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# Resource Use in Thailand

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**C**RITICISM of countries such as Thailand because inefficient use seems to be made of their resources is implied in referring to them as underdeveloped. They are underdeveloped by western standards, but are they really underdeveloped within their own setting? It is well known they do not have the resources and technology of the United States. Yet many people wonder why they do not move forward rapidly, particularly when the leadership seems progressive, and considerable outside financial support is given them. There must be valid reasons.

This paper will deal with two hypotheses: (1) that there is considerable logic in resource utilization in Thailand within the prevailing frame of reference, and (2) that progress in all likelihood will come slowly because improvements in education, communication, transportation, capital accumulation, and adjustments between the rural and urban labor forces will be unavoidably slow.

Thailand, about the size of Texas and with a population of 20 million people, is located in southeast Asia between Burma and Indochina. Bangkok, the largest city in Thailand and the seat of government, is located on the principal river about 20 miles from the Gulf of Siam. The rainfall during the normal crop year (June-January) in the important crop-producing areas ranges between 30 and 80 inches.<sup>1</sup> In spite of what may seem to be adequate rainfall, there were 60

drought years during a period of 115 years.<sup>2</sup> During the same period the crops suffered from flood damage during only four years. Hence, supplemental irrigation is essential in Thailand. About 25 percent of the land is now irrigated and additional projects are under way.

According to the 1950 census, there were 2.1 million farms in Thailand, the average size of which was nearly 11 acres. An average of eight acres was cultivated, and 87 percent of all farm land was owned by the operators.<sup>3</sup> A fairly typical farm had total assets of \$1,117<sup>4</sup> of which 70 percent was invested in land and buildings. Its livestock consisted of two buffaloes, two cattle, two hogs, and 20 chickens. Buffaloes provide nearly all the farm power. The value of hand and animal tools was \$28. One farmer in 33 had some power equipment which usually consisted of a stationary-engine-operated water pump. In the crop year 1952-1953, the average cash family income was \$186, of which \$84 was non-farm income.<sup>5</sup> Farm operating expenses of \$32 and cash living expenses of \$137 left only \$17 a year for purchase of capital goods and for savings. Value of farm production for home use (excluding shelter) was \$84 which indicates farmers were only about 30 percent self-

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<sup>1</sup> The minimum water requirement for wet rice production is about 70 inches annually.

<sup>2</sup> *Thailand and Her Agricultural Problems*, Ministry of Agriculture, Bangkok, Thailand, November 1950, pp. 42-3.

<sup>3</sup> In 1952-1953 the Thai Government, in cooperation with FAO, obtained data pertaining to farm organization, receipts, and expenses from a sample of about 6,000 farmers. The results of this study can be found in: *Thailand Economic Farm Survey*, Division of Agricultural Economics, Ministry of Agriculture, Bangkok, Thailand, 1953.

<sup>4</sup> One dollar equals 21 baht.

<sup>5</sup> The total man-days of work per farm was 320 for an average of about 100 days for each worker. The farm family also worked a total of 132 days in nonagricultural employment which was largely outside labor and home industry.

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sufficient. Another study shows farmers to be about 50 percent self-sufficient.<sup>6</sup> In any case farm levels of living in Thailand cannot be compared directly with those in the United States on the basis of relative cash incomes. Goods and services produced in Thailand sell for much less than those produced in the United States.

Rice is the principal crop in Thailand. Rice was produced on 88 percent of all the farms and on about 80 percent of the cultivated land. All other products raised on farms such as corn, cotton, peanuts, soybeans, sugar cane, tapioca, tobacco, vegetables, fruit, and livestock contribute to the welfare of the people but have little importance in external trade.

Except for plowing and harrowing, which are done by water buffaloes or bullocks, nearly all farming operations are manual. Levees or dikes surrounding each small field are made by hand; young rice plants are removed from seedbeds and transplanted by hand; the crop is harvested with hand sickles; much of it is carried to the threshing floor on the backs of men or women, and the heads are threshed by having buffaloes trample them. The straw and trash are winnowed out of the paddy with hand baskets or, if a threshing machine is used, it is generally turned by hand.

The manufacturing industry of Thailand accounted for nearly 14 percent of the national income in 1954.<sup>7</sup> The important industrial activities are government-owned enterprises started by the several ministries or by government monopolies for processing local raw materials. Among these are the cigarettes

and liquor industries which turn out good quality products at reasonable prices. Other government-owned plants are a gunny-bag factory, sugar factory, a paper mill, and a tannery. New government-owned plants in 1954 included an alum factory and a fish-meal plant.

A cement plant is the largest privately-owned factory in Thailand. It employs 1,300 people and had an annual rate of production of 364,000 tons in 1954. A cotton mill (yarn) and a glass factory are two other commercial plants operated with private capital. There are, of course, many other private enterprises, all of which are small. In fact a large part of manufacturing in Thailand is on a home-craft basis rather than on a factory basis. Tailoring and the manufacturing of soap, ice, furniture, matches, cloth, pottery, and tinware all add value to total production. Value added to product by the slaughter of swine and by milling of rice are among the most important activities in Thailand.

Industrial activity in Thailand is low even when compared with other countries in Asia. Japan uses 32 times more energy (coal equivalent) on a per capita basis than Thailand; the Philippines and India use three times as much.<sup>8</sup>

External trade is of prime importance to Thailand because most manufactured goods must be imported. To obtain the foreign exchange to pay for necessary imports, Thailand must rely largely on the sale of the four primary products listed below.<sup>9</sup>

Thailand is the second largest exporter of rice in the world,<sup>10</sup> relying heavily on Japan, Hong Kong, Singapore, and

<sup>6</sup> Kamol Odd Janlekha, *A Study of the Economy of a Rice-Growing Village in Central Thailand*, unpublished PhD thesis (Ithaca, New York: Cornell University Library, 1955), p. 294.

<sup>7</sup> *Economic Survey of Asia and the Far East 1954*, United Nations, Bangkok, Thailand, Vol. 4, February 1955, pp. 175-81.

<sup>8</sup> *Ibid.*, p. 47.

<sup>9</sup> *Agricultural Development of Thailand*, EGAFFE/FAO, Agricultural Division Economic Commission for Asia and the Far East, Bangkok, Thailand, March 1955, p. 14.

<sup>10</sup> From 1950 until 1954 Thailand was the largest exporter of rice in the world. Since 1954 Thailand's exports of rice are exceeded only by those of Burma.

THAILAND'S PRINCIPAL EXPORTS,  
1950-53 AVERAGE

Item	Percent of total value
Rice.....	56
Rubber.....	20
Tin ore.....	6
Teak.....	3
Others <sup>1</sup> .....	15
	—
	100

<sup>1</sup> Includes dry chile, green beans, hides, salt, sticklac, tapioca, wolfram ore, and vegetable oils.

Malaya for markets. About one-third of all the rice produced in Thailand is exported. Rubber and tin are produced mainly for export, and about 20 percent of the total teak output is for the foreign market.

In Thailand much labor, the most abundant resource, is combined with relatively little capital in a setting which is largely agricultural. Technical knowledge of farming in Thailand is not widespread. Entrepreneurship in agriculture is concerned simply with employing the same production practices as have been carried on for hundreds of years. On the industrial side, a lack of experienced entrepreneurship and of know-how has retarded development. Capital for investment is scarce throughout the Kingdom. Power development has been slow because of a scarcity of capital and lack of potential.<sup>11</sup>

A hasty comparison of resource use in the United States with that of Thailand can easily lead to the ill-founded conclusion that Thailand makes inefficient

<sup>11</sup> Thailand has no known oil or high grade coal deposits. Lignite coal can help to solve the power shortage in Thailand in only an insignificant way because the output averages only about 60 tons per day and it is not likely this output will increase materially in the next several years. There is a moderate hydroelectric potential in places but development will take millions of dollars and much time.

use of its resources. Because income, savings, and output per person in Thailand are low in comparison with those in the United States does not necessarily mean inefficiency. Thailand does not have the same resources with which to work as do the people of the United States. Thailand lacks the important ingredients of capital, technical know-how, and power production so necessary for economic development.

Resource utilization in Thailand must be viewed in terms of possible alternative within the country and not by comparison with other countries. No two countries have exactly the same combination of resources, so a direct comparison of use is illogical. Neither are resources in Thailand and the United States employed in similar settings. The output and level of living in a highly industrial country, however, may serve as a guide to what may be accomplished over a period of time with a given combination of resources and technical know-how.

Industrialization is of recent origin in Thailand and still of minor importance. The few commercial industries that exist, both public and private, are small. Industrial development requires capital. As per capita income was estimated to be less than \$100 in 1952,<sup>12</sup> and probably is not much higher now, capital accumulation is bound to be slow in Thailand because no successful method has been devised for mobilizing even the meager resources of small savers. Most people keep their savings in jewelry or cash. More must be done to encourage farmers and others to use the facilities of savings banks and cooperative credit societies. Furthermore, there is no established bond market. The government sells its bonds to the Bank of Thailand, a procedure

<sup>12</sup> United Nations report, *op. cit.*, p. 199.

which involves the direct creation of money and is, therefore, inflationary.<sup>13</sup>

Another source of capital is external borrowing. Thailand already has borrowed from the International Bank for Reconstruction and Development to develop irrigation facilities, to expand the railway system, and to dredge rivers. Borrowing from the International Bank has proved to be desirable because in addition to providing capital funds on reasonable terms and interest rates, much entrepreneurial skill is also furnished.

Finally, Thailand may obtain capital by encouraging foreign investment. This could become a substantial factor in increasing employment and raising the level of living. The new Industrial Promotion Act which became effective in October 1954 seeks to encourage foreign investment in industrial enterprises. In November 1955 the government decided to ask experts from the International Bank for Reconstruction and Development to survey Thailand's resources. The primary purpose of this survey was to provide foreign investors with accurate information concerning industrial possibilities in Thailand. Nevertheless, foreign capital will move into Thailand slowly. First of all, there must be a definite policy as to import duties on raw materials and machinery, and as to taxes, rates of profit, and transfer of funds. Second, foreign capital will be reluctant to enter Thailand even though encouraged to do so because the Thai market for most goods is very narrow. Only a small proportion of the people have more than a bare subsistence income. Finally, it is well known that Thailand, a small nation, is located near some larger un-

friendly countries. This may be an important factor in retarding the flow of capital into the country, particularly when there are many other places where foreigners may invest funds.

In view of scarce capital resources in Thailand, the marginal capital/output ratio should be as low as possible. An overall requirement of a capital/output ratio of 2.5 for Thailand and other countries in southeast Asia is estimated. The ratio for cottage and small-scale industries is less than 2.5, but the capital requirements of related activities, such as transport and power development required to service the various industries, significantly increase capital needs.

Even with a low capital/output ratio, there is no hope of obtaining all of the required capital funds through savings. Excluding mainland China and Japan, the gap between minimum investment needs and domestic savings is at least 60 percent for the countries of southeast Asia.<sup>14</sup> So, a substantial inflow of funds through foreign investment and borrowing is essential if there is to be an expanding rather than a stagnant economy.

Only during the last few years has there been a need for technically trained personnel and for management other than individual proprietorship. Engineers now are being trained in Thailand and abroad in increasing numbers, and at least one additional engineering school is in the planning stage. There is no easy and quick way to increase managerial capacity. Management achieves proficiency through both training and experience with experience in the native setting an essential. Much can be said for foreign investment since it is usually accompanied by foreign management. Local people then learn from the imported management. The cement industry in Thailand is an example of a

<sup>13</sup> As lines of communication with the people improve, more and more attention needs to be given to encouraging savings for deposit in banks and cooperative credit societies, or for purchasing government bonds. So far, most capital investment has been financed out of current revenue, external borrowing, and United States military and technical assistance.

<sup>14</sup> United Nations Report, *op. cit.*, pp. xiii-xv.

firm that employs foreign management which has developed some excellent ability among its local personnel.

Modern industrial enterprises must have power. Until 1952 Thailand had no hydroelectric plants. The lignite coal fields opened in 1954 may provide a little fuel for power generation. In planning new industrial plants technicians also have considered the use of charcoal which is plentiful but not very efficient in terms of other fuels. Some additional hydroelectric power will be available after 1958 but not nearly enough to meet potential industrial demands. Thailand's best hope may be in developing low-cost nuclear power stations.

Cottage and small-scale industries will and should be maintained in Thailand for a long time. Western technology based on labor-saving machinery is not generally suited to Thailand. What is needed are hand tools, small machines, and equipment to suit a country with scarce capital and abundant labor. Only in a few cases does the factory system seem warranted in the present economic setting.

Because nearly every farmer in Thailand has a small income, the most basic wants are food, clothing, and shelter. If economies of scale are to prevail in a few industries, the products to be manufactured within the country should be within the economic reach of most of the people.<sup>15</sup> The best possibilities are likely to be basic clothing and food. The importation of yarn and cloth is by far the most important of the country. Much revenue is derived from the importation of these items although the duty has been relatively low. The wide-

scale development of yarn and cloth manufacture in the country would likely necessitate the imposition of other taxes to compensate, in part or whole, for the loss in duty revenue. If plants were operated with reasonable efficiency there would still be some comparative advantage in producing these items in Thailand compared to importing them.

As to food, much can be done to add value to primary products by processing. The milling and handling of rice for both the foreign and domestic markets can be improved. Many swine are already produced in Thailand, and more can be. Preliminary steps are being taken to establish a modern processing plant where bacon and ham may be cured on a commercial basis.

In Thailand's agriculture the proportion of capital to labor has not changed appreciably for generations. Farmers are deeply entrenched in traditional agricultural pursuits. Ideas that have prevailed for a long time have become practically imperishable.<sup>16</sup> Nonetheless, concurrent with an industrial development to siphon off some of the plentiful labor supply, farmers generally must adapt themselves to new and better things. As each successive generation receives more and more education, they will tend to be more receptive to new ideas—the people will become more curious and lose their apathy.<sup>17</sup> At the same time some very tangible incentives must be offered the rural people in order to break the existing pattern. The government, through its universities, extension service, and various ministries serving agriculture, needs to show farmers how to increase

<sup>15</sup> With the possible exception of such items as fish oil, rubber goods, and soap preparations, it is not likely that Thailand will export manufactured items in much quantity for a long time. Production to satisfy part of the home market is the best possibility in the years immediately ahead. Of course if some goods can be manufactured for the export market also, so much the better.

<sup>16</sup> In several respects Thailand has a fairly sound agriculture when compared with some other countries. Most farmers own their land, have few debts, and fragmentation is a minor problem under existing cultural practices.

<sup>17</sup> C. W. Chang, *The Rural Community Development Movement in Asia and the Far East* (Bangkok, Thailand: Regional Office, Food and Agriculture Organization of the United States, 1955)

their net incomes by using better seed, fertilizer, proper irrigation practices, labor-saving equipment whenever practicable, and improved cultural practices. Knowledge must be made to work for the farm people of Thailand.

To gain acceptance, so-called new ideas must contain something of the old. Most human beings are inclined to accept only those things they understand. When something familiar is found in a proposal, curiosity may be aroused sufficiently to achieve a fairly comprehensive understanding. Otherwise there is no point of departure in trying to grasp a completely new proposal. People may claim to be readily receptive to new ideas, but most tend to put up some resistance. Some corn-belt farmers in the United States needed 15 years to discover that hybrid corn increased yields per acre to the point where net incomes were enhanced significantly. The Thai are no different.

Up to now most of the people of Thailand have felt that poverty is inescapable. Education has shown some of these people that a chance for a better life may exist.<sup>18</sup> Much has been done in Thailand in a relatively short period of time to raise educational standards and to provide instruction. Education is compulsory through the fourth grade or to 14 years of age with instruction available in even remote areas of the Kingdom. More advanced instruction is being provided as rapidly as additional funds and teaching personnel permit. Although it is essential, formal education by itself does not assure economic development. Education provides the climate in which it is possible to stimulate entrepreneurs. It also provides a continuous stream of information concerning the latest production techniques, prices, markets, and government policies.

Only in exceptional cases is it possible to lift techniques and ideas out of the United States and drop them successfully into a foreign country. What Thailand must do, and in fact is doing, is to formulate objectives and goals that can be realized within the existing milieu described in the preceding section. Goals in Thailand that would involve the use of much capital and highly technical entrepreneurship cannot be realized.

Another important impediment to progress is the fact that technicians, farmers, and others in Thailand and elsewhere think they are doing reasonably satisfactory work and within their frame of reference possibly most of them are. If they thought otherwise, they would change. They have a sense of security in thinking and doing the same things year after year. As a result of this stability in the economic arena, entrepreneurs can predict the outcome of production and marketing processes fairly well after many years of doing the same thing. Everyone finds it difficult to break with tradition. Yet only by changing customs, habits, and methods can there be any real progress.

A number of technical problems also impede economic development in Thailand. It will take a long time in a favorable setting to establish a satisfactory network of communication and transport that reaches all of the people, though much development in transportation already has taken place. The data available indicate the road mileage increased by about four times in the last 20 years.<sup>19</sup>

Postal and telegraph service reaches most parts of the Kingdom but only a few telephone lines extend outside Bangkok. The number of radios has increased greatly in the last few years but they are still far too expensive for the average

<sup>18</sup> Janlekha, *op. cit.*, p. 26.

<sup>19</sup> *Statistical Year Book Thailand, 1952*, National Economic Council, New Series, Vol. I, Bangkok, Thailand, p. 189.

farmer. Bangkok has several radio stations but other parts of the Kingdom have none. The newly organized Extension Service ultimately should become an important vehicle in the dissemination of information to farm people. It is limited in scope at present because of inadequate funds, personnel, and research results.

Capital accumulation is a slow process. To increase per capita income by 2 percent per annum in Asia and the Far East with its population of 1,200 million people would require an initial capital investment of \$10,800 million per year. The amount of capital required would increase in subsequent years as population and national income increase. Yet with a constant annual increase of net income per person of 2 percent, it would take 35 years to double the income of the people.<sup>20</sup> It is unlikely that capital will be accumulated in the amounts indicated to bring about an increase of 2 percent per annum in per capita income. If this is so, it will take longer than 35 years to double per capita income.

Of course, to build a body of research results which may be disseminated to farmers and others takes a long time. Research projects dealing with seed, crop, and livestock improvement usually must be carried on over a period of several years. Such research is of a continuing nature. Furthermore, to push research results into the hands of farmers takes years, even under favorable circumstances. A country can not jump overnight from the production of primary products to a modern economy based on industrialization and outside markets; it has to grow into it gradually.<sup>21</sup>

<sup>20</sup> United Nations Report, *op. cit.*, p. xiv.

<sup>21</sup> Stanley Andrews, *World Agricultural Situation and Its Implications for Economic Mobilization* (Washington, D. C.: Industrial College of the Armed Forces, 1953-1954), pp. 1-12.

### Conclusions

Much labor and relatively little capital are used in Thailand agriculture, industry, and the trades. Most of the people work on the land though unemployed a good part of the year, simply because there are few jobs elsewhere. Firms are small, and use few tools and hardly any complex machines because of a shortage of capital, of skilled entrepreneurship, and of technical know-how. Industrial plants also are small and few because power is exceedingly scarce.

Capital accumulation is bound to be slow because current consumption absorbs current output. External borrowings provide an important source of capital and speeds accumulation but in no miraculous way. Because the gap between investment needs and savings is so great, foreign capital is essential to economic development in Thailand. Skilled entrepreneurship and know-how must be trained concurrent with development. Power development, improved communication, and transport, so essential to greater industrialization and to improvement in agriculture, all require heavy outlays of capital. Thus, much manufacturing will continue to be on a home-craft basis for a long time and in small shops with hand tools.

If the progress of the past few years is to continue, or be accelerated, the people as a whole must understand what is involved. Only through education can the people of Thailand be stimulated to new and better things. Even then some very tangible incentives may be needed to break the traditional patterns, especially in agriculture. However, once the people can see for themselves the value of making changes, subsequent changes may come more easily.