THE ROYAL THAI GOVERNMENT
MINISTRY OF INDUSTRY

THE STUDY
ON
THE PROMOTION OF METALWORKING INDUSTRIES
IN
THE KINGDOM OF THAILAND

FINAL REPORT

JANUARY, 1985

JAPAN INTERNATIONAL COOPERATION AGENCY

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PREFACE

In response to the request of the Government of the Kingdom of Thailand, the Government of Japan decided to conduct a study on the Metalworking Industries Promotion Project and entrusted the study to the Japan International Cooperation Agency (JICA). The JICA sent to Thailand a survey team headed by Mr. Isamu Taki from May 14 to June 13, 1984.

The team exchangeded viewes on the Project with the officials concerned of the Government of the Kingdom of Thailand and conducted a field survey in the Project-related areas, including Bangkok, Ayutthaya and Bang-Pa-in. After the team returned to Japan, further studies were made and the present report has been 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 the team.

Tokyo, January, 1985

Keisuke Arita
President
Japan International Cooperation Agency

Contents

Abbreviations

MOF	Ministry of Finance	
MS	Minister's Secretariate	
MOI	Ministry of Industry	
MOIT	Ministry of Interior	
MOE	Ministry of Education	
MOC	Ministry of Commerce	
MOSET	Ministry of Science Energy and Technology	
MOPM	Ministry of Prime Minister	
ISD(I)	Industrial Service Division (Institute)	
TISTR	Thailand Institute of Scientific and Technological Research	
KMIT	King Mongkut's Institute of Technology	
IFCT	Industrial Finance Corporation of Thailand	
SIFO	Small Industries Finance Office	
TMDPC	Thailand Management, Development and Productivity Centre	
TISI	Thai Industrial Standards Institute	
NSO	National Statistical Office	
NESDB	National Economic and Social Development Board	
BOI	Board of Investment	
IMC	Industrial Management Company)	
	Thailand Factory Development)	
RDR	Research and Data Resources)	Consulting Firms
	Development Services Limited)	
DSL	Development Services Limited)	
ATI	Association of Thai Industries	
TMA	Thailand Management Association	
DIP	Department of Industrial Promotion, Ministry of Industry	
IEAT	Industrial Estate Authority of Thailand	
RIDC	Regional Industrial Development Center	
PIO	Provincial Industrial Office	
BOT	Bank of Thailand	
NISD	National Institute Skill Development	
TTTC	Thai Trade Training Center	

AMRI	Agricultural Machinery Research Institute
NIDA	National Institute of Development Administration
AIT	Asian Institute of Technology
IMA	Industrial Management Association
RCTT	Regional Center of Technical Transfer
ADB	Asia Development Bank
APO	Asian Productivity Organization
JICA	Japan International Cooperation Agency
UNSF	United National Special Fund
WB	World Bank
ILO	International Labour Organization
IDCJ	International Development Center of Japan
UNDP	United Nationas Development Programs
TPA	Technical Promotion Association (Thailand-Japan)
UNIDO	United Nations Industrial Development Organization
TGTAC	Thai-German Teaching Aid Center
EIT	Engineering Institute of Thailand
TTC	Technical Transfer Center
SIAT	Small Industries Association of Thailand
MAT	Marketing Association of Thailand
GEPG	Government Enterprises Productivity Group
TDAT	Training and Development Association of Thailand
EIC	Exports Instructors Club
WDA	Welding Development Association
TDC	Tools and Dies Club
FC	Foundries Club
PMC	Ploughing Machine Club
LSSID	Loan Scheme for Small Industry Development
ESCAP	Economic and Social Commission for Asia and Pacific
KTB	Khrung Thai Bank
ASRCT	Applied Scientific Research Corporation of Thailand
DIW	Department of Industrial Works
DOL	Department of Labor
SIFC	Small Industries Finance Corporation

SBFC	Small Business Finance Corporation
EIDO	Engineering Industry Development Office
EDM	Electric Discharge Machine
CAD	Computer Aided Design
CAT	Computer Aided Testing
AGMA	American Gear Manufacturers' Association
PVC	Polyvinyl Coating
JIS	Japanese Industrial Standard
BTN	Brussel Tariff Nomenclature
GDP	Gross Domestic Product
R&D	Research & Development
ASTM	Standards by American Society for Testing and Materials
DIN	Deutche Industwie Normen
BS	Standards by British Standard Institution
ISO	Standards by International Organization for Standardization
AISI	Standards by American Iron & Steel Institute
฿	Baht
Q	Question
QNO	Question Number

1. PRINCIPLE AND METHOD OF THE STUDY

1. Principle and Method of the study

1.1 Background of the Project

Under the Fifth National Economic and Social Development Plan which will extend from 1982 to 1986, the metalworking industries has been identified as one of the priority sectors and it has been expected to grow not only as a industry having strong linkages with other priority industries such as Agro-based, Chemical and Heavy industries but also as a industry which support leading industries such as mining, construction, textile, and automobile industries.

Most of the joint venture companies with foreign enterprise have been requested to increase the local portion of parts by the Government of Thailand and looking for and bringing up the firms which produce parts of international quality. However, the growth of these firms is not still enough and most of metalworking firms are small and medium size having low level technology. It's therefore very urgent to develop these companies to modern companies which have a higher level of technology.

To make concrete plans for promotion and development of metalworking industries with most favourable efficiency, it's essential to analyze metalworking industries from the various aspects, especially, from the aspect of supporting industries by scientific method. In the survey carried out as part of an international project by the Japan International Cooperation Agency (hereinafter referred to as "JICA") and Technonet Asia, small and medium scale metalworking industries were analyzed by unique statistical method. However, the whole structure of the metalworking industries has not been explained from the viewpoint of relation with big companies and small and medium scale metalworking industries. Therefore, to analyze the structure from this viewpoint is indispensable for leveling up the metalworking industries, particularly, small and medium size metalworking industries.

The Government of Thailand requested the Government of Japan to provide technical cooperation in conducting a study on the promotion of metalworking industries (hereinafter referred to as "the Study").

The Government of Japan, at the request of the Government of Thailand, decided to extend technical cooperation in conducting the Study.

JICA, the official agency responsible for the implementation of the technical cooperation programs of the Government of Japan, undertook the Study and dispatched the preparatory survey mission twice (on July, 1981 and on September, 1983). After the discussion on the problems that the metalworking industries are facing with the authorities of the kingdom of Thailand, both parties agreed to sign "Scope of the Study on the Promotion of Metalworking Industries in The Kingdom of Thailand".

1.2 Objective of the Study

The study aims at formulating an implementation programs for the promotion of the metalworking industries in Thailand in order to contribute to the implementation of the National Development Plan and establishment of self-supporting economy, with special focus on the following points.

(1) Technological upgrading of small/medium scale firms.

(2) Strengthening of interrelation between large and small/medium scale firms

1.3 Definition of the Metalworking Industries

In this Study the metalworking industries are defined as those performing one or more of the following operations and producing one or more of the following kind of products.

(1) Processes:

1) casting
2) forging/heat treatment
3) sheetwork/welding
4) plating
5) machining
6) machine assembly
7) presswork

(2) Products:

1) agriculture machinery
2) pump, valve
3) mold and die for plastics, gear
4) parts for automobile
5) hand tool, machine tool (simple type)

1.4 Area of the Study

This Study covers the whole area of the Thailand. In the meantime, about 70 percent of total firms are located in Bangkok Metropolitan Area. Therefore, in principle the area investigated is limited within 100 km. from Bangkok.

1.5 Scope of the Study

For the purpose of making the study comprehensive, the present status of Thailand metalworking industries is reviewed and analyzed in the context of the whole economy, Government strategies and policies, institutions, and other factors. The study consist of two parts and cover the following items.

(1) PART I Review and Analysis

1) Historical Background
2) General Economic Situation
3) Industrial Structure, Inter-industry Relations
4) Market Structure, Demand Tendency, Trade Structure
5) Labour Situation
6) Organizations, Institutions and System
   (a) for technology extension and/or guidance
   (b) for research and development
   (c) for testing and inspection
   (d) for finance
7) Government Strategies and Policies
   (a) the fifth five year development plan
   (b) policy of the industrial promotion
   (c) policy of the promotion of the metalworking industries
   (d) policy of taxation, subsidy
8) Resent situation of the small and medium scale metalworking firms and the large scale metalworking firms with emphasis on design and production engineering capability.
9) Concentration of industries in Bangkok Area and decentralization

(2) PART II Formulation of Implementation Programs/Projects

1) Recommendations
   (a) necessity of the development of the metalworking industries
   (b) potentiality of the development of the Thai metalworking industries

(c) target of the program

(d) selection of the leading type of operation(s) and kind of product(s)

(e) identification of the existing problems in the field of metalworking industries and their countermeasures

(f) identification of project for implementation with priority

2) Conceptual Design of the Project(s)

(a) purpose of the project

(b) implementing body

(c) activities of the project

(d) personnel scheme

(e) capital requirement

(f) implementation schedule

1.6 Conceptional Framework of the Study

The following three Figures will make the Study easier to understand.

Fig. 1.6-1 ..... Conceptional Framework

Fig. 1.6-2 ..... Correlation Chart of the Study

Fig. 1.6-3 ..... Flow Chart of the Study

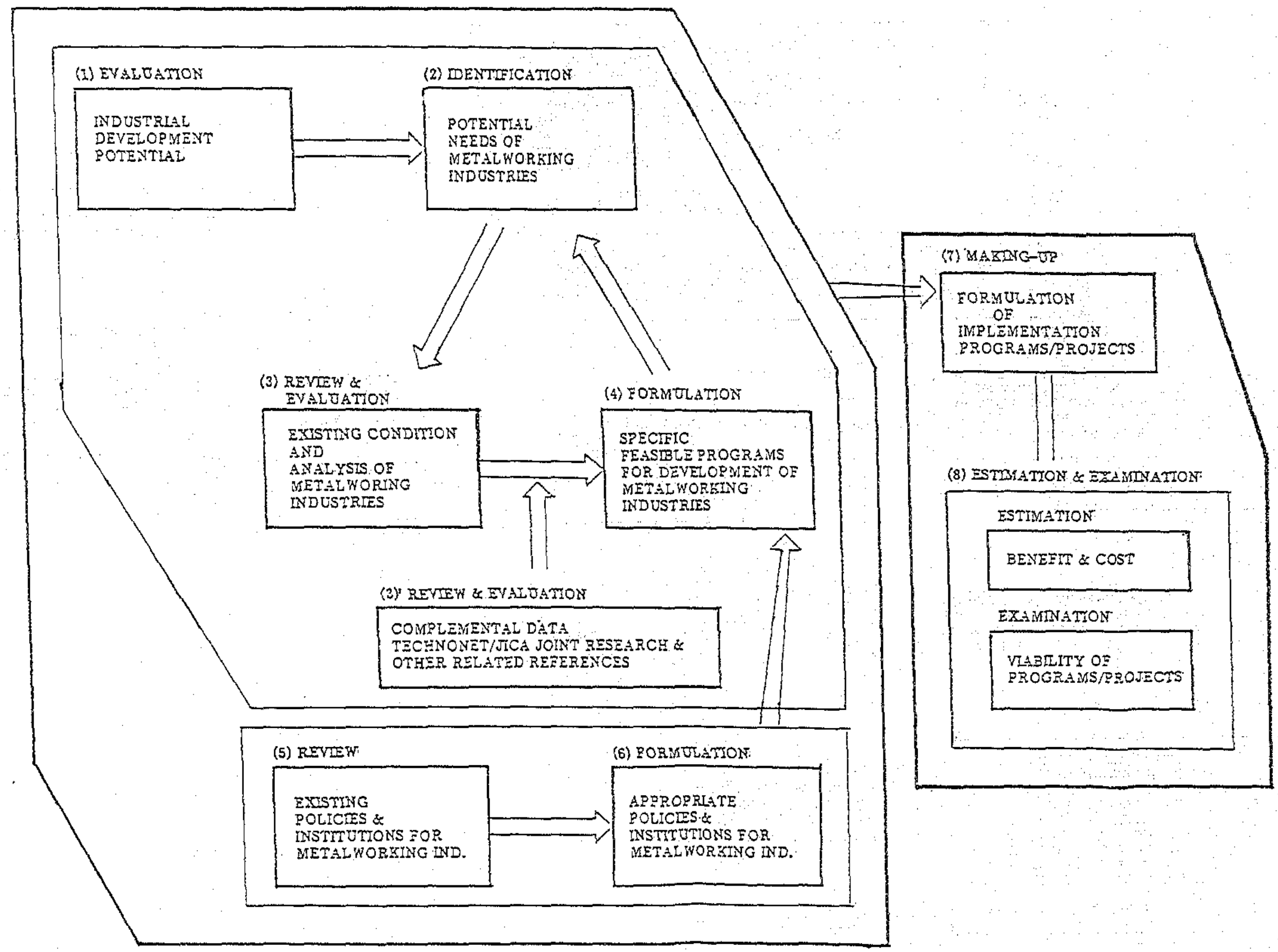

Fig. 1.6-1 Conceptional Framework

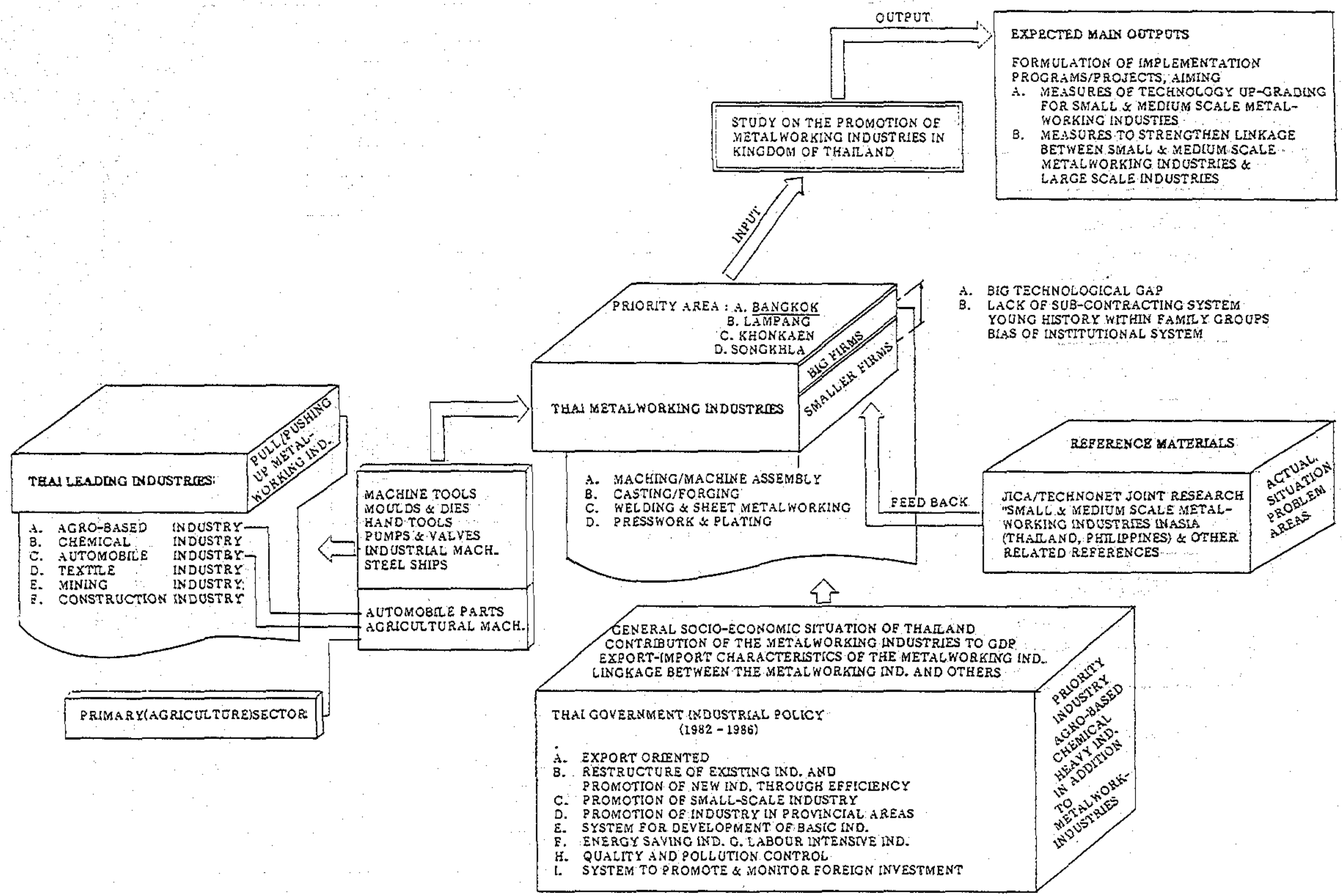

Fig. 1.6-2 Correlation Chart of the Study

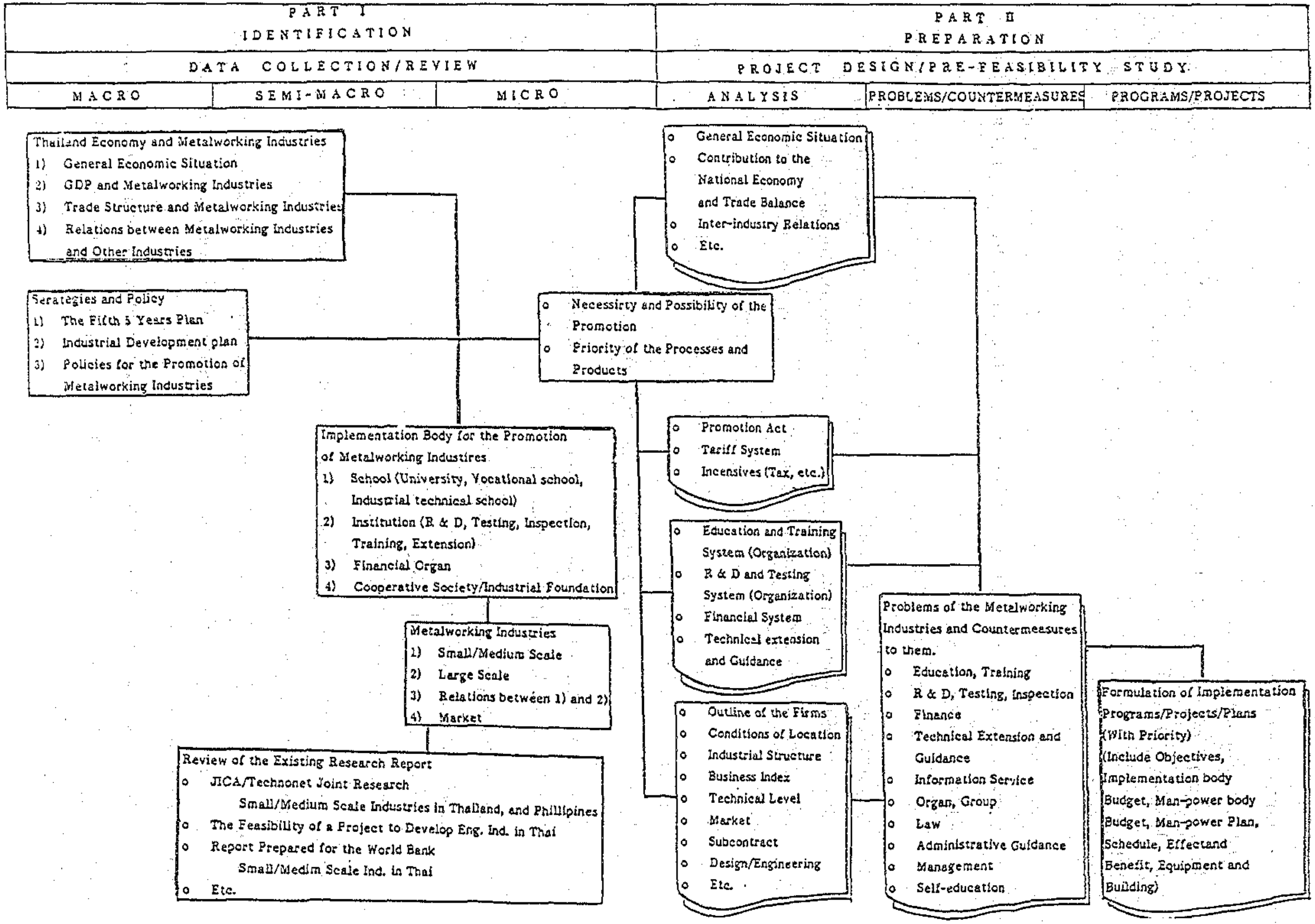

Fig. 1.6-3 Flow Chart of the Study

1.7 Collection of Data

(1) Selection of Enterprises

In the field survey in Thailand, intensive interviews and field investigations are carried out to grasp the industrial structure, production ability and technology level of the metal-working industries. In the selection of the enterprises to be surveyed, the followings are considered.

1) The enterprises answered that they had undertook sub-contracting work sometimes, often, or very often in JICA/TECHNONET ASIA JOINT RESEARCH PROJECT.
   Approx. fourty enterprises are selected.
   The change during past 5 years in technology level, etc. are examined and analyzed.

2) Big joint venture companies with Japanese enterprises and their subcontractors.
   About twenty joint venture companies and their subcontractors are selected.
   The insight into interrelation between large and small/medium scale firms are provided.

3) Big joint venture companies with foreign companies excluding with Japanese companies and their subcontractors.
   About fifteen joint venture companies and their subcontractors are selected.

4) Large local companies and their subcontractors, and local independent firms.
   About two hundreds firms are selected.

5) The enterprises which were established during past 3 years.
   Thirty firms are selected.
   The current industrial tendency and prospect of industrial structure, production ability and technology level are surveyed.

About three hundred twenty five firms are selected in all including some non-metal-working firms like textile firms.

According to the JICA/TECHNONET ASIA JOINT RESEARCH PROJECT report, the approximate population size is about 1,000. On the other hand, the sample size of this survey is about three hundreds.
Therefore, percentage of sample to the approximate population is about thirty three percent which is considered to be enough for the grasping the whole situation of the metalworking industry.

(2) Data Collection

The data and information in respect of the enterprises selected are gathered through direct interviews with use of a questionnaire.

The data and information with regard to the MACRO such as economy, institutions, government strategies, industrial structure, labour situation, are furnished by the Government of Thailand as request of the Study team.

2. REVIEW OF THAI INDUSTRY

2. Review of Thai industry

Past Economic Growth

Starting point to modernization of Thai industry can be said at the time when the Act on the Promotion of Industries was established in 1954. However, real industrialization of The Kingdom of Thailand has begun with implementation of The First Six Year Economic Development Plan (1961-1971) drafted by the National Economic Planning Board in line with the recommendation report in 1959 "A Public Development Program For Thailand" as resulted from a diagnosis of Thai economy by the survey team of the World Bank.

Since the early 1960s when the above economic plan started to be carried out, Thai economy has developed remarkably. As shown in Table 2-1, during the past 21 years from 1961 through 1981, Thailand attained average annual growth of 7.5 percent in gross domestic product in real terms, the growth rate of which was on the high level among the developing countries, while the average growth rate of the GDP per capita stayed 4.4 percent due to considerably high increase of population.

Table 2-1 GDP Growth Rate in Real Terms, 1961 - 1981

(Average annual rate : Percent)

	1961-65	1966-70	1971-75	1976-81	1961-81
Agriculture, Forestry & fishing	4.9	6.1	5.1	3.8	4.9
Manufacturing	11.2	10.4	9.5	9.8	10.2
Total GDP	7.3	8.6	6.3	7.3	7.5
GDP Per Capita	4.2	6.0	1.9	5.2	4.4
Growth Rate of Population	3.0	2.4	4.3	2.0	2.9

Source: Compiled from Table 2.1.4-2, Gross Domestic Product by Industrial Origin and Table 2.1.4-3, GDP Per Capita in Real Terms

Note: Calculated from 1972 constant prices

It is pointed out that there were three principle reasons for the attainment of such high growth of the national economy during the term. Firstly, manufacturing industry sector achieved high growth in GDP at an average annual rate of 10.2 percent which had been done chiefly by the promotion of import substitution for the consumption goods in the 1960s ; the GDP originating from the manufacturing sector in 1960 was shared with only 12 percent of the total GDP but, it grew up to occupy 21 percent in 1981, which went with more than two fold increase of the employment share in the sector from 3.4 percent in 1960 to 7.9 percent in 1980. Thus, the manufacturing sector played an important role for the creation of employment opportunity. Secondly, growth of agriculture sector including forestry & fishing is pointed out ; though the average growth rate of the sector was much inferior to that of the manufacturing sector, it indicated the growth rate of 4.9 percent during the terms. It had maintained share of the GDP more than 30 percent from 1960 through 1975. After the period, the share percentage decreased gradually, but it kept still 24 percent in 1982, which was a more large share than that of manufacturing sector. However, we have to take notice that main factor of the growth was not dependent upon productivity increase per the unit area planted, but was chiefly because of the diversification and the commercialization of crops, and the expansion of the cultivated area. Thirdly, the reason why Thailand accomplished such high economic growth would be in search for the growth of tertiary industry; that is, growth of both the manufacturing and the agriculture sector on the high level led to the development of the tertiary industries such as electricity and water supply, wholesale and retailtrade, banking and finance, etc. In 1982, the tertiary industries in total, excluding public administration and defence were shared with about 44 percent of the GDP.

Now let us review the growth of tertiary industries by sector ; the highest sector was electricity and water supply, one of the infrastructures, with the average annual growth rate of 17.1 percent, followed by the banking, insurance and finance with 13.6 percent, the other services 8 percent, the whole-sale and retailtrade 7.3 percent, these rates of which were more than the average growth rate of 7.2 percent in the GDP in total. The sector that had the highest share percentage of the GDP was the wholesale and retailtrade with 16.2 percent in 1982, followed by the other services 11.2 percent and, share percentage of the trade and the other services in total was 27.4 percent which showed the trading sector had held an important place in Thai economy.

2.1 Industrialization and Industry Policy

Industrialization process would be principally divided into five term as shown in Table 2.1-1 The first term was a period after the end of the World War II through 1960; during the term, Government initiating and leading policy for industrialization based on the Establishment of National Enterprise Act 1953 and the Act on the Promotion of Industries 1954, was adopted.

The second term (1961-1971) was at the times of the 1st and the 2nd Economic Development Plan and the term was characteristic of an import substition policy. The third term (1972-1976) was a period of the 3rd Economic Development Plan; during the term, import of the capital and intermediate goods, and raw materials increased due to import substitute policy and a resultant problem, worsening of imbalance of the trade account was brought about actually on account of change of external situation as we called the world recession which began with the oil crisis. It was the third term that the industriasl policy had been changed from the import substitute to the export promotion. The forth terms (1977-1981) was corresponded to the 4th Economic Development Plan and was also in continuancy of export directing policy, however, it was directing to adjust industrial production structure and to dispersing the industries to provincial areas with emphasis of adjusting inequality of income.

The recommendation report by the World Bank in 1959 which was considered to become a starting point to the Thai industry and was decisive of it afterwards. It advised the Government of Thailand of private sector leading policy for industrialization. Therefore, the Government roles in the industrialization of Thailand have been defined firstly to investment in industrial infrastructures such as water and electricity supply, and transportation and communication and, secondly to legislation concerning fiscal and financial systems for the promotion of investment. As a result, distribution of public development expenditure to industrial sectors in each development plan has been at a small sum so far and the distribution to the infrastructures has been regarded as rather important. Furthermore, for the promotion of introducing indigenous and foreign capital of private sectors into a hopeful field of industries, the act for the promotion of investment to give various kinds of benefits to investors was established and revised in each term of the industrialization process.

In the following, we would like to review industrial policy of Thailand at the respects of the economic development plan and the act for promotion of investment at each of the five term.

Table 2.1-1 Industrialization and Industrial Policy of Thailand

Major Industrial Policy	Investment Releavant Regislation	Socio-ecconomic Development Plan	Share of GDP Originating from Manufacturing
Government initiating and leading policy 1st Term (After the End of World War II - 1960)	1953 - Establishment of National Enterprise Act 1954 - Act on the Promotion of Industries		1960 - 13%
Private sector leading policy 2nd Term (1961-71) : Modernization of industry and import substitution	1960 - Industrial Investment Promotion Act	1961-66; 1st Six Year Economic Development Plan	1966 - 14.2%
	1962 - Revision of IIPA 1960	1967-71; 2nd Five Year Social and Economic Development Plan	1971 - 16.0%
3rd Term (1972-76) : Promotion of export and agro-industry	1972 - Promotion of Investment Act 1972 (Declaration) - Alien Business Act - Alien Work Permit Act	1972-76; 3rd Five Year Social and Economic Development Plan	1976 - 19.2%
4th Term (1977-81) : Export directing and agro-industry	1977 - Promotion of Investment Act 1977 1978 - Alien Work Permit Act 1978	1977-81; 4th Five Year Social and Economic Development Plan	1981 - 20.7%
5th Term (1982-86) : Industrial restructuring and promotion of industrial export		1982-86; 5th Five Year Social and Economic Development Plan	1986 - 22.1%

Note : Share percentage of GDP is calculated from 1972 constant prices.

Table 2.1-2 Growth Rate of GDP by Economic Sector
During The First to Fifth Socio-Economic Development Plan

(Average annual rate : Percent)

Sector	1st (1961-1966)		2nd (1967-1971)		3rd (1972-1976)		4th (1977-1981)		5th (1982-1986)	
	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual
Agro-forestry & fishing	3.3	6.2	4.3	4.4	5.1	5.5	5.0	3.4	4.5	
Manufacturing	9.3	11.1	10.9	11.3	8.0	11.0	9.6	8.7	7.6	
Construction	3.9	12.8	11.4	2.1	6.5	5.4	3.0	9.1		
Electricity and Water supply	16.4	22.4	18.0	29.4	15.0	14.2	11.3	11.7		
Transportation and Communication	9.3	6.1	11.0	5.8	6.0	7.4	7.4	8.6		
Mining and Quarrying	5.3	15.1	6.6	5.6	6.0	0.4	3.2	9.7	16.4	
Wholesale and Retail Trade		8.1	8.4	10.1	7.0	7.4	6.3	5.7		
Banking, Insurance and Real Estate	5.4				15.0	9.1	8.1	13.5		
Ownership of Dwelling		7.6	9.7	9.4	2.5	4.9	4.4	5.2		
Public Administration and Defence					6.0	5.4	6.5	8.2		
Other Services					7.0	6.3	7.8	10.0		
Total GDP	5.5	8.0	8.5	7.8	7.0	7.1	7.0	7.1	6.6	

Note : 1. Figures of 1st-2nd are calculated from 1962 constant prices and that of 3rd to 5th from 1972 constant prices
2. Actual figures are calculated from Table 2.9 Gross Domestic Product by Industrial Origin in Terms of Economic Development Plan

Source : NESDB, National Income of Thailand

Table 2.1-3 Distribution of Public Development Expenditure in Terms of Economic Development Plan

	1st Plan (1961-1966)		2nd Plan (1967-1971)		3rd Plan (1972-1976)		4th Plan (1977-1981)		5th Plan (1982-1986)	
	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual
	(Billions of Baht)		(Millions of Baht)							
Agriculture & irrigation	4.6	3.9 (13.8)	10,557	7,916 (16.8)	13,695	10,961 (11.8)	39,100 (15.5)			
Industry and mining (including manufacturing, construction and commerce)	2.6	2.34 (8.3)	1,096	560 (1.2)	2,350	2,419 (2.6)	3,605 (1.4)			
Transportation and communications	10.2	7.36 (26.1)	17,099	9,068 (19.2)	19,475	16,943 (18.3)	37,175 (14.7)			
Electriciy and other power supply	4.3	4.74 (16.8)	4,971	1,853 (9.6)	7,875	10,079 (10.9)	15,950 (6.3)	n.a.	n.a.	
Sub-total	21.7	18.34 (65.1)	33,723	19,396 (41.2)	43,395	41,402 (43.6)	95,830 (37.9)			
Social welfare	5.5	5.56	10,271	5,136	2,700	15,200	8,620			
Community facilities	-	-	-	-	-	-	33,335			
Public health	1.4	1.06	3,575	2,753	6,340	4,237	19,380			
Education	2.5	2.08	14,121	16,121	32,910	31,709	95,285			
Others	1.5	1.14	4,100	3,722	14,930	-	-			
Sub-total	10.9	9.84 (34.9)	32,067	27,732 (58.8)	56,800	51,146 (56.4)	156,620 (62.1)			
Grand total	32.6	28.18 (100)	65,791	47,128 (100)	100,275	92,548 (100)	252,450 (100)	310,228	799,340	

Source : NESDB, Evaluation of the 1st and the 2nd Economic Development Plan, and 3rd and 4th Economic Development Plan

2.1.1 The First term (After the end of the World War II - 1960)

By enactment of the Establishment of National Enterprise Act 1953 and the Act on the Promotion of Industries 1954, an route of industrialization of which the Government takes leadership was chosen. After that, industrialization had been progressed mainly by the national enterprises and by 1962, more than 100 national enterprises such as pulp and paper, spining, cement, sugar, jute bag, etc were established. Industrial investment by the Government during a period of 1953-1957 held 52 percent of the total industrial investments. However, management of these national enterprises were inclined to inefficency and it caused a severe pressure on the national finance.

Under the establishment of the Act on the Promotion of Industries 1954, for the purpose of promoting the industrial investments as well as preparing for the systems to accept foreign capital, the promoted activity was prescribed (at the begining ; industries of metal products, sugar refineries, jute bag, spinning , drags and medicines, and pottery and chinaware) and as to these activities it was provided that benefits and guarantees or protection are granted as follows : Exemption or reduction of import duty on the machinery and the raw materials imported, protection of the activity by restricting the import of products of the same kind, permission to remit abroad returns on the foreign capital invested, etc. and guarantee not to nationalize the activity of foreign firms, all these provisions made arrangements of most of formalities in legislation, but successful results were not obtained in practice because of inperfectness of the system in carrying the industrial investment into effect. Both the diagnosis of the national economy of Thailand and the resultant recommendation report by the World Bank pointed the rute of industrialization of which private sector should take a leadership and a direction to introduce foreign capital actively, denying at all industrialization of which the national enterprises had taken a leading part. This meant that the roles of the Government in the economic development would be reduced and defined to adjustment of social capital in connection with the industries and , simultaneously the economic development should be principally entrusted to private capital including foreign investment from abroad, based on the principles of profit-seeking and competition.

After a coup deta in 1958, the government took a policy to adopt the basic rute of industrialization as abovementioned, and began to work out the 1st Six Year Economic Development Plan (1961-1966), starting the National Economic Planning Boad in 1959. The Boad of Investment was also established in the same year and the Industrial Investment Pdromotion Act was enacted in 1960. Thus, the policies for investment and introducing foreign capital had been adjusted.

2.1.2 The Second Term (Jan. 1961 - Sept. 1971)

The second term is consisting of the First Six Year Economic Development Plan (Jan. 1961 -Sept. 1966) and the Second Five Year Social and Economic Development Plan (Oct. 1966 -Sept. 1971)

(1) First Six Year Economic Development Plan

The 1st Economic Development Plan was drafted and carried out in line with the basis of the recommendation in 1959 by the World Bank. Lack of data and information for more adequate planning caused the Plan to be somewhat sketchy. In the Plan increase of productivity as well as quantity in agriculture sector was the primary object and a policy to think agriculture with importance was taken and accordingly, water supply facilities for agriculture was expanded.

On the other hand industrial development was also one of the main objectives. The rute of industrialization by the private sector's leadership was so decided as aforementioned that the government made efforts to prepare for the necessary conditions under which the private sectors made an industrial investment, that is, industrial infrastructures such as water, electricity, transportation, communications, etc. Adjustment of the infrastructures was progressed considerably during a period of the 1st Development Plan, though it was not so much as planned. As shown in Table 2.1-3 the actual distributions of the public development expenditure by percentage were as follows : The first place was held by transportation and communications (26.1%) , followed by electricity and other power supply (16.8%), agriculture & irrigation (13.8%), and mining, manufacturing and commerce (3.3%) and social development and others in total occupied 34.9 percent.

The policies and objectives in industrial development of the 1st Development Plan were summarized as follows :

1) To encourage domestic and foreign enterprise to undertake more industrial activities in the country. The state will assist promoted industries of various scale to suit the needs of domestic market. The state will not engage in activities competitive with private enterprise. State interference will be only in regard to quality control.

2) To assist industrial development by conducting surveys, research, studies and analysis of natural resources, so as to pave the way for the establishment of heavy industries. Study will also be methods of expanding the capacity of existing industries.

3) To promote and assist small-scale industries and cottage industries by provision of technical and extension services.

In comparing target growth rate with that in actual in the 1st Development Plan, it is agreeable that the Thai economy achieved main targets successfully as the Government evaluated the results of the development since average growth rate at 8 percent in the total GDP was attained against the planned target 5.5 percent . However, it would be an important point that inadequate capability of the Government agencies prevented from smooth progress of the projects ; in fact actual outay of the public development expenditure came to stop at 28.18 billion baht, 86% of the planned budget 32.6 billion baht of which 10.6 billion baht were come from foreign loans.

It is summarized in the Evaluation of the 1st Economic Development Plan that the Thai economy showed so dynamic capability as to realize more than 7% average growth rate, stabilizing the standards of prices. It is certain that such infrastructure as electricity and power supply marked an avarage annual growth of 22.4%, while the growth rate of manufacturing sector was so high at 11.1%. The growth inpulses in the manufacturing sector reflected both the rapid increase of agriculture-based industries as well as establishment of new industries. Agriculture sector recorded the growth at 6.2%, about two fold of the target growth rate (3.3%). Economic and social development plans concentrated mainly on the basic infrastructure facilities and conductive frame work for the future economic growth and , these high growth rates were made possible by sharp increase in both private and governmental investment. However, there were several problems left behind such a high economic growth ; it was firstly, an widening of income gap and inequality of allocation of social capital between sectors or industries and different regions and, secondly, it was an high increase rate of population.

(2) The Second Five Year Social and Economic Development Plan

The 2nd Development Plan had at least two features ; at first, data was arranged much better than that of the 1st Development Plan and, at second, social aspect was emphasized as the name of the plan was so changed.

The 2nd Development Plan was on the same basis of development as the 1st Development Plan was and, emphasis was placed in continuancy of the 1st Plan on expansion of productivity in industrial sectors as well as agriculture sector, especially, in the manufacturing sector. The 2nd Plan had aims to promote structural changes of the national economy, to create more opportunity of the employment and to raise the level of utilizing indigenous raw materials. According to the 2nd Plan, main objectives of the Plan were as follows:

1) Mobilization of human and natural resouces for optimum utilization in expanding the productive capacity and national income of the country, so that the benefits of development can be shared equitably by all classes of people.

2) Promotion and maintenance of social justice; the preservation of social stability, national institutions, customs and culture; and the provision of relief to people in isolated areas who cannot effectively help themselves.

3) Maintenance of economic and financial stability to enable the development process to continue on the basis of sound values and productive investments for long term growth.

4) Preservation of national security, which depends in the final analysis upon the economic strength and social unity of the country.

To accomplish the above objectives as policy target, principal policies were proposed in the Plan as follows:

1 To increase the productive capacity and national income of the country and to ensure an equitable distribution of the benefits of development; To increase per capita income by increasing public development expenditure and to narrow regional differencs in income distrubution.

2 To encourage increased agricultural production and higher quality, as well as further diversification of the products as the key sector to other sectors and to expect the economy in a pattern of balanced growth.

3 To promote private enterprises and encourage private investment both domestic and foreign, especially joint ventures using domestic raw materials and available labour.

4 To promote employment and develop manpower by improving skills of labour at different levels; to develop education and vocational training to take responsibility for the society.

5 To promote scientific progress and application of the modern technology.

Emphasis on social development in the Plan was clarified by the account for the public development expenditure ; out of the total outlay 28.2 billion baht during the period of the 1st Plan, 26.1% was accounted for transportation and communications, and 13.8% for agricultural projects. In the original budget under the 2nd plan, it was intended to increase 30% and 20% respectively and share percentage of education was also increased from 7.4% to 12%.

Total amount of the planned budget for the public develpment expenditure was raised up at the beginning to 57,520 million baht twice as much as the total actual outlay of 28.2 billion baht in the 1st Plan and, further more the budget for the social development increased from 33.4% to about 40%, which showed special emphasis on policy measures for the social development concerned. However, the average annual growth rates attained under the ambitious 2nd Plan were not all sufficient. An target for the average growth rate of the GDP was setout considerably high at 8.5%. As to the manufacturing and agriculture sector, the target for the average growth rate was set up at 10.9% and 4.3% respectively. It was in prospect that per capita GNP would rise at an annual average rate of 5%. As a result of achievement of the 2nd Plan, the planned targets of the GDP growth rate for the key sectors such as agriculture, manufacturing, and electricity and water supply were either achieved or exceeded; both agriculture and manufacturing accomplished slightly over the target with the average growth rate of 4.4% and 11.3% respectively and, electricity and water supply exceeded greatly with 29.4% but construction could not attain the target and the total GDP remained at the low average growth with 7.8%. Per capita GNP also stayed at 3.9% average growth at current prices from 1967 through 1971. In this regards, it might be said that the planned targets for the growth were too high to attain a satisfactory results.

Table 2.1.2-1

Number and Capital of firms Receiving
Incentives under the Industrial Promotion Act : April 1959 - June 1966

	Total Registered Capital (millions of baht)			Thai Companies	Joint Ventures	Foreign Companies	Total
	Thai	Foreign	Total				
1959 - 1961	671.4	196.8	868.2	50	46	5	101
1962	252.5	122.6	375.1	17	27	3	47
1963	337.6	191.5	529.1	23	38	5	66
1964	261.8	248.8	510.6	18	43	2	63
1965	157.1	91.6	248.7	27	33	-	60
1966 (6 months)	281.5	134.0	415.5	9	12	-	21
	1,961.9	985.3	2,947.2	144	199	15	358

Source : NESDB, Second five Year social and Economic Development Plan

3) Industrial Investment Promotion Act

Now, we look back upon the first term of the industrialization processes in Thailand. In 1960 the Industrial Investment Promotion Act was established and the Act was revised drastically in 1962. After that it had been effective untill 1972 as an center of conductive frame works in promoting industrialization of Thailand.

The contents of the Act were summarized into following three points.

(1) Preference of private enterprises ; public enterprise will avoid competing with private enterprises and make efforts to arrange industrial infrastructures.

(2) Bringing up import substitute industries ; to grant benefits of tax or duty exemption or reduction, etc. to the promoted industries.

(3) Active introduction of foreign capital ; permission to remit principal and returns from investment and to ownership of land.

During the priod from 1959, the year of establishment of the BOI to 1966, total number of firms which received incentive under the Act is shown in Table 2.1.2-2.

2.1.3 The Third Term (Oct., 1972 - Sept., 1976); The Third Five Year Social and Economic Development Plan

Industrial policy of Thailand in the 1960s was taken for the industrialization through manufacturing mainly of the consumption goods and so it aimed at import substitute industries for the goods. There has been a pattern of industrialization to make a domestic industry substitute for the home market to which the imported goods were predominatelly provided and to encourage to bring up the industry. As a result, such a country has to depend so strongly upon the capital goods, intermediate products and the raw materials imported from abroad that the structure of development itself will increase the import volume going with the progress of the industrialization. This is a phenomena which is seen generally in the process of industrialization of the developing countries, not only limited to Thailand.

It is rather problematic that the industrialization policy of Thailand was formulated at that times, mainly, for introducing foreign capital and, its import substitute policy was taken without promise of the future export; the foreign capital advanced into the country on account of securing a market in Thailand and accordingly, production size was not so large as to make good use of scale merits. Moreover, according to the Government policy, there brought about small scale production, overcompetition and low operation rate so that the price of the goods became much higher than that in international market. It was constituence of the Thai industry that it could secure the domestic market under protection of the high import duties but could not all produce competitive goods in international market.

Under such situations as above mentioned, the Government established in 1969 an industrial policy aiming at utilization of the indigenous raw materials. In 1970 it started to raise both import duties and business tax and to make restrictions on the advancement of foreign enterprise into Thailand.

However, the import substitute industries of which textile industry took a leading part were being brouhgt up during the 1st Development Plan period. Such a base of industrialization came to stipulate gradually the growth of modern manufacturing industry, being linked up to a remarkable increase in foreign investment from abroad during the period of the 2nd Plan.

Whatsoever the rates of achievement in the 2nd Plan might be, the growth of the Thai economy during the term may be said in short "it was very smooth", if we take account of the prices of the primary products in hanging low, dullness in exports, a rapid increase in import of the capital goods, intermediate products and the raw materials due to the import substitute policy, decrease of the U. S. military special procurments, etc.

The achievement results from the 2nd Plan can be evaluated that in spite of delay for the some projects and lower growth in public utilities like as transportation and communications, and construction, growth of the private sectors represented by the manufacturing industry had been remarkable.

It sould be pointed out again that a delay for the input of public development expenditure due to shortages of trained technical and administrative personnel as well as implementing organization of projects and problems in the negotiation of foreign loans and the placement of equipment orders.

The 3rd Social and Economic Development Plan had been worked out at the background as mentioned above and the objectives of the Plan were set down as follows:

1) To promote national security

(National security is closely linked with economic development and neither can be neglected without jeopardizing the other)

2) To overcome the economic slow-down and to increase national income in keeping with the availability of national resources

3) To solve the balance of payments problem

4) To maintain economic stability

5) To raise the income and living standard of the rural people in various regions

6) To increase public services to satisfy the requirements of the population

7) To reduce the growth rate of population

8) To raise the level of employment

In order to achieve the above objectives, the Government set the following policies for development during the 3rd Plan period:

1 Improve the production structure of the economy to meet market demand.

2 Promote exports and improve import structure
(The main policy for improving import structure is to switch the demand for goods and services from those produced abroad to those produced locally)

3 Promote economic stability through proper monetary and fiscal policies

4 Promote private sector's and Thai people's role in the economy

5 Promote a better income distribution

6 Distribute development efforts for social equity

7 Family planning

8 Promote education and training

9 Employment

Item 7 family planning and item 9 employment were mewly established.

It was an important point that the 3rd Plan intended to clarify a turnover from directing toward a high economic growth to the stable one and the Plan made much more emphasis on the social aspect than the 2nd Plan, acknowledging that it connect economic development projects to social development projects. The 3rd Plan revised going straight line in the pursuit of qantative economic development in the past and, it gave priority to improving the production structure of the economy and to adjustment of the social distrotion or reginal differences in distribution of development benefits and the income ; public development expenditure were much increased in the field of social development like as rural development, improvement of living stanadard in both urban and rural area and improvement of the quality of manpower.

(1) Industrial Policy and Measures

As regards with industrial development, policies and measures are summarized as follows :

1) To reduce the cost of production of existing merchandise exports in order to compete in the international markets

2) To promote production with low import content, but which utilize domestic raw materials and are labour intensive, for instance construction, agri-business, canned foods industry, etc.

(Emphasis will be placed on the promotion of new export products and industrial products using domestically produced raw materials and labour).

3) To promote industries which can produce more than domestic requirements and consequently have a surplus for export. These commodities are gunny bag, cement, thread, clothes, sugar, construction materials, tires and edible oil. More could be exported but the cost of production is too high to compete in the international markets.

4) To promote industries which are already producing export products. The cost of production should be lower in order to expand the market. These commodities are canned foods, garments, watch parts, furniture, woods products, wigs and handicrafts.

5) To promote import substitution industries ; some kinds of raw materials can be domestically produced. These are cotton, tabaco, pulp, iron ore and diary products.

As described above, in the industrial development, efforts were made to bring up industries to utilize domestic raw materials, to be labour intensive, to be at rural and provincial location and to produce export goods. On the other hand stress were placed on such pleblems as financing system, taxation system, public administration services, etc. which the industrial development faced.

Achievement of the growth rates by sector under the 3rd Plan exceeded mostly the planned targets. Average annual growth of the GDP accomplished 7.1% to 7.0% target. As to per capita GNP, although there is no complete data available, it is assumed according to the average growth rate in real terms of 4.9% from 1972 through 1976 that the target growth rate 4.5% was attained. As to the growth of key sectors, agriculture attained the average annual growth of 5.5%, slightly over the target rate 5.1%, the growth of manufacturing exceeded the target 8% and continued to maintain the 11% level at the average annual growth rate. However, in these sectors as construction, electricity and water supply, mining and quarring, financing and other services, the targets were not accomplished.

After 1974, foreign investment decreased to a great extent and investments in the import substitute industry made a round. Such policies as quoted as "Promote private sector's role in the economy" and "Establish by private sector large scale industry such as petro-chemical, irons and steel, food processing, and machinery and equipment industry" could not be realized during the Plan period.

As regards with the public development expenditure, distribution of social capital or development efforts for social equity, total amount of the planned budget was 100,275 million baht, which amount was more than 70% higher than the original budget (57,520 million baht). However, the actual outlay came to stop at the amount of 92,548 million baht, about 90% of the planned budget and moreover, the rate of achievement for agricultural projects including irrigation and for public health projects was very low at 80% and 67% respectively.

(2) Promotion of Investment Act

In October, 1972 Promotoion of Investment Act was established as the supplement to the Industrial Investment Promotion Act 1962. Main revised points are summarized as follows :

1) Bring up export industries (Reduction of import duties and business tax on the import of the raw materials is subject to the materials for the export goods)

2) Promotion of dispersing industrial locations to rural and provincial area (For the purpose of rural development, to adjust differences in income distribution between urban and rural people, to encourage agro-industries and to grant benefits for favorable treatment of tax and levies on industrial location in the promoted provincial area)

3) Strengthening of Competence of BOI.

2.1.4 The Forth Term (Dec. 1976-Sept. 1981) ;
The Forth Five Year Social and Economic Development Plan

The planned targets during the 3rd Development Plan were not fully achieved due to sluggishness in production and high rise in the prices of the commodities generated by internal and external situations. The 4th Development Plan succeeded the outstanding targets of the previous plan and in the short run, it aimed to recover the business and in the long run to improve the problems derived from the structure of industries.

Under the 4th Plan, main policy target was to aime at being free from poverty in the long run and to promote economy and social order in equity. For that purpose priority in policies should be shifted to change a pattern of growth and to directing at adjustment of the structural problems which were latent at present in the society in Thailand, rather than making objective of social and enonomic growth itself.

The national objectives for the 4th Plan were summarized as follows :

1) To accelerate economic recovery

2) To reduce income disparties

3) To reduce population growth rate, improve manpower quality and increase the level of employment.

4) To improve the management of basic resources and rehabilitate environmental conditions.

5) To strengthen national security management.

Among the above items, the item 4 was introduced newly. To grasp the problem in this manner was based on reflection that the development of the basic resources had been undertaken unruly and the development benefits had been not always distributed in equity. It is certain that rice production was increased in volume and maize grew up to become one of the main export goods. However, at the background there was expansion of the cultivated area, accompanying a great decrease of forestry area.

In 1976, the first year of the 4th Development Plan the share parcentage of the GDP in agriculture sector was 29.8% and that in manufacturing was 19.2%. The 4th Developments Plan estimated these shares in 1981, the target year were 23.9% and 22.9% respectively. This meant that the Government so intended to weigh the two sectors with almost the same importance as to aime to get away from the agricultural country.

Under the 4th Plan, in the industrial development, several significant problems which had been generated in the preceeding period of the three development Plans were taken up and, of each of them policies and strategies were set forth as follows :

(1) Industrial Structure

(1)-1 Policies

1) The Government will encourage industrialization concurrently with agricultural development and give priority to basic industries, supporting industries and agro-industries.

2) To supplement the policies and targets relating to income distribution, the Government will encourage the decentralization of industries from the Bangkok area to the outlying regions by accelerating the provision of various infrastructural facilities in those areas.

(1)-2 Strategies

1) The Government will invest jointly with private concerns in basic industries vital to economic development and the national economy such as iron and steel, fertilizers, pulp and paper, large scale industries utilizing natural resources which the private sector is unable to carry out alone, industries with forward and backward linkages with other industries such as petroleum industry and labour intensive industires.

2) The Government will encourage the establishment of agro-processing industries near the main sources of raw material which are located outside the Bangkok area by providing facilities, tax protection and various promotional privileges as well as

accelerating the production of agricultural raw materials.

3) The Government will give high priority to export oriented industries and less importance to the protection of and the granting of promotional privileges to import substitution consumer goods industries.

4) The Government will encourage the development of small-scale industries which are important for generating employment. This will be done through the provision of credits, risk guarantees, the provision of investment opportunity, technological services and marketing services.

(2) Development of Export-Oriented Industries and Import-Substitution Industries

(2)-1 Policies

1) The government will encourage and promote export-oriented industrial production both in volume and in types of industries through an overall revision of export promotion measures and efforts to find new markets for Thai exports.

2) The Government will encourge and promote import-substitution industries especially, intermediate industries, capital-goods industries and industries with high domestic raw material content.

(2)-2 Strategies

1) Exports will be promoted through geater efforts on the marketing side and through financial assistance.

2) Establishment of export processing zones at seaports and at commercial airports will be expedited.

3) Revision of tax structure in order to assist import substitution of intermediate and capital goods.

4) Revision of import substitution and export promotion measures so that they do not hinder the process of industrialization in any way.

(3) Government Services

1) Industrial Location

1)-1 Policies

In order to decentralize industries to regional areas according to the set targets, the Government has to pursue the following policies:-

1 The Government will promote the decentralization of industries from the Bangkok Metropolitan area by applying privileges granted under the Investment Promotion Act in such a way as to increase the establishment of industries in provincial areas.

2 The Government will give special importance to the establishment of industries is regional areas.

1)-2 Strategies

To attain these objectives, the Government has to implement the following measures:-

1 No special privileges will be granted to industries in the Bangkok Metropolitan area.

2 The Government will consider increasing the amount of promotional privileges granted to investors in provincial areas.

3 The establishment of industrial estates in areas around the Bangkok Metropolis and in every region will be completed within the Fourth Plan period.

4 The Government will provide sufficient facilities for industrial development in provincial areas.

5 The Government will assist the industries in provincial areas by seeking to reduce their costs of production through lower transportation and electricity rates.

6 The Government will provide financial assistance through the expansion of provincial credit services of the Industrial Finance

Corporation of Thailand (IFCT) and the Small Industries Finance Office (SIFO). In addition, the Government will set up a special fund to finance industrial investors in regional areas.

2) Funds for Industrial Development

2)-1 Policy

So that the industrial sector can expand and contribute significantly to the overall objectives and targets of the Fourth Plan, the Government will support credit expansion so that there is enough credit to meet industrial demand. High priority will be given to the channelling of funds into small-scale industries and rural-based industries.

2)-2 Strategy

To reach the above objectives, the Government will implement the following measures.

1) All financial institutions will be requested to expand credit to industries, especially industries in rural areas.

2) The SIFO will be reorganized and made independent from the Ministry of Industry and Krung Thai Bank so that it will be able to function efficiently in the same way as the IFCT. This change will be completed during the early part of Fourth Plan period.

(4) Industrial Cooperation in ASEAN Countries

(4)-1) Policies and Strategies

To fulfill the targets of economic cooperation especially with respect to industrial cooperation, the Government will set up the following policies and strategies:-

1) Promotion of ASEAN economic cooperation through joint investment for industrialization concurrently with selective trade preferential treatment.

2) A permanent agency will be set up to study the feasibility of

inter-ASEAN cooperation in various areas covering those already agreed upon and those that will be agreed upon in future with special emphasis on trade and industrial cooperation.

(5) Government Industrial Enterprises

The inefficiency of the state enterprises is indicated by the rising cost per unit of production and low rates of return on investment. The low production efficiency and the low rate of return inhibited the utilization of these enterprises as price stabilizers or sources of government revenue. The main problems underlying this present condition of the state enterprises can be listed as follows:-

1) Supervision Problem

The absence of operating flexibility and the slow decisions on investment and expenditure in comparison with private enterprises are results of too much supervision by too many agencies, including the Ministry of Finance, the Budget Bureau and the National Economic and Social Development Board. Investment decision procedures are too cumbersome, involving various stages of considerations of many government agencies.

2) Management Problems

In many government industrial enterprises, the management team lacks experience and expertise in their respective areas of business. In addition, political interventions in the administration are prevalent, generating problems of overstaffing and high costs. The executives and the members of the Board of Directors of government industrial enterprises are generally appointed by the Government which selects officials from government agencies instead of recruiting people with knowledge and experience in relevant fields.

(5)-1) Policies

To make government industrial enterprises contribute to the process of industrialization and to national economic development, the Government will revise the following policies:-

1) The Government will continue to support monopolistic state enterprises only to control product quality, to stabilize prices and to generate government revenues. These state enterprises include the Thailand Tobacco Monopoly, the Government Distillery and the Pharmaceutical Organization.

2) The Government will support state enterprises which are strategically necessary, such as enterprises producing explosives.

3) The Government will consider the establishment of new government industrial enterprises which require:-

   1 large budgetary investment on infrastructure.
   2 large capital investment in which private enterprises are reluctant to invest on their own,
   3 complex technology which cannot be provided solely by private enterprises, and
   4 natural resources, where concessions for utilizing these resources must be obtained for production.

4) The Government will close down or sell state enterprises which were origionally established to introduce a new industry, and those which are now operating inefficiently. These types of enterprises can now be operated by the private sector.

5) In sectors where the Government considers that both state enterprises and private companies can operate concurrently, the Government will apply the same measures to regulate the activities of both types of enterprises.

6) The Government will take measures to improve the efficiency of state enterprises in the industrial sector as well as other types of state enterprises which will be allowed to continue operations. The Government will revise the laws and regulations which inhibit the freedom of action of state enterprises so as to enable them to operate efficiently. At the same time, the responsibilities of the management and the Boards of Directors will be clearly stipulated.

(5)-2) Strategy and Corrective Measures.

To ensure that the operations of state enterprises contribute significantly to overall economic and social development, the Government has formulated the following strategies and corrective measures:-

1) The Government will study the objectives and the operations of both new and existing state industrial enterprises in order to identify those which should be promoted and those which should be dissolved or sold to private concerns.

2) The Government will formulate operational and administrative planning. These plans will define the scope of operations of the responsible agencies, the relevant budget, time and working location so that state enterprises can operate efficiently, effectively and economically. Definite procedures for controlling the investment of state enterprises will be laid down and greater freedom of action for state enterprises will be promoted.

3) The Government will encourage cooperation and joint investment with the private sector in industries which are new to Thailand.

4) Laws and regulations controlling state enterprises will be revised with the view to facilitating a greater degree of efficiency in the operations of such enterprises and to allow more operational flexibility. Government control of the operations of state enterprises should be retained.

(6) Government Industrial Management

(6)-1) Policy

The Government policy on his matter is to establish a special organization which will have the responsibility of supervising industrial development efforts.

(6)-2) Strategies

1) Duties and responsibilities of all government organizations concerned with industrialization will be reviewed and clearly defined.

1 The National Economic and Social Development Board will be responsible for planning and formulating industrial development plans an strategies. Long-term policy and planning should be coordinated and revised annually. This will be the responsibility of the NESDB working in coordination with the Ministry of Industry and the Board of Investment.

2 A single agency will be vested with the responsibility of granting investment incentives and of regulating the level of domestic prices of products manufactured locally through such measures as tariff rate adjustments.

3 Industrial services:-

(i) SIFO should be made an independent institution under a government agency so that it can expand its activities.

(ii) Research and technology should be completely under the responsibility of the Ministry of Industry.

(iii) The provision of infrastructural facilities should be coordinated by the Ministry of Industry.

(iv) Industrial information will be systematically collected and coordinated by the Information Centre of the Ministry of Industry which will be expanded in future.

4 The Ministry of Industry will be responsible for regulating and registering factories and supervising various industrial operations in accordance with stipulated regulations, environmental control guidelines and quality control standards. Products for domestic consumption in particular must be subject to strict quality control.

2) Law relating to industriallization will be revised and made consistent with the functions and responsibilities of agencies outlined above.

3) An organization to be directly responsible for industrialization will be established.

(7) Development of Specific Industries

In the preceding Plan periods, the development of specific industries to support the growth and development of the economy was hindered not only by the basic problems outlined above, but by crucial problems within each individual industry. Such problems include those relating to raw materials, quality and standard of products, price and export control, competition in foreign markets and the lack of planning to coordinate production and exports.

(7)-1) Policies

The Government will urgently solve the existing problems of each individual industry and will promote new industries to contribute to the process of industrialization and the overall economic developmet objectives.

(7)-2) Strategies

1) The Government will accelerate and assist projects to produce raw materials for agro-industries. Natural resources will be surveyed to ascertain the extent of their deposits and the amount of reserves that will be available. The Government will also promote investment in basic industries producing raw materials such as petroleum and pulp industries. Information and data services will be provided on existing production capacity, domestic consumption and export potential.

2) Quality and standards for each type of industrial product will be urgently stipulated and inspection of quality and standard will be done, strictly in accordance with the law.

3) Prices will not be controlled but will be determined by market conditions. If if is necesary to control prices, the controlled prices have to be in line with production cost plus an equitable profit for producers. The principle of price control will be to prevent "exessive" profits.

4) The expansion of plants and the establishment of new factories will take into account the existing production capacity and market conditons. Laws will be strictly enforced and the Factory Act will be revised to help solve the problems mentioned above.

5) Foreign markets will be expanded, for instance, through advertisement of manufactured goods, and sending trade missions to open up new markets ; negotiations will be carried out to reduce tax barriers, quota system or import ban of various countries.

As referred to in the foregoing, the policies and the stretegies formulated by the Government had diversities and , for the purpose of implementing them, the following projects were planned. Table 2.1.4-1 is the distribution of industrial development expenditure in the public development expenditure under the 4th Plan.

Table 2.1.4-1 Industrial Development Expenditure

(Millions of Baht)

Projects \ Sources	National budget	Foreign loans	Foreign aid	Public enterprises & Public organizations in provinces	Total
Arrangement of industrial infrastructure	255	455	5	215	930 (31.0)
Technical and training servies	250	-	15	-	265 (8.8)
Technological services	5	-	5	-	10 (0.3)
Survey of investment fields	60	-	10	-	70 (2.3)
Quality control	275	-	5	-	280 (9.3)
Promotion of important industries	1,450	-	-	-	1,450 (48.3)
Total	2,295(76.4)	455(15.1)	40(1.3)	215(7.2)	3,005(100) (100)
Total Public Development Expenditure	200,400	29,800	2,500	19,750	252,450

Source: NESDB, The Fourth National Economic and Social Development Plan 1977 - 1981

As shown in the table, share of the industrial development in the public development expenditure was only 1.2% which was correspondent to 3,005 million baht. The following was the contents projected.

(1) Arrangement of industrial infrastructure

Establishment of industrial estate and export processing zone, and provision of public services, subsidies and public facilities such as electricity and water supply ; proposed locations are senven places in Minburi, Samut Sakhan, Hat Yai, Utapao, North Region, Northern-East Region and Klong Daan.

(2) Technical and training services

The services will be done in provincial area other than Bankok and the adjacent provinces ; for instance, to collect, improve and avail the information and the statistics on industry, to give Thai engineer and technician knowledge and technology of the industry, to promote cottage industry through vocational training in cooperation between Civil Service Commision and each province.

(3) Technological services

To investigate abilities of 50 industrial products and improve them, to promote maintenance of machinery in the factory and to open technology on cost saving, decrease of accidents, fuel saving, etc. to the public.

(4) Survey of the investment fields

- o To investigate possibilities to utilize raw materials or byproducts from agriculture, and forestry products or natural resources.

- o To study and research food products in provincial area

- o For the promotion in provincial area of important industries, such as irons and steel, fertilizer, agricultural chemical, furnace for chinaware and porcelain, to do survey of investment environment of the industries.

(5) Quality control and inspection

- o To encourage establishment of quality and standards for industrial products.

- o To do training in quality control and inspection, and of administrator in factory.

- o To subsidize the fund for testing and inspection equipment, to dispose of the used machinery of the Government in installments or to give credit to small scal enterprise

(6) Promotion of important industries

For the purpose to establish important industries, to improve the structure of industries, to secure confidence from foreign investors, etc. at the initial stage of the 4th Plan, the Government will establish industries which necessitate a large capital investments, jointly with the private sectors. Such industries are lubricating oil production, NH4 fertilizer, agro-processing industries in rural area and joint projects with ASEAN Countries.

The total budget of the public development expenditure under the 4th Plan was 252,450 million baht, about 2.5 times of the planned budget and about 2.7 times of the actual outlay in the 3rd Plan. Of the total budget, 3,230 million baht was expected to be foreign founds and so dependency on the founds was decreased from 15.5% on the actual outlay basis to 12.8% in the planned budget. Feature of the account for the expenditure is that at first, 38% of the total expenditure was intended to invest in repletion of education, at second, 16% of the expenditure was accounted for agriculture and irrigation for both promoting farm-land development and supplying water to 1.1 million rai farm-land as well as for the control of floods and, at third, emphasis was placed on the establishment of regional urban centers to serve as an economic base together with Bangkok metropolitan improvement plan. However, the share of industry and mining including commerce in the total expenditure was decreased from 2.6% on outlay basis in 3rd Plan to 1.4% in the planned budget for the 4th Plan.

Economic growth in real terms during the 4th Plan period was 7.1% at an average annual rate in the GDP, which exceeded slightly the target rate 7%. However, agriculture sector could not achieved the target average rate of 5% for the first time since the 1st Development Plan. Growth of agriculture during the period from the 1960 to about 1976 depended chiefly upon the diversification and commercialization of the crops and the expansion of agricultural land, but since the beginning of the 4th Plan period, the output of the crops per value added in real terms were declined to be cloudy and, besides 1978 and 1981, growth rate of the crops in the GDP marked -0.5% in 1977, -3.3% in 1979 and 4.6% in 1980, all of these were below 5%, the target average growth rate of the agricultural sector. While growth of manufacturing sector like as the agriculture sector stayed at 8.7% against the average growth rate of 9.6% and could not achieve the target for the first time since the 1st Development Plan.

In especial, the share of the GDP in agriculture sector was reduced from 29.8% in 1976, the last year of the 3rd Plan to 25% in 1981, but it failed to reach the target of 23.9% while the share of the GDP in manufacturing sector increased from 19.2% to 20.7%, however, the target share of 22.9% in 1981 was not held , so that the Government intention to give these two sectors with the same importance in the gross domestic product was not realized, but it might be said that the structure of the industry had changed gradually during the 4th Plan period.

Table 2.1.4-2 Gross Domestic Product by Industrial Origin at 1972 Constant Prices

(Millions of Baht)

SECTOR	PRIMARY	SECONDARY			TERTIARY							
Year \ Sub-Sector	Agriculture	Mining and Quarring	Manufac-turing	Construction	Electricity, and Water Supply	Transport and Commu-nication	Wholesale and Retail Trade	Banking Insurance & Real Estate	Ownership of Dwelling	Public Admin-istration and Defence	Other Services	Total GDP
1960	2,822 (40.2)	860 (1.2)	8,389 (12.0)	3,343 (4.8)	210 (0.3)	4,827 (6.9)	11,123 (15.9)	1,306 (1.9)	2,063 (2.9)	3,168 (4.6)	6,623 (9.4)	70,139 (100)
1965	35,931 (36.1)	1,692 (1.7)	14,249 (14.3)	5,688 (5.7)	532 (0.5)	6,444 (6.5)	16,220 (16.3)	2,580 (2.6)	2,391 (2.4)	4,258 (4.3)	9,559 (9.6)	99,544 (100)
1970	48,332 (32.2)	2,555 (1.7)	23,320 (15.5)	8,705 (6.2)	1,638 (1.0)	9,195 (6.0)	26,524 (17.7)	5,806 (3.9)	3,000 (2.0)	6,476 (4.2)	14,541 (9.6)	150,092 (100)
1975	62,081 (30.5)	2,485 (1.2)	36,787 (18.1)	8,514 (4.2)	3,181 (1.6)	13,445 (6.6)	35,774 (17.6)	9,629 (4.7)	3,555 (1.7)	8,359 (4.1)	19,704 (9.7)	203,514 (100)
1976	65,898 (29.8)	2,906 (1.3)	42,529 (19.2)	10,022 (4.5)	3,642 (1.7)	13,366 (6.0)	38,821 (17.6)	10,208 (4.6)	3,664 (1.7)	8,893 (4.0)	21,276 (9.6)	221,225 (100)
1977	65,537 (27.6)	3,526 (1.5)	48,071 (20.3)	11,996 (5.1)	4,144 (1.7)	14,474 (6.1)	41,213 (17.4)	11,574 (4.9)	3,823 (1.6)	9,555 (4.0)	23,260 (9.8)	237,173 (100)
1978	72,513 (27.8)	4,104 (1.6)	52,521 (20.1)	13,583 (5.2)	4,500 (1.7)	16,205 (6.2)	43,658 (16.7)	13,443 (5.1)	4,052 (1.6)	10,166 (3.9)	26,352 (10.1)	261,097 (100)
1979	71,408 (25.8)	4,531 (1.6)	57,841 (20.9)	14,547 (5.3)	5,178 (1.9)	17,563 (6.4)	45,497 (16.4)	15,582 (5.6)	4,289 (1.5)	11,594 (4.2)	28,777 (10.4)	276,907 (100)
1980	72,784 (24.9)	4,780 (1.6)	60,597 (20.7)	16,576 (5.7)	5,560 (1.9)	18,811 (6.4)	48,227 (16.5)	17,419 (5.9)	4,502 (1.5)	12,423 (4.2)	31,173 (10.7)	292,852 (100)
1981	77,701 (25.0)	4,623 (1.5)	64,490 (20.7)	15,500 (5.0)	6,330 (2.0)	20,209 (6 5)	51,103 (16.4)	19,197 (6.2)	4,723 (1.5)	13,192 (4.2)	34,202 (11.0)	311,270 (100)
1982 e	77,784 (24.0)	4,615 (1.4)	68,224 (21.0)	15,721 (4.9)	6,821 (2.1)	21,939 (6.8)	52,669 (16.2)	21,489 (6.6)	4,925 (1.5)	13,813 (4.3)	36,290 (11.2)	324,290 (100)

Note : 1. Figures 1960 - 70 are cited from Bank of Thailand, Industrial situation 1977
2. e is estimate

Source : NESD" National Income of Thailand

Table 2.1.4-3 GDP Per Capita in Real Terms

Year	GDP (millions of baht)	GDP Per Capita (baht)	Population (one thousand)	GDP Per Capita (US$)
1960	70,139	2,658	26,392,000	126
1965	99,544	3,256	30,572,834	156
1970	150,092	4,364	34,397,000	210
1971	157,127	4,267	36,820,097	205
1972	164,626	4,292	38,359,008	206
1973	180,146	4,509	39,950,306	219
1974	189,950	4,595	41,334,152	226
1975	203,512	4,801	42,391,454	236
1976	221,225	5,119	43,213,711	251
1977	237,173	5,357	44,272,693	263
1978	261,097	5,774	45,221,625	284
1979	276,907	6,005	46,113,756	294
1980	292,852	6,236	46,961,338	304
1981	311,270	6,502	47,875,002	298
1982	324,290	6,688	48,489,364	291

Note : GDP, 1960-71 is cited from Bank of Thailand, Industrial Situation 1977

Source : 1. NESDB, National Income of Thailand
2. National Statistical Office, Statistical Summary of Thailand

Table 2.1.4-4 Gross Domestic Product by Industrial Origin in Terms of Economic Development Plan

(Millions of Baht)

SECTOR	PRIMARY	SECONDARY			TERTIARY							
Year \ Sub-Sector	Agriculture	Mining and Quarring	Manufac-turing	Construction	Electricity, and Water Supply	Transport and Commu-nication	Wholesale and Retail Trade	Banking Insurance & Real Estate	Ownership of Dwelling	Public Admin-istration and Defence	Other Services	Total GDP
1960	21,400 (38.2)	610 (1.1)	7,320 (13.0)	2,725 (4.9)	241 (0.4)	4,224 (7.5)	8,846 (15.8)	1,089 (1.9)	1,611 (2.9)	2,586 (4.6)	5,418 (9.7)	56,070 (100)
1966	30,785 (34.5)	1,418 (1.6)	13,795 (15.5)	5,604 (6.3)	809 (0.9)	6,013 (6.7)	14,133 (15.8)	2,620 (2.9)	1,931 (2.2)	3,542 (4.0)	8,539 (9.6)	89,189 (100)
1971(a)	38,145 (29.4)	1,879 (1.4)	23,569 (18.2)	6,210 (4.8)	2,934 (2.3)	7,981 (6.2)	22,816 (17.6)	5,297 (4.1)	2,399 (1.9)	5,647 (4.4)	12,740 (9.8)	129,617 (100)
1971(b)	50,537 (32.2)	2,855 (1.8)	25,202 (16.0)	7,689 (4.9)	1,879 (1.2)	9,373 (6.0)	27,189 (17.3)	6,599 (4.2)	3,106 (2.0)	6,993 (4.5)	15,705 (10.0)	157,127 (100)
1976	65,898 (29.8)	2,906 (1.3)	42,529 (19.2)	10,022 (4.5)	3,642 (1.7)	13,366 (6.0)	38,821 (17.6)	10,208 (4.6)	3,664 (1.7)	8,893 (4.0)	21,276 (9.6)	221,225 (100)
1981	77,701 (25.0)	4,623 (1.5)	64,490 (20.7)	15,500 (5.0)	6,330 (2.0)	20,209 (6.5)	51,103 (16.4)	19,197 (6.2)	4,723 (1.5)	13,192 (4.2)	34,202 (11.0)	311,270 (100)

Source : NESDB, National Income of Thailand

Note : 1. GDP 1960 - 1971(a) is at 1962 constant prices
2. GDP 1971(b) - 1981 is at 1972 constant prices and GDP 1971(b) is cited from Bank of Thailand, Industrial Situation 1977

Table 2.1.4-5

STRUCTURE OF EMPLOYMENT AND ECONOMICALLY ACTIVE POPULATION BY INDUSTRY

Unit: Thousands

Name of Country: THAILAND

SECTOR	PRIMARY	SECONDARY			TERTIARY							
Year / Sub-Sector	Agriculture, Hunting, Forestry and Fishing	Mining and Quarry	Manufacturing (1)	Construction	Electricity, Gas and Water (2)	Transport, Storage and Communication	Wholesale/ Retail Trade, Restaurants and Hotels	Financing, Insurance, Real Estate & Business Services (3)	Community, Social and Personal Services (4)	Activities Not Adequately Defined	Persons Seeking Their First Job/ Umeployment	Total
1960	11334.4 (82.0)	29.6 (0.2)	471.0 (3.4)	68.8 (0.5)	15.5 (0.1)	165.9 (1.2)	779.9 (5.6)	Not Available	655.3 (4.7)	251.7 (1.8)	64.9 (0.5)	13837.0 (100)
1970	13 201.9 (78.2)	86.6 (0.5)	682.6 (4.1)	181.5 (1.1)	25.3 (0.2)	263.4 (1.6)	875.8 (5.2)	Not Available	1 184.2 (7.0)	145.9 (0.9)	197.9 (1.2)	16 850.1 (100)
1971	13 157.6 (79.2) 13 157.6 (79.0)	19.0 (0.1) 19.0 (0.1)	659.0 (4.0) 659.0 (4.0)	188.9 (1.1) 188.9 (1.1)	18.5 (0.1) 18.5 (0.1)	213.3 (1.3) 213.3 (1.3)	1 180.8 (7.1) 1 180.8 (7.1)	Not Available - " -	1 171.9 (7.1) 1 171.9 (7.0)	9.2 (0.1) 9.2 (0.1)	- 35.3 (0.2)	16 618.6 (100) 16 653.9 (100)
1972	11 642.1 (72.2) 11 642.1 (71.8)	118.4 (0.7) 118.4 (0.7)	1 239.5 (7.7) 1 239.5 (7.6)	256.7 (1.6) 256.7 (1.6)	24.0 (0.2) 24.0 (0.2)	313.6 (1.9) 313.6 (1.9)	1 230.4 (7.6) 1 230.4 (7.6)	Not Available - " -	1 302.7 (8.1) 1 302.7 (8.0)	2.1 (0.0) 2.1 (0.0)	- 85.5 (0.5)	16 129.5 (100) 16 215.0 (100)
1973	12 270.5 (72.0) 12 270.5 (71.8)	110.9 (0.7) 110.9 (0.6)	1 201.1 (7.0) 1 201.1 (7.0)	258.0 (1.5) 258.0 (1.5)	48.4 (0.3) 48.4 (0.3)	383.9 (2.3) 383.9 (2.2)	1 392.3 (8.2) 1 392.3 (8.1)	Not Available - " -	1 375.6 (8.1) 1 375.6 (8.0)	2.0 (0.0) 2.0 (0.0)	- 73.9 (0.5)	17 042.7 (100) 17 116.6 (100)
1974	11 226.3 (65.4) 11 226.3 (65.1)	49.6 (0.3) 49.6 (0.3)	1 693.6 (9.9) 1 693.6 (9.8)	276.8 (1.6) 276.8 (1.6)	61.5 (0.4) 61.5 (0.4)	465.1 (2.7) 465.1 (2.7)	1 628.6 (9.5) 1 628.6 (9.5)	Not Available - " -	1 756.7 (10.2) 1 756.7 (10.2)	0.9 (0.0) 0.9 (0.0)	- 72.5 (0.4)	17 159.1 (100) 17 231.6 (100)
1975	13 269.9 (73.0) 13 269.9 (72.7)	28.4 (0.2) 28.4 (0.2)	1 355.7 (7.5) 1 355.7 (7.4)	205.7 (1.1) 205.7 (1.1)	41.4 (0.2) 41.4 (0.2)	381.2 (2.1) 381.2 (2.1)	1 377.2 (7.6) 1 377.2 (7.5)	Not Available - " -	1 521.6 (8.4) 1 521.6 (8.3)	- -	- 73.6 (0.4)	18 181.6 (100) 18 255.2 (100)
1976	13 948.5 (75.8) 13 948.5 (75.1)	28.5 (0.2) 28.5 (0.2)	1 145.3 (6.2) 1 145.3 (6.3)	235.9 (1.3) 235.9 (1.4)	44.6 (0.2) 44.6 (0.2)	326.6 (1.8) 326.6 (1.8)	1 298.2 (7.1) 1 298.2 (7.0)	Not Available - " -	1 381.9 (7.5) 1 381.9 (7.4)	1.2 (0.0) 1.2 (0.0)	- 154.6 (0.8)	18 410.7 (100) 18 565.5 (100)
1977	14 921.5 (73.5)	50.2 (0.2)	1 329.2 (6.5)	331.7 (1.6)	48.3 (0.2)	382.8 (1.9)	1 674.5 (8.2)	Not Available	1 567.1 (7.7)	0.7 (0.0)	- 168.6	20 307.8 (100) 20 476.8
1978	16 018.1 (73.2) 16 017.0 (73.2)	30.2 (0.1) 29.6 (0.1)	1 477.5 (6.7) 1 476.5 (6.7)	313.4 (1.4) 312.5 (1.5)	58.2 (0.3) 58.0 (0.2)	387.7 (1.8) 386.9 (1.8)	1 639.5 (7.5) 1 638.6 (7.5)	Not Available - " -	1 812.9 (8.3) 1 811.7 (8.3)	- 5.7 (0.0)	- 156.8 (0.7)	21 738.1 (100) 21 893.3 (100)
1979	15 018.8 (70.7)	39.3 (0.2)	1 724.9 (8.1)	410.0 (1.9)	53.9 (0.3)	425.4 (2.0)	1 741.8 (8.2)	- " -	1 815.5 (8.6)	-	- 190.2	21 229.6 (100) 21 419.8
1980	15 942.7 (70.8) 15 942.7 (70.1)	36.6 (0.2) 36.6 (0.2)	1 788.9 (7.9) 1 788.9 (7.9)	435.9 (1.9) 435.9 (1.9)	59.9 (0.3) 59.9 (0.3)	455.9 (2.0) 455.9 (2.0)	1 915.9 (8.5) 1 915.9 (8.4)	Not Available - " -	1 886.8 (8.4) 1 886.8 (8.3)	0.5 (0.0) 0.5 (0.0)	- 204.2 (0.9)	22 523.9 (100) 22 728.1 (100)

Source: UN Year Book of Labour Statistics
Year Book of Labour Statistics, Thailand

Note: *1 - Including repair and installation services
*2 - Including sanitary services
*3 - Including restaurant and hotels prior to 1972
*4 - Including restaurants and hotels beginning with 1972
Economically active population in 1976 does not include unpaid family workers who worked less than 20 hours during survey week

Table 2.1.4-6

GDP Originating from Manufacturing at 1972 Constant Prices

1/2

(Millions of Baht)

Year / Commodity	1965	Share (%)	1970	Share (%)	1971	Share (%)	1972	Share (%)	1973	Share (%)	1974	Share (%)	1975	Share (%)
Food	4,542	31.9	4,798	20.6	5,206	20.7	5,027	18.0	5,441	17.3	6,077	17.7	6,313	17.2
Beverages	1,140	8.0	3,035	13.0	2,188	8.7	2,488	8.9	2,978	9.4	3,721	10.8	3,348	9.1
Tobaco and snuff	1,368	9.6	2,401	10.3	2,510	10.0	2,622	9.4	2,969	9.4	3,071	8.9	3,444	9.4
Texitiles	1,137	8.0	2,157	9.2	2,707	10.7	3,392	12.2	4,242	13.5	4,536	13.2	5,058	13.7
Wearing apparel except footwear	752	5.3	1,093	4.7	1,543	6.1	1,781	6.4	1,915	6.1	2,226	6.5	2,694	7.3
Leather, leather products and footwear	38	0.3	232	1.0	287	1.1	219	0.8	762	2.4	265	0.8	324	0.9
Wood and cork	637	4.5	735	3.2	819	3.2	729	2.6	269	0.9	895	2.6	945	2.6
Furniture and fixtures	202	1.4	308	1.3	314	1.2	301	1.1	200	0.6	250	0.7	268	0.7
Papaer and paper products	40	0.3	171	0.7	199	0.8	227	0.8	847	2.7	415	1.2	319	0.9
Printing, publishing and allied industries	406	2.9	517	2.2	612	2.4	719	2.6	286	0.9	953	2.8	1,026	2.8
Chemicals and chemical products	835	5.9	1,478	6.3	1,502	6.0	1,755	6.3	552	1.8	1,562	4.5	1,985	5.4
Petroleum refining and petro products	866	6.1	1,412	6.1	1,959	7.8	2,404	8.6	1,669	5.3	2,477	7.2	2,782	7.6
Rubber and rubber products	137	1.0	374	1.6	468	1.9	545	2.0	2,841	9.0	743	2.2	903	2.5
Non-metallic mineral products	763	5.4	1,179	5.1	1,295	5.1	1,576	5.7	1,852	5.9	1,985	5.8	2,192	6.0
Basic metal industries	60	0.4	392	1.7	442	1.8	434	1.6	534	1.7	462	1.3	409	1.1
Metal products	170	1.2	439	1.9	524	2.1	728	2.6	666	2.1	588	1.7	475	1.3
Machinery	152	1.1	534	2.3	557	2.2	559	2.0	636	2.0	680	2.0	612	1.7
Transport equipment	739	5.2	1,200	5.1	1,150	4.6	1,384	5.0	1,811	5.7	2,412	7.0	2,419	6.6
Electrical machinery & supplies	114	0.8	318	1.4	338	1.3	400	1.4	420	1.3	447	1.3	479	1.3
Miscellaneous n.e.c.	150	1.1	547	2.3	582	2.3	566	2.0	633	2.0	638	1.9	792	2.2
Total value added	14,249	100	23,320	100	25,202	100	27,864	100	31,523	100	34,403	100	36,787	100

(to be continued.)

Table 2.1.4-6 (cont.)

GDP Originating from Manufacturing at 1972 Constant Prices

(Millions of Baht)

Commodity / Year	1976	Share (%)	1977	Share (%)	1978	Share (%)	1979	Share (%)	1980	Share (%)	1981	Share (%)	1982e	Share (%)
Food	7,321	17.2	8,390	17.5	8,380	16.0	8,865	15.3	8,598	14.2	9,229	14.3	10,945	16.0
Beverages	4,034	9.5	4,952	9.4	5,585	10.6	6,752	11.7	5,890	9.7	5,425	8.4	5,611	8.2
Tobaco and snuff	3,727	8.8	3,545	7.4	3,610	6.9	4,091	7.1	4,601	7.6	4,901	7.6	3,990	5.8
Texitiles	5,655	13.3	6,271	13.0	7,197	13.7	7,713	13.3	8,839	14.6	9,195	14.2	9,710	14.2
Wearing apparel except footwear	3,252	7.6	3,649	7.6	4,560	8.7	5,011	8.7	5,566	9.2	6,428	10.0	7,283	10.7
Leather, leather products and footwear	279	0.7	280	0.6	317	0.6	293	0.5	315	0.5	361	0.6	381	0.6
Wood and cork	995	2.3	964	2.0	815	1.6	968	1.7	829	1.4	850	1.3	865	1.3
Furniture and fixtures	288	0.7	355	0.7	351	0.7	345	0.6	353	0.6	410	0.6	479	0.7
Papaer and paper products	453	1.2	597	1.2	732	1.4	842	1.5	959	1.6	983	1.5	1,086	1.6
Printing, publishing and allied industries	1,287	3.0	1,255	2.6	1,412	2.7	1,642	2.8	1,665	2.7	1,884	2.9	1,991	2.9
Chemicals and chemical products	2,299	5.4	3,054	6.4	3,544	6.7	4,177	7.2	5,035	8.3	5,342	8.3	5,916	8.7
Petroleum refining and petro products	3,066	7.2	3,195	6.6	3,246	6.2	3,405	5.9	3,108	5.1	3,218	5.0	3,097	4.5
Rubber and rubber products	1,033	2.4	1,270	2.6	1,386	2.6	1,552	2.7	1,611	2.7	1,594	2.5	1,350	2.0
Non-metallic mineral products	2,442	5.7	2,916	6.1	3,193	6.1	3,274	5.7	3,387	5.6	3,671	5.7	4,032	5.9
Basic metal industries	454	1.1	512	1.1	577	1.1	667	1.2	710	1.2	593	1.0	530	0.8
Metal products	517	1.2	488	1.0	488	0.9	618	1.1	632	1.0	612	1.0	573	0.8
Machinery	792	1.9	856	1.8	872	1.7	997	1.7	1,102	1.8	1,223	1.9	1,304	1.9
Transport equipment	2,996	7.0	3,768	7.8	4,141	7.9	4,382	7.6	4,812	7.9	5,549	8.6	5,473	8.0
Electrical machinery & suppliers	656	1.5	780	1.6	989	1.9	1,094	1.9	1,237	2.0	1,322	2.0	1,402	2.2
Miscellaneous n.e.c.	983	2.3	974	2.0	1,126	2.1	1,153	2.0	1,348	2.2	1,700	2.6	2,206	3.2
Total value added	42,529	100	48,071	100	52,521	100	57,841	100	60,597	100	64,490	100	68,224	100

Note: 1. Figures 1965 - 1971 is quoted from Bank of Thailand, Industrial Situation 1977
2. Share percentage in total does not always become 100%
3. e is estimated

Source: NESDB, National Income of Thailand

2.2 Actual Situation of Thailand Industry

2.2.1 Growth and Structural Change of Thailand Industry

The modernization of industry in Thailand began in the 1960's, and as is stated in the preceding chapter 2.1 "Industrialization and Industrial Policy", it was promoted by the preparation of the industrial foundation through the economic development plan and the introduction of national and foreign private capitals owing to the Industrial Investment Promotion Act 1960 - 1962. The average annual rate of growth in real terms of the manufacturing industry of Thailand is said to have been 4-5%, but, as is shown in the Table 2.1-2, its substantial growth rate after 1960's is shown in the average annual rate of 11-10%. As the recent tendency, its average growth rate during the 4th Economic Development Plan (1977-1981) is 8.7%, and that of 1982 is 5.8%, thus showing some slowdown. The weight in the gross domestic production of the value added created by the sector of manufacturing industry that had attained such a high growth has increased, as is shown in the Table 2.1.4-2, from 12.0% of 1960 to 21.0% in 1982, and the manufacturing industry has developed into one of the key industries of the economy of Thailand ranking with the agriculture.

(1) Constitution of the Value Added of the Sector of Manufacturing Industry

1) Constitution of the Value Added by Industry

As is shown in the Table 2.2.1-1 "Shares of Value Added by Industrial Group and kind of Industry" in the sector of manufacturing industry, the industries that had a large weight in the total value added in 1960 were food (42.1%), then tobacco (10.1%), beverage (7.8%) in said order. And these industries occupied 60.0%, but in 1970, their weight went down to 44%. This was due to that the weights of tobacco and food, especially of tobacco, went down to less than a half. The industries that rose in their weight were the textile (4.6 to 9.2%), oil-refining and petroleum products (0 to 6.1%), and beverage (7.8 to 13.0%). All of these, except petroleum products, are consumer goods, and this represents the change in the structure produced by the development of the import-replacement industrialization in the 1st Economic Development Plan and in the 2nd Economic Development Plan. The industries that comparatively increased in their weight from 1970 till 1982 were apparel wear (4.7 to 10.7%), textile (9.2 to 14.2%), transport equipment (5.1 to 8.0%) and chemicals (6.3 to 8.7%), and in these beside the consumer goods, capital goods and intermediate goods are also included.

The industries that went down in their weight were beverage (13.0 to 8.2%), food (20.6 to 16.0%), tobacco (10.3 to 5.8%), wood, etc.

From the afore-mentioned, it is known that the industry that increased their weight from 1960 to 1982 is the textile (14.2%), and the industries that increased comparatively their weight since 1970 are apparel wear (10.7%), transport equipment (8.0%) and chemicals (8.7%). And the industries that decreased comparatively their weight from 1960 to 1982 are food (16.0%) and tobacco (5.8%), and the industry that had increased the weight till the 1960's but decreased it in the 1970's is beverage (8.2%). (The figure in parenthesis is the rate of 1982).

Table 2.2.1-1 Shares of Value Added by Industrial Group and Kind of Industry
(at 1972 constant prices)

(Unit: Percent)

Industry \ Year	1960	1970	1981	1982*1	Average Annual Grouth Rate 60 - 70	70 - 81
I. Consumer Goods	76.7	61.3	58.0	58.5	8.3	9.1
Food	42.1	20.6	14.3	16.0	3.1	6.1
Beverages	7.8	13.0	8.4	8.2	16.6	5.4
Tobacco & Snuff	10.1	10.3	7.6	5.8	11.0	6.7
Textiles	4.6	9.2	14.2	14.2	18.8	14.1
Wearing Apparel	7.5	4.7	10.0	10.7	5.6	17.5
Furniture & Fixtures	1.2	1.3	0.6	0.7	11.9	2.6
Printing & Publishing	3.4	2.2	2.9	2.9	6.2	12.5
II. Intermediate Goods	15.8	24.0	24.9	24.6	15.4	10.7
Wood & Cork	4.0	3.2	1.3	1.3	8.1	1.3
Paper & Paper Products	0.2	0.7	1.5	1.6	29.4	17.2
Leather, Leather Products & Footwear	0.3	1.0	0.6	0.6	24.5	4.1
Rubber & Rubber Products	0.8	1.6	2.5	2.0	18.8	14.1
Chemicals & Chemical Products	6.7	6.3	8.3	8.7	10.2	12.4
Non-metallic Mineral Products	3.8	5.1	5.7	5.9	13.9	10.9
Petroleum Products	0.0	6.1	7.1	4.5	116.5	7.8
III. Capital Goods	6.7	12.4	14.5	13.7	17.8	11.2
Basic Metal Industries	0.3	1.7	1.0	0.8	29.7	3.8
Metal Products	0.7	1.9	1.0	0.8	22.6	3.1
Machinery & Repairs	0.5	2.3	1.9	1.9	30.2	7.8
Electrical Machinery & Supplies	0.6	1.4	2.0	2.2	20.8	13.8
Transport Equipment	4.6	5.1	8.6	8.0	12.0	14.9
IV. Miscellaneous n.e.c.	0.8	2.3	2.6	3.2	23.2	10.9
All Industries Total	100.0	100.0	100.0	100.0	10.8	9.7

Note : *1 Figures of 1982 are estimate.

Source: NESDB, National Income of Thailand

2) Constitution of Value-added by Economic Goods

As is seen in the Table 2.2.1-1, each industry was presented by the rate of constitution of value added (percentage), dividing each industry into economic goods according to the industrial classification. The value added of the manufacturing industry increased from Bt 8,389,000,000 of 1960 to Bt 23,320,000 in 1970, to the 2.8 times within 10 years, with average annual rate of 10.8%, but the weight of the consumer goods industry decreased from 76.7% to 61.3%, and that of the intermediate goods and capital goods industries increased from 15.8% to 24.0% and from 6.7% to 12.4% respectively.

The change from the 1970's till the beginning of the 1980's was, some falling in the consumer goods industry, and some rise in the intermediate goods and capital goods industries, but when compared with that of the 1960's, it does not represent so large a change in the structure. In continuation, we will see the transition of change by goods and by industry.

1 The industries that increased in the 1970's the constitutional rate (weight): textile (9.2 to 14.2%), wearing apparel wear (4.7 to 10.0%) — consumer goods industry, chemicals (6.3 to 8.3%) — intermediate goods industry, and transport equipment (5.1 to 8.6%) — capital goods industry.

2 The industries that decreased the weight in the 1970's: food (20.6 to 14.3%), beverage (13.0 to 8.4%) and furniture (1.3 to 0.6%) — consumer goods industry, wooden products (3.2 to 1.3%) — intermediate goods industry.

The above-mentioned increase and decrease of weight is the change mainly in the consumer goods industry, and in the intermediate goods industry and capital goods industry it is not so much. As for the industries of capital goods, those that showed high growth in the 1960's, machinery and reparation, base metals, metal products, transport equipment, etc., show rapid slowdown in their growth rate in 1970's. Of these, the industries that increased their weight are only transport equipment and electrical machinery, and the weight of the remaining industries decreased. Of the intermediate goods, the weight of chemicals and petroleum products showed some rises. Accordingly, the down of the weight in the consumer goods industry is considered to represent not the process in which the industrialization from the intermediate goods industry to the capital goods industry progressed rapidly, and the development from the light industry to the heavy industry became intensified, but the process in which the growth was being equalized between each group of industries.

In the observation of the change in the constitutional rate of value-added, as is shown in the Table 2.2.1-2 "Structural Change of Value Added by kind of Industry", it is noted that compared with the large constitutional change in the 1960's, the change in the 1970's is smaller. The weight of the consumer goods such as food, textiles, beverage, etc., remains still high. The wearing apparel rose from the 9th position in 1970 to the 3rd position in 1981 and tobacco fell from the 3rd to the 7th. The slowdown of growth in the intermediate goods such as rubber and rubber products, petroleum product, etc., and the depression in the capital good, such as machinery, metal product, base metal, etc., is very notable. Transport equipment and electrical machinery have risen from the 7th and 16th position in 1970 to the 4th and 13th position in 1981 respectively. Consequently, the actual basic structure of the Thailand industry may be considered to have been formed by the import-replace industrialization by the beginning of 1970's during the period of 2nd Development Plan (1967 - 1971), and was completed about the 1970.

Table 2.2.1-2 Structural Changes of Value Added by Kind of Industry (at 1972 Constant Prices)

(Unit : %)

Year	1960			1970			1981		
Rank	Industry	Share	Cumulated Share	Industry	Share	Cumulated Share	Industry	Share	Cumulated Share
1	Food	42.1	42.1	Food	20.6	20.6	Food	14.3	14.3
2	Tobacco & Snuff	10.1	52.2	Beverages	13.0	33.6	Textiles	14.2	28.5
3	Beverages	7.8	60.0	Tobacco & Snuff	10.3	43.9	Wearing Apparel	10.0	38.5
4	Wearing Apparel	7.5	67.5	Textiles	9.2	53.1	Transport Equipment	8.6	47.1
5	Chemicals & Chemical Products	6.7	74.2	Chemicals & Chemical Products	6.3	59.4	Beverages	8.4	55.5
6	Transport Equipment	4.6	78.8	Petroleum Refining & Petroleum Products	6.1	65.5	Chemicals & Chemical Products	8.3	63.8
7	Textiles	4.6	83.4	Transport Equipment	5.1	70.6	Tobacco & Snuff	7.6	71.4
8	Wood & Cork	4.0	87.4	Non-metallic Mineral Products	5.1	75.7	Non-metallic Mineral Products	5.7	77.1
9	Non-metric Mineral Products	3.8	91.2	Wearing Apparel	4.7	80.4	Petroleum Refining & Petroleum Products	5.0	82.1
10	Printing, Publishing & Allied Industries	3.4	94.6	Wood & Cork	3.2	83.6	Printing, Publishing & Allied Industries	2.9	85.0
11	Furniture & Fixtures	1.2	95.8	Machinery	2.3	85.9	Miscellaneous n.e.c.	2.6	87.6
12	Rubber & Rubber Products	0.8	96.6	Printing, Publishing & Allied Industries	2.2	88.1	Rubber & Rubber Products	2.5	90.1
13	Metal Products	0.7	97.3	Metal Products	1.9	90.0	Electrical Machinery & Supplies	2.0	92.1
14	Electrical Machinery & Supplies	0.6	97.9	Basic Metal Industries	1.7	91.7	Machinery	1.9	94.0
15	Machinery	0.5	98.4	Rubber & Rubber Products	1.6	93.3	Paper & Paper Products	1.5	95.5
16	Basic Metal Industries	0.3	98.7	Electrical Machinery Supplies	1.4	94.7	Wood & Cork	1.3	96.8
17	Leather, Leather Products & Footwear	0.3	99.0	Furniture & Fixtures	1.3	96.0	Basic Metal Industries	1.0	97.8
18	Paper & Paper Products	0.2	99.2	Leather, Leather Products & Footwear	1.0	97.0	Metal Products	1.0	98.8
19	Petroleum Refining & Petroleum Products	0.0	99.2	Paper & Paper Products	0.7	97.7	Leather, Leather Products & Footwear	0.6	99.4
20	Miscellaneous n.e.c.	0.8	100.0	Miscellaneous n.e.c.	2.3	100.0	Furnitures & Fixtures	0.6	100.0

Sourse : NESDE, National Income of Thailand.

(2) Distribution by Region of Gross Domestic Product

As for the distribution by region of domestic production, as is shown in the Table 2.2.1-3, it is highly concentrated in the Central Region including Bangkok. Such difference between the regions is mainly caused by the regional difference of the industrial foundation between the central region and other regions, the concentration in the central region of the manufacturing industry and the construction industry as the result of the concentration in the central region of the budget of the public development expenditure the 1st and 2nd Development Plans. In the GDP per capita by region, the difference is getting extensive between Central Region and other regions as follows: GDP per capita of Central Region Bt 4,734 (except Bangkok), North Region Bt 2,590, North East Region Bt 1,685, South Region Bt 3,743 in 1970 changed to Bt 11,378, Bt 5,458, Bt 3,145, Bt 7,238 in 1976 respectively. And it is standing that the GDP per capita of North Region is low.

Table 2.2.1-3 Distribution of Gross Domestic Product by Region

(Unit: Percent)

	Central Region			North Region	North-East Region	South Region	Nation
	Bangkok	Others	Total				
1961			48.5	16.1	20.2	15.2	100.0
1971			57.2	14.4	15.4	13.0	100.0
1975	27.4	29.8	57.2	15.4	16.0	11.5	100.0
1977	28.0	30.6	58.6	14.0	14.7	12.7	100.0

Source : NESDB

The Table 3.2.9-1 "Value-added of Manufacturing Industry by Region: shows the distribution by region of the value added of manufacturing industry. The Central Region including Bangkok is overwhelming the other regions, rising from 71% of 1960 to more than 80% in the 1970's. According to the progress of industrialization from the initial stage of industrialization in the 1st and 2nd Development Plans, the concentration to the Central Region is getting higher, attaining to 87.7% in 1980.

(3) Structure of Employment in the Manufacturing Sector

As is shown in the Table 2.2.1-4 "Transition of Employment by Industry", in 1960, the 82.3% of the 26,392,000 habitants of total population, 11,334,000 were engaged in the sector of agri-forestry and fishery, and only the 3.4%, 471,000 inhabitants were engaged in the sector of manufacturing industry. The growing rate of the employment in the agricultural sector during the 10 years till 1970 is rather low being 1.5%, but in its absolute number, 1,870,000 workers, namely the 65% of the increased workers in 1970 is absorbed in it. On the other hand, in the manufacturing industry, its average annual growth rate is more than double but the absorbed workers are 210,000, that is only 7.2%. During the period of 1970 to 1980, the manufacturing industry absorbed the 18.8% of workers, that is 2.6 times the former rate, but the agricultural sector had still higher rate of absorption of 46.7%. As is shown in the Table 2.1.4-5 "Structure of Employment and Economically Active Population by Industry", what is absorbing the most of the work force population and the employee population is the agriculture, and although in the work force population, its employment absorption rate (weight) had fallen from 82.0% of 1960 to 70.1% of 1980, it aspect of employment tells that Thailand is a country based on the agriculture. On the other hand, the weight of manufacturing industry doubled from 3.4% of 1960 to 7.9% of 1980 in the period of 20 years, but during the same period of 1960 to 1980 it absorbing power is getting, though slightly, inferior to the weight of the commerce. (But the year 1974 is excluded).

In the Table 2.2.1-5 "Structure of Employment by Industry and Region" the distribution of employment in each region is analyzed by industrial sector, and from this study it is known that the employment rate of agriculture and fishery in North East and North Regions, the employment rate in Bangkok of manufacture industry (1971 - 17.2%, 1976 - 24.5%), of commerce (1971 - 29.3%, 1976 - 25.7%) and service industry (1971 - 26.4%, 1976 27.1%), became high.

In the Table 2.2.1-6 "Employment in Manufacturing Sector", the transition of the number of employees by industry in the manufacturing sector is analyzed. According to the data of this study, the industries of which the number of employees in the 1960's increased

Table 2.2.1-4 Transition of Employment by Industry

(Unit: Thousand)

Industry	1960 *2		1970 *2		1980 *3		Average Annual Growth Rate (%)	
	Number	Share (%)	Number	Share (%)	Number	Share (%)	1960 - 1970	1970 - 1980
Population	26,392	-	34,397	-	47,282	-	2.7	3.2
Work Force	-	-	-	-	22,728	-	-	-
Employees Total	13,772	100.0	16,652	100.0	22,524	100.0	1.9	3.1
Agri-Forestry & Fishing	11,334	82.3	13,202	79.3	15,943	70.8	1.5	1.9
Mining & Quarring	30	0.2	87	0.5	37	0.2	11.4	-8.3
Manufacturing	471	3.4	683	4.1	1,789	7.9	3.8	10.1
Construction	69	0.5	181	1.1	436	1.9	10.2	9.2
Electricity, Gas and Water	16	0.1	25	0.2	60	0.3	5.0	9.0
Wholesale & Retail Trade	780	5.7	876	5.3	1,916	8.5	1.2	8.1
Transport, Storage and Communication	166	1.2	268	1.6	456	2.0	4.9	5.4
Services *1	655	4.8	1,184	7.1	1,887	8.4	6.1	4.8
Activities not defined	252	1.8	146	0.9	1	0.0	-	-

Note : *1 Including financing, insurance, real estate & business services.
*2 Population and Housing Census
*3 Labour Force Survey

Source: NSO, Population and Housing Census 1960 and 1970 and of 1980, Labor Force Survey.

Table 2.2.1-5 Structure of Employment by Industry and Region (As of 1971 and 1976)

(Unit: Thousand and percent in parenthesis)

Industry \ Region	Bangkok		Central Region		North Region		North-East Region		South Region		Nation	
(1971)												
Agri-Forestry & Fishing	193	(15.7)	2,300	(69.8)	3,467	(87.4)	5,592	(90.4)	1,605	(82.9)	13,158	(79.2)
Mining	1	(0.1)	4	(0.1)	-	(-)	-	(-)	14	(0.7)	19	(0.1)
Manufacturing	211	(17.2)	214	(6.5)	98	(2.5)	90	(1.5)	45	(2.3)	659	(4.0)
Construction	62	(5.1)	63	(1.9)	18	(0.5)	34	(0.6)	11	(0.6)	189	(1.1)
Electricity, Gas and Water	11	(0.9)	4	(0.1)	1	(0.01)	2	(0.02)	1	(0.06)	19	(0.1)
Wholesale & Retail Trade	361	(29.3)	293	(8.9)	196	(4.9)	220	(3.6)	111	(5.7)	1,181	(7.1)
Transport, Storage and Communication	66	(5.4)	56	(1.7)	24	(0.6)	23	(0.4)	43	(2.2)	213	(1.3)
Services	325	(26.4)	361	(10.9)	156	(3.9)	224	(3.6)	106	(5.5)	1,172	(7.1)
Activities not defined	-	(-)	2	(0.1)	7	(0.2)	-	(-)	-	(-)	9	(0.05)
Total	1,231	(100.0)	3,298	(100.0)	3,968	(100.0)	6,185	(100.0)	1,937	(100.0)	16,619	(100.0)
		(7.4)		(19.8)		(23.9)		(37.2)		(11.7)		(100.0)
1976												
Agri-Forestry & Fishing	158	(10.9)	2,735	(70.3)	3,336	(82.0)	6,126	(88.8)	1,592	(75.9)	13,949	(75.8)
Mining	1	(0.04)	12	(0.3)	1	(0.03)	3	(0.05)	11	(0.5)	29	(0.2)
Manufacturing	355	(24.5)	309	(7.9)	160	(3.9)	216	(3.1)	105	(5.0)	1,145	(6.2)
Construction	61	(4.2)	59	(1.5)	73	(1.8)	19	(0.3)	25	(1.2)	236	(1.3)
Electricity, Gas and Water	22	(1.5)	10	(0.2)	7	(0.2)	5	(0.1)	1	(0.1)	45	(0.2)
Wholesale & Rental Trade	372	(25.7)	314	(8.1)	217	(5.3)	248	(3.6)	148	(7.1)	1,298	(7.1)
Transport, Storage and Communication	88	(6.1)	89	(2.3)	37	(0.9)	63	(0.9)	51	(2.4)	327	(1.8)
Services	393	(27.1)	365	(9.4)	239	(5.9)	221	(3.2)	164	(7.8)	1,382	(7.5)
Activities not defined	-	(-)	1	(0.03)	-	(-)	-	(-)	-	(-)	1	(-)
Total	1,449	(100.0)	3,893	(100.0)	4,070	(100.0)	6,902	(100.0)	2,097	(100.0)	18,411	(100.0)
		(7.9)		(21.1)		(22.1)		(37.5)		(11.4)		(100.0)

Source: National Statistical Office, Report of the Labor Force Survey, Whole Kingdom Round 2 1971 and 1976

Table 2.2.1 - 6 Employment in Manufacturing Sector

(Unit : Thousand baht)

Sector	1960	1970	1977	Average Annual Growth (%) *1			Shares (%)		
				1960-70	1970-77	1960-77	1960	1970	1977
Processed foor	103.3	115.7	212.5	1.1	9.1	4.3	21.9	17.0	16.0
Beverages	6.5	10.3	16.0	4.7	6.5	5.4	1.4	1.5	1.2
Tobacco and snuff	16.5	19.7	30.5	1.8	6.4	3.7	3.6	2.9	2.3
Textile	48.0	62.3	158.2	2.6	14.2	7.3	10.2	9.1	11.9
Wearing apparel	81.5	132.5	203.2	5.0	6.3	5.5	17.3	19.4	15.3
Leather, leather products	7.9	11.1	15.3	3.5	4.7	4.0	1.7	1.6	1.2
Wood and cork	86.6	75.3	47.5	-1.4	-6.4	-3.5	18.4	11.0	3.4
Furniture and fixtures	3.2	14.9	82.3	16.6	27.7	21.0	0.7	2.2	6.2
Paper and paoper products	3.6	8.1	18.8	8.4	12.8	10.2	0.8	1.2	1.4
Printing and publishing	10.8	16.1	29.6	4.1	9.1	6.1	2.3	2.4	2.2
Chemical and petroleum	6.8	17.0	48.0	9.6	16.0	12.2	1.4	2.5	3.6
Rubber and rubber products	5.0-	8.9	18.6	5.9	11.1	8.0	1.1	1.3	1.4
Nonmetallic minerals	26.4	43.6	86.4	5.1	10.3	7.2	5.6	6.4	6.5
Basic metals	0.2	27.3	76.3	63.5	15.8	41.9	0	4.0	5.8
Metal products	15.5	18.4	51.5	1.7	15.8	7.3	3.3	2.7	3.9
Machinery	4.7	1.1	3.1	-13.5	16.0	-2.4	1.0	0.3	0.2
Electrical machinery	2.9	14.3	39.9	17.3	15.8	11.7	0.6	2.1	3.0
Transport equipment	26.3	59.3	167.8	8.6	15.9	11.5	5.6	8.8	12.6
Miscellaneous	15.4	26.0	54.5	5.4	11.2	7.7	3.3	3.8	4.1
Total	471.0	682.6	1,327.2	3.8	10.0	6.3	100.0	100.0	100.0
Labor force	13,749	16,132	19,730	1.6	2.9	2.1	*2 3.4	4.2	6.7

Note : *1 Calculated from end points.
*2 Percent of total labor force.

Source : Population Censuses, 1960, 1970; Labor Force Surveys, 1974-75 : NESDB estimates.

most in the average annual rate are the basic metals such as steel industry, etc. (63.5%), followed by electrical machinery (17.3%), furniture (16.6%), chemicals and petroleum products (9.6%). As for the industries relative to the metalworking industry, the increase is as follows: metal product (1.7%), machinery (-13.5%) and transport equipment (8.6%), that of the metal products being lower than that of the mean rate of the whole industries of 3.8%, and in particular in the machinery industry it was of negative growth. In the total of these industries, the annual growth rate was 5.4%. In the 1970's, with the highest growth rate of furniture (27.7%), each of machinery, transport equipment, electrical machinery, metal products and basic metals in the level of 16%, textile (14.2%), paper and paper products (12.8%), rubber and rubber goods (11.1%), etc., in said order, the average annual growth rate of capital goods and intermediate goods industries have got high.

Through the years from 1960 to 1977, the industries that had the highest growth rate was basic metals (41.9%), followed by furniture (21.0%), chemicals and petroleum products (12.2%), electrical machinery (11.7%), transport equipment (11.5%) in said order. What is particularly notable is the decrease of the number of employees in the machinery industry and wood industry. In particular, that of machinery industry was -2.4%. The rate (weight) of the total number of the employees in the manufacturing industries to all the work force population is 3.4 - 4.2% in the 1960's, 6.7% in 1977 and 7.9% in 1980. The industries that had the highest weight of the number of employees through the period of 1966 - 1977 were food, textiles, wearing apparel, non-metallic mineral products (cement, pottery, etc.) and transport equipment and those that had low weight were machinery, rubber, and rubber products, paper and paper products, leather goods and beverages. In regard to the metal working industry, as of 1977, metal products have the share of 3.9%, machinery of 0.2%, transport equipment of 12.6% and electrical machinery has the share of 3.0%. The total of the shares of the three industries, except electrical machinery, relative to metalworking industry is, as of 1977, 16.7% (222,400 employees) of the total of 1,327,000

2.2.2 Basic Structure of Thailand Industry

(1) Distribution by Industry

As is shown in the Table 2.2.2-1, the total number of the registered factories in Thailand (note) is 86,015 as of the end of 1982, but as for the numbers by kind of industry, as is stated in the Chapter 3.2.1-3 Small Scale and Medium Scale Industries in Thailand — Number of Major Industries in Each Region (See the Table 3.2.1-4), the rice cleaning mills occupy more than half of them, and beside them, sawmills, agricultural product processing industries such as flour mills, etc., occupy a large share. Also, industries of manufacture and reparation of engine, metal products, printing and publication have many factories.

Note: The registered number of factories is accmulative, and is under the Factory Control Law, but it is not known if all of them are in operation actually.

According to the Table 2.2.2-2 "Number of Factories by Major Industry", till the beginning of the 1960's, as the major industry, the industries of primary products such as rice cleaning, flour mills, etc., were dominantly many and the consumer goods industries were occupying the main position. In the stage of the 2nd Economic Development Plan which may be considered as the second half of the initial stage of industrialization, that is in the latter half of the 1960's, the increase of factories becoming notable in the industries with somewhat higher working grade such as wood products, metal reproduction, jewel working, welding and plating, etc., and further, in the industries of durable consumer goods such as assembly and reparation of automobile, reparation and manufacture of parts of engine, fabrication of plastic household articles, etc.

As for the number of registered factories as of 1978, as will be proved in the chapter 3.2.9 "Features of Industrial Location", of small scale and medium scale industries, of the registered 60,296 factories, the rice cleaning mills occupy more than half, followed by flour mills (4.8%), manufacture and reparation of engine (3.5%), sawmills (3.5%), metal product (3.4%), printing and publication (2.5%), etc. The Table 2.2.2-3 "Number of Manufacturing Plants, End of the Year 1982" analyzes, under somewhat different classification, the numbers of the manufacturing factories as of the end of the year 1982. According to these data, the shares are; machinery and electrical machinery (7.2%), metal products (5.8%), wooden goods (5.5%), food (4.3%), printing and publication (2.3%), manufacture and reparation of automobile (2.2%), etc. The number of factories that includes rice cleaning mills, grain mills, flour food factories is 60.8% in 1978, which is almost equal to the 61.3% obtained from the data of 1982, and also in this figure, the factories of the primary products such as agricultural product, etc., occupy more than

Table 2.2.2-1 Number of Registered Factory

Year	No. of Factories
1947	1,154
1950	1,561
1953	2,006
1955	2,528
1957	10,409
1960	16,007
1961	23,062
1962	24,557
1963	27,336
1964	28,756
1965	38,459
1966	41,081
1967	43,420
1968	45,318
1969	47,644
1970	50,535
1971	53,000
1975	44,135
1977	49,817
1978	60,296
1982	86,015

Source : Factory Control Division, Ministry of Industry

half. Of the metal products, the number has increased from the 3.4% (2,051 factories) of 1978 to 5.8% (4,986 factories) and of the manufacture and assembly of automobile, the number has increased from 1.4% (841 factories) to 2.2% (994 factories). According to the data of 1982, the number of factories relative to metal working industry, including electric appliance and equipment, represents 13,093 factories, 15.2% of the total of 86,015 registered factories. Of the said number, 57.4% (7,520 factories) are located in Bangkok, and this indicates the concentration of factories in Bangkok.

Table 2.2.2-2 Number of Factory by Major Industry

Industry \ Year	1961		1965		1969 (June)	
	No. of Factories	%	No. of Factories	%	No. of Factories	%
Rice Cleaning	11,919	51.7	22,789	59.2	25,998	56.5
Sawing	664	2.9	706	1.8	699	1.5
Printing	695	3.0	937	2.4	1,211	2.6
Foundry & Lathing	1,230	5.3	1,574	4.1	2,082	4.5
Machinery Repairs	421	1.8	555	1.4	638	1.4
Welding & Plating	481	2.1	685	1.8	1,007	2.2
Sugar Refining	633	2.7	743	1.9	629	1.4
Flour Food	667	2.9	1,013	2.6	1,036	2.3
Grain Mill	344	1.5	522	1.3	737	1.6
Wood Products	395	1.7	794	2.1	1,245	2.7
Metal Reproduction	308	1.3	633	1.6	1,199	2.6
Jewely Processing	114	0.5	437	1.1	867	1.9
Car Assembly & Repairs	371	1.6	553	1.4	633	1.4
Others	4,820	20.9	6,518	16.9	8,008	17.4
Total	23,062	100.0	38,459	100.0	45,989	100.0

Source: Factory Control Division, Ministry of Industry

Of the concentration of factories in Bangkok, there is great difference between the rate of 1978 and that of 1982, and some 22% of the total registered factories is located in Bangkok. However, the number of all the factories in whole the country except rice cleaning mills, grain mills, flour mills and food processing is, as per the data of 1982, 33,239, of which 54.1% (17,977 factories) are concentrated in Bangkok.

(2) Major Industries by Region

In regard to the subject of the major industries in each region which is stated later in the Chapter 3.2.1 (see Table 3.2.1-3, each region has the industries of the type that respond to the local demand of consumption such as sawmills, manufacture and reparation, mainly reparation, of engine, flour food, ice making, reparation of automobile, etc. According to the data of 1982, the factories that abundant in Bangkok are of metal products (3,984 factories) and printing and publication (1,769 factories), and among other regions, in Central Region except Bangkok, flour mills (1,283), manufacture and reparation of engine (757), sawmills (726) are located in larger number, and in North Region sawmills (282), manufacture and reparation of engine (194), flour mills (169) are located in larger number. In North East Region, flour mills (169), manufacture and reparation of engine (267), processing of agricultural products (240) are located in larger number and in South Region, manufacture and reparation of engine (419), sawmills (200), ice making (138) are located in larger number.

As for the number of registered factories by employment size, detailed description will be given in the Chapter 3.1.1 and 3.2.1-2 "Definition" of small scale and medium scale industries and "Distribution of Establishments by Region and Employment Size", in the actual situation as of 1979, factories with under 10 employees, just like cottage factory, occupy the 63.5% of the total number of factories, and small industries with 10-49 employees occupy the 29.7% and medium industries with 50-199 employees occupy the 5.2%. Accordingly, the total of small and medium industries comes to occupy just the 98.7% of all the registered factories. (But rice cleaning mills are excluded). And, according to the same data, 11,496 factories, that correspond to the 43.4% of total number of 26,468 registered factories, are located in Bangkok, and in the neighbouring five provinces that compose the Metropolitan Area of Bangkok, the 11.3%, 3,002 factories are located. Accordingly, totalling all these, 54.7%, 14,498 factories are found concentrated in the Metropolitan Area of Bangkok. This can be proved also, as is abovementioned, by the data of the number of the registered factories of 1982. (See Table 3.1.2-2 "Number of Registered Factories by Number of Employees").

Table 2.2.2-3 Number of Manufacturing Plants
End of The Year 1982

	Industrial Activity	Number of plants		
		Bangkok	Other province	Total
1.	Manufacture of cereals	325	48,743	49,068
2.	Manufacture of beverages	48	116	164
3.	Food manufacturing	967	2,741	3,708
4.	Manufacture of textiles and knitting	766	636	1,402
5.	Manufacture of wearing apparel, except foot wear	1,150	51	1,201
6.	Manufacture of leather and leather products	103	163	266
7.	Manufacture of wood and wood products	1,717	3,042	4,759
8.	Manufacture of paper and paper products	334	67	401
9.	Printing, bindling, covering or etching	1,769	216	1,985
10.	Manufacture of chemical product	639	411	1,050
11.	Manufacture of rubber and rubber product	335	391	726
12.	Manufacture of plastic products	1,295	181	1,476
13.	Manufacture of non-metallic product	254	1,576	1,830
14.	Basic metal industries	270	212	482
15.	Manufacture of metal products	3,984	1,002	4,986
16.	Manufacture of machinery, mechanical appliances, electric appliance and equipment	2,542	3,637	6,179
17.	Manufacture and repairing of vehicles and equipments	994	934	1,928
18.	Other manufactureing industries	1,777	2,627	4,404
	Total	19,269	66,746	86,015

Source : Industrial Works Department, Ministry of Industry

(3) Structural Characteristics

In order to seize the industrial structure, an industrial census that provides inclusive data is required. In Thailand, two industrial censuses are available; "Industrial Census 1964" that was effectuated in 1963 (hereinafter referred to as 1963 Industrial Census) and "Industrial Census 1970" that was effectuated in 1970 (hereinafter referred to as 1970 Industrial Census). After these no industrial census is published.

1) Industrial Structure in 1960's

From the Table 2.2.2-4 "Structure of Industry" composed with the data of the Industrial Census 1963, the following characteristics can be seized. Of the total number 164,002 of industrial establishments, 87.6% is occupied by the establishments with less than 10 workers and without employer, and 10.2% is occupied by the establishments with under 10 workers and with employer more than 1, and in this way, in regard to the number, the 87.6% of the total number is occupied by the small cottage type family managements. As to the output and value-added, the family type managements with less than 10 workers and small establishments with less than 10 workers and with more than one (1) employers occupy less than 10% respectively, and on the other hand, the establishments with over 10 workers that represent only the 2.2% of the total number of establishments occupy more than 86%, and from the per capita output and value-added of the establishments with under 10 workers also, the low productivity and the smallness of scale of the Thailand Industry is deduced.

Table 2.2.2-4 Structure of Industry (1963)

Items \ No. of Employees	Less than 10 Managed by family member	Less than 10 (More than 1 employee)	More than 10	Total
(1) Number of Establishments	143,711 (87.6)	16,707 (10.2)	3,584 (2.2)	164,002 (100.0)
(2) No. of Employees	259,998 (54.0)	66,259 (13.8)	154,956 (32.2)	481,213 (100.0)
(3) Wages & Salaries (10^3 ฿)	-	165,100	967,050	1,132,150
(4) Production (10^3฿)	473,904 (3.6)	1,237,560 (9.5)	112,277,174 (86.8)	12,988,638 (100.0)
(5) Value Added (10^3 ฿)	255,320 (4.6)	513,397 (9.2)	4,840,382 (86.3)	5,609,099 (100.0)
(6) Production per Employee (฿)	1,823	18,678	72,777	26,991
(7) Value Added per Employee (฿)	982	7,748	31,237	11,621
(8) Wage & Salary per Employee (฿)	-	3,780	6,443	5,842

Note : As the value added is calculated from production minus raw materials and fuels, the amount of value added is overestimate.

Source: National Statistical Office, Report of the 1964 Industrial Census

As for the industrial structure by industry, as is shown in Table 2.2.2-5 "Structure of Industry by Industrial Group and Kind of Industry (1963)", it is characterized in the following aspects: three industries of food (mainly rice cleaning, sugar manufacture that require small degree of working), textiles, wood and wood products, occupy the 70.9% of the total establishments, the 65.8% of the total employees, the 44.8% of the total output, and the 30.6% of the total value-added, and the consumer goods industries are having an important share in each one of these indices, representing more than 60% in all of them.

As for the labour productivity (per capita value-added) by scale and by industry, as is shown in the Table 2.2.2-6 "Comparison of Labour Productivity by Employment Size and by kind of Industry (1963)", in A Group (Family type management with less than 10 workers), electrical machinery presents the highest, followed by machinery and repairs, beverage, printing and publishing, rubber, leather, and in B Group (Establishments with less than 10 employees and more than one (1) employee), beverage, electrical machinery, chemicals, and rubber present high productivity, and non-metallic mineral, tobacco and textile present low productivity. In C Group (Establishments with over 10 employees), beverages, tobacco and rubber present high productivity and paper, wearing apparel, textile present low productivity. In A Group, large difference by industry of productivity exists among all the industries.

According to the data obtained by the Industrial Census 1970, thorugh the Table 2.2.2-7 "Structure of Industry by Industrial Group and Kind of Industry (1970)", of the total of 3,005 establishments, divided by industry, 1,567 factories (52.1%) are concentrated in consumer goods industry, having higher weight the 901 factories (30.0%) of food, and 257 (8.6%) of textile, followed by 332 (11.1%) of wood and wooden products, 207 (6.9%) of non-metallic mineral, 175 (5.8%) of machinery and reparation, 174 (5.8%) of metal products, in said order.

Of the total of 197,494 employees, 40,586 (20.6%) of textile industry occupy the top position, followed by 32,152 (16.3%) of food, 19,201 (9.7%) of wood and wooden products, in said order, and a large part is concentrated in these three of consumer goods industry.

In the Chapter 3.1.2 "Position of Establishments" of small scale and medium scale industries in Thailand, the structural characteristics are analyzed by scale of establishment (See Table 3.1.2-1 "Economic Characteristics of Establishments by Employment Size (1970 Study)"), and according to these data, of the total establishments, the establishments with 10-19 employees occupy the 38.5% of the total, those with 20-49 employees occupy 33.5%, thus the establishment with 10-49 employees occupy the 72% of the total number of establishments. (Excluded the establishments with less than 10 employees).

Table 2.2.2-5 Sturcture of Industry by Industrial Group and Kind of Industry (1963)

(Unit: Percent)

Industry	No. of Establishments	No. of Employees	Production	Value Added
I. Consumer Goods				
Food	14.5	19.4	30.4	18.8
Beverages	0.1	1.6	7.9	14.1
Tobacco & Snuff	0.2	2.6	12.1	20.2
Textiles	41.8	33.3	7.4	5.5
Wearing Apparel	12.9	7.5	2.2	2.6
Furniture & Fixtures	0.8	0.9	0.7	0.8
Printing & Publishing	0.5	1.6	2.1	2.5
Sub-total	70.8	66.9	62.9	64.4
II. Intermediate Goods				
Wood & Cork	14.6	13.1	7.0	6.3
Paper & Paper Products	0.4	0.6	0.7	0.3
Leather, Leather Products & Footwear	0.2	0.3	0.5	0.4
Rubber & Rubber Products	0.2	0.8	4.9	4.0
Chemicals & Chemical Products	0.4	2.0	5.2	5.1
Non-metallic Mineral Products	4.7	6.0	6.7	8.4
Petroleum & Coal Products	-	-	-	-
Sub-Total	20.4	22.7	24.9	24.5
III. Capital Goods				
Basic Metal Industries	-	-	-	-
Metal Products	3.2	3.7	5.5	3.8
Machinery & Repairs	0.7	1.3	1.1	1.4
Electrical Machinery & Supplies	0.4	0.7	1.1	1.0
Transport Equipment	2.1	2.5	3.3	3.5
Sub-total	6.5	8.2	10.9	9.7
IV. Miscellaneous n.e.c.	2.3	2.2	1.3	1.4
Grand Total	100.0	100.0	100.0	100.0

Source: K. Shishido, Asian Institute of Developing Economies "Terms for the Development of Thai Economy" 1973

Table 2.2.2-6 Comparison of Labor Productivity by Employment Size and Kind of Industry (1963)

(Amount Unit: Baht)

Industry \ No. of Employees	A. Less than 10 managed by family member		B. Less than 10 (more than 1 employee)		C. More than 10	
	Amount	Index (Total=100)	Amount	Index (Total=100)	Amount	Index (Total=100)
I. Consumer Goods	(907)	(92)	(7,467)	(96)	(33,633)	(108)
Food	2,190	223	7,440	96	19,507	62
Beverages	5,000	509	15,520	200	106,359	340
Tobacco & Snuff	1,161	118	4,915	63	95,873	307
Textiles	274	28	5,212	67	10,530	34
Wearing Apparel	2,579	263	7,111	92	9,362	30
Furnitures & Fixtures	3,871	394	8,423	109	20,259	65
Printing & Publishing	4,445	453	10,093	130	22,778	73
II. Intermediate Goods	(738)	(75)	(6,631)	(86)	(28,277)	(91)
Wood & Cork	575	59	8,817	114	15,209	49
Paper & Paper Products	1,398	142	7,509	97	7,839	25
Leather, Leather Products and Footwear	4,010	408	7,527	97	25,784	83
Rubber & Rubber Products	4,206	428	12,151	157	72,344	232
Chemicals & Chemical Products	2,839	289	12,376	160	34,507	110
Non-metallic Mineral Products	1,008	103	3,669	47	48,248	122
Petroleum Products	-	-	-	-	-	-
III. Capital Goods	(2,610)	(266)	(8,873)	(115)	(28,207)	(90)
Basic Metal Industries	-	-	-	-	-	-
Metal Products	1,718	175	7,441	96	27,507	88
Machinery & Repairs	5,133	523	10,810	140	16,352	52
Electrical Machinery & Supplies	6,918	704	14,180	183	21,742	70
Transport Equipment	3,450	351	7,949	103	40,503	130
IV. Miscellaneous n.e.c.	(2,643)	(269)	(10,236)	(132)	(12,796)	(41)
V. Total	982	100	7,748	100	31,237	100

Source: N.S.O, Report of the 1964 Industrial Census

Table 2.2.2-7 Structure of Industry by Industrial Group and Kind of Industry (1970)

(Amount Unit: Thousand baht)

Industry	No. of Establishments	No. of Employees*	Wages & Salaries	Raw Materials, Light & Heat	Production	Value Added
I. Consumer Goods	1,567	104,576	897,446	15,899,178	18,692,357	2,793,177
Food	901	32,152	264,838	9,242,492	8,689,939	-552,553
Beverages	43	7,431	116,793	1,864,850	2,389,004	524,153
Tobacco & Snuff	114	15,055	167,708	1,936,425	3,561,076	1,624,650
Textiles	257	40,586	262,267	2,470,949	3,387,838	916,889
Wearing Apparel	79	1,656	4,730	22,372	40,481	18,109
Furnitures & Fixtures	35	992	11,061	70,494	114,011	43,517
Printing & Publishing	138	6,704	70,049	291,596	510,008	218,412
II. Intermediate Goods	827*	60,837	586,695	5,264,582	8,215,159	2,950,577
Wood & Cork	332	19,201	110,888	848,312	1,168,414	320,102
Paper & Paper Products	20	2,506	28,014	284,723	278,368	-6,355
Leather, Leather Products and and Footwear	29	902	6,619	66,297	97,367	31,070
Rubber & Rubber Products	95	10,643	85,138	1,298,300	1,695,615	397,315
Chemicals & Chemical Products	133	11,045	138,460	1,264,979	2,962,632	1,697,653
Non-metallic Mineral Products	207	16,381	216,812	1,494,449	2,001,115	506,666
Plastic & Plastic Products	8	159	764	7,522	11,648	4,126
III. Capital Goods	498	27,544	301,874	4,722,620	5,824,555	1,101,935
Basic Metal Industries	47	3,738	49,617	776,613	1,007,581	230,968
Metal Products	174	7,089	50,209	1,166,237	1,748,580	582,348
Machinery & Repairs	175	3,730	33,282	428,593	625,698	197,105
Electrical Machinery & Supplies	37	4,372	35,644	410,835	457,780	46,945
Transport Equipment	65	8,615	133,122	1,940,342	1,984,916	44,574
IV. Miscellaneous n.e.c.	133	3,510	19,148	184,648	256,851	72,203
Total	3,005	197,494	1,870,816	27,915,963	35,737,417	7,821,454

Note : Number of employees in total includes the employees of three petroleum refineries

Source: National Statistical Office, Report of the 1971 Industrial Census

As to the number of the employees, the 18.3% of the total employee are working in the establishments with 10-49 employees, and the number of workers that work in the establishments with over 100 employees occupies the 72% of the total number, but the number of the establishments only occupies the 15.5% of the total establishments, which indicates that the employment is concentrated in the medium and large scale establishments that are small in the number. And relative to the total output and the total value-added, these medium and large establishments also occupy 80.6% and 87.9% respectively.

As to the labour productivity, it is rising according to the growth of the employment size. (However, the low figure of the establishments with 50-99 employees is due to the negative value-added in the food industry).

2) Change in the Structure during 1963 - 1970

The industrial structures by industry seized by the industrial census of 1963 and of 1969 respectively are compared in the Table 2.2.2-8 "Change of Industrial Structure in Comparison between 1963 and 1970". The comparison of the number of establishments, with exclusion of 727 factories with less than 10 workers, shows that the 3,005 factories of 1963 is reduced in 36%, to 2,278 of 1970, but the mean number of employees per establishment increased in 52.1%, from 43.2 to 65.7 employees, and this means the growth of the scale of the establishment. Observed by industry, the mean number of employees is increased in the capital goods or export consumer goods industries, such as tobacco, textile, transport equipment, electrical machinery, etc.

With respect to the output, it grew 3.1 times. Classified by industry, the share of the consumer goods fell from 62.3% to 52.3%, and the share of the capital goods rose on the contrary from 10.3% to 16.3%. Likely in the value-added, the share of the consumer goods fell, and the capital goods and intermediate goods rose, from 8.1% to 14.1% and from 26.1% to 37.7% respectively, and this suggests the development in the industrialization.

As is shown in the Table 2.2.2-9 "Change of Industrial Structure by Size of Employment (1963, 1967 and 1970)", the trend of the development of industrialization in 1960's may be deduced from these data. The weight of the establishments with over 100 workers is elevated in all the indices of number of establishments, number of employees, output, value-added and wages, salaries and the contrast between the overwelming number of establishments of small industry and the tendency to the concentrative oligopoly by the modern industry that increased in the number during 1960's indicate the double structure of the Thailand industry, showing the great difference between the small scale establishments and the large scale establishments. This point was also reflected in the modification of the difference of income that was the aim of the policy of the 3rd five year Plan, as promotion of a better income distribution and distribution of development efforts for social equity.

Table 2.2.2-8A Changes of Industrial Structure in Comparison between 1963 and 1970

A. 1963

Industry	No. of Establishments (%)	No. of Employees (%)	Wages & Salaries (%)	Production (%)	Value Added (%)	Labor Productivity (10^3฿)	Distribution (%)	Wage & Salary per Employee (฿)	Gross Value Added to Production Ratio (%)	Average Employees per Establishment (person)
I. Consumer Goods	(59.2)	(60.4)	(55.5)	(62.3)	(65.1)	(33.6)	(17)	(5,731)	(45)	(44.1)
Food	38.9	272	20.0	28.9	17.0	19.5	23	4,571	25	30.2
Beverages	1.7	4.8	8.1	9.0	16.2	106.4	10	10,637	77	121.0
Tobacco & Snuff	3.9	7.6	12.0	13.9	23.3	95.9	10	9,815	72	83.0
Textiles	8.4	16.2	9.6	7.8	5.5	10.5	35	3,707	30	83.3
Wearing Apparel	1.5	0.6	0.4	0.2	0.2	9.4	42	3,936	47	17.8
Furniture & Fixtures	1.2	0.7	1.1	0.4	0.5	20.3	46	9,233	47	27.0
Printing & Publishing	3.5	3.3	4.3	2.0	2.4	22.8	37	8,342	51	39.7
II. Intermediate Goods	(26.6)	(28.8)	(32.4)	(26.7)	(26.1)	(28.3)	(25)	(7,015)	(42)	(46.8)
Wood & Cork	13.7	12.8	11.0	7.3	6.3	15.2	35	5,330	37	40.7
Paper & paper Products	0.6	1.1	1.3	0.7	0.3	7.8	94	7,358	17	87.4
Leather, Leather Products Footwear	0.4	0.4	0.4	0.4	0.3	25.8	26	6,621	29	40.3
Rubber & Rubber Products	1.3	2.0	1.8	5.5	4.5	72.3	8	5,807	36	63.4
Chemicals & Chemical Products	4.5	5.1	7.4	5.6	5.6	34.5	26	9,075	43	48.6
Non-metallic Mineral Products	6.1	7.4	10.5	7.2	9.1	38.2	23	8,813	54	52.5
Petroleum Products	-	-	-	-	-	-	-	-	-	-
III. Capital Goods	(11.2)	(9.0)	(10.9)	(10.3)	(8.1)	(28.2)	(27)	(7,594)	(34)	(34.8)
Basic Metal Industries	-	-	-	-	-	-	-	-	-	-
Metal Products	4.0	3.9	4.5	5.7	3.5	27.5	26	7,140	26	41.9
Machinery & Repairs	3.0	1.5	1.8	0.6	0.8	21.7	46	7,458	38	21.3
Electrical Machinery & Supplies	0.8	1.3	1.5	1.0	0.9	16.4	35	7,632	52	66.2
Transport Equipment	3.3	2.3	3.1	3.0	3.1	40.5	21	8,426	42	30.4
IV. Miscellaneous n.e.c.	(3.0)	(1.8)	(1.2)	(0.7)	(0.7)	(12.8)	(32)	(4,152)	(44)	(25.1)
V. Total	100.0	100.0	100.0	100.0	100.0	31.2	20	6,241	43	43.2

Table 2.2.2-8B

B. 1970

Industry	No. of Establishments (%)	No. of Employees (%)	Wages & Salaries (%)	Production (%)	Added Value (%)	Labor Productivity (10^3฿)	Distribution (%)	Wage & Salary per Employee (฿)	Gross Value Added to Production Ratio (%)	Average Employees per Establishment (person)
I. Consumer Goods	(52.1)	(53.0)	(48.0)	(52.3)	(35.7)	(26.7)	(32)	(8,582)	(15)	(66.7)
Food	30.0	16.3	14.2	24.3	-7.1	-17.2	-	8,237	-	35.7
Beverages	1.4	3.8	6.2	6.7	6.7	70.5	22	15,717	22	172.8
Tobacco & Snuff	3.8	7.6	9.0	10.0	20.8	107.9	10	11,140	46	132.1
Textiles	8.6	20.6	14.0	9.5	11.7	22.6	29	6,462	27	157.9
Wearing Apparel	2.6	0.8	0.3	0.1	0.2	10.9	26	2,856	45	21.0
Furniture & Fixtures	1.2	0.5	0.6	0.3	0.6	43.9	25	11,150	38	28.3
Printing & Publishing	4.6	3.4	3.7	1.4	2.8	32.6	32	10,449	43	48.8
II. Intermediate Goods	(27.5)	(30.8)	(31.4)	(23.0)	(37.7)	(48.5)	(20)	(9,644)	(36)	(73.6)
Wood & Cork	11.1	9.7	5.9	3.3	4.1	16.7	35	5,775	27	57.8
Paper & Paper Products	0.7	1.3	1.5	0.8	-0.1	-2.5	-	11,179	-	125.3
Leather, Leather Products & Footwear	1.0	0.5	0.4	0.3	0.4	34.4	21	7,338	32	31.1
Rubber & Rubber Products	3.2	5.4	4.6	4.7	5.1	37.3	21	7,999	23	112.0
Chemicals & Chemical Products	4.4	5.6	7.4	8.3	21.7	153.7	8	12,536	57	83.0
Non-metallic Mineral Products	6.9	8.3	11.6	5.6	6.5	30.9	43	13,236	25	79.1
Petroleum Products	0.4	0.1	0.04	0.03	0.1	25.9	19	4,805	35	19.9
III. Capital Goods	(16.6)	(13.9)	(16.1)	(16.3)	(14.1)	(40.0)	(27)	(10,960)	(19)	(55.3)
Basic Metal Industries	1.6	1.9	2.7	2.8	3.0	61.8	22	13,274	23	79.5
Metal Products	5.8	3.6	2.7	4.9	7.4	82.1	9	7,084	33	40.7
Machinery & Repairs	5.8	1.9	1.8	1.8	2.5	52.8	17	8,923	32	21.3
Electrical Machinery & Supplies	1.2	2.2	1.9	1.3	0.6	10.7	76	8,153	10	118.2
Transport Equipment	2.2	4.4	7.1	5.6	0.6	5.2	299	15,452	2	132.5
IV. Miscellaneous n.e.c.	(3.8)	(1.8)	(1.0)	(0.7)	(0.9)	(20.6)	(27)	(5,455)	(28)	(31.1)
V. Total	100.0	100.0	100.0	100.0	100.0	39.6	24	9,473	22	65.7

Note : 1. Gross value added is production minus raw materials, fuels, etc.
2. Labor productivity is gross value added by number of employees.
3. Distribution is wages & salaries by gross value added.
4. Of 1970, establishments with employees less than 10 are included.

Source: 1. K. Shishido, Asian Institute of Developing Economies, "Terms for the Development of Thai Economy" 1973, originally from NSO, Report of the 1964 Industrial Census
2. Of 1970, NSO, Report of the 1971 Industrial Census

Table 2.2.2-9 Changes of Industrial Structure by Size of Employment
(1963, 1967 and 1970)

(Unit: Percent)

Items \ Employees		10 - 19	20 - 49	50 - 99	More than 100	Total
(1) No. of Establishment	1963	49.4	34.9	9.1	6.6	100.0
	1967	39.1	32.4	11.0	17.5	100.0
	1970	38.5	33.5	12.5	15.5	100.0
(2) No. of Employees	1963	15.1	23.5	14.7	46.7	100.0
	1967	6.7	11.8	8.8	72.7	100.0
	1970	6.3	12.0	10.1	71.7	100.0
(3) Production	1963	8.9	18.3	11.9	60.9	100.0
	1967	4.8	7.6	11.1	76.5	100.0
	1970	4.0	8.0	7.4	80.6	100.0
(4) Value Added	1963	6.2	12.5	9.3	72.0	100.0
	1967	3.3	6.2	8.7	81.8	100.0
	1970	3.1	6.6	2.4	87.9	100.0
(5) Wages & Salaries	1963	9.7	17.1	12.2	61.0	100.0
	1967	5.2	7.9	8.6	78.3	100.0
	1970	3.1	6.5	7.1	83.4	100.0

Note : 1. Establishment with employees more than 10.

2. Of 1967 and 1970, establishments with employees less than 10 are excluded.

Source: Of 1963 and 1967 from K. Shishido, Asian Institute Developing Economies "Terms for the Development of Thai Economy" 1973, originally from Report of the 1964 Industrial Census and of the 1968 Industrial Census. Of 1970 from Report of 1971 Industrial Census.

3. SMALL SCALE AND MEDIUM SCALE INDUSTRIES IN THAILAND

3. SMALL SCALE AND MEDIUM SCALE INDUSTRIES IN THAILAND

3.1 The Position of Small Scale and Medium Scale Industries in Thai Economy

3.1.1 Definition

In Thailand, definition of small scale and medium scale industries (hereinafter referred to as S/M industries) is found out in the loan regulations of the Small Industries Finance Office (SIFO), the Department of Industrial Promotion (DPI), the Ministry of Industry (MOI), a public financial institution for S/M industries and it is provided in the regulations that "Small scale industries are defined as those enterprises which engage in manufacture, service business, handicraft and cottage industry, of which fixed assets or registered capital do not exceed 5 million baht", but there is no provision of the number of employee. According to another definition by the Industrial Service Institute, the Dept. of Industrial Promotion, MOI, small scale industries are defined as those enterprises of which registered capital is less than one million baht, or which employees are less than 50 persons and of which machinery is run by more than 2 HP prime mover. However, there is no official definition in statistics by the National Statistical Office, MOI and the Department of Labor.

Now therefore, in this report we would like to use the definition of S/M enterprise which was adopted in the first joint servey on S/M industries in Thailand conducted by the National Institute of Development Administration (NIDA) and Thamasat University (note). The definition was based on the number of employees in the following.

Small Scale Industries (SI);	10–49 employees
Medium Scale Industries (MI);	50–199 employees
Large Scale Industries (LI);	more than 200 employees

Note: Saeng Sanguanruang, Somasak Tambunlertchai and Nit Sammabhum, A Study of Small and Medium Scale Industries in Thailand.

Main reason why we adopt the above definition is that reliable statistic data on S/M industries in Thailand has been very limited besides the data resulted from the studies abovementioned.

3.1.2 Position of Establishment

According to the 1971 Industrial Census which is shown in Table 3.1.2-1 "Economic Characteristic of Establishments by Employment Size (1970 study)", of the total number of 2,278 firms with 10 or more employees, 1,641 firms are small scale enterprises with employees 10–49, which hold 72% of the total and 248 firms are medium scale enterprises with 50–99 employees, comprising 12.5% of the total. Accordingly, the number of small scale and medium scale enterprises with employees 10–99 are 1,889 firms which occupy 84.5% of the total. As shown in Table 3.1.2-2 "Number of Registered Factories by Number of Employees (as of June 1979)" compiled by by the Factory Control Division, MOI, out of the total 9,649 firms with 10 or more employees, small scale enterprises with employees 10–49 are 7,871 firms with 81.6% of the total and medium scale enterprises with employees 50–199 are 1,469 firms with 15.2% of the total, excluding rice-milling enterprises, and accordingly, the S/M industries (with employee of 10–199) comprise 96.8% of the total. Accordingly to the same statistics, large scale enterprises with employees 200 or more are 309 firms and occupy 3.2% of the total. As regards with small scale enterprises with employees less than 10, the number of enterprises are 16,819 and it comprises 63.5% of the total registered firms 26,468. This data so indicate that the numbers of small scale industries with employees less than 10 had a significance in the Thai economy. Table 3.1.2-3 shows "Number of Firms by Regions and Employment size" which was conducted by the Department of Labour, the Ministry of Interior, in 1977–1978, out of the total numbers of 17,364 firms with 10 or more employees, small scale enterprises are 14,119 firms with employees less than 50, comprising so high share as 81.3% of the total and medium scale enterprises with employees 50–99 are 1,821 firms with 10.4% of the total. The small scale and medium scale industries with employees 10–99 occupy such a share of 91.7% of the total.

As a result of the above statistical annalysis, the S/M industries in Thailand are estimated to occupy about 90–97% of the total number of the firms, including the SI with employees 10–49 comprising about 80%–82% of the total number of the firms with employee 10 and more. Therefore, it is estimated that the MI comprise about 10–15% of the total number.

(1) Employment

As shown in Table 3.1.2-1 according to the Industrial Census 1970, of the total number of 192,903 employees working in establishment with employees of 10 or more, employees equivalent to 18.3% engage in the SI and employees equivalent to 10% engage in the MI. According to the survey on the number of establishments (non-agriculture) by region and employment size in Table 3.1.2-3, out of 915,948 employees working in establishment with 10 or more employees, employees equivalent to 32.3% engage in the SI, and the equivalent to 13.6% engage in the medium scale industries with employees 50–99.

Table 3.1.2-1 Economic Characteristic of Establishments by Employment Size (1970 Study)

(Amount : Thousands of Baht)

	Number of Employee					
	less than 10	10-19	20-49	50-99	more than 100	Total
(1) No. of Establishment	727 (24.2)	878 (29.2)	763 (25.4)	284 (9.5)	353 (11.7)	3,005 (100)
(2) No. of Employees	4,591 (2.3)	121,190 (6.2)	23,087 (11.7)	19,400 (9.8)	138,226 (70.0)	197,494 (100)
(3) Gross outut (10^3 ฿)	753,771 (2.1)	1,400,940 (3.9)	2,803,822 (7.8)	2,591,820 (7.3)	28,187,064 (78.9)	35,737,417 (100)
(4) Law Materials and Light & Heat (10^3 ฿)	667,246 (2.4)	1,163,509 (4.2)	2,2940,084 (8.2)	2,404,187 (8.6)	21,386,937 (76.6)	27,911,963 (100)
(5) Value Added	86.525 (1.1)	237,431 (3.0)	509,738 (6.5)	187,,633 (2.4)	6,800,127 (86.9)	7,821,454 (100)
(6) Wages & Salaries	22.354 (1.2)	56,383 (3.0)	120,153 (6.4)	130,403 (7.0)	1,541,523 (82.4)	1,870,816 (100)
(7) Gross Prifits (10^3 ฿)	64.171 (1.1)	181,048 (3.0)	389,585 (6.5)	57,230 (1.0)	5,258,604 (88.4)	5,950,638 (100)
(8) Labor Productivity (5)/(2) (10^3 ฿)	18.8	19.5	22.1	9.7	49.2	39.6
(9) Wages & Salaries Per Capita (10^3 ฿)	4,869	4,625	5,204	6,722	11,152	9,473
(10) Distribution Ratio (%)	25.8	23.7	23.6	69.5	22.7	23.9
(11) Gross Profits Ratio (7)/(3) (%)	74.2	76.3	76.4	30.5	77.3	76.1
(12) Value Added Ratio (5)/(3) (%)	11.5	16.9	18.2	7.2	24.1	21.9

Note : Figures in parenthesis are parcentage

Source : NSO, Report of the 1971 Industrial Census

Table 3.1.2-2 Number of Registered Factories by Number of Employees (as of June 1979)

( ) : Percentage

Number of Employees	Central Region				North Region	North-East Region	South Region	Nation
	Bangkok	Greater Bangkok ex. Bangkok	Other Provinces	Total				
less than 10	7,865(46.8) (68.4)	1,356(8.1) (45.2)	2,983(17.7) (71.0)	12,204(72.6) (65.3)	1,224(7.3) (56.8)	2,061(12.3) (58.5)	1,330(7.9) (63.7)	16,819(100.0) (63.5)
10-49	3,174(40.3) (27.6)	1,128(14.3) (37.6)	1,029(13.1) (24.5)	5,331(67.7) (28.5)	719(9.1) (33.3)	1,165(14.8) (33.0)	656(8.3) (31.4)	7,871(100.0) (29.7)
50-99	262(26.0) (2.3)	264(26.2) (8.8)	102(10.1) (2.4)	628(62.4) (3.4)	146(14.5) (6.8)	172(17.1) (4.9)	61(6.1) (2.9)	1,007(100.0) (3.8)
100-199	110(23.8) (0.96)	154(33.3) (5.1)	44(9.5) (1.0)	308(66.7) (1.6)	31(6.7) (1.4)	102(22.1) (2.9)	21(4.5) (1.0)	462(100.0) (1.7)
200-499	52(25.0) (0.45)	76(36.5) (2.5)	21((10.1) (0.5)	149(71.6) (0.8)	28(13.5) (1.3)	15(7.2) (0.4)	16(7.7) (0.8)	208(100.0) (0.8)
500-999	21(30.9) (0.18)	18(26.5) (0.6)	14(20.6) (0.3)	53(77.9) (0.3)	6(8.8) (0.3)	6(8.8) (0.17)	3(4.4) (0.14)	68(100.0) (0.3)
1000 or more	12(36.4) (0.1)	6(18.2) (0.2)	7(21.2) (0.2)	25(75.8) (0.13)	2(6.1) (0.1)	5(15.2) (0.14)	1(3.0) (0.04)	33(100.0) (0.12)
Total	11,496(43.4) (100.0)	3,002(11.3) (100.0)	4,200(15.9) (100.0)	18,698(70.6) (100.0)	2,156(8.1) (100.0)	3,526(13.3) (100.0)	2,088(7.9) (100.0)	26,468(100.0) (100.0)

Note : The figures are from the registration in 1969 and the increase and decrease after that year.
Rice-cleaning mills are excluded.
Greater Bangkok Area excluding Bangkok = Pathum Thai, Nonthaburi, Phra Nakhon, Thon Buri, Samut Prakan

Source : Factory Control Division, Ministry of Industry

Table 3.1.2-3 Numbers of Firms and Employees by Region and Employment Size

Size of Employees	Bangkok		Central Region ex. Bangkok		North Region		North-East Region		South Region		Nation	
	Firm	Employee	Firm	Employee	Firm	Employee	Firm	Employee	Firm	Employee	Firm	Employee
5 - 9	7,339 (40.0) (51.6)	58,351 (39.9)	3,600 (19.6) (46.9)	27,571 (18.9)	1,915 (10.4) (50.5)	15,755 (10.8)	3,424 (18.6) (58.6)	27,560 (18.9)	2,111 (11.5) (50.0)	16,877 (11.6)	18,389 (100.0) (51.4)	146,114 (100.0) (13.8)
10 - 19	3,477 (40.1) (24.5)	51,159 (40.4)	1,882 (21.7) (24.5)	27,196 (21.5)	880 (10.2) (23.2)	12,923 (10.2)	1,333 (15.4) (22.8)	19,794 (15.6)	1,089 (12.6) (25.8)	15,473 (12.2)	8,661 (100.0) (24.2)	126,545 (100.0) (11.9)
20 - 49	2,215 (40.6) (15.6)	68,868 (40.8)	1,230 (22.5) (16.0)	37,798 (22.4)	573 (10.5) (15.1)	17,821 (10.6)	785 (14.4) (13.4)	23,922 (14.2)	655 (12.0) (15.5)	20,503 (12.1)	5,458 (100.0) (15.3)	168,912 (100.0) (15.9)
50 - 99	650 (35.9) (4.6)	44,592 (35.8)	462 (25.5) (6.0)	32,085 (25.8)	261 (14.4) (6.9)	18,020 (14.5)	188 (10.4) (3.2)	12,899 (10.4)	251 (13.9) (5.9)	16,793 (13.5)	1,812 (100.0) (5.1)	124,389 (100.0) (11.7)
100 - 299	375 (36.4) (2.6)	60,791 (36.3)	334 (32.4) (4.4)	55,550 (33.2)	124 (12.0) (3.3)	20,126 (12.0)	95 (9.2) (1.6)	14,807 (8.8)	102 (9.9) (2.4)	16,050 (9.6)	1,030 (100.0) (2.9)	167,324 (100.0) (15.8)
300 - 499	69 (34.9) (0.5)	26,993 (35.5)	84 (42.4) (1.1)	32,148 (42.3)	27 (13.6) (0.7)	10,147 (13.4)	8 (4.0) (0.1)	3,063 (4.0)	10 (5.1) (0.3)	3,632 (4.8)	198 (100.0) (0.6)	75,983 (100.0) (7.2)
500 - 999	62 (48.1) (0.4)	43,280 (49.0)	50 (38.8) (0.7)	34,090 (38.6)	10 (7.8) (0.3)	6,779 (7.7)	5 (3.9) (0.1)	3,035 (3.4)	2 (1.6) (0.04)	1,214 (1.4)	129 (100.0) (0.4)	88,398 (100.0) (8.3)
More than 1,000	33 (43.4) (0.2)	90,229 (54.9)	31 (40.8) (0.4)	48,892 (29.7)	5 (6.6) (0.1)	6,116 (3.7)	6 (7.9) (0.1)	18,072 (11.0)	1 (1.3) (-)	1,088 (0.7)	76 (100.0) (0.2)	164,397 (100.0) (15.5)
Total	14,220 (39.8)	444,263 (41.8)	7,673 (21.5)	295,330 (27.8)	3,795 (10.6)	107,687 (10.1)	5,844 (16.3)	123,152 (11.6)	4,221 (11.8)	91,630 (8.6)	35,753 (100.0) (100.0)	1,062,062 (100.0) (100.0)

Note : Bangkok is of 1973, Nonthaburi, Pathum thani and Samut Prakan is of 1978 and other Regions are of 1976 and 1977, excluded are agriculture, public corporations, international organizations and automobil sales.

Source: Industrial Development in Thailand, Small- and Medium-scale Industries 1979/78, originally from Department of Labor, Ministry of Interior, Yearbook of Labor Statistics 1977

(2) Gross Output and Value Added

According to the Industrial Census 1970 of the total output of 34.98 billion baht produced by establishments with 10 or more employees, the amount equivalent to 12% (4.2 billion baht) was produced by the SI and the equivalent to 7.4% (2.59 billion baht) was done by the medium scale industries with employees 50 – 99.

As regards with value added, of the total value added 7.75 billion baht generated by the establishments with 10 or more employees, the value added equivalent to 9.7% (0.75 billion baht) was created by the SI and the equivalent to 2.4% (0.19 billion baht) was done by the medium scale industries with employees 50 – 99.

3.2 Characteristics of Small Scale and Medium Scale Industries and Problems

3.2.1 Firms by Industry and by Employment Size (1976 Study)

According to the data from "A Study of Small and Medium Scale Industries in Thailand in 1978" (Study in 1976 and 1977 hereinafter called as 1976 Study), joint research and survey on S/M industries in Thailand by NIDA and Thamasat University under a proposal of IFCT, the numbers of firms which were objective of the survery in final are 1,049 establishments including firms with employees less than 10. Table 3.2.1-1 shows "Distribution of Firms by Industries and by Employment Size".

(1) Distribution of Firms by Industry

In the numbers of the firms, the first place is held by food manufacturer with 14.3% of the total number of 1,049 firms, followed by Textiles (11.1%), fabricated metal products (7.8%), non-metalic mineral products (7.7%) and so on, industries under a category of metalworking in this report are fabricated metal products (7.8%), machinery (5.5%) and transport equipment (4.3%), comprising 17.6% of the total firms, excluding electrial appliances (3.0%).

As to distribution of the SI by kind of industry, it is distributed to all most of the industries, particularly, in the manufacturers of textile (14.7%), non-metalic mineral products (9.3%), fabricated metal products (8.2%), machinery and transportation equipment (4.8%). Distribution of the SI in metalworking is 22.7% of the total numbers of the SI, 625 firms.

At a reviewal of distribution of the SI by kind of industry the first place is held by the manufacturers of food with 14.7%, followed by textiles (12.2%), non-metal mineral products (9.3%), fabricated metal products (8.2%), machinery (6.2%), transportation equipments (4.8%), electrical appliance (4.8%) and so on.

Table 3.2.1-1 Distribution of Firms by Industry and by Employment Size (1976 Study)

Industry / No. of Employees	Lee than 10	10-49	50-99	100-199	200 and over	Total	Share (%)
Food	29	92	17	7	5	150	(14.3)
Beverage	1	8	5	3	2	19	(1.8)
Tobacco	-	11	11	3	5	30	(2.9)
Textiles	5	76	22	6	7	116	(11.1)
Wearing Apparel	9	15	5	1	2	32	(3.1)
Leather Products	5	8	2	-	-	15	(1.4)
Footwear	4	6	-	-	-	10	(1.0)
Wood Products	9	12	-	2	2	25	(2.4)
Furniture	4	19	5	3	1	32	(3.1)
Paper Products	4	10	2	2	-	18	(1.7)
industrial Chemical	2	19	3	-	2	26	(2.5)
Other Chemical Products	6	8	13	10	-	37	(3.5)
Rubber Products	3	24	9	7	6	49	(4.7)
Plastic Products	7	19	5	2	1	34	(3.2)
Pottery	4	26	9	3	1	43	(4.1)
Glass Products	1	4	5	2	-	12	(1.1)
Non-metallic Mineral Products	12	58	6	5	-	81	(7.7)
Iron and Steel Products	10	25	1	-	-	36	(3.4)
Non-ferrous Metal	8	14	1	-	1	24	(2.3)
Fabricated Metal Products	12	51	10	7	2	82	(7.8)
Machainery	13	42	1	2	-	58	(5.5)
Electrical Appliance	5	19	2	3	2	31	(3.0)
Transport Equipment	8	30	3	2	2	45	(4.3)
Scientific Equipment	-	2	1	-	-	41	(0.3)
Miscellaneous	13	27	-	-	1	41	(3.9)
Total	174 (16.6)	625 (59.6)	138 (13.2)	70 (6.7)	42 (4.0)	1,049 (100.0)	(100.0)

Source : Industrial Development in Thailand, Small-and Medium-scale Industries 1979/80 by International Development Center of Japan, originally, from Saeng Sanguanruang, Somsak Tambunlertchai and Nit Summabun, A study of Small and Medium Scale Industries in Thailand, 1978 (in Thai).

The industries in which the MI have the highest shares are the manufacturers of tobacco and other chemical products.

In the metalworking industries, metal products (8.2%), machinery (1.4%) and transportation equipment (2.4%) occupy 12.0% in total, excluding electrical appliance (2.4%).

(2) Distribution of Establishments by Employment Size in each Region

As is shown in the Table 3.2.1-2 "Distribution of Establishment by Region and Employment Size (1976 Study)", of the 1,049 establishment, object of the study, 62.4% (655 establishments) are located in the Metropolitan Area of Bangkok, and Central Thai, excepting Metropolitan Area of Bangkok (13.3%), North Thai (11.0%), South Thai (9.7%) follow it. As the rice cleaning mills and sawmills are excluded in the 1976 Study, the distributions of establishments in the North and North East Thai, where many of these establishments are seated, so the lower percentages of 11% and 3.6% respectively.

According to the "Number of Registered Factories by Employment Size in Each Region (as of June 1979)", prepared by The Factory Control Division and MOI, shown in the Table 3.1.2-2, of the 26,468 registered factories, excluding rice cleaning mills, 43.4% (11,496 factories) are seated in Bangkok, 11.3% (3,002 factories) are seated in the neighbouring five provinces that constitute the Metropolitan Area of Bangkok, and uniting all these the 54.4% (14,498 factories) are concentrated in the Metropolitan Area of Bangkok. In other provinces in the Central Region, the distribution is 15.9% (4,200 factories), and the total of the Central Region is 70.6% (18,698 factories). As for the other regions, 13.3% (3,526 factories) of North East Region, 8.1% (2,156 factories) of North Region, 7.9% (2,088 factories) of South Region follow it.

As for the factories with employees less than 10, 72.6% are distributed in Central Region, and of these, 54.9% (9,221 factories) are concentrated in Bangkok. In the Central Region, excluded the Metropolitan Area of Bangkok, 17.7% (2,983 factories) are distributed. As for the small factories with 10–49 employees, 67.7% (5,331 factories) are distributed in Central Region, and of these, 54.6% (4,302 factories) are concentrated in the Metropolitan Area of Bangkok, and of this latter, 40.3% (3,174 factories) are concentrated in Bangkok, and in the Central Region except Bangkok, 13.1% is distributed. The 63.7% (936 factories) of the medium scale factories with employees 50–199 are distributed in the Central Region and of these, 53.8% (790 factories) are concentrated in the Metropolitan Area of Bangkok, and of this latter, 25.3% (372 factories) are distributed in Bangkok. In the Central Region except Bangkok, 9.9% (146 factories) are distributed.