No. 5

BASIC DESIGN STUDY
ON
THE ESTABLISHMENT PROJECT
OF
THE NATIONAL INSTITUTE OF HEALTH
IN
THE KINGDOM OF THAILAND

MARCH, 1984

JAPAN INTERNATIONAL COOPERATION AGENCY

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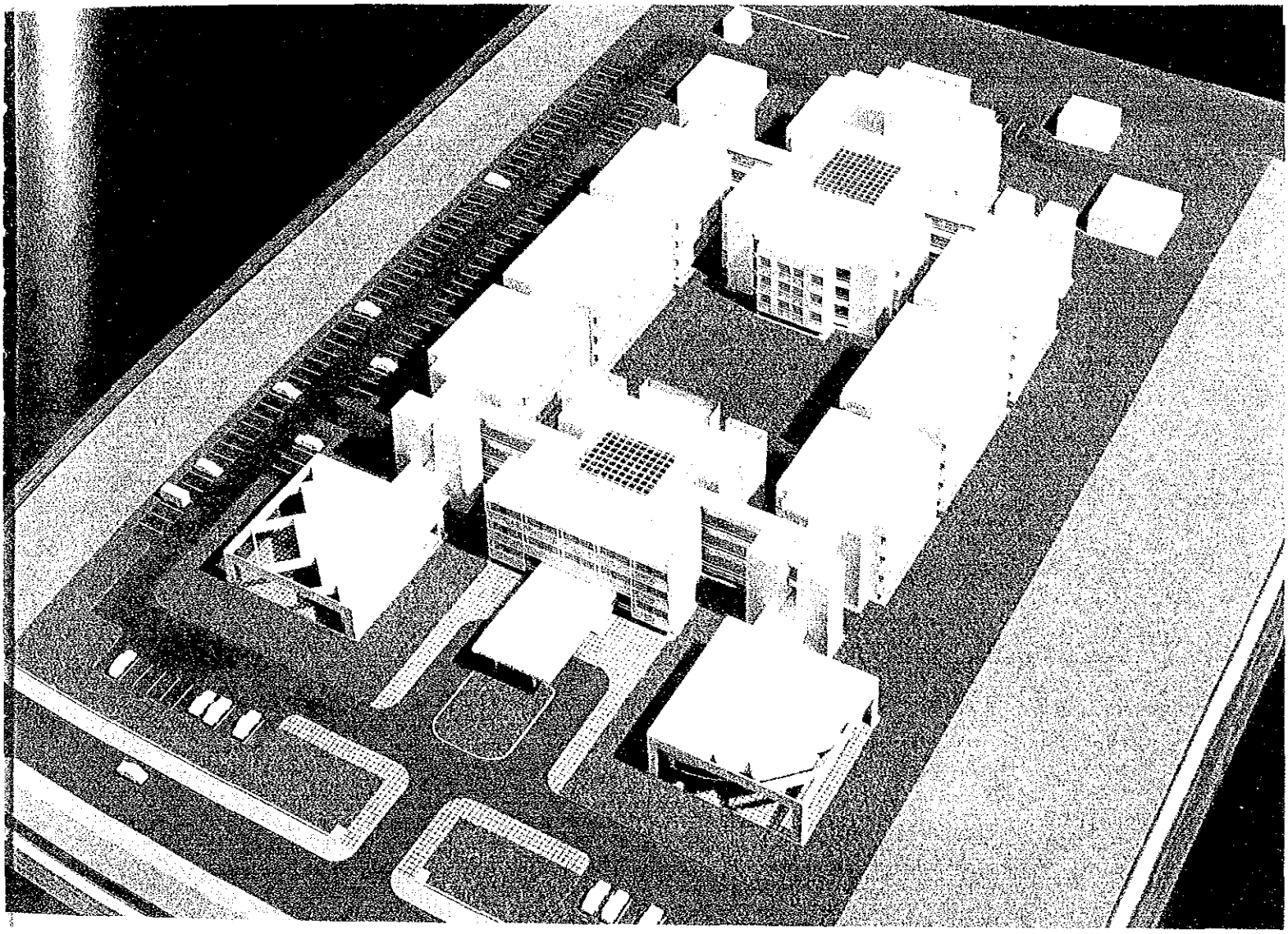


NATIONAL INSTITUTE OF HEALTH
ESTABLISHMENT PROJECT

PREFACE

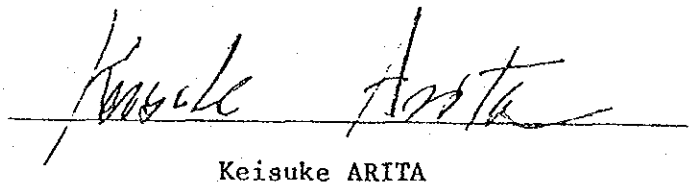
In response to the request of the Government of the Kingdom of Thailand, the Government of Japan decided to conduct a Basic Design Study on the Project for the National Institute of Health and entrusted the survey to the Japan International Cooperation Agency (JICA). JICA sent to Thailand a study team headed by Dr. Ryosuke MURATA (Honarable Member, National Institute of Health of Japan) from November 15 to December 7, 1983.

The team had discussions with the officals concerned of the Government of Thailand and conducted a field survey. After the team returned to Japan, further studies were made and the present Report has prepared.

I hope that this Report will serve for the development of the Project and contribute to the promotion of friendly relations between our two countries.

I wish to express my deep appreciation to the officials concerned of the Government of the Kingdom of Thailand for their close cooperation extended to team.

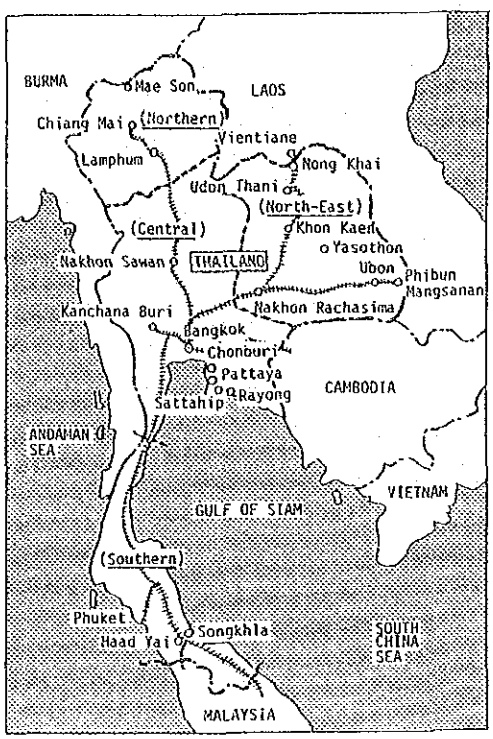
March, 1984



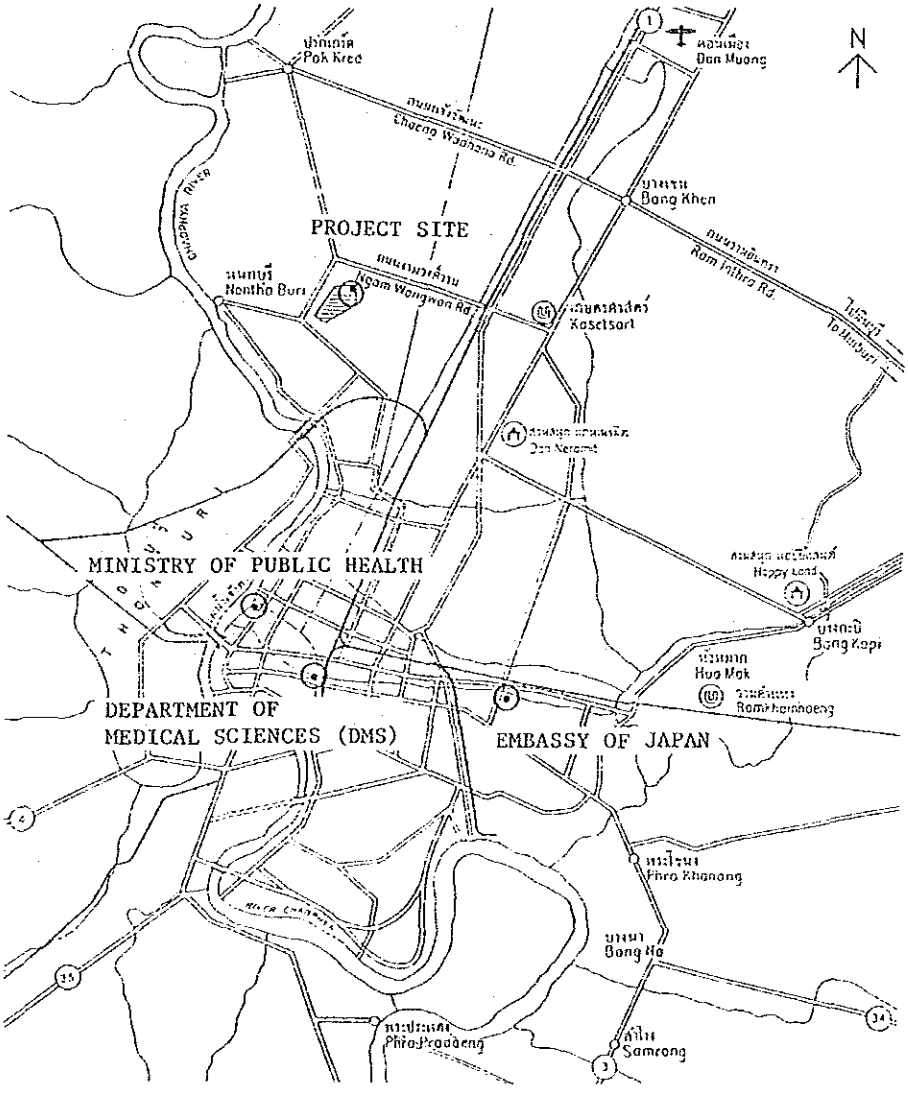
Keisuke ARITA

President

Japan International Cooperation Agency



MAP OF THAILAND



MAP OF BANGKOK

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SUMMARY

SUMMARY

During the past 30 years, the conditions of public health in Thailand has marked a substantial improvement through successful disease control programs and expanding maternal and child health service including family planning activities. In rural areas, however, the problem of various infectious diseases, gastro-intestinal diseases, parasitic infestations and malnutrition remain to be solved and the poor health of the residents of rural areas, who take up almost 80% of the total labor force in Thailand, is a serious blow to agricultural production. Under these circumstances, the Government of Thailand is making serious efforts for improvement of public health through the Fifth National Economic and Social Development Plan (1982 - 1986) supported by the Fifth National Health Development Plan with a specific target of reducing the morbidity and mortality of the nation.

Since 1976, the Government of Japan has been making contributions to this program through the implementation of the Promotion of Provincial Health Services Project, based on the technical cooperation by the Japan International Cooperation Agency, with target on drawing up effective means of promoting public health activities in rural areas, reinforcement of the function for health laboratory services at the regional and provincial levels, and organizing a system for such research and examination.

The Government of Thailand has been recognizing for some time the importance of promoting researches in public health confirmed by scientific data for effective prevention and treatment of diseases, and the above technical cooperation project has helped to further convince them on the urgent need for such researches. As a result, the Government of Thailand drew up a plan for establishing a central institute where such researches can be conducted, and requested for the cooperation of the Government of Japan in the form of a Grant-Aid Project. Responding to this request, the Government of Japan despatched a Basic Design Study Team organized by the Japan International Cooperation Agency and headed by Dr. Ryosuke Murata, honorary member of the National Institute of Health in Japan (hereinafter referred to as "the Team") for the period of November 15 to December 7, 1983 for the purpose of finding out the adequacy of the Project and conducting necessary surveys for drawing up the basic design.

Through various studies conducted in Thailand, the Team confirmed the importance and urgency of organized researches in public health in Thailand, for which it is necessary to establish a central institute for intensive research which will also function as a domestic reference center and a training center for researchers and will help to extend the results of the researches throughout the nation.

By separating the research activities formerly conducted by the existing Department of Medical Sciences, Ministry of Public Health, to form an independent and specialized organization equipped with appropriate facilities and equipment, the Project will provide a pivotal institute for the health research in Thailand.

The researches to be carried out at this organization will be focused on basic researches on health science, to be conducted in the areas of Virology, Bacteriology, Mycology, Parasitology, Immunology, Development and Control of Biological Products, Medical Entomology, Medicinal Plant Research, Environmental Health Science Research, Boimedical Research in Food and Pharmaceutical Sciences, with opportunities for future development in the area of health research directly involved with improving the health of the people. Facilities for joint research such as Scientific Equipment Center and Animal Experiment Center will be prepared for a smooth and effective implementation of the researches.

As a result, it was agreed that the total floor area of the facilities shall be reduced to a little less than 40% of that which had originally been proposed by Thailand, although effective use of common facilities and equipment will most certainly help the institute to exercise its function to its full extent.

Both parties agreed on the official naming of the institute as the National Institute of Health (hereinafter referred to as NIH) which adequately expresses the objectives and features of the institute.

The outline of the Project is as follows:

Project name : National Institute of Health (NIH)

Objectives :
1) To aim at high grade of research on a central level with focus on basic research related to infectious disease control
2) To aim at expansion of public health activities through investigation and analysis of food, drugs and toxic substances
3) To extend to local districts the activities for prevention, diagnosis and treatment of diseases through Regional Medical Science Centers
4) To train and to develop specialized researchers indispensable to such researches

Executing Agency : Department of Medical Sciences (DMS), Ministry of Public Health

Project Site : Nonthaburi Province, Thailand
in the land area of 48,000 m^2 (30 rai) owned by the Ministry of Public Health

Facilities : Research Laboratories, Scientific Equipment Center, Animal Experiment Center, Administration & Training facilities, other facilities, for a total floor area of 14,299 m^2

Equipment : Equipment for Research Laboratories, Scientific Equipment Center, Animal Experiment Center, Training, and Others

Aligned with governmental policies, the Project is expected to contribute substantially in the development in research activities on public health in Thailand by promoting basic research on a high grade in public health at a central level and upgrading the level of research in rural areas at the same time. Such development will pave the way to effective prevention and control in infectious diseases in Thailand contributing, in the long run, in the improvement of health and physical strength of the people of Thailand. Technical cooperation in line with the Project will be expected to carry out in view of effective cooperation and will contribute to promote mutual understanding and friendship between Japan and Thailand.

CHAPTER 1: INTRODUCTION

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1-1 PROPOSAL

For the past 30 years, the Government of Thailand has been making serious efforts, through its Five-Year National Economic and Social Development Plan, for improvement of public health with focus on preventive medicine to pull down the morbidity and mortality of the nation. Those efforts have drastically improved the public health, but has not yet reached a point of substantially controling the infectious diseases, vector-borne disease, parastic infestation and malnutrition in rural areas. Such unfavorable public health of the rural population, which take up about 80% of the total population, is causing a serious drop-down in the labor force.

Since 1976, the Government of Thailand has been implementing the Promotion of Provincial Health Services Project with technical cooporation extended from the Japan International Cooperation Agency (JICA). With the Department of Medical Sciences (DMS), Ministry of Public Health, as its executing agency, the Chon-Buri Regional Health Laboratory, Chanthaburi Provincial Health Laboratory and regional hospital laboratories as a base, the Government of Thailand has been successfully implementing nationwide surveys on public health and related policies, reinforcement of technics and functions of research and examination, training of staff and improved administration.

DMS which is the sole administrative organization in Thailand which provides comprehensive research and examination in the area of

public health, has recognized the importance of reinforcing its organization and function in order to improve the national public health, particularly in rural areas, and has requested for the cooperation of the Government of Japan.

The following is the outline of the proposal made by the Government of Thailand.

(1) Name of Project : National Institute of Health Sciences

(2) Executing Agency : Department of Medical Sciences (DMS), Ministry of Health

(3) Project site : Nonthaburi Province, in an area owned by the Ministry of Public Health
land area : approximately 50,000 m^2

(4) Objectives of the Project : To establish a National Institute of Health Sciences which combines the function of the National Institute of Health and the National Institute of Hygienic Sciences in Japan, to carry out the research activities based on intensive national programs with the ultimate aim of upgrading public health services in rural areas.

(5) Facilities and Equipment for the Project : 1) Facilities
- Main Building of the National Institute of Health Sciences (7-story)
Floor Area : 35,000 m^2

- Accessory Building (for central power supply and central sterilization unit)

  Floor area : 1,000 m^2

- Animal Houses

  Floor area : 1,000 m^2

  Grand total floor area : 37,000 m^2

2) Equipment

- Research equipment (including those for Regional Medical Sciences Center)
- Furnitures

(6) Organization

1) Research Section

- Section of Bacteriology
- Section of Virology
- Section of Parasitology
- Section of Medical Entomology
- Section of Biomedical Research on Foods
- Section of Environmental Chemistry and Toxicology
- Section of Pharmacology and Pharmaceutical Chemistry
- Section of Pharmacognosy and Phytochemistry
- Section of Pathology
- Section of Biological Products

2) Library

3) Office of Administration

1-2 DESPATCHMENT OF BASIC DESIGN STUDY TEAM

Based on the request of the Government of Thailand previously outlined, the Government of Japan despatched a Basic Design Study Team (the Team) headed by Dr. Ryosuke Murata organized by the Japan International Cooperation Agency (JICA) to Thailand from November 15 to December 7, 1983.

After learning details from Dr. Nadhirat Sangkawibha, Director-General of the Department of Medical Sciences (DMS), Ministry of Public Health and other Directors of the Divisions, on the current status of research activities related to public health in Thailand and what laboratory services and medical researches are currently being conducted at DMS, the Team set out to study the social needs and the contribution expected of the Project for National Institute of Health Sciences.

The Team also made detailed studies on the background of the proposal for this Project and the activities on examination and research which DMS wished to conduct through this institute, to find out the specific roles the Institute of National Health Sciences is expected to play. The Team then contacted the experts from JICA who have been assigned to the Promotion of the Provincial Health Services Project in Thailand, to hear about the general circumstances of public health activities, and the researchers and technical staffs involved, and also made a tour of the Chanthaburi Provincial Health Laboratory and Chon-Buri Regional Health Laboratory, etc. At the same time, the Team made in-depth studies on the presence and role of examination/research activities conducted by organization other

than DMS; how the task is alloted to each organization, while finding out about related regulations and collection of information and statistical data.

As a result of these studies, the Team reached the conclusion that promotion of intensive research activities on a governmental level is not only indispensable but also urgent. It was also confirmed that DMS is most appropriate and adequately equipped to function as the implementing organization for this Project.

Based on these understandings, the Team discussed and reached an agreement on the objectives and activities of the newly-planned Institute with DMS, Ministry of Public Health. Those items confirmed by the discussions were summarized in the Minutes of Discussion on the Establishment Project of the National Institute of Health in Thailand and signed by both parties (Refer to (1) of Appendices.) The Team went on to study the activities, size, kinds of facility and equipment necessary, etc., for each unit of research to be conducted at the new Institute, and also held sessions with DMS and made further studies on the Project site.

Taking these results into consideration, JICA made further detailed studies in Japan on the research activities, size, construction schedule and construction costs for the Project, etc., which was compiled into the Report of the Basic Design Study (draft of the final report), and conducted a Confirmation Study in Thailand from February 27 to March 7, 1984. The Team met with the authorities in Thailand to present the Report of the Basic Design Study (draft) and confirm its contents and the issues discussed at the time of

the Basic Design Study. As a result, the two parties reached an agreement on the Report of the Basic Design Study (draft) and exchanged the Minutes of Discussions on March 5. (Refer to (2) of Appendices.)

CHAPTER 2: BACKGROUND OF THE PROJECT

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2-1 SOCIAL AND ECONOMIC STATUS IN GENERAL IN THAILAND

2-1-1 Social and Economic Status in General

Located in the center of the Indochina Peninsula, Thailand shares its borders with Burma to its northwest and west, Malaysia to its south, Laos to its northeast and north, and Cambodia to its east. The southern part of central Thailand and the eastern part of southern Thailand face the Gulf of Siam, while the western part of southern Thailand borders on the Andaman Sea. The total land area of Thailand is 513,000 square kilometers, approximately 1.4 times as large as that of Japan.

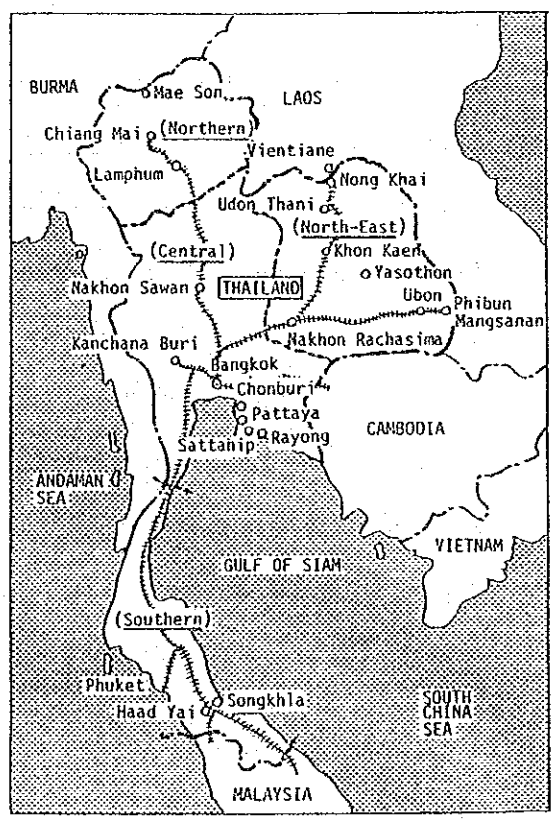


Fig. 2-1-1(a) Regional Sections and Major Cities of Thailand

Officially named the Kingdom of Thailand, the nation works under a constitutional monarchy (two-chamber system) headed by His Majesty King Phumiphol Adulyadet, the ninth king of the Chakkri Dynasty. Thailand is sustained by the deep traditional reverence of its people for the King and the Royal Family, and their confirmed faith in Buddhism. External policies are based on collaborations with the countries of the Western block represented by U.S.A. and Japan, with particular stress on the development, reinforcement and unity of the ASEAN countries. Government powers are highly centralized and well organized. Local administration is sectioned into 72 provinces, which are further subdivided into districts, tambons and villages.

Japan and Thailand have a long history of cultural and economic exchange. Post-war restoration of diplomatic relation was established in 1952, and friendly relationship between the two nations have been maintained to this day. Stronger economic bonds, in particular, have been established in recent years, and Japan today ranks at the top of the list of countries that play a role for promoting trade, investment and general economic status of Thailand. Japan, on the other hand, is extending support, in both economic and technical terms, especially for agricultural development and energy exploitation in Thailand.

The total population of Thailand, according to the statistics of the Ministry of Interior as of the end of 1981, amounted to 47,875,002, broken down to 20.6% in the Northern Region 34.2% in the Northeastern Region, 32.8% in the Central Region and 12.4% in

the Southern Region. Increase in the population of the Bangkok Metropolis has been accelerated in recent years, counting 5,331,402 and taking up 11% of the total population, according to the statistics of the Ministry of Interior as of the end of 1981. The population of major cities other than Bangkok are exceeding small, such as 105,000 for Chiang Mai and 87,000 for Kakhon Ratchasima.

Economy in Thailand has long been dependent on primary products such as rice, teakwood and tin, with the product and export of rice substantially supporting the economy of the nation. Since the 1960s, however, full-range efforts have been adopted for reorganizing of economic structure, and the multilateral and diversified system of agriculture, development of industries and improved infrastructures to conform to new demands have resulted in a remarkable economic growth which continues to this day. During the process of the Five-Year National Economic and Social Development Plans, the first of which started in 1961 and the most recent of which was commenced in 1981 and is still in execution, the Thai economy has confronted, and has overcome such difficulties as the Oil Crisis, Refugees from Indochina, unfavorable balance of trades and aggravated inflation. The results are the steady growth in economy, as shown in the table 2-1-1(a). In particular, the average growth rate of 7.3% during the period of the fourth National Plan, which exceeded the target of 7%, was a remarkable one when the fluctuations and slackening of the world economy in general at that time is taken into account.

(Unit: %)

	1st. Plan (1961.1-1966.9)	2nd. Plan (1966.10-1971.9)	3rd. Plan (1971.10-1976.9)	4th. Plan (1976.12-1981.9)
Agriculture	4.6	4.1	3.9	3.0
Mining	10.9	8.1	0.5	11.2
Manufacturing	10.2	9.2	8.6	9.0
Construction	12.3	8.4	4.0	11.7
Electricity/Water Works	18.2	20.7	14.4	10.9
Transportation/ Communication	9.0	7.5	8.1	8.7
Retail Industry	8.0	7.7	4.8	6.2
Finance	16.6	14.4	5.1	14.4
Real Estate	3.7	4.1	3.6	5.0
Public Service	7.2	10.0	6.0	9.0
Service Industry	6.0	8.8	8.2	9.7
GDP	7.3	7.2	6.2	7.3

Table 2-1-1 (a) Actual Growth of Gross Domestic Product (Source: NESDB)

Breakdown by industries of the Gross Domestic Product is as shown in the table 2-1-1(b). The growth of the secondary industry, as compared with that of the primary industry, is noteworthy. Yet, despite the active efforts made to promote industrialization, however, the economic structure of Thailand is still basically dependent on agriculture, as is evident from that processing and distribution of agricultural products take a high ratio in the Manufacturing/Commerce division, the large contribution of agricultural products in exports, and that 72% of the working population is engaged in agriculture/forestry/fishery.

	Amount (Million Bahts)		
	1980	1981	1982
Agriculture/Forestry/ Fishery	72,784	77,701	77,784
Agriculture	54,179	58,528	59,045
Live Stock	9,011	9,500	9,490
Fishery	6,276	6,777	6,383
Forestry	3,318	2,896	2,866
Mining	4,780	4,623	4,615
Manufacturing	60,597	64,490	68,224
Construction	16,576	15,500	15,721
Electricity/Water Works	5,560	6,330	6,821
Transportation/ Communication	18,811	20,209	21,939
Retail Industry	48,227	51,103	52,669
Bank/Insurance/Real Estate	17,419	19,197	21,489
Housing Ownership	4,502	4,723	4,925
Administration/Defence	12,423	13,192	13,813
Service Industry	31,173	34,202	36,290
GDP	292,852	311,270	324,290

Table 2-1-1(b) Breakdown by Industries of the Gross Domestic Product
(Source: NESDB)

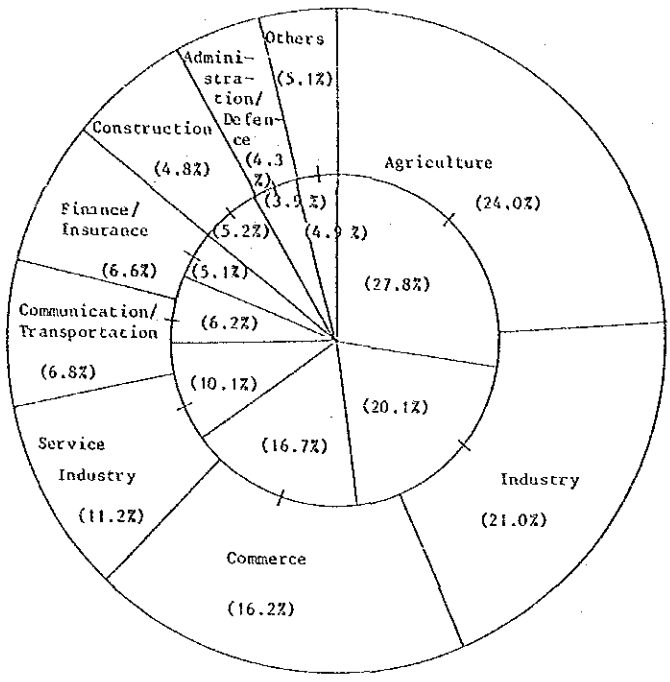


Fig. 2-1-1(b) Composition of the Gross Domestic Product (Source: NESDB)

Trade policy in Thailand is generally free of restrictions, and import and export are conducted on a free basis except for a few authorized and restricted trade items. As is common in developing countries, foreign trade in Thailand can be characterized by export of agricultural products and other primary products and import of industrial products from developed countries. Balance of trade in Thailand has been marking a deficit for a succession of years which, in turn, is intensifying the pressure on the international balance of trade. As a result, industrialization of the nation itself, to lessen the import of industrial products, has emerged as the new target for economic development in Thailand.

Year / Item	1960		1970		1975		1980		1981		1982	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
Rice	2,570	29.8	2,516	17.0	5,852	13.0	19,508	14.6	26,366	17.2	22,504	14.1
Tapioca products		288	3.3	1,223	8.3	4,597	10.2	14,887	11.2	16,446	10.7	19,763
Crude rubber	2,579	29.9	2,232	15.1	3,474	7.7	12,351	9.3	10,841	7.1	9,490	5.9
Sugar	8	0.1	94	0.6	5,696	12.7	2,975	2.2	9.572	6.3	12,932	8.1
Tin	537	6.2	1,618	11.0	2,247	5.0	11,347	8.5	9,091	5.9	7,773	4.9
Maize	551	6.4	1,969	13.3	5,705	12.7	7,299	5.5	8,349	5.5	8,330	5.2
Others	2,087	24.2	5,120	34.7	17,436	38.7	64,830	48.7	72,366	47.3	79,022	49.4
Total	8,612	100.0	14,772	100.0	45,007	100.0	133,197	100.0	153,001	100.0	159,818	100.0

Table 2-1-1(c) Amount of Export of Major Products
(Source: Bank of Tailand)

(Unit: Million Bahts)

	1960	1970	1975	1980	1981	1982
Import (A)	8,614	14,772	45,007	133,197	153,001	159,818
Growth Rate			(8.2)	(23.1)	(14.9)	(4.5)
Export (B)	9,622	27,009	66,835	188,686	216,746	196,612
Growth Rate			(5.6)	(29.1)	(14.9)	(9.3)
Balanceof Trade (A-B)	1,008	12,237	21,828	55,489	63,745	36,794

Table 2-1-1(d) Total Output of Trade
(Source: Bank of Thailand)

The impact of the first oil crisis resulted in the sharp rise in Consumer Price Index of 15.6% in 1973 and 24.3% in 1974, and the prices continued to soar since then, recording a rise of 19.7% in 1980. In 1982, however, the prices settled down, marking arise of less than 10%, and the favorable condition was carried over to 1983 when the rise in commodity prices for the former half of the year remained at only 3.0% compared with the same period in the previous year.

	1978	1979	1980	1981	1982
General	(7.9)	(9.9)	(19.7)	(12.7)	(5.2)
	116.1	127.6	152.7	172.1	181.1
Food	(8.9)	(9.1)	(19.6)	(10.6)	(2.8)
	119.1	129.9	155.4	171.8	176.6
Non-Food	(6.8)	(10.5)	(19.9)	(14.2)	(7.3)
	112.0	123.8	148.4	169.5	181.8
Clothing	(5.1)	(13.7)	(20.3)	(10.0)	(5.5)
	109.6	124.6	149.9	164.9	173.9
Housing	(5.4)	(9.8)	(19.3)	(13.3)	(7.2)
	111.2	122.1	145.7	165.1	177.0
Medical	(9.1)	(6.9)	(20.7)	(10.2)	(6.5)
Expenses	115.1	123.0	148.4	163.5	174.1
Transpor-	(14.8)	(16.7)	(24.2)	(28.5)	(4.8)
tation	118.4	138.2	171.7	220.6	231.2
Culture/Enter-	(6.4)	(10.4)	(19.4)	(10.1)	(8.2)
tainment/Edu-	109.5	120.9	144.4	159.0	172.1
cation					
Cigarettes	(2.7)	(2.7)	(10.9)	(11.4)	(17.8)
and Alcohol	110.0	113.0	125.3	139.6	164.4
beverages					

( ): growth rate compared with previous year

Table 2-1-1(e) Consumer Price Index (for the whole nation 1976=100)
(Source: Ministry of Commerce)

The working population in Thailand is approximately 23.5 million, which take up about 49% of the total population. Breakdown by industries reveal the high concentration of 72.3% of the working population in the field of agriculture/forestry/fishery, although the ratio is gradually going down. The ratio of unemployment is exceedingly small, at 0.8%. Notable trends in recent years is the increase of construction laborers seeking work overseas, and remittance of money by these overseas workers is contributing to the improvement of the balance of the international payment.

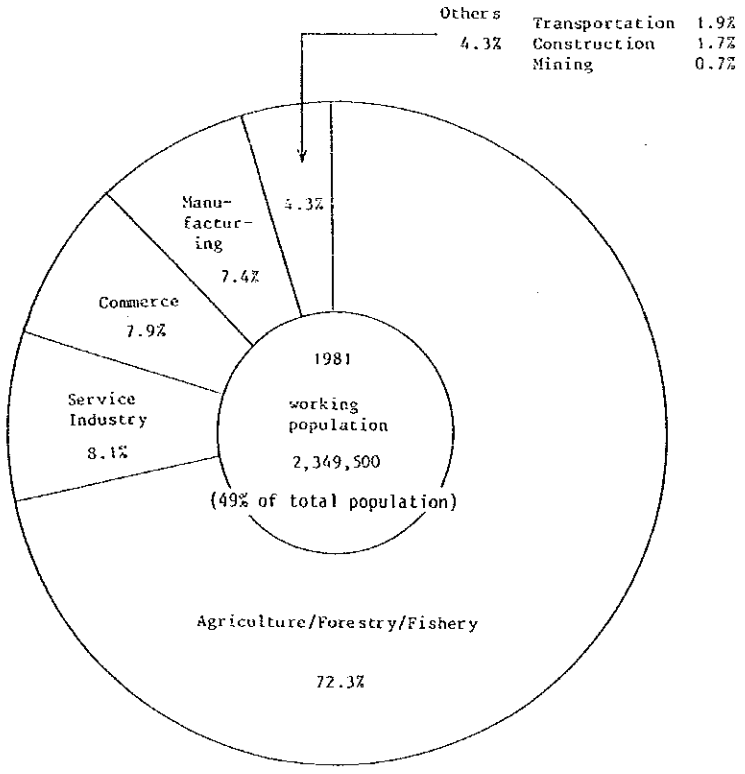


Fig. 2-1-1-(c) Breakdown by Industries of the Working Population (Source: NESDB)

A standard for minimum wages is established by the Ministry of Interior, which is subject to be raised in proportion to the raise in commodity prices in each region. There is a large disparity in the level of wages according to corporations and regions.

(Unit: Baht/day)

Region / Date of Implementation	Bangkok Metropolis and 5 Surrounding Provinces	Central/Southern		Northern/ Northeastern	
		(1) Phangnga Phuket Chonburi Saraburi	(2) Regions excluding (1)	(1) Chiang Mai Naghon Ratchasima	(2) Region excluding (1)
Apr. 1973	12	-	-	-	-
Jan. 1974	16	-	-	-	-
Jun. 1974	20	-	-	-	-
Oct. 1974	20	18	18	16	16
Jan. 1975	25	18	18	16	16
Oct. 1977	28	21	21	19	19
Oct. 1978	35	28	28	25	25
Oct. 1979	45	38	38	35	35
Oct. 1980	54	47	47	44	44
Oct. 1981	61	61	52	61	52
Oct. 1982	64	64	52	61	52
Oct. 1983	66	66	56	63	56

Table 2-1-1(f) Minimum Wages

2-1-2 The Fifth National Economic and Social Development Plan

(1) Policies

The Fifth National Plan commenced in October 1981 regards the following six policies as its main characteristics:

1. To place stress upon the adjustment of economic structures rather than upon economic growth.

2. To take a serious view on equalization in national economy and social development.

3. To alleviate the poverty for people in backward rural areas.

4. To make adjustment between economic development, social development and national security.

5. To give serious consideration on coordination in the implementation of the Plan.

6. To attach importance to the role and cooperation by Private Sectors.

(2) Objectives

The Plan holds up the following six major national development objectives as its specific targets:

1. Recovery of National Economic and Financial Status

To encourage savings and to demand efforts for elimination of wastes from public and private sectors as a means of reducing deficits in the balance of trade and in budget and to increase government revenue. To seek after the enhancement of economic efficiency and productivity for the sake of expansion of exporting capacity by means of improving economic structures and promoting efficiency in the utilization of natural resources.

2. Adjustment of Economic Structures and Improvement of Economic Efficiency

To reinforce the capacity for economic independence to cope with worldwide economic changes as well as to secure high incomes and employment rates for people in rural areas and to diffuse economic activities in rural areas. To realize the annual growth rate of 4.5% in agriculture by increasing the annual crops for the principle farm products by 4.0%. To set a goal of annual growth rate of 7.6% in industries, aiming, in particular, at the annual growth rate of 15% in exporting industries. To suppress annual rate of increase in oil consumption down to 4.8% and to decrease the annual import of oil by 3%. While seeking after the diffusion of economic activities in rural areas, to promote the cultivation of basic industries in the Eastern Seaboard as its pivotal project.

3. Development of Social Structure and Distribution of Social Services

To develop such a social structure as will meet the economic changes. As specific goals, to decrease the annual rate of population growth

down to 1.5% by 1986, and to improve the educational system so as to upgrade the economic, cultural and ethical standard of the people for the foundation of orderly, cultural and ethical society. To reduce differentials of social services such as education, health preservation and medical treatment between rural and urban areas in order to improve the regional standard of living.

4. Poverty Alleviation in Backward Areas

To designate 216 districts and 30 sub-districts in the Northeast, North and South to Target Areas where the extension of education and training and health services and living necessities are to be promoted. To carry out projects for developing fishery and water resources, foundation of district hospitals and soil improvement and to raise the present annual growth rate of 1% up to 2%.

5. Adjustment between Economic Development Activities and National Security Management

To increase defence capability and efficiency of national security management seeking after the effective disbursement of national defence budget and promoting the home production of light firearms. To promote economic and social development in security sensitive and depressed areas in terms of national security.

6. Reformation of Development Administration and Diffusion of Ownership

It is necessary to reform national development administration and management system on central as well as local levels and to acquire

cooperation from private sectors, so that various sectors may carry out the Program efficiently. It is also necessary to promote the diffusion of concentrated ownership of capitals and land.

The following figures have been drawn up as target for the above economic development:

	4th National Program	5th National Program
1. Deficit in Balance of Trade (current value)		
1.1 Annual Average Deficit	45,300	78,400
1.2 Ratio to GDP (%)	7.6	5.9
2. Deficit in Balance of Current Account		
2.1 Annual Average Deficit	37,400	53,000
2.2 Ratio to GDP (%)	6.3	4.1
3. Export of Merchandise & Service		
3.1 Rate of Increase of Total Amount (% per year)	23.7	21.9
3.2 Rate of Increase of Quantity (% per year)	12.1	10.9
4. Export of Merchandise		
4.1 Rate of Increase of Total Amount (% per year)	21.9	22.3
4.2 Rate of Increase of Quantity (% per year)	10.5	11.3
4.3 Annual Average Amount of Export (% per year)	110,900	309,400
5. Income from Tourism		
5.1 Rate of Increase of Total Amount (% per year)	36.2	21.5
6. Import of Merchandise & Service		
6.1 Rate of Increase of Total Amount (% per year)	25.4	18.1
6.2 Rate of Increase of Quantity (% per year)	10.1	7.2
7. Import of Merchandise		
7.1 Rate of Increase of Total Amount (% per year)	26.3	18.1
7.2 Rate of Increase of Quantity (% per year)	10.9	7.3
7.3 Annual Average Amount of Import	156,200	387,800
8. Rate of Growth for Respective Sectors (% per year according to fixed price)		
8.1 Agriculture	3.5	4.5
8.2 Manufacturing Industry	9.3	7.6
8.3 Mining Industry (including Natural Gas)	12.6	16.4
8.4 Natural Gas (Daily Production 1 million F^3)	200 (1981)	525 (1986)
8.5 Gross Domestic Product (GDP)	7.3	6.6
9. Rate of Increase of Demand (% per year according to fixed price)		
9.1 Private Sectors	7.3	5.2
Consumption	6.2	4.8
Investment	12.0	6.9
9.2 Public Sectors	9.3	6.8
Consumption	8.5	7.9
Investment	11.0	4.9
10. Saving/Investment (% to GDP)		
10.1 Saving	23.1	27.0
Public Sectors	1.5	4.3
Private Sectors	21.6	22.7
10.2 Investment	29.4	31.1
Public Sectors	7.9	8.1
Private Sectors	21.5	23.0
11. Public Finance Income (% to GDP)	14.0 (1984)	18.0 (1986)
12. Rate of Increase of Population (%)	2.1 (1984)	1.5 (1986)
c.f. Rate of Increase of GDP Deflator (%)	11.2	10.6

Table 2-1-2 Major Index of Macroeconomy

2-2 CURRENT CONDITIONS OF HEALTH, MEDICAL SERVICES AND PUBLIC HEALTH IN THAILAND

2-2-1 Current Conditions of Public Health in Thailand

(1) Current Conditions of Diseases

The remarkable improvement in public health promoted by the Government of Thailand for the past 30 years has resulted in decrease of mortality and extension of the average life expectancy of the nation. However, the hot and humid climate typical to tropics and the underdeveloped living conditions, particularly in rural areas, are still causing a large number of illness such as malaria, dengue haemorrhagic fever and other vector-borne diseases, a diarrhoea, gastro-intestinal diseases, parasitic infestation and T.B.

Causes	1977		1978		1979		1980		1981	
	Cases	Rates	Cases	Rates	Cases	Rates	Cases	Rates	Cases	Rates
Total	236854	539.3	241146	536.2	241111	523.4	247970	533.8	239423	504.2
Injury and Poisoning	15210	34.6	17076	38.0	16599	36.0	16672	35.9	16426	34.6
Pneumonia	5624	12.8	5144	11.4	4655	10.1	4639	10.0	4250	9.0
Neoplasms	8380	19.0	9174	20.4	9672	21.0	10961	23.6	11726	24.7
Tuberculosis	6934	15.8	7470	16.6	6738	14.6	6643	14.3	5587	11.8
Diseases of circulatory system	6981	15.9	6764	15.0	13246	28.8	14607	31.4	14891	31.4
Acute diarrhoea	5787	13.2	6499	14.5	5031	10.9	3834	8.3	3187	6.7
Malaria	4771	10.9	4595	10.2	3787	8.2	3755	8.1	4071	8.6
Peptic ulcer	3308	7.5	2986	6.6	2830	6.1	2212	4.8	2155	4.5
Complications of pregnancy, child birth and puerperium	1391	3.2	1355	3.0	1105	2.4	1061	2.3	863	1.8
Nutritional deficiencies	1033	2.4	1280	2.8	1164	2.5	850	1.8	817	1.7
Others	177435	404.0	178803	397.6	176284	382.7	182736	393.4	175450	369.5

Table 2-2-1(a) Major Causes of Death (per 100,00)
(Source: Ministry of Public Health)

Year	INDONESIA 1975 - 1980	JAPAN 1981	PHILIPPINES 1975 - 1980	SINGAPORE 1970	THAILAND 1974 - 1975	MALAYSIA (Peninsula) 1976
Male	48.7	73.79	59.1	65.1	57.63	66.2
Female	51.3	79.13	62.4	70.0	63.56	71.4

Table 2-2-1(b) Average Life Expectancy of Newborn Babies (Source: SEAMIC)

The table 2-2-1(c) showing the Major Disease Reported Cases Rates per population of 100 thousand reveals that infectious diseases that can be prevented still exist in large numbers, posing a serious problem on the public health of the people in Thailand.

Diseases	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972
1. Cholera	0.08	9.09	3.25	8.72	0.82	0.01	3.21	3.62	2.13	0
2. Acute Diarrhoea	513.19	475.86	383.52	304.07	224.66	171.28	148.89	133.85	139.00	83.63
3. Food Poiksoning	45.76	40.15	27.65	18.26	13.34	4.30	-	-	-	-
4. Dysentery, total	91.76	63.56	70.72	39.59	28.15	18.50	13.28	10.16	12.84	9.72
Bacillary	20.23	13.21	14.74	8.66	26.86	18.04	13.18	10.10	12.64	-
5. Enteric fever, total	23.85	21.98	21.98	19.36	27.10	14.72	9.36	7.99	6.83	5.16
Typhoid	9.16	7.95	6.64	5.60	8.82	-	-	-	-	-
Paratyphoid	0.14	0.13	0.11	0.21	0.14	-	-	-	-	-
6. Hepatitis, total	19.90	26.93	27.39	21.00	22.49	15.91	14.12	12.99	12.35	10.58
infectious	5.19	5.69	6.26	5.00	-	-	-	-	-	-
serum	0.14	0.14	0.09	0.14	-	-	-	-	-	-
7. Poliomyelitis	0.54	0.63	2.35	1.42	1.99	1.87	1.05	1.53	2.32	0.89
8. Rabies	0.45	0.53	0.50	0.50	0.52	0.44	0.36	0.35	0.36	0.30
9. Influenza	116.09	106.31	69.98	50.04	62.09	53.50	31.82	22.08	9.11	15.47
10. Measles	51.17	35.60	28.55	18.90	19.98	12.92	8.10	6.73	7.35	4.15
11. Rubella	0.76	1.50	1.58	0.66	0.39	0.15	0.16	0.16	0.14	-
12. Chickenpox	6.96	7.60	2.99	1.30	1.81	1.32	0.66	1.00	0.22	1.24
13. Conjunctivities	115.99	64.09	22.11	9.30	3.94	2.48	6.35	4.15	0.70	0.32
14. Dengue haemorrhagic fever	54.06	91.96	24.92	27.90	88.28	22.43	42.43	20.05	20.92	61.81
15. Encephalitis, total	3.29	5.12	4.52	3.34	3.96	3.64	3.87	3.97	4.51	3.21
Japanese B.	0.07	0.06	0.01	0.06	-	-	-	-	-	-
16. Malaria	344.15	261.79	164.16	156.93	147.54	122.12	123.85	110.03	81.01	26.19
17. Scrub typhus	0.05	0.04	0.12	0.15	0.13	0.22	0.05	0.01	0.02	-
18. Diphtheria	1.67	4.07	4.36	3.94	5.21	5.47	4.62	4.68	4.26	6.02
19. Pertussis	6.20	10.22	11.06	5.72	7.17	4.62	7.84	5.89	4.74	6.36
20. Tetanus, total	3.87	3.85	4.34	4.82	4.50	4.12	3.69	3.68	3.76	3.94
neonatorum	59.31	1.41	1.63	-	-	-	-	-	-	-
21. Meningococcal disease	0.04	0.05	0.07	0.08	0.08	0.11	0.06	0.05	0.06	0.06
meningococcal meningitis	0.04	0.05	0.06	0.07	0.08	0.10	0.06	0.05	0.06	0.06
22. Tuberculosis, total	30.37	31.76	28.83	23.53	16.09	5.12	-	-	-	-
pulmonary	28.85	30.16	27.52	22.72	15.63	4.89	-	-	-	-
meningitis	0.92	0.89	0.67	-	-	-	-	-	-	-
23. Leprosy	1.24	0.95	0.74	1.09	0.97	0.20	0.30	0.36	0.03	-
24. Yaws	0	-	-	-	-	-	0.02	0.02	0.03	0.04
25. Pyrexia of Unknown Origin	294.73	297.57	178.32	128.85	140.30	99.39	77.30	-	-	-

Table 2-2-1(c) Major Disease Reported Cases Rates
(per 100,000 population)
(Source: Ministry of Public Health)

The transition in the number of reported cases of acute diarrhoea and malaria, both of which rank high in the list of morbidity, shows a steep annual increase. The abrupt increase in the number is partly due to the result of administrative efforts to track down the actual circumstances and to encourage reporting of such diseases.

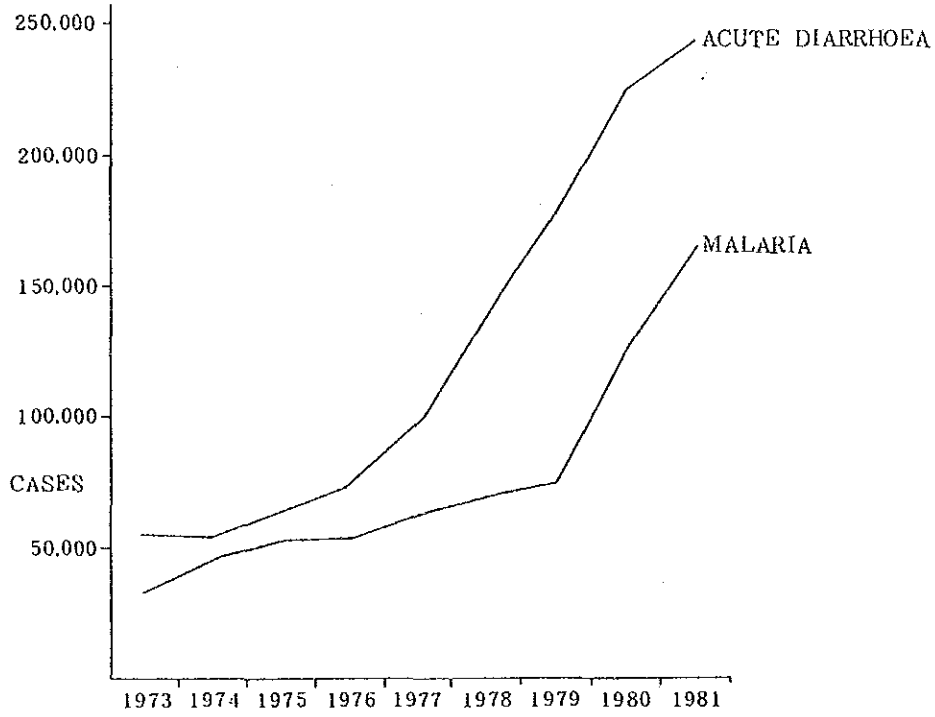


Fig. 2-2-1(a) Acute Diarrhoea and Malaria-Reported Cases (Source: Ministry of Public Health)

(2) Infectious Diseases

As these statistics point out, Thailand has not yet reached a point of controlling the prevalence of infectious diseases which is a grave concern in the public health of the nation, as it is in other developing countries.

The urgent need to solve this problem is recognized by the Government of Thailand, which is adopting countermeasures in wide scopes.

Countermeasures are called, particularly for gastro-intestinal infections such as cholera, dysentry, enteric fever, hepatitis, poliomyelitis, acute diarrhoea of unknown causes and food poisoning, followed by malaria, dengue haemorrhagic fever and encephalitis. The efforts of the Government, however, has not yet resulted in a substantial improvement of the situation and, despite some effects in the treatment of the patients of those diseases, systems for preventing them has not yet been sufficiently organized. Countermeasures against infectious diseases, especially for preventing them, is expected to play an increasingly important role in public health in Thailand, for which it will be necessary to promote the improvement and extension of medical services, provide appropriate facilities, and also prepare for epidemiological surveillances. Reorganization of the administrative structures and upgrading of the sanitary environment is also indispensable. These countermeasures are regarded as targets in the field of public health in the Fifth National Economic and Social Development Plan, and the problem of infectious diseases is counted among the major objectives of the Fifth National Health Development Plan.

2-2-2 Public Health Administration in Thailand

Public health administration consists of two systems, namely, administration under the jurisdiction of the Ministry of Public Health and rural administration under the jurisdiction of the Bangkok Metropolis and provinces. The Ministry of Public Health is responsible for public health in general and most of the medical

services. It is organized as indicated in the Fig. 2-2-2(a). In Thailand, practically all of those engaged in public health, including doctors, belong to this Ministry under the circumstances where the Ministry of public health is able as well as is obliged to control the public health administration. As to the rural administration of public health, it is under the control of the Office of the Under-Secretary of State with Provincial Health Officers stationed in each of the 72 provinces under whom District Health Offices are placed and carry out public health administration. On the other hand, within the administrative frameworks of respective provinces, District Hospitals, Health Centers and Midwifery Centers are operated under the supervision of Provincial Health officers and District Health Officers. While Regional Hospitals, Provincial Hospitals and District Hospitals are under the jurisdiction of the Provincial Chief Medical Officer, the nine National Hospitals in Bangkok are directly controlled by the Department of Medical Services, Ministry of Public Health.

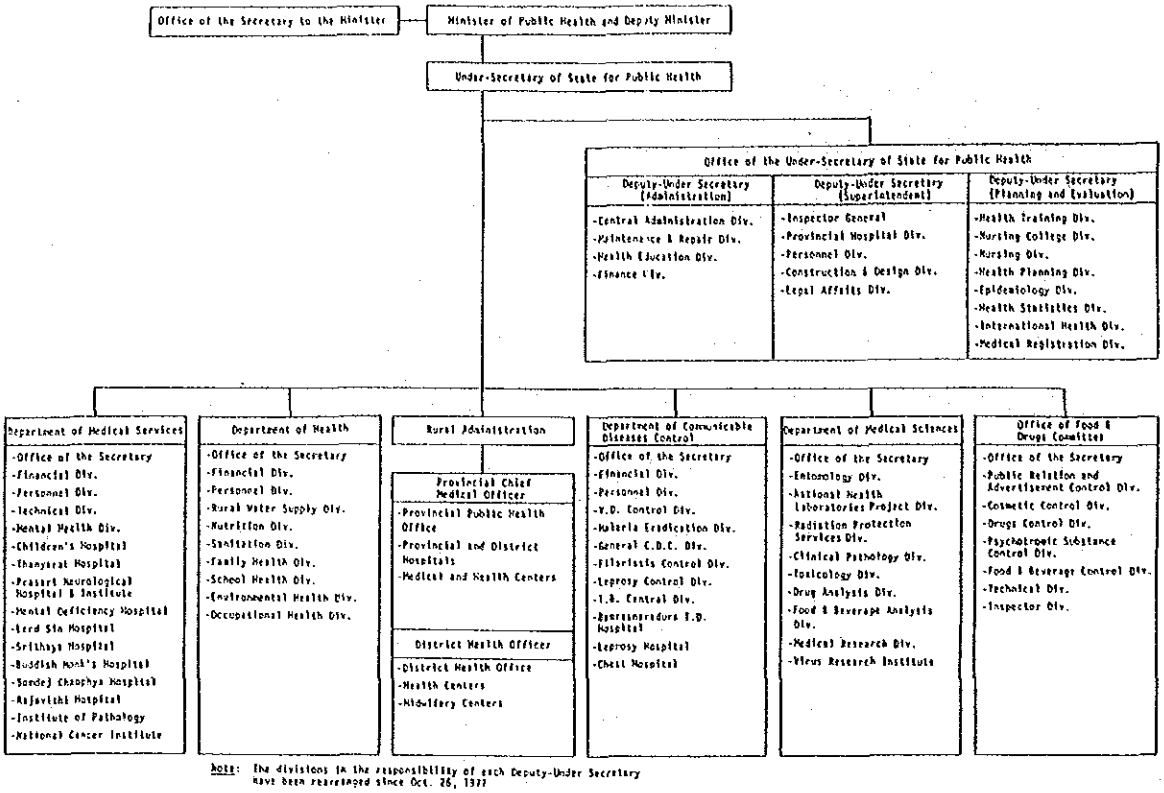


Fig. 2-2-2 (a) Organization of the Ministry of Public Health

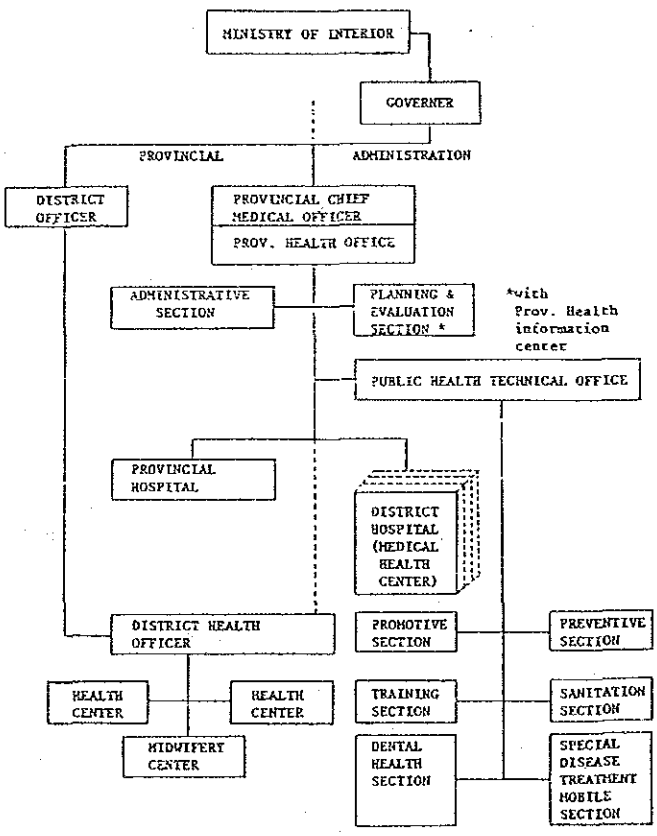


Fig. 2-2-2 (b) Organization for Rural Adminsitration of Public Health
(Soruce: Ministry of Public Health)

2-2-3 Facilities and Manpower of Public Health in Thailand

(1) Facilities

Facilities for public health consist of governmental and private facilities, and the ratio in the average per capita of their utilization is about 3 to 1. Private facilities, as may be expected, lay emphasis on medical treatment, and are predominant in Bangkok and main cities, while public health services by governmental organizations give priority to rural areas. The present number of facilities and number of beds are indicated in the Table 2-2-3(a) and (b).

Type of Organization / Category of Establishment	Governmental	State Enterprise	Municipality	Private	Total
Hospital	50,840 (88%)	729 (1%)	1,589 (3%)	4,628 (8%)	57,786
Health Center 1st Class	3,427 (98%)	0 -	78 (2)	0 -	3,505
Health Center 2nd Class	0 -	17 (100%)	0 -	0 -	17
Maternal and child Health Center	607 (100%)	0 -	0 -	0 -	607
Midwifery Center	0 -	0 -	0 -	395 (100%)	395
Total	54,874 (88%)	746 (1%)	1,667 (3%)	5,023 (8%)	62,310

Table 2-2-3-(a) Number of Hospitals, Health Centers, Midwifery, Maternal Centers and Sector ratio (1976) (Source: Ministry of Public Health)

Type of Organization / Category of Establishment	Governmental	State Enterprise	Municipality	Private	Total
Hospital	179 (61%)	14 (5%)	6 (2%)	96 (32%)	295
Health Center 1st Class	295 (76%)	0 (0%)	94 (24%)	0 (0%)	389
Health Center 2nd Class	3,626 (99%)	7 (0%)	11 (0%)	0 (0%)	3,644
Maternal and child Health Center	5 (100%)	0 -	0 -	0 -	5
Midwifery Center	1,442 (96%)	0 -	2 -	53 (4%)	1,497
Total	5,547 (95%)	21 -	113 (2%)	149 (3%)	5,830

Table 2-2-3-(b) Number of beds and Sector ratio (1976)
(Source: Ministry of Public Health)

Detailed composition of governmental hospitals is as follows:

Number of hospitals in Bangkok	7
Number of regional hospitals	14
Number of provincial hospitals (total)	75
61 - 120 beds	6
121 - 140 beds	26
241 - 360 beds	35
more than 361 beds	8
Number of district hospitals (total)	297
60 beds	7
30 beds	85
10 beds	205

Per Hospital Bed Population in Thailand is 670 (1977), about nine times as many as that of Japan, and there is also a great difference between Bangkok and rural areas, per bed population in Bangkok is 330 as compared with 1,600 in other areas, which is partly responsible for these circumstances.

(2) Manpower

The Number of personnels engaged in public health and medical services is indicated in the table 2-2-3(c).

Type of Organization / Category of Establishment	Governmental	State Enterprise	Municipality	Private	Total
Phisician	4,314 (83%)	151 (2%)	284 (5%)	461 (9%)	5,210
Dentist	602 (81%)	29 (4%)	77 (10%)	36 (5%)	744
Dental Hygienist	201 (83%)	7 (3%)	23 (10%)	10 (4%)	241
Pharmacist	687 (33%)	96 (5%)	62 (3%)	1,229 (59%)	2,074
Health Worker	6,050 (96%)	5 (0)	211 (4%)	7 (0)	6,273
Nurse	10,816 (79%)	5,205 (4%)	1,073 (8%)	1,286 (9%)	13,700
Practical Nurse	8,710 (83%)	184 (2%)	316 (3%)	1,264 (12%)	10,474
Midwife	6,785 (93%)	29 (0)	46 (1%)	444 (6%)	7,304
Sanitary Engineer	63 (93%)	0 -	0 -	5 (7%)	68
Total	38,228 (83%)	1,026 (2%)	2,092 (5%)	4,742 (10%)	46,088

Table 2-2-3-(c) Number of Public Health Personnels and Sector Ratio (1976)
(Source: Ministry of Public Health)

As to the number of doctors, one doctor versus population of 6,800 in Thailand compares very unfavorably with the similar figure of

882 in Japan which is about eight times as many. Apart from the insufficient absolute number of doctors, a large disparity between Bangkok and other areas is partly responsible for this. While one doctor versus a population of 1,000 in Bangkok comes up to the international standard, one doctor versus a population of 80,000 in rural areas is much below the standard. As many as 67 percent of doctors, and 75 percent of total public health manpower, are concentrated in Bangkok. An average District Hospital with about 10 beds, the main provider of rural medical services, is maintained by one doctor and several nurses, serving a population of 50,000 and an average Health Center maintained by one midwife and one sanitarian covers a population of 4,000 to 5,000.

category	1978	1981
A. In provincial towns & rural areas (excluding Primary Health Care Workers):		
1. Nursing personnel, midwives and sanitarians	24,645 1/1,796	27,784 1/1,576
2. Physicians	1,458 1/30,365	2,048 1/21,386
B. In rural areas* (excluding Primary Health Care Workers):		
1. Nursing personnel, midwives and sanitarians	13,287 1/2,814	12,302 1/3,373
2. Physicians	379 1/98,658	524 1/79,198

* district and sub-district towns

Table 2-2-3-(d) Number of Physicians and Nurses in Rural Areas (Source: Ministry of Public Health)

As to the education of doctors, the number of graduates is increasing since 1979 owing to new establishment of two medical colleges. In connection with the training of nurses, new nursing schools are being founded and reinforcement of medical experts are being sought after. The number of doctors and nurses, as indicated in the table 2-2-3(e), is considered to be necessary and is aimed at. Measures to increase laboratory technicians and laboratory aids are also being taken.

New *	Total	For Provincial - Hospitals	For Provincial Offices	For District Hospitals and Health Centers
M.D.	2,500**	1,372	152	525
Nurses	10,000	7,950	62	1,292
Dentists	750**	-	172	-

* Does not include the requirements of other ministries or private sector.

** The excess over provincial and rural health centers are needed in urban areas and teaching hospitals.

Table 2-2-3-(e) Required Number of Physicians and Nurses (Source: Ministry of Public Health)

In order to improve the rural health services, the Ministry of Public Health started Primary Health Care Program in 1977, training so-called non-experts such as Village Heatlh Volunteer, Village Health Communicator, Tambon Doctor and Granny Midwife, as primary health workers so as to replenish and reinforce the insufficient experts.

2-2-4 Health Development Plan in Thailand

(1) National Health Development Plan

The National Health Committee consisting of top executives in the Ministry of Public Health and the National Economic and Social Development Board (NESDB) exercises overall responsibility for national health policies and priorities. The NESDB is the responsible body at the national level for stimulating and integrating plans from all the social and economic sectors. It comes directly under the Office of the Prime Minister.

The National Health Planning Sub-Committee consisting of representatives from various health and health-related agencies, including the Department of Technical and Economic Cooperation (DTEC), Budget Bureau, formulates the Health Development Plan and submits it for final approval by NESDB. For a diagramatical representation of the planning process, refer to the Fig. 2-2-4(a).

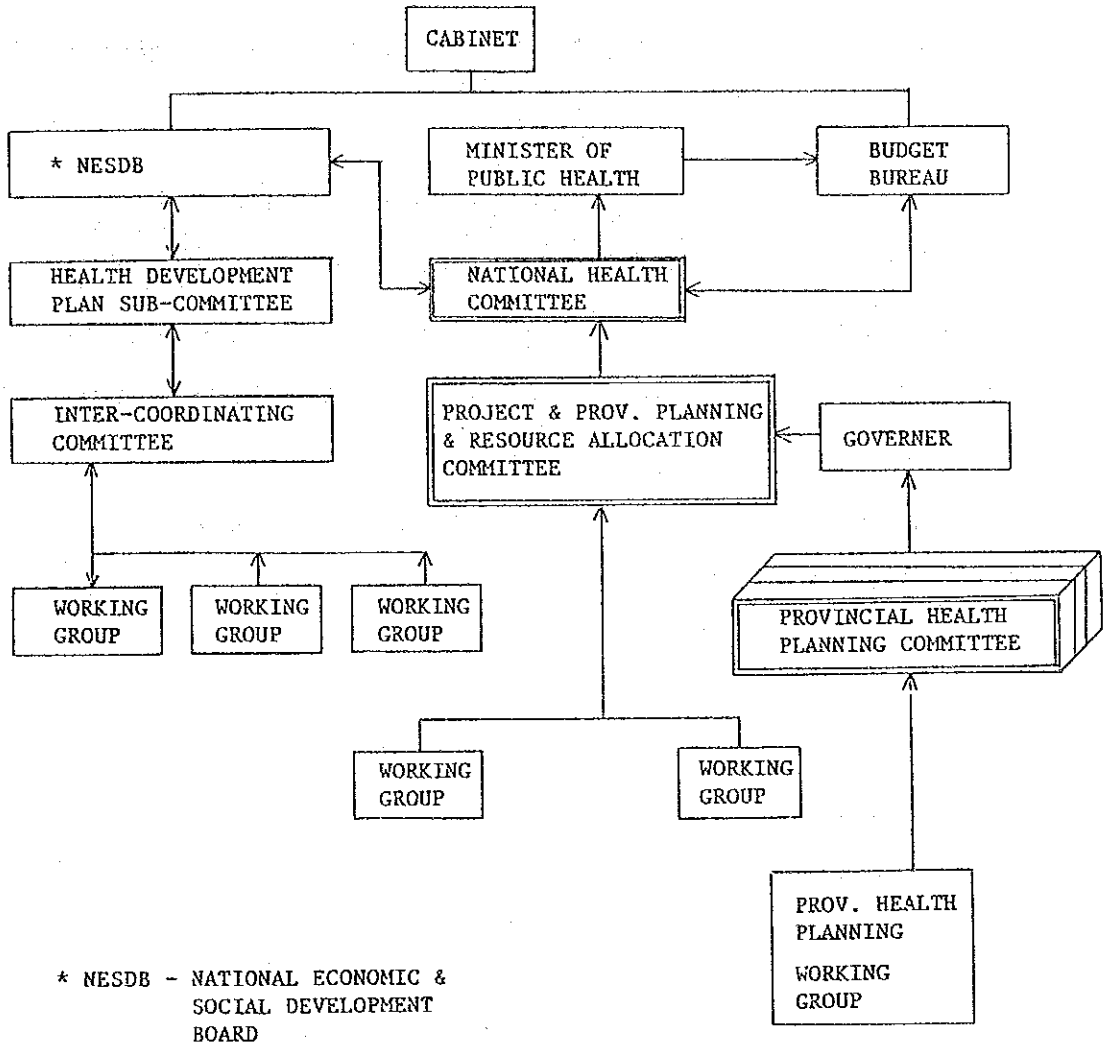


Fig. 2-2-4-(a) Planning Process and Budgeting (Source: Ministry of Public Health)

After the approval of medium term health program in NESDB and the Cabinet, the Office of the Under-Secretary of State and all the departments of the Ministry of Public Health prepare annual plans and submit them to NESDB and the Budget Bureau. After they are approved by these two offices, necessary funds are included in the

Annual Budget, which is presented to the Parliament for final approval. The implementation of the plan is carried out by the Ministry of Public Health.

The long-term health program is made out in accordance to the National Economic and Social Development Plan and the Fifth Five-Year National Health Development Plan, now effective, was started in 1982. The Fifth Five-Year National Health Development Plan set up the following targets corresponding to the targets in the field of public health of the Fifth National Economic and Social Development Plan.

a. to reduce prevalence and morbidity rates of preventable diseases:

- reduce the morbidity and mortality rates of diptheria, pertussis and tetanus in infants by 60%
- reduce the prevalence rate of poliomyelitis and typhoid by 50%
- reduce the prevalence rate of diarrheoa by 25%
- reduce the prevalence rate of rabies by 25%
- reduce the prevalence rate of acute respiratory tract diseases by 25%
- reduce the morbidity rate of malaria in the control area of 9 million population by 25%
- reduce the overall mortality rate of malaria by 20%

b. to reduce the morbidity rate caused by malnutrition of infants and children under 5 years of age through eradicating 3rd degree malnutrition and decreasing 2nd degree malnutrition by 50%;

c. to reduce the annual population growth rate to 1.5% by rendering family planning service to 4.5 million new acceptors and 4.1 continued users by 1986;

d. to increase coverage of immunization services to various target groups particularly infants under 1 year of age:
   - increase D.P.T. vaccine (3 doses) from 49.2% of infants to 70%
   - increase Polio vaccine (3 doses) for infants from 12.9% to 70%
   - increase B.C.G. vaccine for infants from 67.7% to 70%
   - increase Tetanus toxoid (2 times) from 25.2% of pregnant women to 50%;

e. to achieve the goal of having one hospital in every district of the country through building 252 new district hospitals and upgrade 75 existing 1st class health centers into district hospitals;

f. to achieve the goal of having one health center in every sub-district of the country through establishing 1,000 more health centers and upgrade 1,031 midwifery centers into health centers;

g. to achieve the goal of having health volunteer and health communicators in every village through training 24,000 health volunteers and 240,000 health communicators;

h. to produce and develop the quality and quantity of health manpower to meet the needs of rural areas through training 3,972 doctors, 19,450 junior nurses, 15,923 professional nurses, 3,950 midwives, 5,000 male health workers, including a number of other health service providers;

i. to set up 10,000 more drug cooperatives at village level, managing by village health volunteer;

j. to provide adequate supply of safe water and increase coverage from 64% of the rural population to 95% covering 2.5 million households by the end of 1986 through provision of the followings:

- deep well	36,000
- village work	3,800
- Shallow well	6,500
- water supply in hospitals	7,500
- concrete water tank or gallon water tank	2,200
- concrete rainwater tank	11,000
- household water jar or water filter	1,567,542

k. to promote sanitation through provision of:

- household toilet	1,700,000
- economy privy	25,000
- bio-gas unit	25,000

The components of the Fifth Five-Year National Health Development Plan are indicated in the table 2-2-4(b).

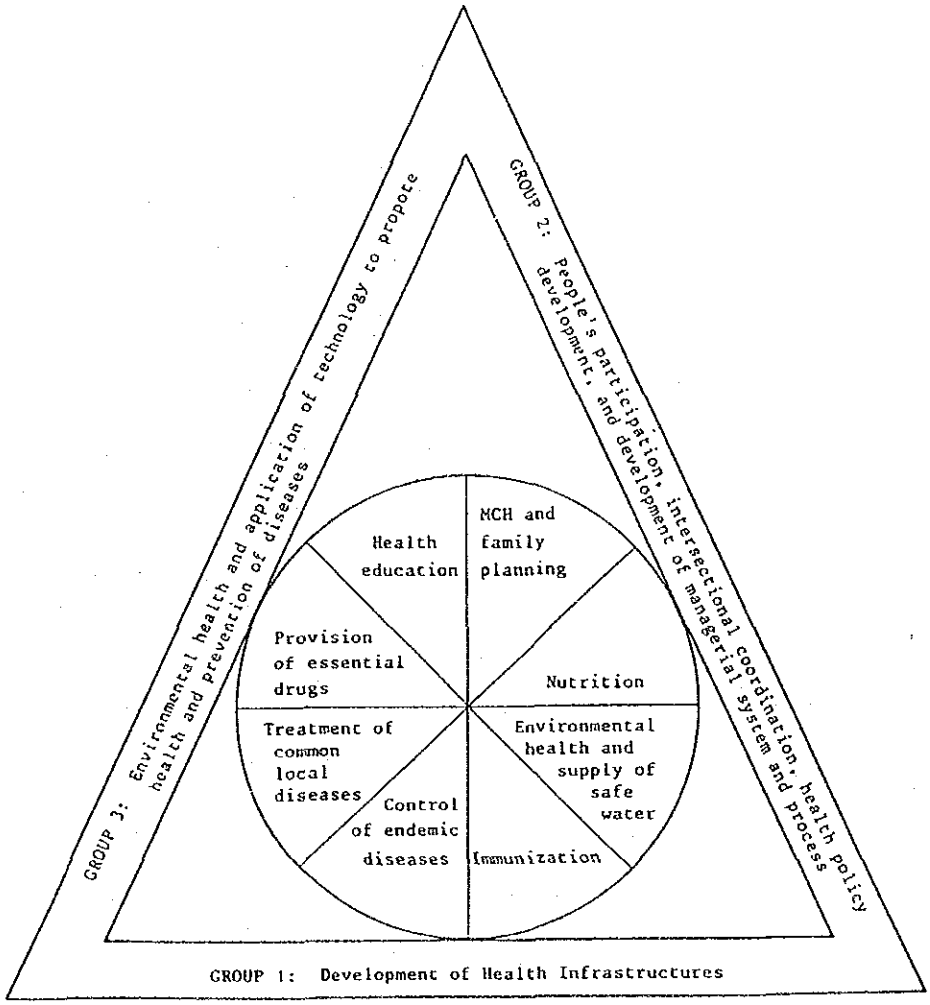


Fig. 2-2-4-(b) Components of the Fifth Five-Year National Health Development Plan (1982-1986) (Source: Ministry of Public Health)

(2) Rural Area Health Development Plan

As stated above, the policy of National Health Development Plan lays stress upon the health care services in rural areas where almost 75% of the population of Thailand lives. It aims at suppression of infectious diseases and the guiding principles for its attainment were set up based on the Primary Health Care Program. Education of inhabitants and communities for better consciousness of public health and their active participation in the health and sanitation activities were adopted in the guidelines, and in order to make these possible, various measures are being taken such as financial assistance, reorganization of executive bodies of health care services below district levels, improved adjustment between central and rural administration, more practical application of laws and regulations concerned, decentralization of planning and operation, and improvement of adjustment functions between central and rural areas. The Primary Health Care Program launched by the Ministry of Public Health in 1977 had been approved by the Cabinet in 1979 as the Principle of the National Health Development Policy and is being strongly promoted by Public Health Care Division set up in the Office of the Under-Secretary of the Ministry of Public Health. (Refer to Organization of the Ministry of Public Health in the Fig. 2-2-2(a).)

As the National Health Development Plan has begun to set importance on the rural circumstances, health planning procedure was reorganized so that the Provincial Chief Medical Officer and Provincial Health Planning Committee draft plan and propose it to the Ministry

of Public Health and above proposal is naturally reflected in the national plan drafting for the Ministry of Public Health. (Refer to above Organization in the Fig. 2-2-4(a).)

(3) Collaborative Program with External Sources

In order to improve public health, collaborative programs with international agencies and organizations of foreign governments including aids from these bodies are being strongly promoted. Above all, WHO, under consultation with the Government of Thailand, is playing a leading role in the coordination of assistances and cooperations from international agencies and organizations of foreign governments, in the execution of Public Health Programs. UNDP, UNICEF, UNFPA, World Bank, USOM and other international agencies, foreign governments and private funds are cooperating to many projects, sending experts, providing a training to the experts of Thailand, procuring materials, equipment and funds.

Thailand is also positively participating in the collaborative programs and information exchanges with other member countries of ASEAN.

(4) Relationship with Japan

Japanese cooperation to Health Development Plan of Thailand have been carried out mainly by three organizations, i.e., JICA, JOICFP, and SEAMIC. Above all, JICA has carried out many projects such as cooperation to National Cancer Institute Project (1967-1981), Family Planning Project (1974-1979), Promotion of Provincial Health

Services Project (1976-1983), Tuberculosis and Environmental Sanitation Fellowship, Virus Research Institute (1962-1967), Establishment of Maharaj Hospital (1980-1983), Establishment of Mahasarakham Nursing College (1981-1983), Establishment of Primary Health Care Training Centers (1983-1985). JOICFP has carried out cooperations to training works, family planning, parasite, nutrition integration project in the International Family Planning Seminar, etc. while SEAMIC has carried out cooperations to International Seminar for Health Statistics, bibliographic information, workshop and publishing works. As shown in above-mentioned performances in the past, cooperations to rural area health development projects, as well as those to high medical scientific and medical treatment technics are positively being carried out.

2-2-5 Health Legislation in Thailand

The following acts are in force in Thailand.

(1) Those related to the practice of health professions

1. Act for the control of the practice of the art of healing B.E. 2479
2. Medical Premises Act B.E. 2504
3. Medical Profession Act B.E. 2511

(2) Those related to communicable disease control

1. Infectious Disease Act B.E. 2477
   (Revision completed : To be promulgated 1980)

2. Malaria Control Act B.E. 2485

3. Leprosy Control Act B.E. 2484

4. Act for Protection against Rabies B.E. 2498

(3) Those related to food and drug control

1. Drug Act B.E. 2510, Drug Act (2nd Revision) B.E. 2518 and Drug Act (3rd Revision) B.E. 2522

2. Toxic Substances Act B.E. 2510 and Toxic Substances Act (2nd Revision) B.E. 2516

3. Cosmetic Act B.E. 2517

4. Psychotropic Substances Act B.E. 2518

5. Narcotic Act B.E. 2522

6. Food Act B.E. 2522

(4) Those related to environmental health

1. Act for the Control of Cemetery and Crematory B.E. 2481

2. Public Health Act B.E. 2484

3. Act for the Control of the Use of Human Excreta as Fertilizer B.E. 2486

4. Ground Water Act B.E. 2520

5. Act for the Control of Noises and Fumes - inaugurated as the Announcement of the Revolutionary Party Number 16 B.E. 2514

6. Enhancement and conservation of National Environment Quality Act B.E. 2518

2-3 CURRENT CONDITIONS OF RESEARCH ON PUBLIC HEALTH IN THAILAND

Researches in medical sciences in Thailand had formerly been carried out mainly at academic department of the medical schools, where the selection of research subjects are based on academic interests and sometimes have little connection to the social problems in public health. In order to orient researches toward more realistic problems, the Medical Research Council was established within the Ministry of Public Health in 1948, as a supporting organization for research. Subsequently, the National Research Council was founded in 1956. The Council has 10 Committees, one of which is Medical Research Committee whose main function is to set up research policies, review the priority of reseach subjects and select the party to whom subsidy is granted. Composed of 15 members from various organizations involved with medical sciences, the Cmmittee aims at promoting and supporting researches that will prove effective in solving various problems related to public health and medical services in Thailand. The Committee will promote to give financing support or research grant to valid researches conducted by qualified scientist. It will promote an institutional research in form of contract research for the subjects which are requested by governmental agencies or organizations. The main targets of the Committee are researches in the fields of infectious diseases, malnutrition, diseases caused by environmental pollution, family planning, biomedical studies in the fields of genetics and physiology, improvement of public health, and studies in drug addiction.

Research activities in medical sciences in Thailand are roughly divided into those conducted through the Ministry of Public Health and those carried out at medical schools and their hospitals. Medical Schools include Mahidol University, Chulalongkorn University, Chiang Mai University, Khon Kaen University, Prince of Songkhla University, etc. and researches are also conducted at seven institutes established by the cooperation of WHO and located within the Ministry of Public Health and some universities. In addition, the research institute for the former SEATO currently under the supervision of the Ministry of Defence is conducting researches mainly in infectious diseases and drug addiction. A variety of seminars and workshops are also available for mutual communication and collaboration between research organizations and upgrading the level of research.

2-4 CURRENT CONDITIONS OF THE DEPARTMENT OF MEDICAL SCIENCES (DMS), MINISTRY OF PUBLIC HEALTH

2-4-1 Organization and Activities of DMS

The Ministry of Public Health is composed of the office of the under-secretary, 5 departments and divisions for provincial administration for public health. One of the departments is the Department of Medical Sciences (DMS), which is responsible for researches in public health within the Ministry of Public Health, tests and, examinations at a central level and upgrading of public health activities at a local level. It functions as the sole comprehensive organization in the administrative structure of Thailand involved with researches in public health. The activities of DMS combines the functions of the National Institute of Health and National Institute of Hygienic Sciences of Japan. As shown in the organization chart in the fig. 2-4-1, DMS has 8 divisions, the Virus Research Institute and 6 Regional Medical Sciences Centers.

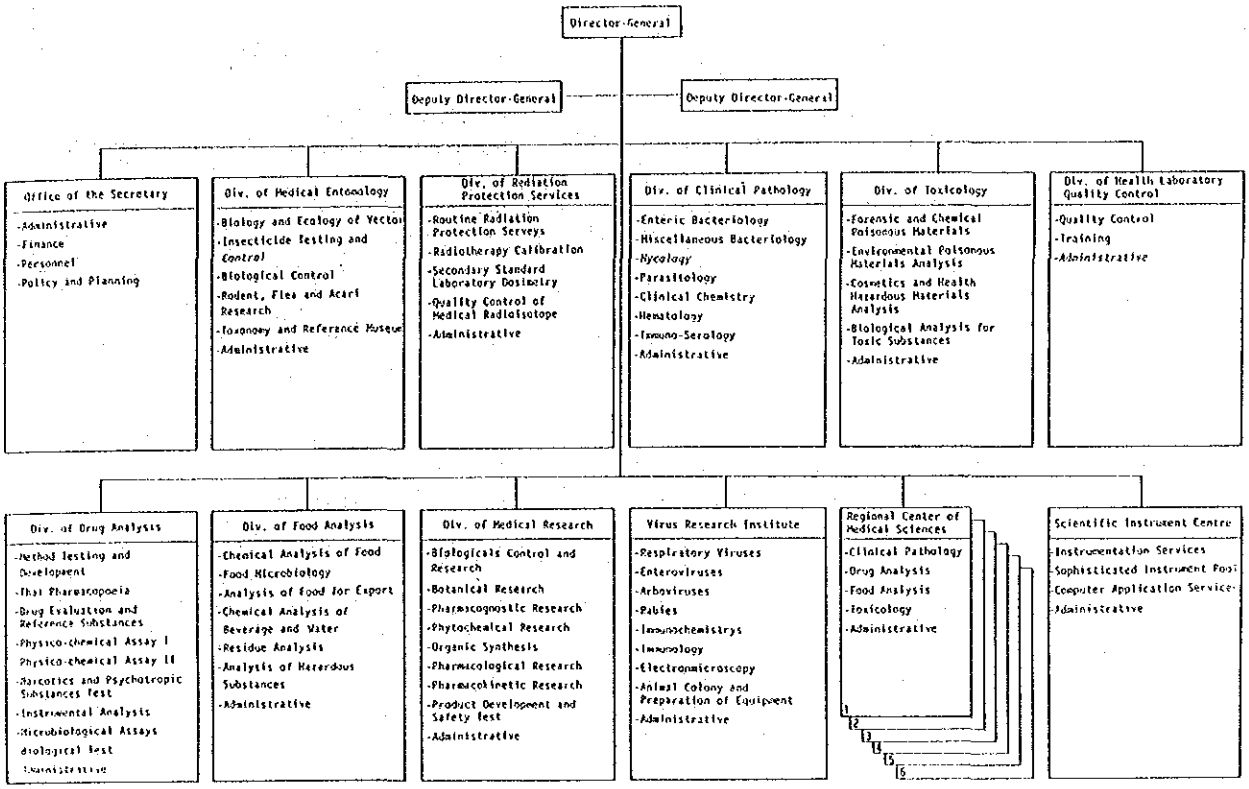


Fig. 2-4-1 Organization Chart of the Department of Medical Sciences (DMS)

Up till now, efforts at DMS had mainly been focused on tests and examinations with some related researches. Now that the importance of research activities for improving public health has been fully recognized, the Department has set up new goals for reinforcing research activities for which it has sufficient potentials also in terms of manpower.

2-4-2 Activities of Each Division of DMS

(1) Div. of Medical Entomology

Established in 1968 succeeding the Aedes Research Unit of WHO. Main function is biological and ecological studies in vectors, aedes and culex mosquitoes in particular, development of insecticide, chemical and biological control, study of rodent, etc.

(2) Div. of Radiation Protection Services

Registration and measurement of x-ray, protection services such as monitoring of x-ray, quality control of clinical usage of x-rays and radioisotopes, and related research.

(3) Div. of Clinical Pathology

This Division to serve as the national reference center for testing and medical diagnosis. Its activity includes testing and examination, confirmation of diagnosis in the area of bacteriology and related researches as well as, mycology, parasitology, biochemistry, hematology and serology, and related researches as well as production and standardization of diagnostic antisera and antigens.

(4) Div. of Toxicology

Chemical and physical analysis for investigation and identification of toxic substances, to serve medical diagnosis and forensic purposes, analysis of toxic substances in cosmetics and home products, identification and related researches in poisonous plants and hazardous substances.

(5) Div. of Health Laboratory Quality Control

Responsible for the quality control in all disciplines of technology in health laboratories and quality control programs with all universities concerned in Thailand and also international federations and organizations. It is also involved with the training of laboratory personnel and provides a 2-year course for training Trained Medical Laboratory Technicians.

(6) Div. of Drug Analysis

Established in 1952, the Division consists of 9 sections and is engaged in analysis of all types of pharmaceutical products, narcotics and psychotropic substances, to establish Thai Pharmacopoeia as a legal reference in the quality control of drugs, to inspect the performance of the analysis of drugs in various laboratories, to supervise the local drug manufacturers on the standards and operation of their control laboratory and carry out related research. The division also functions as a cooperation and information center in the establishment of ASEAN Reference Substances.

(7) Div. of Food Analysis

Composed of 6 sections, the division is engaged in investigations of food adulteration, analysis of food additives, quality analysis of dairy products and soft drinks, analysis of tap water in Bangkok, and safety services in control of imported food, domestic food and food intended for export. Collaboration with the Ministries of Industry, Sciences, Technology, Energy, Agriculture and Coopera-

tives, University Affairs and Commerce, as well as technical co-operation from international agencies and foreign governments has made great progress.

(8) Div. of Medical Research

The main function of this Division is to conduct researches on medicinal plants and their biologies. The important role played by medicinal plants for public health and medical treatment in Thailand, particularly in rural areas, enables the division to function independently. Surveying and ecological study of local medicinal plants, study of the physical and chemical properties of plant constituents, structural elucidation of active components derived from plants, and study of drug absorption, distribution, metabolism and excretion. Although this Division has experimental gardens.

(9) Virus Research Institute

Established in 1963, the responsibilities of this Institute are fundamental and applied research in virology and related fields; investigation of clinical specimens to provide information needed by the physicians for diagnosis, prophylaxis and treatment, virological surveys which may assist the epidemiologist in evaluating pertinent situations or in planning preventive measures; acting as reference center for local laboratories, serving as a WHO National Influenza Center, a WHO National Viral Hepatitis Center and a National Serum Bank. The Institute also raises animals for experiments, which are supplied to other divisions.

(10) Regional Medical Sciences Centers

Among the six Regional Centers, the one in Chonburi is in the process of establishment. The Centers are engaged in food analysis, drug analysis, toxicology, and also serves as the regional reference in clinical pathology of regional health laboratories. The Centers will help to diffuse to local regions the results of researches conducted at a central level. (Refer to location map of Regional Medical Sciences Centers as shown in the Fig. 2-4-2)

(11) The Scientific Instrument Center

Scientific instruments play an important role in scientific research and analysis. Its development is endless and follows closely to the progress of experimental methods and technologies including that of medical sciences. Research and analysis in medical sciences need the support of instrumentation; a science of procurement, installation, utilization, maintenance, precision control, modification and repair of instrument. The efficient scientists at the Scientific Instrument Center will carry out these activities, and more extensive functions can also be expected in future.

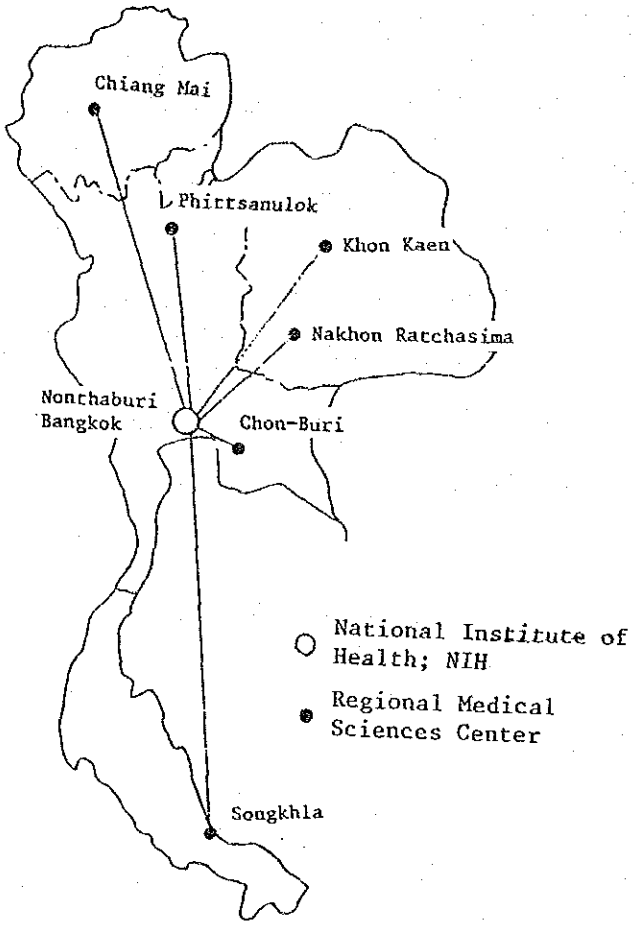


Fig. 2-4-2 Location Map of Regional Medical Sciences Centers

2-4-3 Organization and Manpower for Research at DMS

As shown in the organization chart and staff in the Fig. 2-4-3, DMS is equipped with sufficient manpower for future extension of its research activities.

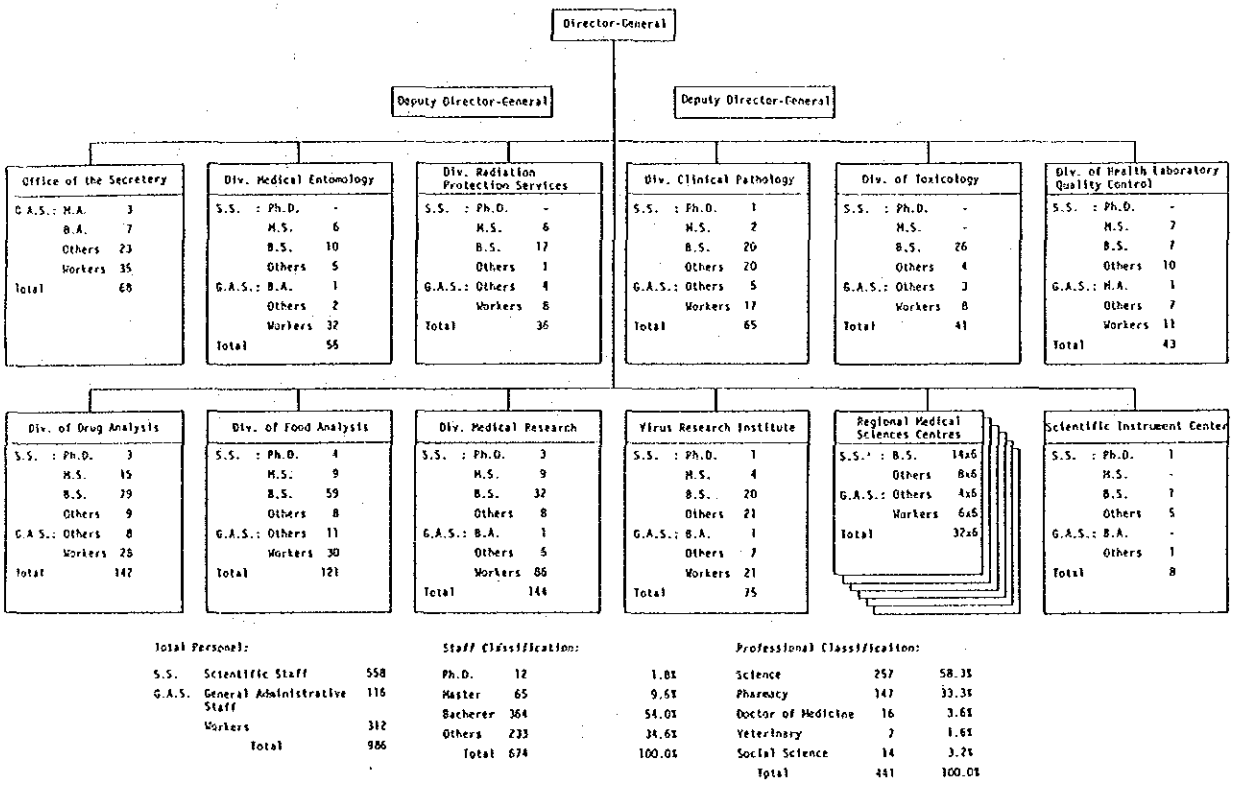
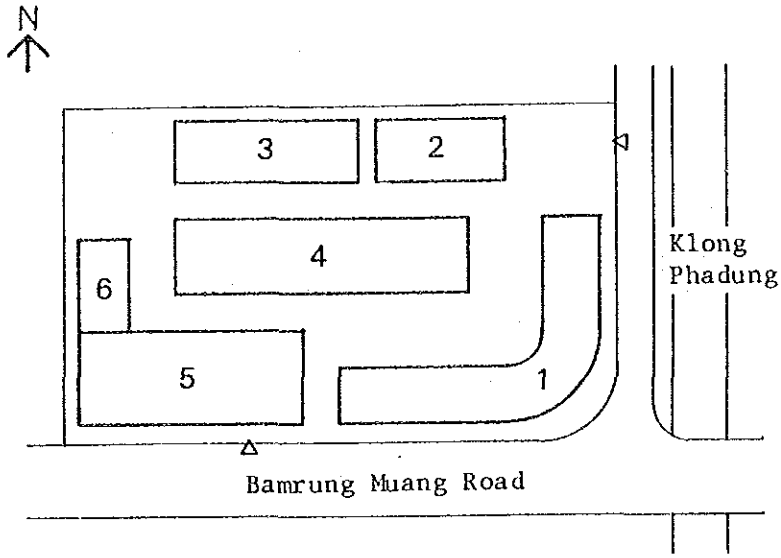


Fig. 2-4-3 Organization Chart and Staff of DMS

2-4-4 Current Facilities of DMS

DMS is situated in Yod-se, Bangkok, away from the main compound of the Ministry of Public Health. The facilities are clustered together in the relatively small area of 1,600 m^2. There are 6 buildings in all.



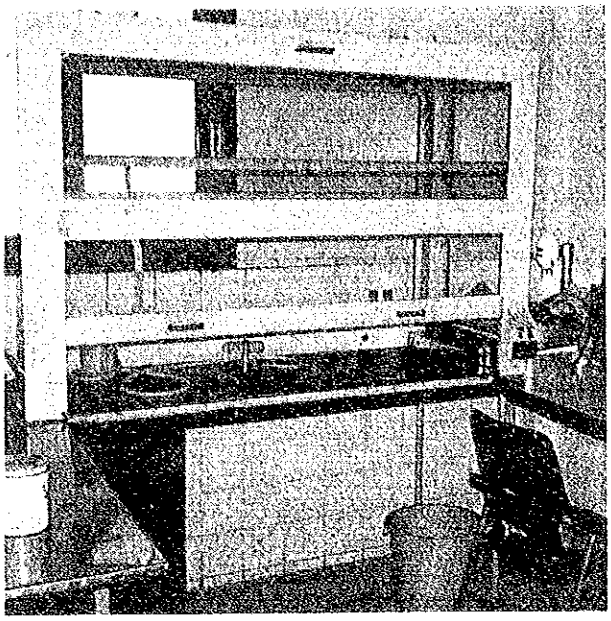
1.	Administration	2-storied	480 m^2
2.	Health Laboratory Quality Control	3-storied	465 m^2
3.	Visus Research Institute	3-storied	1,500 m^2
4.	Clinical Pathology, Medical Research	5-storied	4,820 m^2
5.	Medical Entomology, Toxicology Food Analysis, Drug Analysis	10-storied	5,550 m^2
6.	Radiation Protection Services	1-storied	335 m^2

Fig. 2-4-4 Facilities of DMS

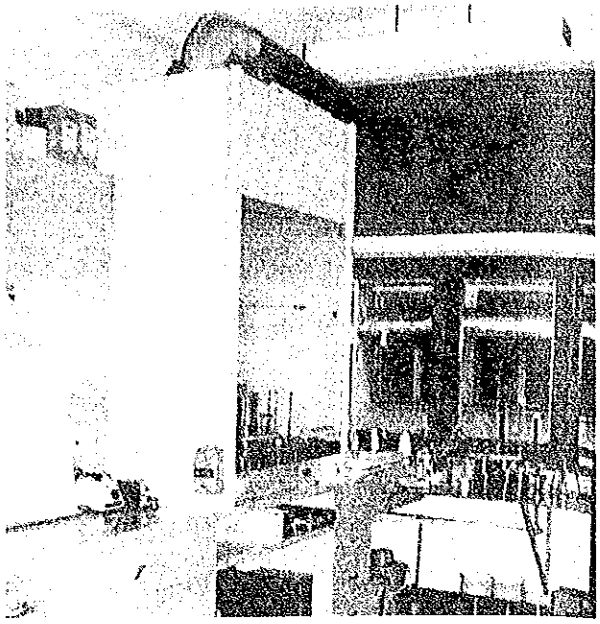
The floor area of each division is as shown below:

- Office of the Secretary	480 m^2
- Div. of Medical Entomology	354 m^2
- Div. of Health Laboratory Quality Control	465 m^2
- Div. of Radiation Protection Services	335 m^2
- Div. of Clinical Pathology	850 m^2
- Div. of Toxicology	310 m^2
- Div. of Drug Analysis	880 m^2
- Div. of Food Analysis	1,430 m^2
- Div. of Medical Research	753 m^2
- Virus Research Institute	1,500 m^2
total	7,357 m^2

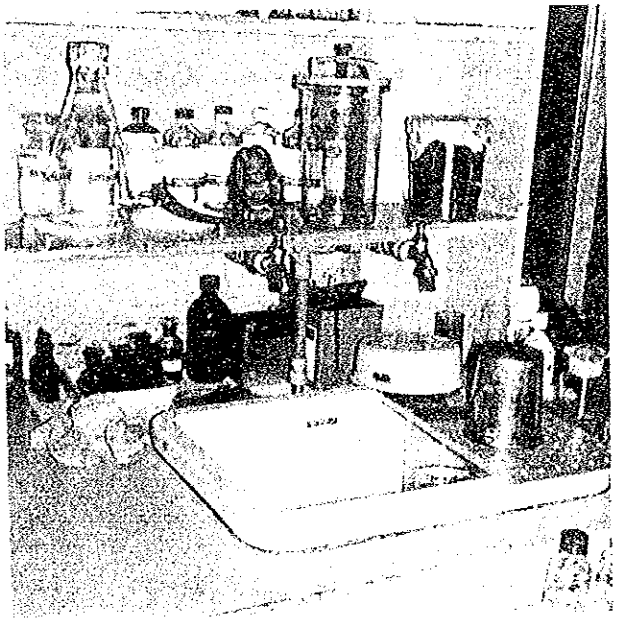
In addition to these facilities, there are also 6 Regional Medical Sciences Centers. The facilities of the Government Pharmaceutical Organization (G.P.O) are partly used for the Biological Products Control Section of Medical Research Division.



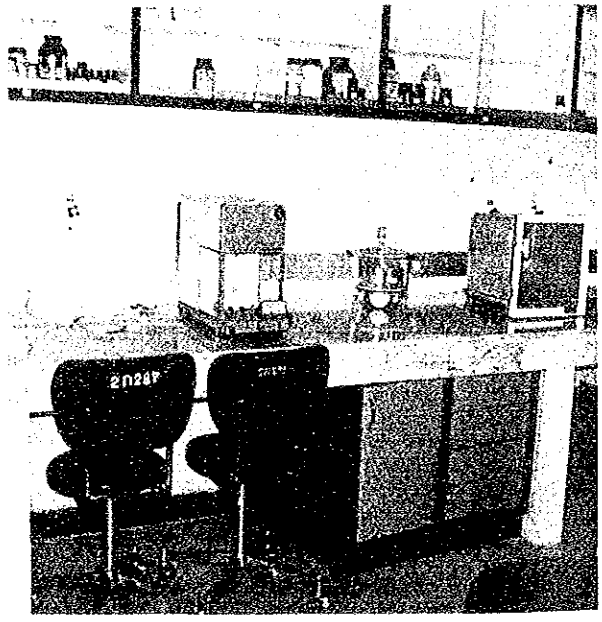
Clean Bench



Fume Hood



Laboratory Sink



Gas piping, power service using case way system and laboratory table top made of marble

Photo 2-4-4 Facilities of DMS

CHAPTER 3: PROJECT

CHAPTER 3: PROJECT

3-1 OBJECTIVES OF THE PROJECT

Because of the high prevalence of infectious diseases among diseases in Thailand, efforts are being made in wide areas for prevention of such diseases, which has also become a major issue in the National Health Development Plan. Despite such efforts, however, infectious diseases continue to plague the health of people in Thailand and, unless effective countermeasures are adopted for solving the problem, the economic and social development of the nation itself will be at stake.

For a long time, Japan has been forwarding to Thailand through Grant-Aid and Technical Cooperation for improvement of public health. In particular, the "Promotion of Provincial Health Services Project" executed since 1976 through technical cooperation provided by JICA in the model areas of Chanthaburi, Chon-Buri has brought about many fruitful results by establishing effective means of promoting public health activities aiming at prevention of infectious diseases, reinforcing the functions of health research activities at a regional level and organizing health laboratory services at the district, provincial and regional levels. The above program has also convinced the Government of Thailand of the importance of reinforcing basic researches for elucidating the mechanism of infectious diseases, as well as improving public health activities at a regional level, to cope with the problem of infectious diseases.

Furthermore, the studies conducted for this Project revealed the urgent need for systematic researches in public health for effective prevention and treatment of diseases, for which the establishment of a central organization for conducting researches, training specialized researchers and extending research results on a nationwide basis is indispensable.

DMS, the Ministry of Public Health, currently serves as the sole public organization in Thailand in charge of tests, examinations and researches in public health. However, their work mainly consists of regular tests and routine examination and their research areas are quite limited. The Project therefore aims at separating the functions of the current DMS and unifying the research system to enable the Department to function independently as a specialized institute for public health research. The necessary, facilities and equipment provided for the Project will also help them to play a vital role in public health contributing, in the long run, in improving the general public health of the people in Thailand.

3-2 MOTIVATION OF THE PROJECT

The initial request forwarded to the Government of Japan by the Government of Thailand was to establish a National Institute of Health Sciences, combining the functions of the National Institute of Health and the National Institute of Hygienic Sciences in Japan, where comprehensive researches and tests can be conducted in the area of medical sciences. The outline of the proposal was to build facilities of a total floor area of 37,000 m^2 where health researches and laboratory services as well as training of researchers and specialized staffs can be conducted for the respective fields of bacteriology, virology, parasitology, medical entomology, biomedical research in food, environmental chemistry and toxicology, pharmacology and pharmaceutical chemistry, pharmacognosy and phytochemistry, pathology and biological products.

In the course of the field survey, the Team conducted researches to grasp the current circumstances and activities related to health, medical services and public health in Thailand, after which repeated discussions were held to find out the most pressing problem in public health in the country is now seeking solution for, and the appropriate activities required of the Project, to draw up the following motivation of the Project.

Regarding the specific research activities proposed by Thailand, it was decided that the Project should mainly focus on researches, in order to provide independent functions to the Project and define its unique features. As to specific divisions of research, it was

confirmed that the research to be conducted at the new institute shall be basic researches for various infectious diseases that are in urgent need in Thailand today as well as those that provide opportunities for future development in the areas of other health researches and immunology which has brought about remarkable progress in elucidation of the occurence, prevention and treatment of diseases but is nevertheless still underdeveloped in Thailand. As a result, the areas of Virology, Bacteriology, Mycology, Parasitology, Immunology, Development and Control of Biological Products, Medical Entomology, Medicinal Plant Research, Environmental Health Science Research, Biomedical Research in Food and Pharmaceutical Science have been selected as official research areas of the new institute.

For a smooth and effective implementation of the above research activities, facilities and research equipment for common-use among research areas shall be prepared, as well as those for animal experiments that are indispensable to researches in public health.

Besides the above-mentioned research activities, training and education should also be conducted at the new institute for upgrading the level of researchers and extending technical knowledge to research staff of local health laboratories, contributing to the extension of researches in public health in general.

As a result, it was agreed that the total floor area of the facilities shall be reduced to a little less than 40% of that which had originally been proposed by Thailand, although effective use of

common facilities and equipment will most certainly help the institute to exercise its functions to its full extent.

Both parties agreed on the official naming of the institute as the National Institute of Health (NIH) which adequately expresses the objectives and features of the institute.

3-3 ACTIVITIES OF THE PROJECT

In planning the National Institute of Health, establishment of a new organization should be considered, in addition to the existing research facilities, after contemplating the present ciurcumstances and background of medical science research in Thailand. The essence of the plan is that the following areas should be reinforced so that they would adapt themselves to the rapid progress in medical sciences currently taking place.

(1) Establishment of the Immunology unit substantially relevant to the elucidation of the preventive mechanism of organism.

(2) Upgrading of the Parasitology unit to meet the urgent demand for research in parasitic and protozooic infestation.

(3) Reinforcement of the unit for development and control of biological products urgently needed by the nation.

(4) Strengthening of the Medicinal Plant Research Division for the effective utilization of natural resources.

(5) Establishment of the Environmental Health Sciences Research Unit.

(6) Reinforcement of the biomedical research in Food Analysis Division in connection with consumer protection.

(7) Establishment of the Scientific Equipment Center for the improvement of technology as well as the increased efficiency of research activities.

(8) Establishment of the Animal Experiment Center essential to the research in medical sciences.

(9) Establishment of the Laboratory for Radioisotope experiment for the sake of more elaborate research, and Biohazard Laboratory where biological safety should be ensured.

(10) Training of researchers.

Most of the basic sectors of public health research will be covered by means of establishment and reinforcement of above research areas, and it is expected that researches of considerably high level will be maintained as a result. The following is the list of research activities scheduled to be carried out at the National institute of Health (NIH).

1) Virology

2) Bacteriology

3) Mycology

4) Parasitology

5) Immunology

6) Development and Control of Biological Products