Assigned by the Ministry of Agriculture, Forestry and Fisheries

Report on the Survey of Rural Population and Agricultural Development in Asian Countries – Thailand –

MARCH 1986

The Asian Population and Development Association (foundation)

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THE ASIAN POPULATION AND DEVELOPMENT ASSOCIATION, 1986

Nagatacho TBR Building, Rm. 710
10-2, Nagatacho 2-chome, Chiyoda-ku, Tokyo 100
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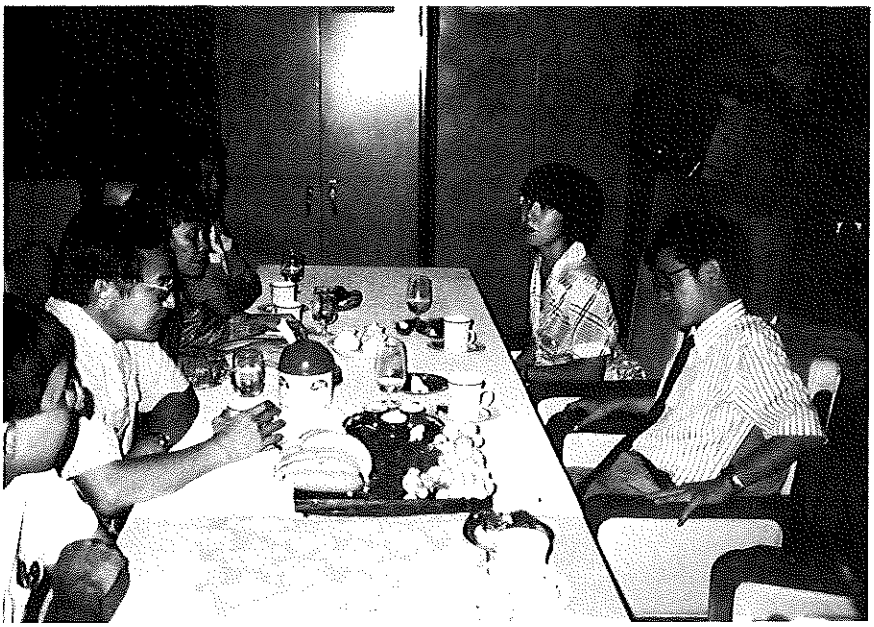
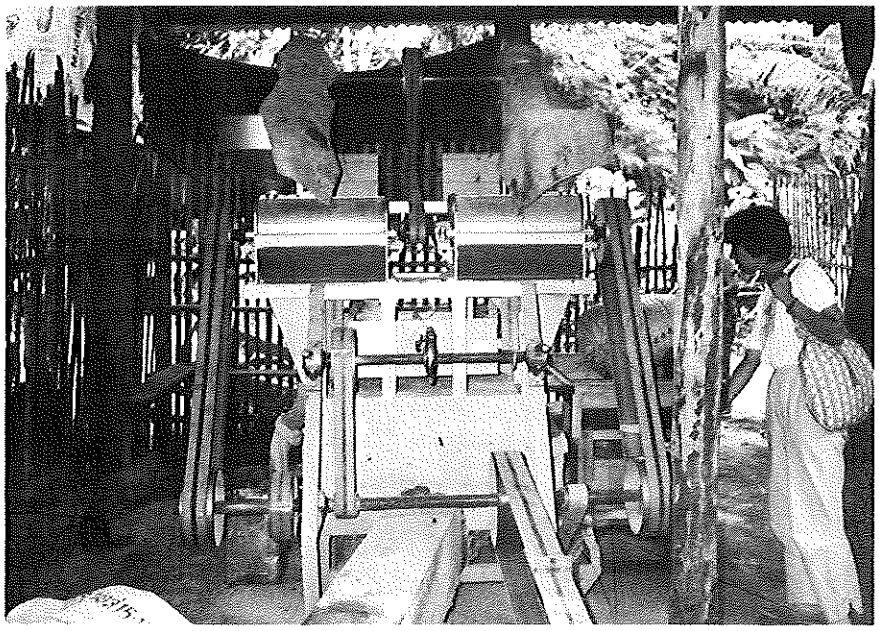
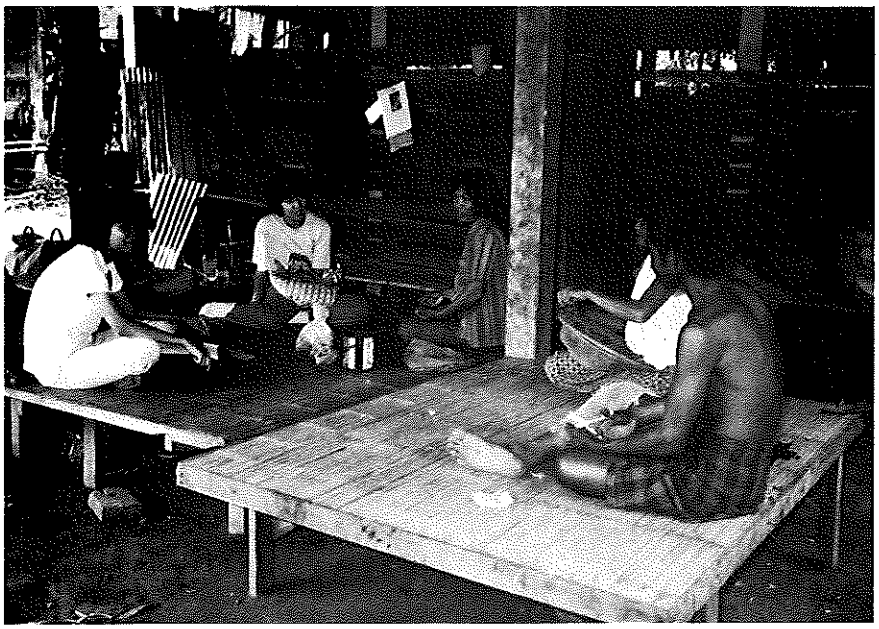


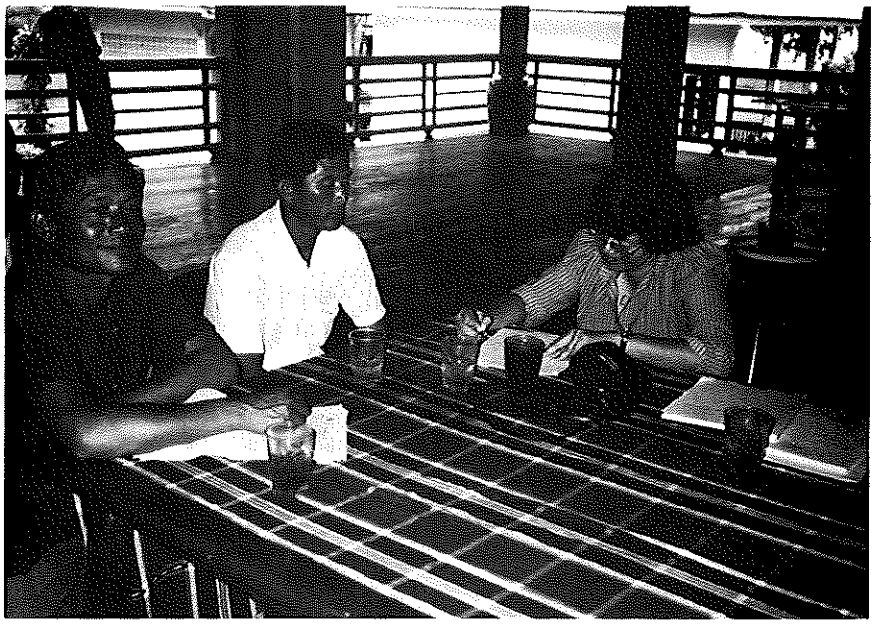
▲From left: Dr. Karoon, Dr. Boontium (Deputy Minister), Ms. Samsen (Secretary), Ms. Tassane, Dr. Yonosuke Hara, Ms. Junko Koizumi, Reporting the survey in Bangkok



▲Rice cleaning machine in Bang Yang Village, Surin Prefecture



▲ Scene from an interview in Bang Yang Village, Surin Prefecture. From left: Ms. Daranee, Dr. Hara, Ms. Koizumi



▲ Scene from an interview in Bang Wat Yai Village, Chainat Prefecture (Ms. Isa at the right)

Foreword

The following report represents the results of a "Survey of the Rural Population and Agricultural Development in the Asian Countries," consigned by the Ministry of Agriculture, Forestry and Fisheries in 1985, and entrusted to be implemented by the Association of Population & Development in Asia (APDA) for Thailand. The survey and compilation of the results were carried out mainly by members of the Association's Committee for Study (Chairman: Mr. Shigetoh Kawano, Professor Emeritus the University of Tokyo).

The survey was conducted to pursue the following objective: In extending cooperation in terms of rural and agricultural development to Asian countries, it is necessary to give due considerations to enhance productivity and to improve the standards of rural life. In particular, special note must be taken to assist in sustenance of rural population bearing capacity. For this goal, a field survey will be conducted in a model district selected from among the Asian nations to determine the rural community and atricultural development programs to be implemented, with the objective of maintaining and enhancing the population bearing capacities. The results will establish a guideline for Japan's international cooperation in the area of agriculture, forestry and fisheries.

The field survey in Thailand was conducted with the guidance and cooperation of Dr. Boontium Khamapirad, Deputy Minister of Communication, Ms. Khunying Kanok Samsen Vil, Member of Parliament, Mr. Masatada Tachibana, the Japanese Ambassador in Thailand and Mr. Katsuyuki Nagayama, First Secretary of the Japanese Embassy. Also, staff members of Bangkok Community Development Project and the Girls Guides Association of Thailand extended their support in the implementation of the survey. In Japan, members of the Department of International Cooperation, Economic Bureau, Ministry of Agriculture, Forestry and Fisheries, and Department of Policies, Economic Cooperation Bureau, Ministry of Foreign Affairs, cooperated in the planning and arrangement of the field survey. I would like to extend my deepest gratitude to these people.

In conclusion, I sincerely hope that this report would hopefully contribute to the advancement of the rural community and agricultural development programs in Thailand, as well as support the Japanese Government's cooperation there in an effective manner. Furthermore, I would like to note that this report was compiled by and is the sole responsibility of the Association, and does not reflect any views nor policies of Ministry of Agriculture, Forestry and Fisheries or the Japanese Government.

March, 1986

Tatsuo Tanaka
Chairman
Asian Population and
Development Association

C O N T E N T S

CHAPTER 1

PROBLEMS AND METHODS

In this research, our main theme is the rural population and agricultural development of Asian countries. Here, we focus our investigation on Thailand, with the intention that it can serve as a referent for Japan's overseas cooperation in the area of agricultural development.

We selected one village in Thailand's central region, and another in the northeast, in which to investigate the state of agricultural development and population trends, particularly family planning. The interview survey was our main means of investigation. The relationship between our main theme and the field survey is similar to that in our Indian survey ("Report on a Survey of Rural Population and Agricultural Development in Asian Countries -- India", prepared by the Asian Population and Development Association in February 1985, under commission from the Ministry of Agriculture and Forestry). Findings of this survey can be summarized as follows.

1. It is generally agreed that the purpose of agricultural development is to increase income and to raise living standards, and thus it may be said to increase population supporting capacity in a broad sense. Agricultural development does not necessarily lead to increased per capital income or living standards, because the greater part of the development effect might be absorbed by the rapid population increase. Given this Malthusian scenario, some form of policy is required to control population increase until the cycle is broken. Family planning is such an interntionally guided policy. In this survey, we investigated the form, degree and motivation of family planning as it is practiced in the survey areas, as a precondition for conducting effective and efficient agricultural development.

2. We are also interested in the relationship between family planning and agricultural development, specifically in the mechanism by which the effects of agricultural development affect -- positively and negatively -- the practice of family planning, and how the effects of the latter in turn affect agricultural development. Generally, agricultural development creates opportunities to improve living standards. In so doing, it can encourage Malthusian population factors such as early marriage and increased fertility, just as it can encourage conditions which would enable and promote family planning, e.g., awareness of and access to techniques. And control of population growth through family planning can in turn bring about conditions conductive to agricultural development, in the forms of increased savings for investment, improved educational standards, etc. We investigated the effects of this two-sided relation on reality.

3. Further there are problems intrinsic to agricultural development, problems pertaining to knowledge, technique and the procurement of capital required for development, and related problems of the market, selling, finance and management. These problems trace back to the intentions, attitudes and desires of managers in relation to

development. Those intentions and attitudes determine in part the replacement of old production capacities by new ones so as to transform traditional economic and management structure, and are also generally accompanied by unstable conditions. And so we investigated how Thai agriculture is addressing these problems. Again, we stress that population problems are closely related to these issues.

4. Finally, we examined these issues from the standpoint of international cooperation. Our reasoning was that while outside influence may have some effect in solving problems, there seems to be a built-in limit as to how much can be accomplished by international cooperation.

5. After going through the problem and concluding the examination outlined above, we chose two villages in Thailand in which to conduct our survey -- Wat Yai village in Chainat province, and Yan village in Surin province. We selected in each village 30 persons from 30 farming families for the interview survey, which covered the issues mentioned above. Chainat and Surin provinces, and the two villages, stand in considerable contrast in terms of location, structure of agriculture, and income levels. Income per farming household in Chainat, a typical central Thailand province, is from 2 to 3 times higher than in Surin province in the northeast. Population growth is more rapid in poorer Surin. Indeed, Surin has both a higher birthrate and a higher in-migration rate than does Chainat province. The two provinces differ economically, in income level, and attitude toward population increase. This may reflect the more frequent incidence of Malthusian population phenomena in Surin, in the northeast. However, our survey revealed that the birthrates of both provinces had been declining for the past ten years and that agricultural production had improved in both regions, despite their different modes of planting (wet rice farming in central Thailand, dry field farming in the northeast). As we will indicate later, the states of agricultural development in both regions have their problems. But taken as a whole, it is clear that agricultural development and family planning are beginning to interact in a positive direction.

We will consider the outlook for international cooperation in light of these basic findings.

CHAPTER 2

GENERAL OUTLINE

Section 1 General Outline of Thailand

1. Land and People

(1) Geographical Features

The geographical position of Thailand is between 6 to 20 degrees north latitude and 97 to 106 degrees east longitude. The climate varies from tropical to sub-tropical with monsoon, while the entire land area is subject to a six-month rainy season and six-month dry season. The land area of Thailand amounts to 513,000 square kilometers, or approximately 1.4 times larger than that of Japan. 70% of its land area is comprised of plains and rolling foothills, while the remaining 30% is mountainous. Mt. Doi Pha Hom Pok, Thailand's tallest peak, is 2,297 meters above sea-level at its summit. The land area as a whole does not include any steep ridges. With these geographical features, the entire land area of Thailand is covered by vegetation, almost all of which is homogeneous in species. The land mass can be divided into the four regions of northern, northeastern, central and southern on the basis of precipitation and topography characteristics. The northern region is comprised of extensive mountains, basins and rolling foothills and receives sufficient amounts of rainfall during the rainy season. Because large amounts of rainfall are retained, the natural water supply situation of the region is favorable. Therefore, the land in this northern region is capable of supporting various types of agricultural crops, including rice and other field crops, as well as fruit all-year-round. The northeastern region of Thailand consists of numerous elevated plains and plateaus, and as a result of the six-monthheavy dry season in this region, there is an insufficient water resources. Accordingly, agricultural operations are concentrated in the period of the rainy season. The cultivation during the dry season is limited to those areas having advanced irrigation systems or river basin. The central region of Thailand is characteristic of a broad plain, which encompasses the alluvial fans of the rolling foothills on both sides of the Chao Phraya Delta. This region is the country's granary zone, with the major grain crop being rice. The country's southern region is situated on the Malaya Peninsula, a finger of the land mass with numerous low mountains and rolling foothills, but with only a small number of plains. This region enjoys year-round rain-fall, thus making its tropical rain forest climate ideal for rubber and fruit cultivation.

(2) People

It is said that Thai people is descendants of the Thai and Meo tribes, originally located in the southern region of China, but who eventually migrated to the current locations in Thailand. They live in all areas of the country, with the exception of the southern region.

Other ethnic groups of Thailand, accounting for 10% of the population, are represented by overseas' Chinese, Malaysians, Indians and the Hill tribes. More than 90% of the inhabitants are followers of Buddhism (Hinayana Sect), and as a result their national characteristics are homogeneous on the whole. Unlike the other countries of Southeast Asia, Thailand is unique in that it has never experienced any serious social issues arising from ethnic or religious differences. The Thai people enjoy a relatively peaceful social integration.

Thailand has also never been colonized. Throughout its history, it has been able to avoid colonial rule or economic exploitation. Other Southeast Asian nations were not as fortunate. Thailand has therefore been able to gradually promote modernization under the dynastic rule of His Majesty, King Chakuri (Royal Family of 1782 to the present), while maintaining its basic character as an agrarian state centered on rice cultivation. In addition to the geographical features of Thailand already described, the country is also free of such natural disasters caused by earthquakes and typhoons. Therefore, as either a state or nation, Thailand has rarely experienced hardships caused either by man or nature. Such an environment is quite favorable, but it also means that the country has no experience or training in surmounting such natural or human disasters. The Thai people have been able to benefit from the richest of their natural environment without significant difficulties throughout its 200-year history under the Chakuri Dynasty to the present. It should be noted that a significant gap exists between the national characters of the Thai people and the Japanese in the sense that the Thais have been able to enjoy food self-sufficiency in their daily lives as well as a history relatively free of hardships. However, the Japanese experience has been quite different and adverse at times.

2. Politics and Society

(1) Political System

The nation of Thailand is currently a constitutional monarchy. The country's head is His Majesty, King Rama IX, the ninth ruler of the Chakuri Dynasty. Thailand's National Assembly consists of two Houses; the Upper-House whose members are appointed by the King, and Lower-House whose members are elected by popular vote. Thailand's Cabinet is not based on the assemblyman system. The Prime Minister is appointed by the King, and the State Ministers do not necessarily have to be members of either House. The Judiciary is not an independent body representing one of the Western three branches of power; administrative, legislative and judicial branches. It is a subordinate body of the Ministry of Justice, and the ministry is actually an administrative body. The present political system of Thailand just described has been in effect since the enactment of the current

Constitution in December 1978, and has not existed for an extended period of time. Since the enactment of the country's first Constitution in 1932, more than twenty revisions and/or abolishments have been implemented. There have also been several periods where no constitution was in existence as a result of frequent coup d'etats, wich led to various political changes. A serious issue for Thailand is its still young political system of representation through popular vote.

Thai politics since World War II to the present have been characterized by the rule of various military juntas, and democratic rule has only been observed during very short periods of time. Also, the development of a system of local autonomy is still insufficient in the sense that the prefectural governor and district headsman, who are the representatives of local administrative bodies, are appointed by the Minister of Interior, and are not elected through popular vote of the actual residents. Regarding local administrative services, most all local projects are determined by the Central Government's budget, while the budgets of the local districts are extremely limited.

As for Thailand's political system described in the above, the different governments to the present have emphasized taxation and public peace and order. What is known as a modern nation now is one whose government plays the leading role in nation- building and national unification as well as one in which public opinion is reflected in its political affairs. However, the political system of Thailand has yet to reflect such characteristics. Specifically, a basic role of government is to positively improve the life of its people, i.e., the function of a welfare state, which appears to be a general world trend at the present. The political system of Thailand should also move in this direction.

(2) Social Structure

The social structure of Thailand should be analyzed in terms of the following three aspects: 1) differences between the Royal Family, nobility and commoners; 2) differences between the Chinese merchants and other residents; and 3) difference between Buddhists and Muslims. Regarding the first aspect, under the current government monarchy, ones ascribed social class is a primary factor in determining ones social position as well as political and economic privileges leading to various differences among the lives of the people of Thailand. The second aspect relates to those problems arising from the substantial gap between the family systems and economic behaviors of the Chinese merchants and other inhabitants. In comparison to other ethnic groups, the Chinese exhibit strong tendency towards patriarchy and ethnic solidarity. There is also a conspicuous inclination towards mammonism. Many of the wealthy in Thailand are of Chinese ethnicity, and the gap created between the rich and poor has caused the appearance of economic class differences. As for the third aspect, there exist significant

variations in cultural values and norms due to Muslim and Buddhist ideological differences, the latter group accounting for more than 90% of all inhabitants of the country. A characteristic feature of Thailand's social structure is the multiple correlations between the just-described three aspects, which result in various issues and problems regarding marriage, inheritance, employment opportunities, business transactions, and the maintenance of public peace and order. In particular, the currently used system of taxation is inappropriate and ineffective because major tax revenues are drawn from indirect taxes and no system of inheritance tax exists. The result is best described as the institutionalized expansion of income/wealth disparity, i.e. the rich becoming richer and the poor poorer. Another result has been the perpetual stratification, including the imbalance of educational background.

3. Economy and Economic Policy

(1) Economic Policy and Industrial Structure

Thailand's economic policy has undergone significant change since 1960 as the turning point. It transformed the Thai economy based on rice monoculture with economic development program for industrialization. With support from the World Bank and the United States, the First Economic Development Plan was initiated from January 1961. This plan focused specifically on 1) consolidating administrative machinery for development, 2) constructing an industrial infrastructure, and 3) promoting industrialization mainly based on private sector investments. This was followed by the Second Five-Year Plan (January 1966 - September 1971), the Third Five-Year Plan (October 1971 - September 1976), and the Fourth Five-Year Plan (October 1976 - September 1981). The Fifth Five-Year Plan (October 1981 - September 1986) is currently ongoing, and efforts are being made to draw up the Sixth Five-Year Plan.

The promotion of economic development projects has enabled Thailand to achieve remarkable economic developments, such as an average annual real economic growth rate of 7% during the two previous decades. Noteworthy achievements and changes between 1960 and the present decade are: 1) 12.3-fold increase in GDP (nominal), and 6.8-fold increase in per capita GNP; 2) 1.7-fold increase in population; 3) advancements in import-substitution industries, consumer goods industries in particular; 4) increase from 10.5% to 19.6% in GDP, while agriculture's share was reduced from 38.9%d to 25.4%; and 5) improvements in underdeveloped industrial infrastructure, including electric power, roads, harbors, communications, and so on.

(2) Recent Economic Challenges

As indicated in the above discussion, Thailand was able to achieve comparatively favorable economic growth during the 1960s and 70s. Nevertheless, a large part of this progress was made possible by economic assistance from such industrialized countries as the U.S., Japan and F.R.G. in particular, including such organizaions as the World Bank and Asian Development Bank. There was also a substantial flow of private capital from various overseas countries. In reality, industry-related developments following the 1960s have been primarily due to the efforts made by foreign-affiliated businesses. The construction of various components of the infrastructure was implemented using an open economic development policy to attract the technologies of overseas countries. Also, public, low-interest loans were offered by foreign governments. The result has been remarkable steps forward, and substantial improvements in the life of the Thai people. Nevertheless, the Thai economy has been greatly affected by the activities of multi-national corporations and diverse industrial technologies, and has come to find itself under their influences of foreign industrial technology.

Affected by the prolonged economic stagnation in the world economy since the second oil crisis in 1979, the high economic growth achieved in the past can no longer be expected by Thailand's economy. Furthermore, together with the wave of industrialization, a shift in the economy toward the consumption of increasingly large amounts of energy has appeared. Subsequently, the Thai economy is increasingly feeling the impact of energy price hikes. In addition to these problems, its total debt is expanding, and the chronic deficits in the fiscal budgets are still reality. At the present, the Thai economy is faced with: 1) implementing an economic policy emphasizing efficiency; 2) developing exports have international competitiveness; 3) reducing existing income differences; and 4) expanding its domestic market.

Table 1 Gross National Product by Industrial Origin

(Unit: Millions of Baht)

Year	1979		1980		1981		1982		1983		1984	
Industry	Value Amount	%	Value Amount	%	Value Amount	%	Value Amount	%	Value Amount	%	Value Amount	%
Agriculture, Forestry, & Fisheries	147,076	26.4	173,806	25.4	187,886	23.9	188,742	22.3	204,443	22.1	198,273	20.0
Mining	12,614	2.3	14,493	2.1	13,373	1.7	14,807	1.7	16,480	1.8	20,165	2.0
Manufacturing	109,740	19.7	134,515	19.7	158,272	20.1	164,659	19.5	176,200	17.1	189,268	19.1
Construction	29,240	5.3	39,665	5.8	42,008	5.3	43,040	5.1	47,129	5.1	51,231	5.2
Electricity & Water Supply	6,075	1.1	6,284	0.9	10,743	1.4	14,454	1.7	16,319	1.8	17,250	1.7
Transportation & Communication	37,844	6.8	45,261	6.6	57,281	7.3	63,133	7.5	73,708	8.0	82,513	8.3
Wholesale & Retail Trades	102,853	18.5	128,731	18.8	150,293	19.1	159,849	18.9	165,812	17.9	184,967	18.7
Financing	31,396	5.6	41,891	6.1	52,025	6.6	61,021	7.2	71,722	7.8	80,514	8.1
Housing	6,297	1.1	7,378	1.1	8,411	1.1	9,912	1.2	11,210	1.2	12,413	1.3
Public Services & National Defence	21,623	3.9	28,263	4.1	30,645	3.9	37,349	4.4	42,551	4.6	47,143	8.4
Services	51,482	9.3	64,443	9.4	75,229	9.6	89,170	10.5	78,680	10.7	108,015	10.9
G D P	556,240	100.0	684,930	100.0	786,166	100.0	846,136	100.0	724,254	100.0	991,752	100.0
Net Income from Abroad	-9,791		-12,490		-21,787		-26,376		-25,370		-31,347	
G N P	546,449		672,440		764,379		819,760		878,884		960,405	
Per Capita GNP (Baht)	11,843		14,475		16,096		16,906		18,174		19,056	
Per Capita GNP (US$)	592.1		723.8		699.8		735.0		790.2		828.5	

Source: Bank of Thailand "Quarterly Bulletin" March 1985.

Note: The per capita national income in US$ is computed at the following exchange rates.
1 US$ = 20 Bahts in 1979, 1980
1 US$ = 23 Bahts in and after 1981.

Table 2 Trends in Trade by Major Item

(Unit: Millions of Baht)

Item \ Year	1979		1980		1981		1982		1983		1984	
Total Exports	108,179		133,197		153,001		159,728		146,472		175,237	
Rice (1,000 ton)	15,592	(2,797)	19,508	(2,800)	26,366	(3,032)	22,510	(3,784)	20,157	(3,476)	25,932	(4,616)
Maize (")	5,644	(2,014)	7,299	(2,203)	8,349	(2,575)	8,330	(2,831)	8,486	(2,659)	10,147	(3,145)
Cassava (")	9,891	(3,961)	14,887	(5,218)	16,446	(6,266)	19,752	(7,815)	15,387	(5,197)	16,600	(6,570)
Sugar (")	4,797	(1,190)	2,975	(452)	9,572	(1,119)	12,932	(2,206)	6,338	(1,537)	5,222	(1,242)
Rubber (")	12,351	(521)	12,351	(455)	10,841	(472)	9,490	(544)	11,787	(555)	13,004	(592)
Tin (")	9,252	(31)	11,347	(34)	9,091	(30)	7,773	(25)	5,265	(18)	5,280	(18)
Textile products	8,795		9,643		12,570		14,005		14,351		19,155	
Precious stones	2,250		3,240		4,486		4,671		6,214		6,129	
Others	39,607		51,947		55,280		60,265		58,487		73,768	
Total Imports	146,161		188,686		216,746		196,616		236,609		245,155	
Consumer goods	15,933		19,286		22,985		22,783		29,699		31,939	
Raw materials, Intermediate products	43,500		45,312		53,575		48,596		59,539		61,542	
Chemicals	14,856		14,962		18,011		16,138		20,790		20,730	
Iron & steel	10,035		10,335		12,039		11,323		13,860		14,035	
Others	18,609		20,015		23,525		21,135		24,889		26,777	
Capital goods	39,902		46,075		56,772		47,778		69,358		72,431	
General machinary	18,648		20,402		25,842		21,172		33,061		34,992	
Electrical machinery	7,355		11,206		10,867		11,008		15,916		16,909	
Others	13,899		14,467		20,063		15,598		20,381		20,530	
Others	46,826		78,013		83,414		77,459		78,013		79,243	
Automobile	7,126		6,912		9,568		7,687		11,416		11,834	
Petroleum & fuels	32,647		58,733		65,100		60,765		57,065		57,353	
Others	7,053		12,368		8,746		9,007		9,532		10,056	
Trade Balance	-37,982		-55,489		-63,745		-36,888		-90,137		-69,918	

Source: Bank of Thailand "Quarterly Bulletin" March 1985.

Table 3 External Debt

(Unit: $ million)

Item	1979	1980	1981	1982	1983
Total debt outstanding disbursed	4,070.5	5,802.0	7,285.6	8,516.0	9,731.1
Public	2,827.1	4,099.5	5,187.0	6,199.1	7,060.3
Private	1,243.4	1,702.5	2,098.6	2,316.9	2,670.8
Principal payments	153.8	166.1	226.9	308.1	418.6
Interest payments	159.9	267.8	394.5	482.9	530.7
Average interest (Public)	5.4 %	6.8 %	7.5 %	8.7 %	8.1 %
Average interest (Private)	10.4 %	13.8 %	13.8 %	10.6 %	8.9 %
Debt service ratio	4.8 %	5.3 %	7.1 %	9.0 %	11.8 %
International reserves	3,100	3,026	2,721	2,674	2,556

Source: IBRD "World Debt Tables" 1984-85.

Section 2 Population Policy: Progress and Effects

1. Good Lessons

Population policy is taking on an increasingly significant role in developing countries. This trend reflects increasing acknowledgement of the effectiveness with which population policy and programs can extend average life expectancies, reduce mortality rates and lower birth rates. Effectively integrated with other development programs, population programs can positively affect various factors that determine population variables and the quality of life.

There have been very significant achievements in countries whose national income ranks them in the lower and low-middle levels -- China, Colombia, Costa Rica, Cuba, Jamaica, the Philippines and Sri Lanka come to mind. These achievements include average life expectancies of over 60 years, improvement of infant and general mortality, and substantial reductions in birthrates. Running through the policies and programs of all of these countries are a number of common threads, the most important of them relating to: 1) health, 2) family planning, and 3) education. Thailand has been no exception.

Population policy has been successfully integrated in Thailand's overall development scheme. Outstanding progress has thus been made in population factors with direct bearing on improving the quality of life. Average life expectancy has extended from 47 years in the period 1950-55 to 62.7 years in the period 1980-85. Life expectancy is projected to lengthen to 66.8 years in the period 1995-2000 (*1).

During the same 1950-85 span, infant mortality has been brought down from 132 to 51 per thousand live births, and general mortality has been reduced from 19.2 to 7.7 per thousand population. These improvements represent a decrease rate of nearly about 60%.

In 1984, the latest year for which we have vital statistics (*2), the birthrate was 26.6 and the mortality rate was 7.8, resulting in a natural increase rate of 1.88%. Average life expectancy at birth is 65.1 years for females and 61.2 years for males, both exceeding 60 years by a good margin. These ESCAP estimates differ little from the United Nations estimate for 1982, just mentioned. In sum, real progress has been made in Thailand in the areas of lowering mortality, increasing life expectancy, and reducing the birth rate.

Other new data from a sample survey made in northeast Thailand -- where development has been most retarded than other regions in Thailand -- estimate infant mortality to be from 53 to 59, and general mortality to be 7.2% (*3).

The estimated birth rate in 1983 was 26 per thousand people, and for 1984, 26.6. However, statistical data we obtained in Bangkok in 1984 indicated 21.6 for 1983 (*4). The considerable difference between the two estimates for 1984 is somewhat explained by remarks made by experts that the rate might actually approach 25 if underenumeration of births were taken into account. Assuming that this assumption is true, the estimate of 26 per thousand persons can be taken as a fair representation of reality. These figures (at any rate) suggest that there has been a significant decline in Thailand's birthrate.

Behind these statistics lies the very important fact that there have been radical changes in people's attitudes and behavior related to reproduction. We might term this a revolution in reproduction, one achieved even prior to comparable progress in other areas of national development. There is another lesson here, one similar to that of China, which has demonstrated the possibility of achieving significant decreases in the birthrate even where there is no consistent high rate of economic growth. Fortunately in the Thai case, a high rate of economic growth was achieved almost in parallel with implementation of family planning policy. The Thai economy grew at an average annual rate of 7.2% in the 1970s; this high growth rate seems to have supported diffusion and development of family planning.

2. Fifteen Years of Family Planning

The Picture through CPS3

The key factors of the progress are the Thai Government's commitment to family planning, its vigorous efforts to diffuse family planning, and the positive supportive effects of a high rate of economic growth. The success also was supported by educational extension emphasizing the economic and social benefits of smaller families and promoting the use of contraceptives. You will recall how effective propaganda was in China. For a national consensus to be reached that accommodates the personal and sensitive behavior of individual acceptor couples, it is essential that propaganda be effective, appropriate, and thoroughly conceived.

A number of factors can be identified as having influenced Thais' willingness to adjust their reproductive behavior. First is the relative economic and social independence of women, suggested by the extremely high female labor force participation rate. Second is Buddhism. The Buddhism practised in Thailand has no effect of restricting contraception practice nor encouraging higher fertility. Rather, that Buddhism stresses individual service, and thus seems conducive to social acceptance of family planning.

Birth rate statistics point to a radical decline in the number of births. The decline is directly related to the adoption and

implementation of family planning policy.

The key reason for the decline in the birth rate is to be sought in the percentage of married females who are practicing contraception. Family planning was officially adopted as Government policy by Cabinet decision in March 1970. The shaping of that policy was completed two years later, in 1972, when the National Family Planning Programme (NFPP) was introduced into the Third Five Year Plan (1972-1976). The Government thereupon worked to moderate population growth to a desirable rate. Effects were immediate and gratifying. The population growth rate dropped from 3.2% (at the onset of the Third Five Year Plan) to 1.9% by 1981, the final year of the Fourth Five Year Plan (1977-81).

In 1970, before the inception of NFPP, married females who were practicing contraception was only 14%. That rate had risen sharply to 37% by 1975, with the absolute number increasing 2.6 fold.

In 1978, the year of the first contraceptive prevalence survey (CPS), prevalence rate was 53.4%. The second survey (CPS2) found it had increased to 59.0%; and CPS3, conducted in April-July 1984, found that prevalence had reached 64.6% (*5). A discussion of other findings of CPS3 follows.

To begin with, contraceptive methods. Sterilization is quite frequent, especially among females. Some 36.5% of acceptor females have been sterilized, making it the single most prevalent method. Shares of other methods are: the pill, 30.7%; injection, 11.7%; IUD, 7.7%; and sterilization of male, 6.8%. Sterilization of females and males together totalled 43.3% of acceptors. By region, the pill and sterilization of females are particularly prevalent (around 70%, two methods combined) in the north and central regions, and in Bangkok. The two methods are most prevalent in the north, at 74.5%. Prevalence of these methods is lower in the northeast and the south, at 63.0% and 58.8%, respectively. Distribution of method by region is summarized in Table 1.

Analysis of trends in acceptance of contraceptive practices and in prevalence of different methods is summarized in Table 2. In 1978, 53.4% of women between the ages of 15 and 44 were acceptors; the figure increased to 59.0% in 1981. The increase largely reflects the increased prevalence of sterilization. It is understood that a widening of the rates of acceptors in 1981 and 1984 also mostly reflects increased sterilization. Sterilization was the most widespread method of contraception in 1984, far exceeding the pill which ordinarily was the method of widest use.

The current contraception practicing rate is quite high at 64.6% in 1984. Including those who have even practiced contraception in the past, the rate is 80%. This is somewhat lower than the combined ratio

of current and previous acceptors in Japan, but is still relatively high. In Japan, moreover, current acceptors had declined to 55.5% in 1981, from 60% in the 1970s ("National Sample Survey on Family Planning" 14th (1977), 15th (1979) and 16th (1981) surveys by the Population Problems Research Council, Mainichi Newspapers).

The Thai experience with contraception differs from Japan's significantly in that the methods most used in Thailand are those which are relatively effective, i.e., sterilization and the pill, whereas less effective condoms are the most widespread method in Japan. It should also be noted that prevalence of pill and sterilization varies by age category. The pill is used overwhelmingly by younger married females, but its use declines, and sterilization inversely increases, as age approaches 30. Prevalence of sterilization peaks among females aged about 40. However, the rapid shift from oral pill to sterilization according to age of married women is expected to further ensure a decline in the birth rate.

It should be noted that prevalence of family planning practices has been quite high in rural agricultural villages. CPS3 revealed that the nationwide rate of prevalence (current acceptors) was 64.6%, with the rate of 63.7% in agricultural villages only slightly below the 69.0% in urban areas. The prevalence rate was 71.8% in Bangkok, 71.4% in the north, and a remarkably low 50.4% in the south.

CPS has also yielded valuable data on fertility levels. The total fertility rate of the entire Thai population was 3.68 in 1981 (CPS2) and 3.47 in 1984 (CPS3), still quite high (see (*5) CPS3, page 24). There were marked regional differences. The total fertility rate was low in Bangkok (2.75) and the central region (2.83), but quite high in the south (4.76) and the northeast (3.82) ((*5) CPS3, page 25).

The average age at first marriage is still relatively young -- 19.7 years. Women have an average of 3.0 childbirths, and the total fertility rate is 3.47 (CPS3). While these rates are still high, recent declines in the birth rate are remarkable. Diffusion of effective contraceptive methods has resulted in a significant reduction of reproductive behavior, and the 1.5% growth rate targeted for 1986 would seem to be within reach, as would the 1.0% target for 1991.

3. Dissemination of Family Planning Idea

Some attention should be directed to the diffusion of awareness of family planning and the role of extension programs in encouraging a favorable national consensus. Some 80% of the decline in the birth rate in Thailand has stemmed primarily from the Government's vigorous and effective family planning program (L. Brown) (*5). Moreover, experiences in Western countries point to the important role individuals and specialists activities can have in promoting people's awareness.

This impact is particularly important in areas, such as family planning, which touch on delicate personal beliefs and behavior. The role of individuals and private institutions is especially important in developing countries, and critical in the absence of positive initiatives by the Government. The charisma and impact of Mechai Viravaidva, a family planning specialist, is acknowledged even internationally (*6).

In Thailand, however, the Government's propaganda and extension efforts are considerable, so that too much stress ought not to be placed on the activities of individuals. A view expressed in the Bangkok Post (*7), is appropriate in this regard:

"The remarkably successful contributions of Mr. Mechai in promoting family planning deserve great admiration, but even greater to be admired is the Government's family planning program -- the real force behind successes achieved in controlling population."

Dr. Morakot Kornkasem, Director of the Family Health Department of the Ministry of Public Health, also stressed a important role played by Mr. Mechai having excellent entrepreneurial spirit in disseminating family planning idea and bringing about successful achievement of national program. However, the success of the Government commitment is also supported by the view (*7), that 80% of acceptors became acceptors through the Government's Family Planning Program, while only 20% of acceptors were influenced by private sectors, including Mr. Mechai. In charge of the Family Health Department's efforts to promote and diffuse family planning activities, Ms. Patama Bhiromrut emphasized that the Government was instrumental in bringing more than one million persons into the Government's program, and pointed out the importance of stressing extension work in agricultural villages, and concluded by emphasizing the Government's role generally.

4. Education and Population Policy

Family planning and education policies have been closely linked in general. A number of studies (including the "World Fertility Survey") have stressed the important linkages among the education level of mothers, the diffusion of family planning practices, and consequent declines in birth rates. Inverse correlations have been identified between infant or child mortality rate, and level of education of mothers. In other words, both birth rate and infant mortality rate are closely correlated with educational attainment of mothers.

As is widely known, the spread of education and literacy rate are both high in Thailand. Enrolment rate of primary education was already 83% as early as 1960, and 96% in 1980. Illiteracy in the total population was 32% in 1960, and had declined to a mere 14% in 1980. These advances paralleled and were connected with sharp declines in the

birth rate and infant mortality.

Moreover, a substantial body of research has established that the significant decline in infant mortality is indirectly linked to the falling down of the high birth rate.

Clearly, implementation of health program, family planning and educational policies has been reinforcing each other to bring down birth rate and death rate, consequently successfully to accelerate demographic transition. Problems do exist, of course. According to CPS3 in 1984, the total fertility rate is still at a high 3.5, and there are wide regional differences. Number of children to desire in the south and northeast are nearly 4 children on average, very high compared to the north and Bangkok, where people desire 2.8 and 2.9 children, respectively. Other problems are associated with the sharply increasing shift from the pill and injection to the far more effective method of sterilization as women approach the age of 30.

Recession in the world economy has had severe negative effects on developing countries like Thailand, and slowing of the population growth rate has thus become even more critical. The Thai Government has targeted its family planning extension activities at the south, ethnic minorities in the mountainous north, factory laborers, and slum dwellers. However, if population growth is to be restrained to target levels, formulation and execution of family planning programs will have to be more sophisticated and thorough.

Population policy is not limited to areas of fertility, mortality and reducing population growth. It concerns as well excessive concentrations of population in cities and the flow of population from rural to urban areas. These are problems of many developing countries, Thailand included. Important research has been done regarding the rural exodus to the slums of Bangkok. The problem is rooted not only in Bangkok as a major area of receiving migrants but in the conditions of rural villages -- it is a problem of reestablishing an equilibrium. High fertility rates in the south and northeast also are another problems in view of family planning policy. Furthermore, it seems that the movement of population is associated with decline in fertility. For example, one of the factors in the low birth rate in the slums of Bangkok is the high percentage of residents there who have migrated from rural villages.

Reproductive behavior like fertility and mortality, and spatial migratory behavior are closely interrelated with economic and social change. Basic objective of our population and development study project is directed to clarify these interrelationship, so as to contribute importantly to find out directions of population policy based on some selective case studies.

Notes

(*1) United Nations, "Demographic Indicators by Countries as Assessed in 1982," 1983.

(*2) "1984 ESCAP Population Data Sheet," Population Division, Economics and Social Commission for Asia and the Pacific, 1984.

(*3) Peerasit Kamnuansilpa and John Knodel, "Mortality, Health and Infant Feeding Practices in the Northeast Thailand: Methodological Issues and Substantive Results," Research Center of National Institute of Development Administration, 1985.

(*4) "Basic Research on Population and Development of ASEAN Countries -- Thailand --," Asian Population and Development Association, February 1985, page 9.

(*5) Lester R. Brown et al, State of the World 1984, A Worldwatch Institute Report on Progress Toward a Sustainable Society, 1984, page 25 (for contraceptive practicing rates in 1970 and 1975); Contraceptive Use and Fertility in Thailand: Results from the 1984 Contraceptive Prevalence Survey, Research Center, National Institute of Development Administration, Institute for Population and Social Research, Mahidol University, National Family Planning Program, Ministry of Public Health, 1985, page 45 (for rates in 1978, 1981 and 1984).

(*6) Henry P. David, "Mechai's Way," People (London), Vol. 9, No. 4, 1982.

(*7) Bangkok Post of Sunday, September 15, 1985.

Table 1 Distribution of Contraceptive Method Used by Current Acceptors, by Region (%) (Married females, 15-44 years)

Method	National	Bangkok	Central	North	Northeast	South
Pill	30.7	30.0	33.6	33.7	28.1	26.4
Condom	2.8	7.4	2.0	2.7	1.4	3.8
IUD	7.7	2.7	4.4	5.2	14.3	4.8
Sterilization (female)	36.5	38.0	34.5	40.8	35.2	32.4
Sterilization (male)	6.8	8.0	9.1	1.9	8.8	5.7
Injection	11.7	9.0	13.8	14.8	9.3	10.7
Coitus interruptus	2.0	2.1	0.8	0.4	1.2	10.6
Others	1.9	2.8	1.9	0.4	1.8	5.5
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: 1984 CPS Report, page 48. See 5).

Table 2 Acceptor and Method Prevalence Trends
(Married females, 15-44 years)

Method	1978(CPS1)	1981(CPS2)	1984(CPS3)
Total	53.4	59.0	64.6
Pill	21.9	20.2	19.8
Sterilization (female)	13.0	18.7	23.5
Sterilization (male)	3.5	4.2	4.4
IUD	4.0	4.2	4.9
Injection	4.7	7.1	7.6
Condom	2.2	1.9	1.8
Others	4.1	2.7	2.6

Source: idem., page 45.

Section 3 Changes in the Patterns and Factors of Agricultural Production

1. Structural Changes in Thailand's Agriculture

Thailand was once known as "the rice bowl of the world." Under the large-land ownership system, the main rice production district of Thailand is located in the vast central plain area of the Chao Phraya River basin. Most of the rice produced there is for the world export market. Thailand has maintained its role as a food-exporting country consistently until the present 1980s. However, the rice monoculture seen in the past has been dramatically transformed. Thailand has become not only a rice exporting country, but also the world's leading exporter of cassava, corn, and sugar. In other words, the agricultural structure of Thailand has changed substantially from monoculture (rice) to diversified agriculture. This structural change first began at the end of the 1950s, and developed on a large scale during the twenty year period of the 1960s and 1970s. The timing of the structural change coincided with the full-scale implementation of assistance by the U.S. and the World Bank, and furthermore, by the earnest execution of Japan's economic cooperation for the development and imports. In addition to the four main crops of rice, cassava, corn, and sugar, Thai agricultural diversity includes such items as rubber, kenaf, pulse, tobacco, fruit, and vegetables. Thailand is characteristically a food surplus country, and because of this situatiin, the diversification of agriculture is closely linked with exports. In 1983, the export volume of the above-mentioned items was as follows: 3.48 million tons of rice, 5.20 million tons of cassava, 2.66 million tons of corn, 1.54 million tons of sugar, 0.56 million tons of rubber. Over 60% of Thailand's export value consisted of agricultural products including the primary agricultural commodities, canned pineapple, etc.

Thai agriculture has achieved striking developments, but is now faced with the following problems: (1) price sluggishness of primary commodities in the world market; (2) backwardness of agricultural technologies; and (3) the low level productivity of agriculture. In short, Thailand has suffered from poverty side by side with over production of crops, although its productivity is low. The structural changes in Thai agriculture after the 1960s were characterized by crop diversity and increased quantity; and the agricultural sector was able to attain a certain degree of success in its own way. At the present, new measures are urgently required in the area of qualitative structural improvements to raise the value-added of agricultural products and to increase the farmers' income.

2. Present Status of Thai Agriculture and Regional Differences

In comparison with the industrial sector, the working population in the agricultural sector dropped by 10.1% from 82.3% in 1960 to 72.2% in 1980. However, in terms of real numbers, there was an increase of 5.49 million people registered (from 11.33 million people to 16.82 million people). The total increase in the working population in all industries from 1960 until 1980 was 9.51 million people. The agricultural sector alone absorbed 57.7% of the total number. Thus, agriculture clearly is an important industry in Thailand, employing more than 70% of the total working population, contributing a majority of employment increases, sharing more than 60% of the export value, and representing 25.4% of GDP (see Table 1, Section 1, 1980).

The number of farming households in 1980 was 4.47 million units; the average number of family members per household was 7.1 persons. The average area of land ownership was 4.26 ha (26.64 rai), which is considerably more than that in Japan. During the six-year period from 1976 to 1982, the number of farmers' households increased by about 500 thousand units, from 4.19 million to 4.69 million units. But at the same time, agricultural land increased only slightly, by 1,676 million ha. As a result, the amount of agricultural land per household decreased by 0.1 ha from 4.32 ha to 4.22 ha, indicating the trend toward breakup of agricultural land.

Regarding land use, 123,587 thousand rai (198 thousand km^2) out of the total national area of 320,697 thousand rai (1 rai = 0.16 ha) is used for agriculture. Of the agricultural land, rice fields compose 59.2%, fields 24.0%, fruit culture fields 9.6%, and others 7.2%. Of the total amount of agricultural land, homesteads compose 84.1% and tenant farmland composes 15.9% (as of 1982).

Per capita agricultural income amounts to 5,743 baht ($250), which represents only 15% of non-agricultural income (38,357 baht, $1,668). By region, there are large differences in the per capita agricultural income. Income is highest in the central region with 9,421 baht ($410), followed by the southern region with 7,421 baht ($323), the northern region with 6,003 baht ($261), and the lowest is found in the northeast region with 3,047 baht ($132) (statistics from 1982).

The characteristics of agriculture by region are described below.

(1) The Central Region: This is a well-developed agricultural region where large-scale agriculture is performed. Large-scale irrigation facilities were constructed at an early date, and mechanization, in the form of large tructors was implemented in the early stage. The best area for rice production is along the Chao Phraya River. Because this land is largely owned by the royal family and nobility, there is a well-developed tenancy system here. In the peripheral area around the delta zone, there are many small-scale independent farmers. The zone of rolling hills was previously unsuitable for rice-growing, but the grand-scale development of practical crops such as corn, cassava,

sugarcane, etc. after the 1960s transformed this peripheral area into a large field zone. Furthermore, to keep up with the sharp population increases and consumption expansions in the capital city of Bangkok, suburban-type garden crops such as vegetables and fruit, coupled with hog raising, poultry raising, and fish breeding were developed. Because of this, there has been extensive development in the central region of commercially successful agricultural operations.

(2) The Southern Region: The southern region is located in the tropical rainforest belt. There are few plains or areas appropriate for rice cultivation. Although Thailand is a large rice exporter, this region alone must import rice. Rather than rice, the southern region produces fly important commodities such as rubber, fruit and fish. The unit prices of all these commodities are high. Accordingly, the region has shown a relatively high agricultural income from early times due to exports and shipment of these products to other regions within the country.

(3) The Northern Region: This area has both climatic and geographical conditions suitable for agriculture. From long ago, this area has seen the stable operation of rice cultivation, dry-field farming and fruit culture. Moreover, large-scale land estates have been settled in the valleys and the river basins. Due to its adequate water supply, many farms are able to grow two rice crops or one rice crop and one other crop in a year. These conditions lead to intensive agricultural development in this area, and agricultural income remained stable. Furthermore, forestry once flourished in this region, which was a major production area for teakwood. However, forest resources have dwindled in recent years. The region faces the large task of forest cultivation through afforestation.

(4) The Northeast Region: The northeast region is called "Isaan" in Thai, and is often spoken of with special emotion. This is attributable to the following: (1) dialects which are close to the Lao and Kampuchean languages exist extensively; (2) there is a severe dry season that lasts for 6 months; (3) due to the many plateaus and rolling hills, water is in short supply, resulting in unstable agriculture of rice cultivation in particular; (4) the staple food of this area is glutinous rice; and (5) it is a region of poverty and bakwardness. However, during the 1960s and 1970s, there was some success in the development of field crops such as corn, cassava, sugarcane, etc. There were some cases of remarkable production growth achieved with the completion of irrigation facilities in a limited area. This area retains a large potential for further development.

3. Tasks in Agricultural Development

(1) Problem Situations

Thai agriculture is presently at an important turning point. One reason for this is that the agricultural diversification and production increases implemented up to the present to meet with export demands are no longer necessarily resulting in income improvements. This is because the growth of the global economy has slowed down, and the primary commodities prices have become sluggish in the current situation of crop surplus. The second reason is that, when the expansion of arable land reached its maximum level in the late 1970s, land division was accelerated under the idea of parity inheritance. This meant that the production means per household was substantially reduced, while agricultural production costs and living expenditures steadily increased.

(2) Task 1: Agricultural Modernization and Improvement of International Competitiveness

Although Thailand has developed into one of the world's leading food exporting countries, its agricultural technologies at the production site still remain at an extremely low level. Specifically, the production volume per unit area is small and production is greatly affected by unseasonable weather. Moreover, badmanagement of crop growing, harvesting, and preservation results in inferior-quality products. Until recently, production increases were principally due to the expansion of arable lands through forest and field exploration. This period has come to a close, as no more expansion is possible. Additionally, the distribution system for agricultural products is primitive. Numerous factors impede export competitiveness in the respective phases of distribution, including a shortage of harbor facilities for exports, a shortage of warehouse and other facilities, and disorderly competition in the cargo collection and distribution systems. It is a critical requirement that Thailand upgrade its export competitiveness through modernization of agricultural production and distribution technologies.

(3) Task 2: Improvement of Farmers' Income and Social Base

The economic development promoted in Thailand since the 1960s has diffused a commodity economy as far as even the smallest villages. The construction of roads has enabled Coca-cola and plastic products to reach the villages, and the transmission of electricity has led to the rapid spread of the television. In the past, the people of Thailand lived a quasi-self-sufficient life, and rarely found it difficult to make a living. However, in recent days, the opportunities of cash expenditures have increased sharply. The majority of farmers cannot make much income merely by selling their small quantity of agricultural products. Agricultural-commodity prices are especially low in the country side, where, because nearly 80% of the population are farmers, there is a surplus of food. Regarding exports, the information

available to the farmers on interational market conditions tends to be delayed, and moreover, the farmers are incapable of analyzing the information even if they obtain it in time. Farmers possess neither the means nor the capacities to implement shipment and production adjustments. They merely produce and wait until they find buyers. As a result, when the international market conditions are favorable, the profits are received in advance by middlemen and farmers do not receive the profits. When the market conditions are unfavorable, farmers suffer from excessive production. In short, although there has been remarkable agricultural and economic development in Thailand, this has helped the farmers but a little. The above conditions do not provide for surplus funds to be reinvested for agricultural improvement or the increasing of the farmers' livelihood. Not only private banks, but even agricultural cooperatives and government-affiliated agricultural banks do not function effectively for use by the farmers in up-country. The majority of the farmers are forced to utilize the informal financing readily availabale to them with an annual interest rate of, for instance, 60%. Consequently, any measures which only aim at production increases will not readily improve the farmers' income. On the contrary, production increases will further enlarge their expenditures for fertilizer and machinery leasing. This will result in also increases in living expenditures necessary for the consumption required by the changing lifestyle. The income gap between the city and agricultural village is continually increasing, as is the consciousness of poverty among the farmers. Accordingly, it is necessary to develop a policy to increase the real income of farmers. The social infrastructure must be improved and consolidated at the level of the agricultural village community so that the farmers will feel secure about the improvements in their livelihood. For example, possible measures include the following: (1) increased access to and promotion of low-interest agricultural financing; (2) implementation of a machinery pool at the agricultural co-operatives, and the provision of agricultural guidance and leased cultivation at reasonable rates; (3) installation of a modern silo in the agricultural co-operatives, followed by the establishment of a crop deposit system, quality control execution, and selection of the proper timing for crop sales; (4) consolidation of the water supply for livelihood in each village; (5) improvement of access roads to the village; and (6) development of additional special products in the regions under the guidance advocated by the one-product-for-one-village movements. It is necessary that these measures be used to upgrade the farmers' real income and to boost agricultural modernization and improvement.

Table 1 Production Trends of Major Agricultural Products

(Unit: Area, 1,000 rai; Production volume, 1,000 t)

Item	Rice				Corn (maize)				Sugarcane			
FY	Planted area	Index	Production volume	Index	Planted area	Index	Production volume	Index	Planted area	Index	Production volume	Index
1960/61	37,012	96	9,475	96	1,785	93	544	91				
1961/62	38,619	100	9,886	100	1,916	100	598	100	441	100	2,196	100
1962/63	41,168	107	10,992	111	2,050	107	665	111	345	78	1,695	77
1963/64	41,229	107	11,585	117	2,612	136	858	143	452	102	2,387	109
1964/65	40,872	106	11,362	115	3,449	180	935	156	532	121	3,913	178
1965/66	40,961	106	10,978	111	3,605	188	1,021	171	523	119	3,045	139
1966/67	46,454	120	11,947	121	4,084	213	1,122	188	361	82	2,535	115
1967/68	41,612	108	9,625	97	4,651	243	1,217	204	448	102	2,379	108
1968/69	45,173	117	10,348	105	4,763	249	1,331	223	646	146	4,399	200
1969/70	47,400	123	13,410	136	4,503	235	1,714	287	739	168	5,102	232
1970/71	47,460	123	13,850	140	5,180	270	1,938	324	862	195	6,586	300
1971/72	47,043	122	13,744	139	6,368	332	2,300	385	991	225	5,926	270
1972/73	45,931	119	12,413	126	6,231	325	1,315	220	1,133	257	9,513	433
1973/74	52,270	135	14,899	151	7,172	374	2,339	391	1,616	366	13,339	607
1974/75	49,889	129	13,386	135	7,749	404	2,500	418	1,935	439	14,592	664
1975/76	55,602	144	15,300	155	8,200	428	2,863	479	2,444	554	19,910	907
1976/77	53,595	139	15,068	152	8,029	419	2,675	443	3,119	707	26,094	1,188
1977/78	56,444	146	13,921	141	7,534	393	1,677	280	3,541	803	18,941	863
1978/79	62,667	162	17,470	177	8,661	452	2,791	467	3,190	723	20,561	936
1979/80	58,971	153	15,758	159	9,529	497	2,863	479	2,730	619	12,827	484
1980/81	60,110	156	17,368	176	8,960	468	2,798	501	2,927	664	19,854	904
1981/82	59,970	155	17,774	180	9,796	511	3,449	577	3,857	875	35,200	1,375
1982/83	60,134	156	16,879	171	10,494	548	3,002	502	3,645	827	24,407	1,111
1983/84	62,596	162	19,545	198	10,552	551	3,552	594	3,607	818	23,869	1,087

(Source) Ministry of Agriculture and Co-operatives, Agricultural Statistics of Thailand.

Table 1 Production Trends of Major Agricultural Products (continued)

(Unit: Area, 1,000 rai; Production volume, 1,000 t)

Item	Cassava				Rubber				Kenaf			
FY	Planted area	Index	Production volume	Index	Planted area	Index	Production volume	Index	Planted area	Index	Production volume	Index
1960/61	447	72	1,222	71	3,009	98	172	92	877	74	181	76
1961/62	621	100	1,726	100	3,080	100	186	100	1,190	100	239	100
1962/63	761	123	2,077	120	4,677	152	195	105	712	61	134	56
1963/64	870	140	2,111	122	5,152	167	198	106	957	80	212	89
1964/65	654	105	1,557	90	5,844	190	211	113	1,365	115	303	127
1965/66	632	102	1,475	85	5,882	191	217	117	2,401	202	529	221
1966/67	806	130	1,892	110	6,144	199	218	117	3,314	278	662	277
1967/68	872	140	2,000	116	7,385	240	219	117	2,177	183	422	177
1968/69	1,060	171	2,611	151	7,576	246	258	139	1,585	133	316	132
1969/70	1,180	190	3,079	178	7,775	252	282	152	2,358	198	373	156
1970/71	1,400	225	3,431	199	7,976	259	287	154	2,631	221	381	159
1971/72	1,376	222	3,114	180	8,177	265	316	170	2,891	243	419	175
1972/73	2,048	330	3,974	230	8,377	272	337	181	2,951	248	428	179
1973/74	2,725	439	5,668	328	8,577	278	368	198	2,714	228	469	196
1974/75	3,000	483	6,240	362	8,786	285	382	205	2,524	212	384	161
1975/76	3,715	598	8,100	469	8,786	285	349	188	2,039	171	308	129
1976/77	4,373	704	10,138	587	9,126	296	393	211	1,023	86	186	78
1977/78	6,000	966	12,372	717	9,275	301	431	232	1,603	135	246	103
1978/79	7,282	1,173	16,358	948	9,426	306	467	251	2,003	168	338	141
1979/80	5,286	851	11,101	643	9,576	311	534	287	1,418	119	222	93
1980/81	7,250	1,167	16,540	958	9,615	312	465	250	1,068	90	211	88
1981/82	7,940	1,279	17,744	1,028	9,867	320	508	273	1,166	98	194	81
1982/83	7,726	1,244	17,788	1,031	10,001	325	576	310	1,357	114	200	84
1983/84	8,552	1,377	18,988	1,100	10,143	329	594	319	1,343	113	235	98

CHAPTER 3

CURRENT SITUATIONS OF AGRICULTURE AND POPULATION IN SURVEY AREAS: CHAINAT AND SURIN PREFECTURES

Introduction

This chapter describes the current situation of the agricultural economy, agricultural development, and population trends in Chainat and Surin prefectures (Changwat), in which there exist our survey villages. The discussion will mainly cover the entire prefectures; statistical data are available only up to 1980. Post-1980 changes will be touched on in Chapter 5.

Section 1 Farming Household Economy in Both Prefectures

Firstly, the current economic status of the two prefectures will be reviewed. In 1980, gross prefectural product per capita was 11,560 baht for Chainat, and 4,822 baht for Surin (Gross Regional and Provincial Product 2524-2525, Central Statistics Bureau of Thailand). Chainat's gross prefectural product per capita is 2.4 times greater than Surin's.

Thailand's gross national product per capita in 1980 was 14,744 baht, but this figure includes Bangkok metropolitan area, where gross product per capita is 41,300 baht. Accordingly, Chainat's level is very close to the average of the prefectures in central Thailand, excluding Bangkok. The average in northeastern Thailand is 6,012 baht, so that Surin's gross prefectural product per capita is by no means high within the region.

It can be said that Chainat is a typical central Thai prefecture, and that Surin is one of the poorer prefectures in the northeast. We will then compare the economy of farming households in the two prefectures. In 1980, the average total income per farming household in Chainat was 56,938 baht. It is about 2.3 times greater than in Surin, where it was 24,675 baht (Statistical Report of Changwat: Chainat, and Surin, Central Statistics Bureau of Thailand, 1983). This figure of farming household corresponds with the differences in gross prefectural product noted earlier.

Income obtained from their own agricultural activities for those households was 42,623 baht in Chainat, where it accounted for 75% of total income. It was 15,057 baht in Surin, only 61% of total income.

Income from sources other than own agricultural activities was 25% in Chainat and 39% in Surin. Such income includes income earned by agricultural labor performed for other households, but mostly consists of non-agricultural wage income in both prefectures.

In Chainat, where gross income per farming household is high, income from agricultural activities is the most important source of

income generation. This contrasts with Surin, where gross income from farming activities is low and where wage income from non-agricultural activities is very important. These distinctions are important for understanding the state of the farming household economy in the two prefectures.

As regards the agricultural activities, crop cultivation generates 82% of the household's income in Chainat and 79% in Surin. Crops differ in the two areas -- rice in Chainat, but rice plus other dry field crops in Surin -- but their share within agricultural income is about same. Live-stock raising generates 14% of agricultural income in Chainat, and 18% in Surin. The relative importance of live-stock raising and of mixed cropping in Surin is noteworthy.

To verify the above again, the composition of gross prefectural product for Chainat and Surin is observed here (from Gross Regional and Provincial Product, 2523-2524, Central Statistics Bureau). Averaged out over the five-year's period 1978-1982, total value added in agriculture was 46.7% of gross prefectural product in Chainat and 43.4% in Surin. As for Chainat, value added from crops was 40.9%, which accounted for about 88% of the income from agriculture. In Surin, value added from crops was 33.8%, 75% of the income from agriculture; also in Surin, value added from live-stock raising was 7.72%, 17% of the income from agriculture. Outside the income from agriculture, the value added from manufacturing was only 4.8% of gross prefectural product in Chainat, but 11.4% in Surin. These ratios are consistent with the previous observations of the farming household economy for both prefectures.

What is the distribution of household income in these two prefectures? As it is not possible to separate farming households from other households because of limitations of statistical data, income distribution for all households in each prefecture is examined here (Statistical Report of Changwat: Chainat, and Surin; Central Statistics Bureau).

The percentage of poor households with annual income less than 6,000 baht is 21.6% in Chainat and 50.9% in Surin. The percentage of households with annual income exceeding 20,000 baht is 15.1% in Chainat and only 2.9% in Surin. This indicates that in Chainat, average income is comparatively high, the proportion of poor households is low, and income distribution is comparatively even, whereas in Surin average income is low, the proportion of poor households is high, and income distribution is comparatively uneven.

Section 2 Agricultural Development

1. Agricultural Development in Chainat Prefecture

Chainat is located in the central regions, the basic environment of which is the delta.

The delta can be divided into three sub-regions. First is the old delta, which is not directly affected by the annual flooding of the Chaophraya River. Second is the area, which is so heavily flooded. Third is the new delta region: it is affected by the flooding, but less so owing to its distance from the main flood plain.

In the old delta region, rice farming, which depends mainly on rainfall, has been practiced. Thailand's annual volume of rainfall of 1200-1300mm is not sufficient for rice cultivation, so this old delta is the region with insufficient water for rice cultivation.

In the flooding area, seasonal flooding affects bogs and back basins, but water does not top the natural banks, where people were living. They were practicing rice farming in the lowland bog and back basin areas. This rice cultivation is famous as "floating rice."

Since flood spreads throughout the new delta region, it is difficult for inhabitants to dwell here in the rainy season. In the dry season, soil is dried out and drinking water unavailable. For these reasons, it was indispensable to raise artificially the ground level above the seasonal flood, and to dig ponds sufficiently deep so as to assure water in the dry season. This process of artificially remodeling the natural environment began initially in response to growth of export markets for Thailand's rice in the latter half of the 19th century; it made possible rice cropping and human habitation in the new delta region. The method of rice planting is almost the same as that practiced in the flooding area.

The above describes rice cultivation in the delta region during the 1950s. Since then, and after FAO emphasized the potentiality of the region as the world's leading food-supplying base, the World Bank and others began to invest capital and technology in the delta.

The transformation of the delta consisted of the following two major development. First was the construction of a large dam at Chainat, the upstream of the Chaophraya River. That dam, completed in 1957, made it possible to control the flow of water throughout the entire delta region. Second was the development of irrigation canal networks spreading throughout the old delta region which covers the northern half of the delta. This network made possible rice cropping in the old delta where water supply had previously been insufficient. In addition, an arterial waterway stretches from intake points at

Chainat to the new delta connected with a water network, built during the pre-war period, that covers the southern half of the delta.

The practices of utilizing water were changed drastically by the Chaophraya project, and the "liberation of the delta from seasonal flooding" (Koichi Takaya, Nature and Land Use in Southeast Asia, 1985 in Japanese) began to become a reality.

Dry season rice cropping began. The west bank area of the Chaophraya River, part of the new delta, became the area into which the water was channeled. The amount of water during the rainy season increased tremendously, so much so that rice cropping during the season became almost impossible. Accordingly, rice cropping in the dry season began in the 1960s.

Double cropping of rice developed rapidly in the 1970s, stimulated by rising of the price of rice. Double cropping increased the demand for labor during the busy period when harvest of the dry season crop and planting of the wet season crop coincides, and thereby served to accelerate the mechanization of agriculture. Mechanization has progressed so rapidly, then water buffaloes which had previously been indispensable to rice cultivation are now disappeared. Moreover, a traditional labor practice called Chuai kan under which farm households mutually exchanged labor, disappeared; now, only cash wage labor employment is observed.

Research and development of high-yield rice varieties by the Rice Department of the Thai Government proceeded. High yield varieties are generally planted during the dry season, and require a higher level of inputs such as chemical fertilizers.

These rapid changes have taken place in just 30 years of development of the delta region of central Thailand.

Clearly, progress in the delta provided impetus to agricultural development throughout central Thailand. In areas peripheral to the delta, such as the lower Maeklong River in the west, efforts to expand arterial waterways are now underway.

Plains outside of the delta region have not been affected by this 30-year wave of agricultural development. The agriculture in such forgotten areas is quite similar to the situation of Surin prefecture discussed later.

In all of central Thailand, including plain areas outside the delta, paddy yield increased from 257kg/rai in 1960, to 340kg/rai in 1980. The annual growth rate is 1.4%. The significance of this progress is very impressive as contrasting with the fact that there was almost no increase in rice yield during the last 20 years in the northeast.

Except for a western part of Chainat that belongs to the plains outside the delta, most of Chainat province lies in the delta.

Average annual volume of rainfall was 1088mm during 1972-1981, which is insufficient for rice farming as in most other parts of the delta. Rainfall is concentrated in the months of May, and from July to October. Dry season cropping is possible in the delta by irrigation fed by arterial waterway. Pumps also make possible dry season cropping in Manorom, upstream of Chainat Dam.

Precipitation is unstable. Standard deviation of annual rainfall in the 10-year period 1972-1981 was 250mm -- a fluctuation coefficient of 23%. Irrigation facilities in the delta are sufficient to prevent this instability causing significant damage to rice cultivation.

In Chainat, acreage devoted to rice cropping has been increasing in recent years. The paddy yield is 427kg/rai in 1980, above the average of central Thailand.

Aside from rice, dry field crops, mainly cassava, are grown in the plains outside the delta. However, dry field acreage is only 12.6% of all rice acreage. Rice can be said to be the main agricultural product.

2. Agricultural Development in Surin Prefecture

Surin prefecture is located in northeastern Thailand, the ecology of which is plains and sparse forests.

There are rivers, the Chi and the Mun, in the northeast, but they are not powerful enough to accumulate diluvial soil as does the Chaophraya River. Accordingly, the salient ecology of the northeast can be said to be the plains.

To begin with, the northeast plateau lacks a catchment area. With no mountains or rivers containing water throughout the year, rainfall is the only source of water for irrigation. Therefore, rice cropping can only be done in basins into which water flows. The typical rainfed rice cultivation is conducted there.

Another important feature of the northeast is that volume of rainfall is low, and the amount and period of rainfall is extremely uneven from year to year. Let us look at the data of Surin on these points.

Average annual volume of rainfall in the period 1972-1981 was 1302mm. This small amount of rainfall is insufficient for rice cultivation. Standard deviation of annual rainfall during the period

was 215mm. A fluctuation coefficient is 17%. This coefficient is smaller than the one found in Chainat, but unevenness itself is a critical problem in rainfed paddy regions. Average volume of rainfall, standard deviation and the fluctuation coefficient for the May-October, when rainfall is concentrated, are presented:

The table suggests that rainfall is uneven from month to month.

In the northeast, only rainy season cropping is possible. Construction of a reservoir was also planned in the northeast, but there has been little progress in building reservoirs in the region.

Rice cropping continues to be done mainly to satisfy household needs. Lao people plant glutinous rice; Mon-Khmer people plant non-glutinous rice. Rice yield in the northeast has not increased. Yield of non-glutinous rice, which was 165kg/rai (paddy) in 1960, increased only to 195kg/rai by 1980, representing an annual increase of 0.8%. The yield was a little above the half of the 340kg/rai yield of central Thailand in 1980. It can be said that the northeast has seen almost no increase in rice yield during the past 20 years.

In contrast to the stagnation of rice production, upland crop farming in the sparse woodlands has developed so rapidly during the last two decades.

Sparse woodlands refer to areas other than rainfed paddy basins (Takaya, op cit). Sparse woodlands originally served as pasture for water buffalo and cattle, which were sold to the farmers in the delta region. The central delta region needed water buffalo to cultivate its vast croplands; ecological conditions of the northeast were suitable for raising animals. With this interregional division of labor, the sale of water buffalo provided a large percentage of the total income of farm households in the northeast.

The fall of imports of cotton during World War II provided the impetus for cultivating cotton in some areas of the northeast. This marked the start of dry field farming of commodity crops in the northeast.

Cultivation of kenaf commenced in the 1960s. Since there appeared a relatively lucrative commodity crop, its cultivation quickly spread over a wide area. Sparse woods gave way to kenaf fields. But, because kenaf requires the laborious process of peeling and washing, it was replaced by the less labor intensive cassava in the 1970s. Increased demand for cassava chips as feed, particularly in EC countries, was another important factor behind the switch to cassava cultivation.

Thus, in the areas not suitable to rainfed rice cultivation, dry field agriculture rapidly increased and has been the main stream of

agricultural development in the northeast for the past 20 years.

Much of such growth stemmed simply from opening of new areas to cultivation; yield per area unit of cassava, for example, has hardly increased beyond 2000kg/rai. The conversion of sparse woods into dry fields is creating another problem, too, which will be discussed in Chapter 5.

Surin prefecture has the typical ecology of the northeast plain. The prefecture does have three reservoirs and there are the small-areas which can be irrigated by water from the Mun River. Some 10% of all rice-acreage is the irrigated, and double cropping can be practiced in such areas. On the whole, however, rainfed rice caltivation predominate in northeast Thailand.

Acreage devoted to rice has been increasing in Surin, although the extent varies from year to year owing to uneven rainfall. Non-glutinous rice is the main type, and the acreage devoted to glutinous rice has been declining recently. Yield of non-glutinous rice was 209kg/rai in 1980, slightly above the average 195kg/rai in the northeast.

Dry field area is quite large, accounting for 54.7% of rice-cropped acreage in 1980. The importance of dry field agriculture in Surin stands out, when contrasted with Chainat prefecture where only 12.6% of acreage is for dry field crops.

Kenaf and cassava are the two major crops in dry field farming. In 1980, some 36.7% of the prefectural total dry field acreage was devoted to kenaf, 14.8% to cassava, and 8% to peanuts. The area of kenaf and cassava has been decreasing since the latter half of the 1970s. The reasons are the considerable labor required in kenaf processing, and low profitability of cassava cultivation due to the lowering of the product-price.

While we were unable to obtain statistics on water buffalo or cattle population in Surin, we were able to confirm the importance of live-stock raising to farming households in our survey (see Chapter 4). The picture in Surin prefecture is one of the integrated farming management, in which dry field farming and live-stock raising together supplement cultivation of rice for household's own consumption.

Section 3 Trends of Population

In this section we briefly examine some demographic trends in Chainat and Surin prefectures.

In the period 1976-1980, the average rates of annual population

increases were 0.67% in Chainat and 2.46% in Surin. The population growth rate of the whole Thailand was 2.0% in the same period, then Chainan's rate is about one third of the national average, and Surin's about 20% higher.

Population growth is equal to birth rate, minus death rate, plus rate of in-migration. An analysis of these factors follows.

The birth rate in Chainat is 1.97%, and in Surin, 2.58%. The cause of the lower rate in Chainat is unclear, but the demographic proposition, that inclination to bear children decreases as per household or per capita income increases, seems relevant here.

Successful diffusion of family planning in Thailand in recent years seems to have had great effect in both prefectures. The birth rate in Chainat declined from 2.0% in 1976-1977, to 1.8% in 1979-1980. In Surin, the birth rate declined from 2.9% to 2.2%.

The mortality rate in Chainat is 55 per thousand in Chainat, and 52 per thousand in Surin. No significant difference can be found between the two prefectures, maybe because diffusion of hygienic facilities are not different.

The last factor is the rate of in-migration. The figure for Chainat is -0.76 (out-migration), and the figure for Surin is 0.40 (in-migration).

Chainat is close to the Bangkok metropolitan area, and the considerable differential between income per capita between Bangkok and Chainat, observed in Section 1, might be the main reason of the out-migration. Moreover, Chainat is located near Kanchanburi and Suphanburi prefectures, which also have higher per capita income mainly owing to production of sugar cane. Gross prefectural product per capita is 28,372 baht in Kanchanburi, and 12,997 baht in Suphanburi, higher than 11,560 baht in Chainat. There is evidence of population outflow to these provinces. In short, there is out-migration not only from rural areas of Chainat to Bangkok, but also from rural areas of Chainat to rural areas of Kanchanburi and Supanburi.

Surin seems to be just between in- and out-migration. In the northeast, two prefectures have notable in-migration: Khonkaen, with gross prefectural product per capita of 6,993 baht, and Nakhon Ratchasima (Korat), 7,973 baht. The population condition of these two prefectures contrasts with that of Mahasarakan, with percapita gross prefectural product of only 4,325 baht. Surin falls between these extremes. Out-migration is directed to urban areas such as Bangkok and Khon Kaen. In-migration to Surin seems to originate in surrounding low income rural areas.

Table 1 Component Ratio of Prefectural Gross Production: Chai Nat

(%)

Industrial origin	1978	1979	1980	1981	1982
Agriculture	52.7	43.2	46.1	47.8	43.7
Crops	47.0	34.0	40.9	43.5	39.2
Livestock	5.0	5.2	4.4	3.6	3.8
Fisheries	0.8	1.0	0.8	0.7	0.7
Forestry	-	-	-	-	-
Mining and quarrying	0.3	0.2	0.2	0.2	0.2
Manufacturing	5.1	6.0	4.3	3.8	4.9
Construction	2.7	9.3	8.0	7.4	8.5
Electricity and water supply	0.3	0.4	0.4	0.4	0.5
Transportation and communication	1.6	1.9	2.5	5.5	6.3
Wholesale and retail trade	19.6	16.1	17.7	18.0	17.1
Banking, insurance and real estate	1.2	1.6	1.5	1.5	1.8
Ownership of dwellings	1.3	1.8	1.7	1.4	1.6
Public administration and defence	8.0	10.4	9.3	7.2	7.9
Services	7.1	9.1	8.3	6.9	7.6

Source: NSO, Gross Regional and Provincial Product, 2523 - 24.

Rural to rural population movement has continued to be important in both central and northeastern Thailand.

Table 2 Component Ratio of Prefectural Gross Production: Surin

(%)

Industrial origin	1978	1979	1980	1981	1982
Agriculture	44.7	44.4	42.0	44.1	41.6
Crops	37.5	35.7	31.6	31.6	32.8
Livestock	6.3	6.6	9.1	9.1	7.5
Fisheries	0.5	0.7	0.8	0.8	0.8
Forestry	0.3	1.4	0.5	0.5	0.4
Mining and quarrying	0.6	0.6	0.4	0.4	0.4
Manufacturing	9.6	12.2	12.6	12.6	9.8
Construction	7.0	3.7	3.9	3.9	3.5
Electricity and water supply	0.4	0.6	0.5	0.5	0.6
Transportation and communication	3.6	3.7	4.3	4.3	6.4
Wholesale and retail trade	18.2	17.5	19.2	19.2	18.1
Banking, insurance and real estate	1.2	1.2	1.2	1.2	1.6
Ownership of dwellings	1.6	1.7	1.6	1.6	1.7
Public administration and defence	4.8	5.6	5.7	5.7	6.6
Services	8.4	9.3	8.7	8.7	9.8

Source: NSO, Gross Regional and Provincial Product, 2523 - 24.

Table 3 Rice Average

(Unit: rai)

	Chai Nat	Surin
Non-glutinous rice		
1976	770,544	1,778,480
1977	770,710	1,605,056
1978	752,878	2,306,114
1979	848,588	2,192,091
1980	911,365	2,328,337
1981	920,913	2,654,410
Glutinous rice		
1976		26,500
1977		61,930
1978		59,029
1979		30,944
1980		26,485
1981		9,070

Source: Statistical Reports of Changwat, Surin, Chai Nat.

Table 4 Farming Acreage Other Than Paddy

(Unit: rai)

	Chai Nat	Surin
1975	90,437	427,940
1976	91,955	240,212
1977	108,764	343,695
1978	150,654	313,385
1979	109,268	219,394
1980	116,938	145,255

Table 5 Percentage of Planted Acreage in 1980

Chai Nat		Surin	
Maize	8,160 (6.9%)	Maize	250 (0.2%)
Mung bean	19,190 (16.4)	Peanut	11,579 (8.0)
Sugar cane	23,333 (20.0)	Kenaf	53,331 (36.7)
Cassava	48,380 (41.4)	Sugar cane	10,000 (6.9)
Upland rice	390 (0.3)	Cassava	21,486 (14.8)

Source: Statistical Reports of Changwat, Surin, Chai Nat.

Table 6 Monthly Rainfall : Surin

	Average (mm)	Standard Deviation (mm)	Coefficient (%)
May	160.6	71.9	45
June	161.5	52.0	32
July	195.9	91.8	47
August	197.4	62.0	31
September	305.5	102.3	33
October	130.1	84.5	64

Table 7 Population

	Chai Nat	Surin
Population increase rate		
1976 - 1977	0.34	2.39
1977 - 1978	0.83	1.98
1978 - 1979	0.78	2.03
1979 - 1980	0.70	3.45
Birth rate		
1976 - 1977	2.0	2.86
1977 - 1978	2.0	2.60
1978 - 1979	2.1	2.64
1979 - 1980	1.8	2.21
Death rate		
1976 - 1977	0.6	0.56
1977 - 1978	0.6	0.53
1978 - 1979	0.5	0.56
1979 - 1980	0.5	0.43
In-migration rate		
1976 - 1977	- 1.06	0.09
1977 - 1978	- 0.60	- 0.08
1978 - 1979	- 0.74	- 0.05
1979 - 1980	- 0.64	1.62

Source: Statistical Reports of Changwat, Surin, Chai Nat.

Diagram 1 Monthly Rainfall: Chai Nat

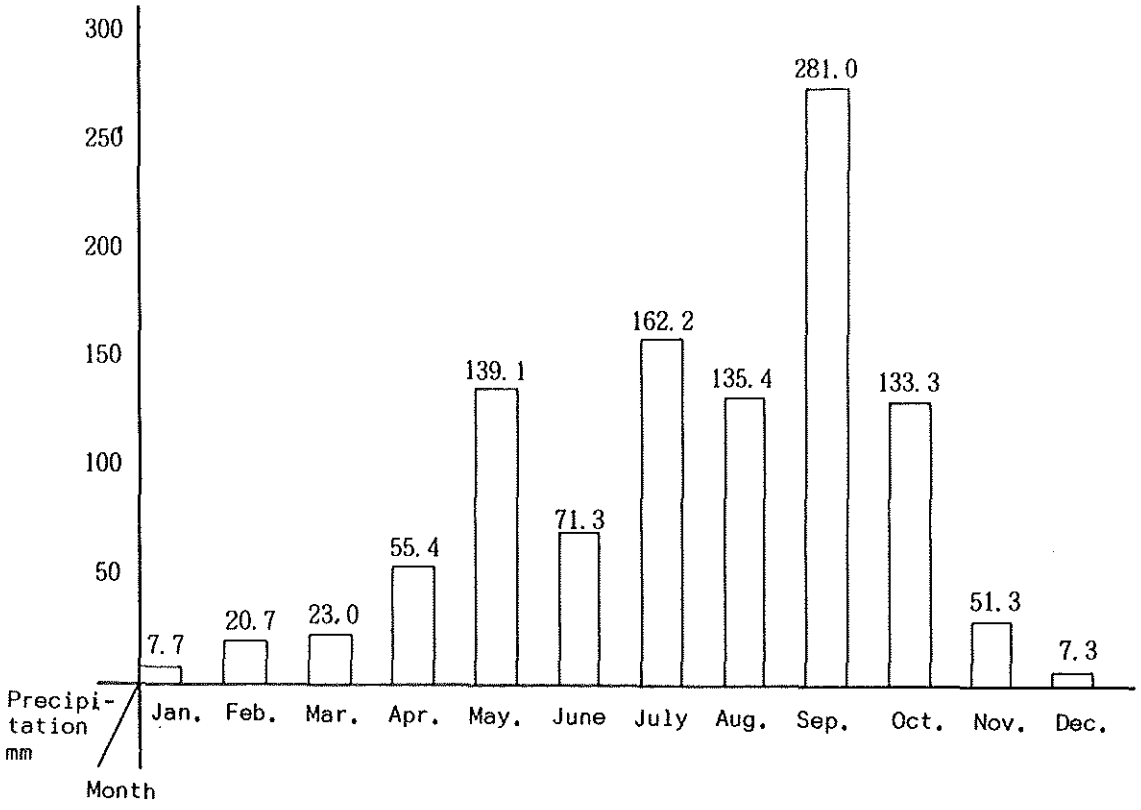
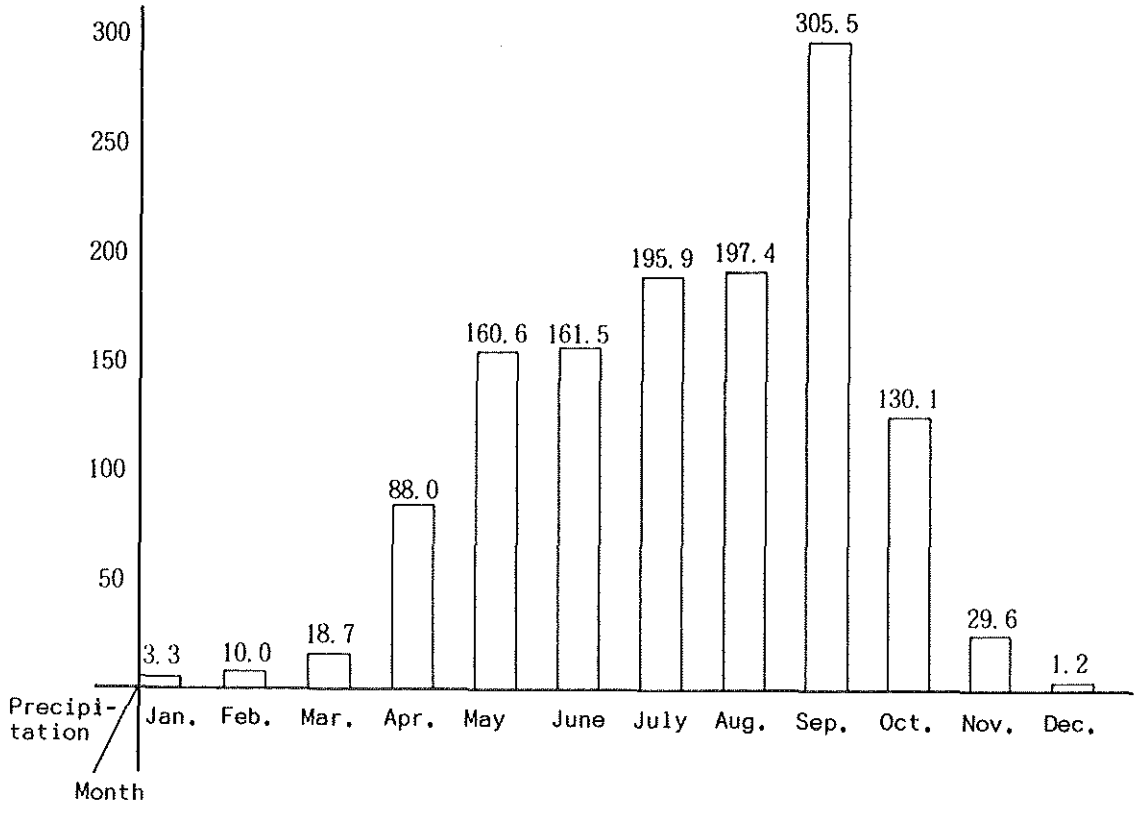
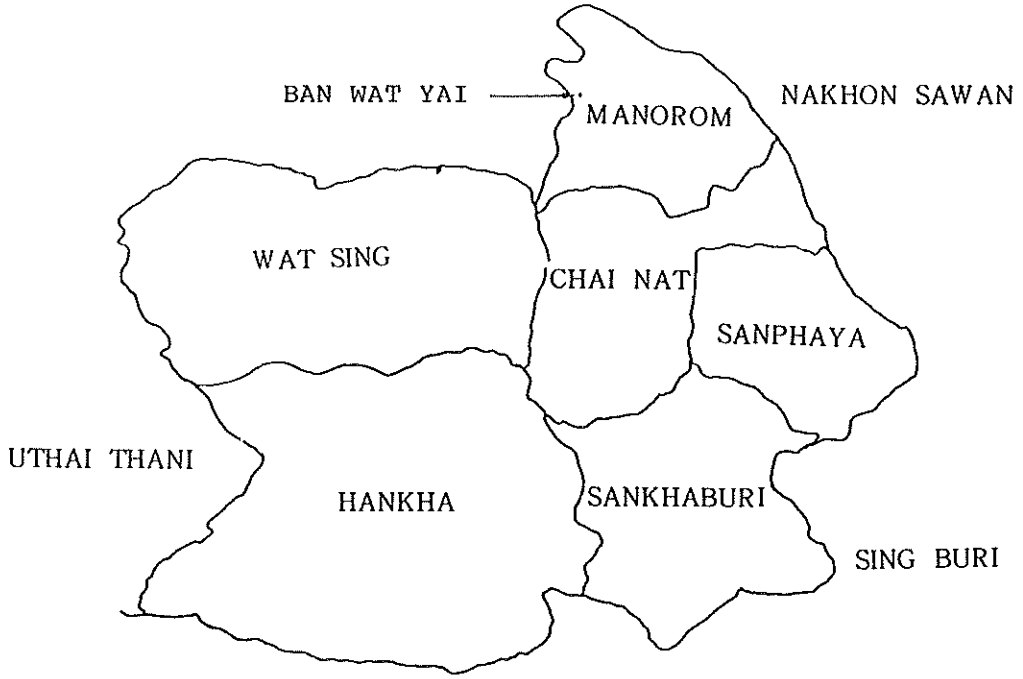


Diagram 2 Monthly Rainfall: Surin



CHAI NAT



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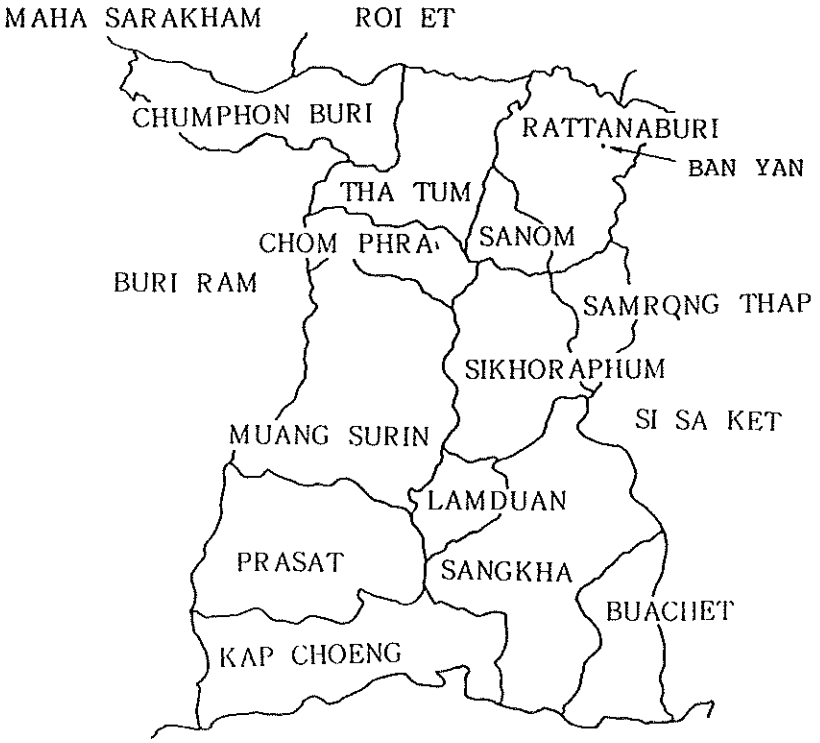


CHAPTER 4

SITUATIONS IN THE TWO SURVEYED VILLAGES

Section 1: Wat Yai Village of Chainat Prefecture

One village surveyed was Wat Yai, which is situated in the Manorom District of northern Chainat Prefecture. The village is about 25 kilometers from the seat of prefectural office, Chainat. The Chao Phraya River flows just along the western edge of the village, making this area in the Manorom District the most blessed with an abundant water supply as well as in Chainat Prefecture. The population is 613 (279 males, 334 females). 153 households line the natural bank of the Chao Phraya River. Out of 153 households, 86 are farming households. There are many non-farming households: 18 operate stores, 20 belong to government officials and 12, other employees. There are no factories with the exception a single small tractor assembly factory. The educational levels of the villagers include 471 primary school graduates, 55 middle school graduates, 22 high school graduates and 7 college graduates.

As indicated by the name, there is a large temple in the village. The temple has a long history and a famous high priests reside here. It is the oldest village in the area, and other villages were formed as the village expanded and branched out.

There is a primary school by the temple. Aside from this, there is a public health center with 3 staff members, a child care center, a corporating center and a reading news center.

Electricity was made available 13 years ago, and durable consumer goods such as electrical appliances have penetrated extensively into the villagers' lives. There are 36 televisions (16 color TVs), 110 radios and 60 motorcycles. Additionally, irons, electric rice cookers, electric fans and cassette tape recorders began to be used extensively over the past 3 to 4 years. (Obviously, not all households possess such items. There were cases among the surveyed households which did not have electricity nor any of the above items.) Of the 30 farming households which were the subjects of the survey, 10 were households of "Tanbon Committee" members, 10 were middle-class households, and 10 were lower-class households. This also included 10 households of non-farming families.

1. Conditions and Trends in Agricultural Production

(1) Present Conditions

The village has 1170 rai for the total agricultural land with the average cultivating area per household being 13.6 rai. Not all villagers are self-employed farmers, and there are 11 land-owner families and 46 tenant families without any land. According to the person in charge of the community development section in the district office, the average operational holdings of farming households in the

Wat Yai village is approximately 15 rai, with 46 families having the smallest holdings of about 10 rai, and 8 families with the largest holdings of roughly 40 rai. This is different from Yan village where self-employed operations are predominant. Among the surveyed households, there were 3 cases where the household was leasing in all its land, and 6 cases where the household was leasing in all of its agricultural holdings.

The average operational holdings of the 20 farming households in the survey amounted to 26.3 rai. The households range from those which operate 80 rai to those with only a few rai.

The agriculture of Wat Yai village is extremely dependent on the rice crop. The village is also famous for production of the Thai shaddock called sôm'oo, but all surveyed households responded that rice was their main crop, and all but 5 households were practicing double-cropping.

This double-cropping is made possible by the water from the Chao Phraya River which flows along the west side of the village. It is impossible to grow rice during the dry season in other areas of the Manorom District that are distant from the river. There, they grow maize and peanuts during the dry season. Here, 2 large pumps of the Royal Irrigation Department are used to get water from the river. In addition, there are 2 natural ponds and 124 wells in the village. These wells were dug by the village chief and are 22 to 30 meters in depth. The cost for digging 1 well is 3,000 baht, and 1 well makes possible the cultivation of 10 rai of land during the dry season. All households in the survey benefit from irrigation for part or all of their operational holdings, and the area of irrigated land amounts to slightly more than 95% of the overall cultivated holdings.

The average annual yield of rice in Ban Wat Yai village was 670 kg/rai. According to the person in charge at the community development section of the district office, the average yield during the rainy season and dry season were approximately 600 kg/rai for the former, and depending on the variety, approximately 1,000 kg/rai for the latter.

With regard to the households surveyed, the average annual yield was 663 kg/rai, and that of the rainy season crop was 552.5 kg/rai (ranging from 750 kg/rai to 213 kg/rai) and 881.0 kg/rai (ranging from 1,233.3 kg/rai to 434.8 kg/rai) for the dry season.

All rice planted in this village is of a high-yield varieties (HYV). RD-4 is planted in the rainy season, and RD-1 and RD-7 are planted in the dry season. According to the villagers, the yield per rai of RD-1 is 1,250 kg, much higher than that of RD-7, which is 700 to 800 kg.

Following the introduction of HYV, all farming households started using fertilizers. 10 households belonging to a co-op purchased their fertilizers from the co-op (2 households purchased from both the co-op and middlemen) and others mostly from the middlemen. On the average, about 100 baht is spent per rai for fertilizer.

At present, 49 small hand tractors and 1 large tractor are used in Ban Wat Yai village. The price of 1 small hand tractor is said to be about 30,000 baht. Threshing is also done by machines. Since there are no water buffaloes in this village, households which do not own such machines do their work by borrowing these machines. In addition, there is 1 machine rice mill in the village.

Only 2 households owned small tractors (1 tractor each) among the surveyed households and none of them owned a threshing machine. Diesel engine pumps were common and were owned by 11 households (12 units), and 2 households owned electric pumps (1 unit each).

Hired labor is generally used for rice planting and harvesting. Out of 19 of the surveyed households, only 1 carried out all the work by family labor alone, while all others used hired labor. There were also 4 cases which combined this method with mutual labor exchange called "ao raing".

The standard wage paid to laborers was 120 baht/rai for planting and 140 baht/rai for harvesting, and these amounts were mostly the same for all households.

Most of the rice produced is sold in market. According to the villagers, the selling price is 2.8 baht/kg for the rainy season harvest and 1.8 baht/kg to 2.3 baht/kg for dry season harvest. The latter crop is sold at a lower price because it is harvested just before the rainy season and paddy becomes damp due to the lack of proper storage facilities. Farmers are also busy at the beginning of the rainy season preparing for the next season, and therefore have to sell their crops quickly.

84% of the harvested rice is marketed. Several cases in which the entire crop was sold have been reported, with the remaining portion used mostly for domestic consumption. 3 households reported the portion which they save as seed rice.

Crops grown here in addition to rice include previously mentioned sôm'oo (shaddock), certain vegetables and flax. Although small in scale, some raise pig and chicken, and in the entire village, 35 rai of land is used for stock breeding. The survey results indicate that 11 out of 30 households raise animals in one form or another, and 9 of these households were rice crop farmers. The reported number of livestock and number of households owning livestock are as follows. Out of 2 households raising livestock with no rice cultivation, one raises

13 pigs and 10 chickens in an area of 2 rai, and the other raises 20 chickens in an area of 1/4 rai, and possess the characteristics of both a pig and a chicken farm.

In addition, handicrafts are particularly important in this village as a non-agricultural activity. Primarily during the dry season, bamboo and palm leaves are used to make a variety of handicrafts, such as baskets, mats and hats.

The village chief attended a school which taught these techniques 3 or 4 years ago, and discovered new personal skills. He subsequently became a teacher, and is teaching not only in this village but also in surrounding ones.

Among the 30 surveyed households, 13 were seen to have some family members engaged in such handicraft work (9 were farming households). There were as many as 9 cases where women (particularly wives) were engaged in mat-weaving. Husbands are primarily engaged in basket-making. The number of work hours used for this activity and income gained differ by case and no consistent data were obtained. Responses vary from a person engaged in mat weaving for 60 days a year and earning 30 baht a day, to one who weaves mats for 90 days and makes a total of 6,000 baht, to an individual who weaves 40 mats in one season and earns 300 baht per mat, or a couple that weaves mats making 2,500 to 3,000 baht a month and a person who makes handicrafts throughout the year and earns 100 baht a day.

The mat-weaving and handicraft groups in the village are comprised of 72 and 54 members, respectively.

In addition to making these handicraft items, there are many earning incomes from carpentry, construction and other forms of paid labor as employees.

(2) New Trends in Production and Investment and Farmers' Attutudes Toward the New Production Trends

It was 10 years ago that HYV rice was introduced into this village. The new variety with its short growing period made the cultivation of a dry-season crop possible. A dry-season crop began in this village at approximately the same time. According to the farmers surveyed, the government was encouraging production of a dry season crop and the price of rice was favorable at the time. Chemical fertilizers necessary for HYV were also introduced.

Villagers say that water buffaloes began disappearing 20 years ago, and tractors were introduced. Out of two hand tractors reported from the surveyed households, one was purchased 10 years ago.

The diesel pump for the irrigation well is presummed to become common since about 10 years ago. Some surveyed households had pumps which they purchased 20 years ago, but most pumps were discovered to have been purchased 8 to 10 years ago.

Thus, the farmers were seen to be responding positively to such changes as the introduction of new varieties of rice, double-cropping, and mechanization, all of which began occurring in the past 10 years.

This attitude has been demonstrated not only in rice cultivation but also in other areas. Well drilling, for example, has been performed under the initiative of the village chief without any government subsidies. 124 wells have already been drilled.

The prefecture also intends to promote the development of handicrafts, but it has been promoted by the village chief, and many people began earning incomes from this in over the past 3 years. The mat-weaving group of the village has 72 members and the handicraft group 54, and both of them are making efforts to improve their products.

Also, there is a group of housewives with 153 members and a group of young farmers with 105 members, both of which are striving to improve the awareness of their members. There is also a credit union in this village comprised of 98 members.

However, a new condition has arisen which demands that the people alter the direction of change in which they have been moving for the past 10 years. Around 3 years ago, the price of rice, especially a dry-season crop, began falling.

Farmers in the villages tried growing other crops such as soybeans, but the results were unsatisfactory due to damage from rats and insects. The village handicraft industry began about 3 years ago in this village, and could be seen as one measure to counteract the loss of income from the decline in the price of rice. However, although handicrafts are definitely important for this village, they can not replace the rice crop. Both the farmers and the district-development officers agree that the problem lies with farmers not being able to stop rice cultivation. It may be that the agriculture based on the abundant water resources in this village has reached a turning point.

The agriculture of this village also has a possibility for change from other factors than these market conditions. Chainat Prefecture has this year begun to promote the use of water buffalo and compost. This policy was implemented because the governor feared the future land erosion from overuse of chemical fertilizers. Compost can be made with rice straw and water buffalo dung. Implementation of this policy has been facilitated by a certain chemical substance which reduces the fermentation period from 3 months to 1 month.

This policy has been implemented at least to the level of the Manorom District, and according to the district chief, reactions from the farmers were generally good. However, we never heard about this new policy during our stay in Wat Yai village.

For the last 10 years, the farmers of the village have been responsive to changes in economic conditions and chose the method of using chemical fertilizers and introducing tractors. It is unclear how the farmers will respond to this radically different ecological approach. Future developments should prove to be interesting.

2. Village Population Transition

(1) Births and Deaths

The current population of Wat Yai village is 613. The breakdown by age is as follows: under a year - 8, age 1 to 14 - 159, age 15 to 25 - 123, age over 26 - 319, and 4 handicapped persons.

The average number of children in the 30 surveyed households was 3.6. The highest level of education of the heads of the families is, with the exception of 2 cases, 4th grade or below. So it is difficult to judge the difference in the number of children by academic background. But for the sake of reference, the 2 exceptions were a middle school graduate and college graduate who each had three children. It is also difficult to make distinctions about the number of children per household by class due to factors such as the unclear economic conditon of non-farmer's households. But concerning farmers households, we sensed that households with many children have relatively larger operational holdings, but, of course, there are exceptions and therefore no definite conclusion can be drawn. In analyzing to number of births by the age of their mother, although there is a bias in the sample, we found a distinct difference between mothers in their 30's and those in their 40's.

The number of infant deaths reported in 30 households were 15 cases (in 9 households). There was 1 household which lost 4 children, 2 households that lost 2 children and in each of the remaining cases, households lost 1 child respectively. The age of the children at the time of death and the causes were as follows. There were 9 cases of children died under the age of 1 (3 of which died within 1 week aftrer birth), 5 cases caused by accidents, and 4 by diseases. One case involved a child within the 1 to 5 year-old range (caused by disease), 3 cases involved teen-aged children, and one case involved a person in his 20s. The latter two examples were due to diseases and accidents.

(2) Social Migration

There was only 1 case among the surveyed households in which children or members of the same household lived outside the village.

This household included 7 sons (ages between 18 and 31), all of whom lived outside the village. Four lived in Bangkok, and 1 each in the Middle East, Ayutthaya, and Lop Buri. Seeking a job not education, was the reason for each of the son's departure. This household received 48,000 baht from their sons last year, and was able to install electricity.

Rather than this permanent (or long-term) migration, temporary, short-term migration out of the village is more common. In addition to the case mentioned above, 7 households among the surveyed households are receiving money from their family members outside of the village. In one case the husband went to the Middle East and sent 120,000 baht back during a year. The amount of remittance varies from 2,400 baht to 36,000 baht a year, and some replied that they receive food rather than money. According to the villagers who gathered for the interview, substantial number of people go to Bangkok, Singapore and the Middle East to work.

To the question, "Do any of your family members want to go outside the village?" 9 households answerd in the affirmative. The overwhelming reason for wanting to leave was to get a job (8 households). In as many as 6 cases, the people hoped to leave permanently.

(3) Attitudes Toward Family Planning

The villagers interviewed said that the average number of children in a modern family of today is 3. When we asked the ideal number of children, the answeres ranged from 2 to 7, but 3 was the most common (11 cases) followed by 5 (5 cases) and 4.

Family planning is practiced by 14 out of 26 couples. The methods of contraception include 9 cases of sterilization, 3 cases of the pill, and 2 cases of other methods. When asked about their source of information regarding family planning and contraceptive methods, except for 1 case which replied "neighbors," all cited the primary health center. Couples have been using these method for varying amounts of time. The earliest couple began 17 years ago, and others gradually started during the last 10 years.

On the other hand, with the exception of 2 couples, all couples not practicing family planning are those with wives in their 50's or older. The majority of them gave "being too old to conceive" as the reason. No one gave "lack of knowledge" as a reason. There were also 2 cases which replied that contraception is "not good for health."

Section 2 Yan Village, Surin Prefecture

Yan Village is located in the northeastern part of Surin Prefecture, in Rattanaburi District. It is about 120 km from the prefectural office.

The population of the village is 666 (317 males, 349 females), consisting of 105 households. Following the typical form of northeast Thai villages, houses are somewhat clustered in one area surrounded by fields. The Mun River, which belongs to the Mekong water system, runs through the northern part of Rattanaburi District, but does not benefit Yan Village.

The Girl's Guide of Thailand, who cooperated in the interview survey, have, until several years ago, been implementing a community development project here, mainly through family planning guidance. However these development project is not being implemented in Yan village today. Compared to the surveyed village in Chainat Prefecture, the general impression of the living standard in this village is low. A considerable number of households do not possess any durable consumer goods. Items such as bicycles, radios and cassette tape recorders have started to be diffused duing the last 4 to 5 years.

1. Conditions and Trends of Agricultural Production

(1) The Present Condition

The total area under cultivation is approximately 2,000 rai in the entire village, and the average size per household is approximately 20 rai. According to the village chief, there are only 5 households in Yan village that do not have their own land, and all farming households are engaged in rice production.

All of the 30 households that surveyed are engaged in rice crop farming. The average size of operation per household is 22 rai, with a range of 8 rai to 50 rai. 6 cases of leasing in and 4 cases of leasing out farm land were reported. However, there are no cases where whole land is leased in or out, and the village is by and large based on self-employed agricultural operations. There was only 1 farming household which had no land of its own, but they were using their mother's land free of charge. Among the borrowers, in 2 cases, land was obviously borrowed from one's mother or relatives.

Differing slightly from the general condition of rural villages in Surin Prefecture, the lives of people in Yan Village are heavily dependent on rice cultivation during the rainy season.

Out of the 30 surveyed farming households, 29 households were engaged in rice farming during the rainy season in 1984, and 27 of them were engaged exclusively in rice farming. The remaining 2 households were also grew rice but used some land for flax growing: (1) 4 rai out of 26.5 rai of the total cultivated area; (2) 2 rai out of 25 rai of the total cultivated area.

Rice cultivation is almost completely dependent on rain water. An small pond pool has been constructed, but its size is woefully insufficient. Only 2 cases among the sample farming households reported the possession of irrigation facilities, namely, a small canal and a reservoir. As there is insufficient water, only 1 household out of 30 households grows rice during the dry season. However, this household does not grow rice during the rainy season, so none of the 30 households is engaged in double-cropping. Dry field crops such as cassava and maize are grown in small quantities during the dry season.

All 30 households have introduced the HYV of rice, and it has been planted in 95% of the entire cultivation area. The average yield of rice for the 30 sample households was 337 kg per rai, which is higher than both the average of Surin Prefecture and that of northeastern Thailand.

Chemical fertilizers were widely used following the introduction of HYV. Out of 30 surveyed households, only 1 household was not using them. 6 households purchased fertilizers from the co-operative, and the rest of the answers were divided evenly between the market and middlemen. The amount of fertilizers used can be calculated as 100 baht per rai.

There has been very little mechanization here. As will be mentioned later, water buffaloes are still widely used, and none of the surveyed households owned a tractor. Pumps (2 diesel and 2 electric) and 1 rice mill are the only farm machinery reported. The mill was purchased only 3 months ago by a wealthy farming household which owns 50 rai of land.

10 of the 30 farming households manage all the works by their own family members, and most of them are small-size households with operational holdings under 20 rai. During the peak periods of labor demand such as rice-planting, harvesting, plowing and threshing, hired labor and a system of mutual labor exchange called "ao raeng" are widely used. The degree of dependence on "ao raeng" is higher than in the surveyed village in Chainat , but the use of wage labor is also predominant here.

However, such a peak of demand for labor only lasts for a certain period during the rainy season. Opportunities for agriculture works during the dry season are severely limited by the water condition. Two thirds of the farming households that were interviewed had some member

of their family obtaining income from labor other than agriculture. The village chief described the general dry season work situation in this way: "During the dry season, women are mostly engaged in weaving while men cut down trees and build houses. Many of those who do not have work in the village go to Bangkok and to sugar cane farms in Kanchanaburi to work."

Approximately half of the rice produced by the 30 households is sold. This ratio seems to hold for all cases regardless of their operational scale. Most of what is left is used for domestic consumption. There were several cases in which the debt for fertilizers etc. was paid by rice, but the volume for these repayment of debt was around 8% of the total yield at most, normally between 2% to 3%. Moreover, two thirds of the farming households save about 200 kg to 300 kg of seed rice for the next year.

There is also a rice bank (Thanaakhaan Khao) in this village. There is no rice granary, but more than 3 kg of rice is taken from every household under the guidance of the village chief and 2,000 kg of rice is stocked. There is a committee which manages the system. (e.g. when one borrows 5 kg of rice, 6.5 kg must be repaid).

Not many other crops besides rice are grown. 2 households grew flax during the rainy season. One of them had a yield of 200 kg from a cultivation area of 2 rai, and obtained an income of 2,200 baht. There was also a household which grows cassava during the dry season of 4 rai of land and harvests 2 tons, and a household which grows corn on 24 rai of land and fruit trees on 2 rai of land.

According to the village chief, there are 3 other farming households that grew jute. Attempts have also been made to grow peanuts and green beans, but the results are not encouraging.

In addition to these non-rice crops, stock raising is conspicuous. All surveyed households were raising animals such as water buffaloes, pigs, chickens and ducks, and some households were raising a considerable number of these animals. This is very different from the surveyed village in Chainat .

(2) New Trends in Investment for Production and Attitudes of Farmers Toward New Production Trends

Farmers are not hesitating to try new things. As was mentioned previously, HYV of rice has been adopted by most of the sample households. Some households replied that they started as early as 10 years ago, but most households started using HYV 4 to 5 years ago. According to the village chief the variety called Koko (RD) 15 was introduced about 5 years ago under the guidance of agricultural development officers (Kaset Tambun). This new variety has a higher yield than the traditional varieties. The use of chemical fertilizers

became widespread after the introduction of HYV.

Although limited by the amount of rainwater, there has been a gradual development in this village's rice cultivation over the last 5 years. Development is observed not only in production but also in the incident to build a rice bank under the village chief's initiative.

Concerning the non-rice crops, those such as kenaf, cassava and maize which represent dry field farming and the diversification of agriculture in northeastern Thailand, are hardly seen in this village at present.

Their absence is not due to lack of response by the farmers to the opportunity to introduce these crops, but rather, might be response to the worsening market conditions of these crops. 3 households in the village grow jute, but this seems to have been initiated by demand from a jute factory built in the suburbs of Surin. (With the exception of the rice mills, this is the only relatively large factory in Surin Prefecture. However, this factory is carrying over the stock from last year and not buying from the farmers this year.)

Other crops are also being tested. In Surin Prefecture, the production of crops other than rice which can be grown during the 3 months after the rainy season crop (e.g. peanuts, soybeans and mango beans) is being promoted in places which has water during the dry season. This measure is being taken because of the fall in the price of rice. In this village, peanuts and green beans are being grown experimentally, but the results have not been satisfactory due to damage by plant desease and insects.

2. Population Transition in the Village

(1) Births and Deaths

Currently 666 people live in Ban Yan village, but 5 years ago the village population was over 700. The village chief indicated that the population has been following a decreasing trend.

The average number of children in the 30 households was 3.6. With the exception of 1 or 2 cases of the elderly and those in their teens, the final educational level of all the couples is the 4th grade. Therefore it is impossible to correlate the number of children (or deaths) with the level of education of the parents. There is no difference in the average number of children (3-4) by operational holdings either. However, in comparing the number of children of different aged mothers, there is a gap between that of women in their 30s and that of those in their 40s. Effects of the government population policy can be seen clearly after this generation.

There were 14 cases of infant death reported by sample households (9 households). One household reported 4 deaths, 2 households reported 2 deaths each, and the remaining households reported single deaths. All deaths were caused by disease except for one case in which the cause was unknown. The age of the infant at the time of death was under a year in 3 cases and at age 1 in 4 cases, accounting for half of all deaths. 3 deaths occured between the ages 2 to 5, and 1 case each at ages 8, 10 and 21. No correlation was found between child's death and parents' education and class.

(2) Social Migration

Among the surveyed households, 13 replied that they have some members of their family (esp. children) living outside the village. The total number of children living outside the village is 25. Since the total number of children was reported to be 109, nearly 1 out of 4 children are not in the village.

A third of them go to Bangkok. Other destiions include Rattanaburi, where district office is located, and Surin, where prefectural office is located. In a few cases, they went to neighboring prefectures, and in a single case, the child went to Saudi Arabia. (In a nearby village where pre-test were conducted, about 30 people had gone to the Middle East to work. In some cases, things did not go well at the place of work and the person lost his mortgaged land to a broker, which seems to be a growing problem.)

Many of those who live in Rattanaburi and Surin study at middle school and college, but many of those who live in Bangkok received only primary education in the village and have gone to Bangkok to work.

9 households receive money from family members living outside the village (including seasonal short term migration). The amount of money sent varies. In one case, a husband is engaged in construction in Saudi Arabia and sends home 8,000 baht a month, and in another case, a employee send home 800 baht a year. The income from selling rice can be roughly estimated at a little under 10,000 baht per household, so clearly money sent home from family members outside the village is a big help to the livelihood here.

In 7 cases, households responded that a family member wished to leave the village. 6 of these correspond with those whose family members are sending home money at present. All of them, including 1 case which also gave education, cited employment as the reason. Except for 1 case, all of them desire temporary migration.

(3) Attitudes Toward Family Planning

Twenty-one couples have practiced or are practicing contraception in one form or another. 2 couples of them are not practicing

contraception at present, one because of an allergy and one because they want to have more children.

There are 9 couples who have never practiced birth control and are not practicing at present. All of them except one case knew about contraception (or family planning). Reasons for not practicing included "too old," "want more children," and "contraception is not good for health."

Some couples started family planning as early as 13 years ago. (Of course, the age of the couples and time of marriage are important factors which must be considered.) There is no specific year on which the replies are concentrated. Family planning has been penetrate gradually among the people for about the last 10 years. Regarding methods, sterilization accounts for 14 out of 19 cases. Other methods include 3 cases of the pill and 2 cases of an IUD. The majority of people cited primary health centers (district level or village level) as the source of information regarding family planning and methods of contraception. There were only 3 exceptions to this, and they cited the village health workers.

Rice Yield in Wat Yai Village

	Rainy season	Dry season
Total area of the land planted	444 rai	225 rai
Average yeild per rai	552.5 kg/rai	881.0 kg/rai
Total area of operational holdings	552.5 rai	

Livestock Raising in Wat Yai

	Total No. reported	Total No. of households reporting
Buffaloes	0	0
Pigs	27 (max. 14)	2
Ducks	22 (max. 10)	4
Chickens	93 (max. 20)	10
Cows	2	1

Non-crop/Non-agricultural Activities in Wat Yai Village

Non-crop (non-agricultural) activities	No. of the cases reported	
Basketry	1	
Mat-weaving	7	(7)
Handicraft	1	
Sewing	1	(1)
Carpentry	3	
Construction	1	
Employee	6	(3)
None	6	

Note: Figures inside parenthesis are women.

More than one answer from a household was counted separately.

Average Number of Births by Wife's Age in the Villages of Survey

Age	Chai Nat Wat Yai Village		Surin Yan Village	
	No. of cases	Average No. of children	No. of cases	Average No. of children
20 and below	0	-	1	1
21 - 30	0	-	3	2.7
31 - 40	6	3.2	11	3.7
41 - 50	7	6.3	6	5.2
51 - 60	10	5.2	6	5.7
61 -	5	1.6	3	2.7

Land Use in Yan Village

	Rainy season		Dry season	
	Cultivation area (rai)	%	Cultivation area (rai)	%
Rice crop: Total	598.5	99	15	33.3
Nonglutinous	593.5		15	
Glutinous	5			
Flax	6	1	-	
Cassava	-		4	8.9
Maize	-		24	53.3
Fruit	-		2	4.4
Others	(Vegetables for domestic use)			
TOTAL	604.5 rai	100%	45 rai	100%

Rice Yield (nonglutinous only) in Yan Village

1984	Rainy season	337 kg/rai	(Entire yield)
		361 kg/rai	(HYV only)
1985	Dry season (only 1 case)	333 kg/rai	(HYV)

Adoption of HYV (1984 rainy season) in Yan Village

Area under HYV	569.5 rai	95.2%	(30)*
Area under Traditional variety	29.0 rai	4.8%	(4)

* -- Figures inside the parenthesis refer to number of households reporting.

Existence of Income Other Than from Agriculture in Surveyed Households of Yan Village and Their Sources

(No. of the cases reported)

Occupation	Husband	Wife	Children
Employee	3	-	4
Construction	3	-	1
Wood sawing	1	-	-
Carpentry	3	-	-
Basketry	3	-	-
Marchant	1	1	-
Weaving	-	1	-
Servant	-	-	1
Waitress	-	-	1

Existence of Income from Sources Other Than Agriculture in Yan Village

Yes 20 households

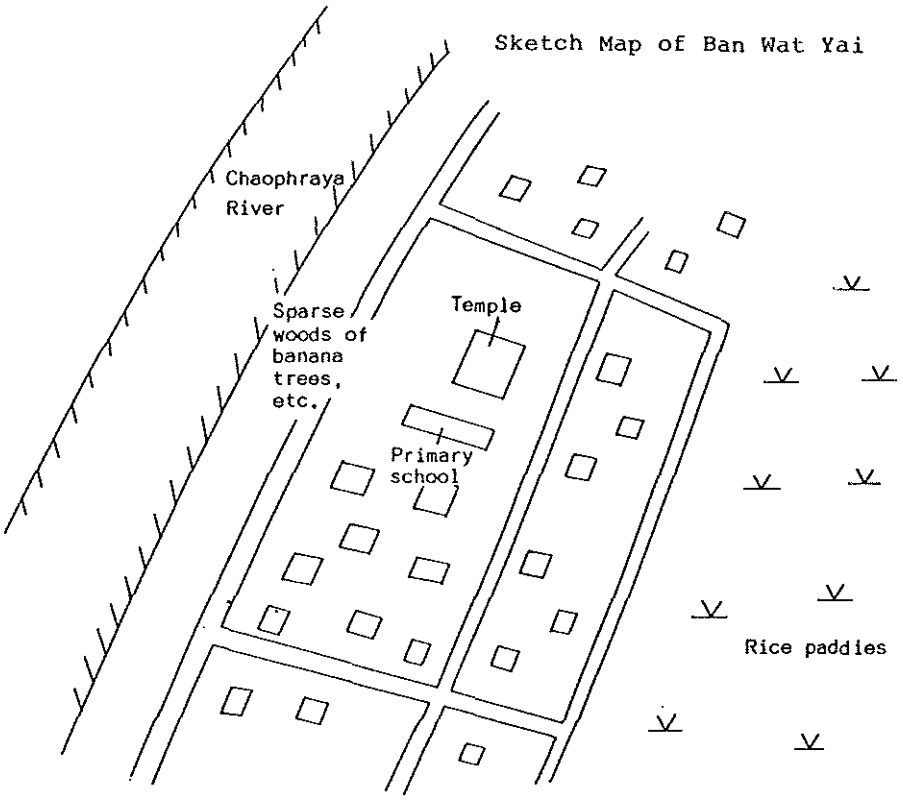
No 10 households

Stock Raising in Yan Village

	Total No. reported (*)	Total No. of households reporting
Buffaloes	67 (max. 5)	27
Pigs	14 (max. 12)	3
Ducks	222 (max. 34)	25
Chickens	281 (max. 32)	24
Cows	8 (max. 7)	2

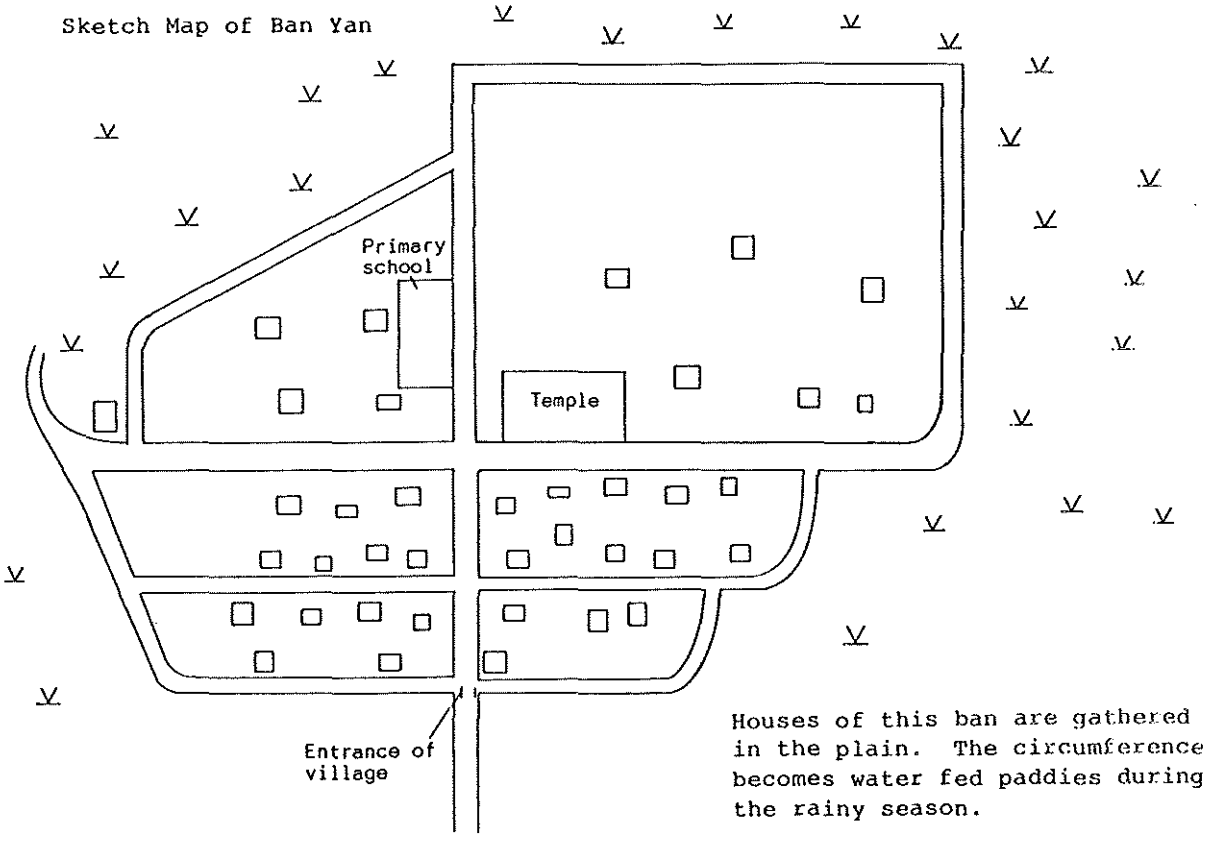
Note: (*) = Maximum number raised by 1 household.

Sketch Map of Ban Wat Yai



Houses are lined up along the natural bank of Chaophraya River, and there is no district sign on the boundary with the next village.

Sketch Map of Ban Yan



Houses of this ban are gathered in the plain. The circumference becomes water fed paddies during the rainy season.

CHAPTER 5

POSSIBILITIES FOR INTERNATIONAL COOPERATION

Section 1 Institutional Conditions for Rural and Agricultural Development

This section will discuss the institutional conditions regarding rural and agricultural development in Thailand as a precondition for considering the possibilities of providing international cooperation to Thailand.

1. Policy formation

Nowadays in Thailand, the term "phatthana chonnabot" (rural development) appears to have deeply penetrated and to be famous, because numerous rural development-related projects have been implemented during the past 25 years.

The "Mobile Development Team," initiated in 1963, is a typical example and it is still functioning today. The purpose of this group is to implement urgently needed development projects in the areas with difficulties concerning public peace and order. Another example is the "Rural Development Promotion Plan," which has been implemented mainly in Northeastern Thailand in 1964. The aim of this particular project, stresses road construction, for rural development

The "Self-defense Village Development Establishment Plan" started in 1975. This plan aims at organizing committees comprised of village chiefs (phu yai ban), which are responsible for self defense, education, health and agriculture. These committees are now actively functioning in the rural areas.

The "Rural Employment Promotion Plan" has been implemented since 1980. This plan aims to resolve unemployment during the dry season by providing jobs such as constructing roads and irrigation facilities. The "Regional Development Plan for Poor Rural Areas" has also been conducted, since 1981 in 37 poor prefectures outside Central Thailand, as a part of "The Fifth Five-Year National Economic and Social Development Plan". In addition to the above, a relatively large number of rural development projects, such as the "Capital Reflux Plan" (normally called "The Tambon Plan") by Prime Minister Kukkrit in 1975, have been initiated.

It is extremely difficult to evaluate these many rural development plans individually. On the whole, however, it can be said that, through the processes of preparing and implementing these plans, the policy-makers in Thailand have accumulated the ability to draw up and conduct agricultural and rural development plans.

It cannot be denied that institutional inefficiency still exists. For example, many relevant plans are not adequately coordinated at the local administration level where they are actually conducted. The relationship between the Prefectural Governor (phu-wa-ratchakan changwat) dispatched from the Ministry of Home Affairs and the officers from other central authorities is not well coordinated. However, the fact that the rural development is a new concept in Thailand should not be overlooked. The formation and implementation of rural and agricultural development programs in Thailand has progressed rapidly during such a short period since the 1960s. Therefore, it cannot be necessarily said now that rural and agricultural development in Thailand has been hindered by the institutional inefficiencies of formulating and implementing policies and plans for rural agricultural develoment.

2. Response by the Farmers

Among the administrative organizations concerned with rural and agricultural development plans, the district (amphoe) office is the body closest to the farmers. In the district office there are development instructors (patthanakon), agriculture instructors (kaset amphoe) and health instructors (anami amphoe) under the district chief (nai amphoe), and these district officials maintain direct contact with the farmers.

The corresponding organizations of the farmers are "Tambon Council" organized within the administrative village (tambon). Under this Council, the Development and Health Committees are organized in each respective village (mu ban).

It has so often been said that the farmers and villagers of Thailand are very individualistic and self-centered, immediately responding to demands that are to their own benefit, but do not work as a unified group. Numerous examples of such behaviors can be found in Thai farmers. However, these farmers have clearly begun participating in various organizations, such as those mentioned above. It also became clear, in our survey, that family planning information has been widely diffused among the villagers, because they participated in the Health Committee under the director of district health instructors. Their participation in agriculture-related organizations also seems to be becoming more active. For instance, it was found in the our survey that participation in the "rice bank" (thana kaan khao), an organization formed under the direction of village chief (phu yai ban) for mutual assistance regarding distribution of rice within villages, is becoming rather common.

These movements are clearly emerging among the Thai farmers, who had been said to be very individualistic. This recent trend, that the

farmers began to participate in certain group-actions organized on the basis of various objectives and necessities of a particular rural community, might suggest that what may be termed "pluralistic collectivism" is beginning to take root in the rural areas of Thailand. These trends among Thai farmers cannot be ignored although there exist such problem as no participation by the landless class. It cannot be said that rural and agricultural development is hindered by the capacity and propensity of the farmers.

Section 2 Tasks of Agricultural Development

1. Evaluation of Past Agricultural Development

First of all, agricultural development in both the Central and Northeastern regions of Thailand during the past 30 years must be evaluated, to enable identification of the major task of agricultural development in these regions. The recommendations by the World Bank in the late 1950s regarding agricultural development in both regions are referred here as criteria for this evaluation.

The World Bank report entitled, A Public Development Program for Thailand published in 1959, recommended, as the desirable direction of agricultural development in Central Thailand, "to develop substantial possibilities existing at the present to further increase rice production by the use of modern agricultural techniques, especially in the Chao Phya Plain".

As far as the central delta region (i.e. Chao Phaya Plain) is concerned, expansion of irrigation networks, increase of double-cropping and mechanized agriculture as well as diffusion of high-yield varieties of rice and use of chemical fertilizers have already been realized. It can be said that the above-mentioned recommendation by the World Bank was realistically achieved as for Central delta region.

As regards agricultural development in Northeast, the World Bank report recommended "to improve the agricultural economy of the Northeast through various means, including the promotion of the steady change in the cropping pattern of the Northeast, with less emphasis on rice and greater emphasis on rain-fed upland crops and pastoral (livestock) agriculture."

Agricultural improvements in Northeastern Thailand during the past decades, can be evaluated to be successful as regards the rapid expansion of dry field crops since the 1960s. The first half of the recommendation by the World Bank can be said to be realized actually. However, development of pasturage and livestock recommended by World

Bank were not so successful as the expansion of dry field farming. When considering the ecological condition of Northeastern Thailand, development of live stock farming can be proposed as a remaining important task. It might be necessary to emphasize once again the active roles of farmers in agricultural development in both regions. Activities conducted by foreign assistance agencies such as the World Bank, which implemented the Great Chao Phraya Project in the Central delta area, and the Royal Government of Thailand, which actively implemented road construction projects that in turn stimulated the expansion of dry field farming in Northeast Thailand, cannot be overlooked in the agricultural development of the two regions. However, the active economic response by individual farmers should not be ignored.

It has been assumed that the farmers in many developing countries do not guickly respond to economic opportunities as they are strongly bound by various social and institutional customs. It is true in some countries traditional social customs hinder agricultural development. However, such an argument is not relevant to Thailand. Double cropping of rice in the Central delta region or expansion of dry field crops in Northeastern region, these Development has been basically achieved through Thai farmers' own decision-making. This point is worthy of attention.

2. Difficult Problems Now Emerging

The results of agricultural development efforts in both regions over the past 30 years can be evaluated in the above manner in relationship to the recommendations by the World Bank from the late 1950s. However, these favorable developments have caused the problems unforeseen by the World Bank. This point should be given due attention.

One problem is the excessive development of forests in Northeastern Thailand. These sparsely wooded and forested areas of eastern Thailand have been drastically transformed into the fields during the rapid expansion of dry field farming in the 1960s and the 1970s. Now very little forest areas remain. Recently, topsoil have erosion and depletion began to manifest their negative effects. If topsoil is washed away, the land is no longer able to produce agricultural crops. This is a major problem in the light of preserving the agricultural resources of Northeastern Thailand for the future.

A similar issue is depletion of soil quality resulting from the improper use of chemical fertilizers in the delta region of Central Thailand. Although this problem has not become so serious as topsoil water erosion in Northeastern Thailand, it might be a very serious problem from the long-term perspective of preserving agricultural

resources.

As a problem somewhat different from preservation of agricultural land resources, nonexistence of farm jobs during the dry season is very important, particularly in Northeastern Thailand. Because farming is virtually impossible during the dry season due to water shortage, a few millions of rural people are left with no alternatives to the situation of "waiting for the farming season." Agricultural development efforts in the past have not contributed substantially to resolving such sore spots as seasonal unemployment.

A more medium-term issue in comparison to the above three long-term ones is vulnerability of dry field farming in Northeastern Thailand caused by instability of international market. Dry field farming in Northeastern Thailand is now adversely affected by the low price of primary products in the world market. The E.C. nations in particular, which were once importing large amounts of cassava from Thailand for use as feed, sharply cut back their import volume of this produce mainly as a part of their protectionist agricultural policy, and this has hit hard dry field farming in Northeastern Thailand. The Prefectural Governor of Surin has clearly indicated,in our survey, that he is left with no other choice but to instruct the farmers to reduce their acreage for cassava cultivation. Although the outlook of future cassava export market is an issue beyond the scope of the present report, it is quite clear that dry field farming, dependent on foreign markets will continue to suffer from instability of the foreign market.

Lastly, there is the issue related to rice production. Recently, that rice production in Thailand seems to be excessive. Income elasticity of rice demand has become almost zero at present in Thailand. Domestic demand could increase only in proportion to population growth, which entered a declining phase since the latter half of the 1970s due to the diffusion of family planning. As regards export markets, increases in rice production has been realized in many countries that had been importing Thai rice. The typical example is Indonesia, which recently announced the accomplishment of self-sufficiency in rice. Not much growth can be expected in the future regarding the export market. Reflecting such a trend, the domestic price of rice in Thailand has had a declining trend during the last few years. Low price of rice appears to have a significantly adverse impact on the double cropping of rice, realized for the past decade in the delta region. It is found, in our survey that, some farmers are going back to single cropping from double cropping. Needless to say this problem of overproduction of rice is extremely important in considering the future development of Thai agriculture.

Section 3 Possibilities for International Cooperation

The five points mentioned in the previous section will be very crucial when considering the future development of Thai agriculture.

Excessive exploitation of sparse wooded and forested lands in Northeastern Thailand has already been taken up as an important issue in the "Fifth Five-Year National Economic and Social Development Plan 1983 - 1986". With regard to these points, providing cooperation to tree planting projects, for example, seems to be important.

Regarding deterioration of soil quality due to excessive use of chemical fertilizers in Central delta, the point raised by the governor of Chai Nat Prefecture, in our survey, deserves consideration. As a special agricultural project, Chai Nat Prefecture is working on the diffusion of compost production, with the aim of preventing soil depletion caused by the excessive application of chemical fertilizers. This plan is to produce compost by mixing water buffalo dung with rice straw, and to use it as an alternative to chemical fertilizers. This compost production also entails the raising of water buffaloes, implying an attempt to return back to rice production using water buffaloes as in the past. When taking into consideration the well-known fact that mechanization was diffused to enable the double cropping of rice, the plan seems to imply an attempt returning to single cropping. Anyhow, it will serve as a policy of adjusting rice production. An important task for Japanese side is the desirability of such a plan and also to investigate to what extent such a plan can be materialized. Moreover, technical assistance for compost production seems to be a field where international cooperation might be desirable.

Coping with seasonal unemployment issue is an issue extending beyond mere agricultural development. A point worthy of special note in this regard is the necessity of industrialization of small scale operations in rural area, rural industrialization is indipensable. It is clear that much importance shall be attached to this industrialization of rural areas in the coming "Sixth Five-Year National Economic and Social Development Plan". Research on various aspects of the industrialization of rural areas as well as implementation of rural industrialization project will be the areas in which international cooperation is very much needed at the present.

In order to tackle the issue of the instability of agricultural commodities in world market, adjustment of many countries' trade policies of agricultural products, particularly those of the developed countries are indispensable. When negotiations on agricultural product trade is conducted among the developed countries, it is hoped that these negotiations continuously consider the effects on the developing countries such as Thailand. In some cases, special measures for the developing countries might be needed. If drastic changes in foreign

demand over a short period of time could be prevented through such multi-national agreements of trade, it should be a promising prerequisite for development projects of agriculture such as dry field crops of Northeastern Thailand. Establishing such agreements on trade of agricultural products among the developed countries will be important as international cooperation, not only for Thailand but also for all other developing countries.

Lastly, some measures would have to be taken for rice production, which appears to be over the optional production. This would be the most important issue, because it imply that less and less emphasis should be given to cooperation aiming at increasing rice production from now on. Emphasis in international cooperation should be shifted from matters concerning increased rice production to other issues.

The fundamental solution for excessive rice production in present Thailand must be searched within the framework of promoting regional division of labor in agricultural production throughout Thailand.

The fact that Central Thailand and Northeastern Thailand have the potential or the so-called "comparative advantage", which can be complementary to each other.

With regard to Northeast, its ecological conditions do not offer the comparative advantage of producing rice. Northeast has the comparative advantage of developing live-stock raising based on the effective use of the natural condition. Increasing production of beef cattle, in particular, should be promoted actively because its demand will surely increase in the future. Livestock pastures would also prevent topsoil erosion in dry areas of Northeast. Furthermore, an increase in domestic demand for certain dry field crops as livestock feed can be expected. The activities aiming at promoting rice production should be given the secondary-priority.

Central Thailand, delta region in particular, possesses the comparative advantage of producing rice due to its ecological conditions. It might be possible for this region to specialize in rice cultivation, if the regional division of labor is well established.

Agricultural development in Thailand seems to have reached a stage where it is necessary to establish a system of the regional division of labor. It is imperative to extend international cooperation that could positively faciliate establishment of such an regional division of labor system.

CHAPTER 6

SURVEY MEMBERS AND ITINERARY

1. Survey Members

(1) Japanese Committee

Dr. Shigeto Kawano (Chairman)	:	Professor Emeritus, The University of Tokyo
Dr. Toshio Kuroda (Advisor)	:	Director Emeritus, Nihon University Population Research Institute
Dr. Yonosuke Hara	:	Associate Professor of Economic Development, Institute of Oriental Culture, The University of Tokyo
Mr. Hiroaki Washio	:	Senior Researcher, Economic Cooperation Department, Institute of Developing Economies
Ms. Junko Koizumi	:	Doctor Course, Agricultural Economics, The University of Tokyo
Mr. Junji Funatsu (Coordinator)	:	Councilor, The Asian Population and Development Association
Mr. Masaaki Endo	:	Senior Programme Officer, The Asian Population and Development Association
Ms. Yuiko Nishikawa	:	Research Worker, The Asian Population and Development Association

(2) Preliminary Research Team (July 21 - July 25, 1985)

Mr. Junji Funatsu	:	Research chief
Ms. Yuiko Nishikawa		

(3) Field Research Team (Sept. 8 - Sept. 27, 1985)

Dr. Yonosuke Hara	:	Research chief
Ms. Junko Koizumi		
Mr. Masaaki Endo		

2. Cooperators

(1) Japanese Embassy

Mr. Masatada Tachibana : Ambassador

Mr. Kazuyoshi Urabe : Councilor

Mr. Katsuyuki Nagayama : First secretary

Mr. Yasunobu Takayama : First secretary

(2) Members of Thai Diet

Dr. Boontium Kamapirad : Deputy Minister of Communication

Ms. Khunying Kanok Samsan Vil : Secretary to Deputy Minister

(3) Bangkok Community Development Project

Ms. Tassane Indrasukhsri : Director, Bangkok Community Development Project

Dr. Karoon Liowstrisook : Faculty of Public Health Mahidol University

(4) Girl Guides Association of Thailand

Ms. Isa Choangulia

Ms. Daranee Wenuchan

Ms. Yupadee Deemak

Ms. Aree Limparsong

Ms. Siriluck Thedvisarn

(5) Surin Prefecture

Mr. Saner Mulasart : Governor

Mrs. Plungsri Mulasart : Girl Guides Chairman of Surin Branch

Mr. Saner Chantra : Chief, Governor's Office

(6) Chainat Prefecture

Dr. Pairat Dacharin : Governor

Mr. Surat Nupjinda : Chief, Manorum District Office

I T I N E R A R Y

(Sept. 8 - 27, 1985)

Date	Outline of the Survey
Sept. 8 (Sun.)	. Leave Narita, arrive in Bangkok
9 (Mon.)	. Discuss on the survey with Ms. Isa and Ms. Daranee
	. Discuss wirh First Secretary Mr. Katsuyuki Nagayama
	. Data collection
10 (Thu.)	. Leave Bangkok, arrive at Surin
11 (Wed.)	. Pay Courtesy Call to Mr. Saner Mulasart, Governor of Surin Prefecture
	. Visit Patanaburi district Office
	. Preliminary questionnaire survey in Tard Village
	. Discuss the preliminary questionnaire survey
12 (Thu.)	. Field survey in Yang Village
13 (Fri.)	. Field survey in Yang Village
14 (Sat.)	. Visit OISCA Surin Training Center
	. Leave Surin, arrive at Bangkok
15 (Sun.)	. Visit the Thai Office of Institute of Developing Economic
16 (Mon.)	. Visit Thammasat University
	. Discuss with Dr. Pichit, Institute of Population Studies, Chulalongkorn University
	. Visit Technological Promotion Association
	. Discuss the results of questionnaire survey

Date	Outline of the Survey
Sept. 17 (Tue.)	. Leave Bangkok, arrive in Chainat
	. Pay Coutesy Call to Dr. Pairat Dacharin, Prefectural Governor, and receiving outline of Chainat Prefecture
	. Field Survey in Wat Yai Village
18 (Wed.)	. Pay Courtesy Call to Mr. Surat Nupjinda, Chief of Manorum District Office and receiving outline of Manorum District
	. Field survey in Wat Yai Village
	. Leave Chainat Prefecture, arrive in Bangkok
19 (Thu.)	. Discuss the survey with Dr. Boontium, Deputy Minister, and Ms. Khunying Kanok, Diet member
	. Data arrangement
	. Field trip to a farm village in the suburb of Bangkok
20 (Fri.)	. Interim report of the field survey
	. Data arrangement
21 (Sat.)	. Dr. Yonosuke Hara leaves Bangkok, arrive in Narita
	. Data collection
22 (Sun.)	. Field trip of regional activities in Dindeng District and 42nd District
23 (Mon.)	. Visit the Social Development Section of ESCAP
	. Data arrangement
24 (Tue.)	. Data collection
	. Report of the field survey to First Secretary Mr. Katsuyuki Nagayama

Date	Outline of the Survey
25 (Wed.)	. Field trip to a farm village in the suburb of Bangkok
26 (Thu.)	. Final check of survey questionnaire
27 (Fri.)	. Leave Bangkok, arrive in Narita

ITINERARY OF PRELIMINARY RESEARCH TEAM

(July 21 - 25, 1985)

Date	Outline of the Survey
July 21 (Sun.)	. Leave Kathmandu, Arrive in Bangkok
	. Discuss with Mr. Kazuyoshi Urabe, Mr. Katsuyuki Nagayama, Mr. Yasunobu Takayama
22 (Mon.)	. Discuss on this survey with Deputy Minister, Dr. Boontium
	. Briefing on landreform in Thailand by Mr. Pinit Suvanajata, Chief of Landreform Agency, Ministry of Agriculture
	. Visit an irrigation agriculture project of the Ministry of Agriculture
	. Consultation with Japanese expert
23 (Tue.)	. Leave Bangkok, arrive at Khon Kean
	. Visit Northeastern Thailand Agricultural Development Research Center, briefing on Northeastern Thailand by project leader Mr. Sadao Hatsuta
	. Pay Courtesy Call to Dr. Utai Pisone, head official of agricultural cooperation in the Northeastern region
	. Field trip to a village in the suburb of Khon Kean
24 (Wed.)	. Discuss this survey with Ms. Khunying Kanok Samsen Vil, Secretary of Deputy Minister
	. Field trip to Chaopiano Irrigation Project in Ayuttha a Prefecture
	. Report to First Secretary Mr. Katsuyuki Nagayama
	. Leave Bangkok
25 (Thu.)	. Arrive in Narita

CHAPTER 7

QUESTIONNAIRE SAMPLE

0001

The Survey Rural Thailand

September 1985

Name of Village Ban Wat Yai

Changwat Chainat

Province

I Household :

1.1 Name of the head [redacted]

1.2 Present members of the household 8

Name	relation to the head	residence	age	sex	marital status	education	occupation
1	Self	B. Wat Yai	58	F	Married	F	e
2	Son	"	32	M	"	F (2 years)	A
3	daughter in law	"	31	F	"	B	A
4	daughter	"	22	F	"	B	D
5	Son	"	21	F	"	B	D
6	Son	"	15	M	Single	e	D
7	grand daughter		7	F	Single	F (1 year)	D
8	"	"	2	F	Single	F	D

(education)

A-None B-Primary school 4yrs C-Primary school 6yrs

D-Middle school E-College and University F-others

(Occupation)

Farmer : a Employee . B Others : C Non Worker : D

0001

1.3 If you have other child who died before please gove details.

	Sex	age of death	cause of death
1	—		
2	—		
3	—		
4	—		

1.4 Age of marrige

Husband .....17.....years old wife .....20.....years old

2. Assets

2.1 Do you live in your own house?

◯ Yes ⊘ No.

If yes, how do you get it?

◯ Buying ◯ Heritage ( ) from husband's ancestor

( ) from wife's ancestor

◯ Others.....

2.2 Do you and your household members have any land?

◯ Yes ⊘ No.

If Yes, how many rai you and your household member have in total? ..... Rai.

How do you get it?

◯ Buying

◯ Heritage ( ) from husband's ancestor .....Rai.

( ) from wife's ancestor.....Rai

◯ Others .....

000/

3. For Farmer

3.1. Size of your operation holding ..... Rai

- ◯ own ..... Rai
- ◯ lease in ..... Rai
- ◯ lease out ..... Rai
- ◯ Using Public land ..... Rai
- ◯ Others . .....Rai

3.2. Land irrigation ..... Rai

3.3. Source of irrigation

◯ River ◯ Pond ◯ Tank
◯ Canal ◯ Well ◯ Reservoir
◯ Others .....

3.4. Do you use Fertilizer? ◯ Yes. ⊘ No.

3.5. Do you use fertilizer for what crops ?

	Yes	expen-diture (Baht)	Where do you get it ?			
			Market	Middleman	Cooperative	Others
Rice						
Corn						
Cassava						
Flax						
Others						
.....						
.....						

3.6 Labour pattern

000/

- ◯ by you/your household member's labour
- ◯ by you/your household member's labour and hired labour
- ◯ by you/your household member's labour and Mutual labour exchange
- ◯ by you/your household member's labour/hired labour and Mutual labour exchange
- ◯ only by hired labour
- ◯ others .....

3.7 If you hired labourlers, how many labourers per season you hired?

	Items	Hire (Baht)	Land (rai)	Period (day)	Payment head/day (Manday)
Rice	Land preparation				
	Planting				
	Harvesting				
Corn	Land preparation				
	Planting				
	Harvesting				
Cassava	Land preparation				
	Planting				
	Harvesting				
Flax	Land preparation				
	Planting				
	Harvesting				
Others	Land preparation				
	Planting				
	Harvesting				

3.8 Mutual Labour exchange pattern last year.

Rice	labour (person	Period days	
Land praparation Planting Harvesting Others.....			

3.9 Do you spend money for crops transportation?

◯ Yes ◯ No.

If you spend how much money did you spend per season?

◯ Rice ..... Baht/season
◯ Corn ..... Baht/season.
◯ Flax ..... Baht/season.
◯ Others ..... Baht/season.

6

3.10 What crops are you cultivating this year?

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	Rai	Quantity average yielde (TANG)	Proportion seeds/rai		
			Local Seeds	Improved Seeds	since ago
rainy season (1984)					Years ago
rice					Years ago
corn/maize					Years ago
cassava					Years ago
flax					Years ago
others					Years ago
dry season (1985)					Years ago
rice					Years ago
corn/maize					Years ago
cassava					Years ago
flax					Years ago
others					Years ago

3.11 How did you manage your agricultural product last year?

		How many (Tang)	How much (Bath)	
Rice	consuming			
	repayment			
	selling			
	others			
Corn	repayment			
	selling			
	others.....			
Cassava	repayment			
	selling			
	otners,.....			
Flax	repayment			
	selling			
	others			

000/

3.12 Cattles 7

	numbers		numbers		numbers		numbers
Cow	—	Pig	—	Cuck	—	—	
Buffalo	—	Chicken	—	Others	—	—	

4. Did you work outside your household's farming?

(✓) Yes ( ) No.

If Yes, please tell the following.

	kind of work	days	wage perday (Baht)
husband	—	—	—
wife	as handicraft (weaving)		1,000 B / month

5. Migration.

5.1 What is your birth place?

Husband/Muban.....Tambon.....Amphoe.....

Changwat.....Au Tai Tanee

Wife/Muban.....Wat Yai.....Tambon.....Ta chamuang.....Amphoe.....Mano-rom

Changwat.....chai nat

5.2 Do you receive any remittance from your family member who already gone out?

◯ Yes ◯ No .

If yes, how much did you receive?..... Baht/Year

◯ By giving material :,..... when .....years ago.

5.3 Do you or any family members wish to go out from this village?

◯ Yes. ◯ No.

If yes, what is the reason?

◯ Employment ◯ Education

◯ Others _____

If yes, How?

◯ Permanent ◯ Temporary

6. Family Planning : (husband or wife)

6.1 Do you want more children than you have now? ◯ Yes, ◯ No.

If yes, how many more children do you have? .....

If yes, what is the main reason dosiring more children? .....

6.2 How many children are ideal in your opinion (Circle one form the below

1. 2. (3.) 4. 5. 6. 7. and more _____

6.3 Are you practicing Family Planning now ?

◯ Yes ◯ No.

If Yes, since when you are praticing Family Planning?.....years ago

If No, Have you ever paracticed Family Planning? ◯ Yes ◯ No.

If Yes, why have you stopped to do so? .....

.....

If No, why have you not practiced Family Planning?

a. I do not have enough children.

b. Family Planning is not good for health.

c. Family planning is not good for moral point of view.

d. Family Planning is not good for religious point of view.

e. The partner/family member does not like Family Planning.

f. Others ..... Lack of knowledge

6.4 If you are practing Family Planning/have any experience of Family Planning.

◯ Sterlisation, ◯ Pills, ◯ I.U.D, ◯ Injection

◯ Condom, ◯ Others.....

6.5 From where do you get information and tools of Family Planning?

◯ Primary Helth Center, ◯ Village Health Worker

◯ Private Clinic ◯ Others .....

7. Agricultural machine and durables.

		numbers	when you got	own	rental
tractor	big	—	years ago		
	small	—	years ago		
electric pumping machine		—	years ago		
diesel pumping machine		—	years ago		
thresher		—	years ago		
plough		—	years ago		
bullock cart		—	years ago		
any other items		—	years ago		

	numbers	when you got
car autotrack	-	years ago
motor bike	—	years ago
bicycle	1	10 years ago
refrigerator	—	years ago
television set	—	years ago
electric fan	—	years ago
electric rice cooker	—	years ago
iron	—	years ago
watch	—	years ago
radio	1	10 years ago
casset recorder	—	years ago
any other durables	—	years ago