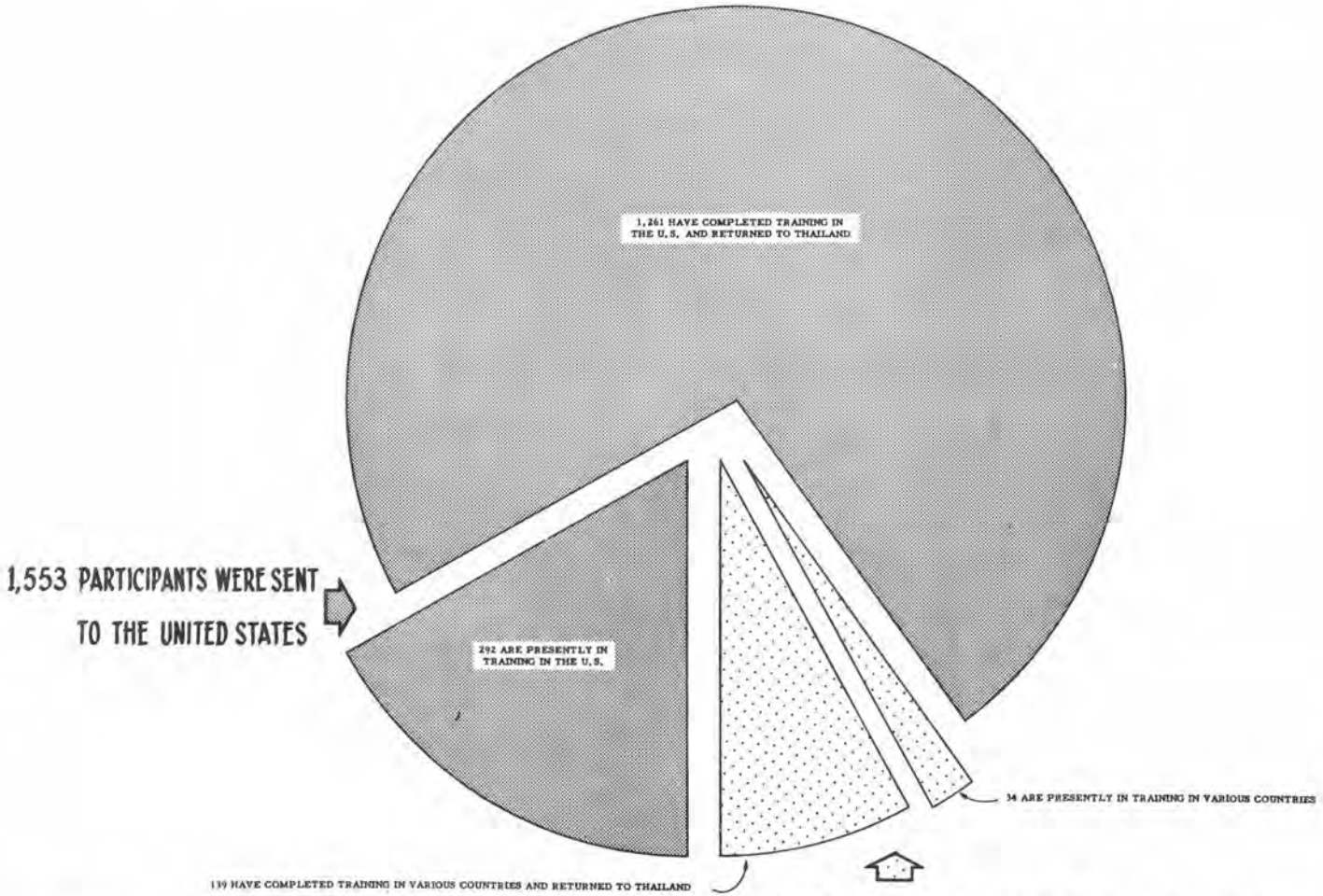
Third country training in Thailand is a jointly sponsored program of the governments of Thailand and the United States. It is designed to provide training and observation in Thailand for participants from other countries, especially in Southeast Asia, as a cooperative contribution to the economic development of these countries. Training may range from several days of observation to enrollment in Thai educational and training institutions. Upon receipt of an official request for training, USOM/Thailand initiates appropriate action for planning and implementing program activities with the various agencies of the Thai Government and supervises administrative arrangements.

Third-country training in Thailand began in FY 1954, when funds were provided for 17 participants from Indonesia to study police training and 2 participants from Korea to study commercial procurement. Since that time some 700 participants have received or are scheduled to receive training in Thailand. Participants have come from Cambodia, Ceylon, Taiwan, Indonesia, Japan, Korea, Laos, Nepal, Pakistan, Philippines, Sudan and Vietnam. The majority of the participants however are from neighboring Laos.

Among the institutions utilized for long-term training projects have been the Kasetsart University, College of Education, Technical Institute, Thai-UNESCO Fundamental Education Center, Ubol Teacher Training School, Udorn Teacher Training School, Karn Reun Home Economics Schools, College of Physical Education, the Malaria Eradication Center at Chiengmai, the Rural Health Training Center at Cholburi, the Police Radio School at Korat and the Siriraj Hospital.

The major field of training has been in education, followed by public health, agriculture, police training, public administration and industry.

1,726 THAI CITIZENS WERE SENT TO THE UNITED STATES AND OTHER COUNTRIES FOR TRAINING UNDER ICA-FINANCED PROGRAMS SINCE FY 1951



OP-8 A

HOW PROCUREMENT IS DONE

1. Procurement financed by ICA is done in the following manner:

a. Private importers receive allocations of foreign exchange and within the limitations contained in the procurement authorization (PA) procure from private exporters.

b. U. S. Government agencies procure by means of invitations-to bid.

c. Contractors, under ICA-financed contracts, are authorized to do all or a portion of their procurement needs under the contract.

d. USOM procures small-value items such as books and filmstrips.

e. The Thai Technical and Economic Committee (TTEC), Procurement and Supply Division, procures by means of invitation-to-bid, except in emergency situations requiring negotiated purchases.

2. When procurement is to be done by a U. S. Government agency, that agency must be listed as the "Authorized Agent" on the Project Implementation Order/Commodities (PIO/C). When the PIO/C has been issued, there is usually no further action required of USOM or the Thai Government.

3. Contractors, under ICA-financed contracts, are named in the PIO/C as the "Authorized Agent" on behalf of the Thai Government. They are required to follow ICA regulation I when they purchase supplies or services, but they are not required to issue formal invitations-to-bid. The Thai Government is responsible for all procurement done by contractors. Dollar procurement by contractors is not usually done on a world-wide basis but is limited to the United States.

4. USOM procures small-value items, usually not exceeding individual PIO/C value of $2,000. When it is desired to issue a PIO/C to USOM, it is necessary to show USOM as the "Authorized Agent."

5. When the procurement is done by the TTEC Procurement and Supply Division, the PIO/C lists "TTEC" as the "Authorized Agent." The manually-signed PIO/C is sent by USOM to ICA/W to issue a letter of commitment to the banking institution listed in the PIO/C. At the same time a copy of the PIO/C is sent to the TTEC Procurement and Supply Division and an invitation-to-bid is issued for a period of 45 days to comply with the requirement of ICA/W Office of Small Business (OSB). Copies of the bids are sent to

OSB and the information is published in OSB circulars for the information of U. S. suppliers. Public opening of bids is held at the TTEC Procurement and Supply Division with representatives of the appropriate Thai Ministry or Department.

A tabulation of bids submitted is prepared by the TTEC Procurement and Supply Division. The tabulation, together with the originals of the bids received, are forwarded to the Ministry or Department for technical evaluation of the bids. The Ministry or Department must return the originals of the bids and the tabulation with a covering letter clearly stating the reason(s) for the rejection of the lower bid(s) if the award is made to other than the lowest bidder. The covering letter must also contain a recommendation regarding inspection, that is, whether the Ministry or Department want an independent inspection made or whether a certificate of inspection, issued by the manufacturer, would be acceptable. A notice of award is then published (copy to OSB/W) and lists the successful bidder(s) and when applicable, the reason(s) for rejection of the lower bid(s). Contracts are then prepared and application for opening the letter(s) of credit is sent to the Bank of Thailand (Foreign Exchange Control Section).

6. Procurement with counterpart funds is done by the TTEC Procurement and Supply Division if the value of the Counterpart Project Purchase Authorization (CPPA) equals or exceeds ฿50,000. The procurement is done by invitation-to-bid, except in emergency situations requiring negotiated purchases, and follows the procedure outlined in Paragraph 5, previous page, except that payment is made by the recipient Ministry or Department by check, no letter of credit is opened.

The TTEC Procurement and Supply Division does not handle construction contracts, regardless of cost.

Ministries or Department may do their own purchasing if the value of the supplies or equipment is less than 50,000 Baht, or they may request TTEC Procurement and Supply Division to do the purchasing for them.

PROGRAM SUMMARY

USOM

UNITED STATES OF AMERICA

OPERATIONS MISSION TO THAILAND

BANGKOK

WHAT HAS BEEN DONE

AGRICULTURE

1. After testing over 200,000 selections and cross breeding, improved rice seed producing a 15 per cent average increased yield is now being distributed to farmers.

2. Improved breeds of cattle and hogs have been established at six livestock stations and breeding stock is now being distributed to village farmers. Eighty-three bulls and more than 1,200 hogs have already been distributed to farmers.

3. A soils laboratory has been established at Bangken and equipped to test soil samples from all parts of Thailand.

4. 110 small water reservoirs have been completed in Northeast Thailand.

5. Agricultural extension centers have been established at Udorn, Korat, Lopburi, Pitsanuloke, Chiengmai, Chachoengsao, Nakorn Pathom, and Songkhla.

6. A National Diagnostic and Research Laboratory has been built and equipped for correct diagnosis of diseases affecting Thailand's livestock.

7. Land clearing equipment, pumps and demonstration grain storage elevators have been furnished to rural cooperatives. A well equipped shop has been set up for maintenance and repair of equipment. A Baht 5,000,000 loan has been made to the Bank of Cooperatives for re-loaning to individual farmers. Also Baht 3,400,000 has been loaned to the Ministry of Cooperatives for re-loaning to marketing cooperatives.

8. A low-cost means of storing sufficient feed for support of livestock herds throughout the dry season has been demonstrated in the Northeast.

9. Ten buildings have been constructed and equipped at Kasetsart University, including the library, a rice mill, a feed mill, and classroom and laboratory buildings.

10. Equipment has been furnished for twenty-five experiment stations.

11. Equipment was supplied for the Foot and Mouth Disease Laboratory at Pakchong, the only laboratory of its kind in Southeast Asia.

12. Production of vaccine at the National Vaccine Laboratory at Pakchong has been greatly increased and Thailand is now able to export vaccines to neighboring countries.

13. Some five seed, fertilizer, and cultural practice demonstrations have been established in each of 915 Northeast Thailand villages. 3,200 fertilizer and seed trial kits and a bulletin titled "How to Take a Soil Sample" have been distributed to farmers in the Northeast.

14. The first National Home Economics Seminar in Thailand was held at Kasetsart University. The meeting was officially opened by the Minister of Agriculture.

15. The fourth National Yuwa Kasikorn (4-H) Club Congress was held at Kasetsart University (May 4-8, 1959). Membership in Yuwa Kasikorn Clubs throughout Thailand passed the 4,000 mark.

16. A preliminary report of the Consultant Team on Agriculture Credit, Cooperative Organization, Management and Administration and Agricultural Marketing for the Government of Thailand was submitted to interested Thai officials for review and comment in May 1959.

17. The Consultant Team Preliminary Report on Research and Extension was completed in April, 1959.

INDUSTRY AND MINING

1. A minerals experiment center has been established for ore dressing and testing of metal ores.

2. Initial capital equipment was furnished to open the lignite mine at Mae Moh now producing 200,000 tons annually.

3. Thai private enterprise has been enabled, by technical advice and assistance alone, to open a profitable gypsum mine near Phichit and some unusually high-grade manganese deposits near Chieng Kharn on the Mekong River.

4. Electricity generation was increased by 19,000 KW of installed diesel capacity.

TRANSPORTATION AND COMMUNICATIONS

Aeronautical Program

1. A variety of navigation communications and other equipment (beacons, generators, lighting systems, radio apparatus, vehicles, etc) has been installed at 21 of Thailand's airports as part of a program to improve domestic and international aviation facilities.

At Don Muang:

Ratating beacon; VHF/DF System, VHF receiver; VHF omni-directional radio range; 10,000 watt non-directional beacon; high intensity approach light systems; teletype equipment.

At Songkhla:

One non-directional radio beacon; one rotating beacon; one code beacon; three transmitters; five receivers; one VHF/DF system; one VHF transceiver.

At Phuket:

Non-directional radio beacon; VHF transceiver; rotating beacon.

At Chiengmai:

Non-directional radio beacon; teletype equipment, three transmitters, five receivers.

These airports and the airports at Lampang, Prae, Udorn, Nakornphanom, Ubol, Nakornsawan, Maesot, Tak, Pitsanuloke, Khun Yuam, Chieng Rai, Mae Hong Sorn, Mae Sarieng, Pai, Korat, Trang and Ranong have also received power generating equipment and a variety of additional items.

2. An aeronautical center has been constructed at Thung Mahamek, consisting of school, soil laboratory, warehouse, garages, and electronics

and heavy machinery workshops. This complex will provide training, repair, and warehousing facilities for the aeronautical system of Thailand.

Highways

1. The Friendship Highway, a 148 kilometer highway, has been constructed between Saraburi and Korat.

2. Five hundred fifty reinforced concrete bridges throughout the country have been completed.

3. Construction of Nana Nuer Bridge in Bangkok over Klong San Sab has been completed.

4. Base repair shops have been established at Korat, and a field repair shop has been equipped at Pitsanuloke.

5. Construction of 1.6 kilometers of city streets at Pitsanuloke, after disastrous fire in December 1956, has been completed.

Railways

1. Railway repair shops at Makasan (Bangkok) and Korat were provided with additional buildings and equipment, greatly improving maintenance of locomotives and rolling stock.

2. A 60 kilometer railway extension was constructed between Udorn and Nongkai, and warehouse and customs facilities and a ferry landing installed at the Mekong River Terminal.

3. Rolling stock, railway supplies, and communications equipment costing approximately $2,000,000 were furnished the railway system.

PUBLIC HEALTH

1. The malaria death rate has been reduced 80 per cent through spraying in areas where some 14,000,000 people live and through treatment of approximately 2,000,000 cases.

2. The Laboratory and Training Center for Malaria Eradication, Chiengmai, was constructed and equipped. It has thus far graduated over

100 Thai malaria technicians and has extended training to more than 100 students from other Asian nations. A similar center has been completed at Phrabuddhabat.

3. Thirty-one provincial hospitals and 750 rural health centers have been furnished essential equipment and supplies.

4. Regional public health headquarters have been erected and equipped at Korat and Songkhla.

5. Schools of Medical Technology have been constructed at both Siriraj and Chulalongkorn medical schools and 41 students have already graduated.

6. A successful post-graduate refresher course program for the medical staffs of rural hospitals has been organized and implemented.

7. Ten demonstration district health units have been organized.

8. Over 100 wells and 2,000 privies have been constructed in the village demonstration areas.

9. The Cholburi Demonstration and Training Center has been constructed and equipped, and has provided in-service and pre-service training for over 1,700 public health workers from all parts of Thailand.

10. Municipal water purification plants have been constructed at Ubol, Srisaket, Surin, Roi-et, Sakonnakorn, and Mahasarakam.

11. Health education services have been improved and the Division equipped to produce necessary audio-visual materials.

EDUCATION

1. New and practical curricula for elementary, secondary, and teacher training schools have been developed. Four secondary and 44 elementary schools have been included in demonstration projects.

2. Supervisory units have been developed in the Ministry and in the provinces to help improve instruction, including training teachers to make and use simple, inexpensive instructional materials.

3. The College of Education has developed an effective teacher training program. There are approximately 2,000 students in the College and its two branches. Six hundred forty-eight graduates have received a Bachelor of Education degree.

4. The Faculty of Education at Chulalongkorn University has developed a good bachelor's degree program and graduates about 150 teachers annually.

5. All thirty teacher training colleges have been improved in physical facilities, teaching equipment, and in qualifications of staff members. The number of students in these colleges has more than doubled in the last three years.

6. Intensive educational surveys have been completed preparatory to development of the twelve regional centers of the General Education Development project.

7. Over 100 teachers from Laos have received training in institutions in Thailand.

8. The linguistic analysis of Thai, Vietnamese, and Laotian languages has been completed under the Regional English project.

9. Technical assistance and equipment have been provided to each of Thailand's seventeen vocational agriculture schools, with emphasis on making use of improved livestock and farm practices and developing farm shops and home projects. Teacher training programs have been greatly improved, particularly at Mae Moh and Surin.

10. Twenty-one Thai scientists have received training in the peaceful uses of atomic energy, with emphasis on radioisotope work and nuclear measurements for application in medicine, agriculture and industry.

11. The Bangkok Technical Institute has been established and has an enrollment of more than 5,000 students receiving training in 15 vocational fields. Branches of the Institute at Korat, Chiengmai, and Songkhla have more than 1,400 students enrolled.

12. The laboratories and libraries of the Faculty of Science and the College of Engineering at Chulalongkorn University have been provided with modern materials and equipment. Teaching has been improved through demonstrations, seminars, and training abroad. The graduate program has been strengthened. Improved training is available for about 3,600 students.

13. To help increase the supply of skilled labor in Thailand, a Teacher Development Center has been opened to upgrade the competency of trade and industrial teachers in 16 vocational schools throughout Thailand.

PUBLIC ADMINISTRATION

1. The Litchfield, Whiting, Boone City Planning Contract group has surveyed and developed maps of the metropolitan area; compiled data on land use, water systems, public service facilities, population, building construction, etc.; and has outlined traffic studies, preparatory to presenting a Master Plan for the future development of the area.

2. With the assistance of the Public Administration Service, a new budget unit has been organized and the 1959 Budget prepared with a more meaningful classification of accounts. Centralized accounting based on a mechanized punched card system has been initiated and comprehensive weekly reports of the governments fiscal position are now being issued.

3. The Institute of Public Administration at Thammasat University with the assistance of Indiana University, has established a two-year academic curriculum of graduate work in public administration, engaged in research, conducted in-service training for Thai Government officials, and established a 10,000 volume library of Public Administration.

4. Training in various phases of public administration has been given to 1,965 Thais locally and 149 participants in the United States.

GENERAL

1. Camps in 40 border provinces and Bangkok were constructed for the training of volunteer defense forces. Most of these buildings are now available for transfer to other uses, such as schools for the Ministry of Education.

2. Including those currently studying abroad, 1,718 Thais have been trained in many fields in the United States, the Philippines, Vietnam, Japan, Taiwan, Hawaii and Western Europe since the program was initiated. About 530 Thais are scheduled for training abroad under the FY 59 program.

WHAT IS BEING DONE

AGRICULTURE

1. A demonstration project is underway at Korat to show the advantages to the farmer of crop diversification and soil and water conservation and to provide training for Thai officials.

2. A modern abattoir is to be constructed at Phra Kanong, near Bangkok, by a private Thai company. Plans were developed with assistance from USOM agriculture technicians. The company has received a $750,000 loan from the Development Loan Fund. This is the first DLF loan to private enterprise in Thailand.

3. Artificial insemination demonstrations of dairy and beef herds are continuing, using the first frozen semen ever imported into Thailand.

4. An entomological control project is being planned and a site for the center has been selected.

5. An oceanographic survey of the Gulf of Thailand is starting this year and should lead to substantial increases in fish caught.

WATER RESOURCES

1. An engineering firm is now preparing specifications for immediate construction of 12 to 20 wells to help meet emergency water supply requirements of Bangkok and Thonburi. These wells will be in operation in October, 1959. They will increase available water supply in Bangkok and Thonburi by approximately 15 per cent.

2. The ground water exploration project in the Northeast will result in the completion of a total of 335 exploratory wells. As of June 30, 1959, the Drilling Contractor had completed 93 wells, 57 (61 per cent) producing good quality water. Eighty-three wells were drilled before the present contract was negotiated.

INDUSTRY AND MINING

1. Airborne geophysical surveys are being undertaken in 1959 to locate possible metallic ore deposits in selected areas of Thailand. Deposits of iron, gold, tin, tungsten, manganese, copper, lead and salt are being prospected and evaluated. A search is being made for bituminous coal.

2. Advisors on development of small industries in Thailand will be available to Government of Thailand should it approve legislation for the creation of the Thai Industrial Finance Corporation. The local currency equivalent of $750,000 in counterpart is being held for an interest-free loan to the corporation after the enabling legislation is passed by the National Assembly.

3. Construction of the 12,500 KW thermal power plant at the Mae Moh Lignite Mine is in progress together with 69 KV transmission lines to Yan Hee Dam, Chiengmai, Lampang and Lampoon. The plant is expected to be supplying power by late 1960.

4. Installation of the 10 MW Interim Plant in Bangkok, consisting of ten 1000 KW Diesel generators, is progressing rapidly. Plant and interconnections should be completed in September 1959. After adequate power is available in Bangkok from Yan Hee, these units will be available for transfer to provincial towns.

5. The DLF has loaned $20 million to the Metropolitan Electric Authority to finance construction of the Bangkok-Thonburi 250 MW distribution system. Actual construction is expected to start about September 1, 1959.

6. Construction of a 75,000 KW thermal power plant in Bangkok is in progress. The plant, scheduled for completion in December 1960, is being financed by a $14 million Export-Import Bank loan.

HARBORS

1. The Development Loan Fund has approved a loan of $1,750,000 for the purchase of a new dredge which will reduce the cost of removing sediment from the Bangkok Harbor.

HIGHWAYS

1. Ten American engineers are working with the Thai Highway Department. Special emphasis is being placed on maintenance of equipment and roads and on the Department ability to provide engineering services for future highway construction.

2. Projects to improve existing streets within the City of Bangkok have been partially completed.

3. The East-West Highway between Pitsanuloke and Lomsak, a distance of 142 kilometers, is proceeding according to schedule. It should be completed in 1960.

4. Engineering on the Bangkok-Saraburi Highway will be started in 1959 and construction should be completed in 1961.

5. A team of experts is making an economic and engineering study of Thailand's transportation needs to be completed in 1959. The report will provide a valuable guide for planning future transportation projects.

6. Sixty-one additional reinforced concrete highway bridges are now under contract.

AERONAUTICAL PROGRAM

1. Additional equipment and technical assistance are being provided to Thailand's civil aviation facilities.

PUBLIC HEALTH

1. The Malaria Eradication project will reach areas with a population of 14 million people this year. A plan has been established to follow the house-spraying campaign with a program to protect every household in Thailand by 1966 with a treatment to eliminate any remaining malaria cases and safeguard against return of malaria.

2. Construction of a third medical school in Chiengmai is now being planned and work should begin before the end of 1959. Training of the future staff in the United States has been initiated and will be completed by the time the school and the adjoining hospital are ready to operate.

3. Self-help projects in construction of sanitary privies, protection of small water supplies, and premise sanitation are underway in over fifty villages. Plans are being drawn up for multiplication of these projects throughout Thailand.

4. A full complement of 24 house officers has been appointed on the medical and pediatrics services at the Chulalongkorn and Children's hospitals, and are now undergoing training.

EDUCATION

1. A total of twelve regional education demonstration and training centers will be in operation before the end of 1959. These centers are designed to improve the quality of instruction throughout the Kingdom.

2. Plans are being made for the installation of a research atomis reactor at Chulalongkorn University, under the President's "Atoms for Peace" program.

3. The SEATO Graduate School of Engineering will open in September 1959. It will start with courses in civil engineering with a major of hydraulic Engineering leading to a two-year Master of Engineering degree.

4. Experimental materials for the teaching of English as a foreign language are being prepared for use in Vietnam, Laos, and Thailand. The teacher training phase of the Regional English Project has begun in Thailand. Within two years, each of the 100 teachers of English in Thailand's teacher training colleges will have completed a special three-month course in the teaching of English as a foreign language.

5. Courses of study and teaching materials are under development for poultry and vegetable gardening courses in the primary extension schools.

6. Shops are being improved in the first eight schools in the SEATO skilled manpower project and 40 teachers from these schools are being trained in a six-month course.

7. Assistance is continuing to the Bangkok Technical Institute and its branches in Korat, Songkhla, and Chiengmai.

8. The College of Education is making its trained leadership available for field service throughout the Kingdom, thus becoming a service agency for the provinces as well as for the Ministry of Bangkok.

9. Thirty-seven Laotian teachers are being trained in teacher education programs in Thailand.

PUBLIC ADMINISTRATION

1. The City Planning Project contract group is now preparing a master Development Plan for the Bangkok-Thonburi municipalities, after having completed 90 per cent of the necessary research.

2. The contract with the Public Administration Service has been extended two and a half years to allow the group to continue work on the new budget and accounting systems, and provide increased assistance to the Revenue and Excise Departments in line with the government's plan for improving tax collection and enforcement.

3. The Institute of Public Administration at Thammasart University is continuing its in-service training program and graduate courses in public administration and research activities. Participants are being trained in the United States who will eventually constitute a permanent Thai faculty of public administration at the University.

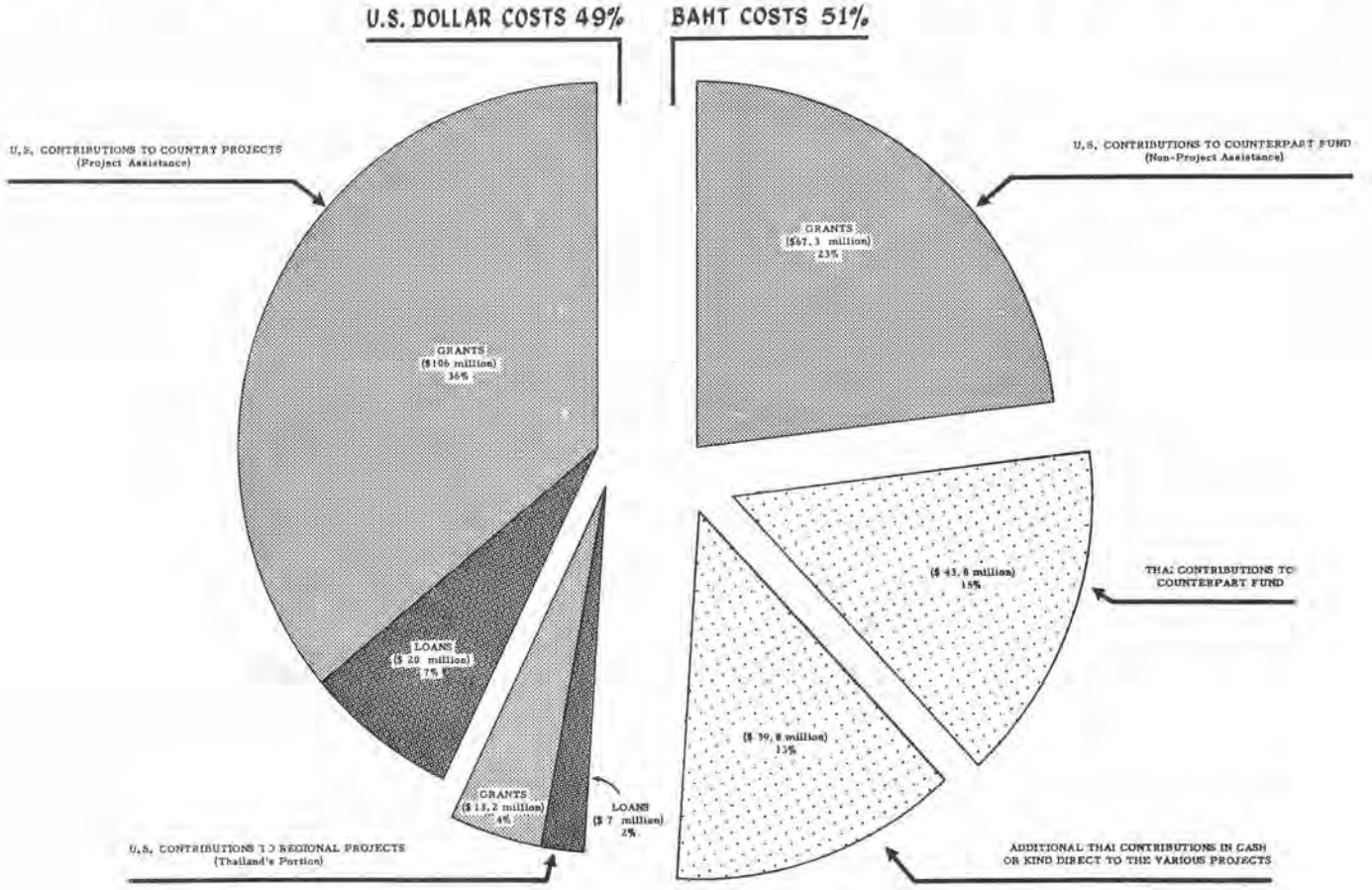
4. A Statistical Advisor has recently arrived to assist the Central Statistical Office in implementing the National Statistics Act of 1952; coordinate statistical agencies to improve techniques for gathering and presenting data; develop a long-range statistical program for the Thai Government; and participate in preparations for the 1960 census.

REGIONAL PROJECTS

1. A competent engineer has been selected to carry out the regional telecommunications project for which $10 million has been furnished Thailand on a grant basis and $7 million as a long-term loan.

2. As the United States contribution to the UN-sponsored Regional Mekong Project, an engineering contract has been negotiated and the work started on a project which includes basic data collection, primarily in the field of hydrology, training of local personnel, horizontal and vertical control surveys, and hydrographic survey.

HOW THAI-AMERICAN TECHNICAL AND ECONOMIC COOPERATION IS FINANCED

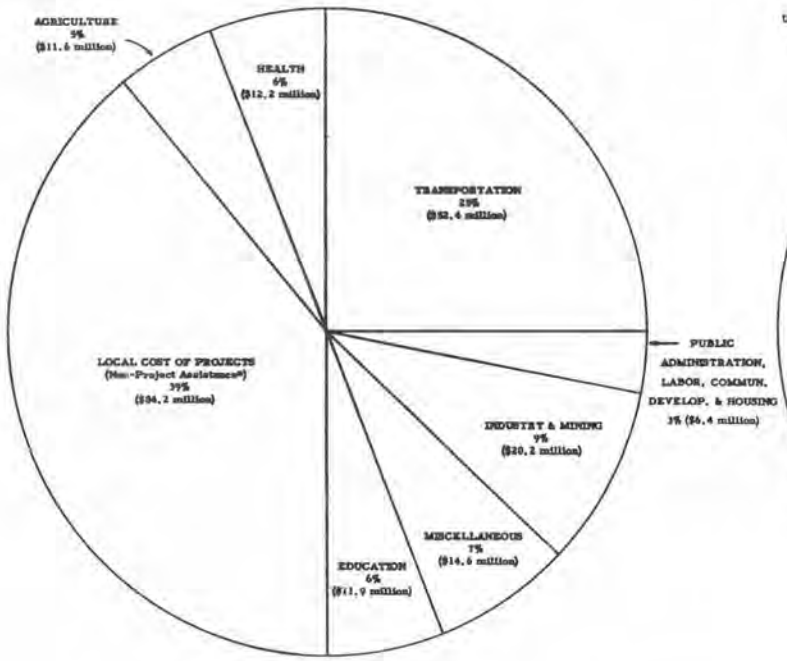


Data based upon cumulative obligations and deposits, FY 1951 through June 30, of FY 1959. FY 1951 through FY 1954 data of the additional Thai contributions in cash or kind is not included since this information is not available. (Records of the "estimated additional Thai contribution" to a project were only begun in FY 1955). Thai contributions to the counterpart fund and additional contributions in cash or kind direct to the various projects, stated above in U.S. dollars, were converted from baht to dollars at the rate of baht 20 equals 1 U.S. dollar. The U.S. contribution used here does not include military assistance, investment guarantees, Exim Bank Loans, DLF Loans and PL 480.

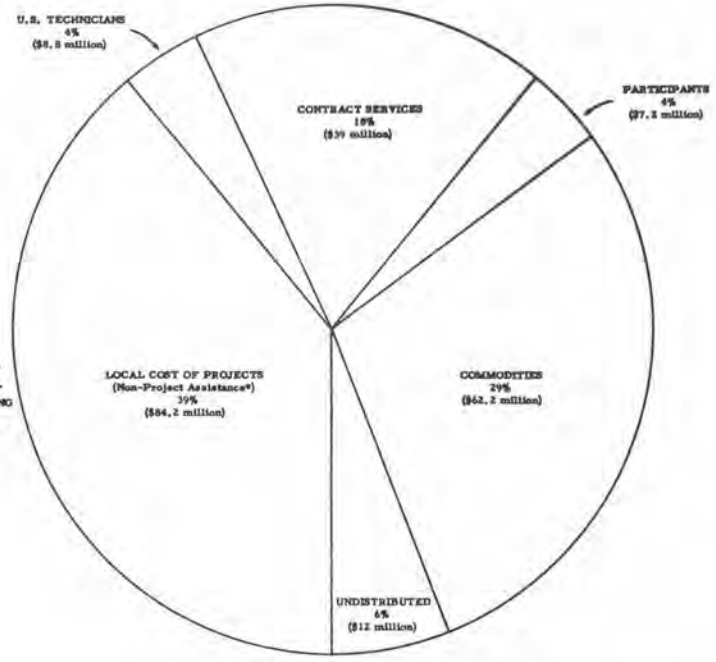
PS-13 & 14

HOW THAI-AMERICAN TECHNICAL AND ECONOMIC COOPERATION IS SPENT

BY FIELDS OF ACTIVITY



BY TYPE OF EXPENSE



Non-Project Assistance is ICA financing of commercial imports of products such as automobiles, milk, petroleum, textiles, etc. which are imported into Thailand by various commercial importers. ICA utilizes this system of financing commercial imports to produce the Baht it needs to be able to pay for Project Assistance expenses in Thailand which are payable in Baht.

Above data based upon cumulative obligations, FY 1951 through FY 1959, totaling $213.5 million. These data include Loans and the Thai portion of Regional Assistance as shown in "SUMMARY" table, page 1, but do not include military assistance, investment guarantees, Exim Bank Loans, DLF Loans, PL 480, Thai Contributions to the Counterpart Fund and Thai Contributions in cash or kind direct to the various projects.

PROJECTS - COSTS
AND
DESCRIPTIONS

USOM
UNITED STATES OF AMERICA
OPERATIONS MISSION TO THAILAND
BANGKOK

TABLES OF PROJECT COSTS
and
PROJECT DESCRIPTIONS

Following are tables of project costs and descriptions of each project grouped according to field of activity.

In order to make a clearer and more concise presentation, many completed projects have been consolidated in the following recapitulation, either into continuing projects where they appropriately belong or with related projects no longer active.

Those who wish to trace funding of individual completed projects, may refer to the USOM Financial Report. All funds that USOM has obligated since 1950 are included in the following report, and the groupings and consolidations are intended to facilitate a grasp of the many activities.

All figures shown are obligations, not expenditures. Expenditures always tend to run less than current obligations, and final expenditures under a given project may not be made for several years. Obligations are adjusted currently, and the figures shown represent the most accurate estimates of what each project has cost or will cost. Expenditure data are in the USOM Financial Report.

Figures for the current fiscal year are incomplete. Obligations continue to be made up to the last day of the fiscal year (June 30).

Figures for "Thai Government Contributions from Regular Budget" are estimated and are not complete. These contributions are not made directly into the project budget, but are expenditures by the Thai Government in support of the project. Before 1956 this information was not systematically reported to USOM.

The general order of arrangement of projects under each field has no significance except that in general the largest projects (in terms of total cost) are shown first. The descriptions are in the same order as the tables. Regional projects follow Thailand projects under each field of activity.

For purposes of most readers, the "appropriation" source of funds for each project (Technical Cooperation, Defense Support, Direct Forces Support, Asian Economic Development Fund, etc.) has not special importance. In order to avoid further complexity, these sources of funds have not been shown. They may be found in the USOM Financial Report.

TABLE OF PROJECT COSTS

Dollars - U. S. Dollar contribution
C/P - Local currency costs from Counterpart Funds
Budget - Thai Government contributions from regular budget
(All shown in terms of thousands of dollars)

	Dollars 1957 & Prior	C/P 1957 & Prior	Budget 1957 & Prior	Dollars 1958	C/P 1958	Budget 1958	Dollars 1959*	C/P 1959*	Budget 1959*
1. AGRICULTURE & NATURAL RESOURCES									
Irrigation & Water Conservation 93-12-158 1951-58	3,794	2,906	634	-	300	700			
Crop Improvement 93-13-032 (002, 031,116) 1951-64	1,799	1,671	301	108	179	360	14		
Agricultural Credit & Marketing 93-14-034 1952-63	975	945	2,897	49	76	100	32	125	
Livestock Industry Development 93-13-033 1952-61	680	858	1,605	83	150	600	29		
Improvement Kasetsart University 93-11-130 1952-60	898	896	122	100	75	70			
Agriculture Extension 93-11-029(007,103, 036) 1951 Cont.	839	599	320	108	60	147	44		
Fisheries 93-18-023 1951-57	697	366	913	-	-	-	-	-	
Agriculture Resource Use & Conservation 93-12-191(027,077, 131,137) 1952-64	316	289	99	81	110	68	28		
Agricultural Statistics 93-14-035 1955-58	58	37	4	4	11	-	-	-	
TOTALS	10,056	8,567	6,895	533	961	2,045	147	125	
(Regional) Rinderpest Eradication 87-13-005 1951-58	102	139	-	-	90	-	-	-	-

* Incomplete

Irrigation and Water Conservation (93-12-158)

Inasmuch as semi-arid Northeast Thailand has few major water resources, the Thai Government in 1939 began construction of numbers of earthen-dam reservoirs for impounding run-off to alleviate the annual shortages of water during the dry season. In 1951 the U. S. began furnishing assistance for the expansion of this farm and village reservoir program.

By July 1958 the Irrigation Department had completed 110 reservoirs under this project, with 11 more under construction. They range in size from the domestic water supply "tank" at Roi-Et of 41,000 cubic meters to the 21,300,000-cubic-meter reservoir under construction at Bunsan. An average reservoir has a dam 6 to 8 meters high, a capacity of some 2 million cubic meters, and can irrigate an area of about 2,500 rai (1,000 acres).

Engineering and construction of the reservoirs was carried out by the Royal Irrigation Department with financial assistance and equipment supplied by USOM. While USOM support phased out in 1958, the equipment furnished should last at least five years at the rate of construction planned by the Department.

Forty-eight engineers and officers of the Irrigation Department were sent to the U. S. for training under this project.

In addition, about $419,000 worth of equipment was furnished under this project to the Irrigation Department for the construction of direct diversion and flood control works in the Northeast which directly benefit some 625,000 rai (250,000 acres).

Thirty-six power pumps for mounting on portable units were furnished for supplementary and emergency irrigation as needed in various parts of the Northeast.

Crop Improvement (93-13-032)

Thailand is mainly an agricultural economy based on the growing of rice, the principal food of the people and the commodity most in demand in its export area.

Crop Improvement - Cont'd.

Constant expansion of rice production is necessary both to accommodate a growing population and to maintain the major source of foreign exchange -- rice being historically the most important and most dependable export. Expansion of rice acreage produces diminishing returns because all the best wet rice lands were long ago put into intensive rice cultivation, and as more land is put into paddy there is a corresponding decline in yields per acre. Even the irrigation developments under way will keep only a step ahead of population -- now increasing by about 400,000 a year. At the same time, it is clear that from the standpoint of the national economy as well as of individual farming areas, diversification of crops is essential for a stable and prosperous agriculture. And the possibilities for diversification are enormous.

These considerations led in 1951 to the establishment of the crop improvement project, to assist the Ministry of Agriculture to develop new and better adapted crop varieties, improve crop management practices, and find profitable crop uses for lands of marginal value.

The project provided substantial assistance in the development of 13 agricultural experiment stations, including buildings, equipment, and on-the-spot training and supervision. These were at Fang and Mae Jo (Chiengmai), Sri Samrong (Sukothai), Ban Mai Samrong and Non Sung (Korat), Roi-Et, Pliu (Chandhaburi), Kuan Kut (Patalung), Kor Hung (Songkla), Bangkok Noi (Thonburi), Saraburi, Surin, and Ubol.

About 60 Thai specialists have been sent to the U. S. for training and hundreds of technicians have been trained on the job and in short courses throughout the Kingdom. The introduction and testing of new and improved crops has resulted in widespread adoption of proved varieties. This year over 2,000 farm demonstrations in the Northeast will show farmers the merits of better varieties and will produce improved seed for further dissemination. These will emphasize both food crops and cash crops other than rice. Thirty thousand seed associations, with farmer membership and committees, will be in operation in 1959.

The rice improvement work, begun in 1951, was completed in 1957 (project 93-11-031). Under this phase of the program, 11 rice stations were assisted with equipment and facilities as well as technical advice and direction. These were San Patong (Chiengmai), Bangkhen (Bangkok), Rangsit - two stations

Crop Improvement - Cont'd.

(Pratumdhani), Hantra (Ayudhya), Kok Samrong (Lopburi), Pimai (Korat), Surin, Kuan Kut (Patalung), Khon Kaen, and Sakonnakorn.

Under this program, over 200,000 varieties and samples of rice were tested. Promising varieties were tested further in over 25,000 farm trials. Fourteen of the most promising varieties were selected for multiplication, a program in which over 40,000 farmers have participated. By 1958 about one-sixth of the farmers in Thailand were growing improved varieties with yield increases of 10 to 80 percent and were receiving quality premiums of from 10 to 30 percent. At this point, with the program in full operation and with the full support of the Ministry of Agriculture, U. S. assistance was withdrawn and concentrated on other crops. The rice committees were enlisted in testing and propagation of other types of food and cash crops.

Among the results of improvement of other crops, the introduction of Guatemalan corn and Hawaiian sugar sweet corn and consistent promotion of interest in improved corn have greatly expanded production of this crop. The 1957 corn crop was the largest on record -- 136,800 tons. Yields have increased 40 percent and production has almost tripled since 1951. Exports of corn in that time have increased in value by $3.5 million or more than four times.

Agricultural Credit and Marketing (93-14-034)

This project was started in 1952 to provide technical assistance in land development and colonization and counterpart funds in the form of loans to expand and improve existing rural credit services in cooperatives. Technical assistance in land colonization and development has been phased out, and the project now concentrates on demonstrations in credit and marketing as well as farm management improvement.

Cooperative credit is the only form of credit available to farmers, and this serves only 6 percent of them. Cooperative marketing is geared primarily to rice, which does nothing to encourage diversification of production.

In addition to technical assistance and demonstrations, the project provided loans totaling 8.5 million Baht to the Bank for Cooperatives to augment its

Agricultural Credit and Marketing - Cont'd.

loan resources and to selected paddy market cooperatives. Large amounts of equipment -- deep-well pumps, trucks, jeeps, tractors, portable pumps, winches, Butler bins, etc. -- were supplied to the Ministry of Cooperatives and 37 Km. of road were financed. Educational and training conferences, workshops, and short courses during 1958 trained 850 farmer cooperative leaders and officials in the direction and management of cooperative services.

In late 1958, three consultants were employed to make a full study and recommend a basic program of credit and marketing and cooperative management activity in Thailand. This report will serve as a basis for planning of further work in this field. Meanwhile, several cooperatives have been selected for demonstration of improved cooperative credit and marketing methods.

Livestock Industry Development (93-13-033)

In 1952 Thailand still had in force an embargo on export of cattle and buffalo because herds had been so badly depleted during World War Two. Livestock diseases were widely prevalent, causing severe losses to farmers and impeding the development of the industry, while Thailand had little means for dealing with them. Furthermore, vast areas of the Northeast were (and still are) devoted to submarginal rice production which might have supported a profitable livestock industry. Growth of such an industry was hampered not only by disease but also by lack of feed supplies for carrying animals through the dry season, by the lack of proved feed and forage crops, and by the poor state of cattle and hog breeds in the area. This project was begun, addressed to the whole problem of assisting the Thai Government in building up a stable, prosperous livestock industry. This involved introducing improved breeds, proper disease control, feeding, management, marketing, and processing.

Under the project, 279 head of purebred cattle were imported for breeding purposes, as well as 245 purebred swine and a large number of chickens.

Eighteen vehicles, seven tractors, large quantities of laboratory and veterinary supplies and equipment, fertilizer, seeds, and numerous buildings were provided for the field stations and central headquarters.

Livestock Industry Development - Cont'd.

A nutritional laboratory in Muek Lek and a diagnostic laboratory in Bangkok were built and equipped. The national serum and vaccine laboratory was expanded and improved with equipment and other facilities. All breeding stations have been assisted and improved. Twenty-five specialists have been trained in the U. S. and numerous others trained in Thailand and in other countries.

The project has met its goals as far as disease control is concerned, with the Department of Livestock Development now manufacturing virtually all of Thailand's requirements for vaccines and serums for the principal livestock diseases and with an educational, prevention, and treatment service in operation in almost all livestock areas. Five regional diagnostic clinics have been established and plans for five more are being developed by the Department. Forage and feed crops are being grown successfully on livestock stations in all regions, and bin storage and trench-silo storage of feed supplies through the dry season have been demonstrated as practicable and in reach of all growers. Management and breed improvement have been fully successful with hogs and poultry at all levels from stations to farmers. Improved management and breeds of cattle have been successful on stations but are just beginning to spread out to farmers, with 1,000 breeding swine and 84 breeding bulls now in villages. Spread of proven practices to farmers is now primarily a job for extension.

Completing the cycle of development, the project is giving administrative and technical support to plans for establishment of the first modern meat processing and cold-storage plant in Thailand (proposed for financing through private capital and the Development Loan Fund) which would assure market outlets and make possible development of exports for meat products.

An indication of the success of the livestock development project is the rise in exports of livestock and products. USOM advocated the removal of the embargo of livestock exports in 1952, which was done. Since that time, the value of exports of livestock and livestock products has increased year by year to $9,400,000 in 1957.

Improvement of Kasetsart University (93-11-130)

In 1952 USOM undertook to assist in strengthening and enlarging Kasetsart University, Thailand's agricultural university. During the years of this project, Kasetsart has grown steadily and the quality of its courses and offerings has greatly improved. Enrollment has increased from 317 students to 1,265, and the faculty has grown from 80 to 133 (full-time), since the 1954-55 school year.

Most of the U. S. assistance has been furnished through a contract with Oregon State College. Several professors are provided directly to Kasetsart, who not only teach courses but who assist in the development of curricula, improvement of teaching methods, establishment of research and extension projects, and preparation of publications for teaching and for extension projects.

Under the project large quantities of laboratory and plant equipment and teaching aids have been imported, and 14 buildings have been constructed with counterpart funds. About 40 members of the University staff have received or are receiving graduate training in the U. S. The project is scheduled for completion in 1963.

Agricultural Extension (93-11-029)

Because the Ministry of Agriculture had no system nor organization for giving advice and practical assistance directly to farmers, this project was begun in 1951 to help the Ministry establish a successful national agricultural extension service.

Seven departments of the Ministry operated field programs of an extension nature, independently and with considerable duplication and overlapping. Comparatively few of the field personnel of these various agencies had sufficient training to give useful assistance to farmers or to furnish leadership in rural activities.

The project also undertook to train personnel in extension work and to carry out demonstrations and other extension activities in an effort to show the way.

Agricultural Extension - Cont'd.

Eight regional extension centers have been established, with buildings, equipment, and in-service training of 250 extension agents furnished by the project. These are at Korat, Lopburi, Chachoengsao, Udorn, Chiengmai, Pitsanuloke, Songkhla, and Nakorn Pathom.

A national extension service council and national extension service office have been created, a proposed extension plan for Thailand has been developed, and a large number of key personnel have been trained. An extension information section is in operation, supplying audiovisual and published materials for use by agriculturists in the field.

Despite encouraging progress in the provinces and with extension staffs of the several departments, the development of a unified organization -- especially at the national level -- has been disappointingly slow. This is because it requires major realignments of traditional functions. The extension concept is proving itself to farmers through the work of the eight regional extension centers, and it is believed that the national organization will be perfected soon.

A branch office of the USOM agriculture division was set up in 1958 in Korat, with several extension advisors on its staff, to carry out an intensive and large-scale demonstration of extension service in the Northeast, to develop methods and practices which will increase productivity and conserve resources, to train provincial and district agricultural workers in extension work, and to pave the way for adoption of a national program. In early 1959, a team of three high-qualified senior agriculturists were brought from the U. S. to make a study and specific recommendations on the implementation of a sound extension and home demonstration program.

Over 100 extension training workshops and conferences have been conducted, several hundred farmer education meetings held, and almost 3,000 field crop demonstrations carried out. This work is being expanded. Training in the U. S. or other countries has been provided for 51 Thai specialists and officials in extension work, and 17 farm youths were sent to the U. S. for one year on "young farmer" training programs.

Rural youth work (formerly project 93-16-036) is now combined with this project. Started in 1954, its aim is to assist the Department of Agriculture

Agricultural Extension - Cont'd.

in developing a national youth farmer (Yuwa Kasikorn) organization similar to the American 4-H Club movement.

An American club advisor has helped organize clubs throughout the Kingdom. Assistance has been given in developing forms, reporting and other procedures; preparing books, manuals, project guides and other materials; selecting, training and supervising local club leaders and advisors; and demonstrating all types of club activities.

By the end of 1958 104 clubs had been organized with approximately 4,000 members. In 1957 this project helped organize and finance the first Far East Rural Youth Conference, which brought 125 delegates and 40 observers from ten countries to Bangkok.

Fisheries (93-18-023)

Next to rice, fish constitutes the most important part of the Thai national diet and may well be considered Thailand's second most important industry.

This project, begun in 1951 and phased out in 1957, assisted the Department of Fisheries in its efforts to improve and expand fish production and marketing through training, market development, assistance to fishery schools, and a fish technology laboratory.

Largely as a result of introduction of improved fishing gear, Thailand's fish catch increased by 25 percent between 1953 and 1955. The improved nets and gear are being purchased by Thai fisherman at the rate of $300,000 worth a year. A fish meal industry was started in 1953 and within three years was producing and selling 2,000 tons a year. The first centralized wholesale fish market in Thailand was established in Bangkok in 1953, with technical advice from USOM, as was a 1000-ton frozen fish plant. Tilapia, a fast growing fresh-water fish, was introduced into Thailand under this project and has become important for inland consumption. A fish technology laboratory was established through this project and its personnel were trained for developing new and improved fish processing.

Fisheries - Cont'd.

Twelve Thai specialists were given advanced training in the U. S. and other countries, and large amounts of equipment and supplies were provided to the fisheries stations, including diesel engines, generators, pumps, marine diesels, trucks, launches, refrigerators, fishing gear, and nets.

Agriculture Resources Use and Conservation (93-12-191)

The philosophy of conservation is hardly known in Thailand except among a small body of dedicated men, mainly because of the seeming abundance of soil and forests and the dependability of food supplies. As virtually all the good land has been put to intensive rice culture, as the forests have receded, as the need for land has driven men to clear marginal areas and put plots to unsuitable uses, resource wastage has become a major problem, as yet not generally recognized. Destructive slash-and-burn farming, once tolerable, can no longer be afforded as population increases and production must be stepped up.

Related to this are the problems of the "arid" Northeast. Actually 35 to 45 inches of rain fall on most of this area; it is arid only to the extent that there is not enough water for dependable wet-rice growing. With moisture conservation, soil improvement and better adapted crops the region might become prosperous despite its poor soils.

The need for diversification, generally recognized by agriculturists, calls for information on land-use capabilities, soil characteristics, and plant food needs. Such information is fragmentary and facilities for gathering it hardly existed a few years ago.

These were some of the considerations which prompted projects, beginning in 1952, to deal with soil fertility studies, soil testing facilities, and related subjects. As these activities gained experience and proved their value, attention was turned to conservation of soil and water resources and improved uses. The present project was established in 1959, carrying on the soils work, but emphasizing soil survey, land-use capabilities, and conservation.

Agriculture Resources Use and Conservation - Cont'd.

Centered at Korat and extending throughout the Northeast, this project is aimed at the establishment of numerous demonstrations, with the cooperation of local agricultural officers. These will show conservation measures to hold water and prevent erosion, results of using fertilizer, composting, rotations, cover crops, green manuring, and so on. Training workshops will be held for local agricultural officers, and farmer meetings will emphasize the value of the demonstrated measures and practices.

The earlier projects in soil fertility and testing services (93-11-027, 93-11-029 and 93-12-131) assisted the Rice Department in studying and promoting the use of fertilizer and green manures on paddy land and helped the Department of Agriculture establish a national soil testing laboratory at Bangkhen to study and introduce to farmers improved soil fertility practices. USOM provided technical assistance and laboratory equipment, and nine Thai technicians were trained in the U. S. As one result, soil testing service is now free to any farmer in Thailand (for composition and fertilizer requirements) and a great deal of information has been gathered on the soils of Thailand as the basis for future agricultural planning.

Assistance in the reclamation of forests in North Thailand and the establishment of forest regeneration centers throughout the Kingdom (project 93-17-077), begun in 1952, was phased out in 1954 by agreement that assistance in the forestry field would be the responsibility of FAO. A number of vehicles, tractors and other equipment were furnished and buildings were constructed at forest stations.

Agricultural Statistics (93-14-035)

Agricultural statistics, especially economic information, has been almost lacking for purposes of agricultural planning and development.

This project provided, between 1955 and 1958, technical assistance and training to the Agriculture Economics Division of the Ministry of Agriculture for improving essential economic services and information. As a result, a number of special surveys were made and reported, and today the various statistical reports are more frequent, more comprehensive, more reliable, and more current than they have been before. This has greatly increased their value

Agricultural Statistics - Cont'd.

for purposes of marketing, planning, measuring progress, and developing Thai agriculture.

(Regional) Rinderpest Eradication (87-13-005)

This project was begun in 1956 to assist Thailand, as part of a regional campaign, to eradicate rinderpest, a serious and destructive livestock disease. Vaccination teams, searching teams, and disease reporters have been trained in the seven provinces where the disease was prevalent. Through USOM and FAO assistance, sufficient rinderpest vaccine is now being produced in Thailand to meet all needs. Besides technical assistance, USOM provided jeeps, refrigerators, and other supplies and equipment.

The disease was gradually confined, and since December 1958 not a single case of rinderpest has been found in Thailand. The project was completed that year, but the Thai Government is keeping searching teams on the alert and has established a 50 Km. belt along the Cambodian border for universal vaccination of animals to prevent reinfection from across the border.

Dollars - U. S. Dollar contribution
C/P - Local currency costs from Counterpart Funds
Budget - Thai Government contributions from regular budget
(All shown in terms of thousands of dollars)

	Dollars	1957 & Prior C/P	Budget	Dollars	1958 C/P	Budget	Dollars	1959*** C/P	Budget
2. INDUSTRY AND MINING									
Mae Moh Thermal Power Facility 93-22-150 1957-60	3,469*	50	-	-	865	-			
Mining Development 93-21-038(003,080, 120,132,133) 1951-63	1,666	1,003	151	52	70	30	11		
Bangkok Interim Power 93-22-155 1957-59	1,981	140	692	-	-	-			
Power Services & Training 93-22-187(041,134) 1950-63	1,836	154	208	37	60	31	12		
Industry Training Projects 93-22-042(044,109) 1951-55	116	13	25	-	-	-	-	-	-
Airborne Minerals Survey 93-21-153 1957-59	130	-	-	-	70	-			
Industrial Technical Advisory Services 93-29-139 1954-60	20	-	-	-	-	20			
TOTALS	9,218	1,360	1,076	89	1,065	81	23		
(Regional) Telecommunications Construction 51-(93)-22-029 1958-61	-	-	-	17,000**	-	-		200	
(Regional) Telecommunications Engineering 51-22-002 1956-58	1,422	59	54	55	83	-			

* - Financed from a 1957 loan of $10 million
** - $7 million of this project is a loan
*** - Incomplete

Mae Moh Thermal Power Facility (93-22-150)

Construction of a lignite-fired thermal power station at Mae Moh, in Northern Thailand, was authorized in 1957. Located at the site of large lignite deposits (which USOM helped develop), this power plant will produce 12,500 KW of electricity which will provide badly needed power for the populous area around Lampang and Chiengmai. It will utilize low-grade and dust lignite presently being dumped at Mae Moh, and it will substantially reduce the existing power rates in this important section of Thailand.

Cheaper power will promote the growth of local industries. Also, during the construction of the Phumipol Dam at Yan Hee, Mae Moh will supply power to that project, substantially reducing construction costs. Thai engineers employed at Mae Moh will receive valuable training in power transmission design and construction.

The project includes building a 69 KV line to Chiengmai by way of Lampang and Lampoon, with substations at all three points. It also includes construction of a 66 KV transmission line from Lampang to Yan Hee, to supply construction power. After Yan Hee is completed, Mae Moh will serve as an auxiliary to that system.

Contract for plant equipment has been awarded to Elin A. G. of Austria and is presently being manufactured. Elin will also erect the equipment. The project is expected to be completed in September 1960.

Mining Development (93-21-038)

This project has, since 1951, provided financial and technical aid to the Royal Thai Department of Mines in making a systematic geological survey of Thailand. Since 1956 it has concentrated also on the discovery, evaluation, and development of Thailand's mineral resources. Under this phase of the project private enterprise is encouraged to use known information in developing mines to provide materials for export and to meet Thailand's own needs and promote its industrial growth.

Many individual mineral deposits and mining areas have been investigated and described. This has contributed to the opening and operation of the Mae Moh lignite mine several years ago and, more recently, has contributed to the

Mining Development - Cont'd.

development of the Chieng Khan manganese mine and the Tapan Hin gypsum mine. These are the only mines now operating in Thailand, other than tin and tungsten. A number of areas have been investigated geologically and basic knowledge has been accumulated toward a systematic geological survey of Thailand. About twenty reports on geology and mineral resources have been published or are on file in the Department of Mines.

Twenty-four Thai geologists, engineers, and other technicians have been trained in the U. S. A modern and efficient chemistry laboratory, equipped and staffed by the project, each month makes more than 100 analyses and assays for government agencies and private interests. A library, consisting of several thousand volumes of books and periodicals on geology and mining in Southeast Asia, has been gathered, catalogued and properly housed in the Department of Mines where it is available for study by all interested persons.

Although essentially concerned with technical assistance and training, the project has supplied some equipment and supplies, including several vehicles, a diamond core drill, Geiger and scintillation counters, and a considerable amount of surveying and laboratory equipment. The work is expected to phase out about 1968.

American aid to the Mae Moh lignite development (project 93-21-003) began in August 1951, when the first exploratory drilling was undertaken by the Royal Department of Mines using a U. S.-supplied jeep-mounted auger drill. Project 080 financed a dragline and shovel unit, 6 tractors, 2 Euclid loaders, 8 Euclid bottom dumps, 31 vehicles, 7 drilling machines and a 107 KW generator.

Project 003 financed the construction of access roads, bridges, two briquetting machines, exploration camp costs, and other expenses at Mae Moh and Krabi, together with some exploration of the site at Kniansa.

Krabi was closed because of difficult mining conditions and its unsuitable marketing location. Mae Moh produced 31,415 tons of saleable lignite in 1955 and was yielding 6,000 tons a month when the project was phased out in 1956 and the mine operation transferred to another government agency. Development of Mae Moh lignite paved the way for establishment of a thermal power plant at that site which will supply power needed during construction of the

Mining Development - Cont'd.

Yan Hee dam. It will also supply the needs of the populous area from Prae to Chiengmai (project 93-22-150).

From 1951 to 1955, a related project (93-21-080, 120) assisted the Royal Department of Mines in carrying out the development and utilization of the mineral resources of the Kingdom. Emphasis was placed on strategic minerals as well as fuel and other minerals needed for use in Thailand or for exporting. During these years, 20 Thai specialists were trained in the U. S., and the Department of Mines was provided with up-to-date equipment and instruments, including vehicles, portable compressors, rotary drilling rigs, jackhammer drills, mine water pumps, steel cutters, jeep mounted drills, caterpillar tractors, diamond core drills, and so on.

From 1951 to 1957 project 93-21-132 also assisted the Thai Ministry of Industry in expanding and improving metal mining in various parts of western and southern Thailand, and two Thai engineers were sent to the U. S. for one year of training in modern underground exploration mining and safety methods. About 30 mine operators and 6 college students of engineering were given demonstrations and training in under-ground mining methods. Sixty laborers received rigorous on-the-job training as miners and machine operators at Pilok (tungsten), Nasam (wolfram and tin), Phuket (tin), and Koh Saba (tin). These persons have, in turn, trained others; and most of the original laborers have since become crew chiefs for underground workings in various projects, such as the first diversion tunnels for the Phumiphol Dam at Yan Hee.

From 1952 to 1958, USOM assisted the Department of Mines in establishing, equipping, and staffing a modern mineral experimental center to help Thailand attain greater efficiency in beneficiating various ores and laying the foundation for a metallurgical industry (project 93-21-133).

Six participants who were sent to the U. S. for training in metallurgy form most of the staff for the experimental center. They, in turn, are imparting their knowledge to younger Thai technicians. A completely integrated mineral experimental plant has been constructed, equipped, staffed, and set in operation. It consists of a powerhouse, ore dressing laboratory, machine shop, pilot mill, minerals laboratory, and offices. Small home-made blast furnaces, sintering machines, and reverberatory furnaces have been erected.

Mining Development - Cont'd.

The center is a valuable unit of the Department of Mines that makes petrographic determinations and microscopic examinations of minerals, ores, and water samples sent in by private companies and government agencies. Many experiments have been conducted on the beneficiation of such ores as tin, tungsten, lead, manganese, copper, and gold.

Bangkok Interim Power (93-22-155)

Bangkok's needs for more electric power are urgent. The already overloaded system is operating in the face of expanding demand and much of it is in need of replacement. Inadequate and undependable electric power at high cost is a serious deterrent to the industrial expansion of this growing metropolitan area where most of Thailand's commerce and industry is centered.

This project, begun in 1957, is to provide the city with a complete 10,000 KW diesel-electric power plant as an interim source of additional electricity until more reliable sources of hydro and steam power now being developed become available. Power from Yan Hee is scheduled to reach Bangkok in the summer of 1963. Distribution improvements will be made to tie this new power source into the system and to put into operation previously purchased switchgear and other distribution equipment. After the Yan Hee power becomes available, many of the diesel units now located in Bangkok will be relocated in rural areas where they will serve to build load so that economic transmission taps will be possible in the future.

The project is supervised by the American firm of Rogers Engineering Company. The first three diesel generator sets, on order from the English Electric Company, Ltd. of England, should be in service in June 1959 and the remaining seven by August 1959. In addition to the generators, the project provides for transformers, conductors, protective devices, hardware, luminaries and insulators. These will be used in tying in this new plant at Lumpini Park with the existing power plants at Wat Lieb and Thonburi as well as other necessary distribution changes.

Power Service and Training (93-22-187)

This project supplements various power projects which are singly or jointly sponsored by the Thai Government, the IBRD, DLF, and ICA, including: Mae Moh thermal power plant and transmission system, Yan Hee hydropower project, Yan Hee power transmission system, Bangkok interim power project and thermal power plant, and Bangkok 250 MW distribution system.

The project began in 1951 and is scheduled for completion in 1963. Currently, it finances a contract between the American firm of Rogers Engineering Company and the National Energy Authority, the continued services of two USOM electrical engineers who coordinate ICA activities with various Thai agencies concerned with power matters, and the training of Thai technicians and specialists in the U. S. (10 or 15 a year).

The Rogers Engineering Company is providing construction drawings and specifications as well as equipment specifications for a modern power distribution system in the Bangkok-Thonburi area. This will be coordinated and tied in with the Yan Hee power network and make possible the utilization of 200 to 250 MW of power in the Bangkok-Thonburi area on completion of the first phases of the Yan Hee project. In addition, the engineering firm has design responsibilities for the Mae Moh power plant and its related distribution lines in North Thailand.

In previous years, this project (93-22-041-134) provided substantial amounts of equipment for meeting power needs in various towns in Thailand, technical services, and training of participants -- 24 in number. The project supplied 7,700 KW of diesel generating equipment, of which 5,000 KW was installed in Bangkok-Thonburi and the balance in Phuket, Lampang, Ubol, Phrae, Yala, Chachoengsao, Chantaburi, Photaram, Prachuabkirikand, and Smutsongkram.

INDUSTRY TRAINING PROJECTS:

Telecommunications (93-22-042) - Trained 16 Thai technicians in the U. S. in various fields of telecommunications, to assist the Thai Government in the expansion of telephone, telegraph, radio, and other telecommunications. Begun in 1951, the activities under this project were transferred in 1956 to the Regional Telecommunications Project (51-22-002).

INDUSTRY TRAINING PROJECTS - Cont'd.

Vegetable Oil Refining (93-23-044) sent two Thai chemists from the Ministry of Industry department of science to the U. S., United Kingdom, and West Germany to study modern methods of refining vegetable oils such as coconut, soya, sesame, cottonseed, and peanuts, in 1954-55.

Diesel Engine Training (93-22-109) -- financed training of one participant in the operation of diesel electric power units in U. S., United Kingdom, and West Germany, in 1955.

Airborne Geophysical Survey (93-21-153)

With evidence that three or four areas of Thailand might yield previously undiscovered metalliferous ore deposits, an airborne geophysical survey was financed in 1957, to be completed in 1959. These areas are being flown with various geophysical instruments by an American company under a blanket contract covering the total cost of the entire operation.

The specific objective is to obtain geophysical maps, cross-sections, and profiles of the promising areas and to indicate the parts of areas where surface exploration by Thai geologists should be concentrated.

After considerable time was spent in gathering basic data necessary for the survey, a contract with Aero Services Corporation was signed in October 1958. Flying was begun in January 1959 to be finished in five or six months.

Industrial Technical Advisory Services (93-29-139)

In anticipation of the establishment by the Thai Government of an Industrial Finance Corporation, this project has assured the Thai of American financial and technical support. The establishment of IFC is now awaiting Thai legislative approval.

The project will furnish three American specialists to assist the staff of the new corporation in encouraging private initiative in the industrial development of the country. It is expected that these technicians will be supplied through

Industrial Technical Advisory Services - Cont'd.

the U. S. Small Business Administration. They will direct their efforts primarily toward development of small industry in Thailand through careful analysis and administration of small industry loans.

(Regional) Telecommunications Construction (51-22-029)

This project covers the second phase of an overall project which began with project 51-22-002, Regional Telecommunications Engineering. The objective is to provide a modern, efficient telecommunications system which will integrate in a single network all Thai civilian, government, and military communications and connect this system with the telecommunications systems of Vietnam, Laos, and Cambodia.

The preliminary engineering phase of this regional (Asian Economic Development Fund) project was completed in February 1958 with the presentation of a "fundamental plan" by the contractor, Hycon-Page Company.

Tudor Engineering Company, retained by ICA to evaluate the Hycon-Page plan and to make recommendations for the implementation of the second phase of the project (construction), recommended in April 1958 that a single modern communications system be established in Thailand and that the present Thai telephone facilities be rehabilitated.

Following the Tudor recommendations, ICA selected in November 1958 a new engineering firm, Television Associates of Indiana, to complete the engineering and supervise the construction.

Of the $17 million total estimated cost of the Thailand portion of this regional project, $7 million is covered by loan and $7 million by grant, both from the Asian Economic Development Fund (ICA). The $3 million balance is a grant under the Military Assistance Program.

Agreements to proceed with construction of the regional telecommunications system were concluded with the Thai, Laotian and Vietnamese governments in June 1958. USOM/Thailand revised the Hycon-Page technical data to comply with the Tudor recommendations and submitted them to ICA in Washington in

(Regional) Telecommunications Construction - Cont'd.

September 1958. In December 1958, a party from Television Associates arrived in Thailand for a reconnaisance (pre-contract) survey. Several programs have been selected for early implementation. The first construction contract awarded in January 1959 concerned installation of cable conduits in Bangkok. It is expected that the Thai portion of the regional system will be completed and turned over to the Thai Telephone Organization about July 1961.

(Regional) Telecommunications Engineering (51-22-002)

In view of the jumble of telecommunications networks throughout Thailand and neighboring countries -- paralleling, duplicating, uncoordinated, and wasteful in addition to being inadequate for today's needs and incapable of meeting constantly expanding demands -- this project was initiated in 1956 under the Asian Economic Development Fund (U. S. Mutual Security Program funds for Asian regional projects). The plan was to develop a modern telecommunications system in Thailand and between Thailand and the neighboring countries of Laos and Vietnam.

A contract was made with a U. S. firm, Hycon-Page, to make a study to produce a preliminary estimate for future planning, a fundamental plan for a modern telecommunications system, and technical specifications for bids for construction. The contractor was also required to conduct a training program. The contractor produced a preliminary estimate, which was accepted by ICA and the Thai Government. Its fundamental plan was, however, rejected and the contract was terminated in June 1958. Work performed will be useful as a basis for future engineering and construction.

The project is going ahead under project 51-22-029, Regional Telecommunications Construction.

TABLE OF PROJECT COSTS

Dollars - U. S. Dollar contribution
C/P - Local currency costs from Counterpart Funds
Budget - Thai Government contributions from regular budget
(All shown in terms of thousands of dollars)

	1957 & Prior			1958			1959**		
3. TRANSPORTATION	Dollars	C/P	Budget	Dollars	C/P	Budget	Dollars	C/P	Budget
Friendship (Northeast) Highway 93-31-066 1954-58	13,650	4,999	-	537	1,291	-	-	-	-
East-West Highway 93-31-184 1955-60	6,807	693	-	2,000	2,733	-			
Airport Development 93-37-094 1955-60	3,143	-	-	-	7,032	-	-	-	-
Highway Bridge Replacement 93-31-197 1955-62	-	6,432	-	-	2,802	-			
Aeronautical Ground Services 93-37-050(069,070) 1951-63	3,905	466	746	416	1,255	1,447	44		
General Highway Improvement 93-31-089(046,047) 1951-59	2,083	4,348	976	-	715	-	-	-	-
Aviation Overhaul Facility 93-37-152 1957-63	3,580*	-	994	-	-	-	-	-	-
Bangkok-Bangkapi Roads 93-31-179 1957-60	-	413	1,300	-	2,614	-			
Railways Improvement 93-33-014(008,143) 1950-57	1,445	282	2,285	-	-	-	-	-	-
Udorn-Nongkai Rail Extension 93-33-090 1955-57	1,287	2,331	-	-	-	-	-	-	-
Highway Equipment Pool 93-31-200 1957-63	3,000	-	-	-	60	-			
Thai Airways 93-37-118 1954-59	1,576	-	465	75	-	218	-	-	-
Railway Equipment 93-33-091(154) 1955-58	1,544	-	-	-	-	-	-	-	-
Highway Department Operations 93-31-159 1957-63	445	16	35	149	130	-	33	160	
Mekong Ferry Landing, Rail Spur 93-33-148 1956-58	-	764	155	-	-	-	-	-	-
Harbor Development 93-34-N104(040) 1951-54	796	103	-	-	-	-	-	-	-
Meteorological Services 93-37-117(049) 1955-62	423	264	99	45	30	10	6		
Bangkok-Saraburi Highway 93-31-185 1957-62	650	-	-	-	164	-			
Evaluation of Transport System 93-39-181 1957-60	300	45	-	-	-	-	-	-	-
Korat-Nongkai Highway 93-31-199 1957-64	-	150	-	-	24	-			
Highway Materials Survey 93-31-201 1959-60	-	-	-	-	-	-			
TOTALS	44,634	21,306	7,055	3,222	18,850	1,675	83	160	

* - Financed from 1957 loan of $10 million
** - Incomplete

Friendship (Northeast) Highway (93-31-066)

Construction of a modern highway, based on American methods of design and construction, was begun in October 1954 between Saraburi and Korat.

The major purpose of this highway was to promote the economic development of Northeast Thailand. The only highway between Bangkok and Korat, the gateway to the Northease and its 8 million people, had been 404 Km. long. About 300 Km. of this was tortuous and rough, with impassable muddy stretches in rainy season, rocky passages through the mountains, and dozens of narrow, flimsy wooden bridges. Under the best of conditions, it meant 8 or 9 hours of dangerous, car-busting travel. Replacement of this part of the road, between Saraburi and Korat, was considered the most-needed link in the improvement of Thailand's highway system.

Design and construction of the highway was carried out under contracts with the American firms of Sverdrup and Parcel Engineering Company (engineering) and Raymond Construction Company (construction). During the building of this road, some 1500 Thai were trained in the various phases of operation of equipment, maintenance, repair, welding, quarry operation, etc. Many Thai Highway Department personnel and some provincial officials were given on-the-job training in modern techniques of bridge and road design and building.

The highway, named by the Thai the "Friendship Highway," was turned over to the Thai Government in a formal dedication in the presence of His Majesty the King of Thailand, on July 10, 1958.

The drive to Korat and the Northeast from Bangkok has been shortened by about 150 Km. (the Friendship Highway is 148.5 Km. long), and driving time to Korat is now about 3-1/2 hours.

Approximately $4.5 million of construction and other equipment was purchased by Raymond Construction Company under this project. After completion of the Friendship Highway this equipment was moved to the site of the East-West Highway. After that job is finished, all equipment remaining which is worth reconditioning will be put in good repair and turned over to the Thai Highways Department.

Friendship (Northeast) Highway - Cont'd.

Funds authorized for the highway totaled $20,477,000. With deduction of cash refunds by the contractors and the equipment and parts transferred to the East-West Highway the net cost was $15,700,000.

East-West Highway (93-31-184)

There has never been an all-weather road between the North and Northeast of Thailand, preventing the development of commerce between these two important regions of the country. Lack of roads has also retarded development of the large sparsely-settled area lying between these regions, which is believed to have mineral resources as well as large tracts of timber and farming possibilities.

This project finances contracts between the Thai Government and two American firms for the engineering and construction of a new 130 Km. asphalt-surfaced highway between Pitsanuloke and Lomsak in northern Thailand.

The new highway traverses extremely rugged mountainous terrain for most of its length. The Thai Government requested assistance in the construction of this road from ICA because it posed construction problems beyond the resources of the Highway Department. ICA agreed, in view of its economic and military significance and the opportunity it offered for training Highway Department personnel in road construction through difficult country. Engineering is being performed by Sverdrup and Parcel Engineering Company and construction by the Raymond Engineering Corporation, the firms that completed the Friendship Highway between Saraburi and Korat.

Over $3 million worth of equipment purchased by the contractor and used on the Friendship Highway project was transferred to the East-West Highway. After completion of this road, the equipment will be turned over to the Thai Highways Department in good condition.

Surveying of the highway began in 1955; construction should be completed by mid-1960. As on the Friendship Highway, Thai technicians, engineers, machine operators and laborers are being trained on the job in modern techniques of highway construction and engineering and in the operation and maintenance of heavy equipment. The highway is 6 meters wide, plus 2 meters

East-West Highway - Cont'd.

of treated shoulders. Twenty reinforced concrete bridges will be necessary, including a badly needed bridge over the Nan river at Pitsanuloke.

Airport Development (93-37-094)

This project was commenced April 1955, and construction is expected to be completed in December 1959. It provides for grading, draining and paving of concrete runways, taxiways, and aprons; construction of entrance roads; installing airport lighting, electric power and other miscellaneous construction at the following airports: Korat, Takhli, Udorn, Ubon and Chiengmai. The ultimate objectives of the project are to provide not only an adequate air defense for Thailand consistent with U. S. policy and SEATO responsibilities but also to provide good civil airport facilities for domestic air carrier operation and the advancement of civil aviation in Thailand.

The project was, in September 1955, turned over to the U. S. Navy, with full authorization to arrange for and supervise engineering, construction, and other services, as well as development of specifications and procurement of commodities in connection with the project agreement.

Considerable difficulty was encountered in securing land requirements for these airports. Contracts were let by OICC for construction in the spring of 1957. Due to certain difficulties it was necessary that the contract be reduced to include only 2 airports (Korat and Takhli), that OICC re-advertise for construction of Udorn, Ubon and Chiengmai, and (due to reduced funds available) that additional funds be furnished for inclusion of civil taxiways and aprons. This was accomplished through the ICA/CAA Group and the Thai Government. A contract was let to Vinnell & Christiani & Nielson, a joint venture, on June 30, 1958.

Construction got under way immediately. The airports at Korat and Takhli are completed (April 1959) and the OMC at Udorn is nearing completion. The grading and draining work at Ubon is nearly completed. It will require approximately a month to move the heavy equipment to Chiengmai, but work is expected to start there about May 1st. The contractor's schedule provides for full completion of all grading and paving at the three airports in December 1959. The Thai CAA technical staff is in the process of preparing

Airport Development - Cont'd.

plans for the terminal buildings at Chiengmai, Udorn and Ubon, and it is expected that the construction of these buildings can be started by November 1959 under Project 93-37-050.

Highway Bridge Replacement Program (93-31-197)

This project finances replacement of dangerous, rickety timber bridges (most of them one-lane) with reinforced concrete structures on many sections of the primary highway system, where existing alignment will be followed in future road improvement. These old bridges are serious hazards to highway safety; they add considerably to highway travel time over long distances, and their occasional failure blocks off entire sections of the highway system.

The project was financed from CY 1955 through CY 1958 under project 93-31-089 (General Highway Improvement).

The total program calls for replacement of 954 selected bridges on 8 principal highways, to be completed in 1962. Box or pipe culverts are utilized wherever possible. The average bridge is 22 meters long and 8 meters wide, curb to curb.

Design and engineering is performed by the Thai Highways Department, but all construction is performed by local contractors, bidding on a firm lump-sum price basis. Over 500 timber bridges have been replaced with concrete bridges under this program. At the end of 1958, 611 bridges were either complete or under construction -- 15 of them built by the Thai Highways Department and 596 by private contractors. More than 4000 Km. of highway have benefited by bridge replacement.

Aeronautical Ground Services (93-37-050)

This project was begun in 1951 to assist Thailand in developing an efficient, integrated system of ground facilities and services to support both domestic and international air commerce. Facilities and services planned will help carry out the plans of the International Civil Aviation Organization. They will be used for both civil and military purposes, and they will be operated without

Aeronautical Ground Services - Cont'd.

duplication of effort.

Specifically, the project undertook to provide Thailand with:

(a) A system of improved airports, located by both economic and military considerations.

(b) Air/ground and point-to-point communications for all airports, basic navigational aids, air-traffic control facilities, power supplies at civil airports, and approach, runway and taxiway lighting.

(c) Technical advisory services and training of personnel (in courses, on-the-job, and overseas) in all phases of civil aviation, but particularly in the fields of air-traffic control, communications, and electronic equipment maintenance.

A large amount of equipment has been furnished or is on the way. Planning and construction work have been done preparatory to receipt and installation of these supplies. Technical assistance has included aid in siting, installing, and commissioning of much of this equipment. Language and technical training have been given to personnel to operate and maintain the various facilities. Organized classes in air-traffic control have graduated qualified tower operators. Engineering assistance has been given to various airport construction and improvement operations in all parts of the Kingdom.

Forty-seven participants have been sent to the U. S. or other countries for specialized training in electronics, air traffic control, communications, airport design, and related fields.

Electronic and power-generating equipment necessary for safe, efficient aeronautical communications and navigational operations has been provided to Don Muang International, Songkhla, Phuket, Chiengmai, Lampang, Phrae, Udorn, Ubol, Nakorn Sawan, Mae Sot, Tak, and other air fields -- this includes an omnidirectional range, radio beacons, radio transmitters and receivers, generators, etc.

The project is under the technical direction of U. S. Federal Aviation Ad-

Aeronautical Ground Services - Cont'd.

ministration technicians assigned to ICA's technical assistance program. All construction and installation work is programmed for completion in 1962, and the project termination date is 1962. It is, however, expected that an advisory civil aviation group will remain for several years after that date, either under a new project or an extension of this one.

General Highway Improvement (93-31-089, 046, 047)

From 1951 through 1954, American assistance to Thai highways consisted of technical assistance and a small amount of construction equipment. It was directed to improvement of a specific list of the most critically needed highways, most of which were incorporated into the system aided under later projects.

Within this limited aid and through the medium of fairly large Thai Government budgets for highway work during those years, the Thai Highway Department carried on the highway improvement entirely within its own resources. When in 1955 U.S. financial aid to Thailand was considerably increased, it became apparent that the portion of this expanded aid to be allocated to improvement of the national highway system could not be effectively utilized until a comprehensive plan for a basic highway system was developed. A primary highway system plan was accordingly prepared by officials of the Thai Ministry of Communications and USOM technicians.

This plan covers a basic system composed of the minimum number and length of primary highways necessary for the economic growth and military defense of Thailand. Since the plan was drawn up, U.S. assistance has been confined to the highways which are components of this primary system, without any commitment to help complete the entire system.

During calendar years 1955 and 1956, a total of $3,647,000 (all in local currency except $213,000 for equipment and American technicians) was provided to the Thai Highway Department to supplement its budget for construction or rehabilitation of various highways. Accomplishments were worthwhile, but progress was not entirely satisfactory and it was impossible to give comprehensive supervision to the American-financed portion of the total highway program. Beginning in FY 1957 it was decided to limit aid to

General Highway Improvement - Cont'd.

specific projects under separate project agreements. Project 93-31-089 was discontinued in 1959 (projects 046 and 047 had been combined with this project earlier).

One project under General Highway Improvement was the Udorn-Loey Highway. USOM provided $1,378,750 of local currency in 1957-58 for building a 20-Km. section of this road west from Udorn. Construction is being accomplished entirely through the physical resources of the Thai Highway Department. No further American aid is contemplated, but the Thai consider this road of such economic importance that they are continuing construction to Bualampoo (45 Km. west of Udorn) through their own resources and plan to complete it into Loey (145 Km. from Udorn) as soon as their budget will permit.

A heavy-equipment training school (project 93-31-047) was established in 1953 under the Thai Highway Department, staffed by American technicians, USOM-employed Thai instructor-translators, and Highway Department personnel. Ten pieces of heavy equipment were utilized, along with other equipment loaned by various Thai agencies. Approximately 300 Thai from various departments were given on-the-job training in operation and maintenance of heavy earth-moving equipment. In the course of training, about 15 Km. of roads were built, making possible the extension of the Thai State Railway from Udorn to Nongkai. An earth embankment was provided for the railway marshaling yards at Bangsue, and some jungle land was cleared for future farms for the public welfare department at Saraburi. The training school was completed with the establishment of the Raymond Construction Company training program on the Friendship Highway in December 1955.

Other projects formerly financed by the General Highway Improvement project, and being continued under individual project agreements, are:

Highway Bridge Replacement (now 93-31-197, since FY 1958)

Highway Equipment Pool (now 93-31-200, since FY 1958)

Korat-Nongkhai Highway (now 93-31-199, since FY 1958)

Bangkok-Saraburi Highway (now 93-31-185, since FY 1957)

General Highway Improvement - Cont'd.

East-West Highway (now 93-31-184, since FY 1957)

Aviation Overhaul and Maintenance Facility (93-37-152)

Bangkok International Airport is the largest and busiest airport in Southeast Asia. At the present time 10 major international airlines and 9 regional airlines operate through this airport, which also serves as the headquarters of the Royal Thai Air Force. Present overhaul and maintenance facilities are inadequate to service the varieties and quantities of aircraft utilizing the airport.

The present Thai Airways Company Overhaul Base can handle aircraft no larger than DC-3's and C-47's. The trend to operation of larger and more complicated aircraft through Bangkok is increasing. Bangkok is ideally located to serve as the strategic center for aviation in Southeast Asia, but if it is to maintain its dominant position maintenance services must match the level of operational service. This project is intended to help Thailand meet that objective.

Bangkok-Bangkapi Roads (93-31-179)

Perhaps the most congested road in Thailand, and growing worse weekly, was the two-lane road through the Bangkapi section, the most rapidly expanding residential section of Bangkok. The road serves as the only highway to southeast Thailand, a rich and rapidly growing area of fruit farming, tapioca, small-scale manufacturing, fishing, and beach resorts along the east coast of the Gulf of Siam.

To remove this bottleneck to commerce and municipal growth, this project finances the widening and resurfacing of 7 Km. of Sukhumwit road and 1.4 Km. of Rama IV road; a new 8 Km. extension of Petburi Boulevard; extension, widening, and resurfacing of four interconnecting side streets; construction of 3 new bridges; relocation of water, electric and sewage lines as required, and construction of sidewalks and additional sewer lines.

The project also improves access to the Klong Toi harbor area, Bangkok's only

Bangkok-Bangkapi Roads - Cont'd.

port facility, and will open up a large area of undeveloped land near the heart of the city for future expansion.

All equipment is supplied by the local contractors who are doing the work, and design and supervision is under the Bangkok Municipality, the contracting agency. The work is scheduled for completion in December 1960, having started in 1957.

Railways Improvement (93-33-014)

Between 1951 and 1957 this project assisted the Thai Government in the planning and construction of three railway shops (Korat, Uttaradit, and Thungsong) and in other improvements in facilities and operations. The railways have long been one of the major factors in the Thai economy. The system suffered from bomb damage and severe usage during the war and was badly in need of repair and maintenance facilities and operational improvements. Especially needed were regional facilities at which rolling stock could be conditioned without deadlining equipment back to Bangkok for long periods.

Two diesel-electric generators were provided and installed in the Bangkok and Makkasan railway shops, total capacity 1,000 KW. About one million dollars' worth of materials and rolling stock parts -- wheels, steel plates and shapes, castings, air-brake parts, couplings, etc. -- were furnished. Various items of equipment and machinery were provided to rebuild the damaged railway shops at Korat, such as boilers, feed water heaters, boring mills, shapers, etc. Various other equipment, machines, and testing apparatus were provided at other locations.

Thirty-seven Thai senior and junior railway employees were sent to the U. S. to study maintenance, operation, administration, bridge design, traffic control, accounting, and other aspects of railroading.

Udorn-Nongkai Rail Extension (93-33-090)

Most of the imports for Laos move through the port of Bangkok, and up the Thai State Railway toward Vientiane. As this traffic expanded rapidly following

Udorn-Nongkai Rail Extension - Cont'd.

the Geneva settlement, USOM agreed in 1955 to assist the State Railway in completing the construction of 60 Km. of meter-gauge single-track line, including sidings and yards, from Udorn to Nongkai, on the Mekong River. Materials and equipment were financed by the U. S. and construction was performed mainly by State Railway forces. Among commodities furnished were 3,900 tons of rail, a 5-ton bridge crane, stone crushers, concrete mixers, sheepsfoot rollers, welders, wire, spikes, rail anchors, etc. The Udorn-Nongkai line was completed in late 1957 under project 93-33-148, Mekong River Ferry Landing and Railway Spur.

Highway Equipment Pool (93-31-200)

Thai Government departments have in the past maintained a virtual monopoly over highway construction, and as a result few Thai construction firms have been able to invest in expensive heavy equipment, with no assurance of continuing opportunities to keep it in profitable use.

This project was designed to help remedy this situation, to foster interest in and provide an impetus for local private enterprise to enter into highway construction. It began in 1957, as a part of project 93-31-089, to provide for establishment of a pool of major items of heavy construction equipment for lease or rental to private contracting firms in Thailand for building highways.

Most of the pool requirements will be procured from U. S. military surplus -- at prices averaging no more than 25 percent of prevailing costs in the local market. Supervision and management of the pool will be jointly performed by the Thai Highway Department and Charles M. Upham Associates, Inc. (a USOM contractor, project 93-31-159) under cognizance of USOM. Safeguards to insure proper utilization and maintenance of the equipment will be written into the rental agreements with the local contractors. In storage, maintenance and major repairs and overhauls will be performed by the Highway Department under Upham supervision.

The entire initial cost of the equipment pool will be offset by savings it will effect in the costs of the Bangkok-Saraburi highway alone, where the pool will be first used.

Highway Equipment Pool - Cont'd.

About $500,000 worth (acquisition value to U. S. Government) of equipment has been procured from military surplus in Japan and delivered to Thailand. Additional requirements are now being selected by an Upham specialist with assistance from ICA.

Thai Airways (93-37-118)

At the request of the Thai Government, ICA undertook in 1955 to finance the services of American experts in airline operations to help improve the operations of Thai Airways, Thailand's national airline, and put it on a paying basis.

In April 1956 a contract was negotiated between Pan American World Airways, Inc. and Thai Airways Company, Ltd. Under this contract, PAA provided the services of 25 specialists in the fields of operations and maintenance, sales and traffic, accounting, fiscal management, purchasing, and stocks and stores. USOM covered the dollar costs of the contract and the Thai Government the local costs. The specific objectives were to determine the causes of unsatisfactory operations, to initiate courses of action to correct the deficiencies, to train Thai Airways and Thai Government personnel, and to provide technical assistance in connection with the establishment of a first-class aviation overhaul and maintenance facility (project 93-37-152), which USOM would help finance.

The contractor undertook to perform all that was expected and for the first months of the contract excellent progress was made. After that time, as a result of a complexity of factors, including a change in government and in the control of Thai Airways, the project began to fall short of its goals. It was not extended beyond the contract expiration date of April 4, 1959. No further assistance to Thai Airways is planned except under project 93-37-152 for expanding overhaul and maintenance facilities.

Railway Equipment (93-33-091)

To enable Thailand to speed up train operations (mostly over single-track lines), increase capacity and efficiency, and promote railway safety, this project undertook in 1955 to provide a traffic control and communications

Railway Equipment (93-33-091)

system in the Northeast region and provide additional badly needed rolling stock. Seventy-eight gondola cars and 16 tank cars were supplied, and a complete traffic control and carrier telephone system was installed from Bangkok to Korat, with branches to Ubol and Nongkai. The system was dedicated in July 1958, with considerable publicity, by the Thai State Railway.

Because Laos must depend upon the Thai State Railway for moving most of its imports (which arrive at the port of Bangkok) and the Thai rail system is overburdened handling expanding internal trade, USOM offered in 1956 to add box-car capacity to the railway in return for assurance that the State Railway would give service to the Laotian trade. Under project 93-33-154 the U. S. furnished 125 box-cars (12.5-ton) and 40 tank under-carriages, the latter financed by USOM Laos.

Highway Department Operations (93-31-159)

Technical assistance is furnished to the Thai Highways Department under this project through a contract with the American engineering firm of Charles M. Upham Associates, Inc.

The specific goal is to improve the organization of the various divisions of the department, and to see that each division is able to function so that Thailand may with its own capabilities continue the development of a system of highways suitable to the transportation needs of the country. This is being accomplished through advice to division heads concerning their various problems, small demonstration projects where engineers and skilled workers can learn by observing and doing, and a program of training qualified engineers in the U. S.

Mr. Charles M. Upham and six associated engineers came to Thailand in 1957 and made a preliminary study of the Highways Department to determine what type of engineers were most needed and to plan the work in which they would be engaged. Studies showed the need for developing construction contractors who could replace the present method of doing all work by force-account methods. Organization of an equipment pool to furnish necessary heavy equipment to these contractors will remove the hazard of dealing with contractors who are not able to finance expensive equipment (project 93-31-200). A reorganization plan for the equipment repair shop and a plan for repair shops

Highway Department Operations - Cont'd.

to be located in the maintenance divisions at their headquarters throughout Thailand have been submitted to the Thai Highways Department for approval. Plans for small projects demonstrating engineering, surveying, planning, materials surveys, maintenance, and construction have been developed.

The project is scheduled for completion in 1960.

Mekong River Ferry Landing and Railway Spur (93-33-148)

To complete the transportation facilities between the port of Bangkok and Vientiane, the capital of Laos, along which flows most of Laos' imports, this project provided funds for freight handling and forwarding facilities on the Thai side of the Mekong River (see project 93-33-090, Udorn-Nongkai Rail Extension).

The Udorn-Nongkai line, which USOM helped build, halted 4 Km. short of the planned river-side terminal when the Thai State Railway was unable to obtain right-of-way through an area set aside for a military air-strip. In late 1956 permission was obtained to build 6 Km. of tract skirting the proposed air-strip. This project financed equipment and supplies for this single-track extension, plus necessary spurs at Nongkai station and the in-transit warehousing facility. It also provided for a masonry and reinforced concrete warehouse, a customs building of 1500 square meters, POL deck, and other facilities. The facilities were dedicated in July 1958 with ceremonies on both sides of the river arranged by Thai and Laotian authorities. The Thai State Railway ran a special guests train from Bangkok to Nongkai.

Harbor Development (93-34-N104,040)

To help clear the bar of the Chao Phya River and a deep-water channel to the port of Bangkok, this project financed the purchase of the second-hand dredge, Manhattan, from the U. S. Corps of Engineers in 1951, with two fuel barges, a tug boat, and a steel cable sling. Costs of towing the dredge from the U. S. were also included.

Harbor Development - Cont'd.

During the long voyage from Philadelphia the dredge suffered considerable damage, and repairs were financed from project 93-34-040 in 1953. The dredge has continued in service, as the "Sandon II," but it is soon to be replaced by a modern one purchased under a DLF loan.

Meteorological Services (93-37-117)

This project was begun in 1955 with the aim of improving Thailand's national weather service system by supplying limited amounts of equipment, instruments, supplies and training. Modernization and improvement of weather services was of considerable importance to civil and military aviation throughout the region, to agriculture, to naval and other craft in the Gulf of Siam, and to cooperating weather and climatological agencies throughout the world.

In cooperation with the Royal Thai Navy Meteorological Service, the U. S. undertook to assist in modernizing the facilities and scientific equipment throughout Thailand's meteorological network to facilitate collection of accurate surface and upper-atmosphere data. Development of an adequate domestic communications system (in conjunction with project 93-37-050, Aeronautical Ground Services Improvement) and of meteorological services required for safe, efficient operation of domestic and international avaiation were also begun. Other goals were to reorganize and improve meteorological services to the general public, agriculture, shippers, government agencies and others -- including storm warning, flood warning, water availability, and related advices.

Fifteen participants have been or are being trained in the U. S., with six more planned for training. Various equipment and supplies have been received or are on order. The modernization program is about 80 percent complete (late 1958) and the communications system survey about 50 percent complete (equipment previously ordered under project 93-37-050). Weather services are now available at most of the airports in Thailand and forecast centers have been established at Songkhla in the south and Chiengmai in the north. In 1960 the aviation forecast center in Bangkok will be moved from the city to Don Muang airport and its operations streamlined. An IBM system for the automatic compilation and verification of weather records is being established. All

Meteorological Services - Cont'd.

improvements planned under this project are expected to be in operation and project completed in 1962.

Note: To assist the Thai Navy Hydrographic Service improve and accelerate the production of nautical and aeronautical charts, project 93-34-049 provided training for Thai Naval officers with the U. S. Coast and Geodetic Survey and furnished equipment and materials for teaching and training others in improved methods. The project was begun in 1952 and completed in 1957.

Bangkok-Saraburi Highway (93-31-185)

The most important and heavily-traveled road in Thailand is the Bangkok-Saraburi highway, which connects Bangkok with all of Northern and Northeastern Thailand. Other than the railway, it is the only overland route for transportation of people and commodities between the port of Bangkok and the greater portion of Thailand, as well as to Laos. The existing highway is inadequate to support the demands presently imposed on it. It is almost constantly under repair, and it will, within a short time, be totally incapable of meeting the requirements of the ever-increasing traffic which must use this route.

The project, begun in 1957, covers engineering and reconstruction of the highway, a distance of 107 Km., which will tie in with the Friendship Highway to Korat as well as the highway system which feeds the Northern provinces. Engineering will be performed by an American firm under contract, and construction will be performed by local companies, under contract to the Thai Highways Department and renting equipment from the Equipment Pool (project 93-31-200).

The first 25 Km. of the highway, from Bangkok to Don Muang International Airport, will be reconstructed as a 4-lane divided highway, paved with Portland cement concrete. The remaining 82 Km. will have a 7-meter-wide asphaltic concrete surface with 2.5-meter-wide treated shoulders. It is presently assumed that the existing alignment, particularly from Don Muang airport to Saraburi, will be closely followed in the new construction, but in order to obtain utmost economy of construction a final location will not be decided until the engineer has completed preliminary studies and right-of-way

Bangkok-Saraburi Highway - Cont'd.

acquisition problems have been solved.

Additional benefits from this project will be the employment afforded large numbers of local people, the maximum opportunity for training of Thai highway engineers and technicians in modern road-building by reason of proximity to Bangkok where many of them are located, and the reduction of the heavy annual cost of maintaining the present substandard road.

Evaluation of Transportation System Requirements (93-39-181)

As a guide to the coordinated development of transportation within Thailand and in relation to neighboring countries, a team of transportation consultants began in mid-1958 a nine-month study under a contract with USOM, in cooperation with the Ministry of Communications. The contractor, the American firm of Transportation Consultants, Inc., is to submit in 1959 a comprehensive plan for the development of a transportation system essential to the economic, political and military requirements of Thailand.

Korat-Nongkai Highway (93-31-199)

This project covers reconstruction of about 414 Km. of existing highway from Korat to Nongkai. This will connect the Friendship Highway with the Mekong Ferry that serves Vientiane, Laos. With the completion of the U. S.-funded Bangkok-Saraburi highway, this will provide a good all-weather truck route from the port of Bangkok through the heart of the economically depressed Northeast to the town of Nongkai, through which must pass most of the imports into Laos.

Detailed surveys will be run and sufficient final design will be completed by the Thai Highway Department, working with specialists of Charles M. Upham Associates, to enable preparation of comprehensive cost estimates by the end of 1959. Final determination of design criteria to be used will not be made until complete engineering studies and cost estimates have been completed. Inadequate drainage structures will be replaced under the Bridge Replacement Program. Actual construction work on the entire project will be done by local contractors bidding on a lump-sum or unit price basis and by the physical resources of the Thai Highway Department.

Highway Materials Survey (93-31-201)

This is a new project, to begin in 1959, providing for a complete, systematic survey of soils and materials on three sections of highway in Thailand, including all pertinent field and laboratory testing and the compilation of detailed findings reports.

Vast areas of Thailand are composed mainly of unstable alluvial soils, with relatively few sources of good embankment and surfacing material. Combining this problem with the difficulty and costs of hauling in Thailand, shows the importance of making full use of all suitable local materials in highway construction. To do this, it is necessary to know what materials are available and their physical qualities and performance.

Surveys will be made on the Korat-Nongkai, Lomsak-Khonkaen, and Ranong-Thanoon highways. All survey work will be done by regular employees of the Thai Highway Department under supervision of and with technical advice and assistance from Charles M. Upham Associates, Inc. Except for testing apparatus and supplies to be provided under the dollar funding of this project, existing facilities of the Highway Department are sufficient for this project.

These investigations, along with the development of the Highway Department's Materials Division to carry it on in the future, will greatly affect the planning and costs of all highway construction in Thailand from location and design through construction and maintenance.

TABLE OF PROJECT COSTS

Dollars - U. S. Dollar contribution
C/P - Local currency costs from Counterpart Funds
Budget - Thai Government contributions from regular budget
(All shown in terms of thousands of dollars)

	Dollars 1957 & Prior	C/P 1957 & Prior	Budget 1957 & Prior	Dollars 1958	C/P 1958	Budget 1958	Dollars 1959*	C/P 1959*	Budget 1959*
4. LABOR									
Labor Training 93-41-051 1954-57	Merged with General Training (93-99-188)								
5. HEALTH AND SANITATION									
Malaria Eradication 93-51-017 (CR5,CR11, CR13,CR28,CR39, CR138) 1951-62	3,770	1,954	451	279	460	189	13		
Local Health Devel. 93-53-053(CR8,CR10, 002,015,022,052,054, 072,075,125,141,146, 173,285) 1951-59	2,906	2,374	1,025	131	200	300	24		
Hospital Improvement 93-55-055(073, 086, 104) 1951-57	1,818	1,088	374	-	-	-	-	-	-
Medical Education 93-54-016 (116) 1951-65	1,412	452	322	264	141	165	163	571	
Cholera Control 93-55-189 1958	-	-	-	140	-	-			
TOTALS	9,906	5,868	2,172	814	801	654	200	571	

* Incomplete

Malaria Eradication and Other Disease Control (93-51-017)

In 1950, malaria was, as it had been for many years, the chief cause of sickness, debilitation and death in Thailand. During 1945-49, reported malaria deaths averaged over 45,000 annually, and malaria cases were about 100 times this figure. Malaria caused the loss of countless man-hours of work and reduced the physical energies of vast numbers of people. It made some areas of the country virtually uninhabitable, discouraged the people from new settlements and other enterprises, and put a great burden on the health services.

After a demonstration of large-scale house-spraying with residual insecticides by the Thai Ministry of Health in 1950, with the cooperation of WHO and UNICEF, the U. S. began assisting the Ministry in 1951 to extend the scope of the campaign. At first the goal was to control malaria throughout all malarious areas (estimated to include over half the national population). As the effectiveness of the work became apparent the objective was changed to eradication.

The malaria eradication program includes as its principal activities (1) an annual house-spraying campaign in the dry season to destroy malaria-carrying mosquitoes and stop malaria transmission, and (2) an all-year antimalaria surveillance program to search out and treat suspected malaria cases, determine malaria foci requiring counter measures, and guard against introduction and spread of malaria. This has involved helping the Thai Ministry of Public Health to develop an efficient nation-wide antimalaria organization, training of technical personnel, supplying of necessary materials and equipment, a public information program, and helping to plan and conduct the antimalaria activities.

By 1959, the homes of over 14 million people had been sprayed--several times each, in most areas--and house-spraying had been discontinued in areas of over 7 million population, due to elimination of malaria transmission. In these areas, surveillance will continue for about three years to complete the eradication of malaria. The results of the antimalaria campaign have included the reduction of the nation-wide malaria death rate from over 250 to less than 45 per 100,000 population--a reduction exceeding 86 percent in both cases and deaths.

Twelve Thai medical officers have been trained in the United States, and 211 technical assistants, 710 technical aids, and over 2500 spraying-squad members have been trained in Thailand. In addition, the Thai antimalaria organization has trained all of the Laotian malaria staff, numbering 90 officers

Malaria Eradication and other Disease Control - Cont'd.

and technicians, and 34 participants from other countries. Over 5 million copies of publications on malaria have been distributed. Two new laboratories and training centers are under construction at Chiengmai and Phrabuddhabat. Vehicles, sprayers, insecticides, drugs, microscopes and other technical equipment have been supplies. Seven American technicians have assisted the project, and two of these are still in Thailand.

The project has been highly successful thus far in terms of organization, training, antimalaria activities, and reduction of malaria cases and deaths. American assistance is expected to end in 1962, with the Thai Government continuing the terminal phases of the malaria eradication program through 1965. The costs of certain other discontinued disease-control projects are (for accounting purposes) included in this project, as follows:

Plague Control (93-51-CR11) in 1953 assisted in establishing three regional laboratories, equipping them with about $45,000 worth of scientific instruments, books, refrigerators and vehicles, and the training of a Thai specialist in the United States. An American technician assisted in a survey of the plague problem in Thailand.

Venereal Diseases Control (CR13) in 1953 furnished $130,000 worth of pharmaceuticals, constructed four VD clinics, and supplied them with vehicles and equipment. An American technician was assigned to this project.

Leprosy Survey (CR28) financed a survey of leprosy, three Jeeps, and $30,000 worth of pharmaceuticals.

Foreign Quarantine (CR39) in 1953 assisted the Division of Communicable Diseases to establish more effective control entry of epidemic diseases through Bangkok sea and air ports by furnishing of motorboats, $50,000 worth of other materials and equipment, and miscellaneous facilities.

Nutritional Disease Control (CR138, CR5) in 1952 and 1954 assisted in constructing a Ministry of Public Health nutrition center; providing $13,000 worth of laboratory equipment, vehicles, vitamin tablets, etc. for establishing a nutrition laboratory; conducting nutrition education and surveys, and increasing production of shark liver oil and soya bean milk.

Local Health Development (93-53-053)

The extension and improvement of public health services among the rural people of Thailand is a matter of the greatest urgency and importance, both from the economic point of view and the political, because there is growing public demand for better medical care. There is no immediate prospect that private practitioners will be able to meet this need. Since the leading causes of illness and death in Thailand now are the filth-borne diseases -- diarrheas, dysenteries, cholera, typhoid, and worm infestations -- U. S. assistance to the public health program is now concentrating on the improvement of environmental sanitation through a health education approach.

In 1957 USOM combined into this one project four separate activities which it has been assisting since 1951, Rural Health (053), Health Education (054), Environmental Sanitation (022), and In-Service Training (072), in order to integrate all assistance aimed at the improvement of local health services. The purpose is a large-scale demonstration and proving ground for improved techniques for meeting the outstanding health needs of rural Thailand.

In cooperation with the Ministry of Public Health, effective and reproducible demonstrations of village-level privy, water-supply and clean-up programs are developed through community self-help organization. Equally important, the practicability of de-centralized administration of health services in 10 selected districts (plus one province and one region) is being demonstrated, as an effort to show that the over-centralized direction of services from Bangkok is unnecessary and lacks responsiveness to local needs. The project aims at completion of the development of the in-service and pre-service training center at Cholburi and of the nationwide health education program under the Thai Division of Health Education. It will also complete development of the vehicle maintenance and repair facility in Bangkok, the first Department-wide facility of this sort in Thailand.

The project is planned for phase-out in 1959. Already 52 village-level demonstration projects have been carried out successfully, showing conclusively that villagers will take an active and useful part in self-help organizations and that they are not resistant to social changes of demonstrated benefit. The first demonstration of provincial decentralization of administration, at Korat, has shown substantial progress and this department is now recognized as one of the best organized and best staffed provincial health departments in the country. The Northeast regional laboratory has been established and a field advisory staff for the public health program in the North-

Local Health Development - Cont'd.

east has taken up its work. A handbook for rural health workers has proved useful and has been distributed to Thailand's 5,000 rural public health workers.

Closely related projects, now discontinued or merged with Local Health Development are:

Environmental Sanitation (projects 93-52-022, 173, and 146) between 1951 and 1955 assisted the Thai Government in three different attempts to improve environmental sanitation conditions and potable water supplies in the Northeast. A shallow-well drilling program involving ten rigs put down 376 wells, of which only 49 produced potable water, the rest being mostly salty. This proved the need for more geological information and for more experienced staff in the field, and the drilling program was transferred in 1955 to the new Ground Water Exploration Project (93-99-108). Water filtration systems were designed to alleviate water shortages in Mahasarakam, Sakorn Nakorn, Roi-Et, Surin, Srisaket, and Ubol, providing 254,000 gallons of potable water per day. Each town was furnished intake water lines, complete rapid sand-filtration plant, distribution lines, meters, and power supply units, and assistance was given in installation. Finally, an extensive environmental sanitation program was planned to benefit directly 500,000 people in the Northeast through self-help well-digging, reservoir building, and pit-privy projects. This was intended to expand a small demonstration program. Elements of this project were incorporated in "Local Health Development" in 1957.

Rural Health (project 93-53-053) assisted the Ministry of Public Health with organization, administration, and operation of the division of rural health, regional and provincial health departments, the development of district health units, the improvement of rural health centers, and development of a repair and maintenance garage for public health vehicles. The project, begun in 1953, was merged with Local Health Development in 1957. Twenty-five doctors and nurses received special training in public health in the U. S. Essential equipment, vehicles, and commodities were furnished to 750 rural health centers. A modern provincial and regional health office was constructed at Korat, and a successful demonstration district health unit was started at Tamuang, with improved medical, public health and other community services.

Health Education (project 93-54-054, 002, 141, 015, CR10) began in 1951 and was merged into Local Health Development in 1957. The Thai Government has been carrying on health education for many years, relying mainly on mass

Local Health Development - Cont'd.

information activities. Early assistance under this project consisted chiefly of seven mobile audiovisual units, darkroom and printing equipment, barges to be equipped as mobile educational units, and generators and trucks. In 1954 the project began assisting the Ministry in shifting emphasis from mass information to development of community organization to solve local health problems. Assistance included community demonstration projects and development and use of effective audiovisual materials for health education. Twelve Thai specialists were trained in the U. S.

In-Service and Pre-Service Training (projects 93-54-072, 075, 125, CR8) established a training and demonstration provincial public health center in Cholburi. Classrooms, office space, dormitories, kitchen, and housing for staff were completed in 1957, financed entirely with counterpart funds. All basic equipment was provided through U. S. assistance. An average of 200-300 Thai public health personnel have been trained each year since training began in 1952 -- sanitarians, midwives, health officers, nurse supervisors, nurse students, students of public health, junior health workers, student nurses, and public health physicians.

An American sanitarian has been in residence at Cholburi, assisting in the development of training curricula as well as assisting in the training itself. Emphasis has been on short-course in-service training, in groups of 10-20 at a time by professional categories. Pre-service training in the field has been provided to new employees of the Department of Health and students from the School of Public Health. In 1957 a new one-year course of study, designed to prepare additional sanitarians to staff the increasing number of rural health centers, was added to the curriculum and 33 students were enrolled. Nine Thai public health workers have been given special training in the U. S. under this project.

Intestinal Disease Control (project 93-51-052) begun in 1952 and ended in 1955, assisted the Division of Communicable Diseases to develop an effective program of control through demonstration, survey and training. Intestinal parasites undermine the health of 60 percent of all persons in Thailand, and in some areas they affect over 90 percent of the people. A limited reconnaissance was completed, to determine the extent and nature of the problem as a basis for control measures. Treatment was given to those persons found to be suffering seriously from intestinal parasites. Training was given to four specialists in the United States, to students at medical and public health schools, to intestinal parasitic

Local Health Development - Cont'd.

disease control teams in the laboratories, and to public health personnel sent to the Cholburi Public Health Training Center. Exhibits and pamphlets were distributed to the public. The United States provided the services of two experts, about $100,000 worth of pharmaceuticals, scientific equipment and 5 vehicles.

The campaign against intestinal and other diseases which are the result of unsanitary conditions and unhygienic practices is now carried on under the project Local Health Development (93-53-053).

Hospital Improvement (93-55-055)

Millions of Thai in rural areas have lacked access to any kind of medical services, and the great strides made in diagnosis, treatment, drugs, and surgery in this century have not benefited them at all.

This project, begun in 1951 and completed in 1957, assisted the Thai Government in providing buildings, equipment, drugs, instruments, ambulances, and other supplies for improving and modernizing existing hospitals as well as establishing new ones in provinces lacking medical facilities. In 1951 there were only 20 provincial hospitals, today there are 73.

The project also provided special training in the U.S. for 123 Thai doctors and nurses. Among the buildings built under this project were 20 X-ray buildings for provincial hospitals, 11 surgical buildings, and 22 other buildings at various locations in all parts of the country -- nurses' dormitories, physicians' houses, laundries, generator plants, and hospital wards.

Medical Education (93-54-016)

There are approximately 3,500 licensed physicians in Thailand, of whom about 2,600 are located in the Bangkok area. This means that in all the rest of Thailand there is only one doctor to each 20,000 population. Expansion of rural health services is a vital need, because of the huge economic and social burden of disease. This requires more doctors, which necessitates expansion of medical education facilities for the long run.

Assistance to Siriraj and Chulalongkorn Medical Schools was begun in 1951 under a three-year contract with Washington University of St. Louis. For

Medical Education - Cont'd.

the first six years assistance to these institutions (and their hospitals) consisted of a few medical and nursing personnel engaged in teaching and of the furnishing of equipment, instruments, teaching materials, drugs, and chemicals. Since 1957 emphasis has been shifted to the construction of a new medical school (third in Thailand) at Chiengmai, in Northern Thailand. This school will serve as a model for future regional schools, as a new source of sorely needed doctors and nurses, and as a means of distributing medical care on a wider geographic basis.

Over 100 medical educators have been trained in the U.S. Two schools of medical technology have been built and equipped. Stimulus and assistance was given to the first Thai National Medical Education Conference in November 1956, at which medical educators evaluated present medical education and planned for the future. A new building was constructed for the School of Public Health, and substantial amounts of equipment were contributed to hospitals in Bangkok and the provinces and to the schools of medicine, medical technology, pharmacology, and nursing. Textbooks and other teaching materials have been developed.

The Chiengmai medical school and hospital is being built and equipped largely with American assistance. Seventy physicians and nurses will be sent to the U.S. for graduate study prior to serving on the faculty. Thirteen American medical and nursing specialists are being furnished, on a staggered schedule, to assist in planning, organizing, and establishing the institution. The target is for graduating 50 physicians and nurses a year, beginning in 1964.

Difficulties in acquisition by the Thai Government of a suitable site for the school house retarded the schedule somewhat. After architectural work has been completed construction contracts will be awarded, probably late in 1959 or early in 1960. Meanwhile, classes have started in temporary facilities. Some students now in Bangkok schools will be transferred to the new institution.

Special Cholera Control Project (93-55-189)

A cholera epidemic broke out in Bangkok in May 1958 and the United States was asked for help. Under this emergency project several shipments totaling 3,500,000 cc. of cholera vaccine were obtained from the U.S. and other sources and flown to Thailand. The project also financed transportation of laboratory

Special Cholera Control Project - Cont'd.

equipment purchased from funds donated by H.M. the King, intravenous-fluid-producing equipment donated by the American Red Cross, vaccine donated by the Canadian Red Cross, and supplies purchased abroad by the Thai Ministry or Public Health. Most of the vaccine and supplies were flown to Thailand by the U.S. Air Force. The U.S. Navy made available the services of its Naval Auxiliary Medical Research Unit in Formosa, and a team of 10 arrived June 12 and set up laboratory, research and epidemiological services at Chula-longkorn Hospital. The project made possible a massive inoculation program by the Ministry of Public Health which limited the incidence of cholera in the first year of the outbreak and it prepared the Ministry to deal with the re-occurence (as expected) of the disease in the second dry season following. A great deal of assistance was rendered to the cholera campaign through other USOM projects as well.

TABLE OF PROJECT COSTS

Dollars - U. S. Dollar contribution
C/P - Local currency costs from Counterpart Funds
Budget - Thai Government contributions from regular budget
(All shown in terms of thousands of dollars)

	Dollars	1957 & Prior C/P	Budget	Dollars	1958 C/P	Budget	Dollars	1959* C/P	Budget
1. EDUCATION									
Teacher Training 93-66-021 (081,182) 1952-60	2,412	638	3,519	280	100	1,754			
General Education Development 93-64-186(018,019, 059,060,076,138, 149) 1952-63	958	1,063	589	491	325	45	88		
Technical Education & Facilities 93-61-057 (071) 1952-60	1,070	656	1,097	-	110	91			
Vocational Agriculture Education 93-61-162 (058) 1952-60	1,074	686	155	261	105	-	27		
Engineering Dept., Chulalongkorn Univ. 93-66-124 1952-60	865	140	121	-	42	100			
Education Training Projects 93-66-026(074,082, 123,126,127,CR133,etc.) 1953-57	87	-	12	-	-	-	-	-	-
TOTALS	6,466	3,183	5,493	1,032	682	1,990	115		
(Regional) Improvement of English Language Teaching 51-61-009 1958-61	-	-	-	1,500	-	400			
(Regional)SEATO Skilled Labor 51-61-915 1958-61	-	-	-	1,000	-	-			
(Regional)SEATO Graduate School of Engineering Chulalongkorn Univ. 51-66-030 1958-61	52	-	-	371	-	364			

*Incomplete

Teacher Training (93-66-021)

Thailand has now about 101,000 teachers and according to one reliable estimate needs 10,000 new teachers each year for the foreseeable future. All of Thailand's teacher training institutions -- even with the expansion that has occurred since American aid began -- graduate only 5,400 teachers per year (1958). The problem of the in-service training of teachers is indicated by the fact that one-third of all secondary school teachers have no formal teacher training at all and have gone no further than secondary school (10th grade) themselves -- only 4 percent have A. B. degrees. The primary school teachers have even less preparation.

This project began in 1952. In 1954 a contract was made with Indiana University to work with the College of Education. Since 1957, all other teacher-training activities (non-contract) have been carried on under other projects (see General Education Development, 93-64-186).

The Indiana University contract concentrates on developing the College of Education (Prasarn Mitr in Bangkok) into a high-grade degree-granting teachers college which will make its influence felt throughout the teacher-training system of Thailand in the form of higher standards of teaching, better in-service training, and improved teaching methods and materials. A four-year degree program in professional education has been developed at Prasarn Mitr, and the Department of Education at Chulalongkorn University has been strengthened for graduate-level training.

Under the Indiana-USOM contract, American faculty members have been provided to Prasarn Mitr, and many Thai teachers have been sent to the U. S. for specialized and advanced training. Large numbers of library books have been provided, and with counterpart funds an excellent library building and classroom and laboratory buildings have been constructed, equipped by American aid.

With U. S. help, the College of Education has increased its student body from 200 (1954) to 1269 (1958), and approximately 300 teachers will graduate in 1959. The library has grown in the same period from 400 to over 16,000 volumes, and with better facilities and procedures book circulation consistently exceeds 7,000 a month. A new evening extension course for teachers in the Bangkok area enrolled 700 students in 1958. Eight major textbooks as handbooks have been prepared and published, as well as a great many lesser materials. After the Department of Education at Chulalongkorn University became a separate faculty

Teacher Training - Cont'd.

in 1957, 114 undergraduates were admitted to the four-year program of teacher training.

The non-contract portion of the project (now merged with General Education Development) in the past worked with all 33 teacher-training schools throughout Thailand. Improvements were made in the curricula of these schools, and an intensive program of in-service seminars, workshops, and training courses was carried out for teachers in these schools. Now, the GED project concentrates on 12 teacher training schools in the 12 centers.

Despite the inadequacy of its teacher training program in comparison with its needs, Thailand has more facilities than some of its neighbors, particularly Laos. The Thai Government in 1957 undertook to expand facilities at teacher-training schools at Udorn, Ubol, and Korat in order to accommodate up to 100 teacher-trainees a year from Laos and other neighboring countries who might wish to send student teachers for training in Thailand, for a two-year course.

Under project 93-64-182, additional classrooms were constructed at Udorn. The Thai Government financed expansion at Ubol and Korat and contributed facilities at Udorn. The expanded facilities will be used also for training of additional Thai teachers. Thirty Laotian participants successfully completed the first year of this program, and 5 returned in 1958 as planned for a second year, along with 63 new participants from Laos. The cost of their training, including tuition and student maintenance, is provided by USOM/Laos.

General Education Development (93-64-186)

The low level of agricultural and industrial productivity throughout most of rural Thailand results in part from the inadequacy of the provincial educational system. Shortcomings in education are also closely related to poor conditions of health, especially those associated with poor sanitation and unprotected water supply.

From a long-range point of view, a general reform in the public education system is essential for sustained economic progress. Curricula must be adapted to present-day conditions, especially to the practical needs of young

General Education Development - Cont'd.

people for productive life in their own communities. The classroom methods should be shifted from emphasis on lecture and memorization to greater emphasis on student participation and problem-solving, as a basis for development of democratic society and private enterprise. Teachers must receive more and better training -- teachers already in service as well as those in preparation; presently over 80 percent of them have no formal training for teaching. A system of supervision must be developed to assure constant improvement in teaching, practice of methods adopted by the Ministry, and career development of teachers. Administration must be improved, especially, establishing the schools as an integral part of the community, from which good ideas may spread, drawing support from parents, and preparing students for useful participation in the affairs of the community and in its growth.

All this involves close coordination of activities under the administration of several compartmentalized departments in the Ministry of Education -- teacher training, educational techniques, elementary education, secondary education, adult education, and school administration -- and it requires decentralization of certain administrative and professional responsibilities to provincial and local officials.

Experience with several projects in educational assistance, dating back to 1952, led to agreement between Thai education officials and USOM advisors in 1958 that a complete new integrated approach, along the above lines, was necessary. The General Education Development project was worked out, drawing on the lessons learned in earlier pilot demonstrations and other types of assistance, and merging a number of continuing projects in this general field.

The project is assisting the Ministry of Education to establish an educational center in each of the 12 regions of Thailand, as the initial step in putting into effect the Ministry's long-range plan to raise the level of schools, to develop local educational support and control, and to improve coordination within and among the Ministry departments and local units. From these centers the Ministry can effect a nationwide program for the general development and improvement of education.

Each center will include not more than one teacher-training institution, two secondary schools, one vocational school, two primary schools, two primary extension schools, and one supervisory unit. Four centers will be es-

General Education Development - Cont'd.

tablished each year, 1959 through 1961. Assistance under this project will end in 1963.

During the life of the project, about 46,000 students will be directly affected. Almost 2,000 teachers in 95 schools will receive continuous in-service training, and another 50,000 teachers outside the centers will be brought in for in-service training. The teacher training schools in the centers will produce about 18,000 new teachers during this time.

In connection with the program, new curricula, courses of study, and materials will be developed which will help raise public literacy and will provide an educational base for advanced and specialized training to meet growing technological demands.

A Ministry-USOM Joint Planning Committee has been established to formulate policy for coordination and implementation of all ICA-supported projects in education. A General Education Development Project Operating Committee has been specially created to supervise this GED project, as a sub-committee of the Joint Committee.

These committees not only assure integration and coordination of all USOM assistance in the field of education but also establish the General Education Development project as an integral part of long-range plans of the Ministry for improvement of education in Thailand.

Now merged into the General Education Development Project (since 1958) are these earlier projects:

Curriculum Development (93-64-060), begun in 1952, concentrated on a province-wide demonstration of a new approach to elementary education. Chachoengsao was selected by the Ministry of Education, and practices were developed and demonstrated which might be adopted in a general reform of elementary education in schools throughout Thailand. It was recognized by both Thai and American educationists that improvements were necessary in this field to adapt to changing conditions and meet the developing needs of Thailand.

General Education Development - Cont'd.

The demonstration included reorganization of pilot project schools, changes in curriculum content and in methods of teaching, production of essential teaching materials, building of additional school facilities, and training of teachers and principals to initiate these changes. Teachers from other provinces were assigned to the Ministry of Education to study and practice in the pilot project schools.

Five educationists were sent to the United States for specialized study in elementary education, and ten were sent to the Philippines and Japan to observe homemaking, agriculture, crafts, and the like from the standpoint of the contribution of the elementary school to the community.

Elementary Education (93-64-149), begun in 1953, assisted the Ministry in various ways -- in-service training programs for supervisors, improvement and expansion of the Ministry supervisory unit, establishment of supervisory units in each of the 71 provinces, coordination of teacher training with elementary and secondary departments, and revision of curricula of teacher training schools with raising of two-year programs to three-and four-year programs. Vehicles and various types of educational equipment and materials were supplied.

Secondary Education (93-65-138), begun in 1956, selected four schools in the Bangkok area for demonstration of the comprehensive secondary school. Six weeks in-service training courses each summer reached about 1,000 teachers. In each subject field in all grades, syllabi were revised, brought up to date, and improved with respect to content, teaching methods, lesson planning and evaluation. Six participants were sent to the U. S. for advanced training. Schools were supplied with science equipment, typewriters, sewing machines, shop tools, and instructional materials.

Supervisory and In-Service Education (93-67-059), begun in 1955, was intended to help the supervisory and in-service education group of the Ministry of Education in its work of assisting area and provincial education officers to plan and carry out local school improvements. Emphasis was given to development of primary extension schools and of supervisory services for elementary schools. The project sought to help teachers already in service through introducing them to some of the improved techniques that had been developed previously and to assist in the selection and training of area,

General Education Development - Cont'd.

province, and district supervisory personnel. Five participants were trained in the U. S. and a variety of vehicles and equipment were provided to schools and supervisory units.

All USOM assistance to the Ministry of Education in these fields is now carried out through the single, integrated General Education Development project.

Technical Education and Facilities (93-61-057)

This project was begun in 1952 with the aim of helping the Ministry of Education establish a Technical Institute, with several branches in the provinces, and to build these into efficient educational institutions. Since December 1956 the project has been carried out under a contract with Wayne State University of Detroit. The project is scheduled for completion in September 1960.

Advancing technology has brought a greater demand for skilled workers than the Thai educational system could supply and has also demanded specialization in training which neither the school plants nor the teachers were prepared to give. Under this project advanced technical training, along with professional education, is being given to teachers and prospective teachers of vocational subjects. Modern machines and vocational teaching aids have been provided, in keeping with technological developments in the various trades and industries. The overall structure of the technical institute system has been reorganized for greater efficiency. In-service programs for teachers, and adult education programs have been developed. Curricula have been developed, training in several additional occupations has been started, instructional and resource materials have been developed and published, and 29 educationists have been given at least one year's training in the United States.

The Technical Institute in Bangkok is now serving about 5,000 students. Its buildings were constructed from Thai Government funds, but most of its equipment (generators, motors, electrical apparatus, machine tools, shop tools, industrial machinery, etc) was supplied by American assistance, many of its staff were trained overseas, and various teaching materials were developed with American cooperation. Branches at Songkhla, Korat, and

Technical Education and Facilities - Cont'd.

Chiengmai have been started and are on their way to becoming outstanding institutions in their respective regions.

Improvement of Vocational Education in Agriculture (93-61-162)

Vocational schools are gaining increasing importance in Thailand, especially in the provinces, as the need for improved agricultural technology and for skilled workers in industrial occupations grows constantly.

In 1952, this project began by assisting in the improvement of Thailand's 16 agricultural schools. The Mae Joh senior school and Surin agricultural school were selected for special emphasis. Their facilities were improved and two American technicians were assigned to help revise the curricula, assist in the development of school farm and shops as laboratories for demonstrating improved practices, develop and improve instructional materials, improve the quality of teaching, and introduce the school-planned home-farm project as a means of moving good farm practices from the schools into the communities.

Improvements made at Mae Joh (near Chiengmai) and Surin were used as models for improving the 16 other agricultural schools. The schools were divided among the two American advisors for technical assistance.

A great deal of land was cleared around agricultural schools for farm demonstrations, terraces and water channels were established, many types of field crops were planted. Velvet beans, imported from Ceylon for trial, proved to be a fine green manure crop and the use of this crop has spread from the agricultural schools.

Increase in feed production was a means of improving the livestock programs. Farm production around the schools has been greatly increased through the use of machinery. In-service training of teachers, a continuous part of the program, has been a major improvement.

Improvement of Engineering Department of Chulalongkorn Uinversity (93-66-124)

With the aim of helping Chulalongkorn University build up its Engineering De-

Improvement of Engineering Department of Chulalongkorn University - Cont'd.

partment into an up-to-date institution capable of turning out technicians with the training necessary in modern technology, a contract was made with Texas University in 1954. Prior to that time USOM had directly assisted the Department through technical advice and participant training. The project will be phased out in 1960.

Texas University has provided from one to four faculty members each year. A total of 35 Chulalongkorn faculty members have been sent to the U. S. for training, and Texas has procured and installed laboratory equipment and furnished about 8,000 library books. The Texas representatives have advised in revision of the curricula, improving teaching methods, and conducting conferences and short courses. They also have advised in development of a research program in the sciences and engineering fields. Equipment was selected, procured and installed for mechanical, electrical, civil, sanitary and hydraulic engineering laboratories. Scientific apparatus was furnished in the fields of physics, chemistry, biology, botany, geology, and architecture.

Completed Educational Training Projects

The following projects, all completed, financed advanced and specialized training in the U. S. for Thai educationists, educational administrators, and teachers:

Adult Education Training (93-66-026) between 1952 and 1955.

Technical Education (93-66-074) in 1953.

Education Administration (93-66-082) in 1955.

Higher Education (93-66-123) between 1955 and 1957.

Education General (93-69-126) between 1955 and 1957.

Education Study Group (93-69-127) in 1955.

Technical Education - Thammasart University (93-77-CR133) between 1953 and 1954.

(Regional) Establishment of Regional Facilities for Improvement of English Language Teaching (51-61-009)

Thailand, Laos, Cambodia, and Vietnam are all interested in improving the teaching of English but they have neither suitable materials nor trained teachers for carrying out an adequate program. Well over 400,000 students are presently enrolled in school levels at which English is being or will be taught in the four countries. English is the established second language of Thailand, being taught in all secondary and higher schools. It is estimated that 3,500 teachers of English will have to be trained to meet the needs of all these students. It will further be necessary for each country to develop a corps of about six specialists to work in this field at the Ministry level and six to work in teacher training institutions.

The project was begun in 1958 as a regional activity, carried out under a contract with the University of Michigan, and scheduled for completion in 1961. Michigan is supplying the services of English language linguists and teaching specialists who will assist educators in these countries with the tasks of linguistic analysis, preparing appropriate instructional materials, training teachers to use these materials effectively, and developing adequate English teaching programs in the schools of the region.

It is expected, by 1961, to provide participating countries of the region with basic types and a small quantity of adequate textbooks, teaching aids and equipment, and other teaching and learning materials related to the teaching of English as a second language. It is also planned to institute by that time adequate programs for training teachers to teach English effectively as a foreign language in the participating countries, and to establish English language curricula in the schools of these countries. The broader aim is to develop better and wider use of English as a common bond of communication in the region, thus promoting both commercial and cultural interchange among Southeast Asia countries.

(Regional) SEATO Skilled Labor (51-61-915)

Latest figures from the Statistical Office of the Thai National Economic Council indicate that Thailand presently needs approximately 30,000 new skilled workers annually in existing trades and industries.

(Regional) SEATO Skilled Labor - Cont'd.

Under the auspices of SEATO, USOM in 1958 undertook to assist the Thai Government in a project to bring the output of existing industrial schools (devoted presently to teaching woodworking) into line with the actual skill needs of the Thai labor force.

The project will make comprehensive community surveys to determine the actual employment opportunities of 18 selected centers. Twelve to 15 of the present woodworking schools will be converted into general industrial schools with instructional programs based on community survey results. The aim is to graduate about 1,000 students each year from these schools, trained in the metal, electrical, automotive and building trades. Some of these will go on to the technical institutes for advanced training, most will go directly into the labor force. A supervisory unit for industrial schools will be established in the Ministry of Education to work to improve the competence of the 255 teachers in these project schools.

The project itself will meet only a fraction of the total skilled labor needs, even with the promotion and establishment of apprenticeship and on-the-job training programs which is another project aim. The project is expected to be completed in 1961 and further expansion of skilled labor education and training will be the responsibility of the Thai Government.

(Regional) SEATO Graduate School of Engineering, Chulalongkorn University (51-66-030)

In March 1958 the Thai Government presented to the SEATO Council meeting at Manila a proposal to establish a graduate school of engineering to serve the countries of the SEATO region, with emphasis in the beginning on hydrologic and hydraulic engineering -- of great importance in the region -- and gradually expanding into all fields. The member countries approved the proposal and the United States agreed to provide the outside assistance Thailand needed to carry out the plan.

Chulalongkorn University was selected as the "mother" institution for the graduate school, and Colorado State University was selected tentatively as the American university which would, under contract with ICA, provide teaching and advisory technical assistance.

(Regional) SEATO Graduate School of Engineering, Chulalongkorn University - Cont'd.

The project will train an administrative and research staff, both locally and abroad, and will assist this staff in developing sound administrative practices and programs of research to support the graduate school program. The contract group will also provide teaching assistance for two years while a counterpart professor is receiving advanced training abroad. Equipment to support the instructional program will be procured and installed, and faculty will be trained in its use. Technical assistance will begin in late 1959 and extend through 1962.

Other SEATO countries have assured the services of various faculty members for the new graduate school.

TABLE OF PROJECT COSTS

Dollars - U. S. Dollar contribution
C/P - Local currency costs from Counterpart Funds
Budget - Thai Government contributions from regular budget
(All shown in terms of thousands of dollars)

		Dol. 1957 & Prior	C/P 1957 & Prior	Budg. 1957 & Prior	Dol. 1958	C/P 1958	Budg. 1958	Dol. 1959*	C/P 1959*	Budg. 1959*
7. PUBLIC ADMINISTRATION										
Bangkok-Thonburi City Planning										
93-72-119	1954-59	1,183	–	23	95	34	13		652	
Institute of Public Administration (Thamasat University)										
93-79-063	1954-60	882	131	273	400	41	90			
Civil Police Administration										
93-71-160	1957-61	122	31	–	587	155	–	119		
Modernization of Government Fiscal Planning										
93-75-098	1952-63	486	58	77	186	65	52			
Economic Policy and Planning										
93-75-146	1956-60	109	12	34	93	11	29	1		
Public Administration Training										
93-71-084	1952-58	232	–	48	–	–	–			
Public Finance Improvement										
93-71-062	1954-57	105	–	35	–	–	–	–	–	–
Government Statistical Services										
93-78-156	1957-59	37	–	8	32	–	8	2		
	TOTALS	3,156	233	498	1,393	306	192	122	652	
8. COMMUNITY DEVELOPMENT & HOUSING										
Land Resettlement										
93-81-064	1954-55	–	129	538	–	–	–	–	–	–
War Relief and Rehabilitation										
93-82-CR 144	1954	–	233	1	–	–	–	–	–	–
Northeast Welfare										
93-82-403	1955	–	209	–	–	–	–	–	–	–
Community Development										
93-81-157	1956-60	30	–	10	15	–	–	8	–	–
Low-Cost Housing Training										
93-83-144	1956	3		1	–	–	–	–	–	–
	TOTALS	33	571	550	–	–	–			

*Incomplete

Institute of Public Administration, Thammasat University (93-79-063)

The purpose of this project is to establish an institution capable of providing high-quality training in public administration for Thai Government personnel and to assist this institution through its formative years. The project is carried out through a contract between Indiana University and Thammasat University, Bangkok, financed and supervised by ICA. It began in 1955 and is scheduled for completion in 1960.

The Indiana group is engaged in training a permanent faculty of public administration for Thammasat; 31 having been trained in the U. S. with more scheduled for training. It has established the beginning of a research division and is giving research support to the Government. An in-service training program has been started; 30 high-level officers completed one two-month course for Training Officers and 26 were graduated from a ten-week course for Department-level training officers. A public administration library has been established and supplied with an excellent collection of reference material -- 6,000 volumes on hand and 2,000 on order. A two-year academic curriculum of graduate work in public administration has been inaugurated, with a capacity of 60 students a year. Among the research jobs completed is the first comprehensive set of organization charts of the Thai Government.

Modernization of Government Fiscal Management (93-75-098)

This project, begun in 1952, finances a contract between the Thai Government and the Public Administration Service of Chicago, designed to assist the Thai Government to improve and modernize fiscal management.

With improved fiscal management and planning, Thailand will be better able to program and finance its economic development. The purpose of this project is to make studies and recommendations and furnish technical assistance leading to a revision of laws and regulations governing budgeting, accounting, auditing, tax and customs administration; installation of a more efficient financial organization, procedures and reporting systems, and introduction of operational improvements in revenue and tax systems.

Reports have been submitted, with draft laws, in the fields of budgeting, accounting, and auditing. The budget report has been agreed to in principle; a new budget unit has been organized and staffed, and the Government's budget

Modernization of Government Fiscal Management - Cont'd.

for 1959 was prepared in a new and more meaningful format along the recommended lines. Sixteen officers of Thai departments have been trained in the U. S. and 12 in other countries in various fields of fiscal management. Forty key personnel have undergone a two-month training course in budget administration in Bangkok.

Civil Police Administration (93-71-160)

Thailand's National Police Department is the primary force for maintaining law and order, preventing crime, apprehending criminals, protecting life and property, and preserving internal security throughout the Kingdom.

This project began in 1956 to strengthen the police force through training, guidance, and other types of assistance to improve its efficiency and effectiveness. Specifically, American technical advisors and their Thai counterparts are engaged in:

1. Improving the investigative structure of the Department by combining all such functions under a single command, with responsibility for coordination where more than one geographical command is involved -- this unit to be called the Central Investigation Bureau.

2. Reorganizing the criminal records system, which involves instituting a new reporting system and combining into one unit the present criminal records office, identification unit, statistical unit, stolen property files, and modus operandi files.

3. Expanding and reorganizing the identification unit for more efficient operation, to process a larger volume of fingerprint cards and expedite requests for identification checks.

4. Improving effectiveness of the police science laboratory by training of technicians and furnishing needed equipment.

5. Creating an effective Bangkok metropolitan police organization through reorganization and by assigning to it certain functions presently assigned to other units of the National Police.

Civil Police Administration - Cont'd.

6. Centralizing all police training, educational functions, and inspections under one command, revising curricula and schedules, eliminating duplications, insuring uniformity of training, and utilizing qualified instructors.

7. Strengthening the Immigration Division to enable it to keep better controls on alien residents and prevent illegal entries of aliens.

8. Increasing the effectiveness of the Border Police, which is charged with protection of borders against smugglers, prevention of illegal border crossings, and suppression of marauding bandits in border provinces.

9. Establishing a motor maintenance facility for servicing all Police Department vehicles.

10. Establishing a central complaint message center (radio and teletype).

The project is scheduled to be phased out in 1962.

Bangkok-Thonburi City Planning (93-72-119)

Bangkok and neighboring Thonburi are a single metropolitan area, containing 90 percent of the urban population of Thailand, a city 15 times as large as the next largest town in the Kingdom. The city has now about 1,500,000 people and is doubling every 15 years. The number of automobiles is increasing about 5,000 a year, in a city which depended originally on boat traffic on canals. Water supply, drainage, traffic, schools, housing, industrial areas, and other factors in municipal growth present problems now which may become almost insoluble in a few more years unless a start is made on urban planning.

Bangkok is more than just the capital of Thailand, it is its only major center of transportation, manufacturing, commerce, higher education, processing, publishing, finance, and tourist attractions. The economic health of Bangkok is essential to the economic health of the nation.

The project began in 1955 with the purpose of assisting the Ministry of Interior to develop a city plan, to include a complete land-use plan, a plan of public

Bangkok-Thonburi City Planning - Cont'd.

works improvements in priority order, plans for financing city growth, and service plans for transportation, sewage, storm drainage, water supply and distribution, and location of schools, recreation areas, government buildings, and institutions.

It was necessary to develop accurate maps of the urban area on a scale large enough for planning purposes, because reliable maps did not exist. Controlled aerial photo-mosaic maps were made, which were used to construct base maps. Ground surveys for developing topographic data and for mapping and measuring land use were made. All existing facilities (such as schools and hospitals) and water system were inventoried. Data have been compiled on population, building construction, roads, navigable canals, vehicle registrations, etc., most of which are not available at central locations in Thailand.

This work is being carried out by a contract team of the American engineering firm of Litchfield Whiting Panero Associates. It is planned for completion in 1960.

This contract group also was called upon to plan and execute an emergency water supply improvement program. The cholera outbreak in May 1958 resulted in 6,000 cases and over 600 deaths inside of three months -- the first epidemic in 15 years. It was clearly established that the disease was waterborne and that the districts of high cholera incidence were also the districts of inadequate and polluted water supply. With the knowledge that cholera epidemics run in two or three year cycles, an emergency project to provide potable water supplies in the water-deficient high-cholera areas was started in 1958. Responsibility for engineering drawings, preparation of specifications, letting of contracts, and inspection of construction was assigned to the Litchfield-Whiting-Panero contract team and their city planning contract was amended accordingly. Three engineers were added to their staff for this special work which involves the drilling of about 20 deep water wells, each to be equipped with pump and a distribution system. Each unit will produce from 800 to 1500 gallons per minute. Repairs to the existing water system will be made in these districts, and the new facilities will be incorporated into the future municipal distribution system. The new wells will increase the present water supply by 15 percent, mostly in areas critically short of water at the present time. The water supply project will be completed in CY 1959.

Economic Policy and Planning (93-75-146)

This project finances the services of an advisor, Dr. John A. Loftus, to the Ministry of Finance and other key agencies on economic policy and planning. The objective is to provide advice and assistance to the Thai Government in the following areas, with the ultimate objective of instituting sound economic policies and planning procedures: (1) Economic development programs; (2) budget and relevant fiscal practices; (3) external economic and financial affairs; and (4) the financial relationship of public enterprises to government and general policies relating to such enterprises. Dr. Loftus has served as chairman of an Economic Survey Group which reported to the Thai Government measures necessary for the desired improvements in economic policy and planning in Thailand. He assists in the selection of participants for training in his general field of work. Total of 16 such officers and specialists are either in the U. S. for training or are programmed from current funds.

Dr. Loftus began work in 1956. His work has gained such confidence among the highest level officials that the Thai Government requested an extension of his contract through 1960.

Public Administration Training (93-71-084)

One of the handicaps of Thailand's government in marshaling, managing and directing its resources for its own development is the shortage of personnel trained in public administration theory and practice, coupled with the lack of an institution for training them.

Beginning in 1952, before the establishment of the Institute of Public Administration at Thammasat University (Project 93-79-063), this project undertook to send to the U. S. for training in various phases of public administration a number of officers selected from various departments and agencies of the Thai Government. When the project was completed in August 1957, a total of 72 participants had been trained abroad in such aspects of government as tax collection and administration, economic development administration, customs practices and administration, administrative management, police administration, and others. Many of these participants now hold key positions in their respective ministries. Training in public administration is being continued in connection with other projects.

Public Finance Improvement (93-75-062)

Between 1953 and 1956 a contract group from Howell and Company, Washington, D. C. studied the administration of existing tax laws and regulations. A six-volume comprehensive report and analysis of the revenue system of Thailand was published, also an audit and enforcement manual. As a result of the Howell team's work, some minor reorganization was accomplished in the Customs Department through the institution of the customs technique section and in the revenue department through creation of a research, statistics, and training division. A number of recommendations of the Howell group were adopted, including machine accounting and a two-week training course for 150 revenue officers from all over the Kingdom.

Government Statistical Services (93-78-156)

The lack of adequate, reliable and reasonably up-to-date statistics handicaps the administration of government in Thailand and makes it difficult to plan the economic development or measure progress. This project was set up in 1957 to assist the Thai Government in improving its statistical services as a necessary support to planning, development, and government economic policy-making.

Specifically, it was designed to assist the Thai Central Statistical Office in implementing the National Statistics Act of 1952, to train Thai personnel abroad, to develop a statistical program, and to assist Thai officials in coordinating all statistical activities in various agencies and improving both their gathering techniques and their presentation.

Sixteen participants are being trained or are programmed for training. The American technical advisors, envisioned in the original project, have not so far been obtained. The project is scheduled for completion in 1961.

Land Resettlement (93-81-064)

This was a short-range project began late in 1954 and ended the following March, to assist the Ministry of Interior, Department of Public Welfare, with its program for adding Thai nationals to obtain their own land through clearing and settlement. A training and observation trip to India for a Thai officer was financed, for the study of Indian community development. Two buildings and about 17 kilometers of roads were built, and certain equipment was supplied.

War Relief and Rehabilitation (93-82-CR144)

This fund was set up in 1954 to cover the costs of emergency projects as they arose in the wake of the Indo-China fighting. It assisted in the resettlement of Annamite refugees, combating an epidemic outbreak of hemorragic septicemia among livestock in the Northeast, and helping the Ministry of Defense in the evacuation of Chinese Nationalist troops who crossed the Burma border into Thailand in 1955.

Northeast Welfare (93-82-403)

This project of Counterpart funds was established in 1955 to enable provincial governors to deal with the more urgent problems of the Northeast, a historically depressed area which was suffering from the added burden of refugees from Indo-China fighting, scarce food supplies, and political agitation. Funds were made available to the governors and were used for the more immediate necessities of food, seed, blankets, and the like.

Community Development (93-81-157)

Despite a live and growing interest in community development, the efforts of the Thai Government in this field have been disconnected and uncoordinated. This project, begun in 1956, provided the services of an advisor to help achieve some coordination of various Thai Government projects.

The general purpose of community development is to involve people in group action for the solution of common problems, to assist citizens in mobilizing

Community Development - Cont'd.

resources for solution of village problems, and to provide village people with selected services (agriculture, health, education, engineering, etc.) which cannot be readily furnished by officials in technical ministries.

The advisor assisted the several departments concerned with community development in planning and training of personnel -- including the Department of Interior's program for training of 42 deputy district officers for two months and the Department of Public Welfare's program for training 150 village multi-purpose workers. Two officers were given training in the U. S. and two in other countries.

Low Cost Housing Training (93-83-144)

One participant was sent to the U. S. in 1956 to study low-cost housing and home financing methods.

Dollars - U. S. Dollar contribution
C/P - Local currency costs from Counterpart Funds
Budget - Thai Government contributions from regular budget
(All shown in terms of thousands of dollars)

		1957 & Prior			1958			1959**		
		Dol.	C/P	Budg.	Dol.	C/P	Budg.	Dol.	C/P	Budg.
9. GENERAL AND MISCELLANEOUS										
Program and Technical Support 93-99-000 (102)	1951 Cont.	1,988	162	134	456	100	150	201		
Ground Water Exploration 93-99-108	1955-62	1,257	108	104	431	375	17	12		
Audiovisual Services & Training 93-92-065 (141)	1953-63	161	555	70	82	85	-	24		
Volunteer Defense Corps Construction 93-05-100	1955-56	86	931	-	-	-	-	-	-	-
Military Facilities & Supplies* 93-03-101 (114)	1955	469	-	-	-	-	-	-	-	-
Atomic Energy for Peaceful Purposes 93-98-085 (140,161)	1955-63	159	-	34	76	-	15	28		
General Training 93-99-188 (051)	1954-63	125	-	25	45	-	25	19		
Pitsanuloke Reconstruction 93-99-180	1957	-	195	-	-	-	-	-	-	-
	TOTALS	4,244	1,951	367	1,090	560	207	284		
(Regional) Mekong River Studies 51-99-021	1958-62	-	-	-	2,200	-	400			
(Regional) Mekong River Reconnaisance 87-99-002	1956	47	1	-	-	-	-	-	-	-

* In 1955 certain projects of military assistance were financed by USOM, although programmed, administered and accounted for by JUSMAG. All these projects were under "Direct Forces Support" appropriation except 93-03-101 and 93-08-114, which were partially "Defense Support." No DFS (i.e., direct military assistance) projects, are included in this briefing book. All DS projects are included, of which this is the only one of military assistance nature. However, 338,370,000 Baht have been made available from Counterpart funds for local costs of military assistance projects (equivalent to $16,918,000).

** Incomplete

Program Technical Support (93-99-000)

This project consolidated all the technical support costs of operating Thai-American cooperative programs, including: (1) Technicians and clerical assistance for administering the various projects in subject-matter fields; (2) procuring certain supplies, equipment, and vehicles needed for the operation of USOM; (3) international travel, English-language training and testing, and medical examinations of Thai selected for participant training abroad; and (4) helping finance the operational costs of the Thai Technical and Economic Committee, which is the Thai agency for coordination of American assistance and liaison between USOM and the Thai Government.

The project consolidates projects going back to 1951, as follows: 93-19-037, 93-29-143, 93-39-045, 93-59-056, 93-69-061, 93-79-147, and 93-99-102.

Ground Water Exploration (93-99-108)

Since 1955 this project has provided technical advisors and financed basic geological and ground water studies essential for planning the development of ground water resources in Northeast Thailand. Since April 1958 it has provided the services of an American contractor to drill exploratory wells and train Thai personnel in proper methods of drilling and developing water wells.

Geological survey parties have been in the field since 1955 studying geology, collecting information on existing wells, locating well sites, and supervising drilling operations. Under the first phase a total of 83 wells were completed, totalling 20,308 feet of drilling (end of February 1958). Pumps were installed in 45 wells, of which 7 had brackish but usable water. Rock salt or salty water caused abandonment of 28 wells and 9 were abandoned as dry holes or for other causes.

A diamond core drill has been in operation to determine the nature, thickness, and sequence of rock formations in outcrop areas for correlation with the well-drilling by the Contractor. This drill has completed 9 holes totalling 4,981 feet.

The Contractor (Daniel, Mann, Johnson and Mendenhall) party began arriving in May 1958. They will drill about 335 exploratory wells totalling approximately

Ground Water Exploration - Cont'd.

115,000 feet, to determine the potentialities of the water-bearing strata as to quality and quantity. Thai personnel are being trained in well drilling methods and in techniques of conducting ground water studies. Any of the exploratory wells which produce good water and are worth developing are fitted with casings and pumps for the benefit of the communities they serve. As of March 31, 1959 the contractor had completed 58 wells totalling 20,634 feet. Usable water was found in 40 wells.

If the exploration proves the wisdom of a long-range ground water development program the project may be expanded to include it, by providing such other contract services and equipment as are needed which cannot be provided by the Thai Government.

Audiovisual Services and Training (93-92-065)

This project, begun in 1953 as a fund for financing printing, film making, and exhibits, was shifted in 1956 to the establishment of a Thai-American audio-visual service. The project renders supporting services to all Thai-American cooperative activities in the form of audiovisual materials, advice, and training for promoting the teaching, training, public education, and public information objectives of technical assistance programs. It produces printed materials, art services, photographic services, silkscreen printing, educational films, filmstrips, and training aids for spreading knowledge among the Thai people. Services are rendered to the various Ministries and departments, through the respective American technical advisors. The project has fully equipped a production facility (the only centralized service of this kind in the Thai Government), staffed it, and trained the staff to operate it. It is scheduled for phase-out in 1963 unless the needs of the total program justify continuation.

In 1956 a related project (93-06-141) provided local currency assistance to the Central Information Division of the Thai Government in support of a program of anti-communist education and information, particularly in the Northeast region. This information program was conducted by teams of information officers of CID with the support of USIS.

Volunteer Defense Corps Construction (93-05-100)

This 1955-56 project constructed 40 training camps for the Volunteer Defense Corps, one in each of the border provinces. Each camp consisted of 100-man barracks, a 4-car shelter, bath house, toilets, a warehouse, and a well or water-tank. It also financed construction of a headquarters building, warehouse, power house, two barracks, and a printing building in the headquarters compound in Bangkok. Printing and reproduction equipment for the printing plant was also provided. All construction was done by local contractors. The purpose of the project was to provide facilities and materials for the training of 19,000 Volunteer Defense Corps personnel.

Military Facilities and Supplies (93-03-101, 93-08-114)

In 1955 certain projects of military assistance were financed by USOM, although programmed, administered and accounted for by the Joint U. S. Military Advisory Group. All these projects, with two exceptions, were financed under "direct Forces Support" appropriation. No DFS projects are included in this report on Thai-American technical and economic cooperation, as they belong more properly in the military assistance program.

The two projects identified above were for providing certain equipment and supplies for military training and for the purchase of military uniforms, totaling about $469,000. Although funded from "Defense Support" appropriation and accountable under USOM financial control, they are also military assistance items, the only ones included in this report.

It should be pointed out that a total of 338,368,000 Baht has been made available from Counterpart funds for financing the local costs of military assistance projects (equivalent to $16,918,000), through December 1958.

Atomic Energy for Peaceful Purposes (93-98-085)

This project, begun in 1956, finances a part of the U. S. agreement with Thailand, under President Eisenhower's "Atoms for Peace" program, which committed the U. S. to assist Thailand in the establishment of a

Atomic Energy for Peaceful Purposes - Cont'd.

research reactor facility.

Under the project, 26 participants have received or are receiving training in the U. S. in applications of nuclear research techniques in engineering, plant physiology, biology, food preservation, medical and agricultural research, geology, physics, and radio chemistry. A Cobalt-60 1000-Curie source has been provided the Department of Radiology at Siriraj Hospital, along with equipment and supplies for a radio-isotope laboratory for medical research, teaching and therapy. Chulalongkorn University has been provided with equipment and supplies for a nuclear measurements laboratory. Equipment and supplies were also provided for a small radioisotope laboratory in the Ministry of Industry department of science, to be used for training the department's staff and to serve as a stimulus to the application of radioisotopes in the industrial and scientific activities of the Thai Government.

This project consolidated projects 98-140 and 98-161. It is scheduled for completion in 1963.

General Training (93-99-188)

Since 1952 this project has financed training of Thai participants abroad, in fields such as agriculture, education, labor, public administration, program planning, and governmental procurement, who were not funded out of individual projects. This project also finances costs of American training officers in charge of USOM's participant training program.

Pitsanuloke City Reconstruction (93-99-180)

In December 1956 the entire heart of the business district of the town of Pitsanuloke was razed by a disastrous fire. The devastation was so great that government agencies, charitable groups, and organizations all over Thailand responded with assistance of many kinds.

After a quick reconnaisance, American and Thai engineers concluded that the down-town area should be reconstructed along modern lines, with better

Pitsanuloke City Reconstruction - Cont'd.

and wider streets, a good sewer system, sidewalks and gutters, and a new bridge across the Nan River. USOM undertook to finance the reconstruction.

The work was performed under contract by two local firms. It involved the building of 1600 linear meters of concrete streets with curb and gutter, sewer pipes and sidewalks in the heart of the business district. The proposed bridge was added to the East-West highway project and was not included in this undertaking.

The completed project was dedicated in an elaborate ceremony arranged by the officials and citizens of Pitsanuloke on June 17, 1958. All the streets were decorated, all school children were out with Thai and American flags, and numerous placards were displayed in the crowd, bearing such messages as "Not a dream but a real gift".

(Regional) Mekong River Studies (51-99-021)

The report of the United Nations Survey Mission on the Lower Mekong River Basin (Wheeler Report) recommended a series of studies and investigations of the river, including collection of basic engineering data. The report emphasized that the collection, collation and analysis of basic data were essential before serious consideration could be given to selection of specific sites for water resources development projects, as too little is known about this mighty stream.

Of the several nations offering assistance in this undertaking which is spearheaded by ECAFE, the U. S. undertook to assist by:

(1) Establishing water-stage recording gauges at 37 points on the main river and tributaries, collecting and analyzing data on stages at these stations and on flow at 31 of them.

(2) Setting up rainfall and evaporation recording stations at about 79 points in the Mekong basin and analyzing the data collected.

(3) Training nationals of cooperating countries in this work.

(Regional) Mekong River Studies - Cont'd.

(4) Completing precise leveling and establishing horizontal control from the mouth of the Mekong to the Burma border.

(5) Completing a hydrographic survey of the main river channel by taking longitudinal soundings from Luang Prabang (Laos) to the sea.

An engineering firm, Harza Engineering Company, has been selected and preliminary work began in December 1958.

(Regional) Mekong River Reconnaisance (87-99-002)

In 1955 the governments of Cambodia, Laos, Thailand, and Vietnam requested ICA to make a reconnaisance survey of the Lower Mekong River to define possible immediate improvements and potential long-range projects designed to develop the river's potential for the benefit of the four countries involved.

USOM financed a survey under the leadership of U. S. Bureau of Reclamation officials, which followed the Mekong River from the China border to the China Sea, as well as its main tributaries, and resulted in a report entitled, "Reconnaisance Report, Lower Mekong River Basin, March 1956." This report has been useful in further studies and plans for development of the basin of last great undeveloped river of the world.

SUPPLEMENTARY INFORMATION AND MAPS

USOM

UNITED STATES OF AMERICA

OPERATIONS MISSION TO THAILAND

BANGKOK

DEVELOPMENT LOAN FUND

In the report of Committee of Conference on the Mutual Security Act of 1957, it states "The basic purpose of the Development Loan Fund, as stated in section 201 in the bill, is to assist, on a basis of self-help and mutual cooperation, the efforts of free peoples to develop their economic resources and to increase their productive capacities".

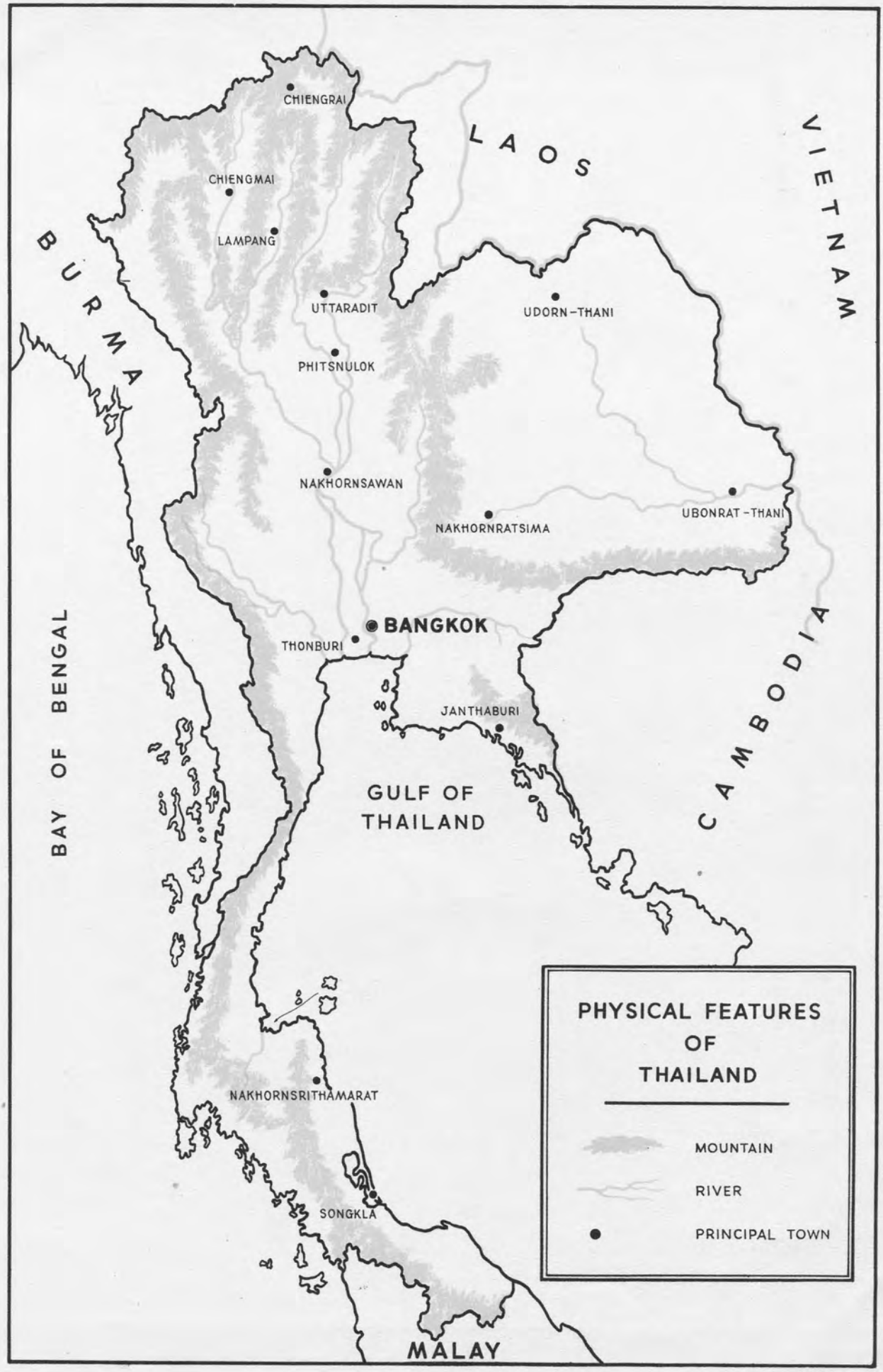
As of this date, the Development Loan Fund has granted three loans in Thailand, two in the public sector, and one in the private sector. The public loans are: a loan of $20 million to the Metropolitan Electric Authority for the Bangkok Electric Distribution System; and a loan of $1,750,000 to the Port Authority for the purchase of a new dredge for use in maintaining the channel in the Chao Phya river. The initial loan in the private sector was signed July 17th, and provides for a loan of $750,000 to the Livestock Trading Cooperation to assist in the foreign exchange costs of machinery and equipment for a modern abattoir to be erected in Bangkok.

There are a number of loan applications now pending, all in the private sector. These would provide loan assistance in various industries: pine-apple canning, production of flash light batteries, oxygen and acetylene plant, enameling plant, sugar refinery, fish processing and canning, chemical industry, and weaving.

It must be pointed out that Development Loan Fund loans are available only for the foreign exchange costs of a facility, and that the local currency costs for land, construction, working capital, etc., must be provided by the borrower from other sources.

Many of the loan applications we have received in the past involved heavy local currency expenditures, and, due probably to a mis-understanding on the part of the borrowers, these local costs were included in their applications. This resulted in a large number of applications being turned down by DLF. It is felt that now sufficient publicity has been given to these factors, future applications will be more in conformance with DLF criteria, and that this form of loan assistance will become a contributing factor to the economic development of Thailand.


VIETNAM
LAOS
CHIENGRAI
CHIENGMAI
LAMPANG
BURMA
UTTARADIT
UDORN-THANI
PHITSNULOK
NAKHORNSAWAN
NAKHORNRATSIMA
UBONRAT-THANI
BAY OF BENGAL
BANGKOK
THONBURI
CAMBODIA
JANTHABURI
GULF OF
THAILAND
NAKHORNSRITHAMRAT
SONG-KHLA
MALAY
PRINCIPAL TOWNS OF THAILAND
AND
OUTLINES OF PROVINCES


CHIENGRAI
CHIENGMAI
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UTTARADIT
PHITSNULOK
NAKHORNSAWAN
NAKHORNRATSIMA
UDORN-THANI
UBONRAT-THANI
BANGKOK
THONBURI
JANTHABURI
NAKHORNSRITHAMARAT
SONGKLA
LAOS
VIETNAM
CAMBODIA
BURMA
BAY OF BENGAL
GULF OF THAILAND
MALAY
PHYSICAL FEATURES OF THAILAND
MOUNTAIN
RIVER
PRINCIPAL TOWN

Printed By Thai-American Audiovisual Service

MAP OF THAILAND

USOM

LAOS

VIETNAM

CAMBODIA

BURMA

MEKONG RIVER

Fang
CHIENGRAI
Pai
MAE HONGSORN
Khun Yuam
CHIENGMAI
LAMPOON
Ngao
NAN
Mae Sariang
LAMPANG
Mae Moh
PRAE
Thorn
UTTRADIT
SUKHOTHAI
TAK
Mae Sod
PITSANULOKE
Lomsak
KAMPAENG PHET
PIJITR
Chumpae
PETCHABOON
KHONKAEN
KALASIN
Tha Phra
MAHASARAKAM
Banphai
ROI-ED
NAKORNSAWAN
UTHAIDHANI
CHAINAT
CHAIYAPOOM
KOKEJIG
Amnajaroen
Yasothorn
Pimai
KORAT
BURIRUM
SURIN
UBOL
SRISAKET
LOPBURI
Pakchong
Prabudhabahi
SARABURI
Hingong
NAKORNPATHOM
CHACHOENGSAO
BANGKOK
RAJABURI
CHOLBURI
PETCHBURI
Huahin
PRAYONG
CHANTABURI
TRAD
PRAJUAB
CHUMPORN
RANONG
Langsuan
Kapor
SURAS
Takuapa
PANG NGA
NAKORNSRITHAMRAJ
KRABEE
PHUKET
TRANG
PATTALUNG
SONGKHLA
Klong Ngeah
Kolok Pon
YALA
PATTANI
NARADHIVAS
NONGKAI
UDORN
Sawang Daendin
NAKORNPANOM
SAKOLNAKORN

CROP IMPROVEMENT

MEKONG FERRY SLIP AND TERMINAL FACILITIES

MAEMOH STEAM POWER PLANT

CHIENGMAI AREA
MEDICAL SCHOOL
MALARIA INSTITUTE
TECHNICAL INSTITUTE

COMMUNITY DEVELOPMENT (74 villages)

EAST-WEST HIGHWAY

HIGHWAY CONSTRUCTION DEMONSTATION PROJECT 20 Kms.

YANHEE HYDRO-ELECTRIC POWER (IBRD FINANCED)

THA PHRA LIVESTOCK STATION

KORAT-NONGKAI HIGHWAY

AGRICULTURE RESEARCH STATION

CREDIT SOCIETY
ANIMAL VACCINE LAB.

MALARIA INSTITUTE

COMMUNITY DEVELOPMENT - 65 villages

BANGKOK-SARABURI HWY.

N.E. FRIENDSHIP HIGHWAY

MAKASAN RAILWAY SHOP

BANGKAPI STREETS

HEALTH TRAINING CENTER, SANITATION

CROP DEMONSTRATION

AIRPORT IMPROVEMENT

KORAT AREA
- TECHNICAL INSTITUTE
- CHO HO POLICE TRAINING
- RAILWAY REPAIR SHOP
- GROUND WATER EXPLORATION OFFICE
  Total Wells in area - 80
- SOIL & WATER CONSERVATION DEMONSTRATIONS
- CROP IMPROVEMENT

BANGKOK AREA
- DIESEL POWER PLANT, 10 MW.
- THERMAL POWER PLANT, 75 MEG.(Ex-Im Bank)
- ELECTRICAL DISTRIBUTION - DLF
- MINING DEVELOPMENT
- DON MUANG AIRPORT - New Control Tower, Ground Services
- AVIATION OVERHAUL FACILITY
- HIGHWAY EQUIPMENT POOL
- UNIVERSITY DEVELOPMENT - Kasetsart, Chulalongkorn, Thammasart, College of Education (Prasarnmitr)
- BANGKOK TECHNICAL INSTITUTE
- MEDICAL EDUCATION - HOSPITAL IMPROVEMENT
- VETERINARY DIAGNOSTIC LABORATORY
- MEAT PROCESSING PLANT

SONGKHLA AREA
- AGRICULTURE EXTENSION
- TECHNICAL INSTITUTE
- REGIONAL HEALTH CENTER
- REGIONAL MALARIA OFFICE

THAI-AMERICAN COOPERATION
MAJOR USOM ACTIVITIES

LEGEND :

- HIGHWAYS COMPLETED OR UNDER CONSTRUCTION
- HIGHWAY PLANNED - ENGINEERING STUDIES
- BRIDGE REPLACEMENT - Total 988 Bridges
- AIRPORT DEVELOPMENT -- Runways, Communications Equipment, Meteorology, 16 Airports
- GROUNDWATER EXPLORATION -- 340 Wells And 6 Water Systems
- LIVESTOCK IMPROVEMENT · BREEDING STATIONS · Extension Service · Demonstrations
- YUWA KASIKORN - RURAL YOUTH - 164 Clubs
- GENERAL EDUCATION DEVELOPMENT - TEACHER TRAINING
- VOCATIONAL AGRICULTURE SCHOOLS
- SEATO SKILLED LABOR SCHOOLS
- HEALTH IMPROVEMENT · VILLAGE SANITATION · HOSPITAL IMPROVEMENT
- PUBLIC ADMINISTRATION AND STATISTICAL SERVICES
  INSTITUTE OF PUBLIC ADMINISTRATION - THAMMASART UNIVERSITY
- PARTICIPANTS TRAINED -- US. & OTHER COUNTRIES
  TOTAL 2300 AS OF SEPT. 1, 1960

REGIONAL PROJECTS
(NOT SHOWN)

- MEKONG RIVER DEVELOPMENT
- SEAREP -- IMPROVEMENT OF ENGLISH LANGUAGE
- SEATO GRADUATE SCHOOL OF ENGINEERING
- OCEANOGRAPHY SURVEY -- MARINE RESEARCH
- TELECOMMUNICATIONS -- Construction and Engineering

Printed by Thai-American Audiovisual Service

SEPT. 15, 1960

USOM - PW