

Table 6.4.2 Classification of Loans by Purposes

Amount of loans in thousands of baht

Fiscal Year	Approved				Engineering Industries				Purpose				Remarks	
	Case	amount	working capital	land	construc- tion	equipment	others	case	amount	working capital	land	construc- tion		equipment
1977	83	46,193	3,254.5	2,830	10,700	29,070.5	340	9	4,650	56.5	700	1,436	2,457.5	-
1978	85	44,880	3,232	2,232	9,970	29,257	295	10	5,880	492	120	1,150	4,118	-
1976	56	28,095	2,294.5	1,450	5,590	15,683.5	3,075	11	5,470	225	400	1,525	2,545	775
1980	17	5,870	380	250	662	4,578	-	3	850	100	-	230	520	-
1981	1	100	20	-	-	80	-	-	-	-	-	-	-	-
1982	5	3,010	225	-	1,720	1,065	-	1	650	-	-	-	650	-
1983	9	5,340	1,295	100	1,170	2,775	-	1	1,000	200	-	-	800	-
Total	256	133,488	10,595	6,862	29,812	82,509	3,710	35	18,500	1,073.5	1,220	4,341	11,090.5	775

Source: SIFO

Table 6.4.3

Classification of Loans Provided by IFCT by Industry (1979 - 1981)

Products	Amount (£ million)				Proportion (%)		
	1979	1980	(Jan.-Sept.) 1981	1979	1980	1981	
1. Iron and Steel, Metal Products	32.90	291.3	305.0	2.8	28.3	32.3	
2. Non-metal Mineral Product	281.20	241.1	48.3	23.5	20.8	5.1	
3. Services	137.40	107.9	108.0	11.5	10.5	11.4	
4. Agro-based Industry, food Processing Agricultural Products Trade	205.06	108.3	163.8	17.1	10.5	17.3	
5. Chemical, Chemical Products	40.82	91.2	11.4	3.4	8.8	1.2	
6. Wood products	40.40	90.0	1.5	3.4	8.7	0.2	
7. Machinery, Equipment	180.00	75.0	3.8	15.0	7.3	0.4	
8. Transportation, warehousing	100.00	28.4	163.6	8.4	2.8	17.3	
9. Rubber, Rubber Product	10.00	20.0	-	0.8	1.9	-	
10. Paper and Paper Product	-	4.5	-	-	0.4	-	
11. Textile, Clothing	4.90	-	78.0	0.4	-	8.3	
12. Electrical Machinery	121.50	-	-	10.1	-	-	
13. Transportation Equipment	3.50	-	-	0.3	-	-	
14. Construction	40.00	-	56.0	3.3	-	5.9	
15. Petro-chemical Products	-	-	6.0	-	-	0.6	
	1,197.68	1,030.7	945.4	100.00	100.00	100.00	

Sources : IFCT

6.5 Fiscal Incentive System

Fiscal Incentive System takes the following 3 forms.

6.5.1 Business taxes

The rate of taxation is set according to product type by the MOF. Table 6.5.1 shows the business tax rate. Finished goods generally are subject to high tax rate and materials for products are enjoying low rate. Moderate tax rate are levied on the intermediate inputs.

This tax is levied on gross revenues or turnover. This tax has been criticised because of cascading effect which discourage the horizontal integration within industry. However, the limited nature of industrial development in Thailand seems to be the major irritant. It is probable that many small firms are able to evade the business tax to a large extent. It seems likely that the business tax falls hardest on the medium size firms because many medium-size firms are too conspicuous to succeed at evasion and they do not possess the personnel resources to achieve legitimate rebates or negotiate with officials for more favourable classification.

A value-added tax would avoid the problem of cascading. However, it has many difficulty in implementing in Thailand within the near future. It would be possible that as part of promotional policy for special industrial sector, for example, for small and medium size metalworking industries, Thai government extends the privilege of getting rebate on business tax to the firms engaging the metalworking.

6.5.2 Tariff protection

Table 6.5.1 shows the import duty for major engineering items. From this Table we find that high import duty are levied on durable consumer goods and that parts for durable consumer goods, raw material and capital goods generally enjoy lower rate of import duty. This represents the import substitution industrial policy. As a result of this tariff policy most of durable consumer goods are now assembled inside Thailand.

6.5.3 INVESTMENT PROMOTION

In 1962 Industrial Investment Promotion Act was enacted to promote private industries and import substitution industries and to induce the foreign investment. After the amendment for the upbringing of the export oriented industries in 1972, Investment Promotion Act was enacted for the purpose of strengthening the power of the BOI (Board of Investment) and the Office of the BOI. (BOI was established as one of the boards in the Office of the Prime Minister in 1959.)

BOI consists of the Prime Minister as Chairman, the minister of Industry as Vice Chairman, not more than ten other competent persons appointed by the Prime Minister to act as members, and the Secretary General as member and Secretary to the Board. In the performance of duties under this Act, BOI may authorize the Office to act on its behalf, and appoint sub-committees to perform any assigned duties.

The activities which are eligible for investment promotion are :

1. Those which are important and beneficial to the economic and social development, and security of the country.
2. Those which involve production for export
3. Those which have high content of capital, labour or service
4. Those which utilize agricultural produce or natural resources as raw materials, provided that in the opinion of the Board, they are non-existent in the Kingdom, or existent but inadequate, or use out-of-date production processes.

The BOI has policy to give special attention to activities which :

1. Enable the country to save or earn considerable amount of foreign currency especially in export activities.
2. Help development of natural resources available in the Kingdom
3. Help increase in number of employment
4. Having located in rural area
5. Able to save or substitute certain amount of imported energy.
6. Become basic industry for future advance industrial development
7. The government sees it important and appropriate.

The Board of Investment is authorized by law to award tax incentives to promoted activity as in the following :

1. Exemption from income tax
2. Exemption or reduction from payment of import duties and/or business tax on machinery.
3. Reduction of import duties for raw and essential materials.
4. Reduction of taxes to encourage investment in the Investment Promotion Zones.
5. Exemption and reduction of import duties to encourage export.

BOI also have the power to grant some permissions and give some guarantees and protection. The above-mentioned incentives are awarded to the firms which are able to satisfy the terms and conditions BOI designates.

Table 6.5.1

Rates of Import Duty and Business Tax
on Major Engineering Items

	<u>Import Duty</u>	<u>Standard Profit Rate</u>	<u>Business Tax</u>	<u>Total Tax Rate</u>
Iron and steel scrap	5	6.5	1.5	6.85
Iron and steel bars, alloy steels	20	6.5	1.5	22.11
Iron and steel wire, cast iron tubes and pipes and pipe fittings, bolts and nuts	30	11	7	41.11
Kitchen utensils	60	11	7	73.68
Unwrought aluminium	5	2	1.5	6.85
Plates, rods, angles etc of aluminium	30	11	7	41.11
Hand tools (incl agri)	15	11	7	24.83
Locks, doors, frames, door furniture etc	30	11	7	41.11
IC engines	15	13	3	19.29
IC engine parts	15	26	5	22.97
Water pumps	15	16	3	19.40
Parts of pumps	15	26	3	22.97
Air conditioners	80	13	30	147.12
Air conditioner parts	80	25.5	15	117.27
Refrigerators	80	13	30	147.12
Refrigerator parts	80	25.5	15	117.27
Agri.machinery (tillers, threshers etc.)	0	16	3	3.83
Parts of agri. machinery	0	20		4.16
Metal-working machinery	10	16	3	14.21
Valves cocks, taps	15	11	7	24.83
Transformers (up to 10,000 Kva)	30	13	3	34.85
Fans	40	13	15	66.1
Parts of fans	20	26	7	31.6

- to be continued -

(to be continued)

	<u>Import Duty</u>	<u>Standard Profit Date</u>	<u>Business Tax</u>	<u>Total Tax Rate</u>
Electrical equipment for IC engines	15	26	7	26.16
Electro-thermic domestic appliances	30	11	7	41.11
Television	60	15.5	30	120.98
Radio	50	15.5	30	107.17
Parts of radio and TV	30	11	7	41.11
Switchgear	30	11	7	41.11
Passenger cars, CKD	50	11	1.5	52.75
Car and motorcycles parts	50	26	7	64.55
Motorcycles	60	11	12	62.13
Spectrometers and other testing equipment	30	11	7	41.11

Source : Customs Department

6.6 Research & Development Assistance

6.6.1 TISTR (Thiland Institute of Scientific and Technological Research)

The TISTR was founded in 1963 through the assistance of the UNDP. It started under the name of Applied Scientific Research Corporation of Thailand (ASRCT) to initiate, implement, promote and support research work concerning applied science involved in or related to activities in national development, natural resources, industries, and administrative work. The original status of ASRCT was unique and created specifically for the organization, neither that of a regular government agency, nor public enterprises. It was operating many large projects which generated considerable income and the organization was managed most efficiently. Restrictions were gradually imposed on the ASRCT over time by the Budget Bureau and the MOF, culminating in its change of status in 1979 to that of a State Enterprise attached to the Ministry of Science, Technology and Energy under the new name of TISTR. It seems that this change was made because of deterioration of the financial position. However, despite the change in status, TISTR remains substantially the same kind of institution as its predecessor. It is given great latitude in the use of funds either earned or donated. New restrictions apply only to the use of government funds. In this respect, its status in practice is the same as that of the IFCT. Table 6.6.1 shows the listing of professional staff by area of expertise as of 1982. The Table indicate that the range of activity of the institute extends most fields of science and technology and that it has a relatively large and well qualified staff. The following are the scope of activity and role in relation to engineering industry.

Scope of activity of TISTR Mechanical Engineering Industry Group;

- metal products
- non-electric machinery
- electrical machinery
- electrical apparatus, appliances, supplies
- transport equipment

Needs of the industry to be served :

- Acquisition of additional skills
- Technological innovations
- New designs
- New adaptations

TISTR has an interest in playing a role as a specialized agency to provide technical assistance and training to engineering industries. The TISTR currently engages in much consulting work for industries which often goes beyond R & D. In order to play a significant role in industrial development. It would need consultants, for more staff, for additional training of existing staff, and for upgrading of facilities.

A high level institution such as TISTR should clearly play a leader role in industrial development. For this, its capacity needs strengthening.

Table 6.6.1 TISTR Professional Staff 1982

Area of Experties	No. of staff	Level of Training		
		Ph. D.	Master	Bachelor
1. Agriculture Group	36	4	13	19
2. Engineering "	28	5	13	10
3. Architecture "	14	0	3	11
4. Chemistry "	18	0	5	13
5. Physics "	9	0	2	7
6. Biology "	6	0	3	3
7. General Science Group	7	0	0	7
8. Math. & statistics "	3	0	0	3
9. Pharmacy "	10	0	4	6
10. Nutrition "	9	2	6	1
11. Economics "	13	2	8	3
12. Commerce & Accountancy	9	0	0	9
13. Library & Liberal arts	7	0	4	3
14. Administration Group	9	0	1	8
15. Social Science "	6	0	4	2
16. Law	2	0	0	2
17. Information Science Group	1	0	0	1
Total	187	13	66	108

Source : Introducing TISTR. Rattanakosin Bicentennial Anniversary Publication, Bangkok, 1982 (In Thai).

6.7 Standardization

6.7.1 TISI (Thai industrial Standard Institute)

Industrial Products Standards Act was enacted in 1968 and the office of Industrial Products Standards was started in the Department of Science. The Office was dissolved into the Thai Industrial Standards Institute under the Ministry of Industry in 1979. The Government passed an Act to encourage use of Standards. The organization of the Institute is shown in Table 6.7.1 and it has 170 officials and some 40 others.

The number of standards already published is approaching 400 (By 1980 Compulsory standards 14 on ground of safety and Optional standards 333) of which 70 are relevant to the engineering industries.

They are mainly covers basic iron and steel products for some electrical equipment and for some automotive equipment.

The following is the problems, troubles and difficulty the organization is facing in carrying out its objects for the promotion of the metalworking industries :

- Man-power ; high turnover of professional staff
- Facilities ; with no laboratories of its own
- Others ; budget and manpower allocations for publicity work are very small, therefore, very few firms have knowledge of TISI, MARK

Figure 6.7.1 Organization of TISI

Industrial Product Standards Committee (the policy-making body)

Under-Secretary of State for Industry (chairman)

Representatives from: Department of Science

Department of Industrial Works

Department of Industrial Promotion

Ministry of Agriculture

Ministry of Interior

Ministry of Economic Affairs

Ministry of Public Health

Department of Customs

Thailand Institute of Scientific and Technological Research

National Economic and Social Development Board

Board of Investment

Six divisions :

Administration Division

Standards Division

Certification and Quality Control division

Technical and Foreign Affairs Division

Standardisation Promotion Division (publicity)

Office of International Codex Alimentarius Division

Within the Standards Division there are 6 sections ;

- o General Services ; Project and Follow-up
- o Editing and Printing of Standards ; Standards Research Development
- o Fundamental Standards ; Textile ; Paper Pulp etc ; Consumer Products
- o Architectural, Furnishing and Construction Materials ;
Civil and Structural Construction Materials ; Metallic
- o Mechanical ; Electronic and Telecommunication ; Electrical Appliances
- o Food ; Agricultural Products ; Chemicals ; Plastics ; Other non-metallic

Technical Committees (which prepare standards and consist of manufactures, independent professional and technical experts and consumers)

6.8 Industrial Estate

6.8.1 IEAT – Industrial Estate Authority of Thailand

The Authority was established as a public enterprise in 1972 as one of the departments of MOI and is completely responsible for the planning and construction of industrial estates and for their administration and operation with the objective of developing and decentralizing the industries.

The industrial estates which the Authority has already completed and those currently being planned are shown in Table 6.8.1.

The following is a brief description of IEAT.

(1) Principal functions

- 1) Acquisition of land as the site for industrial estate
- 2) Construction and improvement of roads, drainage facilities and other infrastructure for the purpose of operating the industrial estate
- 3) Leasing or selling of industrial estate
- 4) Promotion and control of private industrial estates
- 5) Implementation of feasibility studies

(2) Organization

- 1) The Board of Directors which consists of the chairman and directors, establishes the basic policies of IEAT and oversees its activities. The executive director is responsible for the actual operation of IEAT.

(3) Financial basis

The operating revenues of IEAT belong to IEAT, but if a surplus accrues after deducting expenses, it is remitted as "State Revenue" whereas if a deficit accrues, the "STATE" makes up for the deficit.

In the past, the medium and small scale enterprises had known very little about the industrial estate. (A study of Small and Medium Scale Industries in Thailand, 1978 Saeng Sanguanruang, Somsak Tambunlertchai and Nit Sunmabhun.) The activities of IEAT had also been focused on the big businesses, but as evidenced by the construction of the Bang-Poo Industrial Estate, it is beginning to turn its attention on the medium and small scale industries.

Table 6.8.1

Industrial Estates Already Constructed, Under Construction or in the Planning Stage

Name of Estate	Status	Scale	Cost	Fund Source
Bank Chan Industrial Estate	Completed	280 acres		
Latkrabang Industrial Estate	Completed	400 acres	฿165 million	World Bank Loan, Thai Government
Bang-Poo Industrial Estate	Completed	750 acres	Abt. US\$ 30 million	
Northern Industrial Estate (Chiangmai-Lamphun)	Scheduled for completion in 1985	Abt. 300 acres		
Bangplee Industrial Estate	Under construction	Abt. 800 acres	Abt. ฿1.2 billion (1st phase only)	Asian Development Bank, U.S. aid, Thai Government
North-Eastern (Nakorn Ratchasima)	Being planned			
Western Region (Samut Sakhon)	Being planned			
Eastern Region (Loem Chabang and Rayong/Sattahip)	Being planned			
Southern Region (Songkhla/Head Yai)	Being planned			

6.9 Association of Industries

6.9.1 ATI (Association of Thai Industries)

Established in 1967, the ATI has 826 corporate members in 1982. The association has 20 industry clubs today (shown in Table 6.9.1).

The ATI, as the major association bringing together leading members of the manufacturing sector in Thailand, has very important role to play in the development of Thai Industry, helping to sort out and identify the industry's problems and in representing the industry at discussions with government.

The ATI works very closely with the government and other statutory organizations like the BOI, IEAT, EPB, TISI.

ATI's activities are shown following

- o Sending missions for Export Promotion
- o Survey or seminars for energy saving

Table 6.9.1 Industrial Club under ATI

1. Agricultural Machinery Manufacturers Club
2. Air Conditioning & Refrigeration Industry Club
3. Aluminium Industries Club
4. Automotive Assembly Industry Club
5. Auto Parts Industry Club
6. The Thailand Fellowship of Cement Manufacturers
7. Ceramics Industry Club
8. Chemical Industry Club
9. Electrical Electronic & Allied Industries Club
10. Food Processing Industries Club
11. Furniture Industry Club
12. Thai Gas Manufacturers Club
13. Thai Glass Manufacturers Club
14. Iron & Steel Industries Club
15. Leather Based Industries Club
16. Pharmaceuticals Industry Club
17. Plastic Industry Club
18. Pulp and Paper Industry Club
19. Rubber Based Industry Club
20. Packaging Industry Club

- Solving members problems
- Fairs and exhibition
- Seminar very wide field (from economy to technology)
- Training abroad

6.10 Summarization

From Fig. 6.10.1, we grasp the role of each organization and relations with the objects of the Fifth Five Years Development Plan.

Fig. 6.10.1 also shows the various project proposals and their role for the promotion of metalworking industries.

7. POLICY FOR THE PROMOTION OF THE METALWORKING INDUSTRY

7. Policy for the promotion of the metalworking industry

7.1 Preferable government assistance and cause-effect diagram for promotion of metalworking industry

In the questionnaires of the survey, there was a question item (Q74) asking which item or items the surveyed persons desire as the assistance of the public sectors.

The items were divided into the following four categories:

- (1) The development of the infrastructure
- (2) Technical/information services
- (3) The financial and the marketing support encouraging investment
- (4) The protection of the domestic products

The collected replies to the questions showed the following facts: the categorized items (2) to (4) are strongly called for and the assistances and services are demanded in the following order.

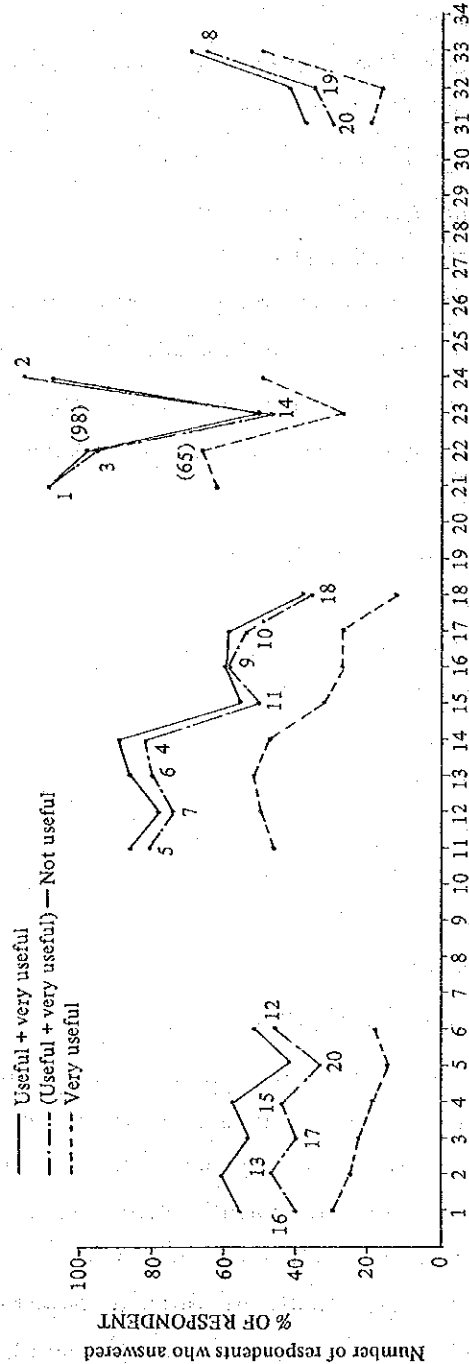
- 1) Tax rebate and tax exemption
- 2) Marketing
- 3) Loan assistance (Credit assistance)
- 4) Testing service
- 5) Training service
- 6) Information service
- 7) Consultancy service
- 8) Export promotion
- 9) Standardization
- 10) Quality control

In detail, please refer to Fig.7.1-1.

Fig.7.1-2 shows the cause-effect diagram for promotion of metalworking industry which is considered to be a summary of the survey analysis. From this figure, we find that all elements making up the metalworking industry such as R & D, Sales, Designing, manufacturing, facilities equipment, quality, management and finance, are to be developed. This figure also shows that the efforts for the development of metalworking industry must be made firstly by firms themselves and that the government private organization and international organization should support their efforts.

Q74 Preferable government assistances and assessment of existing ones (M/A) (1st to 5th priority)

Development of infrastructure	Technical/information services by public organization	Financial/Marketing support Encouraging investment	Protection of domestic products
1. Access road 16	11. Training services 5	21. Tax rebate and tax exemption 1	31. Import surcharge 21
2. Telecommunication 13	12. Consultancy services 7	22. Credit assistance 3	32. Import restriction 19
3. Electric supply 17	13. Information services 6	23. Subsidy 14	33. Export promotion 8
4. Water supply 15	14. Testing services 4	24. Marketing 2	
5. Central sewerage treating 20	15. Laboratory 11		
6. Pollution control 12	16. Standardization National 9		
	17. Quality control 10		
	18. Seminar/symposium 18		



ONE POINT COMMENT:
 1st - Tax rebate and tax exemption 2nd - Marketing 3rd - Credit assistance 4th - Testing Services
 5th - Training 6th - Information services 7th - Consultancy services 8th - Export Promotion
 9th - Standardization (National) 10th - Quality control

Fig. 7.1-1

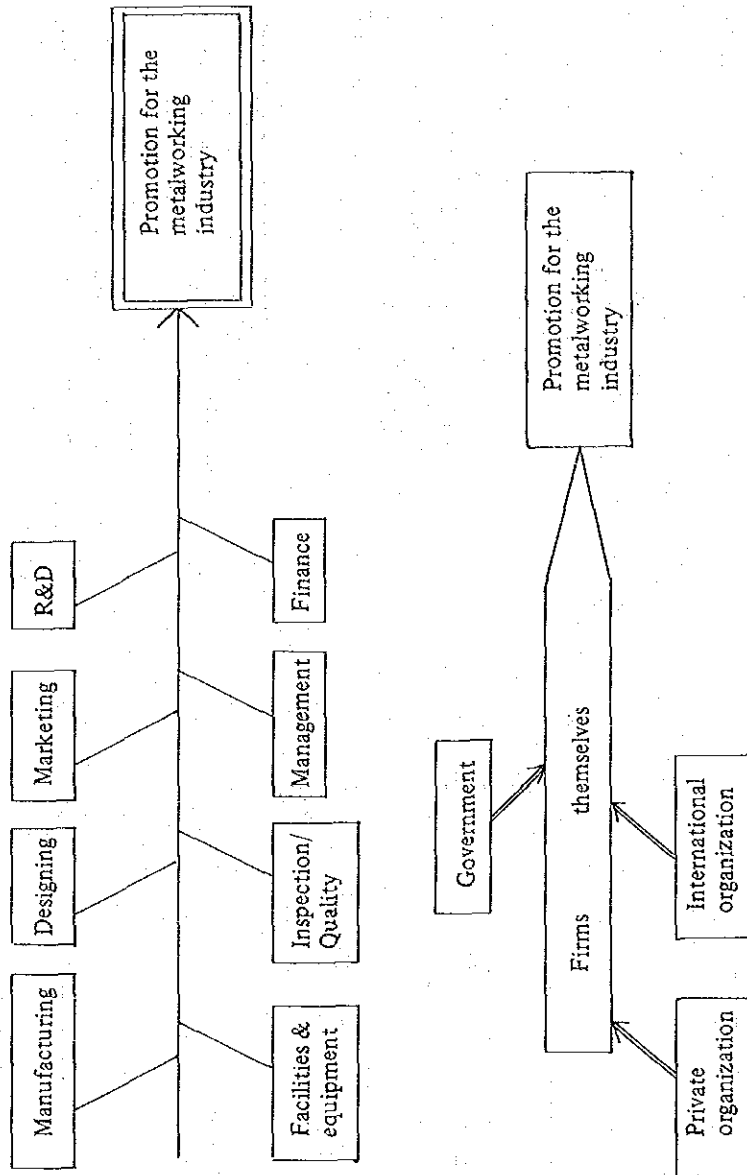


Fig. 7.1-2 Cause-effect Diagram for Promotion of Metalworking Industry

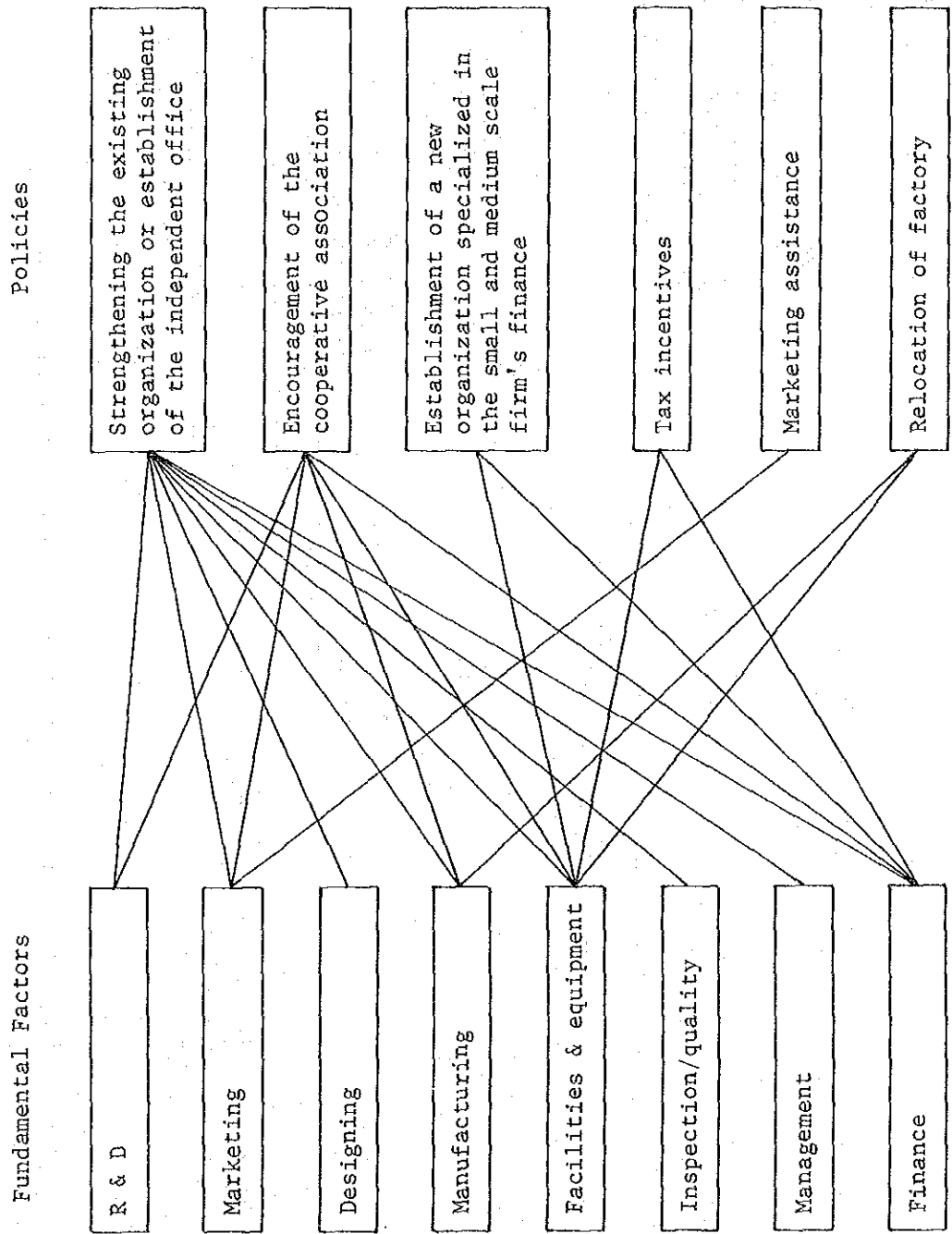


Fig. 7.1-3 Fundamental Factors and Policies for the Promotion of Metalworking Industry

7.2 Policy for the promotion of metalworking industry

From the above analysis, we found that very wide range of problems should be solved and there would be so many kinds of policies purposing the promotion of the metalworking industry. Simple itemization of them all only involves much loss of time. The six policies itemized below are recommended as the most urgent political tasks to be urgently planned on the subject.

- (1) Strengthening the existing organization or establishment of the independent office with all-round responsibility for the promotion of the metalworking industry
- (2) Encouragement of the cooperative association
- (3) Establishment of a new organization specialized in small and medium scale firm's finance
- (4) Tax incentives
- (5) Marketing assistance
- (6) Factory relocation

Fig. 7.1-3 shows the relations between fundamental factors for the promotion of metalworking industry and policies for the promotion of the metalworking industries

7.2.1 Strengthening the existing organization or establishment of the independent office with all-round responsibility for the promotion of the metalworking industry.

The necessities to reconstruct and promote the metalworking industry have been enough acknowledged by the government officials through the fifth five years plan. Not a little activity for the promotion of metalworking industry has been conducted by ISD. However, as analyzed in Chapter 6.2.1, ISD faces a lot of problem and we can hardly say that ISD is carrying out its role enough.

Therefore, it is essential for the promotion of the metalworking industry to strengthen the existing organization or to establish the independent office of which purpose is to accomplish the following tasks.

- (1) Taking the following tasks upon the reinforcement of the instruction activities for enhancing the relevant technical levels.

The tasks are :

- 1) General and individual technical training on the metalworking technology by the relevant experts
- 2) Holding enlightening displays and trade fairs for developing the trades with awarding

the quality product a prize

- 3) Holding short courses mainly for improving the practical ability
- 4) Introduction of sophisticated technology inland and overseas and collection of the reference
- 5) Evaluation and promotion of processes and products contributory to exports
- 6) Stimulation of marked inventions and designs, and encouragement of their industrialization
- 7) Cooperation with the relevant research institutes, and introduction of their technology and utilization their function

(2) Performing the following activities for the management efficiency

- 1) General and individual training of the effectual management by the relevant experts
- 2) Research on the methods for a reasonable use of materials, fuels and power and encouragement of use of the developed methods
- 3) Pushing forward of the established cost accounting system and the improved accounting rule
- 4) Holding short courses mainly for acquiring a scientific and effectual management technique with the practical training
- 5) Guidance in an effectual management to obtain a good creditrating and in the knowledge on financial affairs

(3) Development of practical screening system

With the aim of improving the technical and managerial level of the small and medium scale firms, the following measures should be taken:

- 1) To support the establishment of a screening system on principal items of production under the collaboration of related ministries.
- 2) To strive for prevalence of the above-mentioned screening system established
- 3) To execute the screening and certification activities;;

Such as:

- a) Evaluation of technical level (craftmanship)
- b) Permission of credit from technical view point
- c) Passing of exports inspection
- d) Industrial standards
- e) Others

Needless to say, any person or the firms having any person who passed the inspection under the screening system are to be given some privileges for further prevalence of the system.

Table 7.2.1-1 show the above mentioned tasks by classification of objects and activities. The board of the institution should consist of the representatives of the public sectors including DIP, TISTR, TISI, NISD and other related sectors, and the representations of the private sectors such as TIA, etc., since the cooperation of both private and public sectors is required to develop the metalworking industry.

On order that the firms make effective use of the services given from the institute a share on beneficiaries principle should be introduced, not based on free of charge.

The expenditure can be reduced with the service charge gained. Also the retained money could be available for more productive services of the institution. Besides, strengthening the instructive activities to escalate the technique levels of the small and medium scale firms, a new work would be made to the new institution. The work is to have close contact with the research institutes such as TISTR or TISI to make practical use of their function.

The standardization of products is a requisite matter as a method for ensuring the product's quality and improving the productivity. At present, the standardization affairs are to be set up by TISI as the relevant sectors of Ministry of Industry.

It is an urgent matter to standardize the specifications of the prioritized metalworking products.

Since TISI are not furnished with the inspection and experiment facilities, the new institution which is expected to have inspection and experiment equipment or facilities would be able to contribute to the acceleration of the standardization.

Anyway, the restructured or newly established organization should be required to be provided with their own inspection and experimentation installations to stand on a pivotal position in the standardization polily on the production field.

Table 7.2.1-1 Objects and Activities of Organization for the promotion of metalworking industries

Objects Activities	Improvement of designing manufacturing quality and facilities	Management efficiency	Financial assistance	Marketing assistance	Encouragement of cooperative association	R & D assistance
General and individual training	⊙	Δ	Δ	○	○	Δ
Enlightening displays and trade fairs	⊙			○		
Seminars/lectures	⊙	Δ	Δ	○	○	Δ
Collection and introduction of overseas' information	⊙		○			
Cooperation with relevant institutes	⊙	○	○	○	○	○
Support the screening system	⊙		Δ	○		

Note

- ⊙ – Most important activity at present
- – Activity having second priority
- Δ – Activity playing as an assistant

7.2.2 Encouragement of Cooperative Association

In the fieldwork questionnaires, there was an item questioning on the subcontractor's associations and cooperatives.

The collected replies were as follows:

- The firms not having any association or cooperative 46%
- Those, having cooperatives being active in the tasks less than 10%

Most of the metalworking firms are small-sized business and not stand on a stabilized base in terms of their management.

To foster their self-dependence the organization of same process or same regional producer's cooperative would be recommendable in view of a self-governing mutual aid.

The areas of their activities are regarded as follows:

- 1) Joint business activities-collective purchases, storing, processing and inspection

- 2) Joint sales, publicity and advertizement, and marketing
- 3) Information exchange
- 4) Joint security with loan
- 5) Intermeditation between individual firms and public service sectors

But consideration on the following matters should fully taken in performing these activities:

- 1) On the kinds of industries and the management condition of the cooperative members
- 2) On the problems on the management of every kind of the cooperatives activities, from which some effect would be produced

Upon this, appropriate tasks of the cooperatives can be viewed in the following ways:

- 1) Joint purchasing:
 - In the case where the kinds, quality, standards are the same.
 - In the case where quantities of purchasing items are less than their dealing unit specified.
 - In the case where the creditratings of the individual members are not so good that the purchasing terms are of disadvantage.
 - In the case where profits of the intermediators should be omitted since they are too large.
- 2) Joint sales activities
 - In the case where the kinds, quality, standards are the same.
 - In the case where customers are a large-scale purchasers.
 - In the case where quantities of sales are too large to supply them to purchasers in a proposed delivery term.
 - In the case where profits of the intermediators should be omitted since they are too large.
 - In the case where price supporting measures should be taken for prevention of the selling goods for abnormally low prices.
- 3) Joint producing or processing

In the case where the member can not purchase an expensive equipment which is needful in part of the process of a product, or it is not advantageous for the members to own the equipment.

- In the case where a uniformed standard is required in a large-scale order.

4) Collective inspection

- In the case where advanced inspection facilities or sophisticated technology are needful in the inspection of products.
- In the case where a uniformed quality is required to keep the reputation of products.

These cooperatives should be administrated with self-governing attitude of producers, however, the aid of the public sectors to the cooperatives is indispensable.

Primarily seminars should be held to enlighten producers on the purpose of the cooperatives.

Second, a financial aid to the cooperatives should be made at the time of their establishment.

One of the aid, for instance is to give cooperative facilities some necessary subsidies, to which a form yearly installment can be applied for the reduction of the national financial burden.

Third it is essential for the established cooperatives to be given services of a technical and a marketing assistance to foster them.

Further, as a advantage of membership for fostering sound cooperatives, also a subsidy which can be taken a form yearly installment for the reduction of the government expenditure, should be so made that the cooperative members can purchase a modernized equipment.

This serves to modernize the old facilities which are owned by the small and medium metalworking firms.

Meanwhile, a study was made on the implementation status of joint undertakings irrespective of the organization activities of associations and the like. (For details refer to Section 4.6.2.5)-Prevalent state of cooperative moves and intent.) The study has revealed that 27% of the medium and small scale engineering enterprises are engaged in joint undertakings of some sort while about 54% of the enterprises have intentions of going into some sort of joint undertaking.

This indicates that the basic conditions for their organization have matured.

7.2.3 Establishment of a new organization specialized in small and medium scale firms's finance

In the questionnaires of the survey, there is a question asking whether they have experienced financial aid of the public sectors or not:

Yes, experienced: 15% of contractors (QNO/1041)
4.7% of subcontractors (QNO/60-1)

Table 7.2.3-1 shows the balance of credits by financial institutes in the manufacturing sectors.

Also, low percentage of the balance of credits by the government based financial institutes such as IFCT and SIFO is indicated in the table.

Table 7.2.3-1 Balance of Credits by Financial Institutes in the manufacturing sector

(Year: 1981)

	Balance of the loan	Percent
Commercial Bank	58.3 Billion	73.3
Finance Company	16.7	21.0
IFCT	4.4	5.6
SIFO	0.07	0.1
Total	79.6	100.0

(Source: Dr. Narongchai, Small and Medium Scale Industries in Thailand, Dec. 1982)

According to the national-scale survey in 1983 conducted by the experts of the small and medium scale firms's finance dispatched from JICA to DIP, the demand to credits by the small and medium scale firms was 13 billion (provisional Figures).

While the peak of the loan balance of SIFO was only 128 million, showing a poor financial aid of the government.

Since an investment is essential to develop a nation's industry and the conditions should be a long term installment system because investment is not provided with flexibility to the economic fluctuation inherently, a long-term and low-interest rate credit should be supplied to industry.

On the other hand, small and medium scale firms have been scarcely supplied a long-term credit because of:

- (1) Having a poor credit rate due to lack of an established accounting system
- (2) Being a high credit risk owing to not standing on a stabilized business base and providing less security's capacity
- (3) Incurring a higher cost caused by prevailing small amount of finance (less advantageous than large amount of finance)

Therefore, finance activities aiming at small and medium scale firm are an urgent matter for the public institutes.

In the documentation of the fifth five year plan of Thailand, the restructuring manufacturing sector and the encouragement of the decentralization (Section 3, Chapter (3) is presented, and "the enlargement of credits for the regional small business and the development of the relevant organs" is considered to be one of measures.

Since the approval of the cabinet to Loan Scheme for Small Industry Development (LSSID), the public sectors have strived for the financial aid to the small and medium scale firms. But many reports have focused on SIFO (established as Loan Office for Small Industry promotion based on LSSID of 1964, and called Small Industries Finance Office since 1969) bringing up various problems on the small business financial institution.

The report in which analysis on the present financial system was accomplished and new idea for the future financial system was suggested was issued by the experts of JICA. In accordance with the report, the relevant problems would be introduced below, being followed by a new system specialized in the small and medium size firms's finance.

- 1) The financial institution should provide the following functions.
 - 1 making decision of loan, by itself and with loan-risk assumed
 - 2 for this matter 1, examining closely both the content of loan application, and persistency and/or viability of applicant
 - 3 arranging means of securing loan
 - 4 collecting loans or following up clients
 - 5 finally, through the full proces (1 — 4), getting interest-income as fruits of loans, and managing necessary expenses.

Then, the structure of LSSID being shown Fig. 7.2. 3-1 is divided into three organizations functioning in different ways.

There exists a line of fundamantal problems in which LSSID has:

2) The Agency Loan System are proposed from the viewpoint of the following:

- 1 According to the aforesaid survey of the JICA experts, 74% of the small business have been a financial contact with the commercial banks.
- 2 The above system has scored a success as in Japan.
- 3 The opinion of the commercial Banks is rather favorable to the system.

The system above provides a structure shown Fig. 7. 2. 3-2, which makes full use of the network of the private financial institutes and striving for a wide use of the public funds.

Also, the system performs the following tasks:

- 1 Customers make their applications to the agents
- 2 The agents decide "yes" or "no" of loan.
- 3 Small Industries Finance Corporation (called SIFC, supplier of long-term and low-rate fund based on the system) makes remittance to the agents.
- 4 The agents execute the contracts
- 5 Disbursement of loan by the agents
- 6 The agents take a responsibility for the repayment.

Therefore, the system is advantageous as illustrated below.

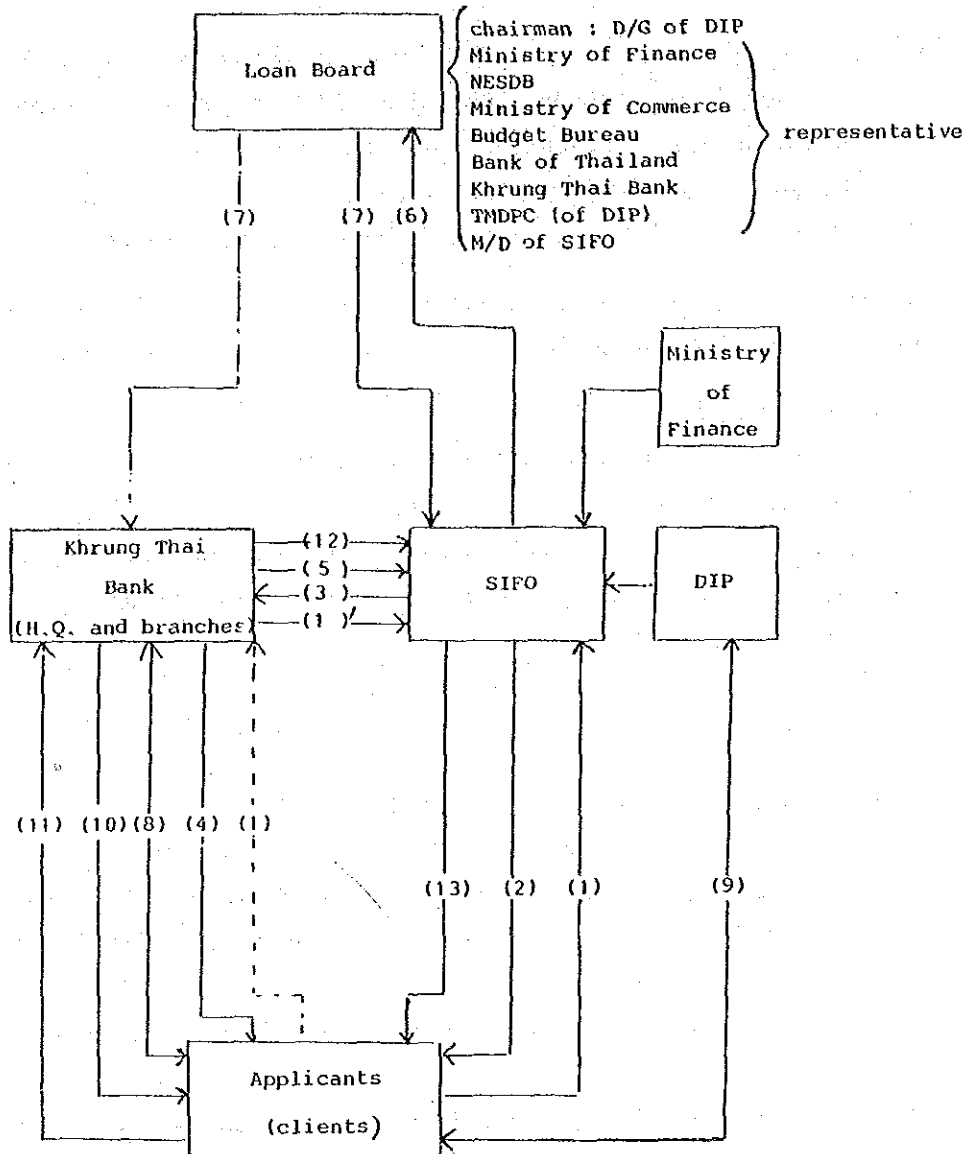
- 1 Applicants which are located even in remote areas can approach SIFC.
- 2 As the agents can easily obtain information on certain industrial area and applicants, it is unnecessary for agents to make credit analysis in detail every time they receive a loan application.
- 3 The agents can make a loan administration with ease for the soundness of the SIFC fund.
- 4 The loan of the SIFC stimulated the agents finance to customers.
- 5 The bad debt risk is shared by the agents and SIFC, however, the 80% are born by the agents. This make agents have strong sense of responsibility.

Though the system involves fundamental problems to develop it, the primarily important matters are regarded as follows:

- 1 The legal form of SIFC (either State Enterprise or corporation)
- 2 Resource of the fund
- 3 Insufficiency of collateral capability of small and medium scale firm

problematic structure of the Scheme

3-1. The Scheme could be charted as follows :



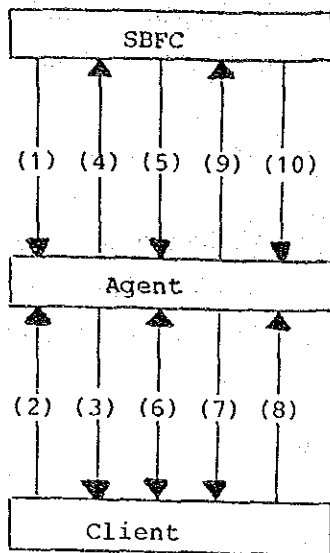
(description)

- | | |
|---|--|
| (1) application | (8) loan contract |
| (1) delivery of application forms | (9) use-of-the-funds contract |
| (2) examination of the projects | (10) disbursement |
| (3) transmittance for collateral evaluation | (11) repayment |
| (4) evaluation of offered collateral | (12) report of collected money |
| (5) delivery of collateral evaluation | (13) inspection of use of the loan and extention |
| (6) forwarding of total report on application | service on technical, management, marketing |
| (7) notification of the decision | and so on |

Fig. 7.2.3-1 Structure of the Scheme

The scheme of Agency-loan of SBFC

T.2



- (1) Designation as an agent.
- (2) Application : loan ceiling is 35M¥.
(180M¥ for Direct loan).
- (3) i) Credit analysis & Project evaluation.
ii) Decision of Loan (including all conditions).
- (4) Report of the decision & Request of remittance.
- (5) Remittance after reviewing the report.
- (6) Signing of loan agreement.
- (7) Loan disbursement.
- (8) Repayment of loan, (follow-up activity).
- (9) Remittance of the repayment.
- (10) Regular inspection.

(Some remarks)

- (1) Agents have to assume 80 percent of the principal & interest on bad debts.
- (2) SBFC fixes a budget in which a agent can make loan, on a quarter basis.

Fig. 7.2.3-2 Agency Loan System

As we have already mentioned in Chapter 6.4.1, the reason why application can not be approved is mostly insufficiency of mortgage. Therefore, it is necessary to start the study for the establishment of financial credit supplementing system of which purpose is to make up for the insufficiency of collateral capability and to smooth the loan for from the financial institution to small and medium scale firms.

7.2.4 Tax incentives

The sound development of a firm can be achieved by the improvement of financial status, and the investment for the new facilities. Therefore, it is necessary to introduce the policies described hereunder:

- Reduction of tax burden for increase of the retained earnings and for the improvement of the financial position.
- Tax privileges to trigger the investment in equipment and facilities. (But the tax system should be gradually and carefully changed since it gives a great influence to the revenue which is said the business and the import taxes occupy 25% and 20% of the government revenue, respectively.)

The authorization giving the tax privilege is owned by BOI.

The tax incentives are:

- (1) General tax privilege for encouraged enterprises
 - 1) Exemption from income tax
 - 2) Exemption or reduction from payment of import duties and/or business tax on machinery
 - 3) Reduction import duties for raw and essential materials.
- (2) Additional tax privilege
 - 1) Reduction of taxes to encourage for investment in investment promotion zone.
 - 2) Exemption and reduction of import duties to encourage export.

The details on the above are shown in Table 7.2.4-1.

The primary problem would be the scale eligible for the Investment Promotion Act. Table 7.2.4-2 shows the process the scale and other conditions eligible for on the minerals, metals, machinery and electrical facilities.

The second problem is that legal form of the firm eligible for the Investment Promotion Act is limited to the "limited company".

Meanwhile in the survey conducted this time, the small and medium scale metalworking firms with the capital of more than 4 million account for about 20% of the total respondents (QNo. 01-1).

The firms are incorporated in a legal form of the limited companies, which are 30% or less of the total respondents (QNo. 07). Therefore, the Investment Promotion Act should be made some revision for the practical application of the tax incentives to the small and medium scale firms.

Further, the Investment Promotion Act should be revised or changed so that the special measures can be added to the law to promote the corporative activities.

Special depreciation system to the rationalized machinery, appliances should be established to reduce the income tax substantially, and increase the retained earning for the stimulation of investment.

Table 7.2.4-4 shows the equipment and facilities which are better to be applied to the special depreciation system in the fields of metalworking industry.

Lastly, we take up the business tax to which some former reports referred as one of the problems of tax system. This tax is levied on gross revenues or turnover to the firms which engage in the production of goods and services, in wholesale trade, or in importing. Retail trade, farming, domestic trade in foodstuffs, and manufacture for export are exempt from this tax.

Table 7.2.4-3 show the rates of business tax in detail.

The following three are some time pointed out as the problems.

- The tax is levied on intermediate transactions as well as final sales. So there happen a "cascading" effect which encourage firms to produce as many of their inputs themselves as possible and discourage them to buy parts from other or subcontracting firms.
- Imported components are imposed only one round of business tax, beside locally made components are subject to some "cascading".

Industrial inputs which enjoy low rates of import duty have an great advantage over locally made industrial inputs.

- The business tax falls hardest on the medium-size firms because it is probable that many small are able to evade the business tax to a large extent, and large firms have a ground to take advantage of the rebate provisions and even to negotiate a lower rate of business tax.

A value-added tax seems to be one of the ways to avoid the problem of cascading. How-

ever, at the same time there is a doubt whether a value-added tax could be implemented in an efficient way within the near future and there is a fears that it would have a disastrous effect on government revenues.

Therefore, a exemption or reduction on the business tax levied on the intermediate inputs is a actual measure. Moreover, this measure would be applied to the limited sectors (for example specified processes or products of metalworking industry).

Table 7.2.4-5 show the priority order of the products and processes in the field of metalworking industry for the business tax exemption or reduction.

Table 7.2.4-1

1. Tax Incentives

The Board of Investment is authorized by law to award tax incentives to promoted activity as in the following:—

- 1.1 Exemption from income tax.
- 1.2 Exemption or reduction from payment of import duties and/or business tax on machinery.
- 1.3 Reduction of import duties for raw and essential materials.
- 1.4 Reduction of taxes to encourage investment in the Investment Promotion Zones.
- 1.5 Exemption and reduction of import duties to encourage export.

2. Criterions for Exemption of Income Tax

In deliberation to award a promotion to an activity whether it be granted an exemption from juristic person income tax for the period of 3 to 5 years depending on the volume of investment (excluding cost of land and operating capital) or total number of the full-time employments, the BOI shall give consideration to the following:—

Size of Investment (Million Baht)	No. of Employment	Period of Incentives (Year)
2–20	or 50–150	3
over 20–50	or 151–300	4
over 50	or over 300	5

The BOI may increase the period of income tax exemption for another year, if:—

- 2.1 The project will be capable to gain net foreign currency not less than US\$500,000 per year within 3 years of operation.

- 2.2 Using domestic agricultural produces or products as its basic raw or essential materials, and/or using domestically procured materials in the value of not less than 50 percent of the overall production cost, excluding costs of employment, interests, depreciations, and utilities.
- 2.3 Factory will be located in any of the industrial estates or in the areas outside Bangkok, Samutprakarn, Samutsakorn, Pathumthani, Nonthaburi and Nakornpathom.
- 2.4 The project in itself shows significance important to national economy. However, the overall combination of time to enjoy such income tax holiday should not be exceeding the period of 8 years.

3. Criteria for Exemption or Reduction from Payment of Import Duties and/or Business Tax on Machinery

In deliberation to award a promotion to an activity whether it be granted an exemption or reduction from payment of import duties and/or business tax on machinery, the BOI shall give consideration to the following:—

- 3.1 The activity, if to be located in Bangkok or Samutprakarn areas, shall not be entitled to tax incentive on machinery, except:—
 - 3.1.1 For export of at least 80 percent of total volume of productions.
 - 3.1.2 The expansion to be made in the existing activity.
- 3.2 Machinery to be imported shall be entitled to tax incentives only in the following cases:—
 - 3.2.1 Such machinery comparable in quality is not being produced or assembled within the country in sufficient quantity to be acquired for use in such activity.
 - 3.2.2 It could not be produced or assembled domestically.
 - 3.2.3 It could not be replaced by manpower in view of commercial determination.
 - 3.2.4 It is a modern and brandnew machinery to be used in the production process.
 - 3.2.5 It would not include the spareparts and replacement of old machinery.

4. Criteria for Reduction of Import Duties for Raw and Essential Materials

In deliberation to award a promotion to an activity whether it be granted a reduction of import duties for raw and essential materials, the BOI shall give consideration to the following:—

4.1 The activity to be awarded such incentives must be activity which has been in operation for at least 6 months, except:--

4.1.1 Request for such incentive has been made originally when applying for promotion.

4.1.2 There has been some revision in taxations on import of raw and essential materials or the finished products in the way comparatively disadvantageous to promoted activity.

4.2 Consideration may be given on a case by case basis and/or by the following accounts:--

4.2.1 Comparative adjustment to import duties of raw and essential materials with those of finished products.

4.2.2 The ability to compete with import products.

4.2.3 Reflexion to other activities and the government income.

4.2.4 Beneficial to national economy.

4.2.5 Others which the BOI sees appropriate.

5. Criterions for Reduction of Taxes to Encourage Investment in the Investment

Promotion Zone

Tax incentives the BOI may consider to encourage investment in the Investment Promotion Zone may include the reduction of business taxes on the sale of products or commodities, and the reduction of the normal rate of juristic person income tax. In deliberation to the award of such incentives, consideration will be given to the following:--

5.1 Reduction of business tax to the sale of products would be:--

5.1.1 90 percent of the normal rates for the period of first three years from the date income is first derived from the promoted activity, and 75 percent for the next two years. This said reduction is to cover only promoted activities within Investment Promotion Zone 3 (Amphur Moung, Khon Kaen; Amphur Ban Phai, Khon Kaen) and Zone 4 (Amphur Moung, Songkhla; Amphur Haad Yai, Songkhla).

5.1.2 75 percent of the normal rates for the period of first three years from the date income is first derived from the promoted activity; and 50 percent for the next two years. This said reduction is to cover only promoted activities within Investment Promotion Zone 1 (Amphur Moung, Lamphoon; Amphur San Kamphaeng, Chiang Mai; Amphur Mae Sod, Tak; and Zone 2 (Amphur Moung, Saraburi;

Amphur Kaengkoi, Saraburi; Amphur Moung, Nakorn Rajsima; Amphurs Pak Thongchai, and Pak Chong, Nakorn Rajsima).

5.1.3 50 percent of the normal rates for the period of first three years from the date income is first derived from the promoted activity. This said reduction is to cover only promoted activities within Industrial Estates.

5.2 Reduction of juristic person income tax of 50 percent of the normal rates for the period of 5 years to be given in addition for the activities within Investment Promotion Zones 1, 2, 3 and 4 and Industrial Estates outside Bangkok, Samutprakarn, Samutsakorn, Pathumthani, Nonthaburi and Nakornpathom, in either case of the following:--

5.2.1 Size of capital (excluding cost of land and operating capital) must not be less than 300 million bahts.

5.2.2 Full-time employment of not less than 200 men.

5.2.3 Enable to net foreign currency earning of not less than one million US dollars.

5.2.4 Using agricultural produces or agricultural products as raw and essential materials and export the finished product at least 50 percent of the overall production capacity.

5.2.5 That activity is vital to national economic development.

However, the Board of Investment reserves the rights not to grant special incentives to any of those activities such as Mining or Dressing of Ores or those service industries which are actually required to be near the source of raw materials or to be operated within the Investment Promotion Zones.

5.3 Permission to deduct for the purpose of assessing juristic person income tax an amount double the cost of transportation and the deduction of the cost of installation or construction of facilities in the promoted activity, the BOI shall give considerations only to those who received privileges as in 9.2 but with the following criterions:--

5.3.1 Permission to deduct income tax an amount double the cost of transportation for the period of 8 years only for those activities settled in Investment Promotion Zones 1 and 2, but 10 years if settled in Investment Promotion Zones 3 and 4.

5.3.2 Permission to deduct from the net profit of the cost of installation or construction facilities at the rate of 10 percent of total investment of such activity and settled in Zones 1 and 2 but, 20 percent if settled in Zones 3 and 4.

6. **Criteria for Exemption and Reduction of Import Duties to Encourage Export**

In deliberation to award a promotion to an activity essentially aimed for export purpose, the BOI shall give consideration to the following:—

6.1 Exemption of both import duties and business taxes for import of raw and essential materials may be given, if:—

6.1.1 Export not less than 30 percent of production capacity for the period of 1 year with the condition that within 6 months from the first time importation has been made the promoted person must submit to the Customs Department an application to place a bank guarantee equivalent to taxation under Article 19 of Customs Tariff Decree.

6.1.2 Only raw and essential materials brought into the country for use in the production for goods to be exported are eligible to be exempted and reduced.

6.1.3 In the event the BOI feels it appropriate the period may be extended longer than 1 year depending on cases.

6.2 Exemption of both import duties and business taxes for imported items to be re-exported will be subjected to consideration the BOI seems appropriate.

6.3 Exemption of export duties and business taxes for products to be exported will be subjected to consideration the BOI seems appropriate.

6.4 Permission to deduct from assessable income for payment of juristic person income tax an amount equal to five percent of the increased income over the previous year, derived from the export of products or commodities, will be accorded to every investor.

(Source: BOI, Criteria Pertaining to the Award of Tax Incentives)

Table 7.2.4-2 Processes, Scale, and other Conditions
Eligible for the Investment Promotion Act

Processes	Scale and other Conditions
1.1 Prospecting	The registered capital is more than 1 million Bahts or over (conditions). The approval by BOI is required to a project.
1.2 Mining and dressing	The investment is more than 10 million Bahts or over (conditions). In the case of the investment with less than 100 million Bahts, 60% of the registered capital is owned by the Thailand.
1.3 Refining	The investment is more than 20 million or over (conditions). The factories in the Bangkok metropolitan region are limited to the primary refinery of the iron and steel.
1.4 Metalworking, casting rolling, plating, other metalworking, steel bolts and nuts	<p>The investment is more than 10 million Bahts (condition related to the casting and rolling). The factories in the Bangkok metropolitan region are limited to the primary casting and rolling only.</p> <p>Conditions related to the steel bolts and nuts:</p> <ol style="list-style-type: none"> 1. The annual export is more than 50% of the whole or over. 2. Not given the exemption from the income tax.
2.1 Production or assembly of engines	The investment is 25 million Bahts or more.
2.2 Production or assembly of machinery and equipment construction machinery and mining machinery	do, 3 million Bahts or more
2.3 Production or fabrication of machinery or electrical equipment --- transformers	<p>do, 5 million Bahts or more (conditions related to the transformers)</p> <ol style="list-style-type: none"> 1. Eighty percent or more of the materials which have been used since the established year is of the domestic products (price-based). 2. Not given the exemption from the income tax.
2.4 Production of parts of machinery or electrical equipment	The investment is 3 million Bahts or more.
2.5 Production of parts of vehicles	do, 3 million Bahts or more The factories located in the Bangkok metropolitan region are limited to the special components or parts for the locomotives or the railway vehicles.

(Source: Investment Opportunities, BOI)

Table 7.2.4-3 Rates of Import Duty and Business Tax on Major Engineering Items

	Import Duty	Standard Profit Rate	Business Tax	Total Tax Rate
Iron and steel scrap	5	6.5	1.5	6.85
Iron and steel bars, alloy steels	20	6.5	1.5	22.11
Iron and steel wire, cast iron tubes and pipes and pipe sittings, bolts and nuts	30	11	7	41.11
Kitchen utensils	60	11	7	73.68
Unwrought aluminium	5	7	1.5	6.85
Plates, rods, angles etc of aluminium	30	11	7	41.11
Hand tools (incl agri)	15	11	7	24.83
Locks, doors, frames, door furniture etc	30	11	7	41.11
IC engines	15	13	3	19.29
IC engine parts	15	26	5	22.97
Water pumps	15	16	3	19.40
Parts of pumps	15	26	3	22.97
Air conditioners	80	13	30	147.12
Air conditioner parts	80	25.5	15	117.27
Refrigerators	80	13	30	147.12
Refrigerator parts	80	25.5	15	117.27
Agri. machinery (tillers, threshers etc.)	0	16	3	3.83
Parts of agri. machinery	0	26		4.16
Metal-working machinery	10	16	3	14.21
Valves, cocks, taps	15	11	7	24.83
Transformers (up to 10,000 Kva)	30	13	3	34.85
Fans	40	13	15	66.1
Parts of fans	20	26	7	31.6
Electrical equipment for IC engines	15	26	7	26.16
Electro-thermic domestic appliances	30	11	7	41.11
Television	60	15.5	30	120.98
Radio	50	15.5	30	107.17
Parts of radio and TV	30	11	7	41.11
Switchgear	30	11	7	41.11
Passenger cars, CKD	50	11	1.5	52.75
Car and motorcycles parts	50	26	7	64.55
Motorcycles	60	11	12	62.13
Spectrometers and other testing equipment	30	11	7	41.11

Source: Customs Department

NB: The standard profit rate is an arbitrary mark-up employed in the computation of the business tax. The business tax is calculated on a sum which includes the C.I.F. price, the import duty and an addition representing the notional 'standard profit'.

$$\text{(i.e. Business tax)} = \frac{\text{Bus. Tax}}{100} \times \text{CIF price} \times \left(\frac{1 + \text{imp duty}}{100} \right) \times \left(\frac{1 + \text{St. Profit}}{100} \right)$$

The total tax rate represents the total mark-up on the CIF price from the import duty, the business tax, and the municipal tax (which is one tenth of the business tax due).

Table 7.2.4-4 Equipment and Facilities for the Special Depreciation System in the Field of Metalworking Industry

- (1) Casting
 - Automatic Forming Machine
 - Melting Furnace (Cupola and Electric Furnace)
 - Shot Blasting Machine
- (2) Machining (Precision Machining)
 - Machining Center
 - Grinding Machine (Cylindrical, Surface)
 - Electrical Discharge Machine
 - Three Dimension Coordinate Gauge, Roundness Tester
- (3) Welding
 - From GAS to Electric
- (4) Heat Treatment
 - Atmosphere Adjustment Furnace
 - Vacuum Furnace
 - Electric Furnace
- (5) Plating
 - Pollution Preventive Equipment

Table 7.2.4-5 Priority Order of the Products and Processes in the Field of Metalworking Industry

Products:	1st Priority	(1)	Agriculture Machinery
		(2)	Mold & Dies
		(3)	Gears
	2nd Priority	(1)	Pump, Valve
(2)		Hand Tool	
(3)		Machine Tool	
(4)		Parts for Automobile	
Processes:	1st Priority	(1)	Casting
		(2)	Machining/Machine Assembly
		(3)	Welding/Sheetwork
		(4)	Heat Treatment
	2nd Priority	(1)	Forging
		(2)	Plating
(3)		Presswork	

7.2.5 Marketing assistance

Marketing assistance again with reference to the late field work, the replies to some questions resulted in the following:

The most products of small and medium scale metalworking firms were purchased by the domestic customers and less than 5% of respondents answered that their main competitors were the manufacturer overseas (Q20, 21).

On the market position of the firms:

The replies were: strong about 20%
medium about 70%
weak about 6% (Q28)

About 75% of the firms had the work corresponding to less than a month production in hand (Q22-1)

Firms having no person put in charge of the marketing: about 50% (Q10-1)

In consideration of the above survey results, the following presumption can be formed:

- Less intention to enlarge the market
- Not having a sufficient marketing technique to newly find a market under water
- Repeating an simple reproduction to meet the demand of limited market

Hence, an appropriate institution or a sector should be urgently established to offer an essential marketing service for the small and medium scale metalworking firms.

Instances of the activities of the institution would be; such as :

- Giving useful information based on a scientific market research
- Holding trade fairs or displays
- Issuing of the excellent firms list
- Employing skilled marketing staff to stimulate use of market plans and, improve the small and medium scale firms marketing capability.
- Softening excessive competition
- Intermediates activities for the promotion of prioritized orders from the public sectors to the small and medium scale firms.

Furthermore, Table 7.2.5-1 and Table 4.2.2-10 are drawn out from the survey relating to 'Engineering industry' held by RDR Co. in 1981 showing the demand and supply trends of the engineering industry. The tables illustrate the following matters:

- There even exist some industrial fields in which the domestic supply are one third of the total demand.

Table 7.2.5-1

Supply and Demand Conditions in the Engineering Sector 1975

Sector	Total Demand	Imports	Of Total Demand	Total Supply	Domestic Inputs	Of Total Supply	Imported Inputs	Of Total Supply	Value Added	Total Supply	Of Total Supply	Exports	Of Total Supply	SS Ratio
Iron and Steel	2,318,846	891,143	38.4	1,427,703	309,076	21.6	683,180	47.9	435,447	30.5	997	0.1	61.6	
Secondary Steel Products	8,682,294	3,612,319	41.6	5,069,975	2,447,532	48.2	954,839	18.8	1,667,604	32.9	98,861	1.9	59.1	
Non Ferrous Metals	5,619,779	1,466,432	26.1	4,153,327	2,907,386	70.0	317,312	7.6	928,629	22.4	2,348,817	56.5	127.0	
Cutlery and Hand Tools	2,069,194	476,255	23.0	1,591,939	717,990	45.1	341,825	21.4	532,124	33.4	91,438	5.7	80.5	
Metal Furniture and Fixtures	713,819	14,541	2.0	699,287	347,514	49.6	114,068	16.3	237,696	34.0	706	0	98.0	
Structural Metal Products	1,032,924	193,804	18.8	839,120	318,879	38.0	217,876	26.0	302,365	36.0	47,838	5.7	65.7	
Other Fabricated Metal Products	3,432,349	2,349,659	68.5	1,082,690	239,841	22.2	425,876	39.3	416,973	38.5	98,738	9.1	32.5	
Engines and Turbines	3,530,334	2,762,706	78.3	767,628	236,708	30.8	237,521	30.9	293,399	38.2	191,258	24.9	83.0	
Agricultural Machinery	1,140,921	520,154	45.6	620,767	260,541	42.0	145,114	23.4	215,112	34.7	3,409	0.5	54.57	
Wood and Metal-Working Machinery	906,085	736,717	81.3	169,368	78,008	46.1	31,774	18.8	59,586	35.2	7,325	4.3	18.8	
Special Industrial Machinery	9,699,744	6,972,479	71.9	2,727,265	832,408	30.5	1,022,907	37.5	071,950	32.0	46,065	1.7	28.2	
Office and Household Machinery	2,138,643	1,580,705	73.9	557,938	208,525	37.6	157,121	28.2	191,292	34.3	20,010	3.6	26.32	
Electrical Industrial Machinery	2,071,573	1,365,286	65.9	706,287	285,666	40.4	190,714	27.0	229,907	32.6	8,001	1.1	34.2	
Radio, TV and Communication Equip.	2,301,937	1,220,742	53.0	1,081,195	432,563	40.0	277,676	25.7	370,856	34.3	472,297	43.7	59.1	
Household Electrical Appliances	731,727	222,486	30.4	509,241	267,138	52.4	63,658	12.5	178,445	35.0	5,040	1.0	70.1	
Insulated Wire and Cable	771,602	234,182	30.4	537,420	282,196	52.5	80,396	15.0	174,828	32.5	10,547	2.0	70.6	
Electric Accumulators and Batteries	710,860	40,186	5.6	678,674	312,752	46.1	149,259	22.0	216,663	31.9	-	0	94.4	
Other Electrical Apparatus	2,147,503	1,384,448	64.5	763,055	358,033	46.9	167,862	22.0	237,160	31.1	56,323	7.4	36.5	
Ship Building and Repairing	728,688	78,184	10.7	650,504	293,276	45.1	128,205	19.7	229,023	35.2	18,500	2.8	91.6	
Railroad Equipment	1,159,531	537,759	46.4	621,772	145,612	23.4	307,653	49.5	168,507	27.1	12	0	53.6	
Motor Vehicles	11,348,996	6,314,509	55.7	5,034,487	1,607,578	32.0	1,701,036	33.5	1,925,803	36.8	381,192	7.3	47.7	
Motor Cycles and Bicycles	2,037,044	909,723	44.7	1,127,321	401,597	35.6	290,754	25.8	437,970	38.6	140,180	12.4	59.4	
Repair of Vehicles	7,926,325	0	0.0	7,926,325	3,963,721	50.0	2,363,393	29.8	1,599,211	20.2	191,929	2.4	102.5	
Aircraft	1,854,812	1,631,920	88.0	222,892	72,860	32.7	118,659	53.2	31,373	14.1	926	0.4	12.0	
Scientific Equipment	680,910	452,546	66.5	228,372	82,035	35.9	73,396	32.1	72,941	31.9	2,251	1.0	33.6	
Photographic and Optical Goods	386,826	275,517	71.2	111,309	54,125	48.6	18,445	16.6	38,739	34.8	68,323	61.4	34.9	
Watches and Clocks	188,270	86,571	46.0	101,699	57,789	56.8	12,662	12.5	31,248	30.7	32,662	32.1	65.3	
009 TOTAL	75,082,530	35,316,439	47.0	39,766,091	17,328,500	43.5	10,488,668	26.4	21,948,923	30.0	4,240,409	10.7	56.1	

Source: Thailand Input-Output Table 1975

NI: The self-sufficiency (ss) ratio the final column is computed as
 Total Supply ÷ (Total Demand - Exports).

- The import goods are more advantageous over the domestic products in the relevant market since the latter are of less quality and sell for higher prices.
- In other words, there is a big latent demand for the import substitution industries.

Accordingly, import substitution policy should be initiated by the government on some specific metalworking products which are essential for the development of small and medium scale metalworking firms.

The following is one idea relating to the target products of this survey.

- Import substitution of Automobile and Agricultural machinery must be Advanced farther.
- Commencement of the import substitution for the industrial machinery which is the core of the capital goods.

However, before the enforcement of the policy careful study should be made on the selection of the products together with the import customs duty to the imports concerned not to cause disadvantage to the national economy by giving too much protection.

7.2.6 Factory relocation

The Thai Government has placed much emphasis on the construction of industrial estates since 1969. The first of its kind is the Bang Cham Industrial Estate which was constructed by DIW (Department of Industrial Works), a department of MOI. In 1971, the Government established the IEAT (Industrial Estate Authority of Thailand) – as one of the departments of MOI. Since then both DIW and IEAT have been planning, constructing and operating industrial estates. A number of industrial estates have been constructed since or are in the stage of planning, but the Bang-Poo Industrial Estate which is as far as 35 km from Bangkok is the only estate that has been build for small and medium scale industries. Generally speaking, the policy of the Government so far has been centered around infrastructure improvement for big industries while infrastructure improvement for small and medium scale industries have been slighted.

The survey conducted this time has revealed that more than half of the firms are located in urban areas other than the industrial area, such as the commercial area or residential area (Q90-0). Also, about a quarter of the firms were found to have some sort of complaint about public pollution (Q90-1). What is more, when the geographic distribution of these factories with complaints about public pollution is reviewed, these factories

seem to be concentrated in certain areas which suggests the need for some sort of regional countermeasure (For details, refer to Section 4.6.2 (2) – Prevalent state of environment of factory sites and public pollution generated by factories).

In the survey on whether the firms had any plans of relocating themselves, one fifth of the enterprises surveyed was found to have relocation plans, and these firms seemed to be concentrated in several areas. In the central area of Bangkok, however, the number of firms with a relocation plan was surprisingly small which is judged to be attributable to the fact that the firms in the area are mostly very small businesses who cannot afford to relocate (For details, refer to Section 4.6.3 – Relocation plan).

It is evident from the foregoing that if the factory production environment and urban environment are to be improved, it is necessary to actively promote the relocation of factories; and in order to make their relocation practically feasible, a factory redeployment program centered around an industrial estate project which includes the system of lending the cost of relocation and other plans to induce medium and small scale engineering industries is necessary.

The following are the matters that need to be considered in the construction and operation of the industrial estate for the small and medium scale metalworking industries.

- 1) Selection of site location
- 2) Layout of factories and facilities
- 3) Nucleus body for administration and operation
- 4) Nucleus body that bears the cost
- 5) Matters requiring attention in administration and operation.

8. FACT FINDING AND COUNTERMEASURES IN PROMOTING
METALWORKING INDUSTRY IN THAILAND

8. Fact Finding and Countermeasures in Promoting Metalworking Industry in Thailand
 How should findings in the survey covered by this report be connected with concrete promotional policies for the sector in question? This is a really important question.

This time the KJ technique is used to systematically prepare data that will go into drafting a promotional program and project through a series of arranging, classifying, eliminating and countermeasure mapping processes in the following nine major steps.

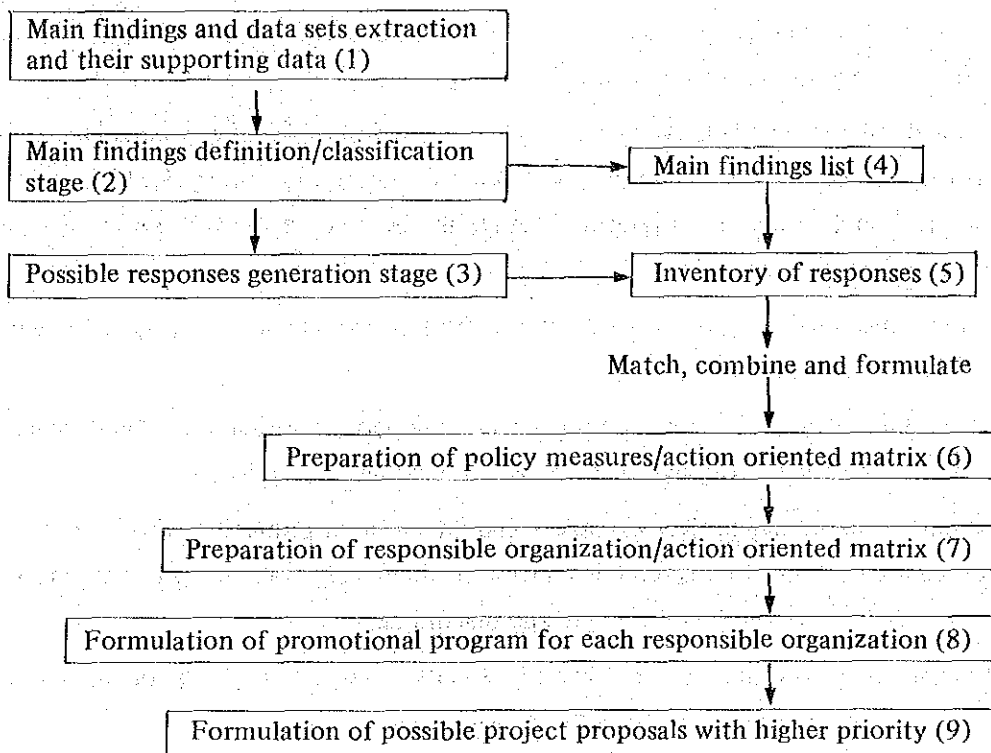


Fig. 8-1 A Policy/Organization Oriented recommendation system based on findings in the survey on the metalworking industry in Thailand

As shown in the flowchart above, steps (1), (2) and (3) corresponds to the report prepared based on data collected through analysis of findings in the survey covered by this report. The report contents will be arranged in a list item by item. Factors and responses

are classified in lateral and vertical columns respectively, and major findings item numbers are combined column by column. The result is Table 8-1. Then the major findings are arranged in order by processes, products, socioeconomic factors, location, promotional systems, policies, etc. ((4), (5) and (6)).

Based on this table, governmental, industrial and other organizations concerned with metalworking industry promotion in Thailand and their responses are arranged in a matrix (7) (Table 8-2).

This matrix (7) then has priority policies selected and weighted in the order of priority in implementing promotional policies.

The weighted matrix (7) is classified in the form of promotional programs by organizations responsible for execution (government level, private level, enterprise level, ASEANS level, etc.), and results are arranged in order in the next chapter (chapter 9) as basic ideas to go into policy making.

Of the promotional programs four of higher priority are selected as projects, which will be introduced in Chapter 10.

Main findings and problematical points were arranged in order and countermeasures systematically prepared through these steps in preparing this report.

Resultant promotional project proposals cannot all be introduced in this report due to space considerations. But several instances of them are given instead. They apply to casting, forging, sheetwork and welding and machining.

Following steps was taken on the way to formulate responsible public organization oriented project proposals in the integrated weight table.

Namely, functions and roles of the existing public organizations are subdivided into major six items as follows.

- (1) Technology
- (2) Management
- (3) Organizing/cooperating
- (4) Financing
- (5) Policy & Institution
- (6) Relocation of Firms

The organizations whose total unit weighed score is 2.0 or over in the integrated weight table, (table 8-3), could be recognized as the responsible organization to implement promotional priority projects.

Those are seven organizations such as:

ISD

TMDPC

SIFO

IEAT

NISD

TTTC

AMRI

Projects relating to ISD, TMDPC, SIFO, IEAT of Ministry of Industry are decided as the promotional priority projects.

To summarize the steps of "Main findings/Problems → Countermeasures → Promotional programs → Promotional Priority project formulation", the summary table of integrated promotional measures was prepared in Table 8-4 below.

Table 8-1 (A) Main Findings Summary Table (In Terms of Causes, Policy, Role & Object) Casting (4.5.1)

No.	Causes	A. Common Element I	B. Common Element II	C. Inspection & Qualification	D. Design Engineering	E. Manufacturing	F. Facility & Equipment	G.	H. Others	Remark
	Q Code etc.	12,23,24,27,28,29 34,35,36,37,39,41 42,43,45-1,46-1 49-6,7,8,12,13 70-8	02,04,05,10,11,14 15,20,21,22,25-1 23,28,29,31-1,45-1 60-1,70,70-1,2,3, 4,7,10,11,13,14, 15,16,90-0,1,3,4 91-1-5,92-1,2,93	42,43,44,46-1,4 49-1,4,7,8,114 118	30,43,49-1,3,4 70-12,103,104 105,111,112,120	10,11,13,32-1 49-8,9,10,50-1 60,108,109,110 111,112,118 119-1,2	01-1,06,42,91-2 108,113		01-1,01-2,05-1	
1	Modernization by Types of Industry (Process/Product)		94-1,2,31-1 4)1,2,3,10,11	4)5,9	5)1		5)1		1)2,4 2)	
2	Development of Technology	6)5	4)4,5,10	5)3	7)2	5)1				
3	Technological Consultation or Assistance	6)5,6								
4	Industrial R & D in Technology	12)7	12)7	12)7						
5	Technological Training	6)5,6	9)1	7)2	6)6 5)1,3	5)1,3,4,5	5)1			
6	Technological Information Dissemination	6)1,5,6	10)1,2,3 12)3	7)1,2	8)	8) 5)1,6	5)1,5			
7	Technological Transfer	6)1,2,3,4	12)3	7)1,2	8)	5)1,3,4,5				
8	Study and Investigation			5)1	5)1					
9	Management Modernization		10)1,2,3							
10	Support for Establishment of Associations									
11	Energy Saving									
12	Promotion of S.M.S.L. in Provincial Area									
13	Promotion of Production Sub-contracting System	6)1,2,3 10)1	3)1,2	7)1,2	5)6 8)	4)3,4,5,6,7 6)1,2,3,5	5)2,4,5			
14	Marketing Services Preferential Order	4)1,2	10)1,2,3							
15	Financial Assistance Improvement		10)1,2,3 12)6	12)5					1)4	
16	Bureaucratic Procedure Assistance									
17	Infrastructure		4)7,8,9,10							
18	Education, Training		9)							
19	License, R & D									
20	Standardization									
21	Planning & Coordination									

Table 8-1 (B) Main Findings Summary Table (In Terms of Causes, Policy, Role & Object) Forging (4.5.2)

No.	Causes	A. Common Element I	B. Common Element II	C. Inspection & Qualification	D. Design Engineering	E. Manufacturing	F. Facility & Equipment	G.	H. Others	Remark
	Q Code etc.	11,24,27,30,34,35 36,37,39,41,44 46-1,47,49,4,6,7, 8,9,10,49-1,10, 13,14,15	20,21,22-1,23,26 28,29,45-1,49-13 60,62,70,71,72,73 74,90,94	211,212,213,214 43,50		221,222,231,232 233,234,235,236	223,224,225,42		01-1,01-2,05-1 06,02-1	
1	Modernization by Types of Industry (Process/Product)		17,8 5/3	4)1,2		2)1,3,4 3)1,14	2)1,2,3,4		1)1,2,3,4,5,6	
2	Development of Technology	3)3,4,5,7,10,11, 12,13,14				2)1,4				
3	Technological Consultation for Assistance					2)1,4	3)4			
4	Industrial R & D in Technology	3)6	5)3	4)1,2		2)1,3,4				
5	Technological Training	3)3,4,12,13,14				2)1,4				
6	Technological Information Dissemination	3)4,6,7,9	5)3	4)1,2		2)1,3,4				
7	Technological Transfer					2)1,4				
8	Study and Investigation	3)8	5)1							
9	Management Modernization	3)7,8	5)1,2,3,4,5	6)1,2,3						
10	Support for Establishment of Associations									
11	Energy Saving			4)2		2)1,3				
12	Promotion of S.M.S.L. in Provincial Area									
13	Promotion of Production Sub-contracting System		5)1,2,3,4							
14	Marketing Services Preferential Order		5)1,2,3,5	6)2,3						
15	Financial Assistance Improvement	3)4,6,14		4)1,2 6)2,3		2)1,2,3,4				
16	Bureaucratic Procedure Assistance	3)4,5,6,9,14	5)1,2,3,4,5	4)1 6)1,2,3 7)1,2						
17	Infrastructure									
18	Education, Training	3)2,4,5,7,8,14	5)1,2,3,4,5	4)1,2 6)1,2,3		2)1,4				
19	License, R & D									
20	Standardization	3)4,5,8,10,11,12, 13,14		4)1		2)1				
21	Planning & Coordination									

Table 8-1 (C) Main Findings Summary Table (In Terms of Causes, Policy, Role & Object) Sheetwork & Welding Process (4.5.3)

Contents	A. Common Element I	B. Common Element II	C. Inspection & Qualification	D. Design Engineering	E. Manufacturing	F. Facility & Equipment	G.	H. Others	Remark
Q Code etc. Policy/Role/Object	11,24,27,30,34,35 36,37,39,41,43,44 46-1,47,49-1,49-3 49-4,49-6,49-7, 49-8,49-9,49-10	20,21,23,22-1,26 28,29,45-1,49-13 60,62,70,70-1 - 70-16,71,72,73,74	311,316,317,331 332	311,313,315,333 335	324,325,326,329 334	321,324,327,328		01-1,01-2,05-1 06	
Modernization by Types of Industry (Process/Product)		31,2, ,10,14	4)4	9)1,2,7,10,12,25	4)7 9)29	4)7 9)14,16,18,20		1)1,2,4 2) 10)1,2 11)	
Development of Technology	6)17	3)5,6,10,14	4)1,12	4)1,15				10)1,2 11)	
Technological Consultation or Assistance	4)16,17,18,19 6)6,7,9,10,11,13, 14,6)15,7)8	5)8 7)1	4)1,12,13	4)1,15 9)8	4)8,11	4)11		10)1,2 11)	
Industrial R & D in Technology	6)10,18	6)8	4)1	4)1 9)1,2,3		4)11		10)1,2 11)	
Technological Training	4)16,17,18,19 6)1,3,4,5,6,7,11, 13,14,16,18,7)8	5)8 7)1	4)1,12,13	4)1,2,13,15 9)4,5,6,8	4)7,11,14 9)24	4)6,7		10)1,2 11)	
Technological Information Dissemination	4)16,17,18,19 6)1,3,4,5,6,7,11, 12,13,14,15,16,18,7)8	4)1,2,3,4,5,7,18 5)8 7)1,3	4)1,4,5,12,13 9)23	4)1,2,3,13,15 9)5,6,8,25	4)8,11 9)24	4)9,10 9)13,14,15,18		10)1,2 11)	
Technological Transfer	6)1,3,4,5,6,7,11, 13,14,15,16,18	7)1	4)1,12,13	4)1,13,15 9)6,8	4)8,11	9)15		10)1,2 11)	
Study and Investigation	6)1		4)1	4) 9)1,2,9,11	9)17,22			10)1,2 11)	
Management Modernization	4)16,17,18,19 6)2,3,4,11,12,17 7)8,9	3)5 4)7,8 5)4,5,6,7,8,9 7)1,2,3							
Support for Establishment of Associations	6)12	5)1,2							
Energy Saving									
Promotion of S.N.S.L. in Provincial Area									
Promotion of Production Sub-contracting System	4)16,17,18,19 6)2,3,4,6,7,11,12, 13,14,15,16	3)1,2,3,4,7,8,9 12,13,16,4)4,5) 12,3,5,9,7)1,2,3	4)3,5,12 9)23	4)1,2,3,15 9)2,5,6,8,25	4)7,8,11,14 5)14 9)21,24	4)9,10,11 9)19,20		10)1,2 11)	
Marketing Services Preferential Order	6)18	3)3,11,13,14 4)1,2,3,4,7 5)1,2,3,4,5,7,9						10)1,2 11)	
Financial Assistance Employment		4)4,5 5)5 7)1,2	4)7					1)4 10)1,2 11)	
Bureaucratic Procedure Assistance					4)14 9)24				
Infrastructure		3)9							
Education, Training	4)16,17,18,19 6)11	4)8							
License, R & D									
Standardization	6)7,10								
Planning & Coordination									

Table 8-1 (D) Main Findings Summary Table (In Terms of Causes, Policy, Role & Object) Machining Process (4.5.4)

No.	Causes	A. Common Element I	B. Common Element II	C. Inspection & Qualification	D. Design Engineering	E. Manufacturing	F. Facility & Equipment	G.	H. Others	Remark
	Q Code etc.	05, 41, 46, 43, 30 14, 50, 70-1, 2	24, 27, 41, 34, 35, 36 37, 39, 519, 70-8, 70-13, 70-9, 10 74, 90, 91, 93, 94	42, 41, 43, 46, 47-6	44, 11, 41	10, 05, 41, 30, 11, 4 70-12, 70-8, 91	42, 30, 41, 43, 519 91			
	Policy/Role/Object									
1	Modernization by Types of Industry (Process/Product)	2)5a 4)1	3)4a, 5 4)2a, 4, 6	3)4b		2)5a 4)2b	2)5a 3)5			
2	Development of Technology									
3	Technological Consultation or Assistance	3)2b	4)6	3)3a		4)2c	2)5a 3)5			
4	Industrial R & D in Technology		4)2f							
5	Technological Training	3)1, 2b, 6f		3)1, 2a, 2b, 3b		2)2 3)1, 3, 5b	3)2a, 2b			
6	Technological Information Dissemination	3)2c, 3a, 6b	3)5	3)3a, 4a		3)6b	3)5			
7	Technological Transfer	3)6b	4)2f							
8	Study and Investigation					4)2c				
9	Management Modernization	4)1, 2b	2)4c 3)1, 4a, 4b, 4c 4)2d, 2e, 4	3)4a		4)2c, 2d	3)2a 2)5 3)5			
10	Support for Establishment of Associations		4)5			4)5	4)5			
11	Energy Saving									
12	Promotion of S.M.S.L. in Provincial Area									
13	Promotion of Production Sub-contracting System	3)6b 4)2b	3)4b, c 4)2f		3)1	3)6b	3)1			
14	Marketing Services Preferential Order		2)4a							
15	Financial Assistance Improvement						3)5			
16	Bureaucratic Procedure Assistance	3)2c 4)1, 2b	2)2b 4)3, 4, 6							
17	Infrastructure									
18	Education, Training	2)3b 3)2a	3)4c	2)3b	3)6a 3)1	2)3b 3)1, 6a 4)2c	3)2a, 3c			
19	License, R & D									
20	Standardization				3)2c	2)3				
21	Planning & Coordination									

Table 8-2 (A) Follow-up Responsibility Summary Table (I) Sheetwork & Welding Process

No.	Responsible Organizations & Bodies	MOI										MOE	MOC	MOSET	MOPM	MOA	
		DIP					MS										
		ISD	TMDPC	SIFO	RIDC	PI/O	TI/SI	HEAT	IFCI	BOT	MOIT						MOE
	Policy/Role/Object	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p
1	Modernization by Types of Industry (Process/Product)	BCDEFH 3	BCDEFH 2	BF 2	BCDEFH 2	BCDEFH 2	BCDE 1	F 2	BF 2	BF 2				ECEF 1			
2	Development of Technology	ABCDH 3	ABCH 1		ABGDH 2	ABGDH 2											
3	Technological Consultation or Assistance	ABCDEGH 3	ABCH 2	F 2	ABDEFGH 2	ABCDDEFGH 2		F 1	F 1	F 1	ABCDEFH 1	ABCDEFH 1	ABCDEF 1				
4	Industrial R & D in Technology	ABCDEFH 1			ABGDH 2	ABCDGH 2	ABCDEFH 1		F 1	F 1	ABCDEFH 1	ABCDEFH 2	ABCDEF 3				ABCDEFH 2
5	Technological Training	ABCDEFH 3							F 1	F 1	ABCDEFH 3	ABCDEFH 1					ABCDEFH 2
6	Technological Information Dissemination	ABCDEFH 2	ABCH 2		ABDEFGH 2	ABCDDEFGH 2	ABCDEFH 2	F 1	F 1	F 1	ABCDEFH 1	ABCDEFH 1	ABCDEF 2	ABCDEF 1			ABCDEF 2
7	Technological Transfer	ABCDEFH 2	ACH 2	C 1	ABDEFGH 1	ABCDDEFGH 1	ABCDEFH 2	F 1	F 1	F 1	ABCDEFH 2	ABCDEFH 1	ABCDEF 3				ABCDEF 2
8	Study and Investigation	ACDEH 3	ACH 2		ACDEH 1	ACDEH 1						ACDEH 1					
9	Management Modernization	AB 2	ABCEH 3		AB 1	AB 1											
10	Support for Establishment of Associations	ABEF 2	ADEF 3		AB 1	AB 1											
11	Energy Saving	C 1	C 1	C 1													
12	Promotion of S.M.S.L. in Provincial Area	H 1			H 3	H 3											
13	Promotion of Production Sub-contracting System	ABCDEFH 2	ABCDEFH 2		ABCDEFH 2	ABCDEFH 2	ABCDEFH 1	F 2									
14	Marketing Services Preferential Order	ABCH 3	ABH 2		ABCH 1	ABCH 1							ABCH 2			BF 1	
15	Financial Assistance Improvement	AEF 1	ABCEH 3		ABCDEFH 1	ABCDEFH 1		ABCDEFH 3	ABCDEFH 2								F 1
16	Bureaucratic Procedure Assistance	ABCE 3	E 2		E 1	E 1											
17	Infrastructure			F 2				B 2	F 1	F 1							
18	Education, Training	ACDEF 3									ABCDEFH 3	ABCDEF 3	ABCDEF 1				
19	License, R & D																
20	Standardization	CDE 1											ACDE 3				
21	Planning & Coordination	ABCDEF 3															

Table 8-2 (B) Follow-up Responsibility Summary Table (II) Sheetwork & Welding Process

No.	Responsible Organizations & Bodies	Private Organization														Other Organization			
		TNA	ATI	EIT	WDA	SIAT	MAI	GEFG	TDAT	EIC	FC	TDC	PMC	TPA	TGTAC	RCTT	Other Int'l. AID Agency		
1	Policy/Role/Object	q	r	s	t	u	v	x	y	z	aa	bb	cc	dd	ee	ff	gg		
1	Modernization by Types of Industry (Process/Product)	BCEF 1	BCEF 1	BCEFH 2	BCDEFH 2	BCDEFH 2	BCDEFH 1	BCDEFH 1	BCDEFH 1	BCDEFH 1	BCDEFH 1	BCDEFH 1	BCDEFH 1	BCDEFH 1	BCDEFH 1	BCDEFH 1	BCDEFH 1		
2	Development of Technology				ABCDH 1								ABODE 2	ABODH 1	ABODH 1				
3	Technological Consultation or Assistance		ABCDEF 2	ABCDEF 2	ABCDEF 1					A 1			ABCDEF 1	ABCDEF 1	ABCDEF 1				
4	Industrial R & D in Technology				ABCDEF 1					ABC 1			ABCDEF 1	ABCDEF 1	ABCDEF 1				
5	Technological Training								ABCDEFH 2					ABCDEF 1	ABCDEF 1	ABCDEF 1			
6	Technological Information Dissemination				ABCDEF 2					ABCDEF 2			ABCDEF 3	ABCDEF 1	ABCDEF 1	ABCDEF 1			
7	Technological Transfer				ABCDEF 1					ACDE 2			ABCDEF 2	ABCDEF 2	ABCDEF 2				
8	Study and Investigation																		
9	Management Modernization	ABCD 2				AB 2		BCDEFH 1											
10	Support for Establishment of Associations		ABCF 3																
11	Energy Saving																		
12	Promotion of S.M.I. in Provincial Area																		
13	Promotion of Production Sub-contracting System					ABCDEFH 2													
14	Marketing Services Preferential Order						ABH 2			ABH 2									
15	Financial Assistance Improvement																		
16	Bureaucratic Procedure Assistance																		
17	Infrastructure																		
18	Education, Training																		
19	License, R & D																		
20	Standardization																		
21	Planning & Coordination																		

Table 8-3 Integrated Weight Table (Organization-Function Wise)

Responsible organizations & bodies Functions (Policy/role/objective)	Public Organizations															
	ISD	TMDC	SIFO	RIDC	P10	TSI	TRAF	IFCT	BOF	NISD (DOL)	UNIV. COLLEGE POLYTECH.	TTTC	TISTR	TTC	BOI	AMRI
Technology (1-9)	22/9 2.4	14/9 1.6	2/1 2.0	13/8 1.6	11/6 1.8	4/3 1.3	2/1 2.0	7/6 1.2	7/6 1.2	6/3 2.0	7/6 1.2	/	6/3 2.0	5/3 1.7	2/1 2.0	6/3 2.0
Management (9,12,13,14)	8/4 2.0	7/3 2.3	/	7/4 1.8	3/2 1.5	1/1 1.0	2/1 2.0	/	/	/	/	2/1 2.0	/	/	/	/
Organizing/Coop. (10,13)	4/2 2.0	5/2 2.5	/	3/2 1.5	2/1 2.0	1/1 1.0	2/1 2.0	/	/	/	/	/	/	/	/	/
Financing (15)	1/1 1.0	/	3/1 3.0	/	/	/	/	3/1 3	2/1 2	/	/	/	/	/	1/1 1.0	/
Policy & Institution (11,16,17,18,19,20,21)	11/5 2.2	3/2 1.5	3/2 1.5	1/1 1.0	/	/	2/1 2.0	1/1 1.0	1/1 1.0	/	3/1 3.0	/	1/1 1.0	/	/	/
Re-location of Firms (1,13,17)	5/2 2.5	4/2 2.0	4/2 2.0	4/2 2.0	4/2 2.0	2/2 1.0	6/3 2.0	3/2 1.5	3/2 1.5	/	/	/	/	1/1 1.0	2/1 2.0	/
Total (1-21)	42/19 2.2	24/12 2.0	8/4 2.0	21/13 1.6	13/7 1.9	8/5 1.6	6/3 2.0	11/8 1.4	10/8 1.3	6/3 2.0	10/7 1.4	2/1 2.0	7/4 1.8	5/3 1.7	4/3 1.3	6/3 2.0

Table 8-3 (Cont.)

Responsible organizations & bodies Functions/ role/objective	Private Organizations & Others															
	TMA	ATI	EIT	WDA	SIAT	MAT	GEPC	TDAT	EIC	FC	TDC	PMC	TPA	TGTAC	RCTT	Others
Technology (1-9)	2/1 2.0	1/1 1.0	4/2 2.0	8/6 1.3	4/2 2.0	/	2/2 1.0	2/1 2.0	/	7/5 1.4	/	/	10/7 1.4	9/6 1.5	3/2 1.5	/
Management (9, 12, 13, 14)	2/1 2.0	/	/	/	4/2 2.0	/	1/1 1.0	/	2/1 2.0	/	/	/	/	/	/	/
Organizing/Coop. (10, 13)	/	3/1 3.0	/	/	2/1 2.0	/	/	/	/	/	/	/	/	/	/	/
Financing (15)	/	/	/	/	/	2/1 2.0	/	/	2/1 2.0	/	/	/	/	/	/	/
Policy & Institution (11, 16, 17, 18, 19, 20, 21)	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Re-location of Firms (1, 13, 17)	/	1/1 1.0	2/1 2.0	1/1 1.0	4/2 2.0	/	1/1 1.0	/	/	1/1 1.0	/	/	2/2 1.0	1/1 1.0	/	/
Total (1-21)	2/1 2.0	2/1 2.0	2/1 2.0	8/6 1.3	2/1 2.0	2/1 2.0	2/1 2.0	2/1 2.0	2/1 2.0	7/5 1.4	/	/	10/7 1.4	9/6 1.5	3/2 1.5	/

Table 8-4 Integrated Promotional Measures of Metalworking Industries in Thailand

