DATA COLLECTION SURVEY
ON
STRATEGY FORMULATION
ON HUMAN RESOURCES DEVELOPMENT
IN
SOUTHEAST ASIA

FINAL REPORT

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LIST OF ABBREVIATION

Thailand

AOTS	Association for Overseas Technical Scholarship
AUN	ASEAN University Network
BOI	Board of Investment
CAT	Communications Authority of Thailand
FTI	Federation of Thai Industry
JTPP	Japan-Thailand Partnership Programme
KMIT	King Mongkut Institute of Technology
KMITL	King Mongkut Institute of Technology Ladkrabang
NESDB	National Economic and Social Development Board
NEC	NEC corporation
NIT	Nontaburi Institute of Telecommunication
NTT	Nippon Telegraph and Telephone Corp
OECF	Overseas Economic Cooperation Fund
OTCA	Overseas Technical Cooperation Agency
TOT	Telephone Organization of Thailand
SEED-Net	Southeast Asia Engineering Education Development Network

Malaysia

AI	Artificial Intelligence
BIPM	International Bureau of Weights and Measures
EPU	Economic Planning Unit
FELDA	Federal Land Development Authority
FTZ	Free Trade Zone
GLP	Good Laboratory Practice
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
IMP	Industrial Master Plan
MP	Malaysia Plan
MARDI	Malaysian Agricultural Research and Development Institute
MIDA	Malaysian Industrial Development Authority
MITEC	Metal Industry Technology Centre
MTCP	Malaysian Technical Cooperation Program
NEP	New Economic Plan
NML-SIRIM	National Metrology Laboratory of Standards and Industrial Research Institute of Malaysia
NOC	National Operation Council
OPP	Outline of Perspective Plan
S/W	Scope of Work
SIRIM	Standards and Industrial Research Institute of Malaysia

SMR	Uniform Quality Standards Malaysian Rubber
WAITRO	World Association of Industrial and Technological Research Organization

Singapore

PPP	Public Private Partnership
PSB	Productivity Standards Board
NPB	National Productivity Board
SPA	Singapore Productivity Association
SPDP	Singapore Productivity Development Project
SPRING	Standards, Productivity and Innovation Board

Summary

1.Outline of the Survey

1.1 Purpose of the Survey

This Survey has the following two purposes.

- To assist the proposal of a new business model focusing on human resources development and networking so that JICA is able to effectively coordinate its three aid schemes (ODA loan, grant aid and technical cooperation) to facilitate the interactive development of Southeast Asian countries and Japan.
- Contribution to the tasks of examining a viable scenario for the countries which will soon graduate from the status of recipient countries (through the establishment of partnerships, etc.)

In this survey we tried to discover and awaken "dormant knowledge" through a review of the project outcomes from unique viewpoints which differ from the five DAC criteria so that this knowledge becomes formal knowledge in the final report. Accordingly, the principal analysis under the Survey will be away from the five DAC criteria which have been used for conventional project evaluation or ex-post evaluation featuring several projects under a single program.

In addition to efforts designed to discover and awaken separate dormant knowledge related to each of the subject projects, further efforts will be made to establish useful knowledge for the formulation of a human resources development strategy for Southeast Asia by examining the analysis results for all three projects in an integral manner.

1.2 Subject Projects of the Survey

The survey focuses on the technical cooperation projects that have a symbolic significance in the context of policy dialogues between the recipient countries and Japan. The Japan's assistance to the recipients' economic development in the human resource development sector of Japanese ODA projects in its longstanding period such as the technical cooperation projects in the medium-developed countries where successful development have achieved such as Singapore, Malaysia and Thailand. Concretely, the Survey features the following human development projects;

Country	Sector	Subject project
Singapore	Productivity improvement	The Productivity Development Project in the Republic of Singapore
Malaysia	Development of industrial human resources	1. The Metal Industry Technology Centre Project in Malaysia 2. The Project on the National Metrology Laboratory of Standards and Industrial Research Institute of Malaysia 3. The Project on Characterization of Fine Ceramics

		4. The Project on Foundry Technology Unit in Malaysia 5. The Project on Evaluation and Analysis of Hazardous Chemical Substances and Biological Treatment of Hazardous Wastes 6. The AI System Development Laboratory Project 7. The Project on Risk Management of Hazardous Chemical Substances
Thailand	Higher education in engineering	1.Telecommunications Training Center 2.The Expansion Project of King Mongkut's Institute of Technology Ladkrabang 3.The Expansion Project of King Mongkut’s Institute of Technology Ladkrabang 4.The Project on the Research Center for Communications and Information Technology of KMITL 5.The ASEAN University Network/Southeast Asia Engineering Education Development Network (AUN/SEED-NET)

1.3 The Methodology of the Survey

The subject ODA projects will be approached from two directions in this Study. One is the orthodox approach where the entire picture of each project is studied in a general manner through a review of the existing literature and other information to establish a general understanding of the impacts of each project on the socioeconomic relationship, human and organizational exchanges and project implementation system in bilateral and multilateral Japanese ODA in the Southeast Asian region. This approach compiles the findings of the Survey, constituting the introductory phase for another analytical approach where the project outcomes are compiled as "a story". The other approach is focusing on the key persons in a project aims at clarifying the long-term impacts of aid by means of following up the changes of the internal and external situations of these key persons.

2. Hypothesis for the Survey

The Survey is required to be based on an approach which reflects such viewpoints as "human networking between the donor and recipient country", "residual social impacts in the recipient country", "changes of the attitudes of organizations and people" and "creation of an Asian concept of value through fusion with the Japanese concept of value". The hypothesis described below is adopted to form the basis for clarification of what will become visible and what kind of situation will become the subject of study when these viewpoints are introduced.

Southeast Asian countries, the subject countries of the Survey, used to be the main recipients of Japan's

early ODA. There must be historical traces or "dormant Japanese knowledge" of Japan's "cooperation for human resources development". Dormant knowledge is temporarily defined here as "something which has been transferred to a recipient country through Japan's ODA and which forms the base for the development of the recipient country as it still lives in the socioeconomic field".

A story means "a visible chain created by the following and clarification of the temporospatial impacts of Japan's ODA on the people and organizations concerned" Such story primarily develops using "people as media". Several patterns of story development are currently assumed as listed below.

3.Lessons from Technical Cooperation for Human Resources Development

3.1 Thailand

(1) Existence of National Policy

Around 1960 when the cooperation was just beginning, national policy was a major factor both in Japan and Thailand. In Japan, the securing of markets in Southeast Asia was the greatest goal of export promotion policy, dovetailing with the Kishi administration's 'Asian diplomacy'. In Thailand, the nurturing of human resources to modernize the state was incorporated into national policy. In particular, it was necessary to develop engineers and other industrial human resources to further expand import substitution industries and export promotion industries based on foreign capital.

(2) Existence of Asian Policy

In the postwar era, Japan promoted economic cooperation diplomacy in Southeast Asia with American military diplomacy in the region while Japan was utilizing postwar reparations and quasi-reparations. The year 1960 marked the beginning of Japan's three-pronged economic activities of revitalized trade, investment and economic cooperation. On the other hand, rapid rise of Japanese corporations in and one-sided trade structure caused by Japan's massive surplus with the region triggered a student-led campaign to drive out Japanese goods. Therefore, Japan adopted an Asian policy which included not only economic cooperation but also technical cooperation through human resources development as seen in KMITL cooperation.

(3) Existence of Political Leadership

Then Japanese political leaders including the prime ministers were expected to possess strong political will and to exercise great leadership in order to reconstruct and further develop the national economy and industry, and to create a peaceful and powerful nation.

(4) Lessons on the Aid Side – Background to 50 Years of Cooperation

1）Collaboration among Ministry of Posts and Telecommunications, NTT, Tokai University, and JICA

The horizontal unification throughout Japanese telecommunications sector was important to expand Japan's technology and research overseas. This solidarity was the driving force for establishing and sustaining assistance projects.

2）Effectiveness of Tokai University-Centered (Single School) Dispatch of Experts (Academics)

This case provides valuable input to the debate over whether single company support is better than multiple institutions, because the former prevents the lack of unity. Thus, dispatching experts from one university enabled to build an effective and efficient support structure setup.

3）Leadership of the President of Tokai University

The success of KMITL was largely attributed to the charismatic leadership of Mr. Shigeyoshi Matsumae, the founder of Tokai University. In particular, the inter-university exchange agreement proposed by Mr. Matsumae to improve the level of the KMITL faculties helped enhancing the value of KMITL in the pantheon of education.

4）Presence of Nippon Telegraph and Telephone Public Corporation (NTT)

NTT played a major role in dispatching experts (engineers) in the early years when it was a state-run corporation. Its activity was characterized by the flexibility and desire to positively serve the national interest. However, following privatization of the corporation shifted its motivation unfortunately towards the pursuit of profit.

5）Contribution of Japanese Affiliated Corporations

Affiliated Japanese corporations in Thailand played a part in the all-Japan setup through donating research equipment to universities, establishing corporate scholarship programs and plant visits. In addition, their greatest contribution was to help KMITL graduates find employment which enabled KMITL to achieve the top employment rate among graduates.

6）Thai Support for Overseas Students at Tokai University

Tokai University's support for MITL and the students at Tokai University fostered a sense of solidarity among them during and even after employment activities in Thailand.

7）Unbroken and Planned Support by JICA

Thanks to continuous support from JICA over decades, communication between JICA and Tokai University's professors on site was maintained effectively and new plans were proposed at appropriate times while incorporating the specialized information and opinions from the professors and academic needs of KMITL.

3.2 Malaysia

(1) Vibrant Early ODA

One thing that continually impressed during this study on the early days of SIRIM 30 years ago was the feeling of vibrancy of Japanese ODA, in which the public and private sectors collaborated to promote economic cooperation, at that time. Such vibrancy cannot be sensed from ODA frontline activities today. While looking back at the SIRIM project, there were many days when the study team wondered if good results could be achieved via ODA simply through lofty theory. One gets the feeling that it is about time we modified the recent approach to Japanese aid, which tends to be top-heavy and dominated by Western aid theory, and revert to the more traditional Japanese approach while merely using the Western model for

reference. There is no need to throw out those past techniques. Looking back on this past experience of the early SIRIM experts where excellent cooperation was realized through warm feeling and practical technology even though English ability was limited, the study team considers it necessary to review the approach to Japanese style economic cooperation.

Another thing that is crucially lacking in current ODA is awareness of the objective of ODA, i.e. why is it implemented? Without a clear objective, for example, to secure resources, support the activities of Japanese corporations, ensure comprehensive security, enhance Japan's presence in the international community or provide humanitarian support, it will not be possible to secure the understanding of citizens for ODA, and motivation will be low among JICA personnel and stakeholders on the JICA side. It is urgently necessary to build a common goal of ODA that the Japanese people can unite behind. Such policy building is conventionally the work of the government and ministry of foreign affairs, however, JICA should also play an active role in policy building in view of its vast know-how as the implementing agency.

(2) Numerous Lessons Obtained from SIRIM

Self help: Self help does not only refer to repaying debts. The most important thing is for the country receiving aid to masticate on the technology that it has been taught.

Length of projects: When projects start generating a good trend of results as in the case of SIRIM, it is best not to curtail the cooperation just because the period of assistance expires. Since successful projects become the assets of both countries concerned, there should be no hesitation in continuing them over the long term. On the other hand, it is also necessary to curtail projects that are clearly not producing the desired results even if it means doing so in midstream.

Emphasis on Asia: In order for Japan to sustain its presence on the increasingly multi-polarized world stage of the 21st century, it must collaborate closely with the local Asian community. Needless to say, emphasis on Asia is crucial in the field of ODA too. There will be two distinct streams in Asian ODA from now on: the first will be conventional assistance to later-developing nations such as Cambodia. Japan previously provided the driving force behind the Asian miracle through providing concentrated ODA to the region. The other stream will be economic cooperation for semi-advanced nations which are developing hard on the heels of the advanced countries. In such countries as Malaysia and Thailand, it will be necessary to consider methods of cooperation which ensure that past assets such as human networks and facilities continue to be utilized after these countries graduate from aid.

Challenge for creating the international standard: SIRIM was able to comply with ISO criteria promoted under EU initiative some 20 years after its establishment. Japan cooperated with the development of SIRIM throughout its early days, however, it didn't make the effort to introduce a quality control certification system such as ISO into Malaysia (Japan uses the JIS standard). When it comes to conducting future cooperation in the software field, it will be necessary to consider the area of institutional design so that the outputs of cooperation are sustained.

Horizontal, triangular cooperation: Malaysia is appropriate as a partner in three-way cooperation. During the field survey in Malaysia, there were strong calls for collaboration with Japan in promoting south-south

cooperation. However, the impression gathered from officials in both countries is that three-way cooperation should be limited to the vertical approach of Japan-Malaysia-later-advanced nations. More research needs to be devoted to finding ways to implement horizontal triangular cooperation whereby assistance is built on a platform comprising the mutual relative advantages of both Japan and Malaysia (in Malaysia's case, features include influence in the Islamic world, medium-level advancement and multiracial society, etc.).

Creating an Asian version of DAC: There is growing potential for assistance cooperation with Malaysia and other aid countries in Asia. As the sole assistance advanced nation in Asia, Japan should start considering preparations for the creation of an Asian version DAC from now on.

Promote the archiving of past economic cooperation models: The study here revealed that records tend to become scattered after JICA projects have finished. In addition to archiving such records, it is necessary to organize human resources on the side of recipient countries and to create networks of Japanese personnel.

Importance of compiling oral history: The study here found that JICA personnel and experts who were involved in early ODA have either passed away or cannot accurately recall past events. The words of these people who implemented Japan's economic cooperation are living educational resources and historical testimony of Japanese assistance. It is necessary to record the experiences of these people in conversational format. Since documents alone cannot provide the whole story, such oral records could contribute to the success of future JICA activities.

3.3 Singapore

(1) Presence of strong political intent

This project was implemented under the strong leadership of Prime Minister Lee Kwan Yew with the political intent to realize national unification. At that time, the Government of Japan also had the desire to utilize Singapore for diplomatic clout in ASEAN.

(2) Contribution to globalizing Japanese management techniques

Singapore was a key station for Japanese corporations as they launched out into Southeast Asia from the 1970s. For Japanese corporations conducting joint ventures in Southeast Asia, it was effective to teach Japanese management techniques such as 5S and Kaizen to ethnic Chinese business managers around the region. If one considers that those techniques have spread to the rest of the world via Singapore's global network, it can be seen that the productivity development project created a significant outcome.

(3) Possibility of international cooperation in collaboration with Singapore

Following the end of the Singapore Productivity Development Project when Japan conducted similar cooperation in Thailand, Brazil and Hungary, it should have been possible to work with Singapore as an equal partner utilizing the experience of the Singapore National Productivity Boar (NB), which overcame barriers of language and culture to learn Japanese productivity concepts. Singapore, which sought to become a regional center, also aspired to that.

A number of the NB counterparts who took part in the project currently work as independent

management consultants away from the government. However, they still continue to see each other. These kind of human ties are another legacy of the project, and it will be very important for the relationship between both countries to build a network of human resources scattered over various fields in the public and private sectors.

(4) Learn from Singapore and approach the world in collaboration

Concerns are being raised over Japan's declining presence in the international community. Mr. Terasawa says, "The only people who know about Japan's former strength are Singaporeans who are now in their 50's and 60's. Younger generations who don't know about Japan in those days have no particular ambition towards Japan now." Unless Japan follows the lead set by the private sector and devise a new form of international cooperation that entails not simply indirect methods such as lateral support for south-south cooperation but rather learn from Singapore and approach the world in collaboration, it will find itself left behind by and isolated from its former allies in Asia and other countries in the rest of the world.

4.Recommendations Derived from Cross-sectional Analysis

4.1 Recommendation for Collaborative International Cooperation

During the course of the Study, it was possible to gather ample raw materials to write the 'story' of aid in three countries, namely King Mongkut's Institute of Technology in Thailand, the Standards & Industrial Research Institute of Malaysia (SIRIM) and the Productivity Development Project in Singapore. Through conducting interviews with numerous associated persons, it was confirmed that Japanese know-how and Japanese feeling (culture), both tangible and intangible, resides in these counterparts, that they enjoy passing on their experiences of life shared with Japanese experts to future generations of children, and they convey this Japanese know-how and feeling via their friends and workplaces (instruction to students and subordinates). These points cannot be quantified in numerical terms. Moreover, such developments are not formed overnight in meeting rooms or deskwork; rather they are created together with the furtherance of human relationships out of close human exchanges including training and overseas study. It is necessary for the Government of Japan and JICA to carefully examine its stock of such assets and make good use of them. Such thinking will form the bedrock for advancing collaborative international cooperation with ASEAN and other emerging countries.

Such counterparts have a sense of Asian unity with Japanese. As one Malaysian interviewee said, "We study in London because there is a lot of know-how there, however, in human terms we cannot acquiesce to their attitude which looks down on Malaysians." Such people have a sense of affinity with the Japanese.

Among the opinions given, these former counterparts pointed to a desire to transfer the things learned from Japan to later developing countries in ASEAN, Asia and Africa in collaboration with the Japanese.

King Mongkut's Institute of Technology in Thailand is already cooperating with Japan in developing human resources at the National University of Laos and making a contribution to the development of advanced engineering human resources at universities in other ASEAN countries within the framework of the ASEAN advanced engineering education project. In Singapore, since it has totally digested and absorbed productivity, it hopes to convey this experience and know-how to other countries in cooperation with Japan.

Singapore is already implementing productivity cooperation in Botswana in collaboration with British Commonwealth assistance. Moreover, Singapore is cooperating with Japanese corporations and making advances into India in the water business, and they say that such cooperation can be extended to East Africa using the same approach in cooperation with Japan and India. In Malaysia, success was achieved in establishing standardization on the global standard under Japanese cooperation, and the Malaysian counterparts hope to see the standardization transfer model transferred further afield to ASEAN nations and Asia in general as well as Africa too.

Out of the above local interview surveys, it is hoped to propose Japanese 'collaborative international cooperation' for thinking and acting together with the semi-advanced or quasi-semi-advanced countries of ASEAN. In contrast to the concept of unilateral support of developing countries by advanced nations that arose out of the north-south situation in the past, this proposal presents a new aid concept of assisting other developing nations through a sense of partnership with ASEAN countries based on profound trust and accumulated legacy of ODA in ASEAN. Agencies which were previously the targets of Japanese assistance programs and are staffed by people who cherish the Japanese know-how and feeling that were passed on to them should be regarded as valued development partners, and development projects should be advanced in collaboration with such agencies.

In particular, regarding the resolution of global environmental problems, there is a pressing need to expand the ring of cooperation in collaboration with semi-advanced nations that were previously developing countries. In that sense, Japanese collaborative cooperation with ASEAN semi-advanced countries and quasi-semi-advanced countries has the potential to become a global model.

Japanese collaboration with ASEAN has significance in the sense of co-existence in terms of physical geography, politics and economy. Like it or not, building a mutually complementary relationship with ASEAN semi-advanced countries is an inescapable proposition for Japan as it faces a declining child population and ageing of society. Furthermore, from the global perspective in the current age, collaborative international cooperation deserves special emphasis in terms of strengthening complementary economic relationships with emerging economies such as China, India, Brazil and South Africa. It should be understood that collaborative international cooperation is deeply linked to this kind of future outlook.

Meanwhile, collaborative international cooperation is a concept that also holds true in the planning of ASEAN cooperation policy and recommendations for intellectual development cooperation discussed later. All these ideas can be summed up into the concept of networked international cooperation. This concept is geared to jointly realizing solutions to common problems while building networks throughout a single area or between multiple countries and agencies.

4.2 Compilation of ASEAN Cooperation Policy

The Asian region is seen as occupying a central position as the production center of the world. In that arena, the semi-advanced countries of ASEAN are inevitably being compelled to shift towards high added-value labor-intensive industries and R&D sectors. During this process they are likely to seek Japan's former experience, and Japan will be faced with the need to compile collaborative international cooperation policy geared to realizing mutually complementary relationships.

Furthermore, the countries of ASEAN will seek Japan's support concerning pollution and other environmental problems, which Japan had difficult experiences with in the past, social security issues brought about by declining child population and the ageing of society, privatization of national enterprises and other issues. For Japan, it is worth considering the compilation of policy for collaborating with ASEAN and exploring joint solutions to such problems.

Conventionally, since aid projects were conducted between countries, cooperation policy was compiled bilaterally between the Government of Japan or JICA and the government of the recipient, and project activities were sustained on the bilateral basis. However, when the general area viewpoint was adopted, the standpoint of Japan taking the initiative in coordinating the differing opinions and interests of multiple countries in that region and implementing projects was more dominant than that of the recipients; moreover, activities tended to be viewed as only supplementary to bilateral cooperation or to be implemented within the bilateral framework alone. Accordingly, project plans were not compiled from the medium to long-term perspective and projects could not be implemented on an ongoing basis. However, if one takes a detailed look at political and economic trends on the regional and global scale, rather than seeking regional cooperation as an adjunct to national policy, it is necessary to have a clear vision whereby regions are viewed as a single unit and it is clarified how the benefit and status of each country should be secured and how projects should be implemented within that single unit. In this sense, the Government of Japan and JICA need to have a cooperation policy and implement projects in tandem with the entire region or all the nations that comprise the region.

4.3 Recommendation for Intellectual Development Cooperation

As has been seen so far, it is necessary to cherish human assets and the assets of Japanese know-how and Japanese feeling (culture) that are built up within people. Since Japanese ODA is funded with Japanese public funds, the fact that it leaves an imprint of Japan that lasts for a long time between people on both sides is an important asset and achievement of ODA that, although not immediately visible, helps to solidify the status of Japan in a changing world.

When adopting a long-term viewpoint, with respect to the semi-advanced nations or emerging economies of ASEAN, rather than cooperation based on objects and money, it will more beneficial for the future survival of Japan to embark on collaborative international cooperation geared to realizing intellectual capacity development and to strive for the formation of intellectual human networks with ASEAN and the emerging economies.

Such efforts should not only be limited to government agencies utilizing ODA but should also entail participation from the private sector and academia. In particular, judging from the fiscal status of the Japanese government and economic trends of Japan, it will be necessary to bundle together numerous strands of conventional cooperation and generate synergies in order to produce numerous effects with limited budget. One possibility is to construct 'platforms' whereby government, private sector and academia can collaborate in implementing projects.

For example, concerning the formation of an ASEAN intellectual human network in ASEAN, it is proposed that a joint research fund be created under public and private sector collaboration with Japan in

AUN/SEED-NET (ASEAN University Network/Southeast Asia Engineering Education Development Network), which is a case of Japanese wide area cooperation. Private sector corporations independently set up funds to provide scholarships and research subsidies, etc. to overseas students, however, the proposal here aims to integrate such support on a wider and more effective scale. On such platforms, it would be possible for specific corporations to establish courses and scholarships. Furthermore, in the public sector too, it is anticipated that synergy can be realized between projects that go beyond the boundaries of ministries, for example, funding by the Ministry of Foreign Affairs, state-funded overseas study programs and academic promotion projects by the Ministry of Education and so forth. Here, it is hoped that universities (the actual operators) also participate in forming an all-Japanese framework geared to the development of advanced engineering human resources and promotion of research between Japan and ASEAN.

Furthermore, following the model of AUN/SEED-Net which is limited to the engineering field, it is proposed that a new ASEAN network of policy research be constructed and that joint research groups be launched in the fields of social security policy, privatization policy, environmental policy and industrial policy, etc., all of which are areas that will have to be confronted by ASEAN sooner or later.

4.4 Recommendation of Long-Term Project Implementation and Review of Existing ASEAN International Cooperation Projects

As was mentioned earlier, JICA technical cooperation projects are configured with three- or five-year terms. However, as was made clear in the Study here, outputs can be achieved in profound areas not measurable under the DAC five-stage evaluation through conducting patient cooperation over 10, 20 and 30 years. In order to further realize such important outputs based on the long-term view, JICA should seek to shift its concepts and systems for implementing projects without being limited by the conventional time frame of five years. This is particularly true in the case of educational projects, which cannot display their true effects in just five or even 10 years.

People who are bound by rules immediately start talking about ‘exit strategy’ and discussing the ‘sustainable development potential’ of projects. Then again, there are others who do not deeply consider future potential but find pleasure in forming new projects. It is not intended to deny the viewpoint and efforts for securing sustainable development potential, however, while taking steps to secure this, it is also important to understand that there are cases where sustainable development cannot be secured over the time span of five and 10 years and to find the value of long-term involvement in such projects.

Naturally, this is not to suggest that projects be implemented aimlessly over the long term. There is validity in the approach of establishing break-points and establishing targets and clarifying results at each point. In such cases, the future vision of cooperation must be articulated. However, in reality, project frameworks tend to be decided based on the approach which says “projects must end in five years because the rule is five years.”Since such an approach inhibits the dynamism of cooperation, it is necessary to construct the project framework from a broader framework that analyzes the future potential of projects more deeply. However, on the level of concrete activity, it will likely be necessary to review outputs and approaches and compile new project deployment strategies every five years or so.

Moreover, depending on the state of implementing agencies, it may be a good idea to selectively

implement long-term projects with respect to agencies that are expected to become important collaboration partners of Japan in the long term.

Limiting review to the ASEAN region cooperation that was surveyed in this Study, in particular the long-term cooperation projects that have continued over decades, collaboration with ASEAN can be made more durable and this continuity can contribute to Japan's national interest if projects that are effective in long-term collaboration with ASEAN are selected for continuation and improvement as collaborative international cooperation.

Finally, Japanese ODA, which started from the development of states and people in fledgling independent states, may basically be called the history of transfer of technology, knowledge and know-how for "building something out of nothing." However, when it comes to the deployment of collaborative international cooperation proposed here between Japan and the semi-advanced and quasi-semi-advanced countries of ASEAN, this conventional modality of 'building something out of nothing' will no longer hold true.

Since the counterparts in collaboration already possess a certain stock of intellectual and technological assets, such cooperation must be based on the new awareness of 'building more out of something.' For this reason, the Japanese side proposing collaboration is required to have horizontal thinking and it must be equipped with an intellectual and technological level commensurate with that.

Accordingly, it will be necessary to build the implementation setup while bearing in mind that collaborative international cooperation cannot be advanced based on the conventional vertical approach to assistance.

Chapter 1

Outline of the Survey

Chapter 1　Outline of the Survey

1.1　Basic orientation of the Survey

1.1.1　Purpose of the Survey

The Survey has the following two purposes.

- Use of the Survey findings to assist the proposal of a new business model focusing on human resources development and networking so that the JICA is able to effectively coordinate its three aid schemes (ODA loan, grant aid and technical cooperation) to facilitate the interactive development of Southeast Asian countries and Japan.
- Contribution to the tasks of examining a viable scenario for the countries which will soon graduate from the status of recipient countries (through the establishment of partnerships, etc.) and of examining a suitable approach for them to provide assistance for human resources development in other countries.

In this survey we tried to discover and awaken "dormant knowledge" through a review of the project outcomes from unique viewpoints which differ from the five DAC criteria so that this knowledge becomes formal knowledge in the final report. Accordingly, the principal analysis under the Survey will be away from the five DAC criteria which have been used for conventional project evaluation or ex-post evaluation featuring several projects under a single program.

What can possibly replace the five DAC criteria as the principal axes of our examination include human networking, socioeconomic impacts, changes of attitudes and creation of a new concept of value. The Survey aims at grasping the essence of project outcomes from a long-term perspective by means of qualitatively reviewing the series of assistance provided under the subject projects. The nature of the interactions among the stakeholders in the process where Japanese assistance produces positive outcomes will be clarified along with factors which have significantly contributed to the realization of outcomes. The essence of this mechanism will be identified. In addition to efforts designed to discover and awaken separate dormant knowledge related to each of the subject projects, further efforts will be made to establish useful knowledge for the formulation of a human resources development strategy for Southeast Asia by examining the analysis results for all three projects in an integral manner.

1.1.2　Background of the survey

(1) Graduation from the status of recipient country through economic development

Currently, the official assistance of the government of Japan is decided based on the Gross National Income (GNI) figures stated in the guideline of the World Bank regarding the free financial aid or the loan assistance and the “DAC list of recipients” as for technical cooperation. Nevertheless, some specific circumstances such as important sectors or urgent needs for the assistance are considered”. (Currently, whether Japan officially selects a country as it’s ODA recipients, although specific circumstances such as important sectors or urgent needs for the assistance are counted, depends generally on the figures of Gross national income (GNI) in the

guideline of the World Bank regarding the free financial aid or the loan assistance, and “DAC list of recipients” as for technical cooperation.)

Due to the limited budget and human resource, especially the fact that ODA is funded by tax payers of Japan, the criteria for selecting recipient countries above are necessary in order to ensure the fairness, transparency and accountability of aid allocation.

However, the recipient countries of ODA will be, sooner or later, moved out of the list owing to their successful economic development. Higher level of economic development is certainly desirable for not only the recipient countries themselves but also neighboring countries and the global economy, as well as from the humanitarian point of view. However, the graduation of ODA would result in the loss of a favorable international relationship tie between Japan and the recipient countries.

The target areas of this survey are Southeast Asian countries where Japan has provided ODA for a long time to assist their socio-economic development. Consequently, among these countries, some have already been or will be in a short run reach the stage of graduation from the status of ODA recipients. In the meantime, it is essential for Japan to draw the scenario of how to continue relationship with these countries toward or afterward their “graduation”.

(2) Possible new partnership development between Japan and aid recipient countries in the region

The achievement of socio-economic development in Southeast Asian countries would possibly bring about new partnership cooperation opportunities in replace for ODA for Japan. The development level of some countries which used to be ODA recipients create a particular situation where Japan can utilize these countries’ resources for Japan to implement other assistance modality with these countries.

JICA has, through it before, recognized these Southeast Asian countries, as the donor countries from which appropriate technology can be transferred to other developing countries. JICA calls it as the scheme of the South-south cooperation. Singapore has now risen to sufficient level where it can engage in technology transfer by itself in the field of productivity improvement. In recent years, Japan and other donor countries have been reduced their aids resources by necessity; it is critical for Japan to consider how to establish new mode of cooperation with these emerging countries in order to assist both within and beyond countries in Asia region.

It is important for Japan to be conscious of its advantages in establishing future collaborative relationship with such countries. At the same time Japan should be aware of the origin of their advantages that Japan has brought into these countries. This awareness enables Japan to ensure the effective aid coordination as well as it’s presence in the world. For instance, the National Productivity Board of Singapore is currently providing training courses to African countries such as South African Republic. This kind of assistance of Singapore developed based on the outcome of technical cooperation and human resource development projects that Japan has been provided for quite a long time.

Nonetheless, the history of Japan’s technical cooperation projects has hardly been made known to people. Hence, it is said that Japanese ODA has a modest attitude even though it seems to exist only in memories of individuals involved in these projects. It is likely because of a fact that

persons and parties of Japan side have never traced and reported this history. Hence, the survey would play an important role in clarifying the actual outcomes and impacts which only remain in memories of individuals through investigating how the Japan's assistance link to the current condition of recipient countries. The results of this survey could make a determination of Japan's responsibility toward relevant countries.

(3) Strengthening transparency and accountability of ODA projects

There is no room to argue about importance of transparency and accountability of ODA projects. A number of international donors as well as JICA have made serious effort toward this issue. For instance, JICA has developed a comprehensive project management system which comprises of project request, pre- and post evaluation study. This system has greatly contributed to the improvement of transparency and accountability of ODA projects. The development of this management system including the whole project cycle from project formulation to evaluation, which aims to avoid any wastefulness and to utilize the effectiveness of limited resources, has resulted in an effective utilization of Japan's ODA funds for overall objectives of each project's scheme. Application of consistent evaluation tools such as the evaluation criteria based on the five DAC criteria and the cross-cutting evaluation across projects for complementing individual project evaluation has enabled us to obtain valuable lessons. Furthermore, the quantification of project outcomes has been strengthened to a maximum extent, which leads us to make a comparison among relevant projects. These efforts contribute evidently to the improvement of the assistance projects and evaluation studies.

At the same time, however, the evaluation methodology so far has an inevitable limitation due to seeking out the standardization, objective/quantitative description. For example, in many case of evaluation studies, the form of outcomes of human resource building projects (*Hito dzukuri* projects) is numerical number such as "XX persons participated in YY training courses", "XX experts have been dispatched to…". Despite Japan has emphasized on capacity building scheme this mode of evaluation fails to illustrate how the persons trained by the project play their role in the socio-economic development in the recipient countries after completion of the project or how they make use of what they obtained in Japan's technical cooperation projects such as knowledge, know-how and people's attitude change are difficult to be shown by the quantitative data. To keep it in a simply way, the established approach for project evaluation has a drawback which make it hard for people to sensuously understand the usefulness of the projects.

Despite numbers of people involved in the projects have pointed out this weak point, there has been, in practical point of view, a difficult question to improve it; it takes too much efforts and resources to collect qualitative data from individual projects. That is the reason why the trial such as this survey has not implemented so far.

In order to cope with the above mentioned issue and establish an evaluation method complementing the existing evaluation system, the survey tried to identify projects' outcome of the past projects by adopting a new approach that is describing "the stories of the project". By adding another type of information toward the project evaluation, the trial would lead to achieving a better accountability for the projects. Most important of all, the survey is expected to help Japanese and the public in other countries including those who involved in the projects to understand what Japan's ODA put its major emphasis on and in what way it has contributed to

recipient countries concretely.

(4) Data collection for the design of a more effective scheme of ODA

The survey where we follow the "stories" of the cooperation projects, in other words, the "association" among series of activities and human network generated by the projects could enable us to evaluate or collect relevant data beyond individual project. In the evaluation of an individual project or a group of relevant projects, we can hardly find out an expression as follow: "there had been the person who had participated in a Japan's technical cooperation project as a member of the project counterpart and afterward she/he had taken part into another project and made use of his/her skills such as project management or activity organization which she/he had learnt from the previous project. As the result, she/he had made important contribution to the impact of the second project that she/he had joined. . In such example, the method of this survey could have potential for tracing the projects' outcomes as "stories".

1.1.3 Subject Projects of the Survey

The survey focuses on the technical cooperation projects that have a symbolic significance in the context of policy dialogues between the recipient countries and Japan. The Japan's assistance to the recipients' economic development in the human resource development sector of Japanese ODA projects in its longstanding period such as the technical cooperation projects in the medium-developed countries where successful development have achieved such as Singapore, Malaysia and Thailand. Concretely, the Survey features the following human development projects;

Table1-1 List of subject projects

Country	Sector	Subject project
Singapore	Productivity improvement	The Productivity Development Project in the Republic of Singapore
Malaysia	Development of industrial human resources	1. The Metal Industry Technology Centre Project in Malaysia 2. The Project on the National Metrology Laboratory of Standards and Industrial Research Institute of Malaysia 3. The Project on Characterization of Fine Ceramics 4. The Project on Foundry Technology Unit in Malaysia 5. The Project on Evaluation and Analysis of Hazardous Chemical Substances and Biological Treatment of Hazardous Wastes 6. The AI System Development Laboratory Project 7. The Project on Risk Management of Hazardous Chemical Substances
Thailand	Higher education in engineering	1.Telecommunications Training Center 2.The Expansion Project of King Mongkut's Institute of Technology Ladkrabang 3.The Expansion Project of King Mongkut's Institute of Technology Ladkrabang 4.The Project on the Research Center for

		Communications and Information Technology of KMITL 5.The ASEAN University Network/Southeast Asia Engineering Education Development Network (AUN/SEED-NET)

1.1.4 The methodology of the survey

The following basic policy is adopted for the execution of the Survey.

(1) Approach

The subject ODA projects will be approached from two directions in this Study.

One is the orthodox approach where the entire picture of each project is studied in a general manner through a review of the existing literature and other information to establish a general understanding of the impacts of each project on the socioeconomic relationship, human and organizational exchanges and project implementation system in bilateral and multilateral Japanese ODA in the Southeast Asian region. This approach compiles the findings of the Survey, constituting the introductory phase for another analytical approach where the project outcomes are compiled as "a story". These findings of the present Study will be included in a report which will primarily feature the background and purposes of the three projects and the summary of their outcomes.

The approach adopted for the Survey focuses on the key persons of individual projects as the starting point and then inductively establishes the reality of the projects based on changes of the internal and external situations which have occurred at the level of individual persons with a view to revealing the general outcome of Japan's aid. This approach focusing on the key persons in a project aims at clarifying the long-term impacts of aid by means of following up the changes of the internal and external situations of these key persons. This follow-up study is designed to clarify aspects of human networking, changes of the attitudes of organizations and people and the creation of a new (Asian) concept of value and to compile the project outcomes as "a story" through a detailed examination of the principal outcomes.

The Survey findings produced by these two approaches will then be compared to enhance the accuracy of the information obtained by checking their compatibility. In this way, the contents of the report will become solid and reliable.

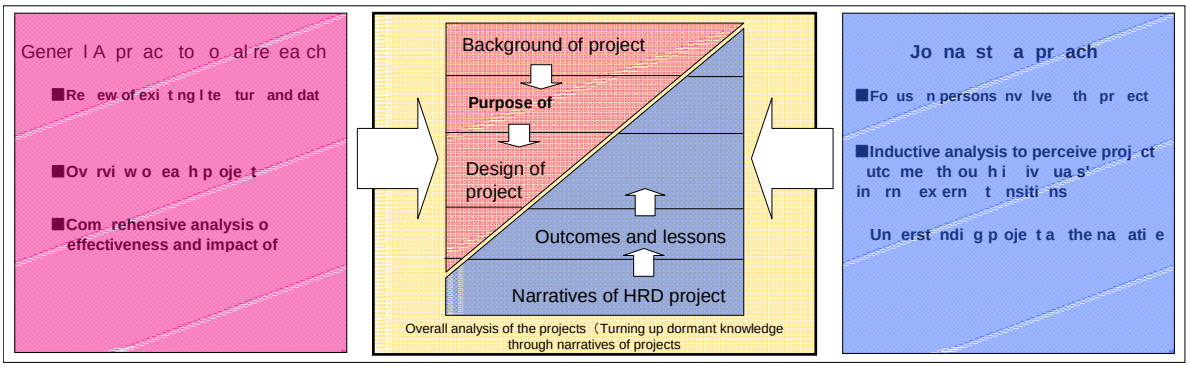


Figure 1-1 Approach of the survey

(2) Implementation structure

In line with the aim of the Survey described above, the implementation system for the Survey anticipates the fusion of the professional expertise of a development consultant and a journalist. The members of the Survey team are required to possess not only the ability to pursue "a story" but also in-depth knowledge of issues relating to Japan's aid schemes and evaluation so that they can establish the said "story" in the context of Japan's aid policies as well as socioeconomic conditions of the recipient country. Such in-depth knowledge is also necessary to sort out information which will assist further analysis based on the findings of the Survey. The team consisting of "a development consultant" and "a journalist with intimate knowledge of development issues" is designed to meet these requirements for suitable personnel.

In the survey participation of journalists who is important so as to ensure the objectivity and show the result of the Survey. The collaborative work between consultants and journalists is adopted as the figure 1-2.

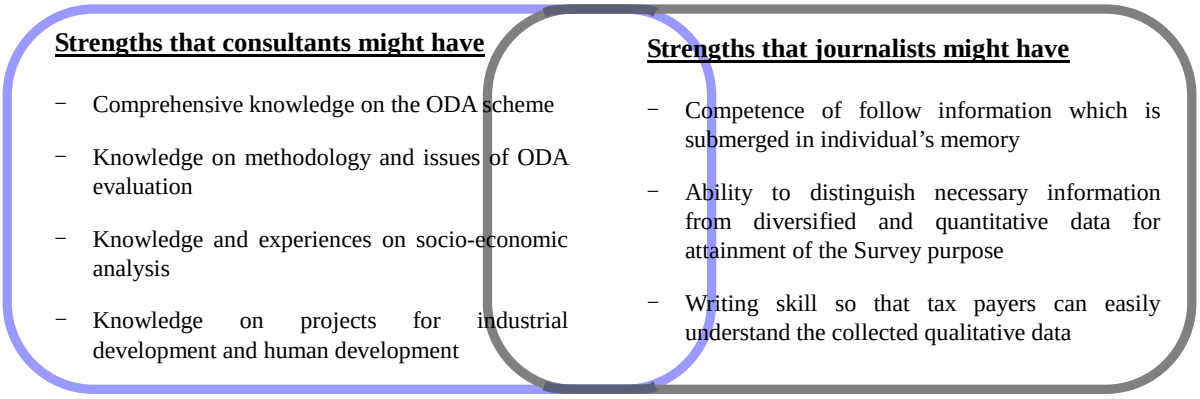


Figure 1-2 Fusion between different two types of expertise

(3) Learning of lessons for future evaluation

In view of the trial elements of the evaluation method to be used for the Survey, the effectiveness of the method itself will be examined in the course of the Survey with a view to learning lessons for the formulation of a new evaluation study method. As clearly indicated in the Work Instructions, the contents and method of the Survey are quite different from those of past evaluation studies. The process where a journalistic approach is incorporated in the Survey to search for "a story" is something of which the importance has been well recognized but believed to be difficult to adopt. Through the entire implementation process, the validity of the new study method itself will be constantly checked to learn lessons for similar studies in the coming years.

1.2 Hypothesis for the Survey

The Survey is required to be based on an approach which reflects such viewpoints as "human networking between the donor and recipient country", "residual social impacts in the recipient country", "changes of the attitudes of organizations and people" and "creation of an Asian concept of value through fusion with the Japanese concept of value" beyond the conventional evaluation

framework based on the five DAC criteria. The hypothesis described below is adopted to form the basis for clarification of what will become visible and what kind of situation will become the subject of study when these viewpoints are introduced.

What is dormant knowledge?

Southeast Asian countries, the subject countries of the Survey, used to be the main recipients of Japan's early ODA. It is reasonable to assume that the achievements of Japan's ODA have remained or been deposited in those people and various organizations involved in projects, still contributing to the development of these countries and their societies. There must be historical traces or "dormant Japanese knowledge" of Japan's "cooperation for human resources development".

Dormant knowledge is temporarily defined here as "something which has been transferred to a recipient country through Japan's ODA and which forms the base for the development of the recipient country as it still lives in the socioeconomic field". Such "something which has been transferred" through Japan's aid projects is likely to include the following.

- Concept of value (for example, concept of value regarding work, product making (monozukuri), business management and education)
- Standards and criteria (for example, industrial standards)
- Institutional framework/system (for example, standards certification system)
- Management know-how (for example, 5S, kaizen and R/D)
- Various technologies and skills (for example, craftsman's skill through oral education)
- Others

Some things have already been established as formal knowledge beyond persons or parties involved in subjective projects, while others presumably remain as implicit knowledge even though this knowledge is actually contributing to the socioeconomic development of a recipient country. The basic stance in this Study is that such implicit (dormant) knowledge does exist without question.

What is a story? What can be disclosed by following it?

A story means "a visible chain created by the following and clarification of the temporospatial impacts of Japan's ODA on the people and organizations concerned" Such story primarily develops using "people as media". Several patterns of story development are currently assumed as listed below.

(1) Case where something which has been transferred from Japan to one person still supports his/her family and contributes to society (community) through his/her activities
(2) Case where something which has been transferred from Japan to one person has been spread to other people and further to society (community), having a tangible social impact
(3) Case where something which has been transferred from Japan has become a tangible social value, resulting in the new start and successful development of businesses
(4) Case where something which has been transferred from Japan has been inherited over the generations and has somehow become localized to become a local brand

Under the Survey, the necessary information will be gathered for each of the three subject projects to produce "individual stories" while referring to the existing information and having possibly different patterns for these stories in mind.

Focusing on the interaction of external and internal factors in the ODA implementation process

It is reasonable to infer that important information for the analysis to be conducted under the Survey can be obtained by understanding the various events experienced by stakeholders in the project implementation process and the consequential interactions of external and internal factors affecting the scope of cooperation which resulted from such events in addition to analysis of the impacts of the project after its completion. The interaction of various factors in the implementation process can be vividly understood by means of following the way of thinking, human connections, actions and later state of key persons.

It is believed that confirmation can be made for three stories conveying the facts without distortion by means of comparing the project outcomes which are ascertained by two different approaches. One approach is the journalistic approach which follows an emerging story with people acting as media. The other is the Survey approach which reviews the background, purpose, contents and results of cooperation and macroscopically as well as qualitatively determines the general impacts (outcomes) of cooperation.

1.3 The structure of the final report

The structure of the final report is as follows.

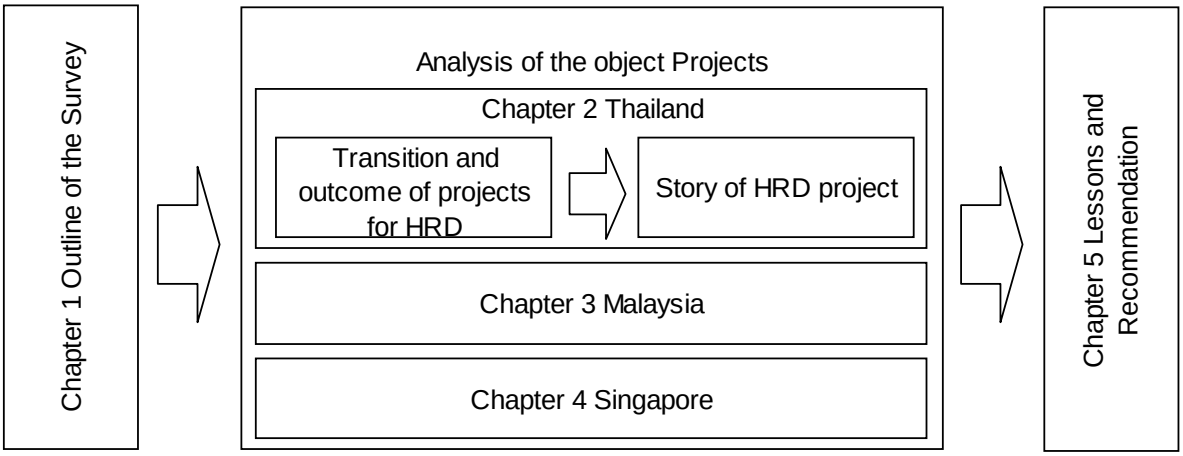


Figure1-3 The structure of the Survey

In Chapter 1 the outline of the Survey is presented including the purpose, policy and implementation structure. It then subsequently examine respective subject projects from two perspectives namely “Transition and outcomes of cooperation for human resource development” and “Story of human resource development” based on the basic approach which used in Chapter 2, Chapter 3 and Chapter 4 of this survey

The results, analysis, recommendation and conclusion of the survey are presented from Chapter 2 to Chapter 4.

1.4 Work Schedule

The work schedule for the Survey is shown below.

Table 1-2 Work schedule

Contents of works			Fiscal year 2009				
			2009			2010	
			Oct.	Nov.	Dec.	Jan.	Feb.
First domestic survey	[1-1]	Review of existing reports					
	[1-2]	Design and preparation of the Survey					
	[1-3]	Completion of Inception Report					
	[1-4]	Interview with resource persons in Japan (1)					
	[1-5]	Preparation of the First field survey					
First field survey	[2-1]	Conduct the First field survey (Thailand)					
		Conduct the First field survey (Malaysia)					
		Conduct the First field survey (Singapore)					
First domestic survey	[3-1]	Redesign and preparation of the Survey					
	[3-2]	Report progress of the survey to JICA					
	[3-3]	Interview with resource persons in Japan (2)					
	[3-4]	Preparation of the Second field survey					
Second field survey	[4-1]	Conduct the Second field survey (Thailand)					
		Conduct the Second field survey (Malaysia)					
		Conduct the Second field survey (Singapore)					
	[4-2]	Report to JICA rep. offices					
	[4-3]	Implement small scale seminar to the counterpart of the survey					
Third domestic survey	[5-1]	Writing Draft Final Report					
	[5-2]	Submission of Draft Final Report/ Organize Discussion Meeting with JICA					
	[5-3]	Completion of Final Report					
		Submission deadline of reports	▲ IC/R				▲ DF/R ▲ F/R

1.5 Structure of the Survey

In this survey the Southeast Asia 1 and Pacific Department of JICA play a role of managing branch and consultants comprise the evaluation mission. The structure of the Survey is as follows.

＜JICA＞

Southeast Asia 1 and Pacific Department	Deputy Director	Takahiro Sasaki
	Director	Koji Oshikiri
	Assistant Director	Shuhei Mano

＜Consultant＞

International Development Center of Japan	Team leader/ Aid policy, evaluation method	Yukihiro Terada
International Development Center of Japan	Team leader/ Socio-economic analysis (3 countries)	Toshihiro Nishino
International Development Journal Co., Ltd.	Deputy team leader/ Strategy of Human resource development (3 countries)	Mitsuya Araki
International Development Journal Co., Ltd.	Productivity improvement	Mitsue Tamagake
International Development Center of Japan	Development of industrial human resources 1	Hisaaki Mitsui
MTA Japan co., Ltd.	Development of industrial human resources 2	Tomoyuki Numachi
International Development Center of Japan	Higher education in engineering	Atsushi Tsukui
International Development Center of Japan	Higher education in engineering	Kerati Kijimanawat
International Development Journal Co., Ltd.	Project coordination	Hiromichi Toki
MTA Japan co., Ltd.	Project coordination	Yumi Shindo
International Development Journal Co., Ltd.	Project coordination	Tsuneo Sugishita

Mr. Tsuneo Sugishita participated in the Survey as an advisor and described a part of the final report.

Assignment of writer of the final report is as follows.

Assignment of writer of the final report

Chapter 1 Outline of the Survey (Nishino)

Chapter 2 Thailand

2.1 Summary of Technical Assistance for Human Resources Development and it's Achievements (Tsukui, Kerati)

2.2 Story of Human Resources Development (Araki)

Chapter 3 Malaysia

3.1 Summary of Technical Assistance for Human Resources Development and it's Achievements (Mitsui, Numachi)

3.2 Story of Human Resources Development (Sugishita)

Chapter 4 Singapore

4.1 Summary of Technical Assistance for Human Resources Development and it's Achievements (Nishino)

4.2 Story of Human Resources Development (Tamagake)

Chapter 5 Recommendations Derived from Cross-sectional Analysis (Araki, Terada)

Chapter 2

Thailand

Chapter 2 Thailand

2.1 Summary of Technical Assistance for Human Resources Development and it's Achievements

2.1.1 Transitions in Industrialization Policy in Thailand

Industrialization of the Thai economy can be divided into the following four eras or stages dating back to the 1960s, when the country embarked on industrial promotion in earnest.

① Era of import substitution industrialization (1960s)
② Era of preparation for export-oriented industrialization (1970s to 1985 (Plaza Accord))
③ Era of expansion of processing and assembly industries (1986 to the 1997 currency crisis)
④ Era of industrial sophistication (currency crisis to 2010)

This section summarizes the transitions in industrialization policy in Thailand according to each of the above eras.

(1) Era of import substitution industrialization (1960s)

Industrial promotion in Thailand began in earnest with the policy of import substitution industrialization by the Sarit administration starting in 1957. Until then Thailand had relied on primary industrial products such as rice and natural resources, however, the new policy marked a shift towards the vigorous attraction of foreign capital and industrialization based on the initiative of private sector enterprises. Thailand's first five-year national economic and social development plan was also compiled in this year, marking the full-scale start of private enterprise promotion and industrial infrastructure development. This national economic and social development plan, which shapes the economic policy of Thailand, has been consecutively formulated up to the 10th plan currently in progress.

The 1960s, a period in which development measures were implemented in earnest under the Sarit administration, also coincided with the Development Decade campaign of the United Nations. Prior to this in 1959, the World Bank had offered suggestions on reform of the Thai economy. In Southeast Asia, since communism had spread to Vietnam and Laos around this time, American assistance was directed towards Thailand amidst fears that communism would spread to other countries in the region. The policy of openness adopted by the Sarit administration was advanced in harmony with assistance by the United Nations and the United States. Thai dams were constructed under loans from the World Bank, while the installation of additional telephone exchanges and modernization of the national rail network were funded under overseas assistance programs.

In the 1960s, 60% of the die industry in Thailand was devoted to production for the food processing and tobacco industries. Under the policy of import substitution industrialization,

which aimed to replace imported consumer goods with domestic products, the basic production setup for textiles and simple household electrical appliances, etc. was established by the latter part of the decade.

(2) Era of preparation for export-oriented industrialization (1970s to 1985 (Plaza Accord))

With the onset of the 1970s, under the third national economic and social development plan (1972-1976), the government formulated the eastern coastal development program aiming to make this area into a center of export-oriented industries following the discovery of natural gas reserves in the area. Under the fifth national economic and social development plan (1982-1986), a lot of expectations were placed on the development of this region.

Figure 2-1 shows major Thai exports by sector from the 1960s to 1985. In the 1980s, there was an increase in the value of exports in the textile industry and agro-industries (processed foods), etc., whereas conversely the value of exports of traditional primary products such as rice and rubber and agricultural products such as feed tapioca and maize, which grew after the Second World War either declined or struggled to grow (although the scale of exports in these categories remained high). In 1985, the value of textile exports exceeded the value of rice exports for the first time, symbolizing the shift that had taken place in the industrial and export structure from agriculture to light industry in Thailand.

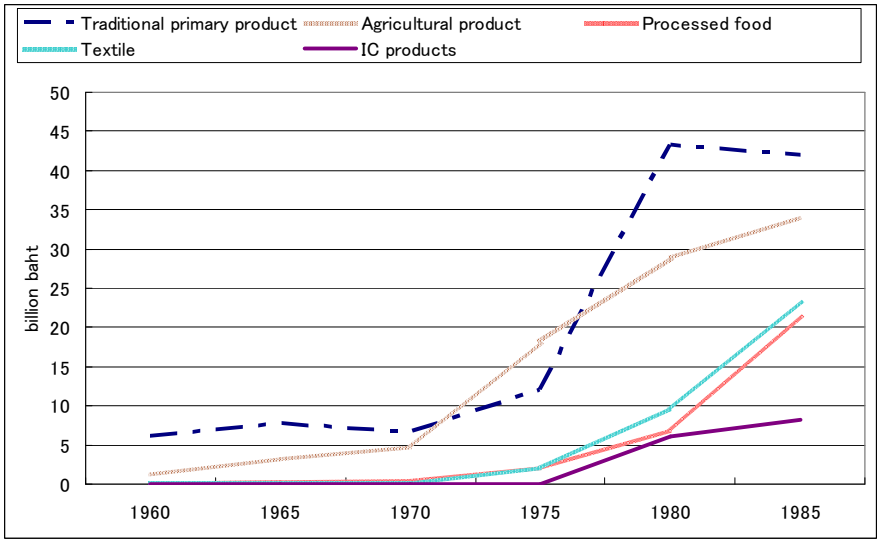


Figure2-1 Value of Exports by Sector
Source: "Industrialization in Thailand, Challenging NAIC"

Meanwhile, the electronics and electric industries and car industry, for which promotion was initiated around the same time as the textiles and agro-industries, displayed growth in export value from 1975, although the value and level of increase of exports were still low compared to light industrial products such as textiles, etc. For example, exports of IC started during the period 1975-1980, however, as of 1985, the full-scale export expansion stage had not been attained (as

compared to textiles and agro-industries), and activities were limited to the domestic production and sale of products as substitutes for imports on the domestic market.

(3) Era of expansion of processing and assembly industries (1986 to the 1997 currency crisis)

Policies under the fifth and sixth national economic and social development plans focused on measures to deal with recession brought about by falling international prices of primary goods. The Thai economy fell into a threefold crisis of trade deficit, fiscal deficit and accumulated debt around the middle of the 1980s, however, this situation was transformed following the Plaza Accord of 1985. Under this the currencies of East Asian advanced and semi-advanced countries such as Japan, Taiwan and South Korea were appreciated, leading to corporations to look overseas for investment opportunities. This triggered a rush of investment into Thailand and other Southeast Asian countries.

Figure 2-2 shows the level of overseas direct investment in Thailand according to the source (country or region) of investment between 1988 and 2005. Direct investment was mainly directed towards the heavy and chemical industrial sectors such as electric appliances and machines, etc., and the primary investor was Japan. Japan has consistently played a leading role in direct investment to Thailand, a trend that still continues today. This overseas direct investment led to a rush of factory establishment and rapid growth of production in the textiles, household electrical appliance and machine sectors in Thailand. The most noteworthy feature of this direct investment was the shift away from import substitution industrialization to the establishment of export production bases targeting the markets of advanced countries such as the United States, etc. As a result, the value of Thai exports, in particular industrial products, increased dramatically. During the 10 years from 1985 to 1995, the ratio of exports in the agriculture, forestry and fisheries sectors plummeted from 42 per cent to 16 per cent, whereas the ratio of industrial product exports increased from 34 per cent to 65 per cent (Figure 2-3).

The influx of direct investment from overseas and resulting growth in industrial production solidified the transformation of Thailand away from an agriculture-based economy to an industrial economy. As is shown in Figure 2-4, Thailand had maintained a solid GDP growth rate of around 5 per cent in the early 1980s, however, this suddenly started to grow from 1986 and reached around 10 per cent by the mid-1990s. Also, the structure of the working population was transformed around this time (see Figure 2-5). The manufacturing industry displayed major growth during the 1960s and 1970s, however, agricultural workers still accounted for the overwhelming majority until the 1980s. From the second half of the 1980s, the number of workers in the service and secondary industrial sectors increased.

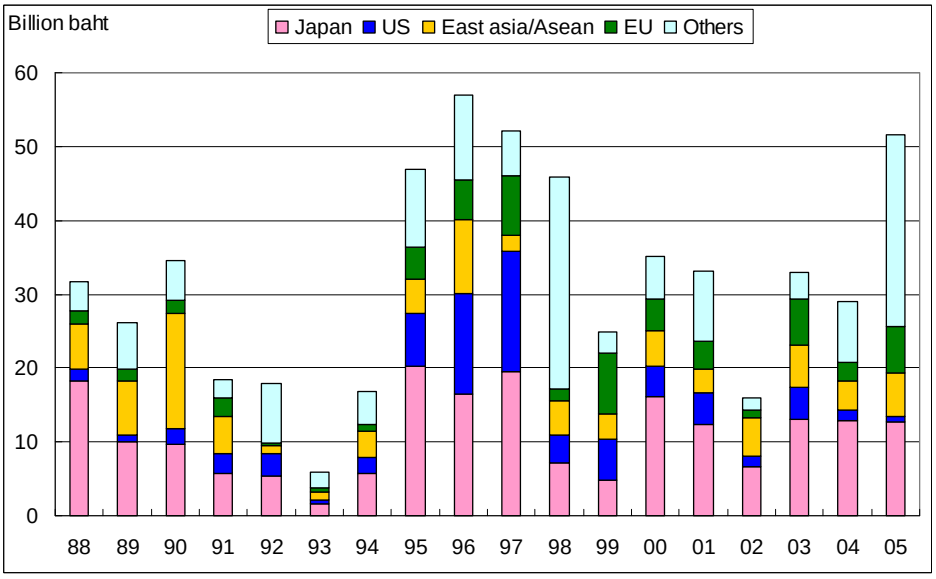


Figure2-2　Transitions in Oversea Direct Investment in Thailand (1988-2005, according to the country or region of investment origin)

Source: Thailand in Figures, amounts are contract values

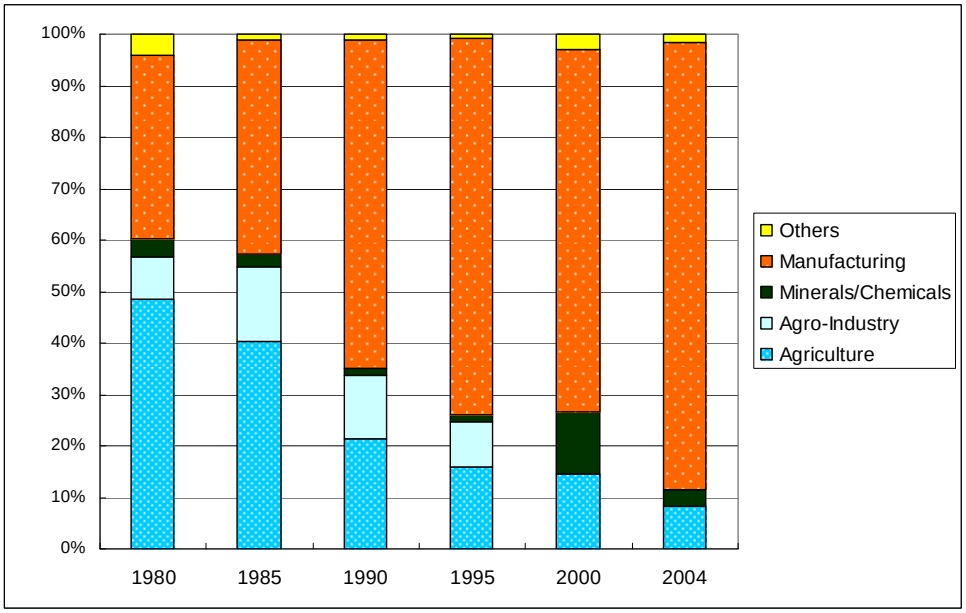


Figure2-3　Transitions in the Ratio of Export Value by Product Category

Source：Thailand in Figures

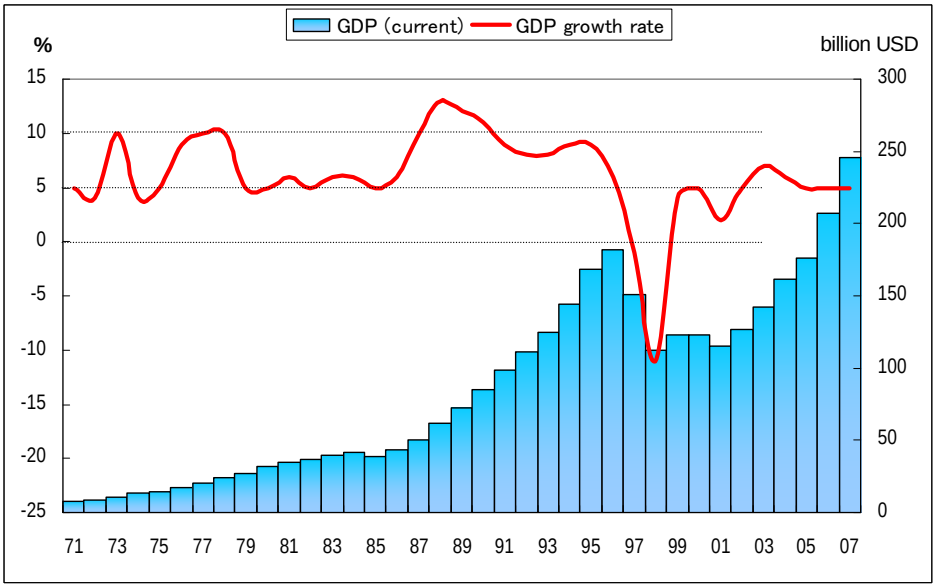


Figure2-4　Transitions in GDP and GDP Growth Rate in Thailand (1971-2007)
Source: IDE-JETRO portal site

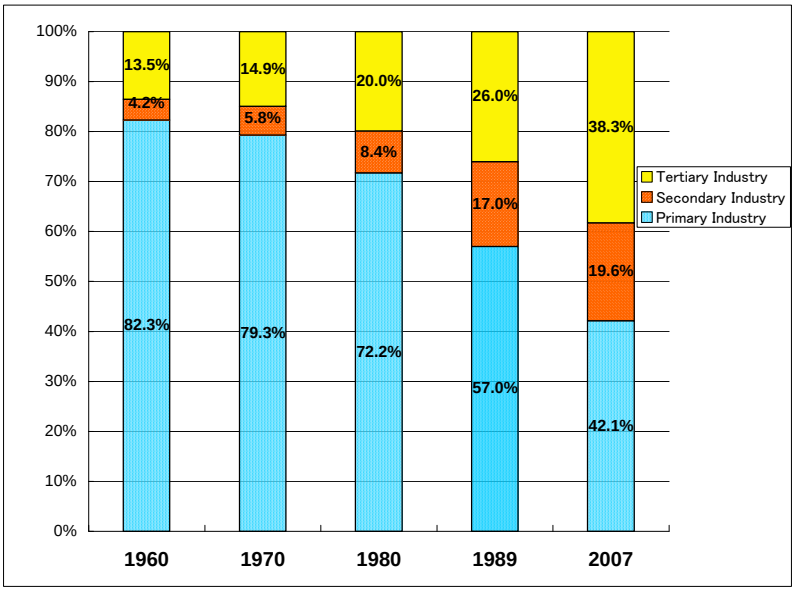


Figure 2-5 Transitions in the Ratio of Working Population by Industry in Thailand
Source：Thailand in Figures, “Industrialization in Thailand, Challenging NAIC”

(4) Era of industrial sophistication (currency crisis to 2010)

Following the Plaza Accord, Thailand promoted industrialization aided by rapid growth in direct investment from overseas and it started to establish its position as a production center in East Asian and ASEAN, however, the currency crisis of 1997 proved to be a major test. Following this crisis, the Thaksin administration exercised strong leadership in launching four state strategy committees in 2002 and reforming the industrial structure of Thailand via ‘mega projects’ in 2005. The National Competitiveness Committee – one of the said national strategy committees - aimed to bolster competiveness in the five designated industries of food processing, car assembly, fashion, tourism and software. Moreover, under the so-called ‘mega

projects,' massive investment was put into strengthening urban industrial infrastructure such as mass transit systems, etc.

Table 2-1 shows Thailand's top five export commodities in each decade. During the 1980s, clothing (textile industry) overtook rice, while in 2000 electronics overtook clothing. Auto-related exports first appeared around 1990 and have been transformed since then, becoming the third most important category in 2004.

Table 2-1 Top 5 Export Items (Unit: $ million)

	1960		1970		1980		1990		2000		2004	
1st	Natural rubber	122	Rice	121	Rice	953	Clothing	2,619	Electronic devices & parts	15,640	Electronic devices & parts	21,161
2nd	Rice	121	Natural rubber	107	Tapioca	727	Electronic parts	2,267	Machines & parts	9,351	Machines & parts	16,313
3rd	Maize	26	Maize	96	Natural rubber	636	Precious stones	1,368	Canned fish and meat	7,531	Cars and auto parts	6,099
4th	Tin	25	Tin	78	Tin	554	Rice	1,067	Fisheries foods	2,696	Natural rubber	5,633
5th	Teak	17	Tapioca	59	Maize	356	Canned fisheries products	1,001	Natural rubber	2,632	Plastic products	4,732
Total exports		407		710		6,505		23,256		61,780		99,499

Source：Prepared by the authors based on "Industrialization in Thailand, Challenging NAIC" and Thailand in Figures

In the 1990s and 2000s, Thailand's industrialization appeared to establish a solid foundation after securing stable exports and overcoming the Asian currency crisis, etc., however, under competitive pressure from the global economy, it was necessary to make further changes in the industrial structure. Specifically, in the manufacturing sector, it became necessary to switch from downstream processes such as product assembly, etc. to upstream processes such as research and development, i.e. it was necessary to switch more from export-oriented industry towards industrial sophistication.

The most important export sector in recent years has been the electric and electronics sector, however, a close look at the actual situation reveals a polarization in product lines. Hard discs, IC, air conditioners and air conditioner parts, etc. alone account for 51 per cent of all electronics exports [1], indicating that only limited products are endowed with international competitiveness. It has become difficult for labor-intensive low added-value products to compete with products from China, where labor costs are even lower. Moreover, because many manufacturing processes are limited to mid-stream processes (manufacturing of integrated circuits and printed circuit

[1] 2009 report of JETRO Bangkok office

boards) and downstream processes (assembly of final products), it is not easy to enhance the added value of products. The major issue facing Thailand is to domestically conduct upstream processes such as system design, parts design, parts production, wafer manufacture and die molding, etc. in order to realize the higher added value of products.

Another important point concerns the promotion of industries expected to display growth from now on. The government declared 1995 to be national IT year, and the National Information Technology Committee proposed the IT2010 Framework. Thailand intends to foster not only the hardware production sector but also research activities and to bolster the software development sector from now on.

2.1.2 Development of Engineering Human Resources and University Trends in Thailand

The following paragraphs describe development of engineering human resources and trends of universities in Thailand based on transitions in the industry and economy of the country from the 1960s onwards.

（1）Establishment of enginering universities in the 1960s and 1970s

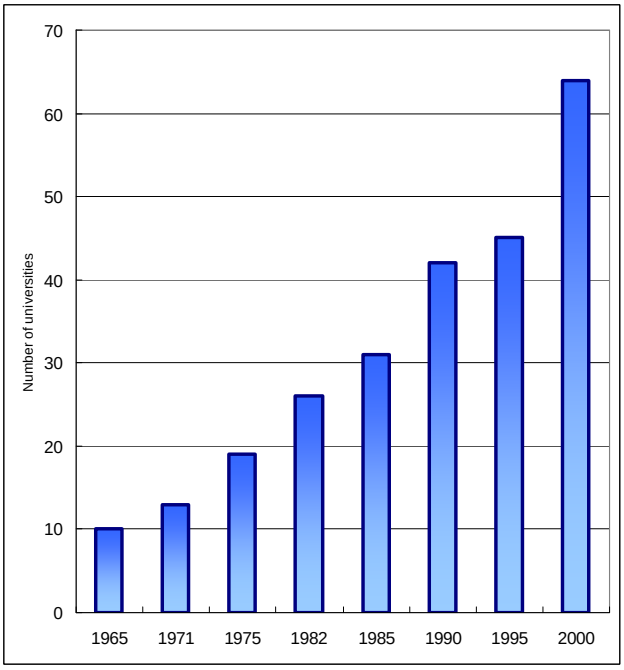


Figure2-6 Number of Universities in Thailand

Source：Thailand in Figures and Thailand National Statistical Year Book

The development policies of the Sarit administration during the 1960s were not intended simply to promote industrialization, but they also included measures for regional development and the development of education, agriculture and transport infrastructures, etc. Within these policies, a lot of interest was directed towards the development of education. Government expenditure on education was equal to that on national defense and economic development and efforts were made to enhance elementary education and extend higher education to the regions.

Prior to the Sarit administration, the only technical higher education agencies in Thailand were the Faculty of Engineering of Chulalongkorn University (established in 1913) and Kasetsart University Faculty of Irrigation Engineering (established in 1954). The government promoted the establishment of new universities in central and rural areas from 1964, however, there were still just 10 or so national universities in 1965 when Nonthaburi Telecommunication Training Center was founded.

Moreover, Thailand had no institute of higher education for directly nurturing human resources in the telecommunications field addressed in this Study. In this field, there were only small numbers of lower level site engineers in state enterprises such as the Telephone Organization of Thailand (TOT), etc. The number of phone lines was extremely small and the sector was almost totally undeveloped.

Under the third national economic and social development plan starting in 1972, emphasis was placed on the development of science and technology and the development of engineering human resources. The following recommendations were presented in the plan: 1) establishment of three new national universities (Khon Kaen, Chiangmai and Srinakarinwirot Universities) possessing departments in engineering, science and pharmacology, etc., 2) official approval of King Mongkut's Institute of Technology as an engineering university, 3) nurturing of university educators who possess degrees, and 4) major boosting of senior education budgets. Particularly concerning item 4), budget was vigorously directed to higher education for the first time, showing just how determined the government was to develop this field.

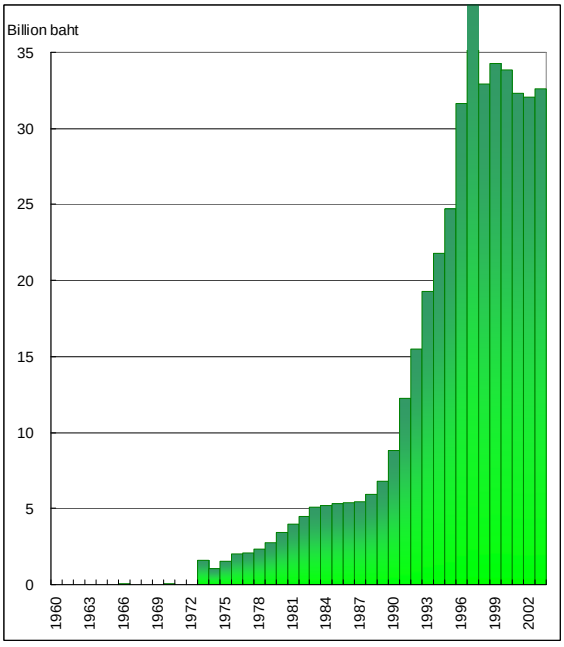


Figure2-7 Higher Education Budget in Thailand

Source：Comprehensive Analysis of Long-term Technical Assistance in Area of Technical Education and Vocational Training on Thailand

Looking at the situation regarding establishment of engineering universities, the first such university to be established in Thailand was Faculty of Engineering of Chulalongkorn University (1913), and this was followed by Kasetsart University Faculty of Irrigation Engineering (1954), Khon Kaen University Faculty of Engineering (1964), Songkla University Faculty of Engineering (1967) and Chiangmai University School of Engineering (1970). At the same time, the three technical schools of North Bangkok, Thonburi and Nonthaburi (the subject of this Study) on the outskirts of Bangkok were consolidated into King Mongkut's Institute of Technology while retaining separate buildings and fields of specialty.

(2) Industrialization Development and Sophistication of Industrial Human Resources Needs

In the fifth and sixth national economic and social development plans (1981-1986 and 1986-1991), the development of technical engineers (energy, petrochemicals, engineering and natural resource development) was raised as a priority item with a view to expanding industrial production. The higher education budget in Thailand displayed rapid growth with the onset of the 1990s; moreover, the Thai Government, viewing science and technology research as important for industrial growth, launched a science and technology promotion program in the sixth national economic and social development plan.

The rapid growth in industrial production from the 1980s onwards led to critical shortages in engineers and technicians. Banks and major enterprises in the metals and auto assembly sectors had little choice but to recruit people even though their results were not great. Newly formed enterprises had to pay large amounts to lure skilled laborers, technicians and engineers from existing corporations. New enterprises and corporations confronted with serious labor shortages secured industrial human resources under scholarship schemes, whereby human resources worked in corporations for certain periods in return for shouldering scholarship payments. Table 2-2 shows the list of corporations that paid scholarships at this time to students of King Mongkut's Institute of Technology (KMITL), which is the target of the Study.

Table2-2 List of Corporations Participating in the Japan Electric & Electronics Scholarship (JEC Scholarship)

- JETRO
- Kang Yong Watana co.,LTD
- NEC Corporation
- TOSHIBA Thailand co., LTD
- Thai YAZAKI Electric Wire co., LTD
- YAMAHA Sports (Thailand) co., LTD
- Nippon Telegraph & Telephone Corporation (NTT)
- Fujitsu Limited
- HITACHI Sales (Thailand) LTD
- SANYO (Thailand) Co., LTD
- Siew National Sales & Service co., LTD
- Kokusai Denshin Denwa co., LTD (KDD)
- SHARP Appliances (Thailand) LTD
- NISSIN Electric (Thailand) co., LTD
- Fujikura (Thailand) LTD.

Source: "A case of international cooperation – 30 Years of King Mongkut's Institute of Technology Ladkrabang"

In addition to the scholarships provided by Japanese corporations to electric and electronics students, construction corporations provided construction scholarships. JETRO acted as the liaison window for these schemes. Also, numerous corporations conducted technical education at KMITL. Because the scholarships offered by Japanese corporations carried no obligation to work at such corporations following graduation, there was a rush of Thai students to receive them. Since this was still a time when there was a lot of anti-Japanese feeling in Thailand, these contributions by Japanese corporations were highly significant and were frequently covered in the Thai press.

In addition to the growing needs for engineering human resources, there was a serious shortage of practical production labor skills among engineers working in the manufacturing sector. It was found that university research proved useless on production lines in new sectors, and it was also pointed out that outdated equipment at research agencies was insufficient to guarantee the practical ability of students. Furthermore, there emerged needs for human resources endowed with a “manufacturing mind” geared to conducting repeated trial and error while learning to work with instruments on processing and assembly lines far removed from the traditional agricultural and agro-industrial sectors.

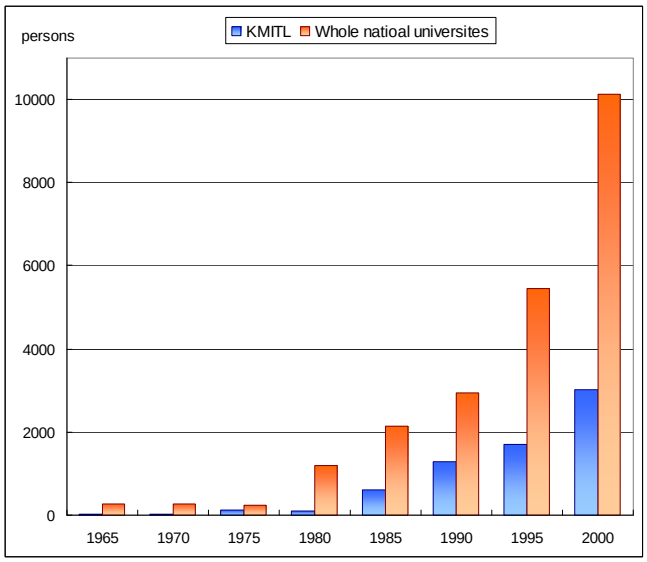


Figure 2-8 Number of Engineering Students (Engineers)
Source：Thailand National Statistical Year Book, Thailand in Figure

Figure 2-8 shows transitions in the number of graduates from engineering departments at all Thailand’s national universities as well as the number of graduates from KMITL. It can be seen that the number of engineering graduates increased rapidly in line with the economic boom from the 1980s. The number of KMITL graduates also displays a high ratio with respect to the overall number of engineering graduates, hinting at the significant contribution made by KMITL during this time.

Manufacturing corporations were also enthusiastic about training and educating engineering employees after recruitment. An interesting trend was that overseas training (education) opportunities were offered to engineering graduate employees after they had received training in production planning and production processes and been evaluated for future potential while gaining practical work experience for three years or so. Conversely, such opportunities for overseas learning were not provided to employees who had graduated social studies courses. It was intended to secure more human resources through showing other employees and prospective recruits that employees from engineering backgrounds received opportunities for overseas learning and promotion. This shows just how much engineering human resources were cherished at this time. As a result of these activities, university graduates, in particular graduates of engineering courses, came to dominate many important managerial positions in companies.

Just as there was a critical shortage of engineering students, there was a similar shortage of teachers for engineering universities. As the aforementioned demand for human resources forced wage levels up, many university teachers were head-hunted by private sector corporations.

(3) Need for Sophistication of Thai Industry and the Engineering Human Resources in Demand

The engineering human resources who are required in the present age can be divided into the following three types:

1) Human resources in the still key industries of processing and assembly manufacturing who possess excellent craftsman skills and can lead production activities;
2) Human resources who can respond to industrial sophistication, i.e. elite human resources who can perform research and development of products, and human resources who can perform industry control and production control as top managers in the manufacturing sector; and
3) Human resources who possess numerous job skills for undertaking the localization of corporate activities as frequently seen in multinational corporations.

A problem developed with these highly skilled engineers in that due to the rapid establishment of a spate of universities and increase in the university advancement rate and number of engineering course graduates, these human resources tended to drift towards clerical and management positions commanding high salaries. According to the president of the Federation of Thai Industries (FTI), if the demand for labor in the auto industry is assumed to be 100, the demand in the industrial sector is 20 for clerical and management positions and 80 for engineering positions, whereas the preferences of workers (graduates) are 40 and 60 respectively, and this imbalance has led to a constant shortage of engineers in the labor force.

In the ninth national development plan (2002-2006), the government announced that the Science and Technology Agency would take responsibility for human resources development in the research field in order to address the sophistication of industry. In the manufacturing sector, there is growing demand for human resources who can conduct research and development in upstream manufacturing processes as well as in new industries such as environmental sectors and

so on. Moreover, concerning management skills, there are needs for human resources who possess the ability to address not only management of assembly processes but also production planning and retail planning.

Amidst the trend of localization whereby multinational corporations strive to entrust corporate activities to local human resources as much as possible, since it is possible that human resources with an engineering background will be assigned to various jobs, the ability of human resources to be flexible and respond to various situations has also become an indispensible element.

2.1.3 Outline of Japanese Cooperation in Engineering Higher Education in Thailand

(1) Trends of Japanese Assistance to Thailand

1) General Trends

For Thailand, Japan is the greatest provider of assistance; indeed Japan has either been top or among the leaders in terms of the ratio of ODA provided to DAC countries. Grant aid showed a major increase from the late 1980s to the 1990s, although it was ended in principle except for grant aid to certain limited fields in 1993. In 1994, the Japan-Thailand Partnership Program (JTPP) was concluded, by which a framework for third country training to be implemented under Thai and Japanese cooperation was established.

In the years following the economic crisis of 1997, the Government of Japan implemented comprehensive support while utilizing various assistance techniques in an effort to guide the Thai economy towards recovery. For example, away from the international support package led by the IMF, it announced the New Miyazawa Initiative under which it provided sector and program loans to the social sector and agriculture sector. Also, in 1999, it made recommendations concerning SME promotion measures and promotion of supporting industries, etc. to the Thai Government.

Looking at trends following establishment of the Thaksin administration in 2001, there was an increase in wide area projects, system building support and policy advisor dispatches in the field of technical cooperation, while in 2003 JTPP2 was concluded in order to further strengthen third country support by Thailand. Moreover, JICA established its Asia regional support office in Thailand in 2004 in order to strengthen support for other JICA offices in the region and promote regional cooperation programs. In the field of yen loans, the number of new yen loans decreased under the Thaksin government’s policy to limit external borrowing. Under a survey by the former JBIC, intellectual support entailing the introduction and utilization of Japanese know-how in the environmental field, etc. was bolstered, however, following a policy shift in the Thai Government, now that Thailand is on the verge of becoming a semi-advanced nation, loan support is being selectively directed towards the four fields of human resources development, correction of differentials, environment and disaster prevention according to Japanese policy.

2) Engineering Human Resources Development Technical Cooperation Projects

So far JIC has implemented 26 human resources development projects including the subject of this Study (see Figure 2-9). It can be seen that there were few such undertakings during the 1960s and 1970s, however, the number of human resources development technical cooperation projects started increasing from around the middle of the 1980s. As was described earlier, amidst the industrialization of the Thai economy starting from the second part of the 1980s, human resources cooperation was vigorously promoted as a priority theme in order to nurture human resources that were indispensible for industrial development and promotion.

The Ministry of International Trade and Industry conducted technical training projects from 1959. From 2000 onwards, the Asian Human Resources Fund Initiative was implemented with the aims of implementing technical cooperation projects in the auto industry, overseas training in Japan and employment assistance activities in Japanese affiliated corporations.

Furthermore, in addition to King Mongkut's Institute of Technology Ladkrabang (KMITL, the target of the Study), there are two other engineering universities in Thailand that have strong ties with Japan. They are the Asian Institute of Technology (established in 1959) and the Thai-Nichi Institute of Technology (established 2007). Japanese affiliated corporations in Thailand have strongly supported these two universities through scholarship schemes and so on. The Japanese Government has also provided assistance to these two institutions, supplying JICA experts (appointed as teachers) and equipment provision support, etc. to the Asian Institute of Technology from 1969 and conducting support via senior volunteers, etc. to Thai-Nichi Institute of Technology.

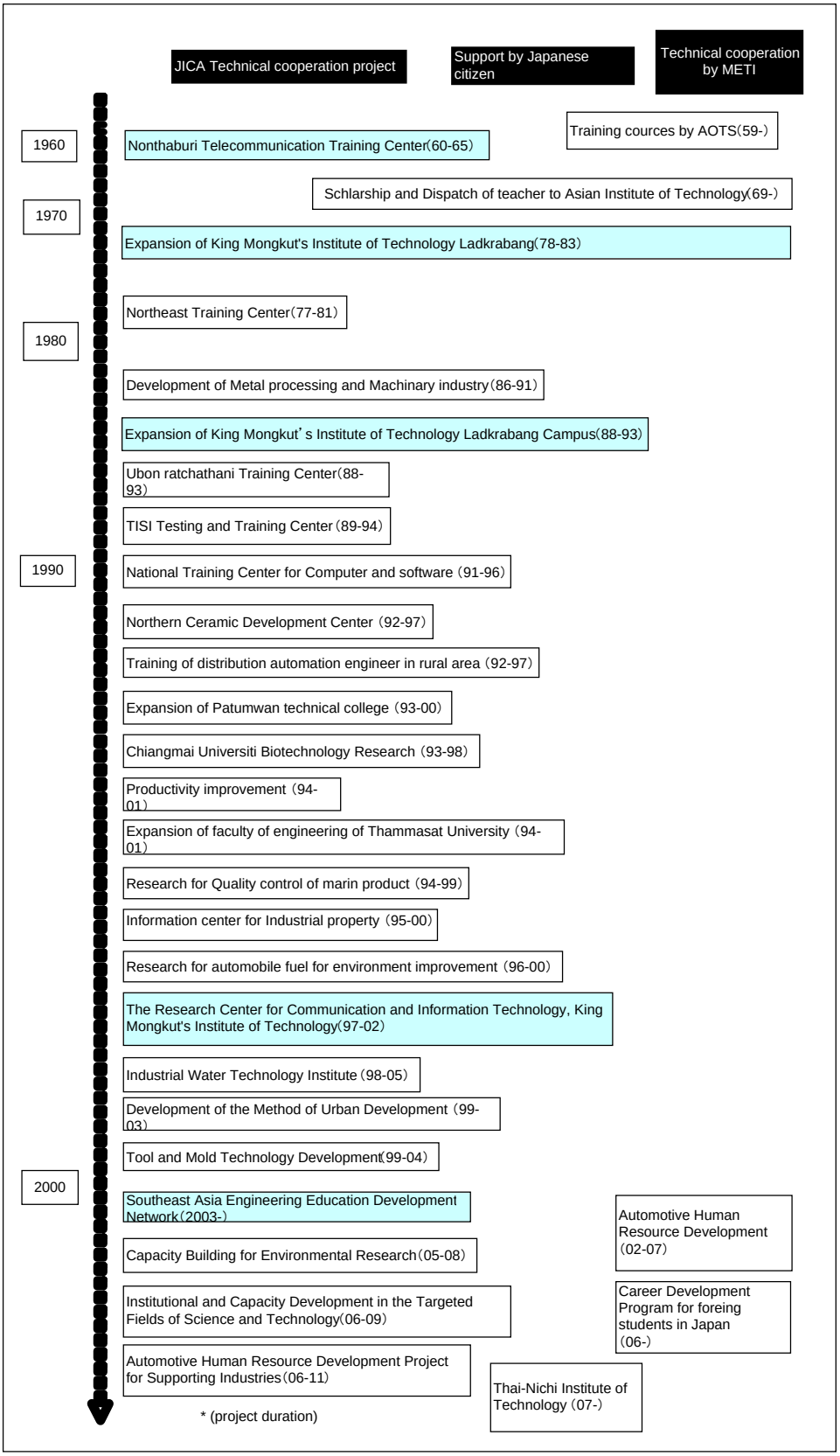


Figure 2-9 Japanese Technical Cooperation for Engineering Human Resources Development in Thailand

Source: Prepared by the Study Team based on the Ministry of Foreign Affairs portal site

(2) Outline of the Target Projects

1) Composition of Target Projects

So far four technical cooperation projects, three grant aid projects and two third country training projects have been implemented at various times with respect to KMITL. In terms of the ASEAN University Network/Southeast Asia Engineering Education Development Network (AUN/SEED-NET), the Phase 1 and Phase 2 projects have been implemented. KMITL projects have been implemented from 1960 to the present as support for technical higher education in Thailand. Whereas JICA technical cooperation projects usually end after 5-7 years, the fact that KMITL projects have been intermittently continued for 40 years is an interesting feature.

Table 2-3 shows the timing, value and contents of target projects.

Table2-3 Outline of Study Target Projects

Project Name	Scheme	Period	Invested Amount	Contents
KMITL projects				
Thailand Telecommunications Training Center (vocational training center and three-year college)	Technical project cooperation	1960-1965	111 million yen	Equipment supply Expert dispatch: More than 40 experts from Nippon Telegraph and Telephone Public Corporation (then), KDD and NHK, etc.
Telecommunications Training Center	Grant aid	1960-1961	68 million yen	
Construction of the telecommunications technology research building on Ladkrabang Campus	Grant aid	1974-1975	950 million yen	Construction of a lecture hall, library, gymnasium, memorial hall and the telecommunications technology research building
Third country group training (Thailand, telecommunications)	Third country group training	1977-1992	—	Acceptance of 271 trainees from 21 countries including Afghanistan, Bangladesh and Bhutan, etc.
The Expansion Project of King Mongkut's Institute of Technology Ladkrabang	Technical project cooperation	1978-1983	650 million yen	Equipment supply 5 long-term experts and numerous short-term experts from Nippon Telegraph and Telephone Public Corporation (then) and Tokai University, etc.
The Expansion Project of King Mongkut's Institute of Technology Ladkrabang	Grant aid	1984-1986	3.8 billion yen	Construction of a lecture and practical study building, administration building, information center, canteen and student dormitory
The Expansion Project of King Mongkut's Institute of Technology Ladkrabang	Technical project cooperation	1988-1993	935 million yen (including equipment supply and	Equipment supply Dispatch of 11 long-term experts and 95 short-term experts

			hand-held equipment)	
Third country training (senior telecommunications technology)	Third country training	1993-2002	—	Acceptance of 243 trainees from 21 countries including Mauritius, Malawi and Zambia, etc.
The Project on the Research Center for Communications and Information Technology of KMITL	Technical project cooperation	1997-2002	648 million yen (equipment supply)	Dispatch of 9 long-term experts, 119 short-term experts, acceptance of 40 trainees, equipment supply, etc.
Southeast Asia Engineering Education Development Network projects				
ASEAN University Network/ Southeast Asia Engineering Education Development Network Project (Phase 1)		2003-2007	2.273 billion yen	Dispatch of teachers from domestic supporting universities, provision of scholarships, provision of joint research funds, etc.
ASEAN University Network/ Southeast Asia Engineering Education Development Network Project (Phase 2)		2008-2013	2.17 billion yen	Ditto
			Total Approx. 9.4 billion yen	

The goals and superior objectives of the target projects are as indicated in Table 2-4. Starting from the training of intermediate and lower level engineers in the telecommunications field, the scope of projects has been steadily expanded to include a wide range of engineering fields and research activities in universities and graduate schools. Moreover, support has grown from activities in KMITL alone to construction of a human network for research and education with higher education agencies in neighboring countries.

Table2-4 Project Goals and Superior Objectives of Target Projects

Project	Project Goals or Corresponding Objectives	Superior Objectives
Thailand Telecommunications Training Center	Retraining and new nurturing of lower and intermediate level engineers	—
The Expansion Project of King Mongkut's Institute of Technology Ladkrabang	To enhance education and research activities in the three fields of data processing engineering, electronic engineering and semiconductor engineering at KMITL	—
The Expansion Project of King Mongkut's Institute of Technology Ladkrabang	To strengthen education and research activities in the four fields of telecommunications, broadcasting, data communications and machine engineering at the engineering department of KMITL	To contribute to growth of the sector in Thailand
The Project on the Research Center for Communications and Information Technology of KMITL	1) The research and development functions of the university will be strengthened with the establishment of the center. 2) The graduate program in the	To bring the research and development capacity and human resources development

	telecommunications technology field will be strengthened in the center and laboratory targeted by the cooperation.	capacity of King Mongkut's Institute of Technology Ladkrabang up to the international standard.
ASEAN University Network/ Southeast Asia Engineering Education Development Network Project	To improve the education and research capabilities of member universities via the active exchange of resources between members and cooperation with supporting universities in Japan	To enhance economic sustainability through engineering human resources development with a view to revitalizing the industrial sector in ASEAN countries

2) Outline and Transitions in KMITL Projects

KMITL was the first education and training agency to be built overseas under Japanese ODA. It started out as a vocational training center for the telecommunications sector, however, in line with the needs of the age, it developed into a three-year college, then a five-year university, and then it established master's and doctoral programs and an institute, eventually growing into a full-scale research and education agency for that field in Thailand.

Projects date back to 1960 when Japan's Ministry of Posts and Telecommunications and Thailand's Ministry of Education cooperated to establish the Nonthaburi Telecommunication Training Center. Receiving Japanese cooperation in the form of building construction, equipment supply and curriculum compilation, etc., the center trained lower and intermediate level engineers in the telecommunications field.

In 1961, when Prime Minister Ikeda visited Thailand, bilateral talks were held between Japan and Thailand with a view to upgrading the vocational training center to a three-year university. As a result, the center became the Nonthaburi Institute of Telecommunication in 1964.

Japanese cooperation up to this point had been conducted under the initiative of the Ministry of Posts and Telecommunications with participation from Japanese telecommunications agencies such as Nippon Telegraph and Telephone Public Corporation (then), KDD (then) and NHK, etc. The Overseas Technical Cooperation Agency (OTCA), which was the predecessor of JICA, was also involved. The experts dispatched from these agencies worked together with elite Thai engineers who had overseas learning experience to compile the curriculums for this new sector university.

In 1965, when the first graduates of the three-year course came forth from the institute, four were selected as scholars under the Colombo Plan supported by the Government of Japan. Under this program, they had the opportunity to obtain master's degrees at Tokai University in Japan on condition that they would become teachers at KMITL after graduating. The origins of the current relationship between KMITL and Tokai University can be traced back to this time. The Japanese Government had participated in the Colombo Plan and had a framework for receiving engineering students in place since 1954, however, no Japanese universities were willing to cooperate at that time. It only became possible to accept overseas students on scholarships after Tokai University offered support.

After that, plans were voiced to establish a full-fledged university for nurturing Bachelors of Engineering through adding a two-year advanced course to the existing three-year curriculum. In 1968, this plan was given impetus by Japanese experts (from Ministry of Posts and Telecommunications affiliated agencies) who cooperated with the preparation of curriculums, etc. The idea of a five-year course was unique since other universities offered four-year courses, however, this form was adopted out of the desire to emphasize high-level professional education rather than to further academic learning. In 1971, the Thai Diet gave approval for Nonthaburi Institute of Telecommunication to become King Mongkut's Institute of Technology（King Mongkut Institute of Technology: KMIT）for nurturing Bachelors of Engineering.

In 1972, three new departments, namely computers, control and electronic circuits, were established and cooperation was carried out by Japanese experts. As the two-year senior course was added and the number of students accepted by the university increased every year according to the government's policy, the university facilities became cramped. In response to this, plans to relocate the buildings of King Mongkut's Institute of Technology（KMIT）to Ladkrabang on the outskirts of Bangkok were included in the third national social and economic development five-year plan. Following this, talks were started between the governments of Japan and Thailand, and in 1974 it was decided to construct the new university buildings under grant aid. The buildings were constructed in Ladkrabang and the university assumed it current name of King Mongkut's Institute of Technology Ladkrabang (KMITL).

The Expansion Project of KMITL was initiated by JICA in 1978. Following establishment of the bachelor's course in 1976, the three fields of semiconductor engineering, data processing engineering and electronics engineering were added to the scope of cooperation to conform with the future plans of KMITL. This project included the nurturing of teachers under a newly established education course. In 1982, KMITL launched the nation's first doctoral degree in electrical engineering.

In 1986, KMITL was reestablished as an independent university under approval from the Government of Thailand, and in 1988 the Expansion Project of KMITL was launched by JICA with a view to supporting the further expansion and development of the university. The fields of cooperation at this time were telecommunications, broadcasting, data communications and machine engineering.

After KMITL had almost completed its development as an education institution, the Research Center for Communications and Information Technologies (ReCCIT) project was started by JICA in 1997 with the aim of enhancing research and education functions to graduate school level.

Table 2-5 shows the development history of KMITL from its establishment in the form of a matrix with respect to Thai industrialization policy and engineering human resources development. KMITL's predecessor, the training center, was established during the fetal stage of Thailand's industrialization, while the growth in KMITL activities and number of graduates coincided with Thailand's full-scale entry into the industrialized age,

Table2-5 Industrialization Issues, Engineering Human Resources Development Targets and KMITL Activities in Thailand in Each Age

Age	Industrialization policy and performance in Thailand	Engineering human resources development targets and performance	KMITL activities	
1960s Import substitution industrialization	Private sector-led economic development and industrial infrastructure development	Development of human capital	Transition from training center to university Nurturing of educators through overseas study at Tokai University	Establishment of the vocational training center under the initiative of the Japan Ministry of Posts and Telecommunications
1970s-1985 Export-oriented industrialization	Attraction of heavy and chemical industries Industrial products for export are mainly from agro-industries	Increase of higher education students	University development under President Gohson Nurturing of practically skilled engineers through introduction of state of the art equipment by JICA Practically oriented education based on the 5-year university system Nurturing of teachers oriented to public benefit through collaboration with Tokai University	Grant aid First phase Ladkrabang expansion
1986-currency crisis Expansion of processing and assembly industries	Shift from agriculture to manufacturing Towards utilization of private sector vitality	Full-scale start of engineering higher education Growing needs for practically skilled engineers	Increase in the number of graduates Emphasis of line principles such as master and pupil relationships and joint work from teachers to students	Second phase Ladkrabang expansion
After the currency crisis Era of industrial sophistication	National rebuilding under the Thaksin administration Strengthening of science and technology	Internationally competitive engineering human resources Nurturing of IT engineers based on National IT Year	Enhancement of research activities Support for Laos as an international research and education center	ReCCIT AUN/SEED-Net Project

Source: Prepared by the Study Team

3) Outline of the ASEAN University Network/Southeast Asia Engineering Education Development Network Project

The concept of the ASEAN University Network/Southeast Asia Engineering Education Development Network Project originated from the initiatives purported by Prime Minister Hashimoto at the 1997 ASEAN-Japan Summit and by Prime Minister Obuchi at the 1999 ASEAN Plus 3 Summit. Prime Minister Hashimoto called for the strengthening of higher education in the science, engineering and technology fields in order to develop human resources who can contribute to the development of industry in the Southeast Asian region, while Prime Minister Obuchi announced the Obuchi Plan cooperation framework laying emphasis on people, in particular the development of human resources with high levels of expertise in the ASEAN nations.

Utilizing the ASEAN University Network (AUN), in which representative universities of ASEAN implement and promote joint academic activities, this concept led to the creation of the ASEAN University Network/Southeast Asia Engineering Education Development Network (AUN/SEED-Net) with the addition of 11 supporting universities in Japan. Education vice-ministers from the ASEAN countries, representatives of the Japanese government, representatives of universities in the ASEAN countries taking part in this project, and JICA representatives, etc. signed the Cooperative Framework (C/F) document stipulating this unique cooperation framework in 2001. KMITL is also included among the member universities (see Table 2-6).

Table2-6 ASEAN University Network/Southeast Asia Engineering Education Development Network Participating Universities

Country	University
Brunei	Institut Teknologi Brunei, Universiti Brunei
Cambodia	Institute of Technology of Cambodia
Indonesia	Gadjah mada University, Institut Teknologi Bandung
Laos	National University of Laos
Malaysia	Universiti Sains Malaysia
Myanmar	University of Yangon, Yangon Technological University
Philippines	De La Salle University, University of the Philippines
Singapore	Nanyang Technological University, National University of Singapore
Thailand	Chulalongkorn University, Burapha University, KMITL
Vietnam	Hanoi University of Technology, Ho Chi Minh City University of Technology
Japanese supporting universities	Hokkaido University, Tokyo University, Tokyo Institute of Technology, National Graduate Institute for Policy Studies, Toyohasahi University of Technology, Kyoto University, Kyushu University, Keio Gijuku University, Waseda University, Shibaura Institute of Technology, Tokai University

The Project officially commenced in 2003 following a preparatory period of approximately two years, and Phase 1 was completed in 2007. Phase 2 is currently in progress. The Project comprises two core activities: one is the overseas study program targeting young teachers from member universities in the region (overseas study in master's or doctoral courses at member universities or in doctoral courses at supporting universities in Japan), and the other is joint research conducted in tandem with the overseas study program.

In the overseas study program, teachers of member universities acquire degrees under support from Japanese universities with the objective of building their capacity. The targeted teachers can choose from a number of options such as courses for obtaining degrees at ASEAN universities or courses for obtaining degrees at Japanese universities while living and studying in Japan. In the joint research program, the ASEAN universities and the Japanese supporting universities conduct joint research in nine basic engineering fields.

In order to nurture engineering high-level human resources, it is necessary to strengthen the capacity of universities which are the higher education institutions in this field, and for this reason it is essential to raise the capacity of teachers themselves. For young teachers who have not yet obtained academic titles (master's degrees and doctoral degrees), research capability is enhanced through conducting research activities in the prescribed courses, while research and teaching capacity is improved via research guidance among teachers at member universities who accept overseas students. This framework also allows for Japanese teachers to participate and offer guidance via joint research and acceptance of overseas students.

2.1.4 Outputs of Engineering Human Resources Technical Cooperation Projects

(1) Nurturing of Large Numbers of Engineers

KMITL grew smoothly following its establishment and developed into one of the best engineering universities in the country bv the 1990s. As is indicated in Figure 2-10, the number of graduates also increased in line with the development of the industrial sector in Thailand, showing that KMITL responded well to the growing needs for human resources in this field. Roughly 30% of engineering bachelors (engineers) in Thailand are graduates of KMITL and this shows just how much of a contribution this institute has made to the development of engineering human resources.

Figure 2-11 shows the distribution of top to bottom scores in entrance examinations (common examinations) for universities with engineering departments between 1975 and 1989. KMITL occupied a lower to intermediate level in 1975, however, by 1989 it had moved ahead of the mid-range group and was second only to Chulalongkorn University.

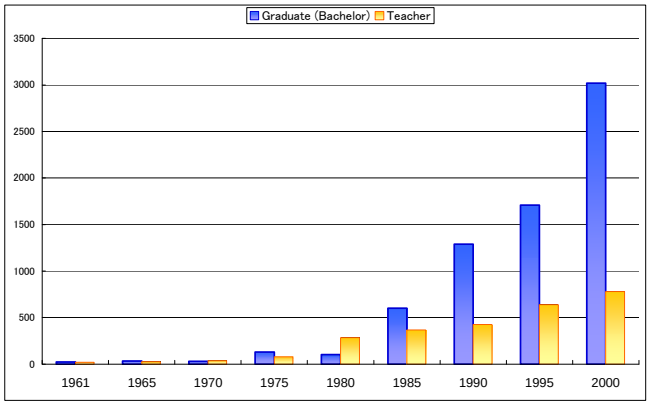


Figure2-10 KMITL Graduates and Teachers

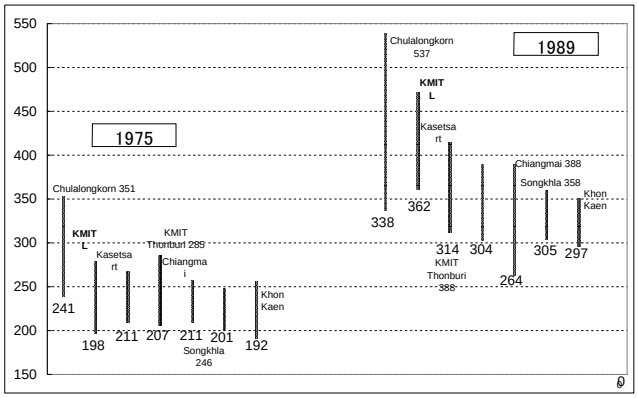


Figure 2-11Top and Bottom Scores in Engineering University Entrance Examinations

Source: "A case of international cooperation – 30 Years of King Mongkut's Institute of Technology Ladkrabang," Statistical Year Book of Thailand

(2) High Appraisal of Graduates in Thai Society – Case of a Panasonic Affiliated Corporation, etc. -

The Panasonic Thailand group is composed of 20 enterprises engaged not only in manufacturing but also in marketing and sales, insurance, customer service and R&D, etc. As of 2009, graduates of KMITL were distributed among various sectors and job types. Table 2-6 shows the results of four-rank assessment of graduates by company executives at 11 of the 20 companies. This shows an average score of 2.7, in other words 'Acceptable' leaning towards 'Good', indicating a generally favorable assessment.

Table 2-7 KMITL Graduates Employees in Thai Panasonic Group Corporations and Their Appraisal

Company Name	KMITL graduates	Appraisal (4-level appraisal: 4 = Excellent, 3 = Good, 2 = Acceptable, 1 = Unacceptable)
PEDTH (devices)	4	3
PMRT (motors)	5-10	3
PST (retailing and service)	7	3
PRDT (parts)	1	2
PAT (sales)	2	3
PECTH (batteries)	2	2
PICT (parts retailing)	1	3-4
PTHC (holding company)	2	3
PHAT (manufacturing, R&D)	2	2
PHRADT（R&D）	3	2
PEWTH (manufacturing)	5-10	3
TOTAL	34-44	Average 2.7

Source: Prepared by the Study Team

KMITL is highly regarded among other sections of Thai society apart from Panasonic. Specifically, the president of the Federation of Thai Industries says, “It is one of the top 10 universities in the country and is especially strong in the field of electrics,” while the president of the Thai-Nichi Institute of Technology says, “Telecommunications graduates perform very wewll. There are many graduates and some of them have been promoted to management class after entering companies.”

- “Graduates from Chulalongkorn University are very proud but that makes them difficult to handle after recruitment. In contrast, KMITL graduates learn practical line skills, so they make smooth progress in work.” (Japan marketing staff member of K Bank)

- “Graduates from Chulalongkorn University are suited to creative work geared to pioneering new areas. On the other hand, KMITL graduates are human resources who work for the workplace.”(Manager of the National Economic and Social Development Committee Investment Strategy Department)

KMITL originally started as a technical training center, and even when a two-year advanced course was added to the three-year institute course to make a five-year course, emphasis was placed on the achievement of high level vocational education rather than academic proficiency. KMITL has thus been able to produce the human resources that are required by corporations amidst the industrialization of Thailand, in other words practical human resources necessary for the industries (electrics and electronics and mechanical devices) that have been introduced to East Asian countries.

(3) Nurturing of Teachers for Educating Engineering Human Resources

Responding to the growing needs for engineering human resources, as was mentioned earlier corporations put greater efforts into recruiting teachers, however, the number of teachers who gave up their jobs at KMITL was relatively few in spite of the lower salary levels. In particular, many of the teachers who acquired doctoral degrees from overseas study in Japan have led fulfilling teacher lifestyles at KMITL. The following reasons can be pointed to here: ① the teachers wish to focus on research activities through exchange, etc. with their Japanese counterparts, and ② they gain a sense of purpose in nurturing students.

The positive cycle and environment, whereby excellent graduates of KMITL (who formerly studied in Japan) become KMITL teachers and work hard on research and education, has been built up through many years of KMITL cooperation. This would seem to point to the realization of the policy purported by Mr. Prakit, the former president of KMITL who also obtained a doctorate at Tokai University in Japan. Mr Prakit called for the realization of “not only an increase in overseas students but rather the nurturing of engineering human resources and development of teachers who can serve the public good via KMITL and the ASEAN University Network/Southeast Asia Engineering Education Development Network.”

(4) KMITL as an International Research Center and ASEAN University Network/Southeast Asia Engineering Education Development Network

KMITL further strengthened its research and education functions from the second half of the 1990s with a view to producing human resources able to support Thailand's second generation of industrial sophistication. The undertaking implemented towards this end was the KMITL Research Center for Communications and Information Technologies (ReCCIT) project by JICA. Having the production of doctorate degree holders as one of its indicators, this project strived to improve research capacity on the graduate school level and establish a system for nurturing high level human resources with emphasis on participation in international conferences and presentation of international academic dissertations.

Similar, the ASEAN University Network/Southeast Asia Engineering Education Development Network Project, implemented since 2003, has generated results in the area of human resources technical cooperation. Under this, 17 young Thai university teachers have studied abroad at counterpart universities in other countries in master's courses, while another seven have studied abroad in doctoral courses. Looking at the total number of teachers from ASEAN countries who have participated in the project, 311 and 134 have studied abroad in master's courses and doctoral courses respectively. Meanwhile, joint research is vigorously conducted between member universities in the region and supporting universities in Japan, and research costing US$2.14 million in total has been conducted over five years under 222 titles.

Now that KMITL has achieved top level status in the engineering field in Thailand, it is turning its attention to technical cooperation for engineering human resources development in Laos in cooperation with JICA. From 1999, minutes were signed between JICA, KMITL and the National University of Laos Engineering Department, and KMITL supported a program to award degrees to 12 young teachers possessing master's degrees from Laos National University. Under the JICA project for Strengthening of IT Human Resources Development Functions at National University of Laos Engineering Department, KMITL offered support and cooperation to the National University of Laos from 2003 to 2006. In this project, bachelor's courses at the National University of Laos were enhanced and strengthened and Laotian engineers, researchers and teachers in the IT field were nurtured. KMITL and the National University of Laos also participate in the ASEAN University Network/Southeast Asia Engineering Education Development Network and maintain relations through academic exchange and support for overseas students, etc.

2.2 Story of Human Resources Development

2.2.1 Historic Good Fortune

On August 24, 1960, an agreement was concluded between the governments of Japan and Thailand concerning establishment of a Telecommunications Training Center. Nobody at the time could have imagined that 10 years later this small training center would develop into one of Thailand's foremost engineering universities in the shape of King Mongkut's Institute of Technology.

In reality, this involved some historical good fortune. If it hadn't been for some chance good luck, King Mongkut's Institute of Technology Ladkrabang (KMITL) would never have been established and the originally intended telecommunications training center would have continued operating quietly within the Telephone Organization of Thailand (TOT). This is where the story begins.

Let's travel back in time to around 1960 to witness this historical piece of good luck and the start of our story.

(1) Historical Considerations in Japan around 1960

The Kishi administration which started in February 1957 is known as the first administration to vigorously promote Asian diplomacy in the post-war period. According to the Diplomatic Bluebook (September 1957), this was hammered out under the following "Three Principles of Diplomacy" (September 1957): 1) Centrality of the United Nations, 2) Cooperation with the Free World, 3) Strengthening Japan's position as a member of Asia

On visiting six Asian countries in May 1957 and nine countries in November that year, Prime Minister Kishi learned that the countries of Asia lacked development funds for national development, and on returning to Japan he started to examine the concept of the Southeast-Asian Development Fund. Following a period of trial and error, the Overseas Economic Cooperation Fund (OECF) was created to offer long-term low-interest development loans in 1961. This marked the start of loan aid (yen loans) for economic cooperation (ODA).

Since yen loan aid at this time was tied in the same way as reparation aid (conditional on the purchase of Japanese products), it was incorporated into the export promotion policy (national policy) of Japan.

Incidentally, technical cooperation (acceptance of trainees and dispatch of experts) linked to Colombo Plan (1) led to the establishment of the Overseas Technical Cooperation Agency (OTCA), formed through the combination of the Asia Association, which had implemented

[1] The Colombo Plan was the main organization for economic development planning in Southeast Asian countries in the postwar period. This organization was born out of a proposal by Australia at the Commonwealth Conference of Foreign Ministers held in Colombo in January 1950. At the London conference held in September that year, the Colombo Plan for the Joint Economic Development of South and Southeast Asia was adopted Japanese participated from 1954. This participation constituted a significant contribution to the international community as Japan geared up to join the United Nations two years later.

cooperation until then, and the Latin America Association. Accordingly, prior to 1960, for example when the Telecommunications Training Center was constructed, the Asia Association assumed responsibility for binding contracts with contractors. Therefore, this was the period which marked the start of technical cooperation in earnest.

The Ikeda administration, which was famous for the 'Double income plan,' came to power in 1960 when the Telecommunications Training Center agreement was signed. Western nations coined the phrase "Transistor radio diplomacy" (using diplomacy to promote sales of transistor radios) to describe Ikeda's diplomatic style. The Ikeda administration placed emphasis on trade promotion and economic cooperation. The 'Double income plan' was based on the following policies: 1) Enhance infrastructure areas such as roads, ports and water supply, 2) Realize a more sophisticated industrial structure shifting from primary industry to secondary industry, 3) Promote trade and international economic cooperation, 4) Enhance human capacity and promote science and technology in readiness for the sophistication of industry, and 5) Enhance social welfare, establish social stability and alleviate the dual structure.

This was an age when the respective circles of government, administration, academia and finance got behind such state policies. Seen from today's perspective, the leadership of the Prime Minister was a major factor in national development. While visiting the Thailand Telecommunications Training Center on his tour of Southeast Asian countries in 1961, Ikeda remarked to the executive of Nippon Telegraph and Telephone Public Corporation (later to become NTT) who was his guide, "If Thai engineers are trained in such a facility, how many Japanese communications devices can we export in future?"From these words can be gathered the Prime Minister's firm belief that Japan's future development couldn't be achieved without export promotion, even if it did earn him the reputation as a "transistor radio salesman." This also gives proof that economic cooperation was incorporated into export promotion policy as a state measure whether people liked it or not.

The post-war Southeast Asian market was still dominated by the technology and brand influence of former suzerains Great Britain and France, etc., and Japan fought desperately to counter this by disseminating its own products and technologies under the mantle of reparation assistance.

Southeast Asia was the primary battleground for advanced nations seeking to expand export markets. In the decade from 1957 to 1967, Japan's trade with Asia increased threefold from US$868 million to US$2.63 billion.

(2) Start of the Project

Around this time, technical advancement into Southeast Asia and the advance of corporations in the telecommunications field were important issues from the national perspective. The prime movers in challenging these issues were, on the ground, Nippon Telegraph and Telephone Public Corporation (hereafter referred to as NTT), and in terms of policy, the Ministry of Posts and

Telecommunications (the present day Ministry of Internal Affairs and Communications).

The International Development Journal issued on October 5, 1968 carried an interview by Mr. Tsuyoshi Kajii (uncle of former Foreign Minister Saburo Okita), who had demonstrated outstanding capability in the Japanese telecommunications field in his position as the first president of NTT after WWII. According to this, Japan was shocked to find that its telecommunications technology after the war lagged far behind that of other countries. The first thing NTT did was to establish a telecommunications research institute within the corporation in order to promote the restoration of telecommunications technology. Since the corporation adopted an independent accounting system, it was able to direct profits towards technical development. As a result of painstaking research, Japanese telecommunications technology was able to overtake that of the United States and compare with that of Germany by 1968.

Around this time, opportunities for advancement into Southeast Asia, the Near East and Latin America in the telecommunications field emerged on the national level. However, Japan had no such experience at that time. Telecommunications makers had been so busy developing new technologies and rebuilding the domestic market they had no resources to spare.

In these circumstances NTT was recommended to organize an overseas telecommunications cooperation committee and to send telecommunications missions to various countries in order to understand conditions of telecommunications development and advertise the progress being made in Japanese technology. Japan had already signed a technical overseas study agreement with Taiwan and had been requested to cooperate with microwave construction in South Vietnam by the American military as early as the mid-1950s. Mr. Kajii was even prepared to visit South Vietnam and Thailand himself. Here he witnessed that the lack of telecommunications development was hindering economic development in Asia, and he realized that Japan sometimes needed to provide cooperation with political awareness rather than simply adopting an engineering standpoint. In other words, his approach to economic cooperation in Asia was based on the reciprocal philosophy that economic development in the region will lead to trade promotion for Japan and thus benefit Japan’s economic development.

The postwar NTT, together with the Ministry of Posts and Telecommunications, developed out of the prewar Communications Ministry and Communications Agency. The prewar Communications Ministry (reformed as the Communications Agency in 1943) administered a wide range of fields including electricity, communications, posts, ocean transportation, airlines and broadcasting, etc. After the war, these departments were divided into the Ministry of Posts and Telecommunications, Ministry of Transport and Ministry of International Trade and Industry, while the communications department was entrusted as a national concern to a public corporation. The president and the employees under his charge worked with the feeling that they were supporting a national enterprise.

Before the war, Mr. Kajii occupied an important position in the Communications Agency as chief of the engineering department (where one of his seniors was Mr. Shigeyoshi Matsumae,

who was the founder of Tokai University and was well-known for his efforts in the communications sector), after which he became the president of NEC which was under the agency's aegis. After the war, following the GHQ purge of people who occupied prewar public positions, Mr. Kajii became the first president of NTT, where he succeeded in developing unique excellent systems and building a telecommunications network covering the Japanese archipelago while introducing microwave and coaxial systems from abroad and the exchange system from Kellogg Corporation.

Meanwhile, in the area of overseas technical cooperation, NTT concluded a technical overseas study agreement with Taiwan, conducted surveys of microwave or ultra-shortwave lines in Vietnam and accepted many students under the Colombo Plan from Indonesia, the Philippines, Malaysia and Thailand to Chuo Gakuen College, which was NTT's technical training facility. NTT's telecommunications college was internationally renowned as Japan's top training facility in the field, and it had already been visited by the secretary of the Colombo Plan technology council and the secretary of ECAFE (United Nations Economic and Social Commission for Asia and the Pacific). It was probably around this time that the NTT telecommunications college approach to overseas technical cooperation was conceptualized.

Meanwhile, the Ministry of Posts and Telecommunications had actively addressed telecommunications development issues in Asia via the ITU (International Telecommunications Union) and ECAFE even before Japan joined the United Nations in 1956. In 1959 the ECAFE/ITU Telecommunications Tokyo Conference was held, further raising awareness of the need for technical training to solve the lack of engineers in developing countries.

Japan's approach to Southeast Asia was extremely cautious at this time, so it avoided independently establishing new organizations or proposing new initiatives. It was careful to avoid making lone proposals that Asian countries may view as the manifestation of a desire to exercise control in Asia. Even taking the case of establishment of the Asia Development Bank, Mr. Takeshi Watanabe (commissioner within the Ministry of Finance), who would later become president of the bank, spent more than a year coordinating opinions and forming consensus within ECAFE before the decision to establish the bank was taken at the ECAFE general assembly.

Supporting NTT, the Ministry of Posts and Telecommunications was interested in the establishment of training facilities such as telecommunications colleges within the Colombo Plan region as a way to make technical cooperation, which was limited to acceptance of trainees and dispatch of experts, more efficient and effective; however, the Ministry of Foreign Affairs was not very enthusiastic about this. This was around 1957, however, in April a notification suddenly arrived from the foreign ministry saying that a ministerial decision had been taken to approve the postal ministry's plan for establishment of group technical training facilities.

Around this time (spring 1958), an employee of NTT set off to become the first manager of the Bangkok office of NTT under orders from President Kajii. That was Mr. Yasuo Makino, who had received orders to work as a project organizer, and he filled this position from 1958 to 1961.

The Ministry of Foreign Affairs considered there to be ample worth in establishing the telecommunications training center in Thailand, which lay at the heart of Southeast Asia. The Ministry of Posts and Telecommunications immediately prepared budget request materials in consultation with NTT, and the plan for establishment was officially decided in the budget for fiscal 1959. It is said that the Ministry of Foreign Affairs demanded that similar center plans in future be incorporated under its jurisdiction, and this led to the formation of an administrative tacit understanding in this area.

In fact, similar thinking lay behind the subsequent creation of JICA (Japan International Cooperation Agency), which was formed when the Overseas Agriculture and Forestry Development Agency (originally formed by the Ministry of Agriculture, Forestry and Fisheries) and the Overseas Trade Development Agency (formed by MITI) were incorporated into a single body with OCTA (Overseas Technical Cooperation Agency) and the Overseas Relocation Agency under the principles of implementation centralization and diplomatic centralization under the Ministry of Foreign Affairs.

This was a time when Kasumigaseki was brimming with vitality. Amidst the national prosperity of the time, government agencies were eager to secure as many ministerial interests as possible. Even in the case of the Thailand telecommunications training center, a certain ministry proposed an amendment adding a training equipment repair building to the Ministry of Posts and Telecommunications' plan, and discussions on this point reached up to the ministerial level. This other ministry is referred to as a "certain ministry" by the people involved at the time in order to avoid conflict, however, the authors believe that it refers to the Ministry of International Trade and Industry (the present Ministry of Economy, Trade and Industry). Thailand at that time was an important export market for MITI which aimed to promote trade, however, bilateral trade figures showed a massive surplus for Japan and friction was emerging between the two countries over the one-sided trade structure. This sentiment eventually boiled over into a student-led movement to drive out Japanese goods in the 1970s. The Ministry of Posts and Telecommunications plan for the telecommunications training center was a commendable undertaking that would help develop human resources in Thailand, and it was natural to think that such an undertaking would help avert trade friction. It was certainly a significant case of technical cooperation for Japan, and for better or worse Kasumigaseki was highly charged at this time.

(3) Choice Made in a Dilemma

When Mr. Makino arrived in Bangkok in 1958, American influence was taking over from British influence in the field of telecommunications. The United States was bolstering assistance with emphasis on Thailand as part of its strategy to strengthen its bulwark against communism (based on the Domino Theory) which had taken root in South Vietnam, etc. For example, not stopping with the construction of military roads, state-of-the-art American microwave systems and Ericson Inc. telephone exchanges (mostly in Bangkok) were introduced to the telecommunications sector.

Mr. Makino approached Telecommunications of Thailand (TOT) with the idea for a training school geared to developing engineers similar to the telecommunications college within NTT. Mr. Makino voiced the Japanese proposal to President Snit of TOT, who was known as Thailand's foremost engineer in the telecommunications field, however, Mr. Sunit did not show an enthusiastic response, saying "Thailand is currently implementing a telephone expansion project which includes a training plan for engineers under assistance from the United States, so there is no particular need for a telecommunications training center proposal from Japan." Since Japanese systems at this time were limited to wireless and telex at best, Japan was not in a position to compete with American systems and technical levels.

This put Mr. Makino in a difficult position. Considering that Tokyo (NTT and the Ministry of Posts and Telecommunications) was counting on a facility like the NTT telecommunications training college and Mr. Makino had arrived in Thailand as the first manager of the NTT Bangkok office with the backing of Mr. Kajii who was the chief mover in Japanese telecommunications circles, he was faced with a dilemma. Moreover, the project was being advanced with the backing of the Ministry of Posts and Telecommunications and Ministry of Foreign Affairs. This was not an issue that could be brushed away by saying that Japan had been misled or had failed to do enough research.

However, Mr. Makino understood that vocational training was basically under the jurisdiction of the Thai Ministry of Education, and he had already spent time on developing a human network in that direction. He sought understanding from Mr. Suhto, the President of the Thailand National Institute of Technology, who made an approach to Mr. Sanan, chief of the vocational education department in the Ministry of Education. Mr. Sanan reported the Japanese proposal to the Minister of Education and obtained his consent for the project. This approach was thus a great success. However, the greatest problem still remained in that it was still necessary to take procedures to secure a cabinet decision by the Government of Thailand.

This was also a time when the Japanese Embassy in Thailand was struggling to deal with the "special yen" (2) currency or military vouchers that had been used during the Japanese army during its occupation of Thailand before WWII. Prime Minister Ikeda's visit to the telecommunications training center on November 8, 1961 was intended to conduct negotiations on this subject.

The Japanese proposal was accepted by the Thai cabinet in August 1959. The Thai government

[2] Before the War, the Japanese Army moved south down the Malay Peninsula from Thailand in order to attack the British Army in Singapore, and in doing so it had to pass through Thai territory from Siem Reap (location of the World Heritage site Angkor Wat) in Cambodia. The Japanese Army secured consent from the Thai Prime Minister Phibun at this time. The Japanese Army stationed in Thailand used military vouchers in order to procure food and supplies. After the end of the War, the special yen derived from these vouchers became a problem and the Thai side naturally demanded reparations for the military vouchers which had become worthless. However, Japan at that time had no national wealth and it bargained to get the best monetary conditions it could. In 1962, the Agreement on the Special Yen issue was signed and it was agreed to pay 9.6 billion yen over eight years. However, Japan still didn't give way easily. It made the payments tied, i.e. conditional of the payments being used to buy Japanese capital goods, equipment and services. This reflected Japan's intense desire to promote exports at the time.

at that time was led by Prime Minister Sarit, who had overthrown the Phibun administration in the coup of September 1957. The new administration adopted a policy of major national construction in which it was stressed that the most important resources for state building are people and the national education program extending compulsory education from four years to seven years was launched. This era also marked the start of import substitution industrialization which triggered the entry of Japanese corporations to Thailand.

The days leading up to the cabinet decision were very tense for Mr. Makino, Mr. Yoshikawa, who was secretary at the Japanese Embassy, the Directorate General of Posts and Telecommunications in the Ministry of Transport, which was the agency responsible for telecommunications on the Thai side, and officials in the education ministry. Mr. Makino later remarked that he burned up all his energy during that time. However, the greatest obstacle had been overcome.

Looking back now, Japan's idea to advance cooperation for construction of the technical training center in TOT without first investigating local conditions was unilateral and hasty, and it highlights Japan's clumsy survey work in the Asian region at that time. However, people back home were eager to get things moving. Only three days after the cabinet decision in Thailand, Mr. Suteroku Yamada, manager of the overseas technical liaison section of NTT, led a study team to Bangkok and commenced negotiations with the vocational education department within the Thai Ministry of Education.

The question was where to establish the center. Various options were discussed, however, it was finally decided to use the carpenter training facility in Nonthaburi Province adjoining Bangkok. The record of discussions (R/D) was signed between Mr. Yamada and Mr. Sanan on August 26, 1959. After that, the draft agreement between the governments of Japan and Thailand concerning establishment of the Telecommunications Training Center was formulated bv the start of February 1960. Following cabinet approval by both governments, the agreement was officially signed in the office of the Thai Minister of Education by the Minister and Japan's ambassador extraordinary and plenipotentiary.

The center opening ceremony was held on February 16, 1961 in the presence of 120-130 people including the Thai Minister of Education, the president of the telephone corporation, the Japanese ambassador, officials of the Japanese embassy and USAID.

2.2.2 Moves Towards becoming a University

(1) The Japanese and Thai Agendas

After a spell of confusion, Japan's plan led to the binding of the agreement between the Governments of Japan and Thailand in August 1960, and Nonthaburi Telecommunications Training Center was opened under approval from the Thai Ministry of Education on February 16, 1961. According to the agreement document signed between the two governments, the center

would offer an ordinary course of one year and special courses ranging from three months to a year (with possible extension). In the first year, the number of trainees was 65 in the ordinary course and 20 in the special course, and it was anticipated that these numbers would double from the second year

The ordinary course accepted 22 new employees from the GPO (post office), however, many of the first students had scant engineering know-how and couldn't even speak English very well, so there was a lot of unease on the Japanese side about whether the new center could become a "lasting symbol of future friendship and cooperation" which was the hope expressed by the ambassador Mr. Oe at the opening ceremony. In other words, there was genuine concern that the center would become a white elephant. Mr. Makino (who was manager of the Bangkok office of NTT but was acting under his qualification as an employee of the Japanese Embassy in Thailand) was determined to make the project a lasting concern as a matter of Japanese honor and trust going beyond the bounds of NTT. After numerous talks were held with the Japanese Embassy and Mr. Pongsak, the vice director of the vocational education department of the Thai Ministry of Education who was known as a sharp bureaucrat, the center steering committee arrived at the decision to change the organization from the conventional center system to the "school system" to coincide with the visit of Prime Minister Ikeda to conduct negotiations over the "special yen" issue (1961). This revision signified the switch to a three-year college system from 1962.

According to the operating policy of the Minister of Education, Nonthaburi Telecommunications Training Center was to provide a three-year course corresponding to the university level with the aim of teaching the basic technologies and applied skills required for telecommunications. In addition, it was conditional for graduates to find employment in the telecommunications sector.

The goals and conditions indicated above were gained through the efforts of Mr. Makino and Mr. Pongsak. In particular, the requirement that graduates find employment in the telecommunications sector was included out of concern that graduates would dissipate into other industries. From this may be gathered the difficulty that Mr. Makino faced. Japan's cooperation in this area was no doubt underpinned by the desire (or strategy) to spread Japanese telecommunications technology to the telecommunications sector in Thailand and to cultivate a sense of affinity towards Japanese technology so that opportunities would be created for imports of Japanese telecommunications products.

From the Thai point of view, since this was an age when it struggled to fund the establishment of new universities, it may have considered it more viable to upgrade the status of the center to a college. Moreover, since advanced engineers would be dispatched from NTT, etc. to boost the teaching staff, a dual advantage could be gained in terms of the cost burden and introduction of advanced know-how and technology. Mr. Kosol, the first president of KMITL, perceived the intentions and desires of both the Japanese and Thai sides.

As of 1961-1962, the number of telecommunications equipment subscribers in Thailand was

approximately 40,000. There were seven telephone exchange stations in Bangkok, however, there were hardly any Japanese instruments installed except for those at some limited international telecommunications facilities. After that, however, Japanese products were steadily adopted by telephone exchange s, and they came to account for the majority of instruments by 1992 (according to Mr. Yoshinori Ohshima, the second director of the Center).

Mr. Danai (current president of Prepack Co.), who was the first overseas student to be accepted at Tokai University and the first Thai student to study in Japan, also gave an interview. After returning to Thailand in 1958, Mr. Danai entered Telecommunications of Thailand (TOT) and rose in the organization to the post of vice president before retiring in 1988. Mr. Danai supported KMITL graduates who had benefited from cooperation with Tokai University and succeeded in making sure that the post of president would be dominated by graduates of KMITL rather than graduates of Chulalongkorn University. As a result, due to the increased sense of affinity towards Japan, Thai companies came to purchase Japanese telephone equipment and so on in large amounts. The initial intent of NTT may have been attained at this point, however, even though the strategic trend of Japan had been established, the NTT staff on the ground continued to display great enthusiasm in transferring the necessary technology to their Thai counterparts.

Mr. Danai

(2) Twists and Turns

Mr. Junichiro Nagai, who was one of the first six instructors to be dispatched from Nonthaburi Institute of Telecommunications (NIT), points to the lack of guidance capacity among the Thai personnel and says that plans to send the best graduates from the ordinary course to Japan for further study were often discussed.

Mr. Yoshinori Ohshima, the second director of the Center, says that he approached the Japanese Government about the need to allow excellent human resources graduating from the first three-year course in April 1965 to take part in long-term study in Japan in order to nurture future leaders in Thailand, however, the negotiations were difficult. Barriers existed within Japan in that the Ministry of Education refused to accept overseas study based on technical cooperation. However, thanks to the persuasion of concerned officials, it was eventually decided to accept four government-financed students from Thailand.

The next difficulty concerned which university in Japan would accept the four Thai students. Since the government rather harshly demanded that KMITL graduates be granted endorsed admission on a sustained basis, both national universities and private universities did not show much willingness. Mr. Nagai (NTT) who was one of the first instructors, says the following: “Since Mr. Miryu Miki , who belonged to the NTT second inspection section was a lecturer at Tokai University at that time, he introduced me to Profesor Kikuchi who was in charge of general

affairs at the university. Thanks to the efforts of Mr. Makino and the cooperation of various others, the university president Mr. Matsumae gave his consent for Tokai University to receive the Thai students."

This was the outcome on the surface, however, judging from the cause and effect relationship, it can be seen that a unified line was connected to Tokai University all along. As was mentioned previously, the entire project started from an idea hatched by NTT and given political support by the Ministry of Posts and Telecommunications. However, since both NTT and the Ministry of Posts and Telecommunications had evolved from the prewar Communications Ministry and Communications Agency, the same human network still lingered even in the 1960s. Looking in further detail, Mr. Shigeyoshi Matsumae, the first president of Tokai University, briefly served as the president of the former Communications Ministry after the war, while Mr. Tsuyoshi Kajii, the first president of NTT, was the manager of the engineering department of the pre-war Communications Ministry and was thus a senior to Mr. Matsumae. Moreover, since Mr. Kajii also temporarily served as the president of Tokai University, it can be gathered just how deep the relationship between these two figures was. Of course, since the Matsumae network stretched from Ministry of Posts and Telecommunications bureaucrats to politicians after the war, it is safe to assume that Mr. Shigeyoshi Matsumae was at the forefront of the old Communications Ministry network of people.

Maybe Tokai University was intended to accept overseas students from Thailand under the aforementioned difficult conditions from the start. In that respect, the project was supported by the firm solidarity and political clout of the former Communications Ministry personnel in Japan.

It is said that Mr. Makino visited the office of the president of Tokai University in Kasumigaseki, Tokyo to seek acceptance for the Thai students and that the president only called him back and consented as he was about to leave. It is likely that the general purport had already been conveyed to Mr. Matsumae at this time. Mr. Matsumae's idea for the university was to realize "education for cultivating thought – education aiming for the mutual understanding of humanities and sciences." Therefore, although he failed to generate much enthusiasm for the idea of a telecommunications training center simply devoted to the training of engineers, he found ideological empathy in the concept of creating a college and aiming for integrated management of the humanities and sciences.

(3) The Role of Tokai University

In the case of international cooperation, the greatest issue in any project or program is the nurturing of successors. In order to upgrade the Thai telecommunications training center to the status of a college, it was necessary to train human resources who would become the backbone of the future teaching staff.

When Nonthaburi Telecommunications Training Center became a three-year college in 1964, it was called Nonthaburi Institute of Telecommunications on the Thai side. In the following year

(1965), four graduates of NIT made the decision to learn Japanese in the separate Japanese language training course and enter the three-year telecommunications engineering course at the engineering department of Tokai University under the Colombo Plan. In reality, since the Colombo Plan only offered limited overseas study of no more than two years, the Japanese language education period was greatly limited to just six months.


Mr. Prakit

In November 1965, the four first-term graduates, Messrs. Naron, Prakit, Manoun and Ginton, were admitted to the Tokai University Japanese language training course, and were incorporated into the telecommunications engineering course of the electrical engineering faculty in April 1966. These four returned to Thailand and became teachers at their former school in 1968. In 1967 too, four second-term graduates (Ms. Jongkol and Mr. Manas, etc.) were admitted to Tokai University and they returned home in 1970. One of the first-term graduates, Mr. Prakit, subsequently became president of KMITL and currently serves as secretary of the AUN/SEED-NET (ASEAN University Network/Southeast Asia Engineering Education Development Network), which Japan is now devoting a lot of energy to.

While these first and second term graduates were studying in Japan, various developments were taking place back home with a view to building a full-scale university system. Mr. Pongsak, vice director of the vocational education department in the Thai Ministry of Education, had held the desire to create a full-scale technical institute if the opportunity arose ever since the telecommunications training center had been established by Japan. This may be viewed as letting Japan plant and help to nurture seeds with the intention of creating a leading engineering college for the benefit of Thailand, however, such thinking was only natural for Thailand. Indeed, KMITL could never have become an “everlasting symbol of Japanese-Thai friendship” without this ambition to realize autonomy on the recipient side.

The plan was to change the three-year course of study into a five-year course. This was because third-year graduates had low social status comparable to that of ‘technicians,’while compared to fourth-year university graduates, their initial salary in government agencies was two years behind. In these circumstances it was difficult for graduates to be elevated to engineer status.

It was thus decided to select third-year graduates with the best results and send them onto an advanced course. Graduates of this advanced course would receive a Higher Diploma of Engineering equivalent to a bachelor’s degree so that they could be recognized as engineers in government agencies. Unlike conventional universities, the five-year institute was geared to providing a high level vocational education rather than academic proficiency. Following the final cabinet decision made on July 30, 1968, the new institute became able to give bachelor’s degrees, marking NIT’s first step towards becoming an institute of technology.

2.2.3 Era of Development for King Mongkut's Institute of Technology

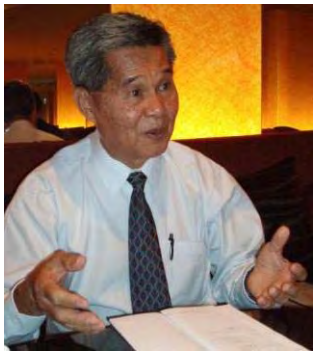
(1) Birth of King Mongkut's Institute of Technology

As was mentioned earlier, the original Nonthaburi Telecommunications Training Center was upgraded to a telecommunications college in 1964, and 38 students graduated in the first graduation ceremony in May 1965. When the course of study was extended from three years to five years, the three-year technician diploma course in electrical engineering became a five-year engineering degree course in June 1969, and 44 students graduated this in the first term.

Finally, the institute became King Mongkut's Institute of Technology Ladkrabang (KMITL), named after King Monkut, the fourth king (1851~1868) of the current Chakri Dynasty, on April 24, 1971. As a minor digression, it was Prime Minister Sarit who thought of renaming the universities in Bangkok after kings and dynasties; for example, following the example set by Chulalongkorn University, Bangkok School of Medicine became Mahidol University after the Imperial Prince Mahidol, who is the father of the present King. Having said that, when Prime Minister Pridi attempted to give Thammasat University, which has boasted a strong anti-authoritarian tradition since its establishment in 1934, the new name of Pumibon University, this idea had to be dropped in the face of fierce resistance from the university side (Akira Suehiro, "Thai Development and Democracy").

King Monkut (King Rama IV) acceded the throne in 1851. Having left home at 20 years of age and spending 27 years in a Buddhist temple, King Monkut preached correct Buddhism first and foremost, but he also concluded a trade agreement with Britain in 1855 and took the initiative in promoting exports of Thai rice. He also encouraged children of the royal household and aristocracy to learn foreign languages and Western culture, and he employed Anna Leonowens from Singapore to teach English. This episode was made into the novel "Anna and the King of Siam" by Margaret Landon, and this later became the long-running Broadway musical "The King and I."

King Mongkut's Institute of Technology was formed through the amalgamation of three technical colleges: Nonthaburi Institute of Telecommunications (NIT), which received assistance from Japan, North Bangkok Technical College, which received German support, and Thonburi Technical College, which was supported by UNESCO (in reality the United States), and it was presided over by a single president. The Nonthaburi campus of NIT covered an area of approximately 3,300 m^2.



Mr. Kosol

The Thai Government, as part of its third five-year economic and social development plan, intended to increase the number of students at KMIT to 800, however, because the Nonthaburi campus could only accommodate around half this number, it was decided to relocate KMIT. A site covering 1.155 million square meters was secured in Ladkrabang 30 kilometers east of Bangkok, and the

Government of Japan, responding to a request, offered first phase grant aid (163.2 million yen) for construction of the institute buildings on the new site. The facilities constructed at this time were the laboratory building, gymnasium, lecture hall (able to accommodate 1,600) and memorial hall with library. However, due to revaluation of the yen and a sudden jump in construction prices in 1972, second phase grant aid amounting to 79 million yen was added in June 1974. The aid on this occasion included a lecture hall, gymnasium, memorial hall with library and experimental equipment.

In June 1976, KMITL (Ladkrabang School) held a major event in the presence of King Bhumibol and the Queen. Details of the event were obtained in an interview with the first KMITL president Mr. Kosol during an interview in Bangkok in 2009. According to this, some graduates of Nonthaburi Institute of Telecommunications (NIT) worked in a television company and they produced a program covering the King's visit to KMITL for this event. At that time all programs covering the King had to be live broadcasts, and broadcasts couldn't be suspended until the King had left the venue. As a result, the whole grand exhibition was broadcast for four hours during prime-time TV from 16:00 to 20:00. Moreover, since broadcasts of the King had to be broadcast live on all channels, KMITL took over the airwaves. The whole Thai nation was glued to the TV screen for four hours, and following this event secondary and senior high school students started organizing bus tours to visit KMITL. The newspapers were also full of praise, and even Thailand's premiere university Chulalongkorn was surprised. This event gave KMITL sufficient name recognition to attract the best high school students in the country.

Mr. Kosol's mantra was that attracting the best students from high schools was the most important thing for university development. The generation of students that were admitted the next year after establishment of KMITL (Ladkrabang) came to be called the 'golden generation,' and they currently fill some of the most important positions in Thai industry and society such as the president of CAT (Communications Corporation of Thailand), executive positions in corporations in the telecommunications field and presidents of universities throughout the country. Mr. Kosol is still active and hopes to foster "human resources who are not only technically proficient but who are excellent human beings."This philosophy may have been influenced by the ideas of Shigeyoshi Matsumae, the founder of Tokai University, who believed in the educational integration of humanities and sciences and education for building human beings, for it was Kosol's meeting with Matsumae that encouraged him to take an interest in Japan in addition to the European thinking he had acquired while studying in London.

All people would agree that Mr. Kosol played an integral role in the development of KMITL in his capacity as the first president of the institute. Whenever negotiations for assistance with Japan succeeded, he would make a big speech at the finance ministry and persuade the Thai government to increase its budget accordingly. He was regarded as an intelligent and strategic negotiator among NTT, Tokai University and JICA circles. It was his unique idea to arrange a royal live broadcast for the opening ceremony of KMITL, thereby advertising the institute throughout the

country and attracting many of the best students in Thailand.

The person of merit in the development of KMITL on the Japanese side was undoubtedly Shigeyoshi Matsumae, the founder of Tokai University. In 1977 he was awarded an honorary doctorate of engineering by the King of Thailand, in 1983 he received the Grand Cordon of the Royal Crown, and in 1988 he was granted the Most Exalted Order of the White Elephant.

Furthermore, the development of KMITL required educators in addition to engineers, and this requirement was filled through the dispatch of frontline professors. Many professors find it hard to be dispatched and live in Thailand for many years, and they worry about their posts after they return home. It was the backing of the influential President Matsumae which ensured that professors were able to devote their full efforts to KMITL without worrying about their later career. Another important factor was the development of a high level teaching faculty at KMITL. Tokai University offered cooperation with special overseas study when the telecommunications training center was upgraded to a special college, and it also helped KMITL improve after five or so years through allowing its professors to obtain doctoral degrees. This was another idea of Mr. Matsumae's.

This was part of the "academic cooperation agreement" signed between Tokai University and KMITL. After this agreement was signed in January 1977, human resources exchange started through the unique route of Tokai University. Under this exchange, which still continues today, teachers from both universities are granted conveniences regarding visit costs and accommodation. For example, according to data for the 10 years from 1980, 23 teachers from KMITL visited Tokai University, while at least 20 teachers went the other way. In tandem with this agreement, based on exchange combining dissertation doctoral support programs and center university support by the Japan Society for the Promotion of Science (JSPS), six teachers of KMITL acquired doctorates of engineering at Tokai University. These six members were Wiwat, Buhnwat, Kanock, Somcat, Jongkol and Manas. Mr. Somcat (the former director of the engineering department at KMITL) is the foremost figure in semiconductor engineering in Thailand. Ms. Jongkol has devoted her life to education as may be gathered from the fact that she offers her services free of charge to students majoring in control after retiring from her office at the age of 60. Mr. Manas is known for laser research and is also renowned as a researcher of medical devices (Ms. Jongkol and Mr. Manas gave interviews in November and December 2009).

Ms. Jongkol

(2) KMITL and Japanese Corporations

Panasonic Thailand operates 20 plants throughout the country, employing 13,000 people, of whom 10,000 are technicians, and its R&D department has around 50 personnel. It launched the Panasonic Scholarship geared to developing Thai human resources in 2000, and this is a very tough scholarship to acquire as may be gathered from the fact that only three applicants are

chosen out of 70 (according to Mr. Mitsuhiro Takayanagi, manager of the personnel department).

Looking at admission test scores since 1970, although KMITL has been second to Chulalongkorn University, it has steadily closed the gap during this period and, reflecting growing expectations, Japanese corporations have inaugurated a number of scholarship schemes. In 1972, Thailand had approximately 10,000 university graduates, of whom approximately 1,500 were engineering graduates and 300 were from electrical engineering courses (including telecommunications). Since around 100 of these came from KMITL, this means that KMITL nurtured one-third of the country's core electrical engineers. The scholarship schemes that Japanese corporations operate in support of KMITL are advertised through the Thai office of JETRO. Such schemes were originally started and presented to KMITL by corporations belonging to the electric and construction sections of the Japanese chamber of commerce and industry in Thailand. One of these is the Japan Electronics Corporation (JEC) scholarship which has participation from 15 corporations with a long history of operations in Thailand, for example, Hitachi, Sanyo, NEC, Toshiba, Sharp, National, Fujitsu, NTT, Yamaha, Yazaki Corporation, Fujikura Ltd., Nisshin Electric, JETRO and so on.

Moreover, in order to promote autonomous research by KMITL, Japanese corporations have established a university support research setup which involves joint research activities, presentations of machinery, research cost subsidies, nurturing of teachers (including graduate students) and sponsored lectures, etc.

Another scheme is the Construction Scholarship, which is supported by 27 companies including Kajima. Furthermore, approximately 22 enterprises belonging to the KMITL Japan corporate support group conduct plant tours to assist in the line training of students.

So, how do Japanese affiliated corporations and industry representatives appraise KMITL? According to a recent four-rank evaluation given by 11 Panasonic enterprises in the manufacturing sector, most gave a "Good" appraisal. Japanese affiliated corporations generally employ between 2-10 KMITL graduates. Among them Panasonic recruits personnel from KMITL, Noth Bangkok, Thonburi and Kasetsart, etc. However, it shies away from recruiting graduates of Chulalongkorn University because they are too academic, and this trend can be seen in Japanese corporations in general.

Similarly, small and medium enterprises belonging to the Federation of Thai Industries (FTI) tend to avoid recruiting graduates of Chulalongkorn University and Thammasat University because they are too fond of discussion and not suited to line work. Mr. Yusasack, manager of the investment strategy and policy department of the Thai National Socioeconomic Development Bureau sums up the image of KMITL into three words: "Application, Produce, and Practical."He goes on to say that KMITL graduates "can work for you." Here, one can see some similarities with the strong points of Japan as pointed out by Mr. Yusasack, i.e. "Quality, Discipline, Team working, Hard working, and Punctuality."

It may be said that this workplace-oriented education culture of KMITL was nurtured in the early days of the institution when students obtained degrees in Japan while learning Japanese. While pursuing their studies, they unconsciously acquired a sense of Japanese customs and values, and they were able to pass this on to students in a very natural manner.

Mr. Amp

Mr. Kitisak, a graduate of KMITL, went on to obtain an MBA (Master of Business Administration) degree in the United States and currently works as the financial director of CAT (Communications Corporation of Thailand). The son of Mr. Prakit, the former president of KMITL and current secretary of the AUN/SEED-Net Project, who is popularly called Mr. Amp, also acquired an MBA in the United States after graduating from KMITL, and he currently works for Kasikorn Bank and is in charge of making loans to Japanese corporations. According to them, compiling and examining business plans with an engineering approach enables more rational understanding of business management.

However, more importantly, better salaries can be expected in management positions rather than engineering. According to the FTI, since salaries are higher in clerical positions than engineering positions, even if engineering needs are 80%, only 40% are filled in reality. Engineers don't want to go factories, and even if they do their skills are not fully utilized. The FTI says that it wants to create a technical work qualification system. This disposition of students in Thailand is also conspicuous in Malaysia and Singapore. They learn Japanese line-oriented management techniques such as 5S, etc. but also seek to learn business (obtain MBAs) in Europe and America. They utilize their MBAs when deploying global business and marketing strategies in English environments, but they also apply Japanese management skills to the production of internationally competitive products. In other words, they strive to find their own way while combining both types of thinking.

2.2.4 Japanese ODA

(1) History of Cooperation with KMITL

1) First technical cooperation. At the original Nonthaburi Telecommunications Training Center, telephone exchange equipment was supplied and seven experts including the president were dispatched from NTT as technical instructors under Japanese and Thai cooperation in August 1960. This was Japan's first experience of project technical cooperation involving the dispatch of experts, implementation of training and supply of equipment. The equipment supplied to Nonthaburi training center had a combined value of 200 million yen.

2) First grant aid (June 1974). The first grant aid for the construction of KMIT Ladkrabang, which started in 1971, was provided in two installments of 163.2 million yen and 790 million yen respectively. The first installment was used to construct the laboratory building, gymnasium, lecture hall and memorial hall with library, and the second installment was

used to make up the shortfall in the first (due to inflation) and to purchase equipment for the laboratory.

3) The second project technical cooperation was implemented over four years starting in 1978. This targeted the data processing, electrical engineering and semiconductor engineering fields and cost a total of approximately 650 million yen, of which 400 million yen was spent on equipment supply.

4) Second grant aid (1983). A grant of 3.69 billion yen was provided for the project to expand the KMITL campus (classroom building, information center, administrative building, cafeteria and student dormitory, etc).

5) Third project technical cooperation (KMITL expansion project). Conducted over five years from 1988 to 1993, this cooperation entailed the strengthening of education and research activities in the fields of telecommunications, broadcast engineering, data communications and machine engineering. There were five long-term experts at all times, and they were backed up by 80 short-term experts. Approximately 40 KMITL employees received research guidance for between two and six months at Tokai University, and equipment expenses over this period amounted to 819 million yen.

6) The fourth project technical cooperation lasted from October 1997 to October 2002. Its primary goal was to establish the Research Center for Communications and Information Technology and aim for world-class research in the information and telecommunications fields and the enhancement of graduate school education.

7) New style of support for the National University of Laos. Japanese ODA for KMITL was brought to an end in September 2002. Since it had started in 1960, Japan's support for KMITL lasted 42 years and became the longest Japanese ODA undertaking ever.

However, the following year (2003) marked the beginning of a joint project for the development of information engineers in the engineering department of the National University of Laos by KMITL, JICA and the said university. Tokai University continues to dispatch numerous professors as JICA experts to Laos, and so far there have been 32. Following on from the program implemented between 1999 and 2001 to offer bachelor's degrees at the engineering department of the National University of Laos, this cooperation is attracting attention as a new approach to Japanese ODA. These activities can be traced back to the third country training in telecommunications that has been conducted once a year in KMITL since 1977. This program, in which the costs are halved between the governments of Thailand and Japan, involves organizing a team of KMITL teachers from Telecommunications of Thailand (TOT) and CAT (Communications Corporation of Thailand) and providing eight weeks of training for participants from Asia.

As well as boosting the confidence of Thailand, this cooperation with the National University of Laos by KMITL realizes the aid cycle whereby those who have received assistance become the

givers of assistance to the next recipients. The collaboration between KMITL and Japan should also be deepened in AUN/SEED-NET, which aims to build an engineering human resources development network in Southeast Asia. Moreover, considering the importance of AUN/SEED-Net looking ahead to the future, there is a growing need to deploy a new type of network ODA for strengthening links with universities in the 19 member Southeast Asian countries in the same way as between KMITL and Japan.

(2) Future Prospects

Among new requests for KMITL cooperation on the Thai side, attention has recently turned away from the telecommunications field and more towards education activities in the wider science and technology field, namely information technology, heavy industry and applied sciences. Mr. Kosol, the first president of KMITL, warns that generalizing studies too much could harm the university's uniqueness and lower its level. Generalizing university studies may be a short path towards improving business standing, but it could also mean the loss of relative superiority and outstanding expertise. The same thing can also be said about universities in Japan.

KMITL will reach its 50th anniversary in August this year. The 'Message to Japan' that many academics on the Thai and Japanese sides send concerns support for 'Joint research.'Joint research not only contributes to raising the academic level of professors but also helps sustain human networks between researchers. Tokai University continues to implement joint research with professors of KMITL, and it now has more than 50 major joint research programs. Each professor is involved in three or four joint research projects.

In future it is said that Japan's approach to Asia will be based not only on objects and money but on so-called 'intellectual' development cooperation based on people. It is pointed out that such Asian intellect will eventually be fed back to Japan and will make an important contribution to its future survival. For example, it may be necessary to examine new collaborative cooperation in Asia via creation of an 'Asia Joint Research Fund' focusing on science and technology (including environmental issues) or an Asia Joint Research Fund' focusing on social policy based on new ideas and with consideration given to declining child population and the ageing of society.

When one considers cooperation with KMITL from these perspectives, a possible idea may be the creation of a Japan-KMITL Joint Research Fund or a KMITL Independent Research Fund supported by the 3,000 or so Japanese affiliated corporations who belong to the Japan Chamber of Commerce and Industry in Thailand. According to the interview conducted with the Federation of Thai Industries (FTI), the following response was given concerning Thailand's future prospects: "Labor-intensive industries will eventually move to other countries, while labor-intensive industries and research and development activities oriented towards high added value will remain in Thailand." In that sense, the 'development of researchers' in Thai universities is a national need. The concept of joint research for fostering researchers will take on a greater sense of reality from now on.

KMITL Main Gate

2.2.5 Lessons from Technical Cooperation for Human Resources Development in Thailand – Lessons Learned from Cooperation with KMITL

(1) Existence of National Policy

Around 1960 when cooperation was just beginning, Japan's national policy, whether it be the 'Asian diplomacy' purported by the Kishi administration or the 'Double income plan' pursued by the Ikeda government, was a major factor. Important policy objectives were reform of industrial structure and promotion of exports, and the securing of markets in Southeast Asia was the greatest goal of export promotion policy and dovetailed with Kishi's 'Asian diplomacy.'

Meanwhile, on the Thailand side too, the nurturing of human resources to carry the modernization of the state was incorporated into national policy. In particular, it was necessary to develop engineers and other industrial human resources to support the development of import substitution industries and export promotion industries based on foreign capital.

(2) Existence of Asian Policy

Japan strived to secure markets in Southeast Asia while utilizing postwar reparations and quasi-reparations, and during the Cold War era it promoted economic cooperation diplomacy in tandem with American military diplomacy, and thanks to this tied assistance Japanese industrial products earned greater confidence every year. 1960 marked the beginning of Japan's three-pronged economic activities of revitalized trade, investment and economic cooperation.

Meanwhile, the rapid advances made by Japanese corporations into Southeast Asia led to cultural frictions in countries such as Thailand and Indonesia; in Thailand, the one-sided trade structure caused by Japan's massive surplus triggered a student-led campaign to drive out Japanese goods. In these circumstances, Japan adopted an Asian policy consisting of not only economic cooperation but one geared to vigorously promoting technical cooperation through human resources development, etc. This trend in policy was also reflected in KMITL cooperation.

(3) Existence of Political Leadership

During this age, Japan's political leaders needed to possess strong political will to guide Japanese economy and industry from recovery to development and to create a peaceful and powerful nation on a par with the rest of the world. The politicians who were chosen to be prime minister needed to display forceful political leadership while withstanding a succession of political battles.

(4) Lessons on the Aid Side – Background to 50 Years of Cooperation

1) Ministry of Posts and Telecommunications → NTT → Tokai University → JICA Collaboration

The horizontal unification of intentions throughout Japanese telecommunications sector was important for extending Japan's technology and research overseas. This solidarity provided the driving force for establishing and sustaining assistance projects.

2) Effectiveness of Tokai University-Centered (Single School) Dispatch of Experts (Academics)

If a tender process or some other approach which involved dispatching experts from multiple institutions had been adopted, the flow of people and research methods would have lacked unity and it might not have been possible to build an effective and efficient university support setup. This case provides valuable input to the debate over whether single company support is better or not.

3) Leadership of the President of Tokai University

In national universities, initial ambitions are either toned down or disappear in personnel movements at the top level. In private universities too, the continuity of programs is hindered if the presence of top personnel is small. It is no exaggeration to say that the success of KMITL was largely down to the charismatic leadership displayed by Mr. Shigeyoshi Matsumae, the founder of Tokai University. In particular, the inter-university exchange agreement proposed by Mr. Matsumae for raising the level of the KMITL faculty helped enhance the value of KMITL in the pantheon of education.

4) Presence of Nippon Telegraph and Telephone Public Corporation (NTT)

The role played by NTT in dispatching experts (engineers) in the early years was great. Since NTT was originally a state corporation, this activity was characterized by the flexibility and desire to positively serve the national interest, however, following subsequent privatization the motivation unfortunately shifted towards the pursuit of profit.

5) Contribution of Japanese Affiliated Corporations

Japanese affiliated corporations in Thailand played a part in the all-Japan setup through donating research equipment to universities, establishing corporate scholarship programs and conducting plant tours for learning, etc. Their greatest contribution was the support they gave to KMITL graduates in their efforts to find employment. KMITL was able to achieve the top

employment rate among graduates not only because of its emphasis on workplace-oriented education but also because understanding was forthcoming from Japanese corporations.

6) Thai Support for Overseas Students at Tokai University

Tokai University support for KMITL and the support offered to Thai graduates studying at Tokai University fostered a sense of solidarity during and after employment activities and in Thai society. Examples of such alumni are Mr. Danai, who graduated Tokai University in 1958 and became president of Prepack Thailand, and Mr. Kitti, who graduated in 1968 and became president of Nippon-tei Co. which has annual turnover of 2 billion yen.

7) Unbroken and Planned Support by JICA

JICA was able to offer unbroken educational support over decades because it maintained communications with JICA and Tokai University teachers on the ground and proposed a series of new plans at appropriate times while incorporating the expert information and opinions of these teachers and listening to the academic needs of KMITL.

(5) Support Policy Demonstrating the Strength of Continuity

Japanese cooperation over the course of half a century which led to the establishment of a university involved sending students to Japan to study and obtain degrees at Tokai University. These students returned to Thailand and passed on theory and practice (technology) to tens of thousands of students while transmitting the Japanese thinking and values they had acquired in Japan. As a result, pro-Japanese human resources were naturally fostered. The maxim “Continuity breeds strength’ applies most pertinently to university cooperation.

JICA’s technical cooperation projects are primarily intended to promote the autonomous development of target agencies, i.e. Japan serves the function of a temporary catalyst geared to enabling the target agency to independently implement projects. As a result, Japanese cooperation (JICA technical cooperation projects) generally tends to be discontinued after no longer than five years. Rather than stocking assets into developing countries, this type of assistance can basically be called ‘flow-type assistance’ whereby projects are reeled off without considering strategy. In contrast, KMITL in Thailand represents ‘stock-type assistance’ in that it has become an intellectual asset of Japan.

2.2.6 Japanese Know-how

(1) Japanese Know-how in KMITL Cooperation

As was mentioned earlier, the Federation of Thai Industries characterizes the skills of KMITL graduates compared to graduates from other schools as oriented towards “Application, Produce and Practical.” In the course of this Study, interviews were held with 15


Mr. Manas

KMITL teachers and graduates of Tokai University, and all of them mentioned these three characteristics. In particular, the education philosophy of Tokai University founder Shigeyoshi Matsumae seeking to "Not only convey technology but also nurture human beings" was strongly sensed among the first and second generations of overseas students at Tokai University such as Mr. Prakit, one of the first professors and former president of KMITL, Ms. Jongkol, a former associate professor, Mr. Manas, who was also an associate professor, and Mr. Kosol, who was the first president.

Summing up their comments, 'Application' refers not only to the application of theory and research but also to the ability to flexibly think and live life. 'Produce' refers not only to the ability to make things but also the code of conduct in the pre-production stage of preparation and planning. In terms of practical capability too, KMITL teaches analysis capacity and insight from the Japanese perspective.

These features of KMITL graduates were passed on and formed by the early experts from NTT, teachers of Tokai University and teachers of KMITL who graduated from Tokai University, and these features are akin to the Japanese characteristics of Quality, Discipline, Team working, Hard working and Punctuality as indicated by the Thai Federation of Industries.

Quality and Discipline can be found in the students' characteristics of Produce and Practical. These ideas and customs are transferred when students and teachers work and research with Japanese counterparts, and it is likely that they are incorporated into the subconscious.

(2) New Trend among the Young Generation


Mr. Nantawut

Mr. Amp, the son of former KMITL president Mr. Prakit and who currently works for Kasikorn Bank, traveled to the United States and obtained an MBA after graduating from KMITL. Mr. Nantawut, who is the second president of the Japanese affiliated corporation Nisshin Brakes, obtained an MBA in Australia after graduating from Tokai University. Also, Mr. Kitisak, who became the executive in charge of financial affairs at CAT (Telecommunications Corporation of Thailand) at 33 years of age, obtained an MBA in the United States after graduating from KMITL. This trend is becoming quite common among young people.

Looking at the reasons for this, first of all salaries are higher for MBA graduates in management than for engineers. As Thai corporations aim to make advances onto the global stage from now on, they will need to obtain internationally renowned MBAs, further exchange with international MBA human networks and acquire greater language ability. However, above all else, high quality products are needed in order to compete on the world stage.

Accordingly, MBA and language ability are inseparable for collecting '*Monozukuri*' know-how and global information on innovation, and a Thailand will need to pursue such a dual approach from now on. This trend is true of not only Thailand but also Malaysia which is also covered in

this Study. In other words, while not on the same level as the Meiji Restoration in Japan, the semi-advanced countries of Asia are currently striving to create a new way of life that combines Japanese and Western styles.

(3) Knowledge Transmission Route

Knowledge is conveyed orally, as opposed to via literature, through the following four routes: ① The Tokai University / Matsumae philosophy (overseas study and joint research) route, ② The NTT (transfer of telecommunications technology) route, ③ The corporation research laboratory (Japan as an overseas study destination) route, and ④ The route of plant tours at Japanese affiliated corporations in Thailand. The first two of these may also be described as JICA expert dispatch routes.

The next stage involves the transmission of knowledge and information from KMITL teachers to students and includes the following routes: ⑤ Direct route to students, ⑥ Route through graduates in the workplace, ⑦ The influential route of numerous graduates becoming politicians, bureaucrats, corporate leaders and top management (the comments of Mr. Prakit, former president of KMITL), ⑧ International route of KMITL cooperation with other universities in the region, namely to the National University of Laos and via AUN/SEED-Net, ⑨ The route of becoming teachers at other universities, and ⑩ The route between generations from parents to children. The prime example of this is former KMITL president Mr. Prakit and his eldest son, who studied at Tokai University, and daughter, who entered the doctorate course at Tokai University after graduating KMITL, and the president of Nippon-tei, Mr. Kitti, whose daughter is also studying at Tokai University. Mr. Amp, the son of Mr. Prakit says: “In Japan, children grow while watching their parents’ back, but in Thailand we grow by following in our parents’ footsteps.” As may be gathered from this comment, there is not such a great difference between Thailand and Japan in terms of culture and values, and Thailand is in a position to understand Japanese values without a great deal of resistance.

(Author: Mitsuya Araki)

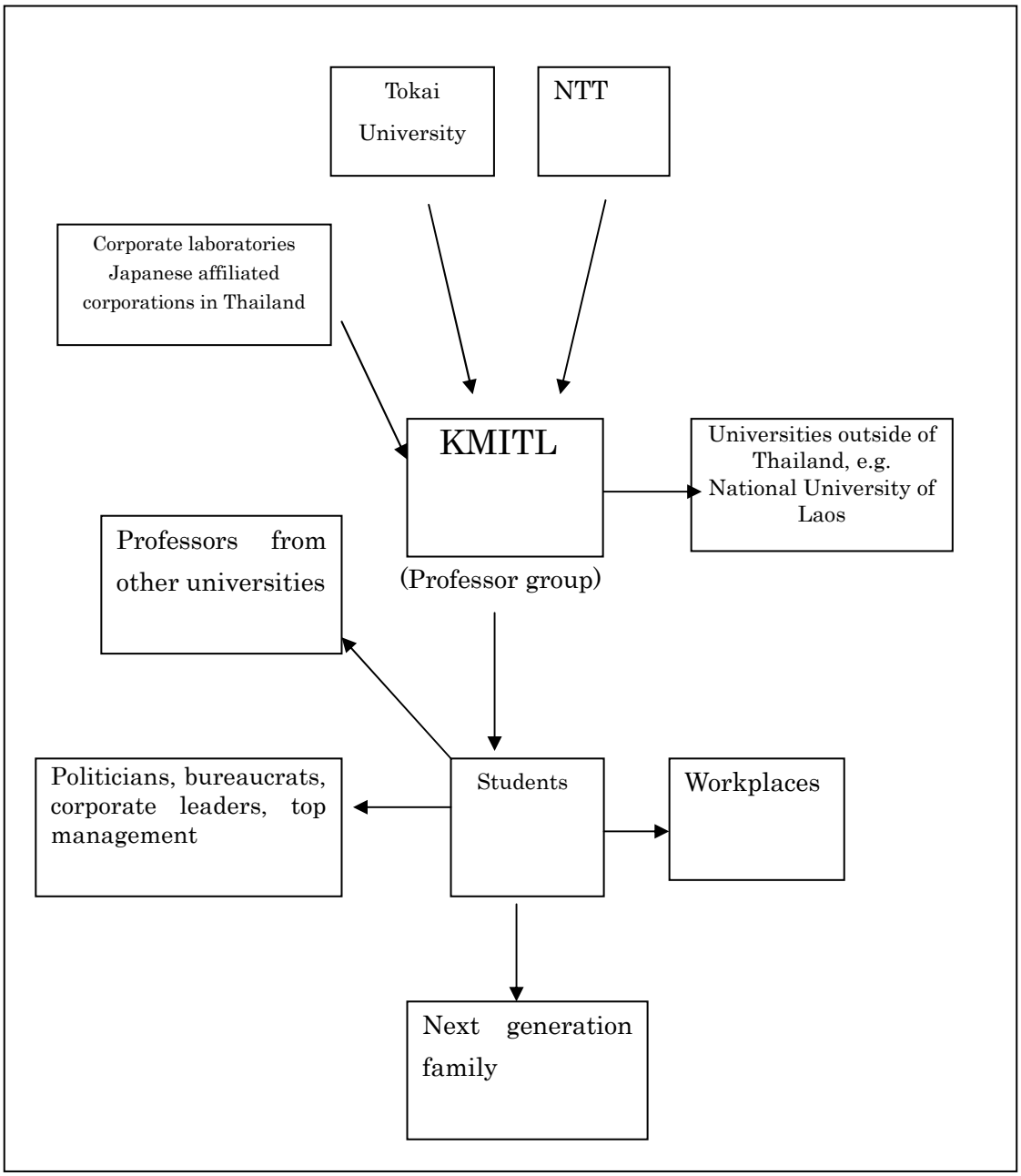


Figure2-12 Knowledge Transmission Routes

Chapter 3

Malaysia

Chapter 3 Malaysia

3.1 Summary of Technical Assistance for Human Resources Development and it's Achievements

3.1.1 Outline and results of technical cooperation projects in the field of Human Resources Development

(1) Outline of the subject projects

JICA has extended technical assistance projects to SIRIM: Standards and Industrial Research Institute of Malaysia during past two decades, focusing mainly on "measurement standards" & "technology reserarch & developments (R&D)".

SIRIM and JICA contributed to the improvement of industrial infrastructure through such technical assistance. Actually, SIRM has been developed as a main organization to support private industrial sector in terms of industrial research and technology innovation. The Table3-1is an overview and results of technical assistance extended to SIRIM.

We can understand that the field of technical assistance was not only industrial standardization but also fundamental technology of industries like metal and well-advanced field such as fine ceramics and environmental issues.

Table3-1 Technical Assistance to SIRIM

Title	Summary	Period
Technical Assistance to Metal Industry Technical Center	Fundamental objective: Strengthen parts industries Range of technical assistance: Metal frame, Press, Welding, Electric Plating technologies, which are Crucially important to parts industries.	11 August 1978～ 10 August 1982 （Extension） 11 August 1982~ 10 August 1984
Technical Assistance to National Measurement Center	Technical assistance to 1) Establish measurement standards' traceability 2) Supply measurement equipments for 1) and train measurement & calibration technology in the field of Mass, Dimension, Volume, Temperature & Electric.	17 Dec 1981~ 16 Dec 1985
Technical Assistance to Fine Ceramic Analysis	Strengthen research level of SIRIM Berhad in the field of electronic Fine Ceramics	18 Nov.1987~ 17 Nov.1991 (F/U) 18 Nov.1991~ 17 Nov.1992 (A/C) 01 Oct 1999~ 30 Sept 2001
Foundry Technology Cooperation Project	Improve foundry technology of Malaysia, which is a crucial to support the important industries of Malaysia, such as parts and raw materials.	12 Oct 1988 ~ 11 Oct 1993 (A/C) 02 March 1998~ 31 March 1999

Evaluation and Analysis of Hazardous Chemical Substances and Biological Treatment of Hazardous Chemical Wastes	Establish standardized rule to control waste of hazardous chemical substances and provide waste technology of hazardous chemical substances	09 September1993~ 08 September 1997
Malaysia AI System Development Laboratory Project	Transfer the knowledge to develop AI System to the counterparts of SIRIM Berhad. Also, provide training and seminar to promote AI technology and develop prototype	01 March 1995~ 29 February 2000
Measurement Center of SIRIM（Phase 2）	Upgrade the accuracy of national standards of NML-SIRIM in the field of dimension, pressure, electric and vibration.	01 March 1996~ 29 February 2000
Risk Management of Hazardous Chemical Substances in Malaysia	To transfer knowledge of evaluation and management of hazardous chemical substances to industries through SIRIM Berhad	01 April 1998~ 31 March 2002
Testing capabilities upgrading of Electric Products	To transfer the knowledge of testing about IECEE-CB in SIRIM Berhad	01 September 1999~ 31 August 2002

Note: F/U = follow up, A/C = after care Source: JICA Malaysia Office website

(2) Results of technical cooperation projects in the field of Human Resources Development

Contribution to the Malaysian economic development by the technical cooperation projects which matched to the Malaysian government plans

Table 3-2is an overview of various national plans of Malaysia, issues occurred in Malaysia and JICA technical assistance. Malaysian government has a principle to show long term vision and execution plans with clear numerical objectives to have a consensus of the goal. After 5 years of Mahathir administration, he introduced Industrial Master Plan by 10 years term, To elaborate those national plans, various ministries and industrial people are contributing. Request for JICA technical assistance is based on those national plans. Also, Malaysian government is executing validation of execution vertically and horizontally.

Table3-2 Relationship between JICA technical assistance and various nationals plans

	1966~70	1971~75	1976~1980	1981~1985	1986~1990
National Development Plan					
Malaysia Plan (MP) (Concrete executing plan)	1st MP	2nd MP	3rd MP	4th MP	5th MP
Industrial Master Plan (IMP)					1st IMP
New Economic Plan (NEP)					
Outline of Perspective Plan (OPP)			1st OPP		
Prime Minister	Tunk Rahman	Tun Razak	Hussein Onn	Dr.Mahathir	
Important international issues		1973First Oil Shock	1978~1979: Second Oil Shock	1982:External debt crisis in Mexico and expanded to Latin America	Privatization boom in Latin America Foreign investment shift from L.A. to Asia
Standardization related issue		1971 Measurement law in Malaysia		1981:NMC-SIRIM was appointed as measurement administration organization ISO9000: 1987	1987:ISO9000 series introduction 1987:Laboratory accreditation scheme in Malaysia
Issues related to SIRIM Berhad		1975: SIRIM Establishment			
Technical assistance of JICA				NMC (1981~85) Metal Industry (1978~1984)	Fine Ceramic (1987~92) Foundry Technology (1988~93)

	1991~95	95~2000	2001~2005	2006~2010	2011~2015
Malaysian Plan	6th MP	7th MP	8th MP	9th MP	10th MP
Industrial Master Plan	1st IMP	2nd IMP		3rd IMP	(2006~2020)
New Development Plan (NDP)			National	Vision Policy	
OPP	2nd OPP				
Vision 2020					
Prime Minister	Dr.Mahathir		Abdullah		Najib Razak
Important international issues	1992 NAFTA Signed 1994 NAFTA started	Currency crisis in Asia (97~98) Introduction of Euro（1999）	2001~2002IT bubble explosion in USA		
Standardization related issue	1995:WTO Start SAMM started in 1991	2000: ISO/IEC17025 Trend of privatization in Malaysia			
Issues related to SIRIM Berhad	1995 Privatization	Concentrate on standardization & R & D	Challenge to clear condition of TBT/ WTO	Try testing on electric and auto parts	
Technical assistance of JICA	Chemical Hazardous (1993~97)	NML-SIRIM (1996~2000) AI System (1995~2000) Foundry Technology (98~99)	Electric Product Testing IEC (1999-2002) Fine Ceramic (1999-2001) Chemical Hazardous (1998~2002)	Automotive Parts Testing (2006~2011)	

There was a great fortune to former Prime Minister Mahathir when he elaborated second Malaysia Plan in 1986 after his inauguration in 1981. External debt problems expanded from Mexico, which declared defaults in 1982 to whole Latin America. Multinational companies which invested to Latin American were facing problem of import restriction on parts & equipments, dividend and profit remittance etc. In addition to that problem, valuation of Yen in 1985 by Plaza Agreement pushed them to consider the investment to Asia and they started to execute large

investments to Asia from late 80th.

Under above international situation, Dr. Mahathir could presume that foreign investment could come to Malaysia by large size when he elaborated 6th Malaysia Plan maybe in 1983, 1984. That was a background to request JICA technical assistance which started in 1981 to National Measurement Center as a first phase under the assumption that such infrastructure could work as a crucial, important factor to clear the requirements of international standardization. Requests to JICA technical assistance were executed slightly before the real need would come. For example, the second phase technical assistance was started from 1996, that is forecasting severe demand on calibration & traceablity by ISO from the year 2000.

As above, we can see the footprints of Malaysian government that they requested to JICA technical assistance to transfer the technologies of Japanese industries to SIRIM Berhad and SIRIM Berhad would work as a core institute to transfer such technologies to Malaysian industries, having a forecast of nearly coming demand. For example, metal industry's technology which started in 1978 and foundry technology in late 80, then fine ceramic technology is always forecasting the trend of up grading of Malaysian industries.

The followings are summary of relationship between each technical assistance projects to SIRIM Berhad and national plans and industrial society's demand.

Technical Assistance to Metal Industry Technical Center (1978~1984)

SIRIM was established in 1975 based on SIRIM Law. Just after the it's inauguration, the relationship with JICA started and Technical Assistance to Metal Industry Technical Center started in 1978 as first JICA technical assistance project to SIRIM Berhad. In 1987, Malaysian government was trying to promote export by the introduction of FTZ (Free Trade Zone) and other institutional frameworks. In the initial moment, it looks like foreign direct investment (FDI) to FTZ was good option to Malaysia but some problem appeared such as needs of large amount import to the raw materials and equipment, no strong linkage between FDI and local small medium size companies. To solve such problem, Malaysian government considered the importance of heavy industry like steel and chemical industries to substitute such raw material and equipment demand by government leadership. This technical assistance to metal industry has a policy to support such government's lead heavy industries.

National Measurement Laboratory-SIRM Berhad（1981~1985/ 1996~2000）

Quality management and safety requirements clearance based on precise measurement are important factor to purchase parts locally and export to U.S.A., Europe and other developed countries. Steel & chemical industries also precise measurement due to the necessity to declare the conformity on chemical substances and environmental requirements.

Technical assistance to National Measurement Laboratory, which started in 1981, is a infrastructure needed to those heavy industries and multinational companies invested to Malaysia. World trade related ISO requirements became very popular from 1987 by the introduction of ISO 9000 series quality system and 1995 WTO TBT (Technical Barrier on Trade) issues. In order to

declare the conformity to those requirements, many countries started to develop laboratory accreditation scheme. The role of NML-SIRIM is very crucial in this laboratory accreditation scheme as a core technical institute in Malaysia.

The fact that JICA supported the initial activities of NML-SIRIM is important. Actual general manager of NML-SIRIM has been involved in the first phase technical assistance of JICA and many other scientists in NML know about the support of JICA. JICA should use such important seeds to expand the activities of ODA to neighboring countries.

Technical Assistance to Fine Ceramic Analysis (1987~1992/ 1999~2001)
Foundry Technology Cooperation Project (1988~1993)

Central issues of 2nd Industrial Maser Plan, which started in 1995, were development of supporting industries to export oriented companies. Fine ceramics and foundry technology are very important technology to add value such supporting industries.

Evaluation and Analysis of Hazardous Chemical Substances and Biological Treatment of Hazardous Chemical Wastes (1993~1997), Testing capabilities upgrading of Electric Products (1999-2002), Testing capabilities upgrading Auto-parts(2006~2011)

Electric, electronics and auto-parts are very important sector for Malaysia. For those industries, ISO/IEC requirements clearance became minimum condition to export to USA, Europe and Japan. Not only quality system management certification but also safety requirements clearance in terms of chemical substances analysis, physical safety and various auto-parts safety testing are becoming minimum condition to export to developed countries.

Beyond the quality of products, exporters have to clear the conformity requirements about chemical substances in the product in the testing laboratory accredited for GLP (Good Laboratory Practice) and also safety requirements in the testing laboratory accredited by ISO/IEC 17025. In Malaysia, SIRIM is only accredited laboratory of GLP. In this sense, JICA technical assistance contributed to Malaysia.

Before extending technical assistance, JICA has a policy to set concrete target during the project, such as getting accreditation of GLP, ISO/IEC17025. During the execution of the project, JICA experts and counterparts make an effort to achieve such goal. In this sense, JICA technical assistance works effectively to contribute to Malaysia.

Malaysia AI System Development Laboratory Project（1995~2000）

Malaysian government is considering that service sector could be a strong drive-force during third Industrial Master Plan. For example, education, medical, tourism, transportation and distribution are considered in that service sector. The service industry will support the development of manufacturing sector which has been a strong drive force of Malaysian economy.

AI (Artificial Intelligence) is a system to make effective linkage between manufacturing sector and the service. AI system development is well matched to the third Industrial Master Plan which started from 2006 by 10 years term. As other technical assistance projects of JICA, Malaysian

government have been requested projects to JICA and implemented them slightly before the demands from industries appear. We do see very strong capability of Malaysian government to forecast the near future demand of industries.

Based on analysis of each technical assistance projects, survey team verified that JICA technical assistance projects to SIRIM Berhad had been well matched to the Malaysian government's national development plan. Also survey team verified that such Malaysian national development plans are based on the demand from industrial societies, including demand from Foreign Direct Investments from overseas companies.

(3) Efforts of SIRIM to improve its management capability

Survey team found many examples of intangible assets left in SIRIM Berhad by the JICA technical assistance execution other than the knowledge transferred by the experts. For example, experience of counterparts in SIRIM Berhad during the conversation, observing the attitude of experts and training in Japan. Survey team focused this issue in 5S which is very popular in Japanese society. In principle, JICA technical assistance has a purpose to transfer specific technology to the counterparts and not to touch on the management of organization, like SIRIM Berhad. 5S is general principle to manage organization so that 5S was not included in the contents of technical assistance. However, survey team found following photos of slogan and also fact that SIRIM is teaching 5S concepts to the employees and industries.

Maybe this fact is showing an example those counterparts found good points of 5S during contacts with experts and training in Japan. 5S is based on Japanese manufacturing spirit but it is well modified to the Malaysian culture to be accepted.

Japanese companies also pay attention to the importance of teamwork. As above photo (right

side), SIRIM Berhad is respecting teamwork, having photos of each employee.

It looks like very difficult to introduce team sprit to the former-British colony, which respect individualism. Maybe top management people thought that such team sprit is good to manage SIRIM Berhad by having contact with JICA experts and training in Japan.

In Malaysia, there is a consideration of GOTONG-ROYONG, which is spirit of respect each other and maybe its spirit matched each other.

(4) Establishment of good-relationship between JICA & SIRIM, looking for a graduation scenario of Malaysia from recipient country to the ODA partner.

SIRIM Berhad has been a good partner for JICA for third country training up to now. For example, The SME & Government Project Department introduced"Policy and Framework for SME Development for South African Countries during 2006~2008. This was a joint project of JICA and MTCP (Malaysian Technical Assistance Program. MTCP also extended Training for Incubator Management for African Countries in 2009. Other than JICA, SIRIM Berhad is extending various training programs with WAITRO (World Association of Industrial and Technological Research Organization), MTCP etc In the case of WAITRO, SIRIM Berhad is a sole agent for training.

Survey team found that many employees in SIRIM Berhad are pleased to participate in those training program. They clearly mentioned that there are benefits for them to share the information of different countries and to develop human network in specific fields.

In addition to those benefits, SIRIM Behad could earn participants' fee so that survey team could verify strong mind of self-finances of each employees in SIRIM Berhad.

Some managers said that human network development for SIRIM Berhad with third countries is important since global issue, such as environmental, food safety and other safety issues could happen from now on by more serious degree.

Also, Malaysia has a merit to use English directly in the conversation and text so that trainees could enjoy the language benefit to study in Malaysia.

In addition to above merits, Malaysia has cultural benefits due to Islamic religion.

By analyzing above benefits, survey team reached to the conclusion that SIRIM Berhad could be a good partner for third countries training.

3.1.2 Consideration by focusing standardization activities of SIRIM Berhad

（1）Historical background about JICA technical assistance

In this chapter, concrete analysis of JICA technical assistance, focusing in the standardization activities, is described.

In order to analyze the historical background of Malaysian society and economy and it's relationship with JICA technical assistance, survey team considered that it is important to pay attention to the leadership of Malaysian politicians, including but not limited to Dr. Mahathir. Survey team found that Malaysian political leaders had a very good view to presume the near

future demand and have been included those forecast in the national plans and executed them up to now. To verify it, survey team analyzed the trends of each decades of Malaysia, focusing in the standardization.

In the decade of 1960

When Malaysia achieved the independence from British colony, Malaysia depended heavily in the primary industry, such as agriculture, fishery, mining etc. In the mining field, Malaysia was an important exporter of rubber and tin. Prime Minister Rahman had a strong concern on the volatility of primary industry's commodities by mono-culture economy He introduced the idea of 5 year plan as First Malaysia Plan to modernize and add value primary industry, like research and development based on rubber, tin, agricultural and fishery products in 1966.

Based on this first Malaysia Plan, important organizations such as Malaysian Industrial Development Authority (MIDA), Malaysian Agricultural Research and Development Institute （MARDI）, Federal Land Development Authority (FELDA) Etc was founded from 1966 to 1970. The habit to have this five-year plan is still continuing now and 10th Malaysia Plan will start from 2011 to 2015. Malaysian government started the activities of mid term evaluation and final review from this decade.

As an example of review and evaluation of national plan, let us see the final review of 1st Malaysia Plan.

- ＊ Malaysian government prepared 470 million Ringitt budget to train the teachers and technical education. However only 70% of the budget was used so that budget was too large considering the capacity of education training
- ＊ Malaysian rubber quality increased due to the introduction of Uniform Quality Standards Malaysian Rubber (SMR).
- ＊ Distribution of equity to Malaysian farmers was not enough.

Etc

We can see very neutral, severe evaluation by Malaysian government. This tradition is still continuing now and the evaluation method is improving.

In the decade of 60th, Malaysian government started to have a conviction that national development execution through development institutes could work as an institutional framework for the country's development.

The principle idea in the decade of 60th was the import substitution of machines and equipment based on foreign currency earned by primary commodities, such as palm oil, rubber, tin etc. After temporally stay in mining site, rubber plantation, Chinese and Indian peoples started to settle in Malaysia and unemployment problem occurred in late 60th and racial riot happened on 13th May 1969.

This racial riot is a root of continuous national plans' philosophy in Malaysia.

In the decade of 1970

The racial riot problem happened in 1969 continued until 1971. And emergency was

announced during that period. During that period, National Operation Council (NOC) was established and it elaborated 2nd Malaysia Plan and other plans.

Practically, Prime Minister Razak inaugurated his office in September 1970 and he showed strong leadership to announce New Economic Plan (NEP) in 1971 and declared Bumiputra policy in the Plan. He defined the term of NEP up until 1990 and declared that the goal in 1990 will be a equity distribution of 30%, 40% % 30% to Bumiptra, Chinese & Indian and foreign capitals.

This 30・40・30 equity distribution is a consensus still now in various concepts, such as employment chances, share equity distribution to start up business etc.

The method to establish long-term vision and concrete execution plan to achieve such vision goal started from this decade and it is natural in the multi-racial, multi-cultural country.

When we look at breakdown of GDP as of 1975, manufacturing was only 16％ and principal

Activities were process of agricultural and forestry products. Chemical processing of palm oil is appearing in this decade.

Malaysian government had a strong concern about primary commodities' price volatility in the first oil shock in 1973. Then, the government introduced a policy to establish Free Trade Zone (FTZ) during 3rd Malaysia Plan to introduce multinational companies.

In this decade, FTZ was concentrated in the state of Penan, Selangor and Malacca. These states are still now working as an attractive investment zone for multinational companies.

Petroleum was found in Malaysia in this decade and started to contribute to the Malaysian export. During this 3rd Malaysia Plan, fundamental infrastructure to attract multinational companies was constructed, such as road, ports and airports.

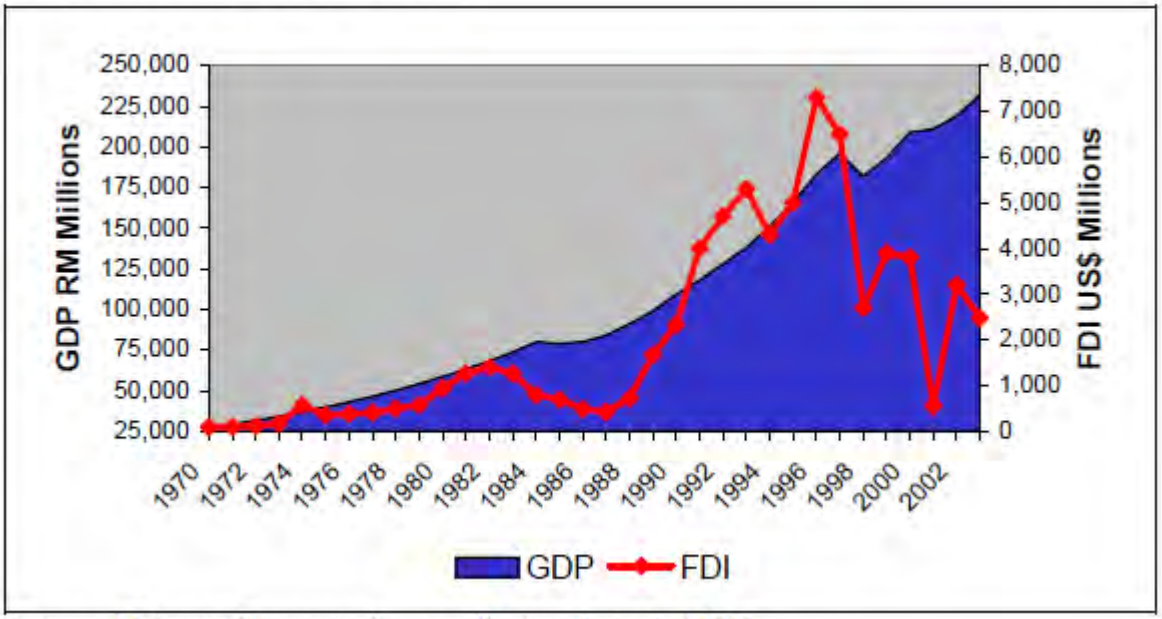
The fundamental policy of this decade 70th is export-oriented and SIRIM was established in 1975 by SIRIM Law. We can understand the expectation of Malaysian government to SIRIM as a core organization to support Malaysian export and supporting industries.

In the decade of 1980

Dr. Mahathir inaugurated his office in 1981 so that we need to consider his first 5 years and later part of 1980th after his conviction as Prime Minister.

During 4th Malaysia Plan（1981～1985）, Prime Minister Mahathir announced Look East Policy and increased the chances to learn and train in Korea, Japan etc. But in this 4th Malaysia Plan, clear results were not gotten due to that. However, Japanese investments increased clearly from late 80th, in concrete, after 1988.

Graph 1: Malaysia - FDI and GDP

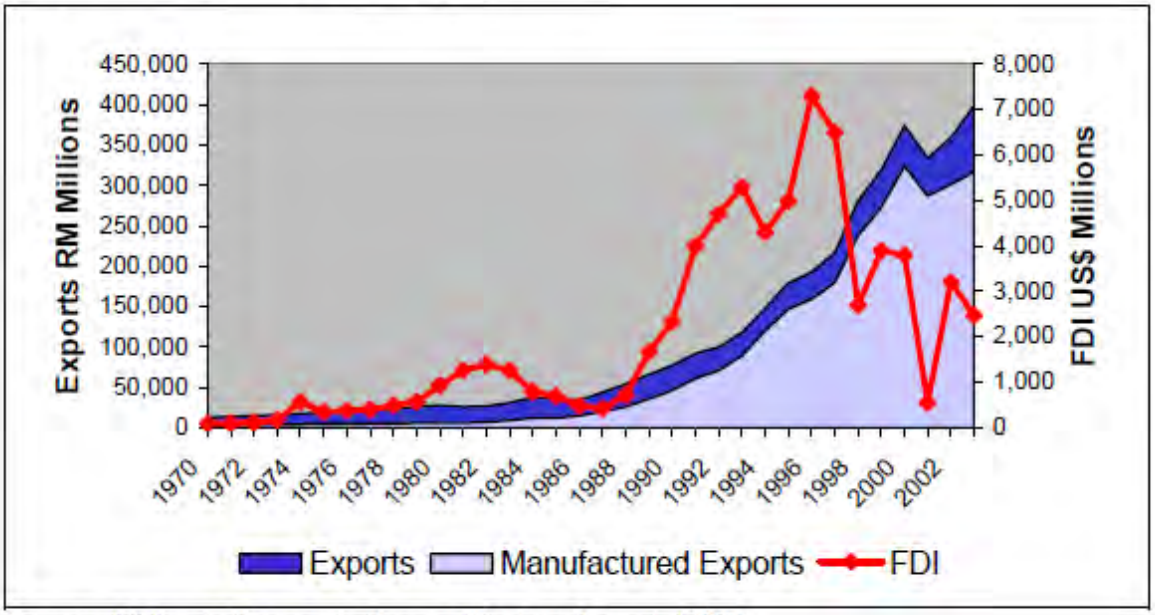


Source: Malaysia Economic Report (Various Issues), MOF

Figure3-1 FDI and GDP

Source：Institute of Management Malaysia , Mr.Azumi Shahrin bin Abdul Rahim, The Changing Role of FDI in the Malaysian Economy-An Assessment

Graph 2: Malaysia – FDI and Export Growth

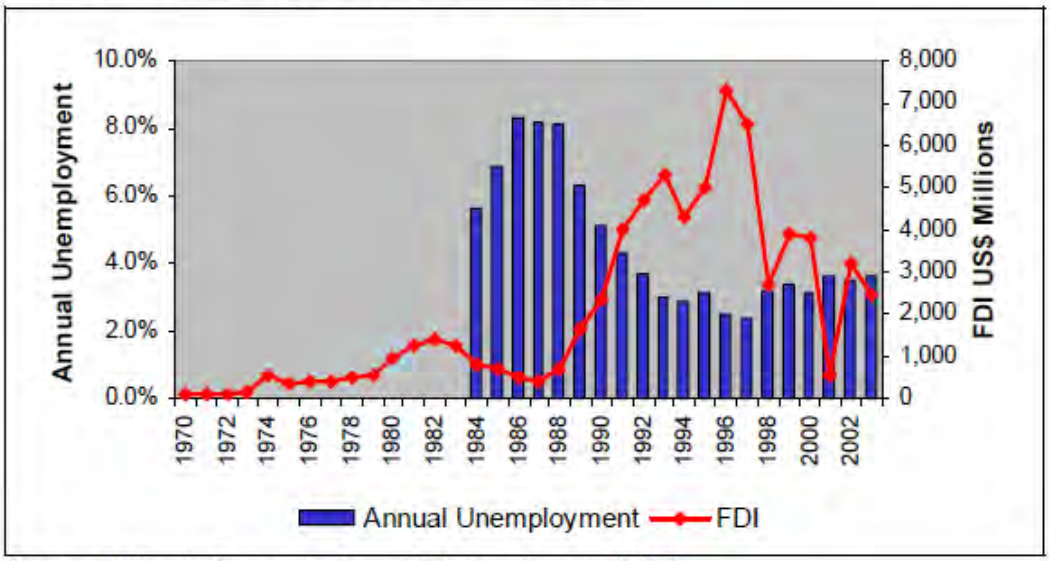


Source: Malaysia Economic Report (Various Issues), MOF

Figure3-2 FDI and Export Growth

Source：Institute of Management Malaysia , Mr.Azumi Shahrin bin Abdul Rahim, The Changing Role of FDI in the Malaysian Economy-An Assessment

Graph 4: Malaysia – FDI and Unemployment Rate



Source: Malaysia Economic Report (Various Issues), MOF

Figure3-3 Malaysia-FDI and Unemployment Rate

Source：Institute of Management Malaysia , Mr.Azumi Shahrin bin Abdul Rahim,
The Changing Role of FDI in the Malaysian Economy-An Assessment

To consider the underlying reason, we need to observe world economic situation. In the mid-70th, Japanese companies started to invest to Central and Latin America due to oil shock because Central & Latin American countries were attractive due to their natural resources, including but not limited to oil. However, Central & Latin American countries introduced a large amount of private sector (banks) short-term loan and equity. Usually national development plan and infrastructure development should involve long-term loan and equity due to the nature of the projects, which need long term to recover the cost.

In August 1982, Mexico declared moratorium to their external debt and external debt problems expanded to other Latin American countries, such as Venezuela, Brazil, Argentina etc. Japanese companies invested there faced many problems, such as difficulty to import equipment, machines and raw materials which are essential to their operation.

Dr. Mahathir presumed that follow wind will come to Asia from Latin America in the late 1980, observing such world economical situation, including economic booming of Japan in mid-1980th.

In the decade of 1990th

Decade of 1990th was a period that Dr. Mahathir executed various plans based on his conviction. In addition to his leadership, world situation also helped him to back up. For example, IT industries in U.S.A. were booming and many Japanese companies invested to Malaysia. JICA technical assistance projects are concentrating in this decade, too.

From mid-80th, machines and passenger cars trade was always negative to Malaysia but turned to surplus for Malaysia in mid-90th. The industrialization policy was a success due to this trend. Dr. Mahathir observed IT bubble of U.S.A. in this decade and he introduced Multimedia Super

Corridor project from this decade, focusing in service industry.

We can say that this decade of 90th was a period that Malaysian national development plan and idea of JICA technical assistance were well matched.

After year 2000

Malaysia is still continuing stable development by overcoming the problems of IT bubble explosion in USA in early 2000 and Asian currency crisis in 1997. The core activity is manufacturing which practically started to contribute to the Malaysian economy from 90th.

This stable development is due to strong leadership of Dr. Mahathir, closing temporally currency market and devalued the Ringitt.

Main issue from now is "How to add value and up-grade the industries".

(2) Objective of technical assistance projects

Malaysia has been active for the standardization from the decade of 1970. For example, Prime Minister Razak introduced measurement law in 1971. Underlying condition was to achieve fair trade and quality improvement of their main commodities like rubber, palm oil etc By the effort of standardization, quality of Malaysian rubber improved and world market trusted that quality. Also, Malaysian government tried to improve the fair trade condition of petroleum in the port of Johor by investing in such infrastructure.

Looking at these efforts, Dr., Mahathir understood the importance of standardization and felt the necessity of establishment of core institute which dedicate in the precise measurement and requested the technical assistance to JICA for the starting operation of National Measurement Center in 1981. He felt that the activities of NMC are essential to attract multinational companies.

Before becoming Prime Minister, Dr. Mahathir was Minister of Education in the Razak administration. He had an idea that Japanese, Korean industrial culture, which respects the benefit of group rather than individual benefit, could add value to the Malaysian industrial culture and that mixture will create some new industrial moral. Then he announced his idea as Look East Policy. This was a background to approach JICA technical assistance, maybe.

Dr. Mahathir had a clear idea that he will introduce Japanese industrial technology to catch up technical level and also to learn from past experiences in Latin American countries to consider the framework of development policy. In Latin America, governments considered government owned public companies as a drive force of development. It is well known the moratorium declared by Mexican government in 1982 and then tight budget control required by IMF and privatization of public sector companies in late 1980th.

Instead, Malaysia started to have active involvement of public sector companies in the economy from mid-80th and privatization started in the decade of 1990, which means the trend of public sector involvement and privatization had around 5 years time difference (Latin America was ahead of around 5 years than Malaysian privatization). So, Malaysian government had enough time to analyze the experience and happening in Latin America.

Underlying condition that Malaysian government did not request the IMF finance during Asian currency crisis was the advise from World Bank and other consultanats1997 with the strong

political leadership. By analyzing so, we should respect the forecasting power of Malaysian political leaders to consider future ODA for ASEAN neighboring countries.

(3) Elaboration of Project Plan

Survey team had a chance to have two times interviews with General Managers of NML-SIRIM, Mr. Abdul Rashid, during this time's survey. NML (National Metrology Laboratory)-SIRIM is a core organization in the standardization. He got master degree in physics from University of Texas and graduated in 1983. Just after returning to Malaysia, he got the job in SIRIM and was assigned to the JICA technical assistance project in National Measurement Center. Mr. Rashid has been promoted to the head metrologist in electric standards when 2nd JICA technical assistance started in 1996.

He explained that Malaysian national plans are elaborated based on questionnaire survey to listen the demand from industries and interactive dialogue among various ministries. Regarding standardization, survey team focused to the dialogue between JICA and NML-SIRIM about detail of technical assistance and needed equipment. NML-SIRIM explained about specific services that they need to supply to industries and JICA made a proposal based on such explanation and detail of the project was decided.

In many other countries, we see lack of capability to prepare the demand side information (needs of industries) by recipients. In case of Malaysia (NML-SIRIM), they had very clear idea about needs of industries and then needed standards that they have to supply. That was an ideal procedure to decide contents of technical assistance of JICA.

Survey team checked the report of "Report of expansion plan of National Measurement Center of Malaysia, January 1994) in order to verify the dialogue between JICA and NML-SIRIM and elaboration procedure of plan.

The following was the objective and underlying condition of that report:

Quote:

The first phase technical assistance of JICA was provided during December 1981 to January1986 by four years term. The counterpart was MC (Measurement Center) SIRIM.

This first phase technical assistance contributed to the establishment of certain national standards and calibration techniques up grading of engineers. However, such national standards development and calibration capability improvement could not reach to the demand of industries.

After the completion of first phase in 1986, JICA and SIRIM did a survey about " Industrial Standardization and Quality System Management Promotion" during January 1992 to January 1993. In that survey, JICA and SIRIM placed very high priority to NMC-SIRIM as an organization which could support the up grading the Malaysian manufacturers.

In February 1993, JICA sent survey team to discuss the contents of activities of second phase. JICA and SIRIM discussed about advanced needs of manufacturing sector in Malaysia, involving other ministries and organizations. Malaysian government requested to elaborate Master Plan based on the dialogue with survey team.

JICA sent pre-survey team of the technical assistance project in March 1993 and the teamconfirmed the background of the request and contents of activities. Both JICA and SIRIM signed on S/W(Scope of Work) with EPU(Economic Planning Unit, Prime Minister's Unit) on 20th March 1993.

Unquote;

As we can observe from above content of report, there were very close dialogue between JICA and SIRIM Berahd based on the results of first phase and possible activities of phase 2.

SIRIM has been appreciating the close and detailed dialogue with JICA.

In the process of dialogue, JICA pointed out 1) the necessity of participation in the Meter Treatment, 2) expansion of NMC space and 3) increase of number of staffs and SIRIM Berhad executed those pointed issues after the phase 2 project. Like that, SIRIM Berhad has been respected the comments and opinions provided by JICA and has been executed by their own budget, recognizing by their point of view.

Like that, SRIM Berhad's own efforts and budgets combined with JICA experts' expertise have been worked very efficiently up to now.

JICA technical assistance has been extended to NMC/ NML SIRIM by two phases, 1st phase from 1981 to 86, and phase 2 from 1996 to 2000. The followings are photographs the survey team got from NML SIRIM and we can understand that SIRIM Berhad has been doing continuous efforts of expansion and modernization.

Figure3-4 Expansion of SIRIM

Above left is a building of NMC (National Measurement Center) when JICA started technical assistance which was located in Shah Alam as a part of various building of SIRIM Behad H.Q.

NMC' importance increased by industries' demand, including the initiation of ISO 9000 series

certification in 1987 and the location was changed to more modernized part of SIRIM H.Q. as right side photographs above after JICA 1st phase technical assistance. In that building phase 2 of JICA technical assistance was executed.

During phase 2 technical assistance, JICA recommended to move to new place, which should be more protective by the influence of noise, emission gas, vibration etc, in order that NMC work as national standard laboratory under highly accurate environment.

In 2004, they moved to new place as shown in the photograph of bottom left and changed the name from NMC to NML (National Measurement Laboratory).

In 2009, NML-SIRIM is expanding their building for chemical standards (reference standards to respond to the industrial society's demand as a photo of bottom right.

Among national's standards held by NMIs in Asean countries, BIPM is publishing following data which is showing number of national standards of world acceptable accuracy level.

(BIPM is international organization of metrology located in France). By this, it is clear that Malaysia is holding various national standards in different fields.

And we can understand the self and continuous efforts of NML-SIRIM in order to serve to the demand of industries.

Table3-3 Position of NML-SIRIM among NMIs in Asean countries
- World acceptable national standards number -

	Malaysia	Thailand	Vietnam	Indonesia	Singapore
Vibration, Sound	21	0	0	0	0
Electric	695	313	0	49	1,219
Dimension	7	0	0	5	5
Mass	15	30	0	27	25
Luminosity	8	0	0	0	36
Radiation	15	0	0	0	0
Temperature	6	4	0	2	10
Time, Frequency	4	0	0	0	4

source：KCDB Database http://bipm.fr (As of 4th Nov. 2009)

In Vietnam, there are no world level accurate national standards yet. In Thailand, we can see very unbalanced concentration in electric standards and they do not have world level accurate dimension standards which means they have difficulty to support auto-industries.

Instead, Malaysia NML-SIRIM is holding well-balanced national standards they can be proud as world level. We can say that Malaysia is leading the metrology in Asean countries and also Malaysia is always paying attention to the development of requirements of ISO to support industries.

(4) Effect of Privatization during the execution of technical assistance

In order to establish national standards, the most difficult and time-consuming task is research

and maintenance of each physical standard. After that process of research and maintenance procedure establishment, NMIs will execute the research of method to supply developed standards to industries. So, the process of national standards are divided into three phases.

1) research & development of physical standards by world level accuracy

2) research of method of maintenance of developed physical standards

3) research of method of supply of maintained physical standards to industries.

This procedure takes time and government has to spend time and money and human resources. Fortunately, Prime Minister Mahathir committed and guaranteed such process. That is why NML-SIRIM achieved above matrix's national standards development.

In Malaysia Plan and Industrial Master Plan, Malaysian government always include support of standardization that means Malaysia government is always placing high priority to the standardization.

This was the underlying condition that Malaysian government requested to JICA to develop the same level of national standards of Japan during phase 1 and phase 2 technical assistance. The provided equipment is still well maintained in NML-SIRIM and they are using them very effectively.

Big change in SIRIM Berhad was the privatization in 1995. Survey team could have an interview with Dr. Tajudin, who was a top management of SIRIM Berhad in 1995. He made a decision of privatization in 1994 and tried to change the mind of public employees to customer oriented one. He evaluated that his efforts were successful, looking at the actual activities of 5S, team work etc which are typical Japanese culture based activities.

It can be said that exchanges of opinion with JICA experts, observation of working ethics of JICA experts and experiences of training in Japan during technical assistance etc influenced to transfer such Japanese ethics to the mind of SIRIM staffs.

As observed in the historical background that Malaysian government learned past experience of privatization in Latin America which were very popular in late 1980 and took good practice of such privatization experience during the privatization of SIRIM Berhad in 1995.

In Latin America, privatization was progressed based on the compulsory requirements of IMF in order to reduce public spending in public sector companies, neglecting the role of each public sector company to the society. They did not pay too much attention about the way to improve the management efficiency, the role to the society etc. Based on that experience, Malaysian government progressed the privatization very carefully, paying attention to the role of each public sector company and the way to improve the management efficiency. Therefore, SIIRIM has been privatized by holding 1005 shares by Ministry of Finance, paying attention to the improvement of management efficiency, not paying too much attention on the profitability of SIRIM Berhad.

Instead, steel company and automotive manufacturing company's privatization is focused to increase the profitability of the company. Like that, Malaysian government has clear policy on priority of public sector companies.

3.2 Story of Human Resources Development

3.2.1 A Start from Zero

(1) Rain Soaked Product Management

"It was certainly an eye opener traveling around the small workshops of Kuala Lumpur on a bus with experts conducting mobile guidance. Workers in a window-less dark workshops were dragging a roll of steel plate for pressing over a concrete floor. At that rate, the product would soon become scratched and rusty. Molded spoons were lined up unevenly, some facing right, others facing left, far removed from the orderly lines of products we were so used to seeing in Japan. More than that, the products were being stored outside in the rain. There was no concept of quality control in this country."

As the first cooperation to the Standards & Industrial Research Institute of Malaysia (SIRIM), JICA implemented technical cooperation over two phases from 1978 to 1984 at the Malaysian Institute of Industrial Technology (MITEC). In order to make preparations for that cooperation, six Japanese experts were sent to Malaysia in November 1978. The above paragraph describes the recollections of Mr. Minoru Sayama (current representative of Sayama Technicians Office and former research and development officer of the MITI Industrial Technology Institute), who paved the way for 30 years of Japanese cooperation with SIRIM as chief advisor to MITEC.

SIRIM outside view

Mr. Sayama looks back on those early days of cooperation that brimmed over with vitality as follows: "We had around one year to prepare before we left Japan, but we had a hard time assembling the experts. Just as we were finding it hard to find people to go out to developing countries, the Japan Metal Stamping Association realized the significance of the project and offered to cooperate with finding people. Thanks to that, we were able to assemble a group of skilled downtown press factory owners as the team of experts. They left their sons to continue their businesses and volunteered with the desire to serve their country. Since they had experienced the war in Asia, they soon became used to the local ways and, even though they couldn't speak any English at all, they were able to give pertinent instructions on the frontline. We had to take drastic measures such as forcing the local workers to open the windows of their dark plants, but the locals accepted our advice when they saw that the results were good."

Malaysia today is continuing economic growth with enough momentum to rival the advanced nations, and the reason behind this growth lies in Malaysia's improvement of its economic structure, which had previously depended on primary agricultural, fisheries and mining products,

and nurturing of the manufacturing sector. If one searches for the reasons why Malaysia was able to succeed in reforming its industrial structure, one eventually arrives at the financial revenues gained from exports of oil discovered around Sarawak in the mid-1970s as well as the success achieved in improving the quality of Malaysian products. SIRIM made a major contribution to the technical innovation and quality control of Malaysian industry, and it should not be forgotten that its work was supported by JICA cooperation over 30 years.

(2) Industrial Structural Reform for National Survival

How did SIRIM come to be established? First of all, let us take a look back at Malaysia in the 1970s.

"When Malaysia gained independence, foreign countries never thought that this nation of poverty and racial conflict would achieve the economic development it has today." (From 'The Way Forward' by former Prime Minister Mahathir)

Although there are no exact statistics, it is estimated that the per capita gross national income (GNI) of Malaysia when it gained independence from the British Commonwealth in 1957 was less than US$300, which is the same level as that in Sub-Saharan African countries today. Furthermore, since there were frequent racial clashes between native Malays and ethnic Chinese and Indian groups in society, as former Prime Minister Mahathir says, it was impossible to imagine that such a country would achieve rapid economic growth.

Immediately following independence, the greatest challenges facing Malaysian leaders were racial harmonization and extrication from the fragile monoculture economy dependent on exports of rubber and declining tin. The First Malaysia Plan (1MP) compiled in 1966 placed emphasis on import substitution industrialization, i.e. building the infrastructure to realize domestic supply of machines and processed goods which until then had been dependent on imports.

With the onset of the 1970s, Malaysia switched policy from import substitution industrialization focusing on the domestic scene towards becoming an exporter of industrial products through introducing foreign capital and technology and promoting an internationally competitive manufacturing sector.

Just as the Malaysian economy was about to plunge into the international economic flow in the early 70s, the Bretton Woods system which had managed the post-war world economy for roughly 30 years was collapsing. The Bretton Woods system was the framework by which the victorious United States had supported the world economy, however, by the 1970s, other advanced nations such as Japan and Germany had grown out of their recovery phase and the world economic order was changing. Furthermore, when the United States experienced deterioration of its fiscal standing due to the war in Vietnam, it unilaterally terminated convertibility of the dollar to gold and announced transition to a floating exchange rate system in August 1971 (the Second Nixon Shock or dollar shock). This marked the transformation of the world economic map and led to the emergence of multiple poles in Japan, the United States and

Europe.

Moreover, the first oil shock which occurred around this time (October 1973) led to the adoption of protectionist policies by the world's economies, thereby leading to a major downsizing of world trade and the occurrence of stagflation in the advanced countries. The early 1970s was also a time when the rectification of such protectionism became a major international issue, and discussions and agreements came to be made on the maintenance and bolstering of the multilateral free trade system at summit conferences and GATT (General Agreement on Tariffs and Trade) ministerial conferences.

Since Malaysia was a relative newcomer to the international community at the start of the 1970s, the impact of these global trends is unclear. However, having paid close attention to international movements since its independence, Malaysia must have keenly sensed the need to build an industrial structure that would be able to respond to the globalizing world economy under the free trade setup. Furthermore, the oil shock which caused economic deceleration in the advanced nations also triggered sudden falls in primary product prices, thereby imparting great damage to the Malaysian economy which was so dependent on primary product exports. Accordingly, the need to promote industrialization became even more acute.

(3) Start of SIRIM in 3MP

The policies that the Malaysian government adopted in response to the world economic flow can clearly be seen in the Third Malaysia Plan (3MP, 1976-1980). One such policy was the attraction of foreign corporations. The government established free trade zones in Selangor, Penang and Malacca State with a view to attracting multinational corporations that would trigger an industrial revolution in the country. Utilizing public finances boosted by oil exports, infrastructure development of ports, airports and roads was carried out in order to build an environment attractive to overseas corporations. Furthermore, the government adopted preferential measures for foreign capital such as exemption of tariff duties on products manufactured by locating industries in order to provide further incentive for Western corporations to locate in the FTZ.

Another key policy in the 3MP was the improvement in quality of domestic products geared to developing the local manufacturing sector with export competitiveness. In order to execute this policy, SIRIM was established as the agency for controlling national standards on length and weight, etc. Establishment of SIRIM had been under discussion since the start of the 1970s, and it eventually came into being based on the SIRIM Incorporation Act enacted in 1975 under the administration of Prime Minister Razak.

SIRIM commenced operations from the second half of the 1970s, just as JICA was launching its cooperation in Malaysia. As Mr. Sayama was surprised to find, the standard of Malaysian manufacturing at that time was far removed from the world level. Malaysian leaders realized that Malaysian products could not survive in globalizing world markets, however, many

representatives of the manufacturing sector were not aware of this necessity. The SIRIM officials who embarked on their mission amidst this environment of almost non-existent quality control awareness no doubt approached their duties with a sense of unease and anticipation.

Mr. Ab.Halim. Ab Rahman (the chief advisor or the SIRIM precision instruments executive department at the time of the interview), who entered SIRIM in 1979 and joined MITEC as an engineer in 1982 in the latter part of Phase 1, recalls the early days of trial and error as follows : "Even though Malaysia was aiming to achieve industrialization, it was still in the early days of development and quality control was viewed as something to be confronted well into the future at the end of the 1970s when MITEC was started. Almost all of the local metal processing enterprises were operated by ethnic Chinese, however, they were all micro enterprises and their products and technologies were not on a level comparable with the world standard. It was amidst such conditions that MITEC was launched. Around that time, there were no technical data concerning related metal industry corporations, and data building started with staff members visiting each workshop and manually collecting information one at a time. More than that, the MITEC employees only had shallow experience, while nobody was qualified enough to provide technical guidance to the local enterprises. At the start, at least three employees would visit Japan in order to learn Japanese technology every year."

However, the Government of Malaysia did not place too much expectation on this project in the early days. Mr. Azis Manan (retired as Vice President of SIRIM in 2004), who served as the director of MITEC from 1978 to 1982 (the JICA cooperation period was 1978 to 1984), looks back as follows, "Malaysia back then hardly had a manufacturing sector, and there weren't even five domestic electrical appliance makers. MITEC was launched in those conditions, however, since Mr. Mahathir (deputy prime minister at the time) attended the opening ceremony and government officials made frequent visits after that, we were always aware of the weight of expectation placed on us. All employees struggled to get used to their duties, however, I think we all gained a sense of satisfaction from the work. I believe that MITEC realized such steady growth thanks to the generous support of the government and the cooperation of JICA.

(4) Japan's Advice and the Establishment of SIRIM

There is no doubt that the key figures in establishing SIRIM were former Prime Ministers Razak and Mahathir and the leaders who accurately gauged the trend of the world economy at that time. However, the policy decisions of these leaders were influenced by what kind of advice and from whom? According to Mr. Azis, "The leaders at that time sought opinions from the World Bank and so on when compiling the MP, however, concerning MITEC, I heard that advice also came from Japan's MITI."

Concerning the reasons why Malaysia sought Japanese technical cooperation for SIRIM, Mr. Ab. Halim points to some good fortune that worked in Japan's favor: "The former suzerain Britain was also interested in cooperating with SIRIM, however, Britain still used pounds and

yards as units of weights and measures. Since the rest of the world adopting the metric system at this time, Malaysia thus elected Japan as its partner since it would provide guidance under this system too."

In order to ascertain the accuracy of Mr. Azis's recollections, we interviewed Mr. Sadao Sugita, who was assigned to Malaysia as the first secretary of the Japanese embassy from 1988 to 1991 (he later became a councilor in the MITI trade and economy bureau and currently serves as a senior director of the National Futures Protection Fund). He says, "It wasn't just Japan's influence. At the start of the 1970s when the plans for SIRIM first appeared, it is true that the MITI attaches who were in the embassy around that time gave various advice to Malaysian Government. I also talked about SIRIM to Mr. Rafidah, the Minister of International Trade and Industry. I think the attaches, who had realized Japanese cooperation for SIRIM, were hopeful of eliminating the influence of the former Suzerain Britain as much as possible and extending Japanese influence in its place."

Judging from the testimony given by officials of various circles on both sides in the interviews for this study, There is little doubt that the establishment of SIRIM, which helped promote industrialization in Malaysia, was decided based on the foresight of Malaysia's leaders, however, it is also fair to say that pertinent advice from external sources such as the Government of Japan and the World Bank, etc. also influenced the decision to establish SIRIM at an early stage.

3.2.2 Growth of SIRIM in Line with Malaysia's Economic Growth

(1) The Expanding Facilities of SIRIM

The vast headquarters of SIRIM in Selangor State is an impressive facility comprising a cleanly maintained building complex in well kept gardens. Whenever one visits, there always seem to be some works in progress. A new science building has only just been completed in 2009, however, when I visited at the end of 2009, renovation works were being carried out on the Environmental and Bioengineering Center. In front of this center is situated the towering headquarters building which contains the administrative sections, etc., and this itself is a modern structure only five years old and distinguished by dark blue panes of glass on white walls. Due to the sheer scale of this series of buildings, the site in Shah Alam district has become too cramped, so the National Metrology Laboratory has been newly constructed (as another modernistic building) in Sepang a little bit apart from Shah Alam.

Mr. Chen Sau Suhn of the Environmental and Bioengineering Center, which participated in two projects, MITEC from 1981 to 1983 and the Project on Risk Management of Hazardous Chemical Substances based on cooperation with JICA from 1998 to 2002, laughs as he says, "I spent around three years studying in the United Kingdom in the latter 1990s, however, the SIRIM expansion works were still going on when I left and when I came back home. How much more will it grow?" Evidence of the evolution of SIRIM is there for all to see in the expansion of its

buildings.

(2) Transformation of JICA Cooperation in Line with Changing Malaysian Industry

The thrust of JICA's cooperation with the expanding SIRIM changed in line with qualitative changes in Malaysian industry. Malaysia has compiled the Malaysia Plan every five years since 1966 to provide guidelines for its industrial modernization. Currently the Ninth MP (2006-2010) is in implementation, while the 10th MP is scheduled to start from 2011. The MP is always compiled while reading future trends in the world economy and with an eye to what will be required in Malaysian industry five and ten years from now. SIRIM has continued to provide the technologies that have supported Malaysia's economic policy.

JICA's cooperation projects with respect to SIRIM over the past 30 years or so have comprised the following 13 projects as shown in Table 3-1 and 3-2. On carefully examining the achievement targets of these 13 projects, it can be seen that JICA cooperation and Malaysian industry have the same goals for five years and 10 years into the future.

Looking back on the changes in Malaysian manufacturing from the 1980s when JICA cooperation for SIRIM became full-fledged, there was a shift from agricultural products, processed forestry products and simple processing of chemicals based on coconuts to domestic electrical appliances, cosmetics and automobiles. The largest project during this period was the establishment of Proton Co. in 1983 and the launch of Malaysia's first ever domestically built car the 'Proton Saga' in 1985. The idea of producing a fully domestic car may have seen reckless, however, there is no doubt that the quality control technology of SIRIM which received cooperation from JICA in the fields of metal engineering, ceramics and casting, etc., combined with the technical guidance provided by the tie-up partner Mitsubishi Motors, made a significant contribution to improving quality of parts in the wide-based automobile industry.

(3) Requests for Domestic Certified Capacity from Large Japanese Affiliated Corporations

In the early 1980s, Latin American countries such as Mexico, Brazil and Venezuela were confronted with a foreign currency crisis and fell into default on their foreign debts. As a result, multinational corporations rushed to withdraw capital from Latin America and instead looked to the politically and socially stable countries of ASEAN such as Malaysia and Thailand from the latter part of the 1980s. Japanese corporations too became more interested in Asia and its cheap labor because they were also affected by the currency crisis and appreciation of the yen following the Plaza Accord of 1985. Prime Minister Mahathir announced a policy permitting the entry of 100 percent foreign-owned corporations in 1986, and this triggered a rush of investment by international corporations into Malaysia at the start of the 1990s. Looking at statistics (Malaysian Industrial Development Authority, MIDA), foreign investment into Malaysia jumped by more than ten-fold from 1,688 million RM in 1986 to 19,848 million RM in 2000.

Against this background of change in the international economy, the number of multinational corporations entering Malaysian FTA which were established in 3MP increased rapidly from the

second half of the 1980s. Japanese multinationals that entered FTZ at this time included Panasonic, Sony, Toyota Automobiles and KDD (Kokusai Denshin Denwa), etc. At the same time, numerous European and American companies such as Volvo (Selangar), Intel and Ford (Penang) also set up in the FTZ.

The local Malaysian manufacturing sector, which comprised numerous corporations run by ethnic Chinese, was very keen to supply parts to the incoming multinationals, and the multinationals also wanted to procure parts locally. However, due to the poor quality of Malaysian-made parts at that time, hardly any corporations actually decided to purchase parts locally. In these circumstances, the JICA cooperation project in SIRIM, which worked hard to extend national standards to the metal engineering, ceramics and casting sectors, etc, contributed to the improvement in quality, homogenization and safety of Malaysian products, and this encouraged the foreign multinational corporations to trust local quality enough to purchase locally manufactured parts some years later. Having secured supply destinations in this way, the local corporations became stronger and stronger so that by the end of the 1990s the reputation of 'Made in Malaysia' products in trade markets was good.

People from that era also testify to the deep relationship that existed between SIRIM's research and the needs of the advancing corporations. M. Zamiri (leader of the SIRIM electric and electronics department at the time of the interview), who was involved in the project for capacity building for international standard testing of electrical products, looks back as follows: "Malaysia had an electrical product inspection agency before the JICA project was started. However, since this wasn't internationally recognized, the incoming corporations sent their products to inspection agencies in Japan and Australia in order to clear international criteria and obtain certificates before exporting. When our project got underway, a large number of domestic electrical appliance makers had already set up operations in Malaysia and they were desperate to see the establishment of a domestic inspection system for Malaysian products. They were keen to see the launch of the project in the fields of weighing and fine ceramics, etc." as may be gathered from Mr. Zamiri's words, the JICA project in SIRIM had the dual objectives of contributing to the local economy and benefiting the Japanese affiliated corporations that had located in Malaysia.

The technical capacity of SIRIM improved every year after its establishment. In terms of the number of national standards that comply with the calibration and measurement accuracy required for international application by Bureau International des Poids et Mesures (BIPM, based in Paris), Malaysia has 695 such standards in the electric field, 21 in the vibration and noise field, 15 in the mass and radiation field, seven in the length sector and six in the temperature field, etc. Among ASEAN countries, Singapore also has many BIPM recognized domestic standards, but these are mainly focused in the electric field (1,219) but include none in the radiation and vibration and noise fields. Thailand has 313 BIPM recognized domestic standards in the electric field, 30 in the mass field and only four in the temperature field. Indonesia too only has 49 in the electric field, 27 in the mass field, five in the length field and two in the temperature field. Thanks

to the contribution made by SIRIM, Malaysia has achieved an excellent record of establishing domestic standards compared to the countries of ASEAN and other developing nations.

(4) Major Contribution to Export Growth

Through bringing Malaysian quality control up to international level and enhancing the reliability of Malaysian products, SIRIM's achievements helped boost Malaysian exports. Various officials give testimony to this fact.

Tankers sailing through the Straits of Malacca

Mr. B. G. Yeoh (current client manager at Eco Securities), who worked as a manager in the JICA project on hazardous chemical substances assessment and analysis and industrial waste treatment technology in SIRIM, says the following: "The government had only just established the Chemical Act at the start of the 1990s, and I was working on developing a chemical substance inspection system in the JICA project. At that time, even though overseas corporations required MSDS (Material Safety Data Sheets) to be appended to products, since Malaysia had no legislation concerning the inspection of chemical substances, industry had little interest in the safety of chemical products. There was also no organization capable of certifying international level safety, which was indispensible for conducting exports. We now have the Occupation Safety, Health Act and there is greater interest in safety of chemical substances from industry. SIRIM became capable of issuing MSDS, etc. and I am proud to say that the projects I worked on helped enhance safety control of chemical substances in Malaysia. You could say that SIRIM increased exports of Malaysian chemical products, albeit in an indirect way."

An indicator for viewing changes in the industrial structure of Malaysia is the calendar year statistics for Malaysian exports. Looking at data (trade directory) issued by the Malaysian Ministry of Finance for the period from 1980 to 2000, the value of Malaysian exports displayed staggering growth in all sectors over this period, for example, it grew from 33,250 (million RM) in 1981 to 233,379 (million RM) in 2000 (approximately an 80-fold increase) in the machine and transport-related product sector (incidentally, the figure in 2007 was 268,522 (million RM)); from 192 (million RM) to 14,278 (million RM) (approximately a 70-fold increase) in the chemical products sector (in 2007, 41,445 (million RM)); and from 3,281 (million RM) to 25,788 (million RM) (an 80-fold increase) in the industrial processed product sector (in 2007, 63,727 (million RM)).

The machine and transport-related products sector, chemical products sector and industrial processed product sector are all linked to the sectors in which JICA offered cooperation to SIRIM. The growth in Malaysia's exports has been driven by Malaysia's own efforts, however, Japanese

cooperation has also had an impact. Although it is difficult to find tangible outcomes of this technical cooperation, the outputs of it may be gathered from these trade statistics and the testimony of related officials such as Mr. Yeoh.

3.2.3 SIRIM – Suited to the Culture of Malaysia as a Trading Nation

(1) An Inherent Feel for Weights and Measures

The Jesuit church on a hill overlooking at Straits of Malacca, built by the Portuguese who occupied the city of Malacca on the west cost of the Malay Peninsula at the start of the 16th century, has all but collapsed and become ruins except for the restored entrance. However, the high stone walls that enclose the church still display the dignified appearance of all those years ago. Francisco Xavier also stayed at this church during his Christian missionary work in the East Indies, and it is here that Xavier made the decision to carry Christianity to Japan too following a meeting with the Japanese man Yajiro, who had escaped to Malacca from Japan after murdering a man in his native Satsuma.

Going down beside the church, one can see the ruins of the main gate of Fort Santiago, and looking beyond the red-roof community housing to the right, one can see the Straits of Malacca frequented by huge tankers and container vessels. Measuring approximately 900 km in length, the Straits of Malacaa are one of the most important sea lanes in the world together with the Suez Canal, Panama Canal and Straits of Hormuz, and it is navigated by more than 50,000 vessels per year. For Japan in particular, the Straits of Malacaa are literally a lifeline since 90 percent of the tankers that carry crude oil from the Middle East to Japan pass through here.

Facing onto the Straits of Malacaa connecting the Pacific Ocean to the Indian Ocean, the city of Malacca prospered from the age of navigation as a port of call for ships travelling on the northeastern and southwestern monsoon routes. Malacca, which was named after the Arabian word ‘Melakat’ meaning market, became the largest trading city in Southeast Asia and a center for abundant Asian specialties such as trade in cloves, cumin, sesame, fennel seed, sandalwood, lauan and pine resin, etc.

In the spacious lobby of the SIRIM National Institute of Metrology in Sepang, there is an exhibition showing the history of Malaysian weighing. The exhibit, which includes scales, beam balances, platform scales and weights, etc. dating back a hundred years, shows the weighing tools that were previously used in trade settings in the past. A major factor behind Malacca’s continued status as a strategic hub of east-west trade was the fact that the local people had the know-how and infrastructure to

Exhibit of old weights and scales at NIM

support trade, for example, the ability to accurately measure quantities of products, the capacity to calculate prices and tariffs, and the ability to control quality, etc.

With the onset of the 19th century, the Malaysian economy developed on the back of exports of natural rubber and tin, while it became an exporter of crude oil in the 1970s. In other words, the Malaysian economy has always relied heavily on trade, and the know-how of weighing and quality control so essential for supporting the reliability of exports is a national asset. The fact that Malaysia was the first among other developing nations to establish a national standards institute at the start of the 1970s was a natural outcome in view of its history as a trading nation and culture that had placed importance on weights and measures since the 15th century. Moreover, an essential condition for growth of the national economy was the possession of world class quality control standards.

(2) Aided by Dissemination of ISO9000

In addition to these moves by the government, the spread of quality certification systems primarily in Europe in the latter 1980s became an external factor that also enhanced the importance of SIRIM. The ISO9000 quality certification system was developed in Europe in 1987. ISO9000 was a quality control system for measuring the mass and length, etc. of products according to specific documented international criteria and for certifying products deemed to be in conformance. Corporations in Japan and the United States, which had confidence in their traditional product control technologies, were initially not very enthusiastic about acquiring certification under this system, which gave attention to the European Union (EU) of documenting and displaying all products. However, as the number of corporations who refused to purchase products unless they had ISO9000 certification increased, the number of Japanese and American corporations acquiring it grew in the 1990s, and ISO has today become such an essential system for trading that it is known as the passport to international transactions.

As the trend of ISO9000 became a dominant force in the new world order, it became urgently necessary for Malaysia to establish an agency for promoting quality control, and expectations in this area came to focus on SIRIM, which was the organization responsible for implementing technical control of the national standards that provided the basis for quality control and safety standards in all sectors. The measuring instruments possessed by Malaysian authorized calibrators at the start of the 1990s lacked reliability because the SIRIM National Metrology Laboratory (NML), in charge of measuring and certifying accuracy, still had not obtained authorization from the Malaysia Department of Standards (DSM); moreover, Malaysian national standards for length and mass, etc. were not at the international level. Accordingly, Japanese affiliated corporations such as Panasonic and Sony which located in the FTZ in Selangaor regularly sent measuring instruments weighing up to a ton not to the NML (the authorized calibrator in Malaysia) but to authorized calibrators in Japan, and this was clearly an inefficient process. Other foreign affiliated corporations who were unhappy with such a situation also made forceful demands for Malaysia to raise its certified calibrating capacity.

However, thanks to the efforts of officials concerned and the cooperation of JICA, SIRIM was able to build its technical capacity. Around the middle of the 1990s, the measuring capability of NML became internationally recognized, while by the end of the 1990s it was able to calibrate the standard instruments used by other authorized calibrators. Malaysia currently has 48 authorized calibrators (as of December 2009), and they have made a massive contribution to the growth of Malaysian exports. Various other effects can be pointed to, for example, thanks to the cost reductions made possible by savings on calibration expenses, foreign affiliated corporations have acquired greater international competitiveness for their products. Needles to say, the technical reform of SIRIM has played a crucial role in supporting this enhancement in confidence placed in Malaysian products.

(3) Carefully Prepared Privatization Success

If the growth of ISO was an external factor that stimulated SIRIM, the privatization that was implemented in 1995 became a factor that triggered SIRIM's reform and growth from the inside. The privatization of SIRIM (more accurately, public management whereby the finance ministry owns 100 percent of shares) was something that was examined from the late 1980s. At that time, numerous countries throughout the world were switching to the privatization of government-owned agencies with a view to achieving efficient operation. In the case of SIRIM privatization, it was fortunate that similar privatization of public agencies in Latin America during the 1980s provided ideal teaching resources. Numerous Latin American countries were plunged into fiscal difficulties due to the financial crisis that started Mexico's debt default in 1982. In order to reduce the financial burden of the public corporations and public agencies that had successively established during the 1970s, these countries were practically forced to resort to privatization in the 1980s. There were a few successful cases, but in many cases this privatization ended in failure. Among the failures, public corporations that had conducted social services were unable to maintain the quality of such services due to over-concentration on management efficiency following privatization.

Malaysia carefully analyzed these cases from Latin America when implementing the privatization of its publically owned organizations. As a result, it was able to separate profitable businesses such as iron making and car manufacture from social services such as waterworks and sewerage, and to spend a lot of time preparing for the privatization of the latter and thereby ensure that customer services were not adversely affected. Naturally SIRIM was included among the fields with high social benefit, and preparations for privatization were started from the start of the 1990s.

Dr. Tajuddin

The prime mover in this privatization process was Dr.

Tajuddin (current Chairman of United Engineering Malaysia), who was the president and CEC of SIRIM at that time. Dr. Tajuddin looks back on the circumstances surrounding privatization as follows: “The trend in many countries was towards privatization in the early part of the 1990s, and I also proposed this to Prime Minister Mahathir in 1994. In response the prime minister instructed me to immediately put it into effect, so we got down to work straight away. The first thing we worked on was to make the employees more customer-oriented in their thinking. This would appear to be simple, however, we in fact had trouble transforming the consciousness of employees, who were after all public servants, to a more customer-oriented style. However, SIRIM succeeded in this area. I believe the firm establishment of customer-oriented thinking in SIRIM helped ensure the smooth business management of SIRIM after privatization. In practical terms, more than the SIRIM privatization act of 1995, the meeting of the board of directors in 1996 was crucial. Numerous voices casting doubt on privatization were raised in the board meeting, however, following discussion the proposed plan was approved without any changes by the board, and I believe that this built the foundations for the SIRIM we see today.

(4) Reservations from the Private Sector

SIRIM thus safely negotiated two important turning points, however, reservations were raised within the private sector about these two reforms. Mr. Mustafa Mansour, Chairman of the Federation of Malaysian manufacturers (FMM), responded to our interview on two occasions and added the following stiff order: “I operate a ceramics business and, thanks to the technical capacity building of SIRIM, we have earned enough international confidence to export our products to Canada. However, there are many other manufacturing enterprises that want to export their products but complain that the high cost of obtaining internationally recognized certification puts pressure on their operations. There are strong demands for SIRIM to lower the cost of certification fees and shorten the time required to issue certificates. SIRIM needs to conduct guidance of certified calibrators more from the standpoint of the users.”

Mr. Azizah Salim, chief researcher in the quality institute of national car maker Proton, also voices a harsh view when he says, “There are 240 parts suppliers under the Proton aegis, so when Proton makes an effort to improve quality, these 240 enterprises must do the same. Since the Malaysian government avoids adopting such an approach as a national policy, Proton has no plans to acquire ISO certification in the immediate future. Of course, Proton is devoted to quality control, and we consign the difficult calibration of electrical instruments to our tie-up partner Mitsubishi Motors and the certified graduation calibrator Sime-SIRIM Technology (SST), which was established in a joint venture between SIRIM and a private sector enterprise. However, not only does SST take two months to perform calibration of instruments, its levels of accuracy are not satisfactory.”

In Malaysia, apart from makers that aim to conduct exports, not many enterprises are interested in costly high-level quality control. However, widespread quality control capacity building will be indispensible in order to realize the sophistication of existing industries that will

be aspired to in the 10th Malaysia Plan (10MP) starting in 2011. It will be necessary to quickly share the importance of high-level quality control as a state concept.

3.2.4 Gotong Royong and Village Society (Japanese know-how and trust of Japan in SIRIM)

(1) An Unexpected Reunion in Shah Alam

Shah Alam in Selangor State is one of the free trade zones that were established during the 3rd Malaysia Plan (3MP). Massive factories belonging to multinational corporations are found lined up between verdant tree-lined roads and parks, while the city center is inhabited by hotels and restaurants frequented by international businessmen. This district has a somewhat artificial and American feel slightly removed from the traditional townscapes of Malaysia.

On May 1, 2009, just as evening was drawing in, 15 gentlemen were gathering at a restaurant in the Conrad Hotel in central Shah Alam. Among those gathered were Yahaya Ahmad, Chairman of SIRIM, and other executives of SIRIM. As the group talked over a meal of Malay cuisine, Mr. Nariaki Sugiyama (64), an advisor to Malaysia Panasonic, was the central figure. Mr. Sugiyama taught Japanese metal processing technology as a JICA expert at the Metal Industry Technology Center (MITEC) of SIRIM in Shah Alam for two years from August 1982 to August 1984.

After finishing his assignment at MITEC, Mr. Sugiyama remained another four years in Malaysia at Malaysia Panasonic, and after returning to Japan in August 1988 he worked for Panasonic in Osaka, in the production engineering headquarters. He sought early retirement in February 2002, but returned to Malaysia Panasonic once again in March 2009 as an advisor. It is rumored that Messrs. Fuad and Ahmad, who learned press technology under Mr. Sugiyama at MITEC, found out about Mr. Sugiyama's return to Malaysia Panasonic. On hearing this, former trainees who received technical guidance from Mr. Sugiyama at MITEC made plans to host this reunion as a welcome-home party. Although not a direct acquaintance, Mr. Yahaya expressed thanks for Mr. Sugiyama's cooperation during the early days of SIRIM, and the board members from that time also attended the get-together. Since Malaysia is an Islamic nation, the reunion was a non-alcohol affair but the conversations went on for three and a half hours.

Mr. Sugiyama was very moved by the gathering and remarked, "I never realized that the work I did 28 years ago was so appreciated in Malaysia. The three and a half hours passed very quickly. I am delighted that my work pleased my partners and made some contribution to the industrial development of Malaysia." Messrs. Fuad and Ahmad, who hosted the party and took part in the interview with Mr. Sugiyama, have utilized the technology they learned at MITEC and have become president and vice president of their own respective pressing companies. They commented as follows: "Even though Mr. Sugiyama was the instructor, he wore the same overalls as us when teaching us practical skills. We were surprised because we had never met such a foreign person before. Mr. Sugiyama's Japanese style of guidance was very easy to understand and helped us quickly learn the technology."

(2) Japanese and Malaysia Thinking with Much in Common

Having benefited from 30 years of JICA cooperation, SIRIM is highly regarded within Malaysia. Among the factors that contributed to the success of SIRIM was the fact that the environment on both sides was unusually favorable in many respects.

One of these advantages was the fact that the national character of both countries is very similar. Malaysia has traditionally cherished the philosophy of Gotong Royong, which means suppressing individual desires and cooperating for the overall good of society. This philosophy has more in common with Japanese group thinking rather than the individualistic thinking of Europe and America. The reason why Malaysians were able to accept the guidance of JICA experts and the training in Japan so readily was because they were nurtured in a similar culture and both sides could empathize with each other. The tractability and cooperativeness, i.e. Japanese traits, of Malaysian people helped them understand the true meaning of the Japanese style of guidance.

Another important factor was the 'look east' policy of learning from Japan and South Korea that was purported by Prime Minister Mahathir, who facilitated the economic growth and reform of Malaysia, six months after coming to office in 1981. During the period from the second half of the 1980s to the middle of the 1990s, when SIRIM improved its technical capacity, secured international trust and achieved privatization, the Japanese economy still retained major influence on the global stage in spite of the bursting of the economic bubble around this time. In addition to the encouragement of the prime minister, there was a strong desire among Malaysian people to learn from vibrant Japan.

JICA experts from that time testify to the unquestioning belief in Japanese technology and willingness to learn of the Malaysian counterparts as follows: "They absorbed our technology like a sponge." The government didn't only talk about 'look east,' but it also provided abundant funds to the necessary programs. Ample budget was always set aside for SIRIM, and Mr. Aziz who was director of MITEC from 1978 to 1982 had the following to say: "Fortunately, the government provided almost all we needed from the start of SIRIM. There were absolutely no problems regarding funds and human resources on the Malaysian side."

Another factor behind the success of SIRIM was that, in spite of the wide disparity in technical capacity between Japan and Malaysia, the guidance was kept to a manageable level. When the JICA technical cooperation with SIRIM started at the start of the 1980s, Malaysian technology was approximately 20 years behind that of Japan. Since Malaysia always compiled national economy growth plans with a view to technical innovations 10 years down the road, the learning of technology from Japan, which was 20 years ahead, represented development on a level two national plans ahead. Since then, the technical gap between both countries has closed somewhat and today stands at approximately 10 years.

Meanwhile, just as JICA was starting its SIRIM cooperation program at the start of the 1980s, Japan's economy was about to dominate the global economy and Japan's ODA budget was

showing double digit growth on its way to becoming the biggest in the world. Although Japan's ODA budget was reduced from fiscal 1988, it remained the world's biggest donor throughout the 1990s and did not struggle for funds. It should not be forgotten that this was an age when ample financial and human resources could be devoted to the numerous requests for assistance that came out of Malaysia then.

Another noteworthy thing was the quality of Japanese style economic cooperation at this time. Many of the Malaysian counterparts who responded to interviews remarked that, "the Japanese experts were not afraid to sweat and get their hands dirty on the frontline;" whereas their impression of European and American experts was that "they don't go onto the frontline very often." Leaving aside the question of which approach is better, a sense of favoritism towards the Japanese experts can be sensed from these words. As is the case throughout the rest of the world, this study reaffirmed the fact that the Japanese style of cooperation which doesn't take a haughty approach was also received gratefully in SIRIM.

Incidentally, the reunion between Mr. Sugiyama and his former counterparts was followed by a trip to the bowling alley, indicating the level of trust and rapport that was developed between both sides through this work.

3.2.5 View from SIRIM

(1) Vibrant Early ODA

One thing that continually impressed during this study on the early days of SIRIM 30 years ago was the feeling of vibrancy of Japanese ODA, in which the public and private sectors collaborated to promote economic cooperation, at that time. Such vibrancy cannot be sensed from ODA frontline activities today. Today's programs are advanced in orderly fashion without mishap, however, one doesn't feel the same human warmth of old.

While looking back at the SIRIM project, there were many days when the study team wondered if good results could be achieved via ODA simply through lofty theory. One gets the feeling that it is about time we modified the recent approach to Japanese aid, which tends to be top-heavy and dominated by Western aid theory, and revert to the more traditional Japanese approach while merely using the Western model for reference.

The ODA which Japan implemented for ASEAN over many years was a case of unusual success in the aid field. There is no need to throw out those past techniques. Looking back on this past experience of the early SIRIM experts where excellent cooperation was realized through warm feeling and practical technology even though English ability was limited, the study team considers it necessary to review the approach to Japanese style economic cooperation. Now that the free world economy finds itself recovering from collapse after becoming too overheated, similar reflections have led to the desire to review traditional Japanese institutions such as lifelong employment and consensus based on consultation which previously helped create the

world's second greatest economic power.

Another thing that is crucially lacking in current ODA is awareness of the objective of ODA, i.e. why is it implemented? Without a clear objective, for example, to secure resources, support the activities of Japanese corporations, ensure comprehensive security, enhance Japan's presence in the international community or provide humanitarian support, it will not be possible to secure the understanding of citizens for ODA, and motivation will be low among JICA personnel and stakeholders on the JICA side. It is urgently necessary to build a common goal of ODA that the Japanese people can unite behind. Such policy building is conventionally the work of the government and ministry of foreign affairs, however, JICA should also play an active role in policy building in view of its vast know-how as the implementing agency.

(2) Numerous Lessons Obtained from SIRIM

Numerous specific lessons were learned from the SIRIM experience. These are described below.

1. Self help refers not only to repaying debts. The most important thing is for the country receiving aid to masticate on the technology that it has been taught. SIRIM spent time masticating and implementing the technology it was taught in Phase 1, and then it requested further cooperation only for the parts still lacking a few years later in Phase 2. This SIRIM model for receiving aid is highly commendable and worth conveying to other countries.

2. When projects start generating a good trend of results as in the case of SIRIM, it is best not to curtail the cooperation just because the period of assistance expires. Since successful projects become the assets of both countries concerned, there should be no hesitation in continuing them over the long term. SIRIM's technology has succeeded in reaching a certain level, however, it is still 10 years behind Japan in some respects and there are still numerous other fields for assistance. On the other hand, it is also necessary to curtail projects that are clearly not producing the desired results even if it means doing so in midstream.

3. Emphasis on Asia: Japan and Asia belong to the same arena, they have much in common in terms of culture, lifestyles and philosophy, and they are viewed as a single category within the international community. In order for Japan to sustain its presence on the increasingly multi-polarized world stage of the 21st century, it must collaborate closely with the local Asian community. Needless to say, emphasis on Asia is crucial in the field of ODA too. There will be two distinct streams in Asian ODA from now on: the first will be conventional assistance to later-developing nations such as Cambodia. Japan previously provided the driving force behind the Asian miracle through providing concentrated ODA to the region. If this know-how can be utilized in support for later-developing Asian countries, it will be possible to implement effective ODA. The other stream will be

economic cooperation for semi-advanced nations which are developing hard on the heels of the advanced countries. In such countries as Malaysia and Thailand, it will be necessary to consider methods of cooperation which ensure that past assets such as human networks and facilities continue to be utilized after these countries graduate from aid. Malaysia is seeking further sophisticated technology from Japan, and Japan should consider methods for sustaining economic cooperation to Malaysia following this graduation. In terms of Malaysian economic indicators, there is no need to count Japanese economic cooperation for Malaysia within DAC/ODA. It is maybe time to consider a unique approach to economic cooperation (as opposed to overseas aid or OA) that benefits both sides.

4. SIRIM was able to comply with ISO criteria promoted under EU initiative some 20 years after its establishment. Japan cooperated with the development of SIRIM throughout its early days, however, it didn't make the effort to introduce a quality control certification system such as ISO into Malaysia (Japan uses the JIS standard). When it comes to conducting future cooperation in the software field, it will be necessary to consider the area of institutional design so that the outputs of cooperation are sustained.

5. Malaysia is appropriate as a partner in three-way cooperation. During the field survey in Malaysia, there were strong calls for collaboration with Japan in promoting south-south cooperation. However, the impression gathered from officials in both countries is that three-way cooperation should be limited to the vertical approach of Japan-Malaysia-later-advanced nations. More research needs to be devoted to finding ways to implement horizontal triangular cooperation whereby assistance is built on a platform comprising the mutual relative advantages of both Japan and Malaysia (in Malaysia's case, features include influence in the Islamic world, medium-level advancement and multiracial society, etc.).

6. There is growing potential for assistance cooperation with Malaysia and other aid countries in Asia. As the sole assistance advanced nation in Asia, Japan should start considering preparations for the creation of an Asian version DAC from now on.

7. Promote the archiving of past successful economic cooperation. The study here revealed that records tend to become scattered after JICA projects have finished. In addition to archiving such records, it is necessary to organize human resources on the side of recipient countries and to create networks of Japanese personnel.

8. It is necessary to compile oral histories. The study here found that JICA personnel and experts who were involved in early ODA have either passed away or cannot accurately recall past events. The words of these people who implemented Japan's economic cooperation are living educational resources and historical testimony of Japanese assistance. It is necessary to record the experiences of these people in conversational format. Since documents alone cannot provide the whole story, such oral records could

contribute to the success of future JICA activities.

(Author: Tsuneo Sugishita)

Chapter 4

Singapore

Chapter 4 Singapore

4.1 Summary of Technical Assistance for Human Resources Development and it's Achievements

4.1.1 Economic and Industrial Policy and Structural Changes in Singapore

Transitions in Economic and Industrial Policy, etc. in Singapore

1960s	Import substitution industrialization (attraction of labor-intensive industries)
1965	Independence
Early 1970s	Export promotion-oriented industrialization (active attraction of foreign capital through preferential measures)
Late 1970s onwards	Transition to knowledge, technology and capital-intensive high added value industries
Late 1980s	Industrial promotion as a total business center Emphasis on technological innovation via service promotion and R&D activities
1989	Surpassing of per capita GDP of US$10,000
Start of 1990s	Strengthening of global and regional trade system Active promotion of WTO, AFTA and bilateral FTA, etc.
1994	Surpassing of per capita GDP of US$20,000
2006	Surpassing of per capita GDP of US$30,000
2007	Per capita GDP overtakes Japan

Source: Created from available materials

Following independence in 1965, Singapore promoted import substitution industrialization, however, in the first half of the 1970s it carried out a major policy shift towards export promotion industrialization geared to vigorously attracting foreign capital and multinational corporations through various preferential measures. This was a pioneering approach within Asia and it led to the location of numerous foreign capital and multinational corporations in primarily labor-intensive industries and heavy and chemical industries such as petrochemicals, and the Singaporean economy grew steadily as a result.

Towards the end of the 1970s, the following trends became apparent:

- Singapore's per capita GDP exceeded US$5,000 and its economic development progressed to semi-advanced status on a par with South Korea and Taiwan, etc.
- Neighboring countries were also realizing sustained economic development.
- There was a growing trend towards protectionism among the advanced nations.

In these circumstance, the Government of Singapore adopted the policy of vigorously shifting from an economic structure comprising mainly labor-intensive industries to high added value industries based on knowledge, technology and capital. The government recommended that

wages be raised by 20 per cent on average in 1979, and the aim of this was to promote aggressive wage hikes and thereby eliminate low added value and labor-intensive industries. At the same time, the government supported transition of the industrial structure through diverse policies such as the creation of the Skills Development Fund (SDF), founding of the National University of Singapore, reduction of tariffs on a wide range of items, announcement of 13 sectors for preferential treatment of foreign capital, and so on. This was the age when JICA launched international cooperation in the shape of the Singapore Productivity Development Project (SPDP) and Information Processing Technology Training Center, etc.

As a result of the government's industrial structure transition policies starting with the wage hikes, the start of the 1980s was marked by the withdrawal and contraction of labor-intensive industries and expansion of investment for mechanization and automation geared to saving on labor. At the same time, investment was increased in high technology sectors and all these changes resulted in the diversification of the industrial structure and adding of higher value to products. Furthermore, in line with the growth in wages, the resulting increase in individual consumption and plant investment also made an important contribution to boosting the economy. The financial and business services sector, which accounted for 14 percent of GDP in 1970, came to account for around one-quarter by the middle of the 1980s, and this came to play an important part in establishing Singapore as a financial center of Asia as well as becoming one of Singapore's main industries.

Singapore experienced negative economic growth for the first time in 1985 due to a worsening of the international economy, etc. In response, the government made a policy shift away from its prior emphasis on manufacturing towards the "realization of an international total business center" through aggressively expanding exports of services in the same way as products. This aimed for the balanced development of manufacturing and related service sectors through the enhancement of R&D, promotion of technological sophistication and higher added value in manufacturing, promotion of regional operational headquarters (RHQ) and privatization of state enterprises, etc. From the second half of the 1980s, R&D investment centering on multinational corporations in Singapore expanded against a background of a stable business environment, vigorous support policies by the government, outstanding human resources and infrastructure, and so on. In 1998, Singapore formulated a plan for construction of a 'science hub' aimed at consolidating high tech, science and technology R&D human resources centers from the viewpoint of enhancing the R&D sector, and in 1999 it announced 'Industry 21'giving further emphasis to R&D and seeking to shift even more to a knowledge-intensive economic structure, and this policy is continuing today.

Moreover, responding to economic development in the countries of ASEAN, Singapore's external economic relations started to grow and display qualitative shift from the start of the 1990s as Singaporean corporations increased overseas investments, etc. The Government of Singapore has contributed to the construction of an open world trade system through the activities

of AFTA and WTO and has taken a positive approach to establishing and improving the international economic and industrial environment. It has also taken a positive approach to bilateral FTA, and the Japan-Singapore Economic Partnership Agreement (JSEPA) was initiated.

In 2005, the Economic Development Board (EDB) announced the New Manufacturing Strategy (SECRET) based around six key strategies including reduction of total cost through strengthening of supply chains, diversification of the customer base for supporting industries, nurturing of new industrial fields through utilizing the existing major industrial infrastructure and so on. SECRET aims to achieve a set a numerical targets by 2018 including ① doubling of production turnover and added value in the manufacturing sector, ② increase in the employment rate of technical workers, ③ maintenance of a GDP share of 25% for manufacturing, and so on. Accordingly, Singapore is continuing to implement policies geared to emphasizing manufacturing[1].

This establishment and improvement of the business and management environment and the resulting vitalization of corporate activities in Singapore have greatly contributed to the expansion of high tech business activities and R&D and the growth and diversification of investment from advanced countries and Asia as corporations seek to use Singapore as a regional headquarters (RHQ) or base for business activities in Asia. As a result, Singapore has sustained steady economic growth as may be gathered from the increase in per capita GDP.

4.1.2 Transitions in the Singaporean Economy (1981-2008)

This section discusses transitions in the related economic indicators of Singapore from 1981, just before the start of the Singapore Productivity Development Project (SPDP), to 2008.

Since the economy of Singapore is small in scale and highly dependent on exports, it is greatly influenced by international economic trends centering on advanced countries, and it has generally displayed a relatively steady growth rate from the 1980s to today. GDP, which stood at US$113.9 in 1981, had reached US$163.1 billion by 2009, indicating economic growth of 11.7 times in just under 30 years. Looking at GDP trends, following a period of steady growth from 1987 to 1998, there was a stagnant spell, and then a further burst of growth after 2004. As a result, per capita GDP had reached US$34,346, exceeding that of Japan and reaching a level approximately 6.3 times greater than the 1981 level, by 2009.

[1] From the JETRO homepage (http://www.jetro.go.jp/world/asia/sg/invest_03/)

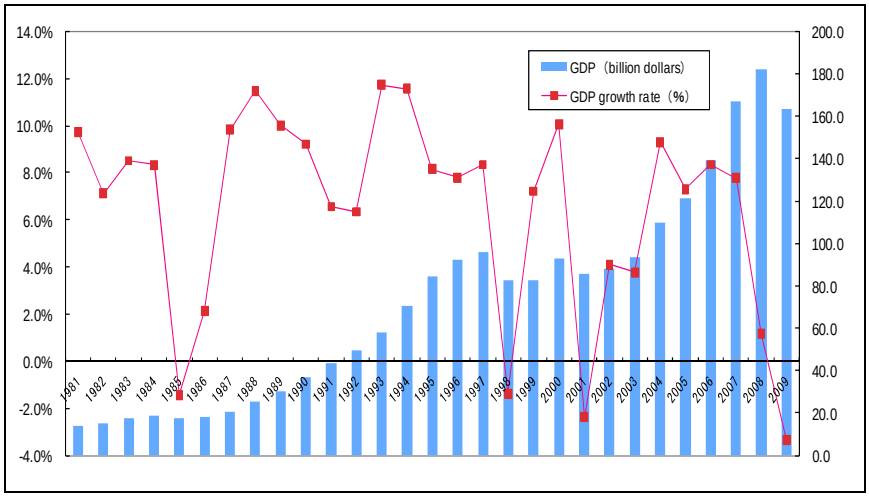
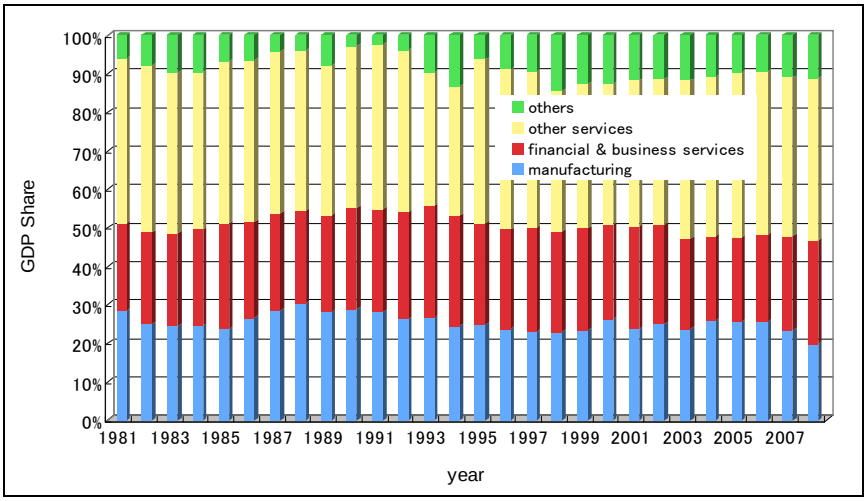


Figure4-1　Transitions in Singapore GDP and Economic Growth Rate

Source:　Prepared based on the IMF World Economic Outlook Database.



Figur4-2　Transitions in GDP Share by Industry

Source: Prepared based on the Yearbook of Statistics Singapore.

Recently in Singapore, attention tends to be directed towards the service sector based on financial and business services, however, looking at the breakdown of GDP by industry, the share of manufacturing remained constant at almost 30 percent until 1991, except for a brief period from 1982 to 1986 when it dipped to around 25 percent. After that, the share fluctuated at or just under 25 percent and was 23 percent in 2007, indicating that manufacturing still plays a significant role. Having said that, the GDP share of manufacturing in 2008 was 20 percent, representing a major drop of 3 percent over the previous year.

One of the biggest factors supporting expansion of the Singaporean economy and manufacturing has been the growth of external economic relations and exports. The value of exports increased by just over 10 times (slightly less than speed of the growth in GDP) in just under 30 years from 1981 to 2008. In particular, looking at machine instruments and parts, there

has been an amazing 20-fold growth rate. This growth in export value, especially exports of machine instruments and parts, has displayed a similar trend to the previously indicated rate of growth in GDP, confirming the trend that export trends have had a major impact on GDP until now. Moreover, in line with the expansion of GDP and exports, the Singaporean current account balance has consistently been in the black since 1988, while the trade balance achieved a surplus in 1998 and has been growing ever since.

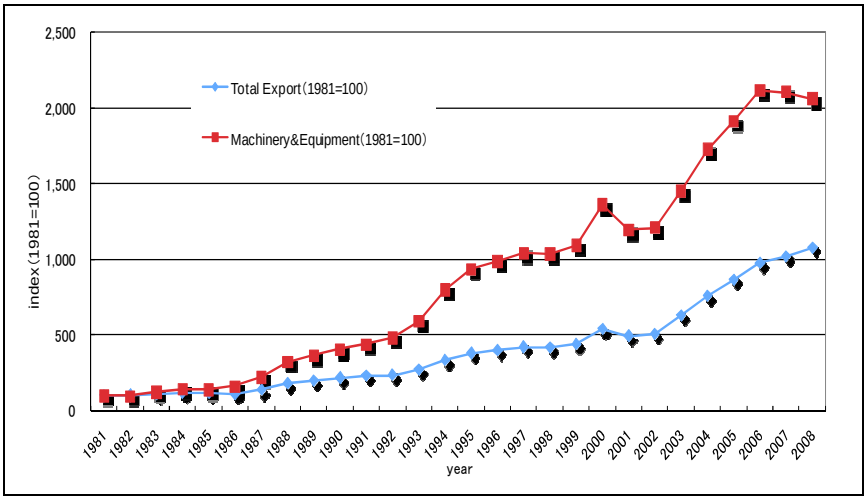


Figure4-3　Transitions in Export Value

Source: Prepared based on the Yearbook of Statistics Singapore.

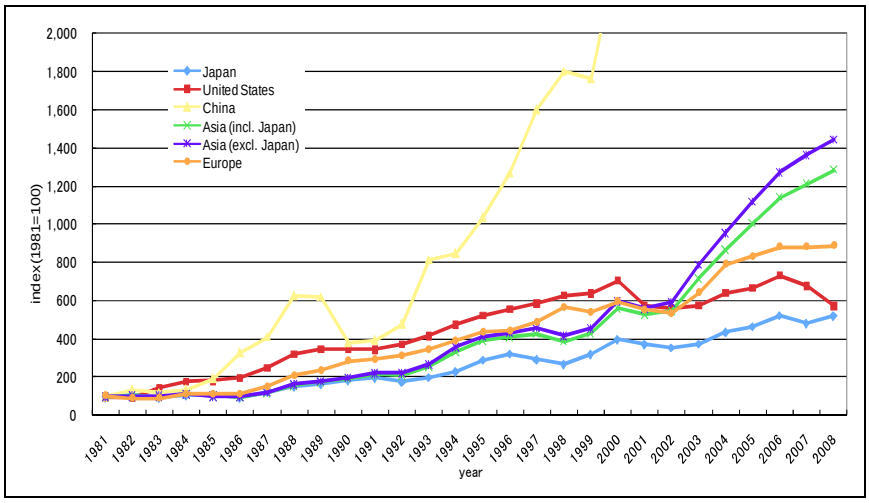


Figure4-4　Transitions in Export Markets

Source: Prepared based on the Yearbook of Statistics Singapore.

Looking at export markets, exports to advanced countries such as Japan, Untied States and Europe, etc. were somewhere between US$4.5-5.8 billion in 1981, however, by 2008 exports had increased between five and six times to Japan and the United States and almost nine times to Europe. In particular, exports to Asia grew dramatically, increasing 12.9 times between 1981 and 2008 with respect to Asia including Japan and 14.5 times with respect to Asia not including Japan.

Exports to China alone increased 116 times over this period, largely because the scale of exports in 1981 was so small, but they came to far outstrip exports to Japan and the United States by 2008 (US$43.8 billion).

Finally, looking at investment in the manufacturing sector, major shifts can be seen in reflection of the transitions in Singapore's industrial structure. Whereas manufacturing investment was less than US$2 billion in the 1980s, following the shift towards capital and knowledge-intensive industries, it increased greatly from the 1990s and reached US$8 billion by 1996 and remained at this level until 2006. After that, as a result of increased investment in high tech sectors, it almost doubled to US$16 billion in 2007 and 2008.

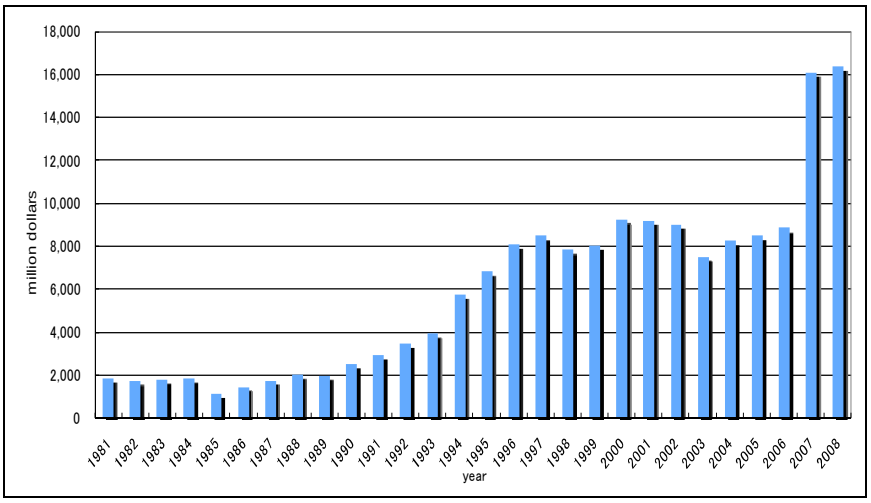


Figure4-5　Transitions in Manufacturing Investment

Source: Prepared based on the Yearbook of Statistics Singapore

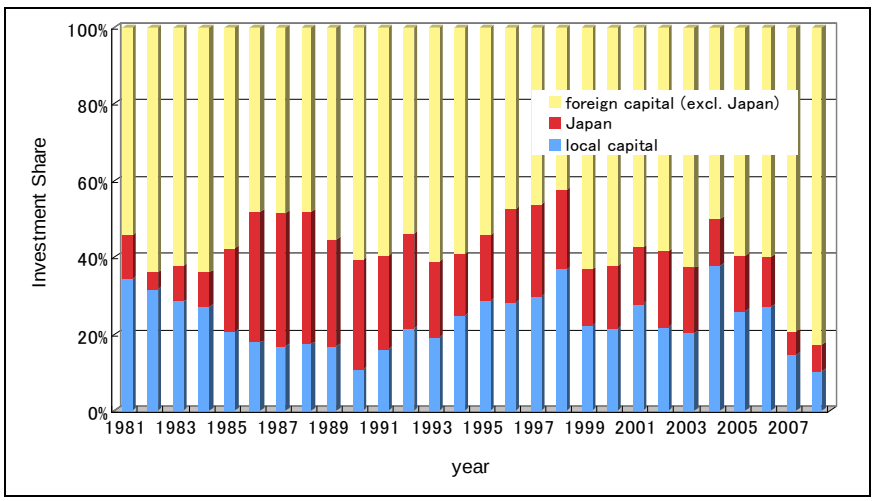


Figure4-6　Transitions in Composition of Manufacturing Investment Sources

Note: Figures from 1998 onwards include sectors other than manufacturing.
Source: Prepared based on the Yearbook of Statistics Singapore

Looking at the amount of investment by source, investment by Japanese corporations into Singapore grew dramatically and came to account for around one-third of the total in the second half of the 1980s following rapid appreciation of the yen in the wake of the Plaza Accord. After that it continued to account for more than 20 percent, however, from 1993 onwards there have been more years where the ratio has been between 10-20 percent. Particularly in 2007 and 2008, due to expansion in the overall size of investment, the ratio of Japanese affiliated corporations fell below 10 percent. The ratio of investment from non-Japanese foreign affiliated corporations has basically varied around the 50 percent mark, however, it exceeded 80 percent in 2007 and 2008. American corporations have played the leading role in the high tech and R&D investment of recent years. Meanwhile, the share of local capital investment fell due to the rapid growth in investment from Japanese affiliated corporations from the second half of the 1980s, but it gradually increased again from the start of the 1990s. However, in line with the rapid growth in investment from American corporations in recent years, the ratio of domestic investment has remained at between 10-20 percent.

4.1.3 Outline of Japanese International Cooperation to Singapore and Target Projects

(1) Japanese International Cooperation to Singapore

Since Singapore's per capita GDP in 1980 was US$5,490, indicating that a considerable degree of economic development had already been achieved, Japanese international cooperation after the second half of the 1970s was largely based on technical cooperation. The net value of yen loans after 1985 has been negative, and grant aid has also not been implemented except for some special case projects.

Since the economy of Singapore during the 1980s witnessed a shift in industrial structure from labor-intensive industries to knowledge and capital-intensive industries, Japanese ODA was implemented with a view to assisting the sophistication of industry through placing emphasis on human resources development, i.e. nurturing of engineers and skilled workers. Concrete examples of technical cooperation were the Singapore Productivity Development Project targeted by this Study, the Japan-Singapore Technical Institute (June 1983 – June 1988), which aimed to develop backbone engineers, the Japan-Singapore Institute of Software Technology (December 1980 – January 1991), which aimed to nurture software personnel in the information technology sector, and so forth.

Moreover, out of the recognition of Singapore as a leading economic and technical state in the ASEAN region, the importance of third country training was raised during talks between then Prime Minister Takeshita and Prime Minister Lee during the former's visit to Singapore in May 1989, while a basic agreement was reached on compilation of the Japan-Singapore Partnership Programme at the meeting of the two country's leaders in May 1993. Through gradually bolstering Singapore's role as an aid provider, this established the framework for joint technical

cooperation geared to supporting economic development in developing countries through combining the human resources, technical capacity and funds of both partners.

Following on from JSPP, the framework document for Japan-Singapore Partnership Programme for the 21st Century (JSPP21) was signed in May 1997 with the objective of implementing joint technical cooperation based on an equal partnership. The major contents of JSPP21 can be summarized into the following four points.

1) Implementation of joint training in Singapore
2) Other cooperation activities comprising: a) staging of joint seminars in developing countries, b) dispatch of experts to joint technical cooperation projects in developing countries, and c) examination of the feasibility of implementing supplementary training, etc.
3) Promotion of human exchanges between aid implementation agencies
4) Establishment of a planning committee for compiling next year's plan

Incidentally, Japanese international cooperation having Singapore as the primary beneficiary was brought to an end in fiscal 1998.

(2) Outline of the Singapore Productivity Development Project (SPDP)

During his tour of ASEAN countries in 1981, Prime Minister Yoshiyuki Suzuki announced that Japan would conduct technical cooperation worth a total of US$100 million with the aim of developing human resources in the region and establishing one training center in each country for that purpose. In response to this, the Singapore side issued a request for the establishment of a Japan-Singapore lifelong capacity development center for implementing lifelong education on know-how and technology for all Singaporean workers (approximately 1.1 million), however, President Lee (at that time) placed greater emphasis on bolstering international competitiveness through shifting the industrial structure from labor-intensive to knowledge-intensive industries and, towards that end, intimated that it was more urgently necessary to implement human resources development and training and to copy the human-based productivity movement of Japan, which had achieved economic development in spite of having scarce natural resources in the same way as Singapore. Accordingly, discussions were held between both countries and it was decided to advance the Singapore Productivity Development Project (SPDP) as an ASEAN human resources development project under Japanese technical cooperation and grant aid.

An outline of the Singapore Productivity Development Project (SPDP) is given below. This is a comprehensive package of international cooperation comprising technical cooperation and, as a special case, grant aid worth 2.56 billion yen.

Outline of the Singapore Productivity Development Project (SPDP)

(1) Objective of the Project

As a part of human resources development, this project aims to transfer productivity improvement technology based on experience of the productivity movement in Japan to the Singapore Productivity Board and thereby establish the infrastructure for the productivity movement in Singapore.

(2) Cooperation period

7 years from June 1983 to June 1990 (with follow-up from June 1988 to June 1990)

(3) Cooperating agencies on the Japanese side

Ministry of International Trade and Industry, Ministry of Labor, Ministry of Posts and Telecommunications, Japan Productivity Center, NHK, Japan Industrial Safety & Health Association

(4) Counterpart agencies

National Productivity Board

(5) Cooperation scheme

Project type technical cooperation (dispatched experts: more than 200 long-term and short-term experts)

Grant aid (purchase of training equipment, development and purchase of training materials, basic design for the new NPB building): 810 million yen, (December 1983), 400 million yen (June 1984), 1.35 billion yen (October 1986)

(6) Contents of cooperation

1) Planning and adjustment, 2) Promotion of dissemination, 3) Personnel and labor management training and dissemination, 4) Manager and supervisor training, 5) Safety and health training, 6) Resource center, (1)～4) are directly linked to productivity).

(7) Concrete priority issues and methods

1) Strengthening of development of industrial human resources and counterparts (education)
2) Review and improvement of conventional customs and systems (system)
3) Enlightenment and dissemination of productivity via the media (media)

Source: Prepared based on the 'Singapore Productivity Development Project – Report on the Ideals and Practice of Technical Transfer,' etc.

Table 4-1Transitions in Singapore ODA and SPDP

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
ODA for Singapore																		
Total(US million dollars)	10.6	7.4	3.9	28.5	8	15.31	11.23	11.23	10.64	−10.44	16	15.5	18.2	13.6	13.5	8.54	3.08	2.27
Yen loans	1.7	0.3	−4.1	15.2	−4.1	−5.89	−6.07	−7.1	−5.59	−24.78	−2.5	−1	−0.2	0	0	0	0	0
Grant aid	0.1	0.1	0.2	2.8	2.5	8.34	1.41	0	0.7	0	0	0	0	0	0	0	0	0
Technical cooperation	8.8	7	7.8	10.5	9.6	12.86	15.89	18.33	15.53	14.34	18.4	16.4	18.4	13.6	13.5	8.54	3.08	2.27
SPDP																		
NPB Chairman			Mah Bow Tan															
Chief advisor			Ishihara	Ishihara	Ishihara /Sakurai	Sakurai /Fukuda	Fukuda	Fukuda	Fukuda	Fukuda								
CP acceptance	4	4	38	33	26	27	28	19	16	5								
Experts (new)	0	9	34	34	21	35	28	19	13	2								
Experts (continuing)	0	0	0	8	11	8	15	15	13	10								
Equipment supply (1000)	0	0	6,319	0	0	0	10,014	26,687	0	0								
Grant aid (million yen)			810	400		1,350												

Source: Prepared based on the MOFA White Paper on ODA and the Japan Productivity Center 'Singapore Productivity Development Project – Report on the Ideals and Practice of Technical Transfer,' etc.

(3) Features and Progress of the Singapore Productivity Development Project (SPDP)

Whereas Japanese technical cooperation in the past had been directed towards technical transfer and capacity development related to software and know-how incidental to hardware, the SPDP had a major distinguishing feature in that it entailed the "transfer of comprehensive management systems including management technology made up of consolidated and organized individual production technologies and corporate culture to situations of entirely differing conditions, i.e. the transfer of soft technology"[2]. Accordingly, the Japanese basic policy and approach to SPDP implementation was based on 'activities for improving productivity in Japan." The specifically envisaged technical transfer and permeation steps can be indicated as follows.

Understanding of philosophy→Permeation of philosophy→Learning and deployment of technology→Concrete achievements

In the original plan, it was consideration of the above steps that led to the designation of the first three years (out of the five-year project period) as a preparatory term and the adoption of a three-phase plan comprising 1) Grasping of conditions and formulation of basic plan, 2) Program development, and 3) Nurturing of counterparts. The following points can be given as factors behind the adoption of these steps.

Factors behind the Technical Transfer and Permeation Steps

1. The Japanese side above all was focused on the concept of productivity (stressing that the people who support the Japanese productivity movement and desirable labor relations are the most important issues).
2. The Japanese side predicted that various improved technologies would be developed in the human resources development stage following the understanding and permeation of the philosophy (as was the case in Japan).
3. It was assumed that the Singaporean side understood Japanese thinking concerning productivity development (In the Report on Productivity which was prepared by the Productivity Committee under the National Productivity Council (NPC) comprising managers, workers, government and academic officials prior to implementation of the project, it was pointed out that "productivity development is not something that can be seen, nor can it be realized overnight. It is also difficult to achieve through reform of institutions and procedures." It also pointed out that, "The human aspect plays a major part in productivity development, but this is also invisible and not something that can be built up in a short time." The project expansion was planned based on this report."[3]

Source: Prepared based on the 'Singapore Productivity Development Project – Report on the Ideals and Practice of Technical Transfer' and interview survey, etc.

[2] 'Singapore Productivity Development Project – Report on the Ideals and Practice of Technical Transfer,' etc., Japan Productivity Center, March 1990

[3] Moreover, the policies and systems concerning productivity development in Singapore started in the 1960s, and the policy infrastructure existed in various forms prior to preparation of the Report on Productivity by the Productivity Committee.

Outline of the Report of the Committee on Productivity (June 1981)

Basic Thinking

1. Productivity development is an essential condition for maintaining Singapore's international competitiveness.
2. Conceptually speaking, productivity development is achieved through improving technology, management systems and labor relations. However, the Committee, although recognizing the importance of technology and management systems in productivity development, believes that the human aspect is the most important thing.

4 Principles of the Singapore Productivity Movement

1. Productivity boosts employment.
2. Each corporation examines and implements concrete measures for productivity development through labor-management cooperation.
3. Employees receive retraining in line with the development of productivity.
4. The achievements of productivity development are shared equally between managers, workers and consumers.

Features of the Japanese Labor-Management System (which achieved remarkable success in productivity development)

Features that are recommended for introduction to Singaporean corporations.

(Features that are relatively easy to introduce).

1. Involvement with work and approach to work advancement (Job Involvement)
2. Small group participation in management (Small group participation)
3. In-company welfare systems (Business welfarism)
4. Loyalty and identification with company

(Features that take time to introduce)

5. "Bottom-up" management
6. House(Enterprise) unions
7. Multi-functional job assignment

(Features that are dificul to introduce)

8. Seniority wage system
9. Life-time employment

Source: Report on Productivity

However, within a year from the start of the SPDP, the Singaporean side was unhappy and clashed with Japan over how the project was being advanced. The greatest reason for this was that no tangible results had emerged at this stage. Until then the business of productivity development had not always been regarded as important in Singapore, however, now that it was regarded as a national policy priority under Prime Minister Lee, officials on the Singaporean side needed to show tangible results. However, because the Japanese side did not anticipate tangible rsults would emerge at this stage, confusion and misunderstanding arose during the project expansion phase.

Confrontation was thus born out of this basic disparity in thinking between both countries regarding productivity development and project implementation (as well as the fact that the seriousness of the situation was not fully understood and dealt with); however, interviews with oficials on the Japanese side and related materials also point to the following issues.

1. The method and systems for transferring the management technologies required for developing productivity were not sufficiently incorporated into the activities.
2. The structure of understanding on both sides was different. Whereas the Japanese side emphasized process (geared to stressing the human aspect of the productivity movement in order to first impart understanding of the overall campaign, breaking it down into individual phenomena and issues in order to realize the ideals, and seeking understanding and technical resolution of those issues), this wasn't properly understood on the Singaporean side, which adopted system-based thinking.
3. It was difficult to realize effective transfer of technology when the role of experts was limited to advice. Moreover, it wasn't clear as to what scope, to what degree, and in what way the Japanese experts should conduct guidance.
4. Not enough objective analysis or systemization for transfer to other countries was conducted concerning Japanese productivity development.
   - Individual differences in the views of experts concerning the philosophy of the productivity movement and the contents regarding promotion of the movement → Minor disparities in the presented vision → Presentation of an abstract or obscure vision
   - Concerns on the Singaporean side concerning the enthusiasm and capability of experts regarding transfer
5. There were some problems concerning the ability (including language skills) of some of the Japanese experts (particularly the short-term experts).
6. The Singaporean side couldn't share a common policy with the Japanese side because 1) the Singaporean side didn't always demonstrate clear thinking regarding productivity development and the SPDP, and 2) The long-term Japanese experts were too busy managing the large numbers of short-term experts who were assigned in a concentrated spell.
7. There was a lack of understanding regarding productivity development among some of the counterparts.

Source: Prepared based on the 'Singapore Productivity Development Project – Report on the Ideals and Practice of Technical Transfer' and interview survey, etc.

In view of these conditions, the project was reconstructed following the appointment of Mr. Sakurai, who was well-versed in Singaporean affairs, as the second chief advisor. Upon reaffirming the objective of the SPDP to be the institution building of NPB, the plan was reassembled from the viewpoint of implementing trainers' training and upgrading of counterparts as the means of achieving this.

The most important revision was changing the technical transfer and permeation step as follows.

Learning and deployment of technology → Concrete achievements → Permeation of the philosophy

In the amended plan, emphasis was shifted to guidance fields in which achievements can be confirmed more quickly and clearly, and priority was given to educating the NPB counterparts in management technologies via practical training. Specifically, the experts taught the C/Ps the 'basics of work' through implementing workplace guidance on local capital and conducting step

by step OJT targeting model companies. From the latter part of 1986, technology transfer concerning management consulting was advanced with a view to developing the groundwork for establishment in NPB. Moreover, the team of experts strived to actively transfer the following nine elements geared to imparting three major characteristics of Japanese business management, i.e. 1) Thorough workplace-based principles, 2) Insatiable pursuit of quality, and 3) Work advancement emphasizing people more than duties.

These revisions were effective in emphasizing to the NPB counterparts, who lacked practical experience on the ground and in corporations and tended to underestimate the workplace, the Japanese style of workplace-oriented thinking.

(Crucially important elements)
1) Basics（5S)）
2) Broad job description and flexible assignment
(Elements playing a supplementary role in assisting the above two elements)
3) Team work, 4) Initiative and creativeness
5) Work ethics, 6) Attentiveness and alertness
7) Information sharing, 8) Mutual trust (between labor and management)
9) Long-term view

Source: 'Singapore Productivity Development Project – Report on the Ideals and Practice of Technical Transfer'

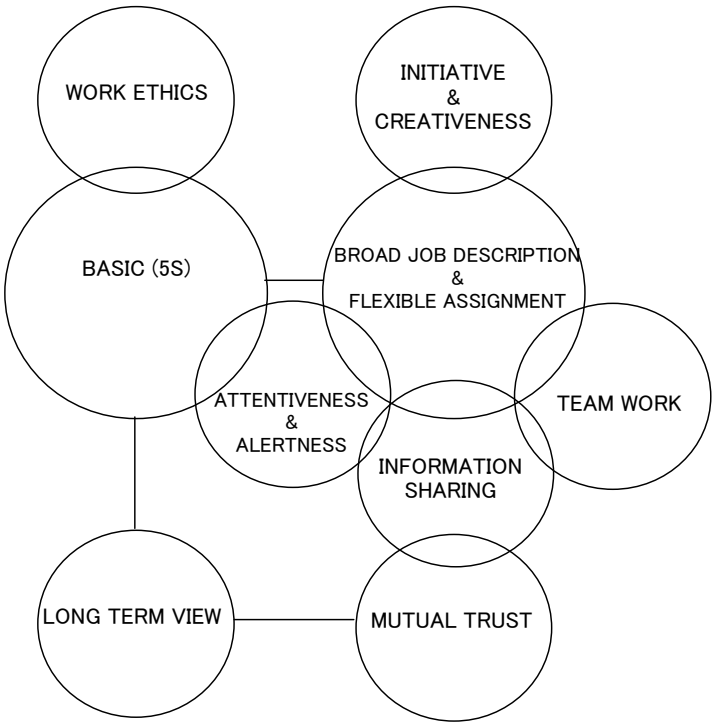


Figure4-7 Matrix of Essential Characteristics of Good Japanese Management

Source: JICA Frontier, November 1999 No.4

The following table gives a comparison of the project contents before and after the revisions.

Table4-2 Outline of Revisions to the Project Contents

	Original Plan	Revised Plan
Policy	Emphasis on Japanese experience of the productivity development movement	Consideration of actual conditions on the Singaporean side
Flow of technology permeation	Understanding of ideal → Permeation of ideal → Learning and deployment of technology → Concrete achievements	Learning and deployment of technology → Concrete achievements → Permeation of ideal
	Emphasize the concept of productivity	Realization permeation of the ideal through clearly demonstrating results.
Technology Transfer	The methodology and setup for transferring management technologies are inadequate	Careful guidance
Role of Experts	advise	assist
	The scope, level and method of guidance by the Japanese experts are unclear.	Prioritization and clarification of guidance fields (11 fields of supervisors, training, labor control, etc.)
Institutional Bilding	Improvement of organizational capacity was one of the basic objectives but was unclear.	Agreement that the objective of SPDP should be to improve the organizational capacity of the NPB.
Others		Emphasis on communication between representatives of both countries (tenacious negotiations, karaoke events, etc.)
		Compromise by the Japanese side in Singapore (implementing what is possible) Active appeal to related agencies on the Japanese side

Source: Prepared by the Study Team

Moreover, the following figure shows the comparison of SPDP deployment according to the original plan and in reality.

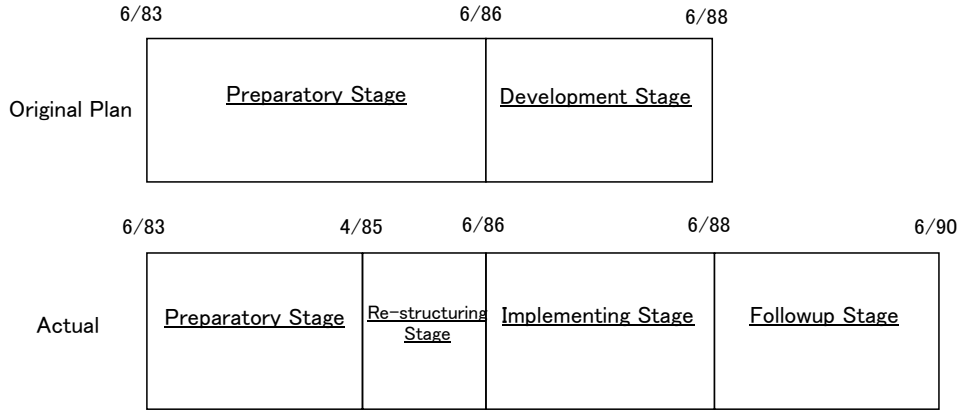


Figure4-8 SPDP Deployment

Source: Prepared by the Study Team based on the 'Singapore Productivity Development Project – Report on the Ideals and Practice of Technical Transfer'

Furthermore, as a result of the cooperation effect evaluation study that was implemented in February 1988, although a high achievement rate was confirmed regarding the technical transfer targets for the overall project, it was decided to conduct two years of follow-up in order to "enhance the productivity development activities and realize a sustained effect." During the follow-up, emphasis was placed on building a mechanism to ensure that the achievements of the technical transfer endure for a long time.

4.1.4 SPDP Achievements and Impact

(1) SPDP Achievements

The SPDP was intended as a plan for organizational expansion of the counterpart agency NPB and aimed to conduct organizational strengthening, human resources development and teaching materials preparation, etc. through the project. In this Study, it was confirmed that officials on both the Japanese and Singaporean sides hold the SPDP in high regard and believe that it was successful in generating major achievements.

First, the following points can be pointed to regarding the achievements of the SPDP project.

SPDP Project Achievements

- 196 Singaporean counterparts received training in Japan.
- Approximately 4,000 course participants received training using teaching materials developed by the SPDP.
- More than 200 Japanese experts took part in the SPDP and implemented guidance to the counterparts, etc. Approximately 15,000 people attended seminars in which these experts were lecturers.
- Approximately 100 training manuals and audio/visual teaching materials were developed.
- The Japanese experts and NPB consultants implemented improvement guidance with respect to 200 or more small and medium enterprises.
- Approximately 100 companies introduced and practiced 5S under guidance from the NPB and long-term experts.
- 70 Singaporeans received Japanese language training.
- The teaching materials production center produced promotional and training videos based on the educational achievements of the SPDP.

Source: Seeking an Endless Tomorrow – 7 Years of the SPDP

Concerning some of the manuals prepared (especially in the initial phase) and the (short-term) experts dispatched by the Japanese side, it was not possible to fully utilize them due to the low level of English language ability. Regarding this point, in addition to the purely linguistic issue, it highlights the difficulty in obtaining understanding for themes and contents based in the unique society and culture of ‘productivity’ in a different society using a foreign language. Also, the following issues were pointed out by the Japanese side: 1) Whereas the objective of the manuals and activities compiled on the Japanese side was educational (raising the quality of the counterparts), the Singaporean side viewed it as training (becoming able to perform the intended tasks); and 2) The contents were not always structured.

The following outcomes were realized via the above outputs on completion of the project.

Outcomes on Completion of the Project

1. Human resources development and organizational improvement of the counterparts
   - Capacity development concerning the productivity development of NPB counterparts was realized as planned.
   - The counterparts became able to independently implement productivity development and improvement guidance for corporations and workplaces. A mechanism for sustaining the achievements of technology transfer was established through the positive cycle of: Earning of revenue for NPB through practical guidance for corporations → Productivity development in corporations → Capacity development of consultants.
   - NPB expanded training courses concerning development of productivity, etc. (QC, labor-management relations, productivity promotion program, production management, IE, supervisor training, etc.). NPB counterparts implemented various productivity development courses.
   - NPB established the management guidance center and started management consulting for local corporations in 1986.
   - Prior to the fourth and fifth training in Japan, the NPB counterparts implemented basic training (core course) in Japan with help from the experts.
   - The NPB took the initiative in starting the productivity development project in key industries (food processing, restaurants, hotels, retailing, clothes making, finance) targeting industry overall.

2. Deployment and permeation of productivity development activities in Singaporean industry and society
   - In Singapore, more than 200 companies are implementing QCC and 5.4 percent of workers are members of QC circles
   - 90 percent of workers are implementing productivity development activities (compared to 54 percent in 1986).
   - More than 100 companies in various sectors have incorporated 5S activities, and many companies are having good effects. Managers of the introducing companies have submitted essays on the subject.
   - Thanks to the positive appeal of Prime Minister Lee such as his attendance at the awards ceremony for excellent corporations, advertising via the mass media, and numerous cases of activities introduction in corporations, the productivity development has permeated Singaporean industry and society.
   - Productivity improvement has been upgraded in those Japanese affiliated corporations, etc. where training for productivity development was implemented.

3. Infrastructure development necessary for implementation of productivity development activities
   - More than 200 consultants have been nurtured to assist the NPB consulting activities. Small and medium enterprises can utilize 191 external consultants and 30 associate consultants.
   - In Singapore, 1. Human resources who understand Japanese technology and productivity development measures and can convey them to other people, and 2. Groups of people (NPB Good Housekeeping Advisory Committees, etc.) who can promote productivity development activities in industry and corporations, have been trained.
   - The Bulletin of Productivity Statistics has been newly issued with contents and to a standard on a par with Japan.

Source: Prepared based on reports and interviews.

The SPDP does not contain a PDM or clear quantifiable project targets which have become the norm in recent technical cooperation projects, however, concerning the necessary capacity development level of the counterparts, it has been confirmed that the originally intended capacity development has generally been realized based on the check list prepared in the guidance implementation and evaluation stage.

The major factors explaining why the SPDP was able to attain its originally planned targets are described below.

The first factor is the powerful top-down leadership displayed by Prime Minister Lee (at that time). Because the nation's leaders clearly demonstrated their intentions to emphasize productivity development to the people, Singaporean government and society overall attached importance to the SPDP as the central project for realizing productivity development, and an environment whereby the project could be smoothly implemented was established. Judging from the national character of the Singaporean people too, the fact that the country's leaders demonstrated a clear direction was helpful. Moreover, Prime Minister Lee's leadership helped realize a reorganization from sector-separate labor unions to corporation-separate unions, and this and other factors were important in laying the foundations to efficiently promote productivity development.

Next, because the SPDP was the first Japanese international cooperation project to entail transfer of software entrenched in the society and culture of productivity development, the approach was appropriately altered in view of the early failures. In particular, upon fundamentally reforming the implementation setup including the appointment as chief advisor of Mr. Sakurai who is well-versed in Singaporean economic and social affairs, a period for project reconstruction was established and the methods with the highest potential for generating an effect were appropriately selected through ample communication between the Singaporean side and the implementing agency JICA. Moreover, it was helpful that the team of experts reviewed from the start how know-how on productivity development can be most efficiently and effectively transferred to the Singaporean side. Improvement guidance emphasizing direct practice on manufacturing lines is an area of specialty for many experts, and this made it possible to effectively utilize Japanese strengths such as practical know-how with emphasis on the workplace and consultant training and capacity development know-how. The team of experts identified nine elements necessary for improvement and demonstrated their effectiveness in corporations and line settings in such a way that was easy for the local side to understand. As a result, the reputation of the SPDP among the NPB and Singaporean government was transformed and the project became a success.

The third point was the high degree of initiative displayed by the Singaporean side in the SPDP. During the field survey in this study too, many officials on the local side said that one of the factors behind the success of the SPDP was that the Singaporean side guided it in that way. Since the SPDP started out as a national undertaking under the initiative of Prime Minister Lee (then),

the Singaporean side regarded it as a joint project of Singapore and Japan and, as an equal partner, it requested a wide range of contents and items which contributed to its success. Specifically, the following examples can be pointed to.

- Appointment of suitable experts, particularly long-term experts (the past achievement of experts were checked in advance, and replacements were sought when experts were deemed to be unsuitable).
- Voicing of requests concerning the instruments to introduce, and request of revisions where necessary (concerning personal computers, Japanese products were replaced by American products which the local side was used to)

Moreover, the initiative of the Singaporean side can be gathered from the fact that it set the different stages of the productivity movement as follows: 1) Awareness stage (1981-85), 2) Action stage (1986-88), and 3) Ownership stage (1989-90s).

The fourth point was the sheer scale of the technical cooperation, as may be gathered from the large numbers of dispatched experts and accepted trainees. In particular, the fact that almost 200 counterparts were able to visit Japan and actually see and know Japanese productivity development settings and society was highly effective because the target of technology transfer, i.e. productivity development, was total software. Among the many participants in the Japanese training, there were owners and executives of private sector corporations who would never ordinarily be targeted in such projects, however, the fact that such a wide range of participants was able to deepen understanding of actual productivity development (and realize that productivity development know-how can actually be introduced in Singapore too) was highly beneficial in terms of permeating productivity development activities throughout Singaporean industry after they returned home. One trainee commented as follows: “It was difficult to understand the initial classroom learning in the training in Japan, however, observing actual line settings helped promote understanding. It was useful to experience comprehensive training contents over an extended period.” As may be gathered from this, the fact that an extended training term could be established was also effective. Thanks to the large scale of the technical cooperation, it was possible to accept large numbers of counterparts into Japan and enable them to experience line setting and actual work over an extended training period. Moreover, the assignment of long-term experts according to each productivity development theme proved effective for conducting smooth technology transfer to the counterparts.

The fifth point is that productivity development activities were modified, introduced and established according to the conditions of Singaporean society. The Japanese team of experts also held the belief that they would offer guidance on theory and methodology but that the Singaporeans should conduct actual application, however, since the transfer progressed while the Singaporeans confirmed the certainty of basic know-how through actual line guidance, it was possible to modify know-how according to conditions in Singapore while the counterparts continued a process of trial and error in guidance and introduction activities. For example, the

following cases were seen:

- Concerning the introduction of 5S to workplaces, whereas in Japan there is no problem in approaching this as work from the viewpoint of discipline, such an approach wouldn't result in establishment and permeation in Singapore. Accordingly, 5S was treated as a special event or festival and employees were encouraged to take part autonomously and positively so that the new thinking would be naturally incorporated into the workplace.
- In some cases 5S was referred to as 'Good Housekeeping Practice' in the Singaporean style, while in other cases the 5S were arranged to become 7S.
- In other cases, Japanese corporation or national level productivity measurement methods were modified to measure productivity on the industry-wide level.

Furthermore, in SPRING, the Approach for learning based on the 4As, i.e. Adopt, Adapt, Advance and Affirm, is still given emphasis, and this type of thinking is also steadily becoming entrenched.

Other important factors behind the success of activities are as indicated below.

1. The Singaporean side steadily advanced system building.
- The internal organization of NPB was reorganized into specialized departments for productivity measurement, release center and management consulting, and the PDP Division and PDP Implementation Section were inaugurated as overall liaison departments.
- From August 1986, the ministry with jurisdiction over the NPB was changed from the Ministry of Labor to the Ministry of Commerce and Industry, and the NPB became part of a powerful government agency with partial responsibility for industrial policy. As a result, conditions were established for the NPB to display greater leadership in the promotion of the SPDP.
- Mr. Mah Bow Tan was appointed as the chairman of NPB (1985).

2. Since the Government of Singapore and the NPB had conducted a vigorous and multi-faceted campaign for productivity development prior to the start of the SPDP, at least a surface recognition of productivity had permeated to the different sections of Singaporean society.
- Policies and initiatives concerning productivity development in Singapore dated back to the 1960s, so the political infrastructure existed in various forms even before formulation of the Report on Productivity by the Productivity Committee.
- The Government of Singapore established the Productivity Committee to discuss productivity development, labor attitudes and improvement of labor-management relations in April 1981, and based on the recommendations reported by this committee, it established the National Productivity Council (NPC) in September 1981 and it made a concerted effort to promote the productivity movement in earnest.
- From 1982, November was designated as productivity development month.

3. Officials from both countries built trust relationships through conducting tenacious negotiations, strengthening and improving communications on both the official and private level and eliminating miscommunications.
- Chief advisors took part in Board Meetings and Management Meetings.
- Officials from both sides held monthly meetings to voice and listen to comments.
- Staging of karaoke events

4. Through attracting participation from a wide range of entities including private sector enterprises, a structure was built whereby productivity development efforts were directly effective in the corporations that needed them.
- Participation of corporate officials in training in Japan
- Practice of productivity development activities in model companies

5. A comprehensive support menu necessary for promoting productivity development in society was prepared.
- Public relations utilizing the mass media
- Support for establishment of the resource center
- Consideration for reform of organization, setups and management systems

6. There were high industrial and social needs for productivity development

Source: Created from available materials

(2) Impact of the SPDP and productivity Development Activities

Roughly 20 years have passed since the end of the SPDP, so how have the SPDP and productivity development activities affected Singapore's economy and society? The following paragraphs consider this question.

1) Transitions in labor productivity

Looking at the situation regarding labor productivity development in the manufacturing sector between 1981-2008, year-on-year fluctuations were large, however, the average annual rate of increase was 3.29 percent. Labor productivity is deemed to have gradually increased at a rate equivalent to roughly half the rate of wage increase among manufacturing workers. Since the Manufacturing GDP/Number of manufacturing workers, which is another indicator of labor productivity, also increased at a rate of 4.67 percent, the wage increase rate greatly exceeded the pace of productivity development.

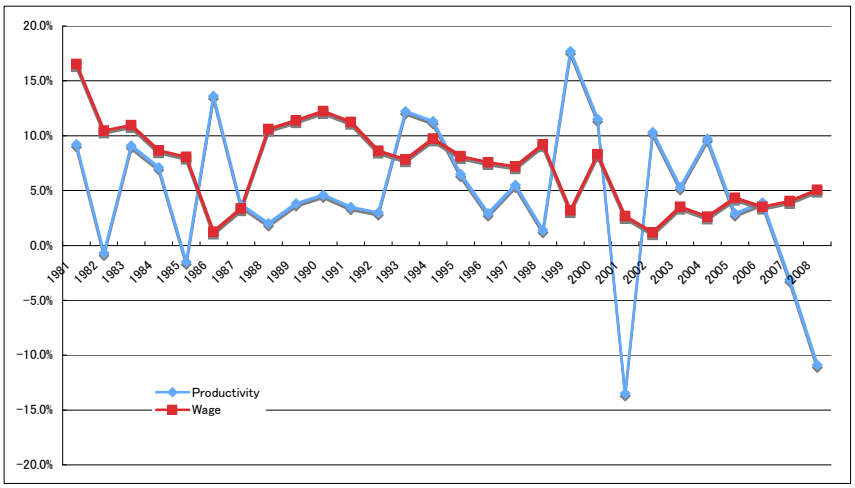


Figure4-9 Transitions in Productivity Growth Rate and Wage Growth Rate in Manufacturing (1981-2008)

Source: Prepared based on the Yearbook of Statistics Singapore.

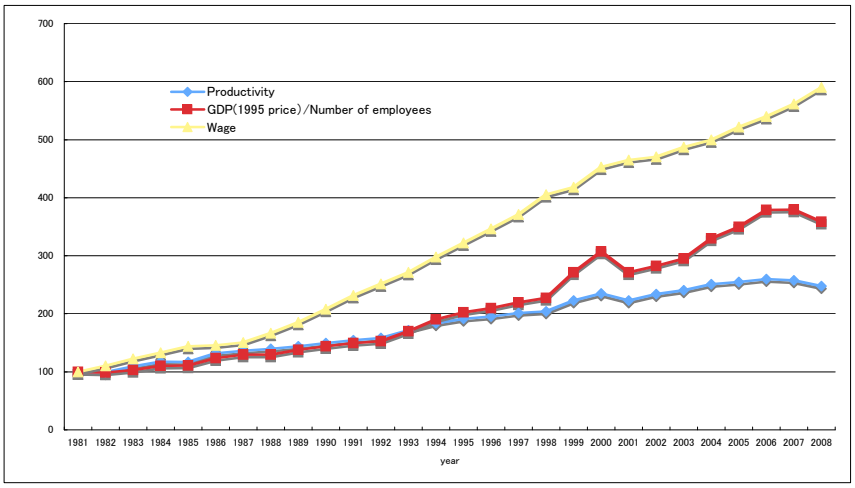


Figure4-10　Transitions in Indicators of Productivity and Monthly Wages, etc. in Manufacturing (1981-2008)

Source: Prepared based on the Yearbook of Statistics Singapore.

Looking at the rate of growth in labor productivity in the manufacturing sector according to period, apart from 2001-2006 when the rate of growth in labor productivity slightly outstripped the rate of wage increase, productivity failed to keep pace with wages at all other times. In the first half of the 1980s, as has already been seen, the government initiated a policy to boost wages, and labor productivity also displayed rapid growth due to corresponding capital investment at this time, however, the rate of productivity development at other times remained far below 5 percent.

Table4-3　Transitions in the Labor Productivity Development Rate by Period

	1981-86	1986-91	1991-96	1996-01	2001-06	2006-08
Labour Productivity	5.7%	3.0%	4.8%	2.7%	3.1%	-2.3%
GDP(1995 price) /Number of Employees	4.3%	3.8%	7.0%	5.3%	6.9%	-2.7%
Monthly Wage	7.9%	9.7%	8.3%	6.1%	3.0%	4.5%

Source: Prepared based on the Yearbook of Statistics Singapore.

As was described previously, although the GDP ratio of the manufacturing sector in Singaporean industry remained fairly static until recently, the sector experienced qualitative shift towards more capital- and knowledge-intensive manufacturing. Over the past two or three years, the economy of Singapore has rapidly shifted towards services, and the GDP share of manufacturing has declined markedly. Following the shift from labor-driven to capital-driven industry during the SPDP era, Singapore shifted towards innovation-driven economic development from the second half of the 1990s. Although calls for reduction of costs including wages and improvement of productivity are raised from the viewpoint of sustaining and strengthening international competitiveness every time the economic growth rate of Singapore slows down, Singapore has basically been able to maintain a high economic growth rate until now, and the shift towards innovation-oriented policy from the second half of the 1990s has reduced the degree of priority of the productivity development movement in policy. Furthermore, during

the field survey, officials pointed out that other influential factors have been the fact that the leadership displayed by government representatives has diminished, Japanese investment in Singapore declined with the onset of the 1990s[4], and the status of Japanese corporations in Singaporean industry and society has been reduced.

Moreover, the Study Team also heard that while the number of workers accepted from overseas increases, quality is a problem and attention is once more being directed towards 'productivity' from a modern viewpoint. Moreover, according to the report of the Economic Strategy Council announced in February 2010, it is noteworthy that productivity development is once more raised as a priority policy in order to enhance the international competitiveness and quality of growth of Singapore[5].

2) Permeation of basic thinking and know-how concerning productivity in Singaporean industry and society

The term 'productivity' has an old-fashioned image in Singapore, and greater interest is now directed away from this and more towards Western management techniques and themes such as 'innovation' and 'business excellence.'

However, many of the counterparts who were trained under the SPDP were still in their 20s and 30s at that time and, even though many of them moved away from the NPB, they are still active today as independent consultants, etc. Even though the number of manufacturing line settings has declined in Singapore, industrial guidance and improvements targeting the service sector are still carried out, and principles such as cooperation between management and workers geared to increasing the size of the pie and benefiting both sides, emphasis on line settings, importance of organizational approach to quality improvement and control, the nine elements of improvement and so on continue to be purported by officials during guidance in fields other than productivity development. Accordingly, even when Western style management techniques are introduced, these principles are utilized in differing form. The same holds true for corporations that learned and introduced productivity development in the SPDP, and management practices that skillfully combine Western techniques with Japanese techniques such as Kaizen, etc. are implemented. In 2001, 13 percent of the total working population participated in QC circles (compared to 0.4 percent in 1983, and corporations send 3.8 percent of employees to take part in training courses (twice as many as in 1988).

Representative of the changing status of 'productivity' in Singaporean society and economy

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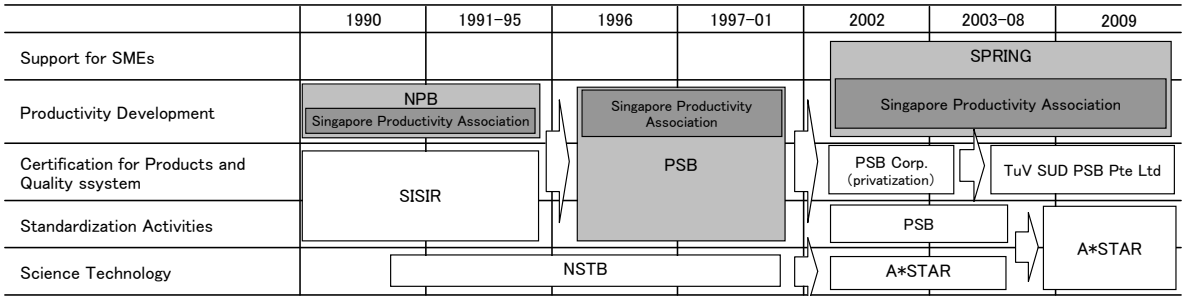
[4] Unlike corporations in Europe and America, since Japanese corporations had to maintain R&D bases and higher added value products manufacturing centers within Japan in the same East Asian region, the status of Singapore as an investment target within ASEAN declined from the 1990s due to its high cost constitution.

[5] See the following homepage for an outline of reports by the Economic Strategy Council. Since productivity will increase by 2-3 percent over the coming decade, establishment of a new council of higher level than the NPB has been proposed, and the importance of ongoing education and retraining for corporations and all Singaporean citizens is being emphasized.
http://www.esc.gov.sg/recommendation html#esc1

has been the transformation of the counterpart agency NPB. As this transformation suggests, productivity development has changed (productivity development activities have been enhanced) while being incorporated with and separated from SME support and other affairs in line with the shifting economic environment and industrial structure [6]. In Singapore, the basic Japanese-inspired principles of investing in and honing people and regarding human competition as the basis for the state are still maintained today, and techniques continue to be selected and introduced based on the outcomes and achievements realized through the SPDP. Moreover, reflecting changes in the role of administration, training and so on is being transferred to the private sector. Through flexibly continuing such changes, activities are being sustained in line with current conditions. This point can be viewed as desirable from the viewpoint of securing the autonomous growth potential of projects and activities.

Table4-4 Transitions in Productivity Development Organization



Note: Shaded parts are organizations and departments in charge of productivity affairs.
Source: Prepared based on interviews

Transitions in Organizations concerning Productivity Development

1996 Amalgamation of the NPB and SISIR to form the PSB (Productivity Standards Board)

2002 Within the PSB, the conventional NPB was renamed as the Standards, Productivity and Innovation Board (SPRING). SME support functions were enhanced. Conventional productivity development functions were taken over by the Singapore Productivity Association (SPA) inside SPRING, and these functions continue today.

3) Promotion of Productivity Development Cooperation in Other Countries

Following the success of international cooperation for productivity development in Singapore, similar cooperation is being advanced with respect to other countries. Contents are outlined below.

During the SPDP implementation period, the NPB and JICA cooperated to stage the Japan-ASEAN Regional Training Programme for ASEAN officials three times from 1988. In March 1990, a large-scale regional training course (attended by five ASEAN countries) was implemented on the theme of management consulting over two months. Even after the end of the SPDP, third country training concerning productivity development was implemented in

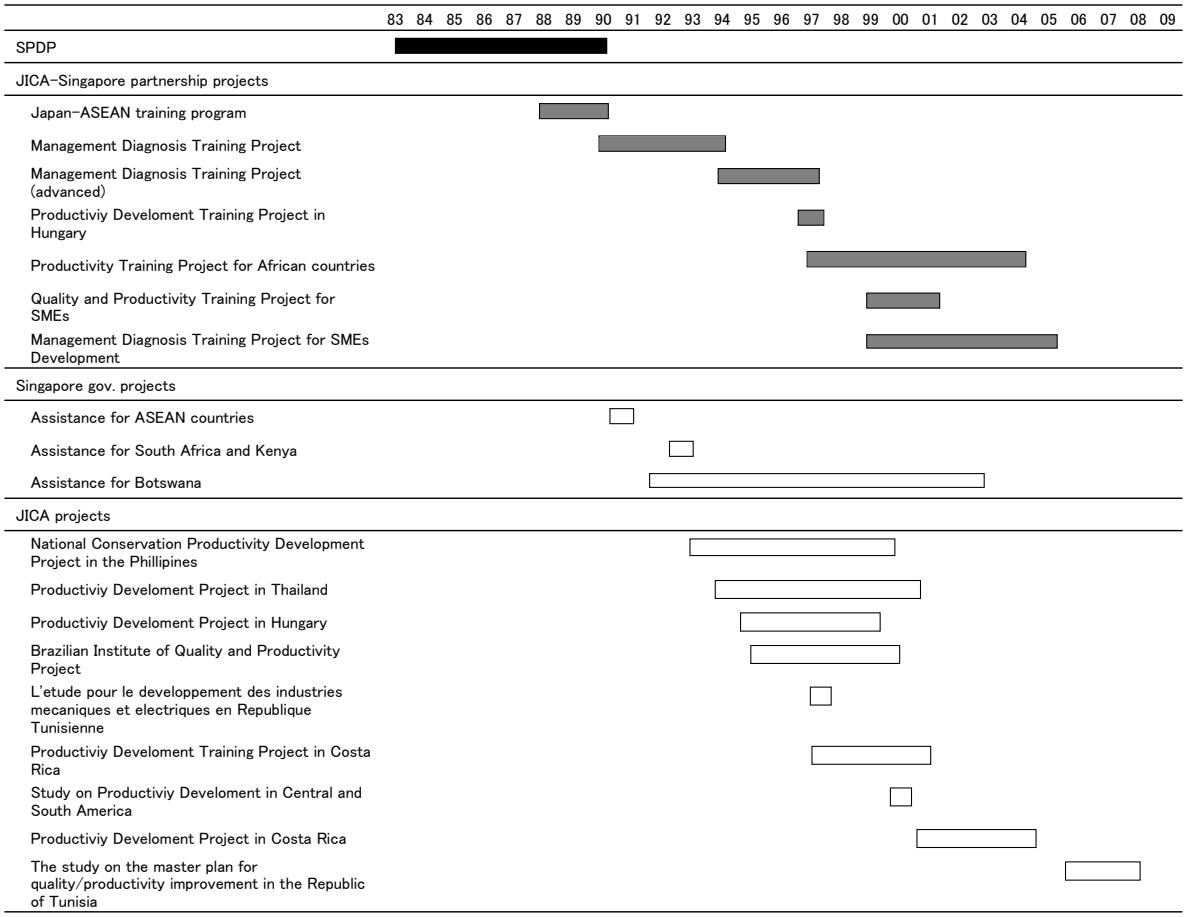
[6] Support was partially boosted, for example, the number of training facilities supported under the Skill Development Fund increased from 36,000 (1981) to 650,000 (2001).

cooperation with the NPB and PSB, etc. up to fiscal 2005. An outline of the implemented third country training is given below.

- Management counseling course (1990-1994): Implementation of five management diagnosis courses (participated in by nine Asian countries)
- Advanced management diagnosis (1994-1997)
- Hungary production development (1997)
- Productivity and quality improvement in SMEs (1999-2001)
- Management diagnosis for nurturing of SMEs (1999-2005)

Moreover, following the end of NPB cooperation projects, the Government of Singapore has autonomously promoted ASEAN cooperation. The government implemented support via the APO for South Africa and Kenya, and in the second half of the 1990s the SPA conducted support in Botswana. Compared to the SPDP, these projects entailed short-term support comprising training implementation and lectures, etc. and they didn't target long-term organization building, etc. In spite of these differences, however, SPDP experience was in evidence in the shape of frontline emphasis, etc. Furthermore, support is currently being planned for the Near East, where interest in productivity is growing, and the promotion of such international cooperation activities by the Singaporean government and related agencies is a major legacy of the SPDP.

Table4-5 Outline of Productivity Development Cooperation in Other Countries



Source: Prepared based on the ODA White Paper and interviews in Singapore, etc.

The success of the SPDP was a major factor in promoting the extension of productivity development projects by JICA. Following the end of the SPDP, projects were implemented in Thailand and Hungary from the mid-1990s, and a diversity of schemes was conducted in Latin America especially. During the field survey a number of officials commented that more efficient and effective outcomes could be achieved through implementing projects in collaboration with Singapore.

Moreover, many of the counterparts and officials who benefitted from technology transfer in the SPDP have since become independent consultants, and they utilize their know-how and English proficiency to implement guidance on productivity improvement to numerous corporations in both Singapore and other ASEAN countries. Moreover, more than 1,200 teaching videos (English and Chinese versions) concerning 5S and so on were produced in the SPDP, and these and other teaching resources are utilized in ASEAN countries with major dissemination impact.

4) Contribution of Japanese Corporations to Overseas Deployment

The experience of transferring know-how on productivity improvement and other management techniques to a foreign culture via the SPDP later proved highly useful to Japanese corporations that were forced to establish production centers overseas especially in ASEAN following the Plaza Accord of 1985.

The know-how developed in the SPDP was provided through various agencies and routes broadly comprising the following two: 1) provision of know-how via the Japan Productivity Center (organization), which was the focal cooperating agency), and 2) provision of know-how through the individual work and activities of experts who were involved in the SPDP. These experiences and know-how were extremely useful and cherished among the middle-standing enterprises that never possessed production bases in overseas locations before.

4.2 Story of Human Resources Development

4.2.1 A Quest for Survival

Covering an area almost the same size as the 23 wards of Tokyo and having a population of 4.5 million, Singapore was a sophisticated and modern city where the people spoke fluent English with a slight Chinese accent, a city true to the magazine and news headlines – Techno parks, the world's financial center, No. 5 in the world in terms of economic competition index, the country with the world's largest container handling volume, the city where East meets West, and so on. While surprised to see none of the other typically Southeast Asian sights of young bike and taxi drives offering to carry visitors or old men black from fixing cars by the side of the road, I searched for the remnants of the Japanese technical cooperation that triggered a major movement in this city a quarter of a century before.

(1) Independence and the Quest for Survival under Prime Minister Lee

The city state of Singapore derives its name from the Sanskrit word meaning "Lion-city." It became a colony of the British Empire in 1819, but in 1963 it declared independence from Britain and became a member of the Federation of Malaysia along with Malaya, Sabah and Sarawak. However, under the policies that gave preferential treatment to Malays, tensions between the majority Chinese and Malays in Singapore boiled over into confrontations and insurrection, and Singapore left the federation on bad terms to become an independent state on August 9, 1965. It is said that the Federation of Malaysia was afraid of the growing influence of Lee Kuan Yew at this time.

Singapore at this time was confronted with a host of urgent problems such as a dearth of water and natural resources, fragile national defense, mass unemployment and frequent strikes. When Singapore claimed independence and became a member of the Federation of Malaysia, it was thought that the policy to promote import substitution industrialization and labor-intensive industries in order to absorb unemployment would yield success following the location there of numerous Japanese (Bridgestone, Seiko, etc.) and foreign affiliated corporations aiming to exploit the common market with Malaysia. However, when Singapore was forced to secede from the federation in just two years, many corporations decided to withdraw since independence meant that the common market of the federation was lost. Furthermore, when the British military announced it was pulling out of Singapore in 1968, the Government of Singapore was faced with the need to create jobs for approximately 50,000 people who had worked on the British base.

Against such a background, the Government of Singapore switched from the hitherto import substitution industrialization policy to an export-oriented development policy geared to attracting Western and Japanese manufacturing corporations and promoting industrialization from the end of the 1960s. Prime Minister Lee Kuan Yew vigorously attracted direct overseas investment, multinational corporations and foreign workers possessing technology through implementing infrastructure development and preferential tax measures, securing industrial land and ensuring

low wages, etc. In doing so, he sought solutions to Singapore's deficiencies in the areas of knowledge, human resources and natural resources from overseas.

Since there were not many countries in the world that vigorously accepted investment from multinational corporations at this time, this policy of Singapore's proved to be successful and led to the entry of numerous foreign enterprises mainly in the heavy and chemical industrial fields, for example, Mobil Oil (United States), Maruzen Oil (Japan, the present day Cosmos Oil) and so on. Furthermore, financial institutions such as Tokyo Bank and Mitsui Bank, etc. set up branch offices; there was a rush of retail operators such as Isetan and Yaohan; and Jurong Shipyard Pte Ltd. was established as a joint venture between Ishikawajima Harima Heavy Industries and the Government of Singapore. In this way the flow of corporations and direct investment into Singapore continued.

However, this success did not last long, and Singapore was forced to review its policy once again. Towards the end of the 1970s, other Southeast Asian countries, able to exploit cheap and abundant labor, started to compete for attraction of multinational corporations. In order to differentiate itself from surrounding countries, Singapore adopted a high wage policy. As a result of this policy, which stated in 1979, labor-intensive and low added value industries such as textiles and woodworking died out, while efforts were made to attract foreign corporations in high tech and capital-intensive industries.

(2) Learning from Japan

Around this time Japan was rapidly enhancing its presence in the world economy. Despite being a defeated country at the end of WWII in 1945, it achieved economic recovery in a short time and became the second largest economy in the world behind the United States by the end of the 1960s. After surviving the oil shocks of the 1970s, Japan rivaled America as the world's largest economy in the 1980s, and this performance made it the object of aspiration of other countries of Asia. In 1979, Professor Ezra F. Vogel of Harvard University wrote 'Japan as Number One' in an effort to explain the secret of Japan's success and provide lessons for the United States, and this publication further enhanced international attention and interest towards Japan.

For Prime Minister Lee Kuan Yew, who had looked hard for a decisive policy to ensure the survival of Singapore in the face of small population, scarce natural resources and numerous development policy shifts, it was natural that he should seek to model Singapore's development on Japan, which had achieved such global success despite also being a small country with few resources. Lee Kuan Yew, who was the first Asian leader to follow the Japanese development model, called on citizens to learn from Japan, and the aforementioned 'Japan as Number One' became compulsory reading among Singaporean civil servants.

(3) A Fateful Meeting

Prime Minister Lee Kuan Yew visited Japan on a number of occasions in order to find out the

secret of its success, and it was during one such visit in June 1981 that he had a fateful meeting with Mr. Kohei Goshi of the Japan Productivity Center.

Going back 35 years, Mr. Goshi was appointed a secretary to the newly formed Keizai Doyukai (Japan Association of Corporate Executives) in 1946. In 1951, during a tour to observe conditions in Europe, Mr. Goshi witnessed the productivity development movement being conducted in the countries striving to rebuild their war-stricken economies under American support, and he keenly realized the need for such a movement in Japan, which was beset with large-scale strikes at the time. Soon after returning to Japan, in 1955, he established the Japan Productivity Center, and a series of missions were dispatched to the United States. Mr. Goshi strived to modernize Japanese management and develop productivity; moreover, in order to obtain understanding from labor unions concerned that increasing productivity would lead to layoffs, he announced the three principles of the productivity development movement, i.e. ① maintenance and expansion of employment, ② cooperation and consultation between labor and management, and ③ fair distribution of achievements.

A noteworthy point here is that just as management, workers and government in Japan were making a concerted effort to spread the productivity development movement, the contents of the movement had evolved a great deal from the contents originally brought home by the missions from the United States. For example, quality control, which was an important element of the productivity movement, was conducted by expert staff in the United States, however, the Japanese regarded it as an element of management and arranged it into something that should be approached by all members of departments from top to middle management. Furthermore, seven specific techniques were identified so that all employees could grasp quality control.

Concerning the background to such an alteration, in the United States, whereas hierarchy was firmly entrenched and it was though that workers were the same as machines and had no need to think at that time, in Japan, since there was no such distance between workers and technicians, the American mode of thinking did not catch on. Accordingly, the productivity movement, which started out in the United States, was fused with Japanese values and institutions such as lifetime employment and the seniority system, and it was transformed and spread to Japanese style management techniques extending to the qualitative improvement of citizen lifestyles.

Meanwhile, in Singapore, the National University of Singapore was formed with a strengthened faculty of engineering following the merger of the University of Singapore and Nanyang University in 1980. Following this, construction of the Japan-Singapore Information Technology Institute, establishment of the System Science Center and expansion of the Industrial Training Center, etc. were decided, thereby almost fully establishing the setup for enhancing the skills of workers. However, managers at this time were troubled by the endemic practice of job hopping, whereby excellent human resources escaped to other corporations even after receiving technical training opportunities. Under such conditions, it would be difficult to nurture skilled workers and to extend social welfare policies. Particularly following the introduction of the wage

increase policy in 1979, the need to improve the working attitude of young people became more and more apparent and was treated as a joint issue by the government and labor union leaders.

How could the labor force be organized and motivated in such a way to make the most of plant modernization and skill development? Prime Minister Lee again looked to Japan for the solution to this problem. Unlike Singaporean workers who tended to jump from one job to another, Japanese workers became skilled in and devoted themselves to a single job. Lee was convinced that the secret of Japan's strength lay in productivity development based on the company loyalty and teamwork ethic of Japanese workers, and that this was made possible by Japanese management philosophies which held that "Workers are not objects but people" and "Corporations belong to the employees including managers." On observing Japanese at work during a visit to Japan at the end of the 1970s, Prime Minister Lee wrote the following impressions: "The Japanese take pride in their own work," "Within a unique culture, workers fit together like blocks," "On a one-on-one basis, Chinese can compete with the Japanese, however, in groups like production teams at manufacturing plants, it is difficult to beat the Japanese" and so on (from the memoirs of Lee Kuan Yew).

Therefore, when Prime Minister Zenko Suzuki made a tour of ASEAN countries in 1981 and announced a program to build human resources development centers in five countries including Indonesia and the Philippines, whereas other countries requested support for human resources development focused on nurturing core engineers, Mr. Lee strongly requested the conveyance of know-how for developing productivity in Singapore. As a result, the Singapore Productivity Development Project (SPDP) was launched as a technical cooperation undertaking in 1983.

Mr. Goshi's 8 principles of productivity displayed in the entrance

(4) Clashes over Tangible Results

However, even though this project started amidst a fanfare with the full backing of Prime Minister Lee, not all was plain sailing at the beginning.

The experts who were dispatched at the beginning of the project entered Singapore with the intention of conducting long-term activities, stating the desire to correctly teach the concept of productivity, hoping the Singaporean counterparts would be willing to listen, and saying that five years would be required to produce good results. For them, productivity was not some specialist knowledge or know-how specific to a certain field, but rather it was a mode of culture rooted in Japanese society and values.

However, due to the fanfare that heralded the start of this project, a lot of political pressure was exerted on the National Productivity Board (NPB), which was the implementing agency on the Singaporean side. The NPB staff were anxious to learn an immediately effective secret to

productivity and to report tangible outcomes from the project, otherwise they would be branded as incompetent. What they wanted was not education but training. Furthermore, they were unable to fathom the conceptualized guidance of the Japanese experts who were saying things like, “The concept of productivity is floating in the air; it is not something that can be easily turned into language.”

Moreover, this project was not the first time that the Singaporean side had encountered the word ‘productivity.’ In fact, the founding of the NPB dated back to 1972, 10 years before the start of the project. The NPB was originally established in order to secure the quality and skills of workers employed by multinational corporations attracted under the policy of export-oriented development, and it taught the American style of productivity that was widely adopted in the West at that time. Also, having previously been a colony of the British Empire and being strongly influenced by Western culture, Singaporeans’ emphasis on logic and rationality and their tendency to emphasize results rather than process further deepened their rift with the Japanese experts. The NPB executives gradually came to demand regular reports from the experts and to closely monitor the activities. Mr. Yasuhiko Inoue, who was in the social productivity center at that time, recalls that time as follows: “Frustrated at the lack of any tangible outcomes, the NPB officials banged the table and stormed out of the room, almost causing talks to collapse, a number of times.”

The project was in a critical state and on the verge of collapse at this time.

(5) Appearance of a Certain Man

One man appeared to rescue this desperate situation. His name was Kiyohiko Sakurai.

After serving as an engineering major in the navy, Mr. Sakurai entered Ishikawa Heavy Industries (later to become Ishikawajima Harima Heavy Industry, IHI). As president (and later advisor) of Jurong Shipyard, which was established as a joint venture between IHI and the Government of Singapore in 1963, he built that company into Singapore’s foremost corporation and made a major contribution to the modern shipbuilding and ship repair industry there. The Singaporean side held him in such high esteem that he was also on direct speaking terms with Lee Kwan Yew. When Mr. Sakurai was appointed as the second leader of the SPDP in 1985, the project was finally set on the path to recovery.

A certain episode concerning Mr. Sakurai is mentioned in "Japanese Management Practices through Singapore Eyes,”the record compiled by the NPB of what Singapore should learn from Japanese management methods.

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According to Mr.Kiyohiko Sakurai, who was for17 years the Managing Director of Jurong Shipyard Ltd in Singapore, the following are the three major areas of differences in the work attitudes of Singaporean and Japanese workers:

(a) Flexibility of Mind

To illustrate flexibility of mind, the analogy of Mount Fuji is often used. Whilst everybody knows where Mount Fuji is, nobody knows where its boundaries end.Similarly, every worker in Japan knows his job functions but does not draw a strict boundary around them. In contrast, workers in Singapore are normally recruited under a well-defined job description, and they adhere strictly to their own job assignments. Under such a situation, management must be patient enough to provide them with proper training and guidance so that they will treat work as something more than a chore and obeying orders mechanically.

(b)Self-motivation

Unlike workers in Japan, Singaporean works are only willing to do exactly as they have been told and will not think of doing anything more. Hence, what they generally lack is some self-motivation to do a little extra. This self-motivation is an important factor in raising the level of productivity. Management should, therefore, motivate workers to derive a sense of achievement in their jobs.

(c)Teamwork

Singaporean workers are diligent, keen and quick in learning their work. As an individual, a worker's skill and efficiency seem to be comparable to those of a Japanese worker who have had the same work experience. However, if we compare the productivity of a group of workers, Singaporean workers are no match for Japanese workers. In Japan, if someone encounters any difficulty his work, other members will help immediately without hesitation. If a worker finishes his part of work ahead of others,he will also lend a helping hand to his counterparts. As a result, the workers can complete their work in a shorter time and achieve better quality and lower production cost. What is significant is that the teamwork among Japanese workers is achieved not at the expense of individual excellence.

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As Mr. Sakurai explained Japanese strengths to the Singaporean side in understandable terms one at a time, the project situation was rectified and efforts were made to give the Singaporean side what it was seeking. For example, the role of the Japanese experts, which had conventionally been limited to indirect guidance via counterpart education, was expanded, and it was highly significant that the experts accompanied NPB staff to Singaporean corporations and conducted direct guidance. Through incorporating the wishes of the local side and building common understanding through clearly distinguishing between training and education, the project was finally able to move forward. The fact that Mr.

Mr. Fukuda – the 3rd project leader

Sakurai earned the nickname the “fireman” in just over a year in this position hints at the high level of trust that was placed in him by officials on both sides.

(6) A New Start – Transformation into a Major Campaign

As the project was being reconstructed a little bit at a time, the productivity movement was spreading to the whole of Singapore.

Mr. Yasushi Fukuda was appointed as the third project leader in 1986. As he recalls, “I came in after the fire had all but been extinguished,” however, there must have been some pressure and anxiety as he inherited the project that had only just been rectified by Mr. Sakurai. Mr. Fukuda says, “I turned down Mr. Goshi’s approach (to be leader) a few times.”

Following Mr. Sakurai’s decision to reassess the role of the Japanese experts so that they could directly go to corporations and carry out guidance, Mr. Fukuda’s term witnessed the full-scale implementation of the model enterprise approach. This entailed the experts and NPB staff making weekly visits to plants and offices of corporations that had volunteered or had been recommended by the NPB, and offering guidance on Japanese style management techniques while conducting line improvements through the 5S (Separate and Scrap, Sort and Straighten, Scrub, Spread, Standardize), etc. Moreover, as was described in the episode of Mr. Sakurai, teamwork was not easy for the Singaporeans. Accordingly, through establishing something like a ‘Champion company system’ and encouraging corporations to compete to establish 5S, it was necessary to take special measures to emphasize to the individualist Singaporeans that group performance is more important that individual performance in obtaining results.

Mr. Fukuda recalled the president of a certain enterprise in Singapore. “That president believed that Japanese could implement the 5S because they were inherently fastidious about cleanliness. However, on participating in training in Japan and visiting Japanese small and medium enterprises, he realized that the Japanese simply worked hard to establish the 5S, so he gained the confidence to do the same in Singapore.”With a smile, Mr. Fukuda reflects, “That is a wonderful thing, don’t you think?” After that, the company in question made an even greater effort to introduce 5S and even came to take part in competitions.

Just like that president, everybody who took part in training in Japan said the following kind of thing: “Thanks to participating in the Japan training and visiting plants, I finally understood the meaning and significance of Kaizen and 5S. When attempting to introduce new methods to corporations, in addition to just preparing and passing on a manual in the style of Western consultants, I realized the importance of actually performing tasks for others to see.” Mr.Low Hock Meng, who worked in NPB as a management supervisor in charge of labor management and took part in the first training in Japan in 1983, looks back as follows: “It was only after visiting Japan and observing clean plants that I understood the behavior of the Japanese experts who always checked the cleanliness of toilets when making company visits. Mr. Low currently serves as the director of the Singapore Productivity Association (SPA), which was founded

following the numerous reorganizations of the NPB.

Once the project was back on track, a massive public relations campaign was conducted with an advertising agency in order to disseminate the productivity movement throughout Singapore. In order to convey teamwork and diligence to the multiracial population which also included large numbers of foreign workers who couldn't read, a worker bee called 'Teamy the Bee' was adopted as the image character and a theme song was played everywhere. Furthermore, each November was designated as 'National Productivity Month' and Prime Minister Lee made repeated speeches aimed at encouraging and prompting the workers.

When asked if the productivity movement in Singapore was even more enthusiastically supported than in Japan, Mr. Fukuda says, "In Singapore, where the scope of each individual's work is clearly defined, when trying to promote a movement going beyond the individual, you have to make it into a 'festival,' otherwise nobody will be interested."That makes sense, however, even if the productivity movement in Singapore was propagated as a festive campaign, the government made a serious and concerted effort to support the capacity development of workers, as may be gathered from its establishment of the Skill Development Fund (SDF) geared to making it easier for corporations to send employees to NPB training and vocational training courses. Furthermore, in the final year of the project, management consultants from surrounding countries were invited to Singapore to take part in training.

For the staff of NPB, who had been previously immersed in Western style rational thinking, how did the Japanese style productivity come across? Mr.Paul Sum, who studied at Manchester in the United Kingdom before taking part in the Japan training in 1985, recalls, "When I was in the UK, the word productivity had the negative connotation of getting as much work out of people as possible for the same wages, and salary was merely a cost factor that reduced productivity. The Japanese concept of enhancing added value to increase the size of the overall pie and make things better for labor and management alike had not existed at all in Singapore until that time. It was an eye opener for me to discover that labor and management can cooperate without coming into collision."

Dr.Danny Lam, who was chief of a training department and participated in the training in 1986, says the following: "Since Singaporean society at that time already had knowledge about the western style of productivity, the Japanese concept of productivity did not spread as a ground-breaking idea. Before taking part in this training, I had been consigned by the government to improve the quality of consultants, however, this was difficult because Singapore had no organization for training consultants. I was surprised to find that Japan was the only country that had programs for training and developing consultants at

Mr. Lam Chun See – founder of Hoshin

that time." Dr. Lam says that this experience helped him realize that the Japanese model was more grounded in practical application than Western models.

Meanwhile, other people say that that the Japanese and Western styles of thinking presented no discrepancy at all. Mr. Lam Chun See, who took part in the training in Japan in 1985, applied after seeing an advertisement for the training in a newspaper. After returning to Singapore, he spent some time offering guidance to corporations in the model company program of the NPB, and in 1993 he retired and set up the consulting firm TEIAN with a friend. Since 1997 he has operated his own consulting firm Hoshin and is an avid fan of Japanese style management. "I took both company names – TEIAN and Hoshin – from Japanese words. Rather than the Western approach to productivity development focusing only on the individual departments of workers, the Japanese approach from the wide perspective going beyond management, workers and organization was essential for Singapore, which was aiming to promote globalization at that time."

It should also not be forgotten that the NPB side was striving to understand Japanese culture at this time. When the project finished in 1990, the NPB compiled a large bound volume entitled 'In Search of an Endless Tomorrow,' and this describes the experiences of NPB staff who strived to learn Japanese and to indirectly understand Japanese management thinking through seeking opportunities for exchange with the Japanese experts away from the workplace.

In his memoirs, Lee Kwan Yew looks back on this project as follows: "We learned the importance of raising productivity through labor-management cooperation and the true meaning of human resources development from the Japanese. (Abridged) We built up an efficient system whereby labor and management could work together to develop productivity."

4.2.2 Emergence of a New Trend

(1) Change in National Policy

It can thus be seen that the productivity movement in Singapore developed into a major national campaign. Professor Pang Eng Fong of Singapore Management University assesses the movement as follows: "Seen from the Singaporeans, who were striving for economic development at that time, the Japanese model was very attractive from the two viewpoints of labor-management cooperation and continuous training." These words indicate that the importance of "investing in people in the same way as investing in infrastructure" was conveyed to the people of Singapore, and that this contributed not only to economic growth but also to the development of labor values and society in that country.

However, the professor goes on to say that "Japan was only an attractive object for Singapore during the 1970s and 1980s." As was mentioned earlier, when other Southeast Asian countries entered the manufacturing competition backed up by low wages and low prices in the middle of the 1980s, the Singaporean government was forced to seek differentiation. At this juncture,

Singapore turned its attention to high added-value industries and the service sector centering on high tech and financial fields, and it encouraged the overseas transfer of labor-intensive industries. The foreign affiliated makers and electronics corporations that were based in Singapore started to relocate their labor-intensive departments (domestic electrical appliance and personal computer assembly operations, etc.) to neighboring countries such as Malaysia, whereas numerous researchers were invited from overseas and development of advanced technologies in such fields as biotechnology, medicine and semiconductors, etc. was promoted under government preferential measures. This coincided with a decline in Japanese economic momentum and sudden drop in investment. As a result, the blue-collar frontline concept of productivity development became almost obsolete and emphasis came to be given to the promotion of innovation rather than Japanese style diversified management.

From the end of the 1990s into the 2000s, greater emphasis came to be placed on venture capital as a fund source. Around this time, the Singaporeans working in multinational corporations were able to autonomously make improvements through incorporating the skills they had learned on the job. Also, local corporations which conducted subcontracted manufacturing for the multinationals started to become interested in technical innovation and to learn technologies from the multinational corporations (customers), and they started seeking ventures in new fields such as information technology, biotechnology and life sciences. Spinoff enterprises also started to appear from universities and R&D agencies, and the number of such enterprises increased every year. Rather than being dependent on overseas corporations, Singapore expanded its own R&D efforts and started to seek autonomy. This trend was referred to as ‘value creation.’

Although the manufacturing sector continued to account for around 20-30 percent of GDP after the 1990s, the service sector accounted for approximately 70 percent, and the industrial structure was very different from the time when the project was implemented. Ms. Chew Mok Lee, who is group director in the Entrepreneurship & Innovation department of SPRING (Standards, Productivity and Innovation Board), says the following: “The things that were taught in that project placed emphasis on process. Cost factor analysis and so on is still effective know-how today, however, viewed in terms of the overall business, it is only a minor part. Rather than that, society today seeks new knowledge on how to open up markets and compile strategies.” Moreover, Professor Pang says, “One rarely hears the phrase ‘Japan as the model’ these days. Rather, in the new industries of today, there is more to learn from the United States rather than Japan.”

(2) Dissolution of the National Productivity Board and Emergence of SPRING

As Singaporean society underwent drastic structural change and the concept of productivity lost some of its importance, the project implementing agency – the NPB – also underwent major organizational reform in a manner that was symbolic of such changes. The NPB, which had

carried the burden of productivity development activities, was amalgamated with the Singapore Institute of Standards & Industrial Research (SISIR) to form the Productivity Standards Board (PSB) in 1996. However, the PSB was also reformed in 2002 and replaced by a new agency – the Standards, Productivity and Innovation Board (SPRING) – which added SMEs support to the functions of the former NPB. Incidentally, the certification arm of the PSB was privatized, leaving the PSB responsible for only national standards (in 2002 the PSB was integrated with A*STAR, an agency conducting science and technology research).

Functions concerning productivity are currently managed by the Singapore productivity Association (SPA) established within SPRING.

4.2.3 Still Fresh 'Productivity'

(1) Japanese-like Singaporeans

So, has Japanese style productivity disappeared completely from Singaporean society?

Mr. Teng Theng Dar, Singapore Business

We met a man who views recent Singaporean society with concern. He is Mr. Teng Theng Dar, who was previously the CEO of the Singapore Business Federation. Mr. Teng previously came to Japan at his own expense and passed the entrance examination to enter Waseda University faculty of commerce, after which he became the first foreign born regular employee of Kao Corporation. During 13 years with Kao, he experienced work in sales, production management and marketing, etc. Under the careful guidance of the late president Yoshiro Maruta, he was immersed in Japanese approaches ranging from sales to human relations.

Mr. Teng Theng Dar is unhappy that "Singaporean people today are only interested in fashionable things such as new slogans and innovations, however, they don't follow the basics." He goes on to say, "Western management is 'unsentimental responsibility management' whereby people are quickly laid off when costs rise and business conditions worsen. It is easy to lay people off, however, this is just transferring the problem from corporations onto society as a whole. Now above all we should get back to basics and stress the merits of Japanese style management, which puts emphasis on the business process."

(2) The DNA of Project Alumni

The earlier mentioned Mr. Lam Chun See, who operates his own company 'Hoshin' named after the Japanese word for 'policy,' also raises his tone when he says, "The idea that Japanese style know-how has been lost is preposterous." According to Mr. Lam, "Of course, since the

project was conducted in the 1980s there has been some shift in the direction of emphasis. However, the things I conducted guidance in via the model company project while I was at NPB in the 1980s are no different from the contents of consulting I provide at Hoshin today." Mr. Lam expresses concern over the recent spate of accidents at Jurong Shipyard: "The 5S are at the root of safety in our society today. Many companies boast that they have introduced the 5S, however, having worked on Kaizen for more than 20 years, I see many companies that are not putting it into practice." There is still a high demand for Mr. Lam's consulting which is based on these Japanese style management principles, and many clients find out about and make contact with him and his company without the need for advertising. He currently travels to Malaysia a number of times each year to offer improvement proposals to a client company there.

Mr. Lam recently wrote a book called 'Ideas@work' which is aimed at the manager class. In this volume, which he describes as the summarization of his experiences, after giving commentary on the concrete tools such as quality control, 5S, Kaizen and Teian, etc. he learned from Japan, he states the importance for corporate management of workers taking the initiative and pursing bottom-up productivity development and describes ways to motivate workers to do this.

It is true that industrial structure and society in Singapore have changed greatly since the time when the project was implemented. However, there are many OBs such as Mr. Chun See who have continued to teach Kaizen and productivity know-how as consultants at production centers which have been transferred to neighboring countries. Working out of Singapore, they are now spreading the knowledge gained from Japan to neighboring countries.

(3) 'Japan' in Manufacturing – Singaporean Corporations

However, if one walks around town in Singapore, one often sees a glass shield engraved with a lion's profile and the letters SQA (Singapore Quality Award) in hotels and restaurants, etc. This is the mark of the annual award system that was initiated by SPRING in 1994 in order to recognize corporations that provide excellent products and services. As has already been seen, venture capital and R&D initiatives geared to technical innovation were rapidly disseminated by Singaporeans during the 1990s. In the midst of this era, this award scheme was launched with a view to encouraging corporations to display business and organizational innovation and improve the quality of management and thereby provide high value products and satisfaction to customers. Since receiving this award infers that the products and services concerned are of world standard, it has become a kind of status symbol for companies.

We visited Singapore Technologies Engineering Ltd., which has received the SQA on numerous occasions and in 2007 also received the SQA Special Award, which is presented only to those corporations which achieve an even higher level of management quality five years or more after receiving the original SQA. This company is a group corporations engaged in the four sectors of aerospace, electronic engineering, shipping and construction, etc. In 1997, Mr.Boon

Swan Foo, who served as both the president of ST Aerospace and representative of the ST Engineering Group, took the decision to introduce line kaizen. While receiving guidance from a Japanese management consulting firm, the Kaizen movement was introduced first to ST Aerospace, then to ST Marine (1998), and then to ST Kinetics and ST Electronics (1999). The Kaizen supervisors from each company gathered to give presentations on the Kaizen efforts in each. Various methods were adopted to promote the activities, for example, establishment of special departments and resource centers, designation of a Kaizen week every two months, distribution of Kaizen notebooks to all employees, and so forth. Ever since the Kaizen movement was introduced to the company 12 years ago, the group companies have made a concerted and ongoing effort to disseminate it, and they are clearly proud of their achievements.

The SQA has encouraged corporations to raise competitiveness through striving for customer satisfaction, and such activities have come to play a focal role in management. Actually, this award system was initiated along the lines of the Malcolm Baldridge National Quality Award (MB Award) which was launched in the United States in 1987, and the SQ Award is decided according to similar review criteria and process as the MB Award. However, it is very interesting that ST Engineering, which never received guidance from Japanese experts as a model company while the productivity development project was in effect and never employed any former personnel of the NPB, made a group-wide effort to introduce Kaizen under frontline guidance from Japanese consultants and was able to become a regular winner of the SQA. When asked what their companies gained by working on Kaizen, the managers of ST Aerospace and ST Marine who gave presentations pointed to better teamwork among employees, higher awareness of organizational improvement, better communications between management and workers, and a greater sense of ownership within each employee. Mr. Harnek Singh, vice president of ST Engineering, said, “Kaizen is a process for improvement - the methodology of corporate management.” Although these representatives of ST Engineering didn’t actually mention the word ‘productivity,’ the outputs of Kaizen which they pointed to were exactly the same as the concepts that Mr. Sakurai, the ‘fireman’ and second project leader of SPDP, tried to convey while using the metaphor of Mt. Fuji. As can be gathered from their words “We have added security and safety to the 5S to create the 7S” and “Kaizen is the tool that enables the organization to keep evolving,” they have acquired and digested Japanese management philosophy without any difficulty at all.

Mr. Yoshiyuki Nogi , Kikkoman (S)

（4）Japan in Manufacturing – Japanese Affiliated Corporations

The next day, we drove about 50 minutes out of town to Woodlands New Town Industrial Estate, to visit Kikkoman (S) Pte Ltd. The Managing Director, Mr. Yoshiyuki Nogi, greeted us with a pleasant smile. When Mr. Nogi established this plant in Singapore in

1983, it was Kikkoman's first ever production facility in Asia. He returned to Japan in 1990 when operations had got off the ground, but he came back in 2006 and has been in Singapore ever since.

Since this is a food company, quality control is given top priority attention. "We gave thorough 5S guidance not only to the plant employees but also to the raw materials wholesalers and packing companies. This is the basis for everything else." Today, the Japanese assigned staff and Singaporean workers do exercises together every morning at 08:00, and they also spend 30 minutes before and after that removing weeds and cleaning, etc. Of course Mr. Nogi joins in too. As he says, "Through showing the workers that the president is willing to take the initiative in cleaning, the workers have a stronger aesthetic feeling for the workplace and a greater sense of solidarity."Nostalgic memories of factory life in Japan can be found in these activities.

(5) From Manufacturing to Service

The Japanese concept of 'productivity' can still be seen in other areas apart from manufacturing. It was mainly the manufacturing sector that was targeted for guidance in the project. However, according to the third project leader Mr. Fukuda, "In Singapore, the concept of productivity soon started permeating the operation departments of service sectors such as hotels and retailing." With the onset of the 1990s, The Government of Singapore dispatched numerous missions to Japan, South Korea and Australia, etc. with the aim of improving quality levels in the service sector. "The Singaporeans like system building a lot. For example, rather than attributing the quality of services to the manners and ability of each employee, they strive to provide a certain level of service through building up efficient systems," says Mr. Fukuda.

Mr.Paul Sum played a part in this systemization of service. Just like the other members, Mr. Paul Sum says that he couldn't grasp the concepts of Kaizen and 5S simply by listening to lectures but that he understood them by watching actual activities in Japanese corporations. At the same time, he strived to arrange these techniques according to conditions in Singapore, realizing that Singapore had a different culture from Japan and that some adaptation was needed. He looks back in the following way: "QC circles and line improvement which emphasize data and sampling were certainly effective for the manufacturing sector, however, I sensed that they may not be readily accepted in Singaporean society, which had a high proportion of service industries catering to civil servants and bankers, etc."

After observing conditions in Yaohan Department Store, Mr. Paul Sum became interested in the retailing trade and, after retiring from the NPB, he set up his own consulting company called The Retail Academyof Singapore Pte Ltd. Today, he teaches to his clients the Japanese ideas he learned in the project, for example, line improvement methods and importance of OJT, etc., but he also incorporates the American approach to human relations building and so on. For example, raising methods for conducting presentations geared to having one's proposals heard and recognized by busy superiors, methods for communicating with subordinates or methods for

mixing with colleagues, Mr. Paul Sum makes clients conduct role playing in specific settings and then conduct mutual criticism sessions. He thinks that OJT and training methods will soon change in line with the spread of video cameras and recording devices, etc. “The know-how required for retailing is very wide ranging. We need to combine methods from various countries like Japan, America and Australia, etc.” he says with a smile. In these words, one can sense the global thinking of Singaporeans, who have to look for ways to differentiate and survive in this world in spite of having no natural resources and few human resources.

(6) ‘Productivity’ Once More

Mr. Masamitsu Okada, the Managing Director of Okada Business Consutancy Pte Ltd says, “The term ‘labor productivity’ has recently come under the spotlight again in Singapore.” Mr. Okada analyzes the results of the wage survey and NWC guidelines published by the National Wage Council every year and he offers business and legal affairs advice to Japanese affiliated corporations setting up in Singapore. According to the guidelines for 2008-2009 which were compiled in May 2008, negative labor productivity was recorded for fiscal 2007 and the average wage was higher than in neighboring countries. Mr. Okada stresses that these results demonstrate that “Improvement of productivity is the primary issue that needs to be tackled in order to raise the international competitiveness of Singapore.”

In an amended version of the guidelines published in February 2009, it was recommended that a MCV (monthly wage variation) that allows for wage freezes and wage cuts be adopted, and Mr. Okada assesses this as “an expression of the government’s desire to avoid social unease through obtaining understanding from unions and corporations for the introduction of wage cuts in order to avert sudden layoffs due to the recession.” Although this matter concerns productivity from the viewpoint of wage costs, the efforts of the Singaporean government to appeal to management and labor and overcome the recession through sustaining corporate competitiveness and employment indicate that the philosophy of labor-management cooperation first conveyed by Mr. Goshi a quarter of a century earlier has taken root in Singaporean society. Today in Singapore, it is a well known fact that the government, corporate managers and labor unions maintain extremely close collaboration, so much so that public hearings are held for industry and government to hold direct dialog when the national budget is decided upon.

The concept of productivity has come under the spotlight even more since the beginning of 2010. In the report of the Economic Strategies Committee that was published on February 1 ahead of the budgetary process for fiscal 2010, it is stated that “Productivity development is important for strengthening Singapore’s international competitiveness and improving the quality of economic growth.” Also, in the Business Times of February 2, 2010 and the Strait Times of February 7, it was reported that plans are being examined for the establishment of a high-level conference geared to achieving a two to three percent improvement in Singapore’s productivity each year over the coming decade. In particular, the Strait Times carried a large picture of Teamy the Bee, which was the image character during the 1980s, as well as the contents of the campaign

at that time, and it called on readers to unite as a country in reviving the productivity movement of that era.

Moreover, in the multiracial state of Singapore, the importance of productivity is drawing attention in the highly modern context of foreign workers. As has already been seen, Singapore has augmented labor shortages through positively accepting workers from neighboring countries. However, in recent years the younger generation is showing a stronger preference for white-collar work, and more and more people are seeking employment in the service sector such as hotels and department stores away from hard, dirty and dangerous jobs. As a result, rapidly advancing infrastructure development geared to the construction of casinos, access roads, subways and Techno Parks manned by foreign researchers can no longer be sustained without accepting laborers from India and Bangladesh, etc., and there is widespread recognition for the need to manage, train and improve the productivity of such unskilled overseas workers. Concerning this type of acceptance of overseas workers, Japan has only just started to accept nurses and care helpers from Indonesia and the Philippines, and it may conversely need to learn from the more open country of Singapore in future.

4.2.4 Prospects – A New Japan-Singapore Relationship

(1) After the Project that was a 'Divide'

Mr. Yoshichika Terasawa, the Managing Director of Singapore Representative Office of JETRO (Japan External Trade Organization), says he is constantly aware of the government's forceful message -"Singapore may have been successful before, but experience is soon erased. Don't hang on to past successes."Dr. Danny Lam similarly comments, "productivity is like a marathon race once you start. It must continue to improve."

Freddy Suhn looking back on the project

Driven by an acute sense of danger, and unable to stop its engine of growth, which direction will Singapore take from now on?

Mr.Freddy HC Soon, who was executive director of the NPB at the time of the project, had the following to say at the bar of his cricket club: "Before the project started, the NPB was just a minor department not worthy of much attention even in government circles. The biggest factor behind the success of that project was certainly the top-down leadership of Prime Minister Lee, however, we NPB members also worked with great perseverance. We learned about Japanese culture as much as we could in order to acquire an understanding of productivity. Thanks to that, I came to enjoy *yakitori* grilled chicken and *sushi*. I even have a favorite Japanese song (*Shiretoko Ryojo*) for *karaoke*."

After stating that “the project was eventually a great success,” Mr. Soon quickly adds that, “We were undoubtedly the first counterparts to answer back to JICA.” Rather than adopting a passive attitude and simply receiving everything from JICA with a “thank you,” the NPB counterparts requested that experts who were not up to the required standard be sent back to Japan, and they issued aggressive demands concerning the specifications and models of equipment, etc. As Mr. Soon recalls, “We clearly stated what we wanted and what we didn’t want.” He went on to say, “Both we and JICA accumulated various experiences over the seven years of that project. However, why didn’t JICA make use of that experience? After the project in Singapore was finished, it is unfortunate that JICA didn’t adopt a joint cooperation setup through dispatching Singaporean experts, etc. when conducting similar productivity development assistance in Thailand and other countries.” Precisely because the NPB counterparts overcame differences of language and culture in understanding the concept of productivity, adapting it and incorporating it, Mr. Soon conveyed a sense of chagrin that Japan failed to utilize Singapore’s experience rather than starting from scratch in each country.

As Mr. Soon laments, Singapore never had the opportunity to cooperate with JICA productivity development projects in Thailand, Brazil and Hungary, however, ever since the end of the project, numerous developing countries have made requests to Singapore for the transfer of productivity development know-how, and the Singaporean counterparts are continuing to convey the know-how acquired from Japan. The Singapore Productivity Association (SPA), for which the aforementioned Mr.Low Hock Meng serves as executive director, implements such cooperation under instructions from the foreign ministry. Surprisingly, the first case of such cooperation dates back to 1992, just before the end of the project. On this occasion, technical cooperation geared to improving productivity was continued until 2003 with respect to Botswana, which was another member of the Commonwealth heads of state summit.

Mr. Low Hock Meng – Executive

During this cooperation, the contents learned by Singapore in the JICA productivity development project were utilized to the full. A study team and experts were dispatched from Singapore to Botswana, while trainees were invited from Botswana to Singapore to take part in practical guidance with emphasis given to displaying actual know-how in corporations. Mr. Low says the following, “We Singaporeans have the experience of overcoming barriers of language and culture to absorb Japanese productivity and make it into our own thing. The important thing is that we belong to the English speaking world. For other countries in the English speaking sphere, it would be far easier to learn through us rather than directly from Japan, and there would be no need to overcome the obstacles of language and culture we encountered. Our experience can benefit such countries a lot.”

Japan arranged European know-how on productivity according to its own circumstances and

realized amazing economic development as a result. Following the end of the SPDP project after seven years of struggle and effort by Singapore to learn that know-how, if Japan had chosen to work with Singapore as a partner, Singapore could have responded to requests for cooperation on productivity development from various countries in a joint effort with Japan. Actually, Japan did establish the JSPP framework (renamed JSPP21 in 1997) for conducting joint training with Singapore (whereby both countries share costs as equal partners) in 1993, thereby supporting the spread of the effects of the productivity development project to third countries. However, even though the potential for collaboration went far beyond third country training, cooperation setup development stopped at this point. In that sense, the post-project period may be described as a kind of water divide where Japan and Singapore could have built a relationship for extending cooperation to third countries, or they could have gone their own respective ways.

(2) World-Oriented Singaporean Corporations

In 45 years since gaining independence after almost being force out of the Federation of Malaysia, Singapore has constantly remained aware of the rest of the world and acquired its own unique presence through pursuing differentiation for survival largely due to the fact that it is not blessed with natural or human resources. As Mr. Terasawa points out, one of the features of Singapore's current strategy is growth as a center for human resources development. One aspect of this is Singapore's invitation of excellent researchers from overseas and provision of long-term research and living environments; also, government officials from China and India are invited to Singapore as researchers for a certain period, while highly talented Chinese in the fields of academic study and arts are invited with their families to live in Singapore. According to Mr. Terasawa, such a policy is motivated by the desire to impart a sense of belonging towards Singapore among such human resources through encouraging them to base their lives and to grow in Singapore. Moreover, top-class lecturers have been invited from overseas and numerous colleges and other education agencies for hotel personnel and other hospitality sector employees have been established, and such qualifications are now sought by both Singaporeans and trainees from all over the world. Lee Kuan Yew School of Public Policy, which is dubbed the 'Kennedy School of the East,' is also well known as a research agency which attracts future politicians and researchers from countries in Europe and Asia.

Meanwhile, Singaporean citizens are encouraged to study overseas. For example, there are more than 100 types of scholarship awarded to Singaporean engineering students aspiring to obtain doctorates at overseas universities. In all these cases, the desire of the Singaporean government to build relationships with overseas via human resources development is vividly expressed.

Another strategy of Singapore's is 'global deployment.' It is precisely because Singapore is such a small nation that the Singaporeans have such a close relationship with the rest of the world. Mr. Teng Theng Dar, who is CEO of the Singapore Business Federation, says "When we talk about Singapore, there is no point in looking at Singapore alone. As a country with a national land

area of just 700 square kilometers, there is naturally a limit to how far Singapore can think solely of its own national benefit." Mr. Teng Theng Dar lays emphasis on the flow of goods rather than national borders. "We obtain resources from surrounding countries and thus form a single market with our neighbors," says Mr. Teng Theng Dar, and he wonders "How far is the actual situation reflected in modern country-separate trade figures?"

Singapore's overseas advances in recent years have been dramatic. For example, in China, the governments of Singapore and China are joint developing an industrial estate in Suzhou, and they are also jointly advancing the Tianjin Eco City development project based on the master plan compiled by a Western corporation. Moreover, numerous internationally successful major corporations have their head offices in Singapore, for example, Banyan Tree Holdings which runs Asia's most representative high-class hotel chain, Singapore Airlines which enjoys immense popularity for offering the world's leading service, and Hyflux Ltd. which is an internationally recognized water treatment corporation. In fact, Mr. Freddy Soon, who earlier lamented the fact that the experience of JICA's productivity development project in Singapore was not utilized in cooperation in other countries, currently works as the vice representative of Hyflux Ltd. He suggests that, "corporate networks such as ourselves that are based in Singapore and have worldwide operations could achieve a lot in collaboration with Japanese corporations which possess excellent technical prowess." Mr. Terasawa similarly says, "Japanese private sector enterprises are already aware of the network of Singaporean corporations which aim to coexist with the world irrespective of national boundaries. Particularly in the fields of water, environment and infrastructure, since Japan has little experience of public-private partnership (PPP) for implementing projects, it could receive greater opportunities for overseas orders through collaborating with Singaporean corporations." According to him, there has been a growing boom in investment in India by Japanese corporations in recent years and the amount of FDI to India exceeded that to ASEAN in fiscal 2008, and this has led to the formation of a tripartite taskforce by Japan, Singapore and India. Through utilizing this, it may be possible for Japan, Singapore and India to further expand investment in India and from there realize dynamic deployment into the rest of Asia and English-speaking nations in Eastern African.

The fusion of Singapore's global marketing fine-mesh network aiming to build a platform of people, money and goods, together with Japanese technology will no doubt advance in the private sector from now on. Based on the suggestions obtained from this, it should be possible to find a way for utilization of Singapore as an equal partner in Japan's international cooperation in future. In the next section, the lessons learned from this Singapore productivity development project for new international cooperation are discussed.

4.2.5 Summary: Lessons Learned from the Productivity Development Project

1. Presence of strong political intent

As representatives from both countries point out, this project was implemented under the strong leadership and political intent to realize national unification immediately following independence of Prime Minister Lee Kwan Yew. At that time, the Government of Japan also had political intent in the desire to utilize Singapore for diplomatic clout in ASEAN.

2. Contribution to globalizing Japanese management techniques

Singapore was a key station for Japanese corporations as they launched out into Southeast Asia from the 1970s. For Japanese corporations conducting joint ventures in Southeast Asia, it was effective to teach Japanese management techniques such as 5S and Kaizen to ethnic Chinese business managers in Southeast Asian countries. If one considers that the Japanese management mind has spread to the rest of the world via Singapore's global network, it can be seen that the productivity development project has had major significance.

3. Possibility of international cooperation in collaboration with Singapore

Following the end of the Singapore Productivity Development Project, when Japan conducted similar cooperation in Thailand, Brail and Hungary, it should have been possible to work with Singapore as an equal partner, utilizing the experience of the Singapore National Productivity Board (NPB), which overcame barriers of language and culture to learn Japanese productivity concepts. Singapore, which sought to become a regional center, also aspired to that.

A number of the NPB counterparts who took part in the project currently work as independent management consultants away from the government. However, they continue to see each other and the atmosphere was more like a nostalgic reunion of old friends when everybody gathered for interviews in this study. These human ties are another legacy of the project, and it will be very important for the relationship between both countries to build a network of human resources scattered over various fields in the public and private sectors.

As it has proved in the productivity development project in Botswana, Singapore is now extending autonomous activities to the rest of the world in both the business and technical cooperation fields. In international terms too, the emergence of new donors is startling, as is typified by the entry of South Korea to DAC at the end of 2009. Conversely, as Japan cuts its ODA budget and concern is raised over its declining presence in the international community, now is the time to throw away the illusion of being the leader in Asia and calmly accept its current standing. As Mr. Terasawa says, "The only people who know about Japan's former strength are Singaporeans in their 50s and 60s. Younger generations who don't know about Japan in those days have no particular ambition towards Japan now." Unless Japan follows the lead set by the private sector and devises a new form of international cooperation which entails not simply indirect methods such as lateral support for south-south cooperation but rather learning from Singapore and approaching the world in collaboration, it will find itself left behind by and

isolated from its former allies in Asia and other countries in the rest of the world. It is the final chance now.

(Author: Mitsue Tamagake)

Chapter 5

Recommendations Derived from Cross-sectional Analysis

Chapter 5 Recommendations Derived from Cross-sectional Analysis

5.1 Recommendation for Collaborative International Cooperation

During the course of the Study, it was possible to gather ample raw materials to write the 'story' of aid in three countries, namely King Mongkut's Institute of Technology in Thailand, the Standards & Industrial Research Institute of Malaysia (SIRIM) and the Productivity Development Project in Singapore. Through conducting interviews with numerous associated persons, it was confirmed that Japanese know-how and Japanese feeling (culture), both tangible and intangible, resides in these counterparts, that they enjoy passing on their experiences of life shared with Japanese experts to future generations of children, and they convey this Japanese know-how and feeling via their friends and workplaces (instruction to students and subordinates). These points cannot be quantified in numerical terms. Moreover, such developments are not formed overnight in meeting rooms or deskwork; rather they are created together with the furtherance of human relationships out of close human exchanges including training and overseas study. It is necessary for the Government of Japan and JICA to carefully examine its stock of such assets and make good use of them. Such thinking will form the bedrock for advancing collaborative international cooperation with ASEAN and other emerging countries.

Such counterparts have a sense of Asian unity with Japanese. As one Malaysian interviewee said, "We study in London because there is a lot of know-how there, however, in human terms we cannot acquiesce to their attitude which looks down on Malaysians." Such people have a sense of affinity with the Japanese.

Among the opinions given, these former counterparts pointed to a desire to transfer the things learned from Japan to later developing countries in ASEAN, Asia and Africa in collaboration with the Japanese.

King Mongkut's Institute of Technology in Thailand is already cooperating with Japan in developing human resources at the National University of Laos and making a contribution to the development of advanced engineering human resources at universities in other ASEAN countries within the framework of the ASEAN advanced engineering education project. In Singapore, since it has totally digested and absorbed productivity, it hopes to convey this experience and know-how to other countries in cooperation with Japan. Singapore is already implementing productivity cooperation in Botswana in collaboration with British Commonwealth assistance. Moreover, Singapore is cooperating with Japanese corporations and making advances into India in the water business, and they say that such cooperation can be extended to East Africa using the same approach in cooperation with Japan and India. In Malaysia, success was achieved in establishing standardization on the global standard under

Japanese cooperation, and the Malaysian counterparts hope to see the standardization transfer model transferred further afield to ASEAN nations and Asia in general as well as Africa too.

Out of the above local interview surveys, it is hoped to propose Japanese 'collaborative international cooperation' for thinking and acting together with the semi-advanced or quasi-semi-advanced countries of ASEAN. In contrast to the concept of unilateral support of developing countries by advanced nations that arose out of the north-south situation in the past, this proposal presents a new aid concept of assisting other developing nations through a sense of partnership with ASEAN countries based on profound trust and accumulated legacy of ODA in ASEAN. Agencies which were previously the targets of Japanese assistance programs and are staffed by people who cherish the Japanese know-how and feeling that were passed on to them should be regarded as valued development partners, and development projects should be advanced in collaboration with such agencies.

In particular, regarding the resolution of global environmental problems, there is a pressing need to expand the ring of cooperation in collaboration with semi-advanced nations that were previously developing countries. In that sense, Japanese collaborative cooperation with ASEAN semi-advanced countries and quasi-semi-advanced countries has the potential to become a global model.

Japanese collaboration with ASEAN has significance in the sense of co-existence in terms of physical geography, politics and economy. Like it or not, building a mutually complementary relationship with ASEAN semi-advanced countries is an inescapable proposition for Japan as it faces a declining child population and ageing of society. Furthermore, from the global perspective in the current age, collaborative international cooperation deserves special emphasis in terms of strengthening complementary economic relationships with emerging economies such as China, India, Brazil and South Africa. It should be understood that collaborative international cooperation is deeply linked to this kind of future outlook.

Meanwhile, collaborative international cooperation is a concept that also holds true in the planning of ASEAN cooperation policy and recommendations for intellectual development cooperation discussed later. All these ideas can be summed up into the concept of networked international cooperation. This concept is geared to jointly realizing solutions to common problems while building networks throughout a single area or between multiple countries and agencies.

5.2 Compilation of ASEAN Cooperation Policy

The Asian region is seen as occupying a central position as the production center of the world. In that arena, the semi-advanced countries of ASEAN are inevitably being compelled to shift

towards high added-value labor-intensive industries and R&D sectors. During this process they are likely to seek Japan's former experience, and Japan will be faced with the need to compile collaborative international cooperation policy geared to realizing mutually complementary relationships.

Furthermore, the countries of ASEAN will seek Japan's support concerning pollution and other environmental problems, which Japan had difficult experiences with in the past, social security issues brought about by declining child population and the ageing of society, privatization of national enterprises and other issues. For Japan, it is worth considering the compilation of policy for collaborating with ASEAN and exploring joint solutions to such problems.

Conventionally, since aid projects were conducted between countries, cooperation policy was compiled bilaterally between the Government of Japan or JICA and the government of the recipient, and project activities were sustained on the bilateral basis. However, when the general area viewpoint was adopted, the standpoint of Japan taking the initiative in coordinating the differing opinions and interests of multiple countries in that region and implementing projects was more dominant than that of the recipients; moreover, activities tended to be viewed as only supplementary to bilateral cooperation or to be implemented within the bilateral framework alone. Accordingly, project plans were not compiled from the medium to long-term perspective and projects could not be implemented on an ongoing basis. However, if one takes a detailed look at political and economic trends on the regional and global scale, rather than seeking regional cooperation as an adjunct to national policy, it is necessary to have a clear vision whereby regions are viewed as a single unit and it is clarified how the benefit and status of each country should be secured and how projects should be implemented within that single unit. In this sense, the Government of Japan and JICA need to have a cooperation policy and implement projects in tandem with the entire region or all the nations that comprise the region.

5.3 Recommendation for Intellectual Development Cooperation

As has been seen so far, it is necessary to cherish human assets and the assets of Japanese know-how and Japanese feeling (culture) that are built up within people. Since Japanese ODA is funded with Japanese public funds, the fact that it leaves an imprint of Japan that lasts for a long time between people on both sides is an important asset and achievement of ODA that, although not immediately visible, helps to solidify the status of Japan in a changing world.

When adopting a long-term viewpoint, with respect to the semi-advanced nations or emerging economies of ASEAN, rather than cooperation based on objects and money, it will more beneficial for the future survival of Japan to embark on collaborative international

cooperation geared to realizing intellectual capacity development and to strive for the formation of intellectual human networks with ASEAN and the emerging economies.

Such efforts should not only be limited to government agencies utilizing ODA but should also entail participation from the private sector and academia. In particular, judging from the fiscal status of the Japanese government and economic trends of Japan, it will be necessary to bundle together numerous strands of conventional cooperation and generate synergies in order to produce numerous effects with limited budget. One possibility is to construct 'platforms' whereby government, private sector and academia can collaborate in implementing projects.

For example, concerning the formation of an ASEAN intellectual human network in ASEAN, it is proposed that a joint research fund be created under public and private sector collaboration with Japan in AUN/SEED-NET (ASEAN University Network/Southeast Asia Engineering Education Development Network), which is a case of Japanese wide area cooperation. Private sector corporations independently set up funds to provide scholarships and research subsidies, etc. to overseas students, however, the proposal here aims to integrate such support on a wider and more effective scale. On such platforms, it would be possible for specific corporations to establish courses and scholarships. Furthermore, in the public sector too, it is anticipated that synergy can be realized between projects that go beyond the boundaries of ministries, for example, funding by the Ministry of Foreign Affairs, state-funded overseas study programs and academic promotion projects by the Ministry of Education and so forth. Here, it is hoped that universities (the actual operators) also participate in forming an all-Japanese framework geared to the development of advanced engineering human resources and promotion of research between Japan and ASEAN.

Furthermore, following the model of AUN/SEED-Net which is limited to the engineering field, it is proposed that a new ASEAN network of policy research be constructed and that joint research groups be launched in the fields of social security policy, privatization policy, environmental policy and industrial policy, etc., all of which are areas that will have to be confronted by ASEAN sooner or later.

5.4 Recommendation of Long-Term Project Implementation and Review of Existing ASEAN International Cooperation Projects

As was mentioned earlier, JICA technical cooperation projects are configured with three- or five-year terms. However, as was made clear in the Study here, outputs can be achieved in profound areas not measurable under the DAC five-stage evaluation through conducting patient cooperation over 10, 20 and 30 years. In order to further realize such important outputs based on the long-term view, JICA should seek to shift its concepts and systems for implementing

projects without being limited by the conventional time frame of five years. This is particularly true in the case of educational projects, which cannot display their true effects in just five or even 10 years.

People who are bound by rules immediately start talking about ‘exit strategy’ and discussing the ‘sustainable development potential’ of projects. Then again, there are others who do not deeply consider future potential but find pleasure in forming new projects. It is not intended to deny the viewpoint and efforts for securing sustainable development potential, however, while taking steps to secure this, it is also important to understand that there are cases where sustainable development cannot be secured over the time span of five and 10 years and to find the value of long-term involvement in such projects.

Naturally, this is not to suggest that projects be implemented aimlessly over the long term. There is validity in the approach of establishing break-points and establishing targets and clarifying results at each point. In such cases, the future vision of cooperation must be articulated. However, in reality, project frameworks tend to be decided based on the approach which says “projects must end in five years because the rule is five years.”Since such an approach inhibits the dynamism of cooperation, it is necessary to construct the project framework from a broader framework that analyzes the future potential of projects more deeply. However, on the level of concrete activity, it will likely be necessary to review outputs and approaches and compile new project deployment strategies every five years or so.

Moreover, depending on the state of implementing agencies, it may be a good idea to selectively implement long-term projects with respect to agencies that are expected to become important collaboration partners of Japan in the long term.

Limiting review to the ASEAN region cooperation that was surveyed in this Study, in particular the long-term cooperation projects that have continued over decades, collaboration with ASEAN can be made more durable and this continuity can contribute to Japan’s national interest if projects that are effective in long-term collaboration with ASEAN are selected for continuation and improvement as collaborative international cooperation.

Finally, Japanese ODA, which started from the development of states and people in fledgling independent states, may basically be called the history of transfer of technology, knowledge and know-how for “building something out of nothing.” However, when it comes to the deployment of collaborative international cooperation proposed here between Japan and the semi-advanced and quasi-semi-advanced countries of ASEAN, this conventional modality of ‘building something out of nothing’ will no longer hold true.

Since the counterparts in collaboration already possess a certain stock of intellectual and technological assets, such cooperation must be based on the new awareness of ‘building more

out of something.' For this reason, the Japanese side proposing collaboration is required to have horizontal thinking and it must be equipped with an intellectual and technological level commensurate with that.

Accordingly, it will be necessary to build the implementation setup while bearing in mind that collaborative international cooperation cannot be advanced based on the conventional vertical approach to assistance.

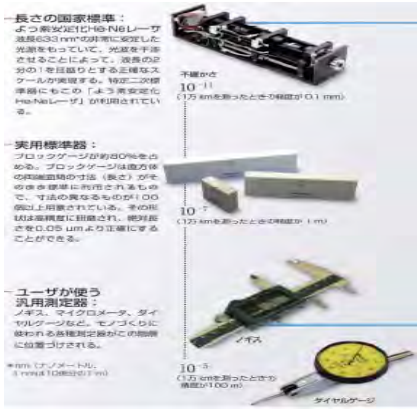
Review of Existing ASEAN International Cooperation Project (the case of technical cooperation for SIRIM in Malaysia)

Taking the case of the 'length' standard, which is the easiest to understand element in JICA's technical cooperation with SIRIM, the industrial world uses instruments such as micrometers and calipers, etc. in order to measure the length of objects.

It is necessary to periodically confirm whether the said instruments such as micrometers and calipers are working properly, and a practical standard instrument known as a block gauge is used for that purpose. Conventionally, a metric scale provided by the Bureau International des Poids et Mesures (BIPM, based in Paris) has been used to confirm the accuracy of the block gauge, however, currently the metric standards using lasers possessed by the national standard research institutes of advanced countries and semi-advanced countries are used.

In other words, as a result of advances in physical research, the metric scales supplied by BIPM have become unsuitable for the world of nano measurements because they become deformed due to temperature changes during transportation and storage and the width of the lines that denote meters at both ends is too thick. It is now more common to physically measure length using lasers. This means that the tangible object of a metric scale has come to be replaced by physical 'knowledge' and measurement 'researchers' are now in demand in each country. Whereas it was conventionally possible to say that possessing standard instruments allowed countries to say they possessed standards, it is now necessary for researchers who possess 'knowledge' to create standards.

JICA's technical cooperation so far has directed the technology of Japanese experts into this area of knowledge in the national standards institute, and combined with the efforts of the SIRIM side too, it has come to possess a good balance of numerous national standards within the ASEAN region. In other words, thee standards are 'assets' of JICA's technical cooperation and remain as a useful legacy and sure output of the cooperation.



In the current age of advancing globalization, the top national standards are periodically compared with the national standards administered by the national standards institutes of Japan, the United States and Britain, accuracy is confirmed and a network is formed between the advanced countries and semi-advanced countries.

In order to establish a system for confirming the accuracy of measuring instruments used by industry having national standards at the top, it is necessary to build traceability (linkage) starting from laser standards and connecting to block gauges and micrometers. In reality, this will vary greatly according to the accuracy required by industry and its accumulation of knowledge, dust and temperature in work settings, micrometer accuracy and the accuracy, etc. of block gauges.

Moreover, the standards prepared vary greatly depending on the industry being promoted.

In other words, since the quantity and accuracy of standards required in Malaysia, Vietnam, Cambodia and Laos, etc. differ greatly, it is necessary to compile a plan that is strongly linked to industrial policy, and it is necessary to greatly alter the contents and techniques included in the plan upon gauging the manufacturing environment in each country.

Put another way, JICA's technical cooperation in the past has built the foundations of the bedrock, and applied problems in industrial circles in other countries are now about to be addressed from this base.

The departments and officials who helped build these foundations have respect for the *monozukuri* spirit of Japan, learned through their contact with JICA, and they are aiming to spread this ring of support to the rest of ASEAN and other developing nations.

As the number of applied problems increases, there is no doubt that the capability to respond to other areas such as Africa will also increase.

5.5 Outputs and Lessons from the Survey Techniques Used in the Study

This Study adopted a journalistic approach in which interviews were conducted with local people who had been involved with the target projects covering a long span of 30~40 years, and aid stories were written from the dialogs. In doing so, it was intended to discover how far past Japanese know-how, Japanese human networks and Japanese patterns of behavior (an aspect of Japanese culture) remain today and are entrenched within people.

We called it a study of 'Revisiting the past in order to know new things." While visiting and interviewing the people who were involved in such projects in the past, we aimed to find new perspectives and knowledge that holds true today while seeking to understand how far the said

Japanese know-how, human networks and behavior patterns remain in those organizations and the people who inhabit them.

For example, in this interview survey, even though standard questions were prepared, difficulties were encountered when impromptu responses were sought according to differences in position, experience and age, etc. In the interviews, one could find life philosophies born out of historical involvement with Japan and understand the Japanese know-how, Japanese human networks and meetings with Japanese culture that arose out of such philosophies.

Sometimes during the interviews, the talk turned from children's education to overseas study in Japan, once more indicating the depth of Japanese know-how and existence of Japanese human networks within the counterparts. Furthermore, through hearing about the counterparts' views on differences between Japanese know-how and thinking and Western know-how, thinking and patterns of behavior based on overseas study experience, it was possible to comprehend the validity and future potential of Japanese know-how.

Out of the idea that aid is a human drama, the Study team aimed to cover the emotions and struggles of the people who were involved in aid and to incorporate them into the stories as live teaching resources. Thus it was possible to compile the findings into a story of three cities, i.e. Thailand, Malaysia and Singapore. Then, recommendations for the future were horizontally drawn from the three stories. Due to the limited space available here, the stories were only written in summarized form here, however, full story writing must be attempted from now on.

In closing, the lessons obtained from the interview-based study are touched on in the following paragraphs.

(1) Possibilities for historical verification

First, through dividing each project into a number of eras and interviewing the people who were involved with the project in each era, it was possible to grasp the features of the approach adopted by both sides according to each age. Next, through understanding the gradual transformations in Japanese know-how in each era, it was possible to confirm the potential for further development in the project concerned. Projects with history have progressed until today while repeating certain failures and successes, and the people who understand that most are the people who were involved in those projects. In order for us to acquire a historical understanding of how conditions really were, we believed that we could find out the truth through obtaining testimony from the live historical witnesses who were actually involved in the projects.

(2) Possibilities for verification of aid assets

Through simultaneously interviewing people who were involved with aid projects in the past and people who are involved at present, it was possible to grasp whether Japanese know-how introduced in the past is still used in the same form or has evolved. Moreover, we could

ascertain how far human network links currently remain with Japan in the relationship with Japanese know-how and the relationships that caused Japanese know-how to evolve. Through verifying such points, it is possible to investigate the potential of collaborative international cooperation as a new asset of Japan's aid.

(3) Possibilities for recommendations on field-based policy

As was mentioned earlier, this study entailed revisiting the past in order to obtain new perspectives and know-how, and by simultaneously interviewing people who were involved with aid projects in the past and people who are involved at present, it was possible to conduct a certain type of comparative research, and from that to clarify policy issues that have future connotations. Through enhancing the accuracy of such policies, it will be possible to compile more realistic recommendations that are more suited to conditions in the field.

The journalistic approach entails constantly facing the interviewees and discovering the truth they hide within while keenly watching their every move. The facts thus obtained also become precious testimony in the sense of complementing literature.

Accordingly, whereas the DAC evaluation method is a technique for investigating surface effects in quantitative terms, the journalistic approach may be described as an effect measuring technique that puts a stethoscope to the inner face of people in qualitative terms. Since this is a human approach, it has a better chance of securing the wonder and confidence of people.