

**Report on the Survey of
Urbanization and Development
in Asian Countries**
———**Thailand**———

MARCH 1995

**The Asian Population and Development
Association**



◀ At Embassy of Japan
From the right :
Mt. Masaaki Endo, Team member
Hon. Ambassador Takashi Onda
Mr. Minoru Kiryu, Team leader
Mr. Tomomi Otsuka, Team member



Courtesy Call on Senator, Prof.
Prasop Ratanakorn, AFPPD
Secretary General,
Second from the right ▶



◀ At Chaingmai City Hall
Mr. Weerechai Neewboonnian,
Governor of Chaingmai



◀ At Thailand Development Research Institute Foundation (TDRI)
Dr. Wisan Pupphavesa, Director
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At Population Division, ESCAP ▶
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◀ Traffic jam and a building boom in Bangkok

Foreword

This report presents the findings of survey of population and development in Thailand. In 1994, the Asian Population and Development Association (APDA) was entrusted with the survey project "Survey of Urbanization and Development in Asian Countries" by the Ministry of Health and Welfare and the Japan International Corporation of Welfare Services. APDA selected Thailand as the country in which its field survey would be conducted. The actual survey and analysis of the resultant findings were conducted by APDA's survey committee (Chairperson - Dr. Toshio Kuroda, Director Emeritus, Nihon University, Population Research Institute).

Urbanization is progressing rapidly in Asian countries. Urbanization resulting from the sudden concentration of the population is causing a deterioration in health and medical services, family planning and maternal and child health services, and the living environment in cities. Because of this, there is a need to understand in detail the growth and distribution of the population, the health and medical situation, population estimates, the age composition, and the family planning and maternal and child health in these countries, and to study how these affect the population policies and development plans of the countries. The objective of this survey therefore was to research and analyze the population trends in Asian countries, and in particular the state of urbanization and health and medical services, so as to contribute to solving the problems of urbanization of the population and development of Asian countries.

The field survey was conducted with the guidance and cooperation of Hon. Ambassador Takashi Onda and First Secretary Mr. Nobuharu Kumamoto of the Embassy of Japan in Thailand, and Senator, Prof. Prasop Ratanakorn, Secretary General, Asian Forum of Parliamentarians on Population and Development. In Japan, members of the Policy Planning & Evaluation Division, Minister's Secretariat, Ministry of Health and Welfare and of the Department of Policies, Economic Cooperation Bureau, Ministry of Foreign Affairs cooperated on the planning and arrangements of the field survey. I would like to express my heartfelt gratitude to all of them.

I sincerely hope that this report will contribute to the future advancement of the urbanization and population programs of Thailand as well as the Japanese government's effective cooperation with Thailand.

Furthermore, I would like to add that this report is the responsibility of the APDA and does not necessarily reflect the views or policies of the Ministry of Health and Welfare or the Japanese government.

March, 1995
Fukusaburo Maeda
Chairman
The Asian Population and
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Chapter One

INTRODUCTION

RAPID PROGRESS OF THAILAND - ECONOMIC DEVELOPMENT AND ENVIRONMENT -

1 Catching up with Asian NIEs

Thailand, with a population of 57 million, is noted as a special case in Asia, particularly in Southeast Asia, because its development is nearest to that of the "four small dragons" (Hong Kong, Taiwan, Singapore and Korea). Thailand has displayed an especially remarkable success in curbing the increase rate of the population and in economic growth.

The effectiveness of population control is determined by fertility. Table 1 shows the total fertility rates of countries in the Southeast Asia. Thailand has a total fertility rate of 2.2, near the replacement level. All other Southeast Asian nations, with the exception of Singapore, have a total fertility rate of 3.0 or higher. Thus, Thailand's total fertility rate is conspicuously lower. Thailand exerts a tractive force in Southeast Asia.

It goes without saying that the remarkable decrease in fertility in Thailand made possible a reduction in the population growth rate and contributed to accelerated economic growth. Between 1990 and 1995, whereas the average annual population growth rate was 1.3% in Thailand, in all other countries in Southeast Asia aside from Singapore they were over 2%. Even in Indonesia, which has achieved remarkable success with family planning, the population growth rate over this period was 1.8%, far higher than Thailand's.

Under these favorable conditions, Thailand has achieved extremely high levels of economic growth. Table 2 shows the real economic growth rate of Asian countries from 1987 to 1995. Thailand's real economic growth rate was highest among the four ASEAN nations in 1990, and very high at over 10% from 1988 to 1990. It has fallen since 1991, and is below that of Malaysia, but still remains around 8%, and in 1994 and 1995 it is expected to grow to 8.4% and 10.2%, respectively.

2 Thailand as Seen in the Demographic Transition Index

The demographic transition index can be calculated considering the extent of both the decrease in fertility and improvements in mortality. Fertility is indicated by the total fertility rate (TFR), mortality by the average life expectancy at birth. When the TFR falls to or below the population replacement level, the process of fertility transition is presumed to be completed. When the average life expectancy at birth reaches 79 years (the current average life expectancy at birth in Japan, which is the highest in the world), the mortality improvement goal is presumed to have been achieved. When fertility and mortality reach these levels, the demographic transition index is calculated as 1.00. When they do not reach the target levels, the index is below 1.00. (See the remark in Table 1.)

Excluding Singapore, a member of the Asian NIEs, Thailand's demographic transition index of 0.85 is highest in Southeast Asia, equal to that of North Korea in East Asia, and near those of Korea and China.

This signifies the success of the simultaneous implementation of active and effective family planning policies and programs for population control along with social development policies for improving mortality, as expressed in the prolongation of the average life span.

However, one point which should be mentioned in the case of Thailand is that virtually parallel to population policies for curbing fertility, Thailand has achieved a higher economic growth than other Asian NIEs, as already stated. This remarkable economic growth has generated serious problems of pollution and environmental degradation, problems seen in the experience of Japan as well.

3 Pollution and Environmental Problems in Thailand and Japanese Cooperation

For about two decades beginning in the middle of the 1950s, Japan achieved remarkable economic growth. At that time, no one anticipated that this "miraculous" success would result in life-threatening pollution and environmental destruction. Pollution problems arose frequently on the local level -- Minamata disease, Yokkaichi asthma, infantile asthma caused by automobile emissions. Fortunately, however, thanks to public outcry, strict regulations by the government and the active development of pollution-preventing technologies and investments in pollution-preventing technology by companies, pollution has been greatly reduced. Of course, it is true that there still remain problems which must be dealt with, such as air pollution caused by NO_x emissions from automobiles and the growing CO₂ emissions.

Korea and Taiwan, which after Japan have achieved demographic transition and high economic growth, are now facing the same pollution and environmental problems which Japan experienced.

In Thailand as well, which is achieving rapid economic growth on the same level as the Asian NIEs, pollution and environmental destruction, byproducts of this growth, are beginning to be conspicuous. Japanese economic cooperation in Thailand is extremely intense, and because of the high percentage of Japanese firms and joint ventures in Thailand, there is rising criticism about pollution caused by Japanese capital, or in other words the export of Japanese pollution to Thailand.

The experience of Japan and Korea gained through efforts made at high costs to resolve the problems of pollution resulting from their development into advanced industrial nations is extremely valuable. Listing a series of pollution problems in Thailand, including the chronic

lead poisoning of school children in Bangkok due to vehicle emissions, farmers suffering from poisonous agricultural chemicals, and unexplained deaths of factory workers and citizens in chemical industry zones, Professor Suraborn Sudara (Chairman of the Thai-Siam Environment Group and Professor at Chulalongkorn University) wonders why Thailand does not learn from countries which have experienced major disasters due to industrial pollution (Asahi Shimbun, December 19, 1994).

A young man working in a Thai non-governmental development organization seriously studied the effects of the industrial development along Thailand's eastern seaboard on the local inhabitants and environment of the area. He happened to learn about the heavy chemical industry of the Japanese city of Yokkaichi and its serious industrial problems, and realized that Thailand's eastern seaboard industrial zone is just like Yokkaichi twenty years ago. This offers a hint for international cooperation between Japan and Thailand. ("Will Aid Make Thailand Richer" by Tara Buakamushi, translated by Yasuo Okura, Iwanami Booklet, No. 330, 1994).

Industrial pollution and environmental destruction can be considered inevitable byproducts of economic growth, and their effects, particularly on human health and human life, are a new area of research. Thus, it is effective to use the technologies and systems of countries which have experienced them.

In order to deal with industrial pollution and environmental destruction, it is necessary to raise public awareness, to implement strict governmental restrictions and to promote the understanding of companies. In the initial stages, however, companies and governments tend to give priority to the economy and to be passive about expensive pollution-preventing facilities. The activities of NGOs are particularly important for increasing the awareness and understanding of the general public.

We believe that the possibilities are high for the success of international cooperation with Thailand on pollution and environmental destruction, and particularly in the area of pollution. The transfer of Japan's experience and technology not only in pollution prevention but also in energy savings and the effective use of energy can be expected to contribute greatly to Thailand. However, what is most important in order to not only improve administrative systems but also raise the awareness of companies and citizens, as well as to reap the fruits of this type of international cooperation at a stage in which economic priority tends to be strong, is thorough joint research by both Japan and Thailand.

Postscript: Recently various interdisciplinary studies have been conducted on the mutual relationship between population growth and the environment in developing countries. In particular, the below report focuses on case studies in Thailand and China. This report,

however, only discusses the results of preliminary research. We expect and hope the next report will discuss more detailed facts and propose measures to deal with problems based on these facts. Let me add that this an interdisciplinary study by various research institutes and specialists, including researchers of the Asian Population and Development Association.

"Report on Preliminary Research of the Effects of Population Growth in Developing Countries on Global Environmental Issues", Institute of Population Problems, Ministry of

Table 1 Demographic Transition Indices of East and Southeast Asian Countries

Country/Territory	Total fertility rate	Average life expectancy at birth (years)	Demographic transition index
<u>East Asia</u>			
Japan	1.5	79.0	1.00
Hong Kong	1.2	77.9	0.99
Taiwan	1.7	73.8	0.93
Korea	1.8	70.6	0.88
China	2.2	70.9	0.88
North Korea	2.4	70.7	0.85
Mongolia	4.7	63.4	0.54
<u>Southeast Asia</u>			
Singapore	1.8	74.5	0.90
Thailand	2.2	68.1	0.85
Malaysia	3.5	70.7	0.75
Indonesia	3.0	60.1	0.68
Philippines	4.0	64.9	0.63
Vietnam	3.9	63.9	0.63

Source : 1992 ESCAP Data Sheet for total fertility rate and average life expectancy at birth (figures for Taiwan from The Statistical Yearbook of the Republic of China, 1991).

Remarks: The demographic transition index (DTI) is calculated by the following formula:

$$DTI = 0.5 [(7.6 - TFR)/5.5] + 0.5 [1 - (79 - e_0/36)]$$

For details, refer to Kuroda, Toshio; Demographic Transition in Japan and Its Spread in Asia (Mainichi Shimbun Population Problems Research Council, "The Population and Society of Postwar Japan", chapter 1, p. 16, 1994

Table 2 Real Economic Growth Rates of East and Southeast Asian Countries (%)

Country/Territory	1987	1988	1989	1990	1991	1992	1993	Estimated	
								1992	1993
China	11.1	11.2	4.3	3.9	8.0	13.2	13.4	11.5	11.0
Asian NIEs	11.8	9.9	6.6	7.6	8.0	5.5	6.0	7.1	7.1
Korea	11.5	11.3	6.4	9.5	9.1	5.1	5.5	7.9	7.6
Taiwan	11.9	7.8	7.3	5.0	7.2	6.0	5.9	5.9	6.4
Hong Kong	14.5	8.3	2.8	3.2	4.1	5.3	5.5	5.4	5.0
Singapore	9.4	11.1	9.2	8.8	6.7	6.0	9.9	9.1	8.9
ASEAN	5.5	8.9	9.1	8.5	6.7	6.3	6.8	7.5	8.5
Thailand	9.5	13.3	12.2	11.6	8.1	7.6	7.8	8.4	10.2
Indonesia	4.9	5.8	7.5	7.2	6.9	6.3	6.5	6.5	7.2
Malaysia	5.2	8.9	9.2	9.7	8.7	7.8	8.5	9.0	8.5
Philippines	4.8	6.8	6.2	2.7	-0.5	0.1	2.0	4.8	5.1
Average of 9 countries/ territories	10.4	10.2	6.2	6.5	7.7	8.5	9.1	8.7	8.7

Source : Nihon Keizai Kenkyu Center, Quarter by Economic Forecasts (Outline), December 1992, No. 88, p. 8, Table 5 - Real Economic Growth Rates of Asian Countries

Remark : The nine countries/territories (Asian NIEs, four ASEAN countries and China) is the weighted average of their GNPs (GDPs) for each year converted into US dollars (using statistics of the individual countries/territories).

Chapter Two

ECONOMIC DEVELOPMENT AND URBANIZATION IN THAILAND

Thailand's economic development is a model of the Asian dynamism symbolic of the current economies of Southeast Asia, characterized by the progress of industrialization and rapid growth. Thailand's economic development began in the 1960s with the promotion of Import Substitute Industry based on the active introduction of private foreign capital. It is a well-known fact that this pattern of economic development progressed parallel to Thailand's urbanization, and in particular with the development of Bangkok (Krung Thep), Thailand's prime city. In this chapter we will analyze Thailand's economic development historically, consider the resulting progress of urbanization and the various problems this has caused, and analyze current issues regarding urban problems and ways to deal with them.

1. General Description of Economic Development and Urbanization in Thailand

The most important event spurring Thailand's modern urban development was the constitutional revolution of 1932. The shift from absolute monarchism to constitutional monarchism led to the beginning of the establishment of a Western style nation, and at the same time the development of the capital progressed. By the end of the 1950s, the basic urban functions of Bangkok were in place. However, Bangkok was still small and its population was under 2 million.

In the 1960s, urban and regional development in Thailand began to change greatly, in both methodology and developmental pattern. Firstly, comprehensive economic development plans were introduced and implemented, and secondly, there was a shift in policy from one aiming at constructing an ethnic nation to one attempting to build a nation in which the domestic market is open to foreign capital.

Thailand's economic development has been guided by five-year plans, beginning with the First Five-year Plan started in 1961. Thailand is now implementing the 7th Five-year Plan, which started in 1992. Urban and regional development are also incorporated into this plan, thereby promoting the progress of urbanization.

(1) Economic development and urbanization in the 1960s

With the First Five-year Plan started in 1961, Thailand began full-fledged economic development incorporating a modern pattern of developmental methods. Until then, the Thai economy had a typical mono-culture structure, based on agriculture (rice, cassava, maize, etc.) and with such agricultural products accounting for 70 to 80% of exports. Most of the ethnic Chinese capital which played a major role in Thailand's economy was commercial

capital principally involving transactions of such agricultural products, and the shift to industrial capital was slow.

Of the basic strategies of the First Five-year Plan, the ones with the greatest impact on Thailand's economic development were the introduction of foreign capital and Import Substitute Industry. These strategies were models of the initial strategies of the Asian dynamism which gradually formed in the 1970s and 1980s.

Until this time, the Thai economy was strongly based on agriculture. In trade with foreign countries, a structure was in place in which Thailand was forced to export cheap primary goods and import expensive industrial goods, and there was no visible progress in industrialization.

Thailand then adopted the policy of promoting Import Substitute Industry, and to do so actively promoted the introduction of private foreign capital. It was at the beginning of 1960 that laws regarding the introduction of private foreign capital were set in place in Thailand. Based on these laws, the Board of Investment (BOI) was established to handle private foreign capital. Legal and systematic preparations were only fully in place in the second half of the 1960s, but in the first half, investments from developed countries, and particularly from Japanese corporations, increased yearly. Japan was at this time in the early stages of rapid economic growth, and this was a period in which there was increasing interest in foreign production of various articles, including automobiles, textiles and household appliances. Of course, there was already activity in this area in the second half of the 1950s. In the Asian region, Japanese corporations made advanced investments in the Philippines, which at the time had a stable government and had early on adopted a policy of liberalization.

The first Japanese corporations to set up in Thailand were textile and household appliance manufacturers. These were labor-intensive industries whose products were aimed at the domestic market. Later, automotive and other manufacturers also set up in Thailand, and by the end of the 1960s manufacturers of a variety of products were operating in the country. At this time, however, there were as yet very few Japanese firms in such service areas as financing, communications and transportation in Thailand.

The arrival of this import substitute type foreign capital was strongly related to the progress of the urbanization of Bangkok.

From the beginning of the 1960s until the middle of the decade, Bangkok's commercial zone was "Yawara", an ethnic Chinese quarter along the Chao Phraya River. Incidentally, even the Bank of Tokyo, the first Japanese bank to set up in Thailand, had a branch at this time in Yawara. Bangkok's function as capital and economic center only began expanding in the second half of the 1960s.

The problem was that there were no cities in Thailand aside from Bangkok with the necessary environment for foreign companies to operate. Because of this, foreign companies,

including those in the manufacturing industry, were forced to set up in Bangkok and the surrounding area. This is why Thailand's industrialization and economic development is synonymous with the progress of urbanization. As industrialization centered on foreign capital progressed in Bangkok and the surrounding area, the Bangkok metropolitan region gradually expanded, and its population and traffic increased. Furthermore, the role of Bangkok's pleasure districts serving American soldiers on leave also grew rapidly with the escalation of the Vietnam war.

On the other hand, the rural areas of northeastern and northern Thailand gradually began to feel the impact of the Bangkok economy, the supply of foodstuffs and industrial raw materials to Bangkok grew, and the currency economy spread. However, this induced a division of classes in rural areas, and because of the already growing gap in income between urban and rural areas, the influx of poor farmers to the city accelerated.

In this way, Thailand's rapid industrialization began in the 1960s and gradually became a factor promoting the urbanization of Bangkok.

However, the initial expectations of Thailand's developmental strategies were grossly miscalculated, and particularly so for the effect of import substitution.

In most cases, production by foreign firms was dependent on the import of equipment and raw materials, so the improvements in the trade balance were far lower than initially expected, and in fact the trade deficit grew. In addition, goods produced by foreign firms in Thailand became more expensive than imports. Import restrictions were put in place in order to protect domestic corporations, so there were temporarily many expensive products on the domestic market.

With this, a pattern in which the trade deficit was offset by full-fledged Japanese official development assistance was established in the second half of the 1960s and continued through the beginning of the 1980s.

(2) Adjustments and urban problems in the 1970s

Thailand's economic development strategy centered on industrialization laid the foundations which formed the dynamism of the Thai economy in the 1960s. However, as mentioned in the previous section, expectations for the Import Substitute Industry were misplaced, and the result was an increasing dependence on official development assistance. At the same time, this rapid economic development created distortions in many areas.

The greatest distortion was the gap in incomes. The gap between the city and the provinces and between agriculture and industry expanded yearly. Even within the agricultural sector, the development of commercial agriculture accelerated the division of farmers into classes, and great numbers of poor and landless farmers appeared.

In search of work, such poor farmers began moving to cities, and particularly to Bangkok where industrialization and urbanization were progressing. In the cities, these newcomers from rural areas began forming slums, and the income gap in cities grew ever greater.

The expansion in the income gap is a basic factor for social unrest. Thailand is no exception. In the 1970s, crime rose greatly, particularly in Bangkok, and social unrest spread. The anti-Japanese riots of 1973 were symbolic of this unrest.

Such riots also took place in Indonesia and Singapore at the same time, and developed in similar ways. In Thailand, along with economic development, prices rose, the number of people coming to Bangkok increased, and slums began to appear throughout the city. Dissatisfaction grew, mainly among those without steady work and slum dwellers. Elsewhere, dissatisfaction with the military's hold on the government was also growing, mainly among progressive students. For the dissatisfied people in the city, Japanese companies and products were perfect targets, since Japanese companies were rapidly making inroads to Thailand and their products were spreading widely in the Thai economy. Thus, these riots chose Japan as their target, and underneath them no doubt laid the various distortions brought about by economic development.

With this experience, Thailand began trying to correct such social distortions with the Fourth Five-year Plan (1977 to 1981). This plan called for correcting the imbalances in the distribution of incomes and promoting social justice, and incorporated the promotion of rural and regional development, the encouragement of medium and small enterprises, employment stability and tax reforms. In particular, various projects for regional development were implemented in order to correct the gap between urban and rural areas.

Also, in order to alleviate the concentration of the population in cities, and particularly in Bangkok, attempts were made to create industrial zones in the suburbs, to expand the city area, and to improve urban functions to cope with the rapidly increasing population and traffic. It was at this time that the idea of the eastern seaboard project for the large industrial zone which was finally completed in the 1990s was formed.

The 1970s can be considered a stage of adjustments for correcting the distortions brought about by rapid economic growth. Of course, these adjustments became the foundations for further development in the 1980s and on.

(3) Upgrade of the industrial structure and new urban problems

The 1970s were a period of adjustments, be these were not only due to internal factors, as already mentioned. There were also a number of external factors, including such changes in the international economy as international currency adjustments and two oil crises, as well

as the end of the Vietnam war which had created many special procurement demands for the Thai economy. In this sense, the 1970s provided an excellent opportunity to reconsider the various obstacles created by rapid growth. The objectives for agriculture and industry outlined in the Fourth Five-year Plan from 1977 to 1981 were not achieved, but even so the economy overall maintained a high annual growth rate of 7.1%.

The Fifth Five-year Plan beginning in 1982 incorporated various objectives for advancing economic development even further, and also called for dealing wholeheartedly with the environmental and urban problems which were becoming obstacles to economic development.

The Thai economy at this time was gradually shifting from one centered on labor-intensive industries to one centered on technology-intensive industries, and the modernization of the industrial organization was gaining speed. Exports of industrial products were beginning to grow rapidly, and export-oriented industrialization was progressing ever more quickly. Thus, in the 1980s the structural changes resulting from the progress of industrialization appeared distinctly.

Incidentally, at this time industry overtook agriculture in the share of the GDP, reaching 17.4% for agriculture and 22.6% for industry in 1987, compared to 27.1% for agriculture and 16.0% for industry in 1970. In addition, the share of industrial products among exports surpassed 50% in 1984, and reached 74.7% in 1990. The share of exports of agricultural products in 1984 was only 15.1%.

Thus, in the 1980s, the rapid industrialization of Thailand's economy progressed even further, but the resulting problems grew more severe than ever.

First, the problem of environmental destruction. This was caused by the rapid industrialization of the Thai economy, and progressed more than expected. Of course, until the second half of the 1980s, the main objective was development, so there was little latitude to consider the environment, and few wanted to take on the costs to do so.

As a result, environmental destruction proceeded in many areas: the forest area was reduced by half over a thirty year period, many natural species of animals and plants became extinct, and rivers and the sea became highly polluted. Such environmental destruction began to be a hindrance to economic development. It was only in the second half of the 1980s that the idea of sustainable economic growth began to be heard.

Secondly, urban problems became increasingly serious. Up to this point, Thailand's economic development and industrialization was concentrated in Bangkok and the surrounding area, and various problems due to the urbanization and growth of Bangkok became apparent in the 1980s.

The astronomical increase in traffic led to chronic traffic jams in the downtown area, resulting in vast amounts of wasted time and costs. Of course, air pollution also became

serious. In addition, industrial wastes and the increase in sewage due to the population growth led to pollution of the waterways and increases in living expenses.

Thailand finally realized that environment destruction and pollution had begun to threaten the population's daily lives in various ways and were becoming obstacles to development.

At New Year in 1990, then prime minister Chatichai gave a speech in which he stated that environmental matters were the most important political issues. This speech symbolized the situation in Thailand.

(4) Sustainable growth and urbanization

Reaching the 1990s, the Thai economy was faced with the task of conducting structural adjustments aiming at achieving "autonomous development" or "sustainable development" considering environmental issues and the upgrade of the industrial structure, as well as making a shift in industrial policy in order to reach these goals.

In the second half of the 1980s, though many obstacles to development appeared, Thailand achieved a high annual economic growth rate of 10.5% during the period of the Sixth Economic and Social Development Plan (1986 to 1991). This was due in part to external factors, such as the benefits for Thailand of the opening of such neighboring countries as China, Vietnam and Myanmar and the rise in corporate investments, particularly from Japan, but proved that the Thai economy was beginning to operate at a high level and was on a path of growth.

In the 1990s, Thailand has so far sustained a high level of growth thanks to increased exports of industrial goods and a rise in private and public investment. The major political crises Thailand has recently experienced, such as the military coup d'état in February, 1991 and the bloody events between supporters of democracy and the military in May, 1992, temporarily acted as negative factors on the economy, but the subsequent economic recovery was fast, and Thailand marked a high growth of 7.8% in 1993 and 8.1% in the second semester of 1994.

The 1990s, and particularly the period since the political upheaval of 1992, can be considered a time of change from adolescence to maturity for the Thai economy. Of course, urbanization and urban problems continue to advance and are still serious, but it is also true that the advancement of the economic structure has created the latitude needed to deal with these problems.

Various measures were attempted to improve the traffic situation in Bangkok. In the 1990s, highway networks have been established in the city and overpasses constructed at major intersections. Concrete studies have also begun for mass transportation systems for the

21st century, including an MTS and a subway network. Active attempts at the regional dispersion of industrial facilities have also begun, including the eastern seaboard industrial zone completed in the second half of the 1980s.

Still, since all political, economic and social functions in Thailand are concentrated in Bangkok, the city is continuing to swell.

To give some figures indicating the economic and social concentration in Bangkok, while the population of Bangkok is 6.7 million or 11.1% of Thailand's total population, the capital city accounts for 13% of the nation's GNP, 75% of industrial production, 80% of high-rises, and has 2 million registered vehicles. If this situation continues to progress, Bangkok will eventually swallow up adjacent rural towns and provincial cities to become one mammoth metropolis. Unless efforts are made at devising medium- and long-term urban design plans and measures to deal with existing problems, the city will lose its urban functions, and this will eventually act as a deterrent to economic development.

2. Urban Problems and Countermeasures

We have already discussed how Thailand's economic development is synonymous with the progress of the urbanization of Bangkok. The issue facing the Thai economy from the 1990s on is "sustainable economic growth", and improvements in urban and environmental problems are premises for sustainable economic growth.

With the Seventh Five-year Plan which started in 1992, Thailand is aiming at becoming a "regional economic hub" with a nuclear role in Asia, and giving its economic development a direction which will make its dynamism more solid.

To achieve this, the plan calls for the installation of infrastructure in all areas and the expanded supply of energy, and sets quite ambitious objectives. However, the distortions caused by rapid growth still exist and are actually becoming worse, and such phenomena as the gap between urban and rural areas, the imbalances between social classes and environmental destruction are becoming increasingly apparent. With this, it is no exaggeration to say that such problems as the concentration of the population in Bangkok, the city's traffic jams, overpopulation and environmental pollution, as well as the delay in coping with these problems, in essence cover virtually all of Thailand's urban problems.

(1) Traffic jams and countermeasures

The concentration of the population in Bangkok continues to proceed at a rapid pace. The Bangkok metropolitan population is expected to grow by 8.3% from 1990 to 1995, and

that of Bangkok and its surrounding areas by 11.03% over the same period to a level of 11.42 million. The national share of vehicles registered in Bangkok and the surrounding area was 26.5% in 1990, and has increased one point to 27.4% in 1994. The concentration of registered corporations in the Bangkok area is also continuing, and though the number of foreign enterprises establishing factories in central Bangkok is decreasing, this number is still increasing in outlying areas.

This shows that central Bangkok has reached saturation, but that the urbanization of the surrounding areas is continuing through outward expansion. However, as administrative, financial and information functions are concentrated in central Bangkok, the frequency of access to central Bangkok is growing ever greater, and though residential areas and production facilities are expanding in the surrounding regions, the daytime population of central Bangkok is growing roughly proportionally to the economic growth rate. In addition, with the upgrade of the industrial structure, there is a strong demand for quick, door-to-door delivery systems. The increase in the number of commuters added to the demand for this new type of transportation is resulting in a steady increase in traffic.

The serious traffic jams are now changing people's living patterns and creating difficulties in daily life. Salaried workers employed in central Bangkok are being forced to move to outlying areas due to rising land prices. Though the average commuting distance was 18.5 km at the beginning of the 1980s, a 1993 survey showed that this distance had increased to 24.6 km, and the average commuting time is increasing in proportion to the greater distance.

A certain female government employee told us that she spends two to three hours each day commuting in her car from her home 60 km away. If she gets caught in rush hour traffic, however, she cannot make it to work on time, so she must leave home at 4 o'clock in the morning. This means that she arrives quite a bit before starting time. She said that there are many women in her situation, so early morning beauty salons, restaurants and coffee shops are very popular. This is a tragicomedy generated by the traffic situation in Bangkok.

Since the beginning of the 1990s, the national and metropolitan governments have been dealing with the problem of traffic jams quite aggressively, but their actions are late in coming.

The greatest problem of traffic in Bangkok is the fact that there are no means of mass transportation aside from buses. There is serious traffic congestion in virtually all areas of the city during commuting hours. Since the second half of the 1970s, the government has made efforts to ensure smooth transportation by bus, the sole means of mass movement, by for example improving signal systems, making streets one-way at certain hours of the day, and establishing bus lanes. In the 1990s, however, such measures are proving insufficient. As a result, the government is hurrying to build overpasses at major intersections and to establish a

highway network in the city, but is not managing to keep up with the increase in the volume of traffic.

Drastic measures have been needed to deal with Bangkok's traffic problems for some time now, and studies have been made for mass transit systems to replace buses. However, subways and elevated monorails (MTRS) have not been constructed due to their high costs. The Bangkok Metropolitan Administration (BMA) has already drawn up master plans and made feasibility studies for these. The plans call for the systems to be constructed by BOT or through cooperation between the government and the private sector. These plans have finally become realistic.

The problem is that the construction of such new means of mass transportation and the establishment and expansion of road and rail networks are fundamentally based on the premise of promoting outward expansion and leaving Bangkok's functions as the capital intact. The metropolitan region development concept being studied by the BMA is a vast project calling for the expansion of the metropolitan region in a radius of approximately 100 km extending to Saraburi in the north, Chachoengsao in the east, from the eastern seaboard to Rayong in the south, and to Nakhonpathom in the west, as well as the construction of three development centers in addition to Bangkok. This project would greatly expand the functions of the capital area and also partially disperse them. Still, it will likely be impossible to solve Bangkok's traffic problems without the fundamental, planned dispersion of the functions concentrated in the Bangkok metropolitan area.

(2) Environmental problems and countermeasures

It was in the middle of the 1970s that various environmental problems began to emerge in Bangkok. The first problems due to the increasingly dense population and rapid industrialization were water and air pollution. Water pollution was most severe in the Chao Phraya river which runs through the west side of the city, and was caused by the rapid increase of factory drainage and raw sewage in the 1970s. At the beginning of the 1980s, the river was so polluted that almost no fish could live in it from the mouth to about 50 km upriver.

Bangkok's famous floating markets on the Chao Phraya and its canals gradually declined due to changes in lifestyles and water pollution.

Bangkok was once called the "water capital". As urbanization progressed, the extensive canal network crisscrossing the city was gradually filled in for roads. Now only a handful of canals remain, and their water is severely polluted and foul-smelling. Filling in the canals reduced the city's drainage capacity in the rainy season, resulting in frequent floods. This is also a cause for traffic jams.

To deal with the problem of water pollution, the Seventh Five-year Plan calls for major efforts to protect water quality, and establishes a BOD target of 4 mg/liter or less for five waterways in the country, including the Chao Phraya. For factory drainage in particular, different standard values are set by industry, and the establishment and operation of factories are regulated by a Factory Act. To protect the sources of drinking water for the Bangkok metropolitan region in particular, in 1988 the Cabinet issued an order prohibiting the installation of new factories and offices emitting drainage of BOD (1 kg/day) or greater in an area of 350 km² extending from Bangkok along the Chao Phraya to Ayuttaya. There are currently some 93,000 registered factories throughout Thailand. These factories are required to obtain operating permits from the Ministry of Industry and are obligated to install drainage and waste water treatment facilities upon renewing their permits. With this, the progression of the pollution of the Chao Phraya water system at least has slowed down in the 1990s. Still, these environmental protection measures are costly for medium and small companies, and in many cases regulations are not observed.

Air pollution is caused by emissions from factories and automobiles. Pollution from cars in particular is deeply related to the number of registered cars, which is increasing rapidly along with economic development. The number of cars in Bangkok is increasing by about 200,000 units per year, and is estimated at approximately 3 million units (including two-wheelers) as of January 1994.

The increase in nitrogenous compounds (NO_x) in Bangkok is progressing rapidly, particularly since the 1980s. In 1994 the NO_x volume was three times greater than the figure for 1980. Carbon dioxide has increased at about the same rate. Pollution caused by emissions is particularly severe in the downtown area, and the rate of asthma and other pollution-related illnesses is increasing. This is a clear example of how environmental pollution is beginning to affect people's lifestyles and health.

To deal with these problems, the government has set measures to deal with air and noise pollution in Bangkok and other urban areas as one of the priorities of the Seventh Five-year Plan and is beginning to expand emissions regulations and air and noise monitoring systems.

(3) Urbanization and changes in lifestyles

With the progress of urbanization in Bangkok, the lifestyle of the citizens has changed greatly. With urbanization, the population increased rapidly, and there was strong population migration from the provinces. Seasonal and low-income workers formed slums in central Bangkok, and by the beginning of the 1980s the number of slums of various sizes is said to have reached 1000. In addition, pleasure districts sprung up throughout the city, resulting in major changes in manners, customs and eating habits, and the number of restaurants, fast food

shops and convenience stores increased. There was only one Japanese-owned department store in Bangkok at the beginning of the 1970s, but this number had grown to five by 1990, and there are also several large Japanese-owned supermarkets. Bangkok is continuing to develop not only as the political and economic center, but also as an international entertainment center and a mass-consumption city.

With this, of the various issues related to the daily life of the citizens, the problem of housing has become particularly serious, especially in recent years. With the advancement of urbanization and the development of the economy, the price of land has increased dramatically, especially in the metropolitan region. Redevelopment has increased dramatically in downtown Bangkok since the second half of the 1980s, with aging buildings being torn down and replaced with modern ones. Because of this, the price of land began rising in the second half of the 1980s. In some places, land prices have increased four-fold in five years. Thus, the general public has begun moving to the suburbs, and commuting distances are gradually increasing.

Since the second half of the 1980s, redevelopment gradually began pushing the slums mentioned above to the suburbs. Furthermore, the rise in the incomes of slum dwellers has resulted in people leaving slums for better housing or increases in the quality of the slums themselves, so the number of slums is decreasing, and the appalling slums of the past are disappearing.

On the other hand, the growth of the urban population, changes in lifestyles and increases in income have led to the major problems of increased sewage and garbage. Like with the problem of traffic, the government's adoption of measures to deal with garbage tends to be late in coming. Immediate and drastic expansion of treatment facilities is necessary.

Another problem resulting from urbanization is the rapid increase in the demand for electricity and other forms of energy. Long-term energy supply plans are necessary.

Table 1 Targets and Results of Economic Plans

	1st Plan (1961 - 1966)		2nd Plan (1967 - 1971)		3rd Plan (1972 - 1976)		4th Plan (1977 - 1981)		5th Plan (1982 - 1986)		6th Plan (1987 - 1991)	
	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual
Economic growth rate (%)	6	8.1	8.5	7.8	7.0	7.1	7.0	7.1	6.6	4.4	5.0	-
Agriculture	4.5	5.0	4.3	4.1	5.1	3.9	5.0	3.5	4.5	2.1	2.9	-
Manufacturing	-	10.5	10.9	9.2	8.0	8.6	9.6	8.7	7.6	5.1	6.6	-
Per capita income (baht)	-	2,787	-	3,835	-	7,330	-	17,200	35,700	21,935	27,783	-
Population growth rate	3.0	3.3	3.3	3.2	2.5	2.6	2.1	2.2	1.5	1.7	1.3	-
Balance of trade (million baht)	-	2,167	-	-10,484	-	-13,047	-17,940	-45,000	-78,400	-54,000	-35,900	-
Inflation Rate (CPI)	-	-	-	-	10.0	12.0	6.0	11.6	10.6	2.7	2.3	-

Source : NESDB

Table 2 Major Indices for the Term of the 7th 5-year Plan (by year)

	Average for 6th 5-year Plan					Average for 7th 5-year Plan	
	(1977-1991)	1992	1993	1994	1995	1996	(1992-1996)
1. Actual growth rate (%)							
1.1 Agriculture	3.5	3.4	3.4	3.5	3.3	3.3	3.4
1.2 Non-agriculture	12.1	9.1	8.7	8.7	8.3	8.3	8.6
- Manufacturing	13.7	10.1	9.6	9.5	9.2	9.2	9.5
- Construction	18.7	9.2	9.6	9.5	8.3	8.2	8.9
- Others	11.0	8.6	8.2	8.1	7.8	7.8	8.1
1.3 Gross domestic production	10.5	8.6	8.3	8.3	7.9	7.9	8.2
2. Expenditures (growth rate - %)							
2.1 Private							
- Personal consumption	9.1	7.1	5.7	5.5	5.1	4.9	5.7
- Private investment	26.2	8.9	9.4	9.4	8.2	8.2	8.8
2.2 Government							
- Governmental expenditures	1.8	3.3	3.3	3.3	3.3	3.3	3.3
- Public investment	6.5	8.7	9.2	9.1	7.7	7.7	8.5
3. Exports							
3.1 Sum of exports (in billions of baht)	496.2	799.4	912.8	1,042.9	1,193.1	1,365.4	1,062.7
3.2 Growth rate (%)	24.6	16.3	14.2	14.3	14.4	14.4	14.7
4. Tourism revenue							
4.1 Sum (in billions of baht)	91.4	141.3	160.5	182.1	206.6	234.3	185.0
4.2 Growth rate (%)	27.4	12.4	13.6	13.5	13.4	13.4	13.3
5. Imports							
5.1 Sum of imports (in billions of baht)	664.3	1,111.8	1,234.5	1,368.6	1,506.7	1,656.8	1,375.7
5.2 Growth rate (%)	32.6	15.0	11.0	10.9	10.1	10.0	11.4
6. Balance of Trade							
6.1 Sum (in billions of baht)	(168.1)	(312.4)	(321.7)	(325.7)	(313.6)	(291.5)	(313.0)
6.2 Trade revenue/GDP (%)	(8.4)	(11.8)	(10.7)	(9.5)	(8.1)	(6.7)	(9.4)
7. Ordinary revenue							
7.1 Sum (in billions of baht)	(98.8)	(202.6)	(197.5)	(185.3)	(154.6)	(111.4)	(170.3)
7.2 Ordinary revenue/GDP (%)	(4.9)	(7.6)	(6.6)	(5.4)	(4.0)	(2.5)	(5.2)
8. Inflation rate (CPI)	4.7	5.7	5.4	5.6	5.6	5.7	5.6
9. Population (*)	56.9	57.8	58.6	59.4	60.2	61.0	61.0
10. Per capita income (baht) (*)	41,021	45,849	51,303	57,475	64,176	71,706	71,706

Source : NESDB

Table 3 Infrastructure Targets for the Term of the 7th 5-year Plan

Sector	Target (by final year of 7th 5-year Plan)
Transportation	To improve capacity and efficiency.
Communications	To increase telephone density to 10 lines per 100 persons.
Energy	To increase electric supply by 8% per year. To make reserved capacity of electricity system 15% or greater. To increase installed capacity of electric generation by 5,400 MW. To keep growth rate of commercial electric consumption to under 5% per year.
Water	To reach a domestic natural gas production of 1.25 billion m ³ per day. To increase the water supply of the Bangkok metropolitan region from 2.8 to 4.5 million m ³ . To increase supply of water to rural area from 1.3 to 2.9 million m ³ .

Source : NESDB Infrastructure Project Division (June 1992)

Table 4 Predictions of Regional Composition of GDP (%)

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Northeast	12.8	12.6	12.3	12.0	11.8	11.5	11.3	11.1	10.9	10.8
North	10.8	10.6	10.4	10.1	9.9	9.7	9.5	9.4	9.2	9.1
South	8.6	8.5	8.4	8.3	8.1	8.0	7.9	7.8	7.7	7.6
East	8.9	9.3	9.7	10.2	10.6	10.9	11.2	11.6	11.8	12.3
West	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
Center	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.8	4.8	4.8
Bangkok	48.7	48.9	49.1	49.3	49.4	49.6	49.8	49.9	50.1	50.1

Source : NESDB

Table 5 Regional Distribution of Economic Activities (1981 - 1987)

	Share per section (per GDP)		Share of GDP		Growth rate
	1981	1987	1981	1987	1981 ~ 1987
Bangkok	100.00	100.00	36.51	39.65	6.42
Agriculture	2.34	1.74	3.99	4.29	2.06
Industry	41.71	42.91	48.22	49.00	5.81
(Manufacturing)	33.41	35.71	54.72	59.13	6.69
Commercial services	55.95	55.35	43.47	44.61	9.97
Inner periphery	100.00	100.00	8.30	9.39	7.54
Agriculture	15.12	9.24	5.85	5.40	1.48
Industry	53.42	59.97	14.04	16.21	8.28
(Manufacturing)	45.00	48.19	16.75	18.89	7.93
Commercial services	31.46	30.79	5.56	5.87	8.64
Outer periphery	100.00	100.00	12.36	11.6	5.51
Agriculture	24.90	17.06	14.36	12.32	2.91
Industry	33.72	39.53	13.20	13.21	6.97
(Manufacturing)	21.74	22.44	12.06	10.88	6.56
Commercial services	41.37	43.41	10.89	10.24	5.73
Central Thailand	100.00	100.00	6.46	5.64	5.04
Agriculture	42.05	30.18	12.67	10.58	2.63
Industry	14.73	20.17	3.01	3.27	9.40
(Manufacturing)	9.33	9.37	2.70	2.20	7.55
Commercial services	43.22	49.65	5.94	5.59	5.45
Northern Thailand	100.00	100.00	12.73	11.21	4.46
Agriculture	41.17	30.26	24.44	21.11	1.49
Industry	16.10	22.33	6.49	7.20	9.15
(Manufacturing)	8.31	6.67	4.74	3.12	6.01
Commercial services	42.72	47.41	11.57	10.80	5.22
Northeast Thailand	100.00	100.00	13.38	12.59	5.05
Agriculture	37.91	31.24	23.66	24.48	2.86
Industry	17.90	18.79	7.58	6.81	5.90
(Manufacturing)	9.02	7.27	5.41	3.82	4.47
Commercial services	11.19	49.97	12.58	12.79	6.41
Southern Thailand	100.00	100.00	10.66	9.92	5.25
Agriculture	33.93	35.32	16.87	21.82	5.65
Industry	22.07	15.04	7.45	4.30	1.23
(Manufacturing)	7.55	4.73	3.61	1.96	0.22
Commercial services	44.00	49.64	9.98	10.01	6.51
National	100.00	100.00	100.00	100.00	5.79
Agriculture	21.44	16.07	100.00	100.00	2.88
Industry	31.58	34.73	100.00	100.00	6.38
(Manufacturing)	22.29	23.95	100.00	100.00	6.61
Commercial services	46.98	49.20	100.00	100.00	6.54

Notes : "Industry" covers a wide range, including manufacturing, mining, etc.

Shares are indicated in nominal values. Growth rate figures use fixed price in 1972.

"Inner periphery" comprises the five provinces of Pathum Thani, Samut Prakan, Nonthaburi, Samut Sakhon and Nakhon Pathom.

"Outer periphery" comprises the ten provinces of Kanchanaburi, Chachoengsao, Chon Buri, Nakhon Nayok, Rachaburi, Samut Songkhram, Saraburi, Supan Buri, Ayuttaya and Ang Thong.

"Central Thailand" comprises the remaining nine provinces of Chanthaburi, Trat, Rayong, Prachunburi, Chai Nat, Lop Buri, Singburi, Petchaburi and Prachuap Khiri Khan.

Source : TDRI, Rural Industry and Employment Survey: A Synthesis Report, April 1990. Originally from National Economic and Social Development Board.

Table 6 Composition of Supply Value-added Production of Manufacturing Industries by Region and Province

Bangkok metropolitan region	38.1	Central Thailand	18.2	Northern Thailand	6.7	Northeast Thailand	7.3	Southern Thailand	4.7
Bankok	35.7	Chon Buri	39.1	Uttaradit	15.2	Khon kaen	15.7	Phuket	13.2
Pathum Thani	58.8	Saraburi	29.2	Tak	12.3	Shrin	13.1	Surat Thani	6.6
Samut Prakan	56.8	Ayutthaya	20.5	Nakhon Sawan	10.7	Nong Khai	10.5	Yala	5.6
Samut Sakhon	32.8	Rayong	14.9	Chiang Mai	10.0	Nakhon Ratchasima	8.8	Nakhon Si Thammarat	5.5
Nonthaburi	25.5	Ratchaburi	14.8	Kam Phacng Phet	8.7	Buri Ram	8.2	Narathiwat	4.8
Nakhon Pathom	20.5	Prachuap Khiri khan	12.5	Lampang	4.6	Mukdahan	7.6	Ranong	1.6
		Kanchanaburi	12.1	Mae Hong Son	4.3	Ubon Ratchathani	7.0	Songkhla	4.3
		Trat	9.0	Phayao	4.2	Chaiyaphum	6.7	Phangnga	3.5
		Singburi	8.6	Phitsanulok	3.9	Udon Thani	5.3	Pattani	3.2
		Chanthaburi	8.2	Phetchabum	3.5	Kalasin	3.5	Phatthalung	3.0
		Samut Songkhram	8.0	Phrac	3.4	Roi Et	2.7	Krabi	2.8
		Prachinburi	7.9	Phicht	3.1	Sakon Nakhon	2.5	Trang	2.7
		Phetchaburi	6.6	Sukotthai	3.2	Maha Sarakham	2.3	Satun	2.5
		Supan Buri	6.0	Chiang Rai	2.7	Yasothon	2.2	Chumphon	2.2
		Chachoengsao	5.6	Nan	2.6	Si Sa Ket	1.8		
		Chai Nat	4.7	Lamphun	2.4	Loei	1.7		
		Lop Buri	4.1	Uthai Thani	2.1				
		Ang Thong	2.8						
		Nakhon Nayok	1.6						

Source : NESDB

Table 7 Income Gap Between Regions

(units: baht)

Region	1962	1969	1975	1981	1986
Average income (actual amount)					
Bangkok	1,509.0	2,746.4	3,535.0	5,934.8	7,428.7
Central Thailand	780.1	1,409.6	2,211.9	3,878.1	3,974.9
Southern Thailand	718.2	929.0	1,729.6	3,362.4	3,820.5
Northern Thailand	438.7	916.9	1,460.2	3,018.3	3,158.1
Northeast Thailand	318.1	812.6	1,452.6	2,637.2	2,600.2
National	594.9	1,098.8	1,856.6	3,445.2	3,800.0
Relative income (index x national = 100)					
Bangkok	253.7	249.9	190.4	172.3	195.5
Central Thailand	131.1	128.3	119.1	112.6	104.6
Southern Thailand	120.7	84.6	93.2	97.6	100.5
Northern Thailand	73.7	83.4	78.6	87.6	83.1
Northeast Thailand	53.5	73.9	78.2	76.5	68.4
National	100.0	100.0	100.0	100.0	100.0

Source : Ikemoto, Y., Income Distribution in Thailand -- Its Changes, Causes and Structure, IDE, 1991.

Table 8 Share of Income by House-hold Income Class (%)

Region	1962	1969	1975	1981	1986
Bangkok					
Lowest 40%	-	14.5	16.0	14.1	13.3
40 to 60%	-	14.7	16.0	14.9	13.9
60 to 80%	-	22.2	23.7	23.3	21.4
80 to 90%	-	15.5	16.0	16.7	15.5
Upper 10%	-	33.1	28.3	31.0	35.9
Central Thailand					
Lowest 40%	-	15.2	16.2	14.9	14.8
40 to 60%	-	15.0	15.8	15.1	14.2
60 to 80%	-	22.1	23.1	22.8	20.5
80 to 90%	-	15.5	16.0	16.8	15.4
Upper 10%	-	32.3	29.0	30.3	35.1
Southern Thailand					
Lowest 40%	16.1	16.8	14.7	14.7	13.1
40 to 60%	13.6	15.1	14.8	14.7	13.4
60 to 80%	22.3	20.8	22.2	21.9	20.4
80 to 90%	15.3	15.1	15.8	15.7	15.5
Upper 10%	32.7	32.2	23.6	32.9	37.5
Northern Thailand					
Lowest 40%	20.7	17.4	15.6	14.2	14.1
40 to 60%	11.2	15.3	15.3	14.5	14.2
60 to 80%	19.8	20.7	22.5	22.0	21.3
80 to 90%	17.4	14.7	16.2	16.6	16.0
Upper 10%	31.0	31.9	30.3	32.6	34.3
Northeast Thailand					
Lowest 40%	23.1	17.2	17.3	15.5	15.3
40 to 60%	12.2	15.9	15.4	14.9	14.5
60 to 80%	15.5	22.4	21.2	21.6	20.7
80 to 90%	15.2	15.6	15.2	15.5	15.2
Upper 10%	34.0	28.8	30.9	32.5	34.2

Source : Ikemoto, Y., Income Distribution in Thailand -- Its Changes, Causes and Structure, IDE, 1991.

Table 9 Distribution of Passenger Cars, Physicians and Hospital Beds by Region (%)

Region	Passenger cars	Motorcycles	Physicians	No. hospital beds
Bangkok	<u>73.5</u>	15.3	<u>46.3</u>	<u>22.8</u>
Bangkok periphery	4.7	3.6	3.8	3.5
Central Thailand	2.3	5.7	3.3	6.1
Eastern Thailand	3.9	8.0	4.9	7.8
Southern Thailand	2.1	8.4	3.8	6.7
Northeast Thailand	4.1	17.3	12.8	19.3
Northern Thailand	5.7	24.4	15.9	21.2
Southern Thailand	3.7	17.3	9.2	12.6
National	100.0	100.0	100.0	100.0
National (actual number)	1.22 million	4.77 million	12,713	76,461

Note : Figures for motorcycles as of December, 1990. Figures for physicians and hospital beds as of December 31, 1989.

Table 10 Distribution of Income by Region

Household distribution		1986	1988	1990	Household distribution	1986	1988	1990	
Nation					Southern Thailand				
Lower	20%	3.05	3.25	3.10	Lower	20%	3.24	3.59	3.52
Lower	30%	5.74	6.07	5.80	Lower	30%	6.04	6.62	6.49
Lower	40%	9.59	10.07	9.67	Lower	40%	10.00	10.87	10.63
Lower	60%	22.58	23.41	22.65	Lower	60%	23.12	24.71	24.10
Upper	20%	52.71	51.63	52.84	Upper	20%	52.46	50.07	51.43
Upper	10%	33.33	32.27	33.70	Upper	10%	33.59	30.85	32.84
Upper	5%	21.22	20.23	21.77	Upper	5%	21.89	19.01	21.40
Northeast Thailand					Central Thailand				
Lower	20%	3.44	3.76	3.94	Lower	20%	3.68	3.83	3.67
Lower	30%	6.37	6.90	7.18	Lower	30%	6.77	7.03	6.77
Lower	40%	10.48	11.25	11.64	Lower	40%	11.05	11.48	11.09
Lower	60%	23.96	25.23	25.79	Lower	60%	24.86	25.81	25.10
Upper	20%	51.31	49.68	49.20	Upper	20%	50.28	48.40	49.50
Upper	10%	32.38	30.77	30.55	Upper	10%	31.49	28.92	30.22
Upper	5%	20.70	19.19	19.18	Upper	5%	19.97	16.97	18.36
Northern Thailand					Bangkok metropolitan region				
Lower	20%	1.90	3.74	3.80	Lower	20%	5.89	4.18	3.82
Lower	30%	3.53	6.87	6.96	Lower	30%	10.22	7.65	7.09
Lower	40%	5.81	11.22	11.33	Lower	40%	15.77	12.44	11.69
Lower	60%	<u>13.27</u>	<u>25.23</u>	<u>25.36</u>	Lower	60%	31.65	27.76	26.84
Upper	20%	73.04	49.54	49.58	Upper	20%	43.55	44.95	45.22
Upper	10%	62.56	30.48	30.72	Upper	10%	26.54	24.47	23.76
Upper	5%	<u>56.09</u>	<u>18.80</u>	<u>19.19</u>	Upper	5%	16.60	11.90	10.50

Table 11 Income Distribution by Occupation

	1986	1988	1990
1. All households	100.00	100.00	100.00
2. Landed farmers	24.13	23.17	22.04
3. Landless farmers	4.77	4.94	3.49
4. Commerce and industry	20.44	18.23	19.77
5. Specialists and administrators	0.42	1.78	0.37
6. Salaried specialists and administrators	13.30	13.22	13.44
7. Rural workers	3.28	3.18	2.73
8. Others	2.41	1.97	1.89
9. Office workers and salespersons	13.22	14.37	16.17
10. Production process employees	10.17	9.80	11.05
11. Non-profit workers	7.86	9.34	9.05

Table 12 Population Estimates for the Bangkok Metropolitan Region

(in millions)

Contiguous BMR:	1990	1995	2005	2015
BMA	5.88	6.37	7.23	8.12
Samut Prakarn	0.77	0.89	1.17	1.5
Nonthaburi	0.57	0.69	0.93	1.24
Pathum Thani	0.41	0.48	0.61	0.78
Subtotal	7.64	8.43	9.94	11.63
Outlying Provinces:				
Samut Sakorn	0.32	0.36	0.44	0.53
Nakhon Pathom	0.63	0.69	0.81	0.93
Chachoengsao	0.55	0.63	0.79	0.97
Saraburi	0.51	0.56	0.65	0.75
Ayutthaya	0.7	0.76	0.88	1.01
Subtotal	2.71	2.99	3.56	4.19
Total	10.35	11.42	13.5	15.82

Source : Thailand Development Research Institute Foundation, National Economic and Social Development Board, UDCD, 1993.

Table 13 Employment Estimates for the Bangkok Metropolitan Region

(in millions)

	1990	1995	2005	2015
Contiguous BMR:	3.89	4.43	5.4	6.63
Outlying Provinces:	1.53	1.17	2.09	2.25
Total	5.42	5.6	7.49	9.18

Source : TDRI and NESDB, 1990.

Table 14 Housing Unit Estimates for the Bangkok Metropolitan Region

(in millions)

	1990	1995	2005	2015
Contiguous BMR:	1.74	1.97	2.43	3.03
Outlying Provinces:	0.61	0.69	0.85	1.05
Total	2.35	2.66	3.28	4.08

Source : Office of the Prime Minister and National Statistics Office, 1990.

Figure 2 Bangkok Metropolitan Region Development Plan Concept

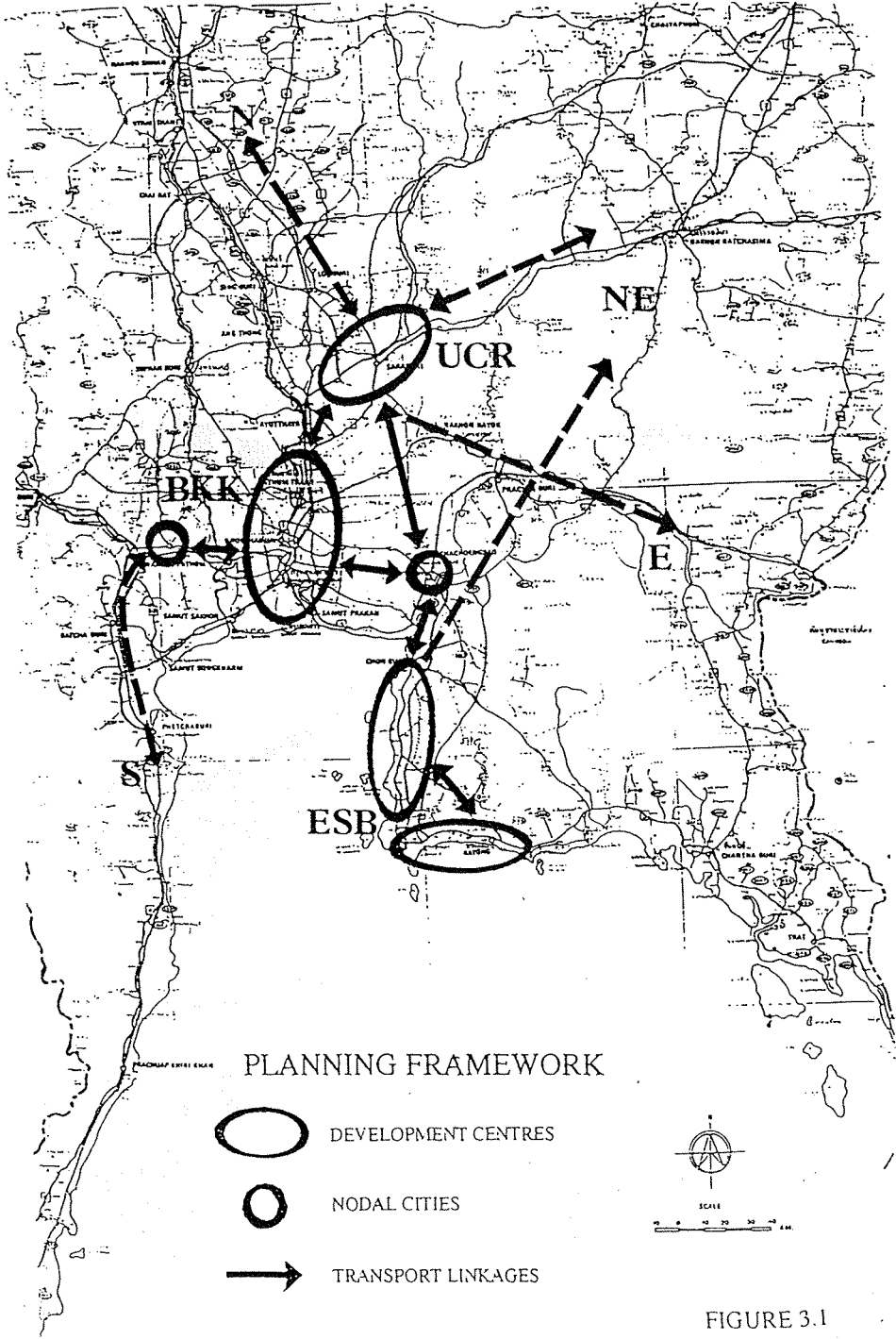


FIGURE 3.1

Chapter Three

THE URBANIZATION OF THE POPULATION IN THAILAND

1 The Population of Thailand

(1) Population and Demographic Transition in Thailand

According to a report of the World Bank ¹⁾, in 1992 the total population of Thailand was 58,000,000, the average annual population growth rate from 1980 to 1992 was 1.8%, the total fertility rate (TFR) was 2.2 ²⁾, and the life expectancy was 69 years. Roughly speaking, Thailand's population is larger, its population growth rate and total fertility rate are lower, but its life expectancy is longer than its neighbors. We will attempt to explain why this population situation has occurred in Thailand using the demographic transition theory (see Figure 1).

The demographic transition theory is a demographic law originating from the historical experiences of Western countries, and is now established as a general demographic theory applying to many countries. Briefly put, it holds that with socioeconomic development, a country's population situation changes from one of high birth and death rates to one of low birth and death rates. This process is called demographic transition. To explain the demographic transition theory in greater detail, there are three factors affecting a country's population size and composition: births (the birth rate), deaths (the death rate) and migration (the rate of migration). However, international population migration of an amplitude large enough to change the character of a country's population is very rare, so if we leave out this factor, a country's population changes due to births (the birth rate) and deaths (the death rate).

These two factors change according to socioeconomic development. When the stage of socioeconomic development is low, the population is distinguished by high birth and death rates, with a high number of people being born and a high number of people dying (stage I on Figure 1-a). Next, as the stage of socioeconomic development starts to advance, standards of living and other conditions improve, so the death rate decreases, but as people's idea that many children are desirable (an idea rooted in the society in the previous stage of development (stage I)) is carried over, the birth rate tends not to decrease (stage II). Next, as socioeconomic development progresses further, a change transpires in the idea that large numbers of children are desirable and family planning spreads, so the birth rate begins dropping rapidly following the decrease in the death rate (stage III). Finally, the society reaches a high level of development with low birth and death rates (stage IV).

These changes in the birth and death rates result in shifts in the natural growth rate (the difference between the birth and death rates - see Figure 1-b), from a low level in stage I, increasing in stage II, decreasing in stage III and once again reaching a low level in stage IV. In addition, with these changes in the birth and death rates, the age composition of a country's

population naturally changes as well. In stage I when both the birth and death rates are high, the young population (aged 0 to 14) is high and the aged population (65 and over) is low, so the country's age composition is "young". On the other hand, in stage IV when both the birth and death rates are low, the young population is low and the aged population is high, so the country's age composition is "aged". Intermediate stages II and III can be considered a transitional period between a "young" and an "aged" age composition.

Table 1 shows the trends in Thailand's vital statistics (birth and death rates)³⁾. These trends are charted in Figure 2. As can be seen when we compare Figures 1 and 2, the birth and death rates in Thailand from 1950 to 1985 changed rapidly following the path predicted by the demographic transition theory. The population growth rate in Thailand increased from 27.4‰ in the 1950-1955 period to 30.4‰ in the 1965-1970 period, then fell to 16.2‰ in the 1985-1990 period. Furthermore, the aging index, which indicates the degree of aging of the age composition, passed through a transitional period of decrease after a level of 7.1 in 1950, but then increased to reach 12.2 in 1990. Thus, Thailand's vital statistics have changed along the lines postulated by the demographic transition theory.

Still, there are other matters which should be considered here. According to the demographic transition theory, the reductions in the birth and death rates are caused by socioeconomic development. In the case of Thailand, the death rate had already begun to decrease in the 1950s, from 19.2‰ in the 1950-1955 period to 15.9‰ in the 1955-1960 period. However, Thailand only began to fully develop socioeconomically in the 1970s. Thus, it appears more appropriate to assume that the decrease in the death rate at this time was not caused by socioeconomic development directly, but by the "public health revolution", that is the active efforts made after World War II by the government of Thailand and of many other developing countries to improve public health.

Also, both the birth and death rates decreased rapidly beginning in the 1970s when socioeconomic development was strong. The decrease in the death rate at this time was likely due largely to socioeconomic development as postulated by the demographic transition theory. However, additional comments should be made about the decrease in the birth rate. Thailand encouraged its people to have many children in the first half of the century. In the 1960s, the country experienced a fierce increase in the population (a population explosion), and this population increase was becoming a serious problem. As a result, the government began actively promoting population control in the beginning of the 1970s. The Cabinet affirmed the need for establishing a population policy in 1970, the Ministry of Public Health formed a five-year plan for family planning services, and the third five-year plan for socioeconomic development adopted population control as a policy objective. Thus, the birth rate in Thailand began dropping strongly in the 1970s, but the main cause for this drop can be taken as the government's policy efforts rather than simply socioeconomic development.

In this way, the sudden transition from high birth and death rates to low birth and death rates in Thailand was not caused merely by socioeconomic development as postulated by the demographic transition theory, but was also due in great part to the government's population and public health policies. These changes in the population situation can be considered to have had a positive influence on the country's economic development. For example, the dependent population index ⁴⁾ which indicates the economic burden on the population of productive age (15 to 64) for supporting the young population (0 to 14) and the aged population (65 and over) fell abruptly in the process of demographic transition, from 96.9 in 1970 to 55.8 in 1985 (see Table 1). This reduced burden weakens the population pressure on the economy and has no doubt aided in accelerating economic development. However, it is also highly possible that this sudden change in the population will have negative effects on Thailand's economic development in the near future, as will be described in section 3 below.

(2) Population Migration and Urbanization in Thailand

As mentioned above, the effect of international population migration on a country's population is negligible, but the influence of domestic population movement on the total population cannot be ignored due to its size. Aside from marriage and schooling, the major factors provoking domestic population migration are generally economic (search for employment, transfer, change of occupation, etc.). In concrete demographic terms, overpopulation, unemployment, low incomes and poverty in rural areas act as push factors pushing out the population, while labor shortages, expectations for employment opportunities and high incomes, etc., in urban areas act as pull factors, resulting in a movement of the population from rural to urban areas. It is well known that this phenomenon of migration occurred in Japan during the period of high economic growth. Thailand is no exception - we can say that the very same phenomenon which occurred in Japan is now taking place in Thailand.

Table 2 shows the total number of migrants aged 5 and over and the direction of their migration. In Thailand, this number began increasing around 1965 when full-fledged economic development began. At this time, migration between rural areas decreased greatly from 62.5% in the 1965-1970 period to 40.9% in the 1985-1990 period, while migration from rural to urban areas increased greatly from 10.5% in the 1965-1970 period to 18.4% in the 1985-1990 period. The causes for these changes are that amount of arable land available in the rural areas reached the saturation point so movement between rural areas dropped off, and that the increased labor demand in urban areas resulting from economic development due to industrialization generated migration from rural to urban areas ⁵⁾. With these changes, the

movement of population between urban areas is also increasing (from 8.9% in the 1965-1970 period to 13.5% in the 1985-1990 period).

Naturally, the migration of the population in the direction of urban areas acts to advance the urbanization of the population. As shown in Table 1, the percentage of the urban population in Thailand has increased from 10.5% in 1950 to 22.6% in 1990. We can expect this urbanization trend to continue in the future (see Table 4). What is distinctive in Thailand's case is that the rate of urbanization, only 22.6% in 1990, is by no means high compared to other developed and developing countries. The urbanization of the Thai population displays another important trait, which is often seen in other developing Asian nations as well: the "primary city" phenomenon, in which the population tends to concentrate in the largest city (usually the capital), and there is a great difference in the size of the population of the largest city and the second and third largest cities.

More concretely, Table 3 shows that the percentage of the population of Bangkok within the total urban population has been gradually decreasing since 1970, but as of 1990 Bangkok still accounted for more than half the total urban population (58%). The cause for this phenomenon is extremely clear: other cities are not sufficiently developed, either socially or economically, so the majority of the migrating population must concentrate in the largest city. This fact can be verified on Figure 3, which gives a more detailed view of the direction of population migration in Thailand. As can be clearly understood from this diagram, population migration in Thailand consists mainly of short-distance movement between rural and urban areas, but at the same time is centered around Bangkok, the nation's capital and the center of Thailand's economy.

We can say that the nuclear functions of the Thai economy are concentrated in Bangkok. As a result, the majority of the corporations responsible for Thailand's economic development are located in Bangkok, so there is a great influx (movement) of people to the capital. As a result, Bangkok's functions and importance as the core of the economy have grown even stronger, and this has acted to draw even more corporations and people. As a result of this accumulative process, Bangkok has expanded extensively in a way corresponding to the development of the Thai economy (see Figure 4). However, if this trend for concentration of the population in Bangkok continues in the future, there is the possibility that the major problems we will discuss in the following section will become even more serious.

(3) Future Problems

The first problems Thailand will face in the near future are the aging of the population

and restrictions in the supply of labor. As stated in section 1 above, the population situation of Thailand has evolved as postulated by the demographic transition theory, particularly from the 1970s on. In other words, the birth and death rates have decreased along with Thailand's socioeconomic development. This trend will likely continue in the future. If it does, the problem arises that if the birth rate remains for long at such a low level that the population cannot be maintained, the young population and the population of productive age will decrease, while the death rate among the aged population will also decrease (in other words, the life expectancy will increase), so the aged population will increase steadily. The results are the aging of the population and the reduction in the population's capacity to supply labor.

Table 4 shows future United Nations' predictions on the population of Thailand. As can be seen in this table, after the 1990-1995 period, Thailand's birth rate will fall below the replacement level (the level at which the population can be maintained - a total fertility rate (TFR) of approximately 2.1), so the number of births will continue to be low. If this trend is sustained for long, the young population and the population of productive age will decrease. On the other hand, the life expectancy will increase from 69.3 years in the 1990-1995 period to 76.0 years in the 2020-2025 period, so the aged population will increase. However, the death rate will take a turnabout and increase from 6.3 in the 2010-2015 period to 7.3 in the 2020-2025 period. This is because the percentage of the aged population among the total population will increase, so even if the death rate for all age levels is low, the total number of deaths will increase mainly for the aged population, and the crude death rate (the number of deaths divided by the total population) will increase.

With these trends in the birth and death rates, not only will the younger population of productive age (aged 15 to 24) decrease from 12.14 million in 1990 to 9.83 million in 2025, the young population index (the young population divided by the population of productive age) will also steadily decrease, while the aged population index (the aged population divided by the population of productive age) will steadily increase. In addition, the dependent population index ((young population + aged population) ÷ population of productive age), which is the compound result of these two factors, will increase from 41.0 in 2010 to 43.7 in 2025. The United Nations' 1990 population predictions only indicate values up to 2025, but if these calculations were made passed 2025, the dependent population index should increase further. Also, if Thailand's economic development further accelerates resulting in further decreases in the birth and death rates, the growth of the aged population and the reduction of the population's capacity to supply labor will become even more marked.

In the near future, Thailand's economy will likely be faced with the predicament that a larger labor force will be needed to actively promote socioeconomic development, but the rapid demographic transition brought about by socioeconomic development will begin to erode the population's capacity to supply labor. According to what we heard at the National

Economic and Social Development Board (NESDB), the NESDB also considers this a serious matter and has begun studying measures to deal with it.

Next let us consider the various problems related to urbanization. As stated in section 2 above, urbanization in Thailand is distinguished by the fact that the rate of urbanization is itself not all that high, but that approximately 60% of the urban population is concentrated in the capital, Bangkok. Furthermore, the majority of the corporations supporting Thailand's rapid economic development is concentrated in Bangkok and the surrounding area. As a result, such problems as the provision of tap water and sewage facilities, waste disposal, traffic, air pollution caused by smoke from factories and automobile emissions, and water pollution caused by industrial and household drainage are becoming increasingly serious. One reason for these problems is that the installation and expansion of the urban infrastructure (tap water, sewage, waste treatment facilities, sewage treatment facilities, roads, public transportation, etc.) cannot keep up with the rapid rate of urbanization.

It is important to remember that Thailand's economic functions are concentrated in Bangkok. Because of this, if the above problems become even more serious in the future, they will become restrictive factors for economic activity in Bangkok, and this may very well lead to a slowing of Thailand's economic development. To evade this situation, it will be necessary to install and expand the infrastructure and to strengthen laws related to environmental conservation and pollution prevention. Still, installation and expansion of infrastructure requires large amounts of capital, so it may be necessary to use some of the capital allotted to economic development. In addition, strengthening laws related to environmental conservation and pollution prevention may slow down corporate activities, because half of Thailand's gross domestic product (GDP) is created by pollution-emitting industries (see Table 5). These policies are essential for the healthy and sustainable development of Thailand's economy, but in the short term they may retard economic development.

In addition to the above problems related to the urbanization of the population, it is quite possible that rural problems will also become restrictive factors for the development of the Thai economy in the near future, though these problems are not yet pronounced. In 1990, 77% of Thailand's population lived in rural areas. With population migration from rural to urban areas and the advance of urbanization, though, this figure is expected to fall to 50% by 2020 (see Table 4). The problem here is the fact that generally many migrants are young, healthy, ambitious people, that is, capable human resources. These capable human resources are needed for the development of the rural sector as well. Their outflow generates an aging of the rural population and a reduction of vitality. In addition, depending on the conditions of this outflow of population, this could lead very quickly to the appearance of rural areas with serious depopulation problems.

Even if Bangkok surmounts the above problems through installation and expansion of infrastructure and the strengthening of environmental protection and anti-pollution laws, it will not be able to fundamentally solve its urban problems. Improved infrastructure and stronger environmental protection and anti-pollution measures would make Bangkok, a place with many economic opportunities, an even more attractive living environment to people in the provinces desiring to move to the city. This would further increase the flow of population migration towards Bangkok, and the result would be a renewed deterioration of the urban environment and a loss of vitality in rural areas. As long as Bangkok is Thailand's largest city, it will not be able to evade this destiny. In order to break this vicious circle and use the national land effectively, it will be necessary to develop medium and small provincial cities by for example actively promoting the decentralization of corporations, educational institutions, etc.

Until now we have discussed current and future problems in order to clarify the issues facing Thailand. However, there are some signs of improvements as well. For example, according to information we received in our field survey, it appears that while urban planning is being actively promoted, the number of corporations moving into provincial areas is rising. This may be partly due to the fact that while Bangkok is Thailand's first city, its status as such has slowly but steadily been decreasing, as shown in Table 3 ⁶⁾. In addition, a change is occurring in slums, the symbol of urban problems. For example, in our field survey we saw what were previously slums in the center of Bangkok gradually being transformed into housing developments. The transfer of slums to the outlying regions of Bangkok as shown in Table 6 is likely a result of such policy efforts.

Furthermore, people who live in slum areas are people with low incomes. However, when we examine the population under the poverty line and their percentage by region (Table 7), there are still more people under the poverty line in urban areas than in rural ones, but their percentage is steadily decreasing nationally and in both urban and rural areas. This can be seen as a demonstration of the increase in the people's living standard brought about by Thailand's economic development. If such policy efforts and economic development are sustained in the future, we can assume that the problem of slums will be resolved naturally.

(4) Conclusion

We have now described the population situation in Thailand and discussed various population problems, namely: (1) the decrease in vitality in rural areas generated by mass migration from rural to urban areas (depopulation) and the rapid urbanization of the population (overpopulation); (2) the appearance of various urban problems brought about by

the urbanization of the population; (3) the destruction of the environment and increasing seriousness of pollution in urban areas where firms and population are concentrated; and (4) the aging of the population and the shortage of labor due to demographic transition. These problems are either already existent in Thailand or will very likely arise in the near future. On the surface, this would naturally lead one to have a pessimistic outlook for the Thai economy.

But is this superficial perspective appropriate? These problems are the secondary effects of rapid economic development. Without economic development the people of Thailand would not face these problems, but they would also not have experienced improvements in their living standards. In other words, these serious problems correspond to the shadows created when the light of remarkable development is shone on the Thai economy. It is essentially impossible to advance further if we limit ourselves to criticizing the aspects which lie in the shadows.

This is very clear when one considers the history of Japan's economy, with its restoration, period of rapid growth and period of stable growth. In the process of development and maturation of the economy, Japan has already experienced the problems of population migration from rural areas to cities, rapid urbanization of the population, environmental destruction, serious pollution, aging and labor shortages. In this sense, Thailand is currently following the same path as Japan in the past. Perhaps the only difference between Thailand and Japan is that the economic development of Thailand has progressed so quickly that the various problems Japan experienced and gradually overcame in the different stages of its economic development have all seemed to surface at once in Thailand.

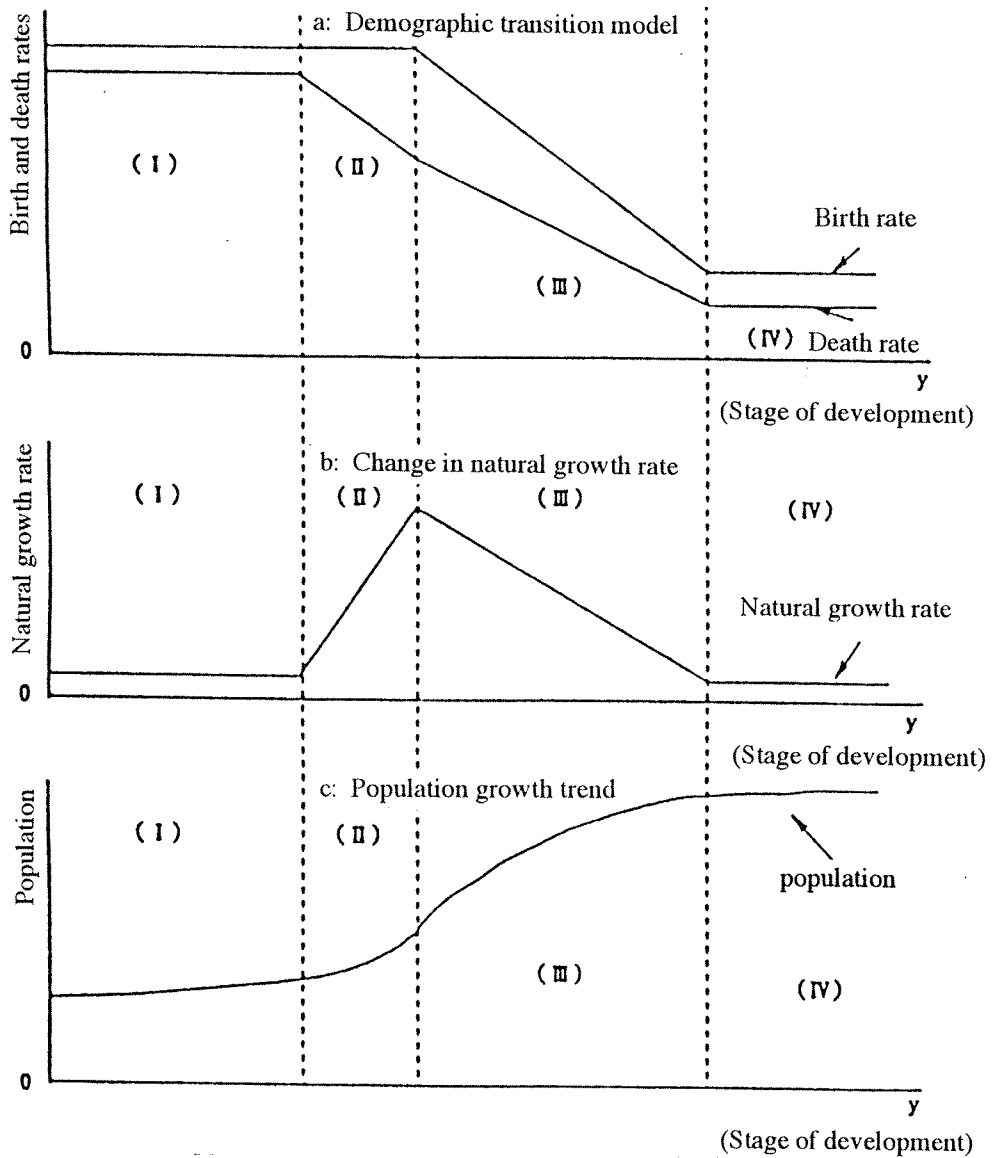
In light of the know-how for problem solving which Japan has gained in the process of economic development, Japan is no doubt capable of and should contributing greatly to Thailand as its government devises policies to deal with the various problems it is now facing and those it will likely face in the future.

Notes

- 1) World Bank, World Development Report 1994.
- 2) Under the current birth pattern, the total number of children borne by one woman throughout her life.
- 3) The registered number of births and deaths announced by Thai authorities lacks reliability due to the great number of omissions. Because of this, many institutions (including the U.N. and the ESCAP) have made various estimations of births and deaths in Thailand. In this report, we have generally used United Nations' estimates.

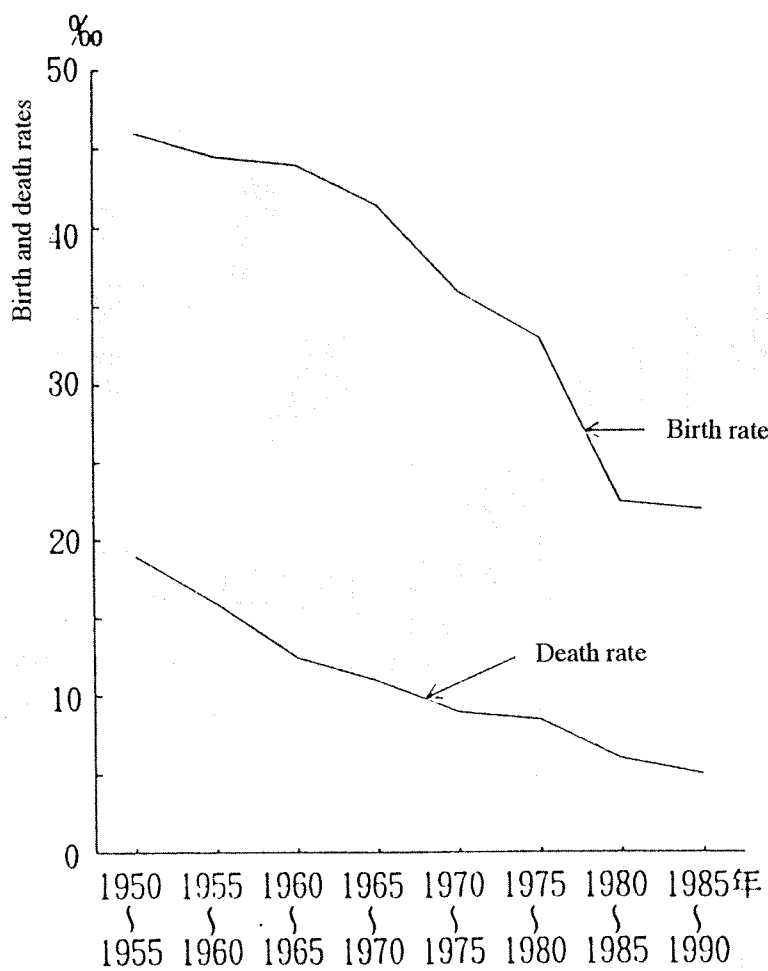
- 4) The reason we use the total fertility rate here is that unlike the crude birth rate it is not affected by the age composition of the population.
- 5) National Statistical Office, 1990 Population and Housing Census (Subject Report No. 1).
- 6) The large number of people moving to the outlying areas of Bangkok, Thailand's capital and its largest city, has also no doubt greatly contributed to the fact that Bangkok's share of the total urban population has been decreasing. This fact can also be surmised from Figure 4 and Table 6.

Figure 1 Demographic Transition Theory



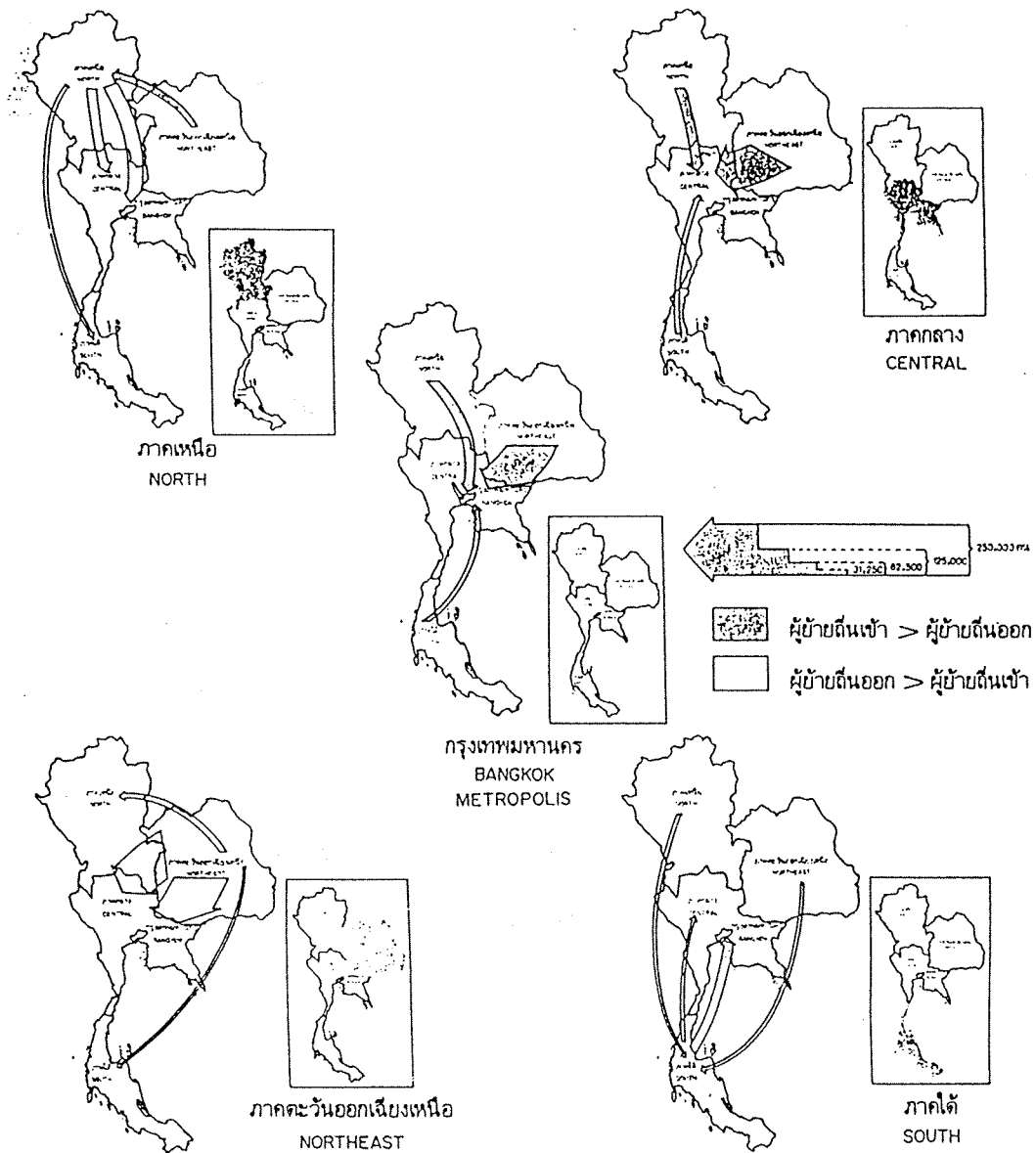
Source : Tomomi Otsuka, "Ajia shokoku ni okeru keizai kaihatsu, jinko zoka, kankyo hakai" (Economic Development, Population Growth and Environmental Destruction in Asian Countries), "Nihon daigaku jinmon kagaku kenkyu kiyo" (Nihon University Humanities and Science Research Bulletin), No. 43, March, 1992.

Figure 2 Demographic Transition in Thailand



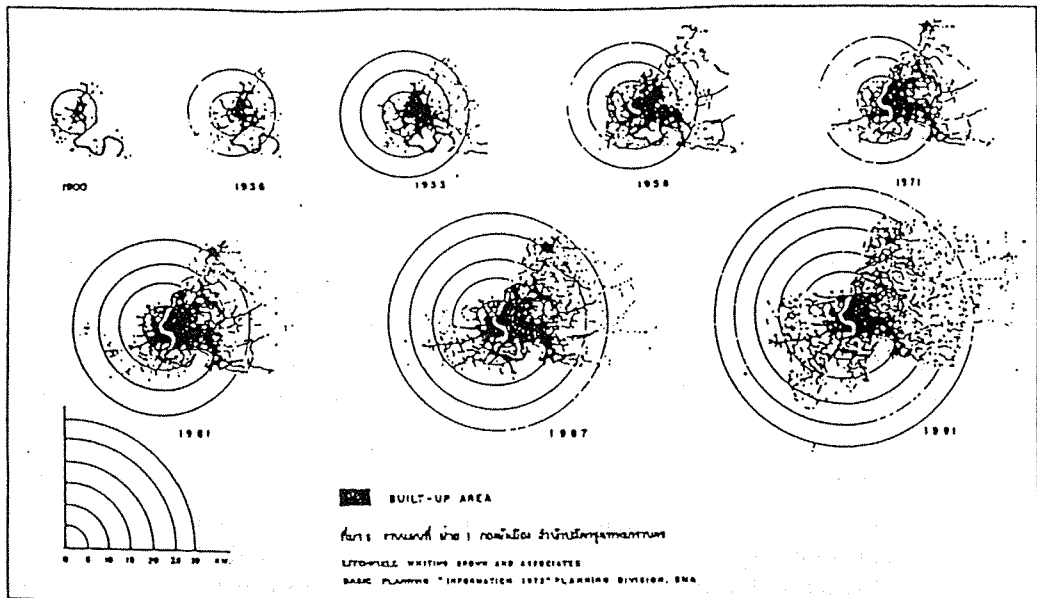
Source : Same as Table 1.

Figure 3 Direction of Population Migration in Thailand



Source : National Statistical Office, Migration, 1990, Population and Housing Census, Subject Report No. 1, Bangkok.

Figure 4 Extensive Expansion of Bangkok



Source : NESDB, National Urban Development Policy Framework (Final Report, Volume 1).

Table 1 Trends in Major Demographic Indices in Thailand

	1950	1955	1960	1965	1970	1975	1980	1985	1990
Total population (in thousands)	20,010	22,762	26,392	30,641	35,745	41,395	46,718	51,187	54,677
Birth rate (‰)	46.6	44.3	43.5	41.8	35.1	31.6	23.7	22.5	
Birth rate (b) (‰)	44.6	45.2	42.1	40.6	-	27.3	*24.8	-	
TFR	6.62	6.42	6.42	6.14	5.01	4.27	3.52	2.57	
Death rate (‰)	19.2	15.9	13.4	11.4	9.3	8.3	7.1	6.3	
Death rate (b) (‰)	22.0	-	-	10.4	9.3	8.4	7.8	-	
Life expectancy (years)	47.0	50.6	53.9	56.7	59.6	61.2	64.4	67.3	
Natural growth rate (‰)	27.4	28.4	30.1	30.4	25.8	23.3	16.6	16.2	
Dependent population index	83.6	84.4	90.3	96.8	96.9	91.9	77.1	65.8	55.8
Young population index	78.1	79.0	85.0	91.1	91.0	86.1	70.9	59.7	49.7
Aged population index	5.6	5.3	5.2	5.7	5.9	5.7	6.3	6.1	6.1
Aging index	7.1	6.8	6.1	6.3	6.5	6.7	8.8	10.3	12.2
Rate of urbanization (%)	10.5	11.5	12.5	12.9	13.3	15.2	17.3	19.8	22.6

Source : For "Birth rate (b)", figures for 1950 to 1969 are from ESCAP estimates, remaining figures are from the Ministry of Public Health, Family Planning Division (*) for 1984). For "Death rate (b)", from Suchart Parasith-rathsint & Chanin Chareonkul, Fertility and Mortality Control Policies in Thailand, National Institute of Development Administration, 1986. Figures for other indices are from United Nations, World Population Prospects (1992) (urbanization figures are from United Nations, World Population Prospects (1990)).

Table 2 Numbers of Migrants Aged 5 and Over and Direction of Migration

(units: % and tens of thousands)

Direction	1965-1970	1975-1980	1985-1990
Urban → Urban	8.9	17.2	13.5
Rural → Urban	10.5	14.3	18.4
Unclear → Urban	3.6	3.3	4.1
Rural → Rural	62.6	52.0	40.9
Urban → Rural	5.4	9.4	12.6
Unclear → Rural	9.0	3.8	10.5
Total migrants	331.1	294.8	402.6

Source : National Statistical Office, Migration, 1990, Population and Housing Census, Subject Report No. 1, Bangkok.

Table 3 Urbanization of the Population and Bangkok

	Year	Bangkok metropolitan area (1)	National (2)	(1) / (2)
Urban population	1960	2,136,435	3,273,865	0.65
	1970	3,077,361	4,553,102	0.68
	1980	4,870,000	7,928,000	0.61
	1990	5,875,900	10,206,900	0.58
Growth rate	1960-1970	3.65	3.3	1.11
	1970-1980	4.59	5.55	0.83
	1980-1990	1.88	2.53	0.74

Source : ESCAP, Urbanization and Socio-Economic Development in Asia and the Pacific, Asian Population Studies Series No. 122.

Table 4 Future Estimates of Major Demographic Indices in Thailand

	1990	1995	2000	2005	2010	2015	2020	2025
Total population (in thousands)	54,677	58,265	61,212	64,088	66,738	69,019	70,875	72,264
Birth rate (‰)	20.5	17.4	16.8	15.8	14.7	13.7	12.8	
TFR	2.21	1.85	1.85	1.85	1.85	1.85	1.85	
Death rate (‰)	5.8	5.6	5.7	5.9	6.3	6.7	7.3	
Life expectancy (years)	69.3	70.8	72.0	73.3	74.2	75.2	76.0	
Natural growth rate (‰)	14.7	11.8	11.1	9.9	8.4	7.0	5.5	
Younger population of productive age (15 - 24) (in thousands)	12,138	11,828	11,657	11,151	10,678	10,146	9,781	9,828
Dependent population index	55.8	50.8	45.4	43.0	41.0	41.0	41.8	43.7
Young population index	49.7	44.0	37.8	34.6	31.7	30.5	28.9	27.7
Aged population index	6.1	6.8	7.6	8.4	9.3	10.5	12.9	16.0
Aging index	12.2	15.4	20.0	24.4	29.3	54.6	69.1	87.0
Rate of urbanization (%)	22.6	25.9	29.4	33.3	37.3	41.3	45.2	49.2

Source : United Nations, World Population Prospects (1990) for urbanization figures. United Nations, World Population Prospects (1992) for all other indices.

Table 5 Trends in Numbers of Pollution-emitting Corporations and their Share of the GDP

Type of pollution-emitting corporation	End of 1969	End of 1979	End of 1989
Water-polluting type corporations	159	5,393	20,211
Air-polluting type corporations	68	2,241	8,120
Water- and air-polluting type corporations	16	604	2,106
Total	211	7,030	26,235
Share of GDP of pollution-emitting industries	-	57%	53%

Source : NESDB, National Urban Development Policy Framework (Final Report, Volume 1).

Table 6 Number of Slum Buildings

Distance from city center (unit: km)	No. of slum buildings			Change in no. of slum buildings	
	1974	1984	1988	1974-84	1984-88
0 - 5	69,738	69,906	63,907	168	- 5,999
6 - 10	42,296	46,031	40,654	3,735	- 5,377
11 - 20	23,091	36,581	47,718	13,490	11,137
21 - 30	4,015	6,370	15,398	2,355	9,028
More than 30	186	1,257	2,961	1,071	1,704
Total	139,236	160,145	170,638	20,819	10,493

Source : NESDB, National Urban Development Policy Framework (Final Report, Volume 1).

Table 7 Population Below the Poverty Line and its Percentage

	1963	1969	1976	1981	1986	1989
Population below poverty line (unit: millions of people)	16.5	13.7	12.8	11.0	15.5	13.1
Percentage by area						
Urban area	61.0	43.0	32.9	25.8	33.9	28.5
Rural area	38.0	16.0	12.5	7.5	5.9	6.7
Nation	57.0	39.0	30.0	23.0	29.5	23.7

Source : ESCAP, Urbanization and Socio-Economic Development in Asia and the Pacific, Asian Population Studies Series No. 122.

Chapter Four

HEALTH AND MEDICAL SITUATION

1. Health

(1) Population density

As of 1993, a population of 58,584,000 persons was living in an area of 513,115.0 km². Though the population growth rate decreased from 3% in 1970 to 1.3% in 1992, by 2012 the population is expected to reach 71,310,000 ¹⁾.

In 1993, the population density was 114.2 persons per km². This is expected to rise to 139.0 persons per km² in 2012, but is still far lower than the figure for Japan (327 persons per km²). However, the population density in metropolitan Bangkok is an extremely high 3,546 persons per km² (as of 1992), so environmental problems can be expected to grow in the future.

(2) Environmental hygiene

In 1991, the percentage of people supplied with appropriate drinking water throughout Thailand reached 67.02%. On the other hand, according to the data of the metropolitan waterworks authority, in 1992 the per capita monthly average consumption of water by the 1,090,995 people with tap water was 64.26 m³. This figure was 28.64 m³ in the provinces ²⁾.

As for waste water treatment, according to 1992 data for Bangkok metropolitan, 68,000 m³ of sewage was processed per day by various methods, including the activated sludge, chemical treatment, aerated lagoon, extended aeration, fixed film package, etc ³⁾.

A report concerning the pollution of waterways ⁴⁾ states that the dissolved oxygen (DO) in the Chao Phraya river was 0.5 mg/liter (compared to a standard value no less than 2.0) and that the biochemical oxygen demand (BOD) was 3.0 mg/liter (for a standard value not more than 4.0). The BOD value has been worsening since 1981, while the DO value has remained virtually constant since 1981. The main causes for the BOD loading are drainage from household (65%) and drainage from factories (22%), followed by restaurants (8%).

84.5% of households had sanitary toilets in 1992. Metropolitan Bangkok produced 4,886.3 tons of garbage per day. In any case, from the health perspective, improvements are necessary in rural areas to check environmental destruction due to the use of chemical fertilizers and insecticides and drainage from chemical fertilizer production factories, and in urban regions in such areas as water supply and sewage systems, waste treatment, air pollution, and environmental hygiene.

(3) Air pollution ⁵⁾

The number of automobiles and transportation services are developing quickly in Thailand and fuel consumption is also rising.

By vehicle type, the most common means of transportation nationally (in 1990) were motorcycles (62.9%), followed by pick-ups (12.2%), private cars (10.2%), private buses (5.9%) and trucks (4.4%). In Bangkok, the most common means of transportation were motorcycles (35.6%), private cars (29.2%), private buses (14.7%), pick-ups (13.1%) and trucks (3.3%). The most common petroleum fuels were diesel fuel (63%), regular gasoline (16%), petroleum (15%), fuel oil (4%) and liquid petroleum gas (LPG) (2%). Thus, diesel fuel, a substance with a low refinement rate and the most damaging consequences on air pollution, accounts for a high share.

Rates of air polluting substances (mg/m^3) were 0.32 for nitric oxides (NO_x) (compared to the U.S. EPA standard of 0.10), 0.01 for lead (Pb) (0.0015), 0.10 (year) and 0.30 (24 hours) for sulfuric oxides (SO_x) (0.365 - 24 hours), 50 (1 hour) and 10 (8 hours) for carbon monoxide (CO) (40 and 10) and 0.33 for SPM (0.26).

Though we do not have sufficient data for evaluation for Bangkok, the number of vehicles emitting black smoke has been increasing in recent years, and this is due to inferior fuels, excess loads and insufficient maintenance of vehicles.

(4) Health and medical expenses ³⁾

The national budget in 1994 is 625 billion baht. Of this, 39.34 billion or 6.29% of the national budget is allotted to the Ministry of Public Health. The 7th five-year plan which started in 1992 calls for 17 programs. The greatest amounts are allocated to health services (64%), followed by environmental health (9.8%) and communicable diseases control (6%).

2. Medical Institutions and Personnel

(1) Medical facilities

Table 1 shows the number of hospitals, medical establishment with bed and health facilities ¹⁾. Approximately one tenth of the 1064 hospitals and 23% of hospital beds were concentrated in Bangkok. This shows that large hospitals are centered in Bangkok.

The most basic units conducting health and hygiene activities are the Health Centers. In each of the 7911 Tambons, there is at least one health center. The midwife and sanitarian are responsible for prenatal, delivery, and postnatal services, immunization, nutrition, family planning and water supply and sanitation activities. The Health Centers also serves first aid and provide treatment for minor illnesses.

(2) Medical personnel

Table 2 shows a comparison of medical personnel for 1987 and 1991 ³⁾. In this

four-year period, the numbers of all types of medical personnel with the exception of auxiliary nurses have increased. In 1991, the number of physicians per 100,000 population was 22.5, the number of dentists 4.2, and the number of nurses (including technical nurses) 112.3. By comparison, in Japan these numbers are 171.3, 47.5 and 455.8, respectively ⁷⁾. Also, the number of physicians per 100 beds is 13.6 in Thailand and 8.9 in Japan. The latter figures alone would imply that conditions are better in Thailand. However, the number of physicians per capita is 4,425 in Thailand and 584 in Japan, demonstrating that the absolute number of hospital beds is insufficient.

3. Causes of Death and Disease Structure

(1) Statistics on deaths

Table 3 shows various statistics on deaths ²⁾. Statistics for deaths of neonates, infants and children under 5 are still high. The maternal mortality rate is low in urban areas, but high in rural areas. It is not possible to make a simple comparison of stillbirths between Thailand and Japan because definitions vary from country to country.

(2) Ten principal causes of death

Table 4 shows the numbers of deaths, deaths per 100,000 population, and a comparison with Japan for the ten principal causes of death. Whereas in Japan the top three causes of death are adult diseases (malignant neoplasm, heart disease and cerebrovascular disease) which occupy 60% all death ⁷⁾, the leading cause of death in Thailand is heart disease, followed by accidents in second place and suicides and homicides in fourth ¹⁾.

Statistics for 1992 show traffic accidents (20.1 deaths per 100,000 population), 19.2 for automobile accidents, 8.6 for homicides or violence, and 6.3 for suicides, suggesting structural problems in Thai society.

(3) PMI (Proportional Mortality Indicator)

The PMI is the percentage of deaths of persons aged 50 and older among total deaths, and is used comparatively to indicate the state of health for a region when mortality statistics are insufficient. In Thailand the PMI was 66.1 in 1991 ¹⁾ (compared to 91.1 in Japan) ⁷⁾. The greater the number of aged persons in a country, the higher its PMI.

(4) Stillbirth rate (per 1000 births)

The stillbirth rate in Thailand is 0.5 below the age of 15, 0.4 to 0.8 from 15 to 39, 1.0 from 40 to 44, and 0.2 from 45 to 49. Normally the stillbirth rate is lowest during the most

suitable years for childbearing. The uniformity of the figures here is likely due to different definition of stillbirths.

(5) Other diseases

In 1992, 15.3% of school children in 99 districts had thyroid disease (goiter)³⁾. Also, 9.05% of newborns were low weight (2,500g or less), while 55.3% weighed 3,000g or more³⁾. Better maternal and infant health care would be desirable.

(6) Physical disabilities

Table 5 shows types and causes of disabilities⁴⁾.

Limb disabilities are the most common, and 28% of these are congenital. This is followed by hearing impairment, of which 82% of the cases is due to congenital anomaly and other causes not specified on this table. 50% of limb amputations are due to four causes (home accidents, farm accidents, factory accidents and traffic accidents), strongly suggesting the need for preventive measures. Furthermore, a large portion of cases of one-eyed and two-eyed blindness is caused by disease which is likely due to nutritional problems, such as lack of vitamin A.

4. Infectious Diseases and Policies

① Morbidity statistics for major infectious diseases per 100,000 population in 1992 are as follows³⁾:

Rubeola:	21.31
Neonatal tetanus:	11.32
Pertussis :	0.59
Diarrhea :	0.05
Polio :	0.007
Dengue fever (morbidity) :	60.7
Tuberculosis (mortality) :	0.22
Tuberculosis (morbidity) :	8.2%

② Malaria³⁾

In 1943, malaria was the leading cause of death in Thailand, with 350 deaths per 100,000 population. Measure to combat malaria were set in place in 1951, and with the 1964 eradication program, the number of deaths had dropped to 8.6 in 1981 and 3.5 in 1986. Currently 40 million people have benefited from this eradication program.

③ Diarrheal diseases ³⁾

Diarrheal are important infant diseases and causes of death. They include dysentery, acute diarrheal and food poisoning, and are related to malnutrition. 0.65% of children aged 5 and under suffer from second and third degree malnutrition. Because of this, oral nutritional supplements and health education are important.

④ AIDS ³⁾

The first patient was reported in 1984, and as of June 30, 1993 a total of 2,260 patients had been reported. Currently, the following plans are being carried with relation to HIV carriers and AIDS patients:

- a. Health education
- b. Discovery of cases
- c. Medical and social counseling
- d. Treatment services for AIDS patients
- e. Expansion of medical and human resources

AIDS has become a major social issue in Thailand, and the statistical data does not necessarily reflect reality. Methods of discovering and offering guidance to HIV carriers will become a major issue in the future.

5. Prevention of Infectious Diseases

In 1992, the rate of vaccination was 90% for BCG, DPT and polio, 80% for rubeola ³⁾.

6. Family Planning

Curbing population growth is a major issue for Thailand. Table 6 shows statistics on the population participating in family planning and methods of family planning ¹⁾.

Whereas oral pills and injections account for roughly 75% of methods of family planning nationwide, in metropolitan Bangkok, oral pills alone account for 55%. Another notable trait is that the percentage of use of condoms among all methods of family planning is 2.7 times higher in Bangkok metropolitan area than in the country as a whole.

7. Crime

Table 7 shows crimes for the nation and for Bangkok metropolitan ¹⁾. Crime can be considered a social malady. The number of crimes involving drugs, gambling and robbery is high. Bangkok, being an urban area, in many cases accounts for 20 to 30% of the national total.

8. Conclusion

Problems which Thailand was facing in the 1980s included the various issues related to economic development and political instability, such social problems as unemployment, poverty, crime, drugs and prostitution, educational problems, and the fact that health and medical measures were advancing slowly despite the existence of many infectious diseases.

Recently, primary health care activities have become common. With the increase of economic power, measures against and prevention of infectious diseases are gradually taking effect, and nutritional guidance is now improving. At the same time, so-called adult diseases are starting to increase.

However, such problems experienced by developed nations as traffic accidents, drugs and AIDS are becoming major issues in Thailand as well. Considering medical treatment, the absolute number of facilities and medical personnel is insufficient, and improvements in these areas will be necessary to improve the health and medical situation.

Though we were not able to sufficiently study environmental issues due to lack of materials, we propose that with the increase of the population density in urban areas, strong measures should be promoted in the future concerning air and water pollution and in the area of environmental hygiene.

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Table 1 Numbers of Hospitals, Hospital Beds and Health Facilities

(1991)

	Nationally		Metropolitan Bangkok	
	Number	Beds	Number (%)	Beds (%)
Hospitals	1,064	93,852	107 (10.1)	21,704 (23.1)
General hospitals	983	79,156	86 (8.7)	18,804 (23.8)
Governmental	755	63,499	20 (2.6)	10,037 (15.8)
Ministry of Public Health	686	48,377	5 (0.7)	2,790 (5.8)
Other ministry	69	15,122	15 (21.7)	7,247 (47.9)
Municipal	11	2,178	4 (36.4)	353 (16.2)
State enterprises	8	2,125	7 (87.5)	2,095 (98.6)
Private	209	11,354	53 (25.4)	4,991 (44.0)
Others	—	—	2	1,328 (—)
Special hospitals	81	14,696	21 (25.9)	2,900 (19.7)
Governmental	33	14,173	8 (24.2)	2,752 (19.4)
Ministry of Public Health	32	13,873	7 (21.9)	2,452 (17.7)
Other ministry	1	300	1 (100.0)	300 (100.0)
Private	48	523	13 (27.1)	148 (28.3)
Health Centers				
Health Centers	7,911			
Community Health Centers	419			
Health Centers (urban)	58			
Private Clinics	13,415			

Note: The figures in parentheses for the number of hospitals and beds in metropolitan Bangkok are the percentage of the national total.

Source: 1

Table 2: Numbers of Medical Personnel

Category	1987	1991 (number per capita)	Breakdown			
			Governmental	State enterprise	Municipal	Private
			Physician	9,580	12,803 (4,425)	9,537
Dentist	1,468	2,408 (23,530)	1,632	76	156	544
Dental hygienist	718	1,221	1,126	9	66	20
Pharmacist	3,622	4,333 (13,076)	2,585	240	116	1,592
Nurse	30,752	40,685 (885)	32,536	1,986	2,263	3,900
Technical nurse	14,286	23,289	22,420	127	260	482
Auxiliary nurse	21,828	14,266	10,375	854	268	2,769
Midwife	8,995	10,582 (5,354)	10,048	25	6	503
Health worker	8,524	15,175	15,050	17	89	19

Source: 3

Table 3 Statistics on Deaths

Item	Numbers	Per capita	Bangkok	Japan ⁷
Total deaths (1992) **	275,313	5.6		6.9
Neonates (under 28 days) (1991) *	3,658	3.8		2.4
Infants (1992) *	7,256	7.5	8.99	4.5
Children under 5 (1991) *	12,338	39.0		
Stillbirths (1992) *	701	0.8	1.4	38.9
Maternal deaths (1991) *	186	0.2	0.07	0.09

Note: * - per 1000 live births; ** - per 1000 population

Sources: 1 for children under 5, 2 for others, 7 for Japan.

Table 4 Comparison of 10 Principal Causes of Death

	1988 (%)	1991 (%)	Per 100,000 population (1991)	Japan ⁷ (1991)
1. Heart diseases	24,286 (10.5)	31,003 (11.7)	54.4	137.2
2. Accidents and poisonings	16,491 (7.1)	25,852 (9.8)	45.4	26.9
3. Malignant neoplasm, all forms	18,284 (7.9)	23,332 (8.8)	41.0	181.7
4. Suicides, homicides and other injuries	8,980 (3.9)	8,386 (3.2)	14.7	16.1 (suicides only)
5. Diseases of liver and pancreas	5,134 (2.2)	7,566 (2.9)	13.3	13.7 (liver)
6. Pneumonia and other lung diseases	5,502 (2.4)	6,394 (2.4)	11.2	62.0
7. Hypertension and cerebrovascular diseases	7,240 (3.1)	6,282 (2.4)	11.0	7.4 (hypertension) 96.2 (cerebrovascular)
8. Nephritis, nephrotic syndrome and nephrosis	3,589 (1.6)	4,511 (1.7)	7.9	13.8
9. Tuberculosis, all forms	4,495 (1.9)	3,668 (1.4)	6.4	2.7
10. Paralysis, all types	3,360 (1.5)	3,466 (1.3)	6.1	
Total deaths	231,227 (100)	264,350 (100)	464.1	674.1

Source: 1

Table 5 Types and Causes of Physical Disabilities

Place of occurrence/ Type	(per 1000 population)										
	Home	During play or athletics	Farm	Factory	Office	Traffic accident	Disease	Congenital anomaly	Unidentified	Others ²⁾	Total
Amputation of part of upper or lower limb	21.3	2.3	12.9	14.8	4.6	12.6	4.4	22.9	1.4	25.1	122.4
One-eyed blindness	11.3	5.6	9.1	5.3	0.4	4.5	15.1	15.7	11.5	21.2	99.6
Two-eyed blindness	0.1	*	2.1	2.4	*	0.4	12.4	10.9	9.5	11.2	48.9
Dumbness	*	*	*	*	*	*	*	51.4	2.1	3.9	57.4
Hearing impairment	0.8	4.1	4.8	0.6	0.7	1.8	12.4	35.3	33.2	46.0	139.8
Total deafness	1.8	0.6	0.6	0.1	*	1.0	2.6	5.5	3.3	4.3	20.0
Paralysis	14.7	*	2.0	1.0	0.9	6.6	29.7	1.3	30.3	18.7	105.3
Cleft lip or palate	-	-	-	-	-	-	-	20.5	-	0.2	20.7
Disability of limbs	17.3	6.0	8.3	*	0.4	16.8	39.6	57.9	18.0	42.4	206.8
Psychosis	*	*	*	*	*	1.1	7.5	8.6	17.3	16.2	50.7
Mental retardation	0.4	*	*	0.8	*	0.2	7.5	84.2	5.9	7.0	106.0
Scoliosis or kyphosis	1.4	0.2	0.9	*	*	*	2.5	3.3	2.1	5.4	15.7
Others ¹ and unknown	11.3	3.6	3.2	1.7	-	10.7	4.4	37.4	13.2	23.0	108.6

Notes: ¹ - severe brain damage, etc.; ² - fight, war, school accident, burns, etc.

Source: 4

Table 6 New Family Planning Acceptors and Methods (1992)

Method	National	Bangkok
Intra-uterine device	102,419 (6.1)	12,188 (3.8)
Oral pills	664,201 (39.3)	174,385 (55.1)
Tubectomy	136,960 (8.1)	13,678 (4.3)
Vasectomy	7,828 (0.5)	3,148 (1.0)
Injection	592,413 (35.1)	47,701 (15.1)
Condom	128,433 (7.6)	64,787 (20.5)
Others	56,364 (3.3)	803 (0.3)
Total	1,688,618 (100)	316,690 (100)

Source: 1

Table 7 Number of Crimes Nationally and in Bangkok

(1991)

Known offense	National total	Bangkok (% of national total)
Murder	5,041	383 (7.6)
Bodily harm and attempted murder	16,173	3,523 (21.8)
Gang robbery	1,198	191 (15.9)
Theft	34,215	9,899 (28.9)
Robbery	2,308	635 (27.5)
Car and motorcycle gang robbery, robbery and theft	8,306	3,124 (37.6)
Cattle gang robbery, robbery and theft	474	—
Sexual offense	10,120	2,294 (22.7)
Against weapons act	15,456	1,312 (8.5)
Against gambling act	95,808	17,099 (17.8)
Against narcotics, opium and marijuana act	102,696	39,965 (38.9)

Source: 1

Chapter Five

DESCRIPTION OF INSTITUTIONS AGENCY VISITED IN THAILAND

Introduction

This year's field survey was conducted in Thailand from July 13 to 26, 1994. In Thailand, the survey schedule was planned primarily by Dr. Prasop Ratanakorn, Secretary General of the Asian Forum of Parliamentarians on Population and Development (AFPPD). We visited two locations: Bangkok, the capital, and Chiangmai, Thailand's second largest city. The institutions visited were chosen in function of the purpose of the survey, and included the Ministry of Public Health, the Bangkok Metropolitan Administration, etc., as listed in the survey itinerary. At these institutions we gathered information on urbanization and development. Here we introduce the information gathered at the different institutions.

1 Ministry of Public Health

Date of visit: July 15, 1994

Person visited: Ms. Patama Bhiromrut, Chief of the Family Health Division

Summary of discussions:

Thailand's national population policy is to support voluntary family planning and to control the population growth rate. Population policies are formulated by the National Economic and Social Development Board (NESDB) as part of the National Development Plan and implemented by the Ministry of Public Health. In addition, university research organizations perform surveys, evaluations and training for the national population policy.

The national population policy was begun in 1972 and incorporated into the Third Development Plan. The Third Development Plan predicted a population growth rate of 2.5% and the number of people using family planning at 2.5 million. The population policy was successful, and in the Sixth Development Plan (1987 to 1991), the population growth rate was 1.3%, the number of people practicing family planning 6.6 million. The current Seventh Development Plan (1992 to 1996) predicts a population growth rate of 1.2% and the number of people practicing family planning at 8.9 million. The main strategy of these policies has been to facilitate the distribution of contraceptives and to widely distribute information about family planning in order to increase the demand for contraceptive methods.

Assistance from Japan and the advanced countries of North America and Europe has played a major role in promoting these policies. For Japan in particular, since 1974 the Japan International Cooperation Agency has provided technical assistance for population and

family planning, trained experts and provided equipment.

Recently, the population policies which Thailand has been promoting are beginning to receive the attention of other developing countries, and some 400 observers from Vietnam, Myanmar, Africa and Latin America visit the Ministry of Public Health each year.

2 Bangkok Metropolitan Administration (BMA)

Date of visit: July 15, 1994

Person visited: Mr. Manu Suvanadat, Director of the City Planning Division

Summary of discussions:

The population of Bangkok in 1994 is 9 million, included unregistered residents. The future population is expected to rise to 12 million. The current population density is 1,800 per square kilometer.

One of the problems in Bangkok currently facing is traffic jams. Bangkok's morning and evening traffic jams are said to be worse than in any other city in the world. For this reason, the Bangkok Metropolitan Administration (BMA) has begun devising measures to deal with the traffic problem. Currently, roads cover 8% of the entire area of Bangkok. In order to alleviate traffic jams, the BMA deems the road surface should be increased to 20%, and is promoting road expansion in some central parts of Bangkok. It is also working on construction plans for other means of transportation, including a subway and an elevated train.

Bangkok's suburbanization plans include the construction of the northern and eastern seaboard and the preparation of new residential zones in the west. In addition, the BMA expects the annual number of airport users to reach 100 million, and is planning the construction of a second international airport in Bangkok.

Another problem Bangkok is facing is air pollution. This problem is related to the traffic issue, as one of the major causes of air pollution is the great number of cars and motorcycles. Table 1 shows the number of motor vehicles in Bangkok. There are 987,999 passenger cars, 70.7% of the national total, in Bangkok. Though vehicle inspections have been partially introduced, it is proving difficult to reduce air pollution caused by exhaust.

Finally, there is the problem of slums. In the 1980s, there were 500 slums within Bangkok. In the 1990s, slums have been moving to the suburbs, and they now number as many as 1000.

3 Chiangmai Province and Chiangmai City

Date of visit: July 18, 1994

Persons visited: Mr. Weereachai Neewboonnia, Governor of Chiangmai Province, and
Mr. Viri Thadtrenon, Clerk of Chiangmai City

Summary of discussions:

Chiangmai Province is located in the north of Thailand. As of 1992, it had a population of 1,530,779 and covered an area of 20,107 km². It is the second largest of the 73 provinces. The capital is Chiangmai City, located 700 km north of Bangkok. It has a population of approximately 150,000. Chiangmai City is a quiet town surrounded by mountains and located at 300 meters above sea level.

Chiangmai City is one of Thailand's major areas of international tourism. Because of this, though its population is 150,000, actually the daytime population is about double this, approximately 250,000, when foreign and Thai tourists and those working in the tourism industry are included. Thus, the city's problems are generated by the daytime population of 250,000.

The first problem is that of garbage. The citizens of Chiangmai and the tourists in the hotels generate large quantities of trash. The City planned to build a new waste disposal site, but this plan is currently on hold due to opposition by citizens.

The City is also projecting the privatization of garbage disposal. A system by which garbage is collected each day for the price of 20 baht (approximately ¥80) per household is being tried out on an experimental basis, with the costs covered half by the City, half by private groups.

Another problem is the illegal construction of homes. The number of illegally built homes is particularly rising on the land along the rivers flowing through the city.

A third problem is sewage treatment. Because of the large daytime population, the amount of sewage is greater than the current sewage treatment capacity, and the city is faced with the urgent task of building more sewage treatment facilities.

Finally, the need for improved transportation systems. The city is planning to build a monorail. However, because of the large number of temples in Chiangmai, the monorail would run above or next to the temples, so the city expects opposition from residents.

4 National Economic and Social Development Board (NESDB)

Date of visit: July 19, 1994

Person visited: Dr. Jawalaksana Rachapaetayakom, Director of the Human Resource Planning Division

Summary of discussions:

The National Economic and Social Development Board (NESDB) is a governmental agency responsible for establishing socioeconomic development as well as population policies. The NESDB is a committee for establishing population policies. Its members consist of personnel from Population Development Association (PDA), Family Planning Association of Thailand, Ministry of Public Health, Ministry of Labor and Ministry of Agriculture. One of the problems regarding family planning in Thailand today is that the people in the south and in the north, particular hilltribe, do not accept it. However, nationwide, the birth rate has been dropping rapidly, and we can say that family planning is succeeding. In addition, with the drop in the birth rate, in 2000 the aged population will account for 9% of the total population. Thus, Thailand is becoming an aging society.

Concerning the education system in Thailand, the rate of students going on to middle school is growing, but the growth in the rate of those advancing to university and higher education institutions is slow. Still, in order to produce and secure human resources for supporting Thailand's high economic growth, emphasis is being placed on higher education consisting of three-year courses after high school (PVS) rather than on university education. The rate of students going on to PVS was 6.8% of total school enrollment in 1988, but this had virtually doubled to 11.4% by 1991. In particular, Thailand's industrial sector has a demand for human resources in technical fields, and it is these human resources which will support Thailand's economic growth in the future.

Finally, let us introduce the model of human resource development in Thailand.

Like in other ASEAN countries, the level of health and medical care in Thailand is by no means high. Because of this, the introductory stage for the development of human resources consists in improvements in the area of health and medical care. The following is the model's cycle:

- 1) Improvements in health and nutrition
- 2) Education and training
- 3) Promotion of employment
- 4) Increases in income
- 5) Increases in rates of saving

- 6) Construction of houses
- 7) Spiritual development
- 8) Improvements in the quality of life
- 9) Preservation of the environment
- 10) Decrease in the birth rate

It is important that in this model the decrease in the birth rate is in tenth place. Experience has shown that beginning with family planning leads to resistance from the people. Models which promote family planning while at the same time improving the living standards of the nation should be adopted by other developing countries as well.

5 National Statistics Office

Date of visit: July 19, 1994

Person visited: Ms. Chintana Pejaranond, Director of the Social Statistics Division

Summary of discussions:

The work of the National Statistics Office's Social Statistics Division consists of collecting and analyzing social statistics, including statistics on population, housing, living quarters, labor, children and youth, education, health and welfare, culture, environment, sports, and attitudes to social conditions.

The functions of the Social Statistics Division are as follows:

- 1) Studies on the particularities, ranges and classification of collected data
- 2) Administration and planning of methods of collecting social statistics data, including the national census and various other surveys
- 3) Planning of questions and guides for data input, including field work and compilation plans
- 4) Analysis and publication of analytical reports on the national census and other surveys
- 5) Planning of population plans for preparing development plan proposals
- 6) Preparation of social indices
- 7) Cooperation with national and international organizations for the exchange of information for the classification and use of social indices
- 8) Cooperation through the exchange of experiences with national and international organizations for the collection of data on social statistics

The Social Statistics Division is divided into four branches with the functions described below.

1. The Population and Housing Statistics Branch

This branch collects and analyzes statistics related to population, housing and living quarters. It also cooperates with national and international organizations concerning the data.

2. The Labor Force Statistics Branch

This branch collects and analyzes statistics related to labor, employment and migration. It also cooperates with national and international organizations concerning the data.

3. The Educational and Social Statistics Branch

This branch collects and analyzes statistics related to education, culture, children and youth, the environment, and related social statistics. It also cooperates with national and international organizations concerning the data.

4. The Social Research Branch

This branch conducts surveys and analyses of social statistics using the national census and related surveys, based on social statistics for the coordination of basic labor data and the preparation of social indices, using demographic analytical techniques, concerning population, labor, education, attitudes and related social statistics. It also cooperates with national and international survey and research organizations. Figure 1 shows the organization of the Social Statistics Division.

6 Chulalongkorn University, Institute of Population Studies

Date of visit: July 20, 1994

Person visited: Dr. Penporn Teerasawat, Vice Director

Summary of discussions:

The Chulalongkorn University Institute of Population Studies was established as an independent research and training unit in 1966. The objective for its establishment was to deepen understanding of the important relationship between population and socioeconomic development in Thailand. The Institute was called the Population Research and Training Center until 1970, at which time it was elevated to the status of institute by Royal Decree. At first, the Institute received subsidies for survey and research expenses from the Population Council in New York, but since 1974 it has been run independently by Chulalongkorn University.

The Institute of Population Studies has three objectives and functions. The first is to promote general and public awareness, interest and knowledge of the population of Thailand. The second is to train Thai people to employ demography or conduct demographic research in the areas of applied studies and science. The third is to offer guidance and information to the

general public, the scientific field, the government and related organizations. The Institute has a demography program for graduate students. Fifteen graduate students study in this program each year, and 130 students have completed the masters course so far.

The Institute has conducted survey and research projects on a variety of subjects, including the urbanization of the population, the aging of the population, population and health, the status of women, the decrease in fertility, the family and household, working women and child raising, population and labor, etc. It also conducts joint research with ASEAN and other Asian countries.

7 Thailand Development and Research Institute (TDRI)

Date of visit: July 20, 1994

Person visited: Dr. Wisan Pupphavasa, Director of the International Economic Relations Program

Summary of discussions:

The Thailand Development and Research Institute (TDRI) was established in 1984 at the direction of the National Economic and Social Development Board with capital assistance from the Canadian International Development Agency (CIDA).

The TDRI was established with the objective of conducting policy research and spreading its results to both the public and private sector. In concrete terms, its goal is to conduct technical and political analyses to support the establishment of long-term policies in order to promote the socioeconomic development of Thailand.

The TDRI's survey and research activities can be divided into six categories. First, "Human Resource and Social Development", concerning the quality of human resource and social development incorporating economic, educational, health, social and cultural elements. Second, "International Economic Relations", concerning the Specialization based on comparative advantage as a major force in the drive toward self-sustained growth. Third, "Macroeconomic Policy", concerning the stability, regulation and growth of Thailand's economy stressing efficiency and fairness. Fourth, "Natural Resources and the Environment", concerning the basic issues of sustainable use of natural resources in all processes, including use, preservation, rehabilitation and development. Fifth, "Science and Technology Development", concerning technology, economy and management in the process of acquisition, development and application of scientific methods for socioeconomic development. Sixth, "Sectoral Economics", concerning the technological and economic transition of the agricultural, manufacturing and service sectors accompanying the social changes of the production structure and rural development as Thailand moves from

agriculture to industry.

Finally, let us list some of the survey and research projects which the TDRI is currently conducting: "Agriculture 2010", "Development of Industrialization", "Promotion of Exports and Economic Development", "Changes in Industrial Structure and Technological Development", "International Environmental Preservation", "Predictions and Policies on the Medium- and Long-Term Demand and Supply of Rice", "Research and Information for the Establishment of Macroeconomic Policies in the Seventh Development Plan", "The Role of the Private Sector in Thailand's Agricultural Development", "Social and Cultural Changes and Policies in Thailand from 1950 to 1990", "Increased Participation of Women in Village Society" and "Thailand's Economic Cooperation in the Asian-Pacific Region".

8 United Nations Fund for Population Activities, Bangkok Office

Date of visit: July 20, 1994 (Wednesday)

Person visited: Dr. Pronchai Suchitta, National Programme Officer

Summary of discussions:

At the Bangkok Office of the United Nations Fund for Population Activities (UNFPA), we discussed the UNFPA's assistance to Thailand and received the following briefing.

The main purpose of the UNFPA is to support the activities of governments in the field of population. The governmental activities targeted for support span a wide range, including proposals for and evaluations of population policies and programs, family planning, population education, the supply of information, the collection of basic data on population, special programs concerning women's issues, and special plans concerning population and development.

The activities of the UNFPA in Thailand began in 1971. Thailand's national family planning program was started at the beginning of the 1970s, and the UNFPA has actively supported these activities. By 1991, the UNFPA's total assistance to Thailand had reached 29 million US dollars. At the first stages, the UNFPA's assistance to Thailand focused on family planning services and particularly on the training of medical personnel and the development of information equipment.

In recent years, the UNFPA has been making efforts to respond to the demands of Thai youth, ethnic minorities and a variety of other population groups. In addition, considering the intimate and important relationship between economic development and population, the UNFPA has conducted various projects in cooperation with the National Economic and Social Development Board (NESDB), and is also actively supporting public and private organizations dealing with population issues with different objectives.

From the above briefing we got the impression that the UNFPA's activities lean to much towards the central government. This may be unavoidable considering the Fund's objectives, but we feel that it should address more efforts at other people who need assistance in the area of population.

9 Economic and Social Commission for Asia and the Pacific (ESCAP)

Date of visit: July 21, 1994 (Thursday)

Person visited: Mr. Nibhon Debavalya, Chief of the Population Division

Summary of discussions:

At the Economic and Social Commission for Asia and the Pacific (ESCAP), we discussed population migration and urbanization in Thailand, received various data on population migration in Thailand, then discussed the following items.

- (1) We suggested that the demographic transition in Thailand (the move from high birth and high death rates to low birth and low death rates) is progressing relatively rapidly, but as a result, the problem of an aging population will likely develop rapidly in Thailand in the near future. Mr. Debavalya agreed that aging would occur. As the survey team imagined, this issue is not very apparent now, but we understood that the faster the Thai economy develops, the more the demographic transition will progress and the birth rate will fall, so aging will become a serious issue. Measures to deal with this issue should be established now.
- (2) We suggested that as demographic transition progresses, the birth rate and in its turn the labor supply will decrease, but that on the other hand, the labor demand will increase as the economy develops, so a shortage of labor will likely occur. Here too, Mr. Debavalya agreed with the survey team. In Thailand, the shortage of labor is beginning to become apparent. It is difficult to obtain detailed statistical data on this, but some signs of the labor shortage are: (a) the fact that the salaries of workers are increasing; (b) the fact that few respond to advertisements for maids, for example; and (c) the fact that in some border areas where there is a shortage of labor the influx of foreign workers is starting to be conspicuous. To deal with these problems, it is necessary to change the structure of the Thai economy from a labor-intensive type to a capital- and technology-intensive type. However, considering the vitality of the Thai economy, it should be possible to surmount this problem.
- (3) We suggested that if the major migration of the population from rural areas to cities continues, the problems of the concentration of population in urban areas and the depopulation of rural areas would become more serious. In response, Mr. Debavalya

stated that various problems are indeed beginning to occur in urban areas, but that the population of rural areas is still high, so there is no need to worry about depopulation for the time being. However, there is a high possibility for depopulation to occur in the future, so Japan's measures to deal with this will be of reference to Thailand.

10 Office of Environmental Policy and Planning, Ministry of Sciences, Technology and Environment

Date of visit: July 21, 1994 (Thursday)

Person visited: Dr. Kluephan Bitrakul, Director of the Urban and Area Planning Division

Summary of discussions:

At the Office of Environmental Policy and Planning, we discussed urban environmental problems. We first received a basic briefing on the organization and role of the Ministry of Sciences, Technology and Environment and the Office of Environmental Policy and Planning. The Ministry of Sciences, Technology and Environment consists of the Office of Environmental Policy and Planning, the Office of Pollution Control, and the Office of Environmental Promotion. The Office of Environmental Policy and Planning is involved in nine projects, including: (1) the establishment of policies and plans for improving and supporting the quality of the national environment in accordance with other national policies; (2) the coordination of various plans concerning the quality of the environment based on the "Enhancement and Conservation of National Environment Quality Act" (B.E. 2535); (3) the monitoring of and the preparation of reports concerning the actual state of the environment; and (4) the management of natural resources in accordance with the "Environmental Quality Management Plan", the "National Environment Quality Improvement Plan" and the "National Socioeconomic Development Plan". We then received the following briefing on the history and current status of environmental and urban issues.

Thailand has actively promoted economic development and achieved rapid economic growth over the last 30 years. As a result, however, Thailand is now faced with the contradiction that this economic growth has led to the deterioration and destruction of natural resources and the environment. In the long term, this situation will be a restrictive factor for economic development and the improvement of the urban environment. Because of this, in 1975 the "Enhancement and Conservation of National Environment Quality Act" (no longer in effect) was established, and such governmental organizations as urban development and regional administrative agencies began managing the urban environment. However, as environmental problems grew more serious, it was necessary to reorganize the administrative mechanism and legislative system, so the new, more comprehensive and legally restrictive

"Enhancement and Conservation of National Environment Quality Act" was enacted in 1992. Furthermore, an Environmental Fund was established as a means of promoting investment in anti-pollution measures by polluting corporations, and the government has already contributed 500 million baht to this fund. Thus, the government is actively dealing with environmental destruction.

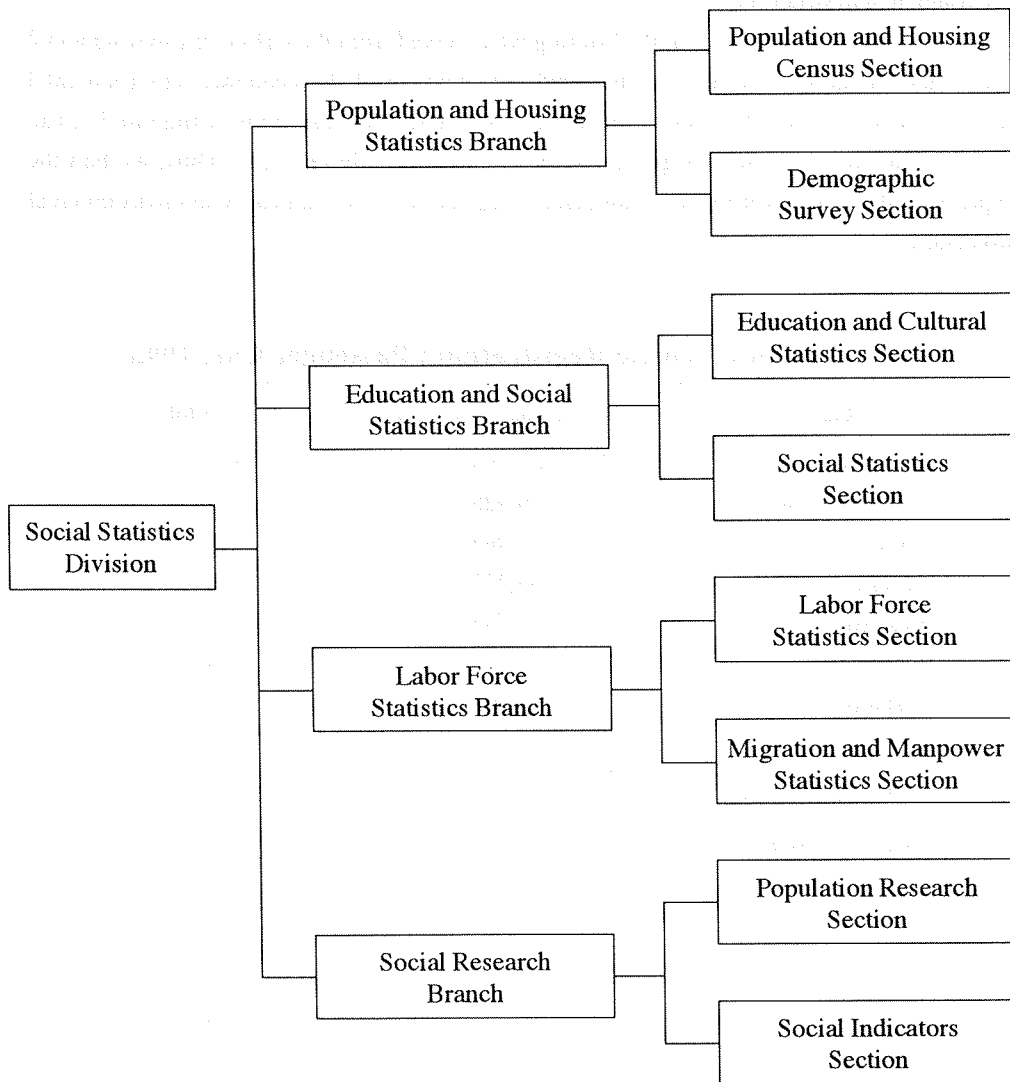
The above is a summary of the briefing we received from the Office of Environmental Policy and Planning. Because of the rapid development of the economy, environmental destruction and the deterioration of the urban environment are also progressing rapidly, and the new law on environmental preservation was just recently enacted. Thus, we had the impression that the government is not prioritizing its measures to deal with environmental protection.

Table 1 Motor Vehicle Registration : Passenger Car, 1992

Region	No. of Passenger Car	% of Total
Bangkok	987,999	70.7
Vicinity of Bangkok	79,928	5.7
Central	32,985	2.4
Eastern	53,237	3.8
Western	32,533	2.3
Northeastern	61,170	4.4
Northern	90,902	6.5
Southern	57,823	4.1
Whole Kingdom	1,396,577	100.0

Source : Pocket Thailand in Figures

Figure 1 Social Statistics Division



Chapter Six

SURVEY MEMBERS AND ITINERARY

Committee in Japan

Toshio Kuroda	Director Emeritus, Nihon University Population Research Institute
Hidesuke Shimizu	Professor, Department of Public Hygiene, School of Medicine, Jikei University
Minoru Kiryu	Professor, College of International Studies, Chubu University (leader of the field research team)
Tomomi Otsuka	Full-time Lecturer, Department of Humanities and Science, Nihon University (member of the field research team)
Tsuguo Hirose	Executive Director, Secretary General, Asian Population and Development Association (APDA)
Masaaki Endo	Assistant Secretary General, Asian Population and Development Association (APDA) (member of the field research team)
Osamu Kusumoto	Senior Researchist, Asian Population and Development Association (APDA)

Cooperators (Survey in Thailand: July 13 - July 26, 1994)

Embassy of Japan in Thailand

Takashi Onda	Ambassador Extraordinary and Plenipotentiary
Nobuharu Kumamoto	First Secretary

Asian Forum of Parliamentarians on Population and Development (AFPPD)

Senator, Prof. Dr. Prasop Ratanakorn	Secretary General
Mr. Skiv Khare	Executive Director

Ministry of Public Health

Dr. Piya Siriphat	Director, International Health Division (IHD)
Mr. Pichayane Saipin	Foreign Relation Officer, IHD
Mr. Patama Bhiromrut	Chief, Family Health Division

Bangkok Metropolitan Administration (BMA)

Mr. Manu Suvanadat	Director, City Planning Division (CPD)
Mr. Premsiri Kasemsunta	Staff, CPD
Mr. Nizuth Rutachong	Staff, CPD
Mr. Sompong Chiraburdarnsook	Staff, CPD

Chiangmai

Mr. Weereachai Neewboonnian	Governor of Chiangmai
Mr. Wichai Kajonpredanon	Chief, Town Planning Office
Mr. Viri Thadtrenon	Chiangmai City Clerk
Mr. Somsak Larpadisorn	Chief, Solid Waste Disposal
Dr. Thongchai Termprasit	Provincial Chief Medical Officer
Dr. Jessada Jittapirom	Deputy, Provincial Chief Medical Officer
Ms. Peyanee Jitjansuwan	Staff, Chiangmai Provincial Public Health Office (CPPHO)
Ms. Surapee Koonyotying	Staff, CPPHO

National Economic and Social Development Board (NESDB)

Dr. Jawalaksana Rachapaetayakom	Director, Human Resources Planning Division
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National Statistics Office (NSO)

Ms. Chintana Pejaranond	Director, Social Statistics Division
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Chulalongkorn University, Institute of Population Studies

Dr. Penporn Teerasawat	Vice Director
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Thailand Development and Research Institute (TDRI)

Dr. Wisan Pupphavesa	Director, International Economic Relations Program
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United Nations Population Fund (UNFPA)

Dr. Pornchai Suchitta	National Programme Officer
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Economic and Social Commission for Asia and the Pacific (ESCAP)

Dr. Nibhon Debavalya	Chief, Population Division (PD)
Dr. Abdus Samad	Chief, Population and Development Section, PD
Mr. Abdul R. Rukanuddin	Project Expert, PD

Ministry of Sciences, Technology and Environment

Ms. Kluephan Bitrakul	Director, Urban Environment and Area Planning Division
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Prasat Neurological Hospital and Institute

Dr. Songsant Panichavatana	Director
Dr. Khanin Kururatapun	Internal Medicine
Dr. Somchai To-wanabutra	Neurologist

Survey Itinerary

(July 13 - July 26, 1994)

Date	Activities
July 13 (Wed.)	<ul style="list-style-type: none">• Departure from Narita.• Arrival in Bangkok.• Discussions on outline of survey with local counterpart.
July 14 (Thurs.)	<ul style="list-style-type: none">• Visit to Embassy of Japan. Courtesy call on H.E. Ambassador Takashi Onda. Briefing on health and medical assistance to Thailand by First Secretary Nobuharu Kumamoto.• Collection of data and materials on population and development.
July 15 (Fri.)	<ul style="list-style-type: none">• Courtesy call on Senator Dr. Prasop Ratanakorn, Secretary General, AFPPD.• Visit to Prasat Neurological Hospital and Institute. Briefing on medical activities by Dr. Khanin Kururatapun.• Visit to Ministry of Public Health. Briefing on population and family planning policies of Thailand by Ms. Patama Bhiromrut, Chief of the Family Health Division.• Visit to Bangkok Metropolitan Administration. Briefing on urban projects in Bangkok by Mr. Manu Suvanadat, Director of the City Planning Division.
July 16 (Sat.)	<ul style="list-style-type: none">• Departure from Bangkok.• Arrival in Chiang Mai.
July 17 (Sun.)	<ul style="list-style-type: none">• Observation of Chiang Mai city.
July 18 (Mon.)	<ul style="list-style-type: none">• Visit to Chiang Mai Provincial Office. Briefing on urban projects in Chiang Mai Province by Mr. Weereachai Naeboonnian, Governor.• Visit to Chiang Mai City Hall. Briefing on urban projects in Chiang Mai by Mr. Viri Thadtrenon, City Clerk.• Departure from Chiang Mai.• Arrival in Bangkok.

Date	Activities
July 19 (Tues.)	<ul style="list-style-type: none"> • Visit to National Economic and Social Development Board (NESDB). Briefing on Thailand's National Development Plan by Dr. Jawalaksana Rachapaetayakom, Director of Human Resources Planning Division. • Visit to National Statistics Office. Briefing on population urbanization and health statistics in Thailand by Ms. Chitana Pejaranond, Director of the Social Statistics Division.
July 20 (Wed.)	<ul style="list-style-type: none"> • Visit to Institute of Population Studies, Chulalongkorn University. Briefing on population urbanization studies in Thailand by Dr. Penporn Teerasawat, Vice Director. • Visit to Thailand Development and Research Institute (TDRI). Briefing on Thailand's National Development Plan by Dr. Wisan Pupphavesa, Director of International Economic Relations Program. • Visit to Bangkok Office of UNFPA. Briefing on UNFPA population assistance to Thailand by Dr. Pornchai Suchitta, National Programme Officer.
July 21 (Thurs.)	<ul style="list-style-type: none"> • Visit to ESCAP. Briefing on population migration and urbanization in Thailand by Dr. Nibhon Debavalya, Chief of the Population Division. • Visit to the Office of Environmental and Area Planning, Ministry of Sciences, Technology and Environment. Briefing on environmental problems in urban areas by Ms. Kluephan Bitrakul, Director of the Urban Environment and Area Planning Division.
July 22 (Fri.)	<ul style="list-style-type: none"> • Observation of eastern seaboard.
July 23 (Sat.)	<ul style="list-style-type: none"> • Arrangement of collected data and materials.
July 24 (Sun.)	<ul style="list-style-type: none"> • Free.
July 25 (Mon.)	<ul style="list-style-type: none"> • Visit to Monawan area. Observation of slum. • Report on survey results to Mr. Shiv Khare, Executive Director, AFPPD.
July 26 (Tues.)	<ul style="list-style-type: none"> • Departure from Bangkok. • Arrival at Narita.

Appendix Documents and Map

List of Documents

- 1 National Urban Development Policy Framework Final Report Volume 1, Office of the National Economic and Social Development Board (Joint NESDB/UNDP/TDRI) P527
- 2 National Urban Development Policy Framework Final Report Volume 2, Office of the National Economic and Social Development Board (Joint NESDB/UNDP/TDRI) P558.
- 3 1990 Population and Housing Census — Whole Kingdom —, National Statistical Office, Office of the Prime Minister Thailand, P269.
- 4 Adjustment of Mortality Statistics and Life Table Construction in Thailand, Suchart Prasith-rathsint, Ph. D. Professor of Sociology, School of Applied Statistics and Urban Studies Center, National Institute of Development Administration, Population Council, December 1986, P78.
- 5 Population, Environment and Resource Sustainability in Thailand, Institute of Population Studies Chulalongkorn University, August 1993, P50 .
- 6 Production Structures, Labor Markets and Human Capital Investment: Issues of Balance for Thailand, Chalongphoh Sussangkar, Thailand Development Research Institute, April 1988, P38.
- 7 Subject Report No. 1 Migration 1990 Population and Housing Census, National Statistical Office, Office of the Prime Minister, P173.
- 8 Impacts of Modernization & Urbanization in Bangkok: An Integrative Ecological and Biosocial Study, A joint research project between Institute for Population and Social Research, Mahidol University and Centre for Resource and Environmental Studies Australian National University, August 1992, P71.
- 9 Thailand Development Research Institute (TDRI) Annual Report 1993, TDRI, P88.
- 10 Population and Economic Development in Thailand: Some Critical Household Behavioral Relations, TDRI, September 1991, P49.
- 11 TDRI Quarterly Review Vol. 9 No. 2, TDRI, June 1994, P35.
- 12 Statistical Profile of BMA 1992, Department of Policy and Planning The Bangkok Metropolitan Administration, P60.
- 13 Bangkok Slums Review and Recommendations, Sopon Pornchokchai, School of Urban Community Research and Actions Agency for Real Estate Affairs, September 1993, P184.
- 14 Report of the 1990 and 1991 Industrial Survey Whole Kingdom, National Statistical Office, Office of the Prime Minister, P260.

- 15 Migration and Urbanization in Asia and the Pacific: Interrelationships with Socio-economic Development and Evolving Policy Issues, ESCAP Asian Population Studies Series No. 111, United Nations, 1992, P117.
- 16 Urbanization and the Status of Women, ESCAP Asian Population Studies Series No. 123, United Nations, 1994, P117.
- 17 Urbanization and Socio-Economic Development in Asia and the Pacific, ESCAP Asian Population Studies Series No. 122, United Nations, 1993, P146.
- 18 Report of the Labor Force Survey Whole Kingdom (Round 1), National Statistical Office, Office of the Prime Minister, February 1992, P371.
- 19 Report of the Labor Force Survey Whole Kingdom (Round 2), National Statistical Office of the Prime Minister, May 1992, P293.
- 20 Pocket Thailand Figures 1st Edition 1994, Alpha Research Co., Ltd, 1994, P324.
- 21 Health in Thailand 1992-1993, Bureau of Health Policy and Plan, Ministry of Public Health, P105.