REPORT OF JOINT EVALUATION STUDY ON JAPAN'S ECONOMIC AND TECHNICAL COOPERATION IN THAILAND

—Summary and Recommendation—

March, 1989

Department of Technical and Economic Cooperation (DTEC)
Japan International Cooperation Agency (JICA)

PREFACE

The Japanese Government decided to conduct an evaluation study jointly with the Government of The Kingdom of Thailand, as the first case of joint evaluation, on the Sericultural Research Center Project, the Khon Kaen Institute for Skill Development Project and the New Village Development Program and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Thailand a study team headed by Dr. Kenzo HEMMI, Professor of Asia University, comprised of members from Mr. Kanji ENDO, Dr. Jinichiroh YABUTA, Mr. Joh CHIBA and JICA staff concerned from June to July, 1988.

The team held discussions with concerned officials of the Government of The Kingdom of Thailand, and conducted field surveys. After the team returned to Japan, further studies were made and the present report was prepared.

I hope that this report will contribute to the promotion of Japan's Economic and Technical Cooperation with Thailand and to the enhancement of friendly relations between two countries.

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

March, 1989

Kensuke Yanagiya

Kensuke Yanagiya
President
Japan International Cooperation Agency

Mr. Kensuke Yanagiya
President
Japan International Cooperation Agency

Dear Mr. Yanagiya:

On behalf of the team for the Evaluation of Japanese Aid Projects in North-east Thailand, I take pleasure in submitting to you its report. The Evaluation was conducted both in Japan and Thailand during June 19th to July 22nd and September 18th to 24th, 1988, following preparatory work carried out both in 1987 and earlier last year.

The Evaluation was performed jointly by a Japanese team led by me and the Social Research Institute, Chulalongkorn University, led by Dr. Amara Pongsapich, Director of the Institute, in accordance with the Scope of Work agreed upon between Mr. Wanchai Sirirattna, Director General of DTEC and Dr. Kenzo Hemmi on September 23th, 1987. The purpose of the Evaluation is stated in the first page of the following report, Summary and Recommendation. The Scope of Work and the list of the members of the team are appended to the report.

The report consists of four parts: Summary and Recommendation; the Report on the Sericultural Research Center Project; the Report on the Khon Kaen Institute for Skill Development Project; and the Report on the New Village Development Program. Although it lacks details of the evaluation of above individual project or program, the Summary and Recommendation is a self-contained report. Dr. Amara Pongsapich will submit the same set of the reports to the Department of Technical and Economic Cooperation, Royal Thai Government.

To produce this report required advice and assistance from many people and organizations. Names of those individuals are too many to list. The list of the names of the government organizations to which those individuals belong is attached to this report. I am extremely grateful to Dr. Amara and her staff for their cooperation and participation. We asked them to participate in this Japanese-Thai experts joint evaluation with very short notice. They performed their parts whole heartedly. We became good friends soon after we started our work. I have never experienced such a successful joint work like this.

Our work is done. I sincerely hope that this report contributes both to furtherance of friendly relation between our two nations and to improvement of Japanese official aid in the future. The work was educational and challenging to us. We learned very much. Thank you for giving this opportunity of working on this very important project.

Sincerely
Kenzo Hemmi
Leader, Japanese Team

The Acknowledgements

The conduct of this review has only been possible with the support and assistance of a large number of people. A large number of staff in government agencies, both in Japan and Thailand, contributed information and otherwise assisted the review team. The willing assistance of each of these staff is acknowledged.

The government agencies concerned are as follows:

- Department of Technical and Economic Cooperation
- National Economic and Social Development Board
- Sericultural Research Institute, Ministry of Agriculture and Cooperatives
- Silk Inspection Section, Department of Commerce
- Department of Labour
- Khon Kaen Institute for Skill Development
- National Institute of Skill Development
- Accelerated Rural Development, Ministry of Interior
- Community Development Department, Ministry of Interior
- Textile Industry Division, Ministry of Industry
- Japan International Cooperation Agency
- Economic Cooperation Bureau, Ministry of Foreign Affairs, Japan
- Embassy of Japan, Bangkok
- Overseas Economic Cooperation Fund

List of Members concerned

Japanese-side

– Dr. Kenzo HEMMI	Team leader
– Mr. Kanji ENDO	Researcher
– Mr. Junichiro YABUTA	Researcher
– Mr. Joh CHIBA	Researcher
– Dr. Katsuhiro OHTA	Researcher
– Mr. Kazuo HAZAMA	Researcher
– Mr. Inohiko KOSUGA	JICA
– Mr. Shinichi SUZUKI	JICA
– Mr. Makoto AOKI	JICA
– Mr. Yukihisa SAKURADA	JICA
– Mr. Kiyoshi NISHIKAWA	Ministry of Foreign Affairs
– Mr. Katsuhiko HOSAKA	Ministry of Foreign Affairs
– Mr. Katsusuke IHARA	Ministry of Foreign Affairs
– Mr. Nobuo HAZEYAMA	OECF
– Mr. Katsunori SAWAI	OECF

Thai-side

– Dr. Amara Pongsapich	Team leader
– Dr. Charit Tingsabadh	Researcher
– Dr. Neungpanich Sinchaisri	Researcher
– Ms. Kobkul Phutaraporn	Researcher
– Ms. Abha Sirivongs Ayudhaya	Researcher
– Ms. Ratana Jarubenja	Research Assistant
– Ms. Nitaya Kataleeradabhan	Research Assistant
– Mr. Verapong Paditporn	Research Assistant
– Mr. Damri Rungsuk	Research Assistant
– Ms. Sunee Chomkhwa	Research Assistant
– Mr. Wanchai Sirirattna	DTEC
– Mr. Pichet Soontonpipit	DTEC
– Mr. Sumethee Srisuchart	DTEC
– Mr. Krisda Piampongsant	DTEC
– Mr. Kittipan Kanjanapipatkol	DTEC
– Ms. Pisamai Kanobdee	DTEC
– Mr. Voravud Tomon	DTEC

SCOPE OF WORK

FOR

THE JOINT EVALUATION STUDY

ON

THE JAPAN'S ECONOMIC AND TECHNICAL COOPERATION

IN

THAILAND

AGREED UPON

BETWEEN

DEPARTMENT OF TECHNICAL AND ECONOMIC COOPERATION

AND

JAPAN INTERNATIONAL COOPERATION AGENCY

BANGKOK, SEPTEMBER 23, 1987

Mr. Kenzo Hemmi
Leader,
Japanese Preliminary Survey Team,
JICA.

Mr. Wanchai Sirirattna
Director-General,
DTEC.

1. INTRODUCTION

Being aware of the necessity of an evaluation for the past economic and technical cooperation programmes, Government of Japan proposed a joint evaluation and the Government of Kingdom of Thailand (hereinafter referred to as "RTG") consented to the proposal at the Japan-Thailand Economic Consultation in December, 1985.

Accordingly, the Japan International Cooperation Agency (hereinafter referred to as "JICA") in cooperation with the Overseas Economic Cooperation Fund (hereinafter referred to as "OECF"), the official agencies responsible for the implementation of the technical cooperation programme and of the loan aid programme of the Government of Japan, will undertake the evaluation jointly with the authorities of RTG.

2. EVALUATION OBJECTIVE AND PRINCIPLES

The primary objective of evaluating projects after completion is to enable the RTG and the Japanese Government to plan more effectively other current and future projects.

Consistent with this objective, it is in the best interest of RTG and JICA to subscribe to the following principles concerning all joint evaluation :

- The evaluation shall be conducted by the joint auspices of RTG and JICA
- An evaluation report shall be prepared by an evaluation team and made available to RTG, the Japanese Government and the Thai implementing agencies

K.H.

- The report shall objectively assess project performance vis-a-vis original expectations
- Sustainability will be assessed through evaluation in relation to transfer of technology, human resource development, management, etc.

3. PROJECTS FOR EVALUATION

(1) Institute for Skill Development in the Northeast of Thailand

(2) Sericultural Research and Training Center

(3) New Village Development Programme

4. EVALUATION PARAMETERS

The evaluation of each project shall cover the following :

- Basic project data
- Assessment of project performance
- Factors affecting project performance
- Findings and conclusions of the joint evaluation

Basic project data

Basic project data shall, in all cases, provide a comparison to original expectations with regard to the following:

Datail of the project (examples of JICA project)

- background
- period of the cooperation
- implementing organization
- site of the project
- target

K.H.

- expert (cost, M/M)
- training in Japan (cost, M/M)
- equipments
- local cost

Detail of the project (examples of OECF project)

Loan Summary

- borrower
- executing agency
- date of exchange of note
- date of loan signing
- date of loan closing

- amount of loan
- amount of disbursed

- date of commencement of project
- date of completion of project

Project Description

- background and purpose
- project location
- outline of project
- OECF financing
- project cost (foreign/local)
- expected project benefits

Assessment of project performance

The assessment of performance shall relate the outcome of the project to those objectives which were established at the

K.H.

outset. The assessment shall be thorough and expressed in quantitative terms wherever possible.

Factors affecting project performance

The evaluation shall assess all factors which, directly or indirectly have affected the execution and final outcome of the project and particularly the impacts (economic, social, etc.) on beneficiaries. This assessment shall be thorough and be done in such a way to improve forward planning of future projects.

Included in this section should be an assessment of the suitability of the original objectives of the project.

Findings and conclusions of the joint evaluation

The thrust of the evaluation should aim at providing insight on how similar projects be planned and executed more effectively in the future.

5. REPORTING

The final report shall be submitted to the authorities of both governments for consideration.

This report shall comprise :

- a summary chapter, including a one-page resume of key project data
- separate chapters describing :
  - the assessment of project performance
  - factors affecting project performance
  - findings and conclusions
- other chapters (if required) and appendices to support the material of the report

C.H.

—Summary and Recommendation—

CONTENTS

PREFACE
Letter of Transmitter ..... (i)
The Acknowledgements ..... (ii)
List of Members concerned ..... (iii)
Part of Scope of work ..... (iv)

Summary and Recommendation
Introduction 1
Summary of The Projects and The Program 2
Main Achievement 6
Recommendations 11

INTRODUCTION

Because of its location, its long and strong historical relation in various fields with Thailand, and increasing size of its economy, Japan has long been the biggest supplier of Official Development Aid to Thailand. Of total bilateral aid received in 1986 Japanese Official Development Aid occupies 66.6%, Thailand has been the second or the third biggest recipient of Japanese Official Development Aid in the last several years. How Japanese Official Development Aid to Thailand has been utilized merits wider attention. However, almost all reports or documents on Japanese aid projects or programs have been published either in Japanese or in Thai. Audiences of these were too limited. Moreover, evaluation in the past were mainly done by either of our two governments. There have been frequent criticism of Japanese aid by Thai scholars which were interpreted by those who were in charge of these aid as ones which may have been caused by their misunderstanding. There is a need to have an independent joint evaluation of these projects and programs by experts of our two countries where the result is published in an international language, English.

In its 5th and 6th National Economic and Social Development Plans, the Royal Thai Government (RTG) places a larger weight on the importance of developing Northeast Thailand which has been far less developed than Central Thailand. Although Japanese aid used to concentrate in Bangkok area, it has concentrated in Northeast Thailand in recent years. It is pertinent to take up projects and programs in Northeast Thailand as subjects of the first trial of our joint evaluation. However, majority of Japanese aid to Northeast Thailand are still on going. Only three of these are completed. We took up these three: the Sericultural Research Center (SRC) Project, the Khon Kaen Institute of Skill Development (KISD) Project, and the New Village Development Program (NVDP Phase I and II). The NVDP covered not only Northeast but also North and South. However, major part of the program was carried out in the Northeast.

We think that economic development is an endless process of social and economic change which includes institutional change, human development, technological change, investment and market expansion. The process includes various efforts to adjust its economy to changing environment. Each aid project or program is merely a stepping stone in this endless process. It is very important to learn lessons from earlier stepping stones for use of later, coming stepping stones. Economic development is a learning process too. Evaluation of aid projects or programs is an effort to learn lessons and make use in following projects or programs. At the end of this report we present lessons we learned from these projects in the form of recommendation.

This is the report of evaluation of Japan's economic and technical cooperation in Thailand. Cooperation means that each project or program is a concerted effort of our two nations for development of the area or sector concerned. This is not simply an act of transferring capital or technology from the aid giving nation to the recipient. Our evaluation covers the area beyond the acts of transferring capital or technology specified in the agreements concerned between our two governments.

SUMMARY OF THE PROJECTS AND THE PROGRAM

(a) General Description

Each of these three project differs distinctly from other two. The New Village Development Program is a program of the Royal Thai Government. About half of its budget was financed by Japanese Government (the Oversea's Economic Cooperation Fund) for the purpose of procuring materials and equipments specified in the Loan Agreement. Both the Sericultural Research Center Project and the Khon Kaen Institute for Skill Development Project are the projects which combined grant and technical assistance. The Sericultural Research Center Project is the sole project in Thai silk industries whereas the KISD is a regional portion of a nation wide network of training facilities. Major part of this network was already developed before the KISD was launched. Moreover, in the case of KISD, technologies developed in Japan could easily be transferred with minor modification. On the other hand, the work of the sericulture project is very location specific. Technological knowledge developed in Japan cannot be transferred to Thailand without significant modification. The core of the project is research. This is the reason why the project was extended so many times as shown below.

The NVDP aims at poorly endowed rural societies mainly in Northeast. The KISD project aims at the region most populated but least educated. The sericulture project is trying to develop a traditional industry in the region.

(b) The New Village Development Program (NVDP)*

Background. Since fruits of economic development has been unevenly distributed among various regions of Thailand, and income disparity among the regions has widened, the Royal Thai Government has been increasingly interested in solving rural poverty problem. As a result of the increased interests, the NVDP was launched as a part of the Rural Poverty Eradication Plan in the 4th National Economic and Social Development Plan (1977-1981) in August 1978. The project was extended for another five years under the 5th National Plan (1982-1986). Both of the programs were assisted by the Japanese Government loan.

Objectives. The main objective is to encourage community participation and self-reliance in village development. The Government played a supportive role by providing funds, materials, tools and implements and other technical services, and by guiding the community participation process.

Main project activities were as follows:

NVDP phase I

(1) Productivity promotion activity

* Although NVDP is a program and consists of many projects, it is called project hereafter.

(2) Physical environment and village infrastructure activity
(3) Rural people organization and development program activity

NVDP phase II
(1) Water resource development activity
(2) Group of production credit (Saving group) and rice bank development activity
(3) Cottage industry promotion and water usage occupation activity
(4) Community education extension activity

Phase I started in 1979 and ended in 1982. Phase II started in 1982 and ended in 1986.

Budgets consisted of four cost items for equipments and materials, labour, inland transportation and management. The budget for equipments and materials was mostly covered by Japanese loan while other expenses were borne by the Thai Government. RTG budget for Phase I was 549.6 million baht and for Phase II was 765.7 million baht. Japanese loan was 7 billion yen each for both budgets. Total disbursement of Japanese loan for procurement of equipments and materials in Phase II was about 6,565 million yen. This amount is roughly converted to 719.4 million baht.

For executing NVDP, Government supportive and coordination organizations and committees were established at the national and local (Changwat, Amphoe, Tambon and Village) levels. The National Rural Development Committee was chaired by Prime Minister, and Secretary General of NESDB assisted him. There was the National Rural Development Coordination Center at national level. The local level organization were chaired by heads of local governments. In Phase I both of the Mobile Development Unit and the Community Development Department participated in activities of the local organizations while in Phase II both of the Community Development Department and the Accelerated Rural Development participated in activities of the local organizations.

(c) Sericultural Research Center Project (SRC)

Background. Although silk industry had been a traditional industry in Northeast Thailand for many, many years, its technological level has been low. In 1960's Thai silk received world wide reputation, and its export increased. However, warp for silk was not produced in Thailand, and 100 tons of warp was imported every year. The Thai Government tried to introduce variety of bivoltine silk worm which could produce warp, and requested Japanese Government to assist its venture.

Purposes. The project aimed to establish a Sericultural Research and Training Center in Korat, to introduce new sericulture technology and to train Thai technicians and extension workers in order to produce and distribute excellent silkworm seeds and mulberry saplings. The project is consisted of grants of implements and materials for construction of the Center, sending of Japanese experts for research and training in Northeast Thailand, and inviting Thai scientists

to Japan for training.

The period. Cooperations was initially scheduled for three years from April 1969 to March 1972. The project extended two times: April 1972 to March 1975 and April 1975 to March 1978. Then there was two years follow-up cooperation from April 1978 to March 1980. During this period Japan provided materials and implements amounted to 554 million yen, sent 45 experts, and received 39 Thai scientists into Japan. The Thai Government provided land, buildings, administrative and technical staff and operation costs. RTG budgets for the SRI has increased very rapidly during these 11 years.

(d) Khon Kaen Institute for Skill Development Project (KISD)

Background. In 1976, the last year of the 3rd National Development Plan, the Labour Department submitted a proposal to NESDB to include a labour development plan in the 4th National Development Plan. One of objectives of the plan was to establish institutes for skill development in the different regions of the country. With assistance, from UNDP and ILO, a National Institute for Skill Development was already established in Bangkok in 1969. With assistance from above donors and ADB, Regional Institutes for Skill Development were established in Ratchaburi, Chonburi and Lampang during 1976-1977. Then Khon Kaen was selected as the location for the center responsible for skill development activities of the 17 provinces in the Northeast. The Labour Department requested Japanese Government for assistance to the establishment of the Regional Institute for Skill Development.

The purpose. The center has the same purpose as other Regional Centers; i.e., (1) to promote manpower development prior to entrance into the labour market; (2) to raise existing skill standard; (3) to encourage business and industrial sectors to become involved in skill development activities; (4) to promote skill development appropriate to the local demand; (5) to provide skill testing facilities; and (6) to promote manpower development to provide vocation and improve income in poverty and sensitive areas. The centers were expected to give short term training and produce semi-skilled workers.

Construction of KISD building started in November 1977 and finished in February 1979. Technical assistance by a group of Japanese experts started in December 1978 and terminated in March 1982. Training of Thai instructors in Japan started in August 1979 and terminated in October 1982. Provision of equipment and materials by Japan was made during July 1979 to December 1981. Activities of the KISD started in 1979 and still going on. In addition to the above Japanese technical assistance was extended for two years to April 1984. Thus the period of cooperation was from 1979 to 1984. Costs of building was about 100 million baht and costs of equipments was 20 million baht. Technical assistance including some equipment costed 56 million baht.

Two main activities of KISD are vocational training and skill training. Pre-employment training is emphasized to prepare young people to enter into the labour market. Activities of

vocational training include inplant training, skill up-grading training, rural mobile vocational training and non-technical training. KISD has given pre-employment training in following six fields: automobile repair, agricultural machines, sheet metal welding, machinery, electricity/ electronics, and architecture/construction.

(e) Social and economic implications of these three projects

Implications of these three projects have changed drastically in the course of changing economic environment of the Northeast. However, basic nature of Northeast economy has remained unchanged. The region is the poorest region in Thailand. Its resources endowment is poor, and we cannot expect much hope in developing major agricultural crops of the region. Moreover, the region is remote from the major market of Thailand in Bangkok area; and regional economy is less commercialized. Population of the region is growing rapidly but employment opportunity in the region is somewhat limited. Excess labour is flowing into Bangkok area.

In these situation encouragement of small scale cottage industries under NVDP is very important. The industries can give subsidiary income to villagers. Products of the industries can find market in neighbouring area. If these cannot be sold out these can be consumed domestically. Development of agricultural sector is very limited, and there is almost no hope of developing large scale and nationally based industry in the region in the near future. Development of small scale industry is crucial to the economy of the region. KISD can supply semi-skilled workers to small scale and locally based industries. Since income of population in the region is low their educational level is also low. Parents in the region cannot afford higher education for their children. KISD can up-grade skill of these children.

Self-reliance community development is a base of development of this kind of depressed rural areas. Capital formation by surplus labour such as construction of ponds which required only minimal monetary expenses should be encouraged. The poor and the rich in the community should cooperate in reducing the role of outside merchants and money lenders.

Activities above can improve regional capacity of holding population, and can reduce the volume of migration from Northeast to Bangkok area. Thus these three projects can mitigate population and industrial concentration in Bangkok area.

Development of silk industry in the region is the core of development of locally based industry. However, it differs from other industries. It depends on local material supply, but it depends on Bangkok market (tourists) and international market (exports). Encouragement of tourism and exports is one of the most important economic program of the nation which can, in turn, influence sericulture development in Thailand.

MAIN ACHIEVEMENT

1. Project Designs

Although designs of the three projects differ due to the different nature of the projects, but nevertheless designs are the basis of the project. Since project designs are to be used as framework for implementation, it is fortunate that there is no sign of distortion of the designs as possible tactics of negotiation on the projects our two Governments. It seems that the projects designed based on technical, economic and social expertise, and generally were aimed at making the project most beneficial for development and the people in the region.

There is a dilemma in project designing. Design of a project has to be as detailed and as focused as possible while there should be sufficient room for redesigning or flexibility to meet changing project environment on which success of the project depends significantly. In the case of plastic lined ponds in NVDP II which covers villages under various physical environments, some construction designs were a little too general and had not adjusted based on differences in local environment sufficiently. Same can be said in the case of rice banks.

The concept of implementation method (top-down/bottom-up) were not clearly identified in project designs. In the case of KISD where training skills of individuals were the main objectives, more consideration on training curriculum based on labour demand/supply is preferably included in the design.

In the case of the SRC project it seems that sufficient attention was not paid on location specific nature of the technology to be developed and more upstream research is required.

Furthermore, effective self-monitoring and evaluation should be included in the project design. This will be discussed later.

2. Implementation

Two distinct features in implementation of the projects are to be noticed. First, executing authorities of our two countries took their responsibility of implementing their parts actively and honestly. Second, when the target on objective of the project was not accomplished during the initially planned period there was extention.

By their nature all of these three projects involved common people – villagers, trainees or farmers -- in their implementation process. Especially in NVDP participation of villagers was indispensable not only in implementation but also in designing of village level activities. Although participation of common people in development process was/is most desired in Thailand as in many developing nations. We have to admit that both officials of the local executing organizations and villagers were not accustomed to the strategy of bottom up economic development.

In many cases these officials did not make sufficient efforts needed for the success of the program at village level. The villagers did not know ahead of time that maintenance of the project in their village was the responsibility of them.

Based on the project designs, the three projects achieved in implementing the projects and programs and initiating the activities. The degree of sustainability is another question. As a training institution, once the building machinery and personnel were made available, KISD has been able to sustain the program up to the present. There were periods of difficulty, but overall implementation is considered satisfactory. KISD should be able to maintain its present function even if no other assistance is given. Of course, more assistance would be preferable.

On the other hand, the sericulture activities have not reached the same level of achievement, since the activities are more technical and knowledge transfer need to be adjusted to local conditions. At present it can be said that achievement is almost made. The project still need further assistance from experts and the project has not reached the sustainable stage. The potential is apparent and there is no reason to doubt the viability and importance of the project.

NVDP II has many components and implementation achievement has to be considered differently because of the nature of the projects. Investment in equipment and machines were substantial. At present Mobile Development Training Unit and Accelerated Rural Development are now maintaining equipments and machines bought. The loan enabled these agencies to acquire the equipment and machine necessary for development of rural infrastructure in general. Village development depends a great deal on socio-economic conditions of the village and cooperation of villagers. Ponds have been dug and lined with plastic. Some are more successful than others. In some villages, the people improved the ponds by putting in cement to make the ponds better. Some ponds are left unattended. But the water is being used for animal and household consumption. This shows that there are evident of sustainability. Similarly all rice banks have been built but the utility varies from village to village. Income generating activities implemented also have different degree of success and sustainability vary from year to year as well. In general it can be said that project implementation was carried out with varying degree of acceptance by the villagers.

Since the project design was not clear on implementation methods, attempts to promote participatory development strategies were not seen in all projects. In NVDP II, if the villagers were allowed to study the different components of NVDP II and choose the projects most fit the local conditions and the needs of community members, implementation pattern may be different. Furthermore, the villagers would know ahead of time that maintenance of the project is also the responsibility of the villagers. Survey result shows that involvement of the villagers in the first year of project implementation was good and decrease later when more input is required. People were not fully aware of the implementation requirement. For sericulture, villagers who received training were not fully aware that problems related to mulberry cultivation and silk-worm rearing also oxist. Although the successful villagers have learned to overcome some of the difficulties or were lucky enough not to have to encounter some of the difficulties,

in general, sericulture is still an income generating activity which the villagers have to depend on advice and consultancy of the training center and/or the experts.

On the other hand, although training programmes of KISD are more individual oriented, a fuller implementation plan in the project design and inter-departmental coordination would be more beneficial. Implementation of training curriculum involve recruitment of trainees, the actual training (both pre-employment and up-grading) and job placement. The evaluation finds that recruitment base on cooperation of different agencies may be questionable and may result in low employment rate. Similarly recruitment of people into sericulture activities is also important and may lead to successful or unsuccessful implementation plan. In general, the total process of implementation process of each project need to be evaluated and adjusted to improve benefits for the people.

Before implementation, a certain degree of pre-implementation evaluation should be made. In case of plastic lined pond, physical and social conditions of the villages where the ponds were to be dug would be more beneficial. This is especially necessary in the Northeast Region where physical conditions vary from village to village. The review team was told that in NVDP II for some site selection, priority was not given to criteria of physical conditions, the implementing agencies gave priority to implementation of projects in sensitive area for political purposes and modest attention was given to limitation due to physical conditions.

3. Goals and Objectives

In the three projects degree of success on achieving the goals and objectives again vary. For NVDP II all equipments and machines were bought according to the objectives. The ponds achieved the objectives of providing agricultural water (ARD pond) in certain villages, and the objectives of providing household consumption water has been achieved in all villages. The rice banks achieved the objectives of helping the poor in most cases. However, the actual role of rice banks have not been fully recognized by farmers because of insufficient guidance. More efforts are required to make more villagers to become members of the rice bank group, in order to enhance the function of the rice bank. On the other hand, income generating activities have marketing problems which may not be the direct objective of the project but certainly is related to making the project successful or not.

In case of KISD, the objective of providing training has certainly been achieved. In quantitative terms the number of graduates and the availability of curriculum are satisfactorily presented. Of course, constant adjustments of curriculum design and recruitment qualifications may help improve quality of graduates making the output of KISD fitting labour demand/supply.

The objectives of transferring technological knowledge of sericulture has certainly been achieved eventhough certain problems still need to be solved and/or corrected. Eventhough the objectives of the project did not mention the need to provide "appropriate technology", it is

apparent from the evaluation study that one factor which lead to incomplete transfer of knowledge was the lack of research which will lead to adjustment of technology appropriate to local conditions enabling transfer of knowledge.

Based on our evaluation, it seems that the goals and objectives of the projects may have been too optimistic. Furthermore, if goals and objectives were fewer and participatory methods of implementation were emphasized, chances for goals and objectives being achieved would be higher.

Although many objectives may be identified, priorities in quantitative and qualitative terms should be made. Instead of trying to implement many projects, fewer but better quality products would be more desirable. This is obvious in case of KISD training where qualified graduates should be preferable to just large number of graduates.

Again, goals and objectives may be altered if mid-term project evaluation is allowed. This may be done by the implementing agencies themselves if desirable.

4. Economic and Social Impacts

Impacts are not easily evaluated. However, it is agreed that evaluation should be made from long term perspective instead of immediate economic return. In all of these three projects being evaluated, attempts on economic analysis were not made at all. And furthermore, at this point, it is still not possible to identify social impacts. For NVDP II, many other government agencies also implement their activities in the same village, and even if economic and social impacts may be apparent, it is not possible to say that it was because of NVDP II. Similarly for KISD which is a training programme, economic and social impact cannot be measured. It is not possible to say that the actual training resulted in the individuals' achievement in life. Other experiences gained after the training certainly influences the ex-trainees qualification and potential.

On the other hand, economic and social impacts of sericulture project can be more easily identified when compared to the other two projects. For sericulture, the project makes Thai sericulture respond to the increase in world demand for Thai silk by supplying various technologies needed, especially introducing new varieties of silk worm. The income of sericulture farmers increased markedly.

5. Area to be Improved

The above examination of the three projects suggests that these three projects were well designed, actively implemented jointly by the authorities of our two countries, and generally attained the goals and objectives. However, the examination reveals that there are areas to be improved. These are as follows:

(1) Project designs and implementation seem to lack location specificity and did not allow for variation in design and implementation strategy fully. Future activities should aim at providing general frame work and promote bottom-up development planning, allowing the villagers to make decision on the details of the project to best fit the conditions of the people.

(2) Without participatory planning, cooperations from the villagers may be less than desirable, or inconsistent. Government agencies tend to put emphasis on implementing and less emphasis on acquiring participation from the people.

(3) What is needed seems to be effective monitoring or self-evaluation of the projects where alterations of project designs are allowed during the project period. If effective monitoring and self-evaluation is included, many projects would be better. This is only possible if flexibility is allowed in the project design.

(4) The learning process has been valuable to the evaluation team. It is not clear how others involved in the project implementation view the lessons learned. Again if implementation agencies are given opportunities to review and evaluate past activities, they would certainly benefit from the lessons learned. Since all three projects evaluated are projects which have been implemented in donor country already, experiences learned from donor country should be transferred also.

(5) Intergovernmental coordination is very essential in project implementation. Experiences in the three projects evaluated indicate that projects would have been implemented more effectively and with more benefits to the people if linkages between agencies are well coordinated.

RECOMMENDATIONS

Following the review of the activities and achievements of the individual projects selected for the evaluation, there are some recommendations that have general applicability to all projects. The recommendations relating to individual projects are given in the separate reports for the projects.

System Approach

Project experiences show the complexity and the dynamic nature of the situations in which the projects under review have been implemented. For this reason, the need to take a system approach to the project should be recognized in all stages of the proejct. Starting from the project design, in the identification of the beneficiaries and the outcome of the projects, as well as the mode of operation of the project as expressed in the sequence of activities and the role of executing agencies. It is necessary to be aware of how the project is fitting into, and in turn it is affecting, the conditions outside the project both in the short term and the long term. For example, the role of KISD in the overall labour market within the Northeast has to be appreciated in terms of the impact of the individual trainees and the impact on the labour market and the national effort in human resource development as a whole. In the sericulture project, the need for the system approach is evident, since the project activities attempt to link many actors together in a highly complex system, from farmers cultivating the silk worm on the one hand to the silk industry catering for the export and tourist markets on the other, with the involvement of extension agents to impact the knowledge and techniques to the farmers and the experts engaged in research to improve and adapt techniques in silk worm rearing to suit local conditions. Problems were encountered in technical areas requiring expert knowledge which needed to be transmitted to the farmers. As for the NVDP Project, the systemic linkages of the various project activities were not always taken into account, leading to problems in the implementation stage. These could have been better appreciated if the implementation was focused on a few demonstration sites instead of trying to achieve a wide area coverage and spreading of project resources. The wider adoption of these activities, after a successful demonstration, could have been left more to the villagers, with partial support from the project.

In brief, there should be an awareness of the long term perspectives with regard to the project and the project environment.

Recommendation: The design and implementation of the projects should be based on a system approach.

Design and Focus

The experience of the different projects within the whole program suggest that the problems of development are varied and often location-specific. Therefore, there is a need to have some flexibility within the project design to take account of these variations. In practice, the role of the intended beneficiaries should be strengthened in each project. For example, the NVDP projects should explicitly involve the villagers in the processes of project planning and selection of activities, in addition to making the contributions to the implementation of the activities in the project, as shown by the failure to maintain the public ponds but the adoption of the plastic-lining technique for individual ponds. In this way, the project is more likely to be more appropriately designed to meet the real needs of the intended beneficiaries, while fitting in with the physical and social conditions of the locality. In other words, the process of project planning should allow for an element of "bottom up" or participation from the beneficiary groups. At the same time, it is important that projects do not attempt to achieve too many objectives, since resources at the disposal of the project is necessarily limited. The focus on the intended beneficiaries will provide an indication of priorities in setting the objectives in project design, while paying attention to local conditions will lead to an awareness of other, similar activities within the area which may have an impact on how the intended beneficiaries will respond to the project.

Recommendation: The design of the projects should have a clear focus on the beneficiary groups.

Technology Development

Broadly speaking, the projects considered in the evaluation involve a development of new technology by the project beneficiary, whether it be the trainee of KISD, the villagers in the NVDP Programme, or the farmer undertaking sericulture. In this learning process, the important factor is time to assimilate the new technology and the timing to put the new knowledge into practice. The project needs to be given sufficient time to make the learning effective, and to have the time to adjust the project to suit the actual conditions which may change. In implenenting the project, it may be that problems are redefined in a different way from when the project was started, or new problems may be identified. In particular, this refers to the Sericulture Project, which may involve a complete redesigning of the project, giving more emphasis to basic and applied research in sericultural techniques rather than to disseminate the techniques which have proved to be appropriate under Japanese conditions but may be less so under conditions in Thailand. In all these cases, it is important to have the flexibility within the project design to use the lessons learned from the experience gained to adapt and modify the project even while it is in progress.

Recommendation: The project should incorporate monitoring and evaluation within the project design, and allow for flexibility or redesigning some activities with the overall scope of the project.

Management Capability

The role of the executing agencies is also an important factor in the implementation of projects. Selection of the appropriate executing agency for the project is an important issue, since departmental traditions will usually prevail over the specific purposes of the project. So it is important to match them well. Where many agencies are involved, the need to have coordinated action is crucial. In this regard, the choice is often between having an elaborate inter-agency coordinating mechanism, or to strengthen the responsible executing agency in the specific areas required. It is the view of the evaluation team that, where appropriate, the strengthening of the executing agencies is to be preferred, to provide for a unity of decision-making and greater speed in implementation. In addition, the capability to undertake monitoring and evaluation functions within the agency, and to utilize the analytical insights gained from these exercises, should be further developed.

Recommendation: Selection of the appropriate executing agency is necessary. The management capacity of the executing agencies should be strengthened, especially with regard to monitoring and self-evaluation, and also in performing the coordinating functions where they are required.

Spare Parts and Follow Up Activities

Another aspect of the need to take the system approach to project planning and implementation is to allow enough resources for maintenance activities. The implications, in terms of budgets for repairs and service of heavy machinery, replacement of parts, etc. need to be assessed and prepared for, particularly on the part of the executing agency on behalf of the Royal Thai Government. In the case of KISD, this means allowing a sufficient budget for spare parts after the establishment of machinery. In the case of NVDP, this may mean the consideration of and preparation of appropriate marketing channels for the product of cottage industry promoted under the project, or the training of villagers in the operation of the rice bank as a saving institution. In the Sericulture Project, problems in finding replacement for machinery and obtaining spare parts have hampered the implementation of the project activities and are likely to affect the continuation of the activities after the termination of the project. Such maintenance and follow up activities are needed to ensure that project activities are not constrained by operational problems and do in fact lead to the intended outcome for which they are designed. Project activities are not ends in themselves, but are more appropriately considered as means to achieve the goals of economic and social development.

Recommendation: Provision of resources for depreciation and maintenance should be adequately made from the start of the projects.

Communications including Language Problems

By taking a "process" view of project implementation, the role of communications of ideas and concepts becomes very important as a means to achieve a common understanding of the project objectives and outcomes. In this regard, the communication skills of the different parties should be improved. Starting from the external experts, the language ability should be adequate to work with the local experts. Secondly, communication with the project beneficiaries should be effective. An example of how effective communication can improve project performance is the development of manual for skill development at KISD, where the manual will be used by trainees with little formal education, so the language used need to be simple and yet convey the correct technical information. From the experience with the plastic-lined ponds, it may not be enough to provide a technical manual and design in the Thai language if the skill needed to adapt such designs to suit local conditions is not already available. The Sericulture Project is a more extreme case, where all the instruction materials are in the Japanese language, and therefore are accessible to only very few of even the project staff, not to mention the farmers who may need the information most. Here, the need to develop local information source and dissemination materials is strongly felt.

Recommendation: More effort should be made to achieve effective communication among the parties concerned in the project, by using international languages among the experts and developing materials in the Thai language for dissemination to the project beneficiaries.

REPORT OF JOINT EVALUATION STUDY ON JAPAN'S ECONOMIC AND TECHNICAL COOPERATION IN THAILAND

—Sericultural Research Center Project—

March, 1989

Department of Technical and Economic Cooperation (DTEC)
Japan International Cooperation Agency (JICA)

PREFACE

The Japanese Government decided to conduct an evaluation study jointly with the Government of The Kingdom of Thailand, as the first case of joint evaluation, on the Sericultural Research Center Project, the Khon Kaen Institute for Skill Development Project and the New Village Development Program and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Thailand a study team headed by Dr. Kenzo HEMMI, Professor of Asia University, comprised of members from Mr. Kanji ENDO, Dr. Jinichiroh YABUTA, Mr. Joh CHIBA and JICA staff concerned from June to July, 1988.

The team held discussions with concerned officials of the Government of The Kingdom of Thailand, and conducted field surveys. After the team returned to Japan, further studies were made and the present report was prepared.

I hope that this report will contribute to the promotion of Japan's Economic and Technical Cooperation with Thailand and to the enhancement of friendly relations between two countries.

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

March, 1989

Kensuke Yanagiya

Kensuke Yanagiya
President
Japan International Cooperation Agency

Mr. Kensuke Yanagiya
President
Japan International Cooperation Agency

Dear Mr. Yanagiya:

On behalf of the team for the Evaluation of Japanese Aid Projects in North-east Thailand, I take pleasure in submitting to you its report. The Evaluation was conducted both in Japan and Thailand during June 19th to July 22nd and September 18th to 24th, 1988, following preparatory work carried out both in 1987 and earlier last year.

The Evaluation was performed jointly by a Japanese team led by me and the Social Research Institute, Chulalongkorn University, led by Dr. Amara Pongsapich, Director of the Institute, in accordance with the Scope of Work agreed upon between Mr. Wanchai Sirirattna, Director General of DTEC and Dr. Kenzo Hemmi on September 23th, 1987. The purpose of the Evaluation is stated in the first page of the following report, Summary and Recommendation. The Scope of Work and the list of the members of the team are appended to the report.

The report consists of four parts: Summary and Recommendation; the Report on the Sericultural Research Center Project; the Report on the Khon Kaen Institute for Skill Development Project; and the Report on the New Village Development Program. Although it lacks details of the evaluation of above individual project or program, the Summary and Recommendation is a self-contained report. Dr. Amara Pongsapich will submit the same set of the reports to the Department of Technical and Economic Cooperation, Royal Thai Government.

To produce this report required advice and assistance from many people and organizations. Names of those individuals are too many to list. The list of the names of the government organizations to which those individuals belong is attached to this report. I am extremely grateful to Dr. Amara and her staff for their cooperation and participation. We asked them to participate in this Japanese-Thai experts joint evaluation with very short notice. They performed their parts whole heartedly. We became good friends soon after we started our work. I have never experienced such a successful joint work like this.

Our work is done. I sincerely hope that this report contributes both to furtherance of friendly relation between our two nations and to improvement of Japanese official aid in the future. The work was educational and challenging to us. We learned very much. Thank you for giving this opportunity of working on this very important project.

Sincerely
Kenzo Hemmi
Leader, Japanese Team

INTRODUCTION

Because of its location, its long and strong historical relation in various fields with Thailand, and increasing size of its economy, Japan has long been the biggest supplier of Official Development Aid to Thailand. Of total bilateral aid received in 1986 Japanese Official Development Aid occupies 66.6%, Thailand has been the second or the third biggest recipient of Japanese Official Development Aid in the last several years. How Japanese Official Development Aid to Thailand has been utilized merits wider attention. However, almost all reports or documents on Japanese aid projects or programs have been published either in Japanese or in Thai. Audiences of these were too limited. Moreover, evaluation in the past were mainly done by either of our two governments. There have been frequent criticism of Japanese aid by Thai scholars which were interpreted by those who were in charge of these aid as ones which may have been caused by their misunderstanding. There is a need to have an independent joint evaluation of these projects and programs by experts of our two countries where the result is published in an international language, English.

In its 5th and 6th National Economic and Social Development Plans, the Royal Thai Government (RTG) places a larger weight on the importance of developing Northeast Thailand which has been far less developed than Central Thailand. Although Japanese aid used to concentrate in Bangkok area, it has concentrated in Northeast Thailand in recent years. It is pertinent to take up projects and programs in Northeast Thailand as subjects of the first trial of our joint evaluation. However, majority of Japanese aid to Northeast Thailand are still on going. Only three of these are completed. We took up these three: the Sericultural Research Center (SRC) Project, the Khon Kaen Institute of Skill Development (KISD) Project, and the New Village Development Program (NVDP Phase I and II). The NVDP covered not only Northeast but also North and South. However, major part of the program was carried out in the Northeast.

We think that economic development is an endless process of social and economic change which includes institutional change, human development, technological change, investment and market expansion. The process includes various efforts to adjust its economy to changing environment. Each aid project or program is merely a stepping stone in this endless process. It is very important to learn lessons from earlier stepping stones for use of later, coming stepping stones. Economic development is a learning process too. Evaluation of aid projects or programs is an effort to learn lessons and make use in following projects or programs. At the end of this report we present lessons we learned from these projects in the form of recommendation.

This is the report of evaluation of Japan's economic and technical cooperation in Thailand. Cooperation means that each project or program is a concerted effort of our two nations for development of the area or sector concerned. This is not simply an act of transferring capital or technology from the aid giving nation to the recipient. Our evaluation covers the area beyond the acts of transferring capital or technology specified in the agreements concerned between our two governments.

The Acknowledgements

The conduct of this review has only been possible with the support and assistance of a large number of people. A large number of staff in government agencies, both in Japan and Thailand, contributed information and otherwise assisted the review team. The willing assistance of each of these staff is acknowledged.

The government agencies concerned are as follows;

- Department of Technical and Economic Cooperation
- National Economic and Social Development Board
- Sericultural Research Institute, Ministry of Agriculture and Cooperatives
- Silk Inspection Section, Department of Commerce
- Department of Labour
- Khon Kaen Institute for Skill Development
- National Institute of Skill Development
- Accelerated Rural Development, Ministry of Interior
- Community Development Department, Ministry of Interior
- Textile Industry Division, Ministry of Industry

- Japan International Cooperation Agency
- Economic Cooperation Bureau, Ministry of Foreign Affairs, Japan
- Embassy of Japan, Bangkok
- Overseas Economic Cooperation Fund

List of Members concerned

Japanese-side

– Dr. Kenzo HEMMI	Team leader
– Mr. Kanji ENDO	Researcher
– Dr. Junichiro YABUTA	Researcher
– Mr. Joh CHIBA	Researcher
– Mr. Katsuhiro OHTA	Researcher
– Mr. Kazuo HAZAMA	Researcher
– Mr. Inohiko KOSUGA	JICA
– Mr. Shinichi SUZUKI	JICA
– Mr. Makoto AOKI	JICA
– Mr. Yukihisa SAKURADA	JICA
– Mr. Kiyoshi NISHIKAWA	Ministry of Foreign Affairs
– Mr. Katsuhiko HOSAKA	Ministry of Foreign Affairs
– Mr. Katsusuke IHARA	Ministry of Foreign Affairs
– Mr. Nobuo HAZEYAMA	OECF
– Mr. Katsunori SAWAI	OECF

Thai-side

– Dr. Amara Pongsapich	Team leader
– Dr. Charit Tingsabadh	Researcher
– Dr. Neungpanich Sinchaisri	Researcher
– Ms. Kobkul Phutaraporn	Researcher
– Ms. Abha Sirivongs Ayudhaya	Researcher
– Ms. Ratana Jarubenja	Research Assistant
– Ms. Nitaya Kataleeradabhan	Research Assistant
– Mr. Verapong Paditporn	Research Assistant
– Mr. Damri Rungsuk	Research Assistant
– Ms. Sunee Chomkhwa	Research Assistant
– Mr. Wanchai Sirirattna	DTEC
– Mr. Pichet Soontonpipit	DTEC
– Mr. Sumethee Srisuchart	DTEC
– Mr. Krisda Piampongsant	DTEC
– Mr. Kittipan Kanjanapipatkol	DTEC
– Ms. Pisamai Kanobdee	DTEC
– Mr. Voravud Tomon	DTEC

—Sericultural Research Center Project—

CONTENTS

PREFACE
Letter of Transmitter ..... (i)
The Acknowledgements ..... (iii)
List of Members concerned ..... (iv)

Sericultural Research Center Project

Chapter I Introduction
§ 1 Purpose of Study 1
§ 2 Members of Study Team and Itinerary 1
§ 3 Methodology of Study 4
§ 4 Summary and Recommendations 4

Chapter II Outline of Project Cooperation
§ 1 Background of the Project 8
§ 2 Process of Project Cooperation 9
§ 3 Achievement of the Project 12
§ 4 Activities of Thai-side 15

Chapter III SRC after the Termination of Project Cooperation
§ 1 Activities on Japanese-side 19
§ 2 Activities on Thai-side 20
§ 3 Outline of historical process of SRC Project 22

Chapter IV Outline of Evaluation Study Results in the past
§ 1 Evaluation Study in the past 23
§ 2 Reports of the Past Evaluations
1. Japanese Evaluation Reports 23
2. Outline of Thai Evaluation Report 25

Chapter V Results of the Evaluation Study
§ 1 Transfer of Technology in the SRC 27
§ 2 Present State of Extension of Technology to Farmers 36
§ 3 Outline of Sericulture Promotion Policy of Thai Government 37
§ 4 Results of Study on Private Enterprises 39
§ 5 Socio-Economic Impact of the Project 43

Chapter VI Conclusion and Recommendation
§ 1 Bases of the Evaluation 53
§ 2 Transfer of Technology in SRC 53
§ 3 Extension to Farmers 55
§ 4 Effect of Cooperation on the development of Sericulture in Thailand 55
§ 5 Problems and Recommendations 56

Appendix: 59

1. Number of Staffs and budget support of SRC
2. Results of research on silkworm races and Mulberry varieties
3. Silkworm seed production in SRC
4. Number of Farmers involving bivoltine rearing
5. Fig; General conditions for Sericultural in Northeast
6. Ubolrat Land Settlement
7. Number of Reeling factories
8. Source of supply of Silk yearn for the Thai Industry 1987
9. Sousing Raw Silk Supplies in the commercial Hand Weaving Sector
10. Record of Discussion (1969)
11. References

Abbreviation

JICA	Japan International Cooperation Agency
DOA	Department of Agriculture
MOAC	Ministry of Agriculture & Cooperatives
SRTC	Sericulture Research and Training Center
SES	Sericulture Experiment Station
SRI	Sericulture Research Institute
SRC	Sericulture Research Center
PWD	Public Welfare Department
ARD	Accelerated Rural Development Department
USAID	United States Agency of International Development
BAAC	Bank for Agriculture and Agriculture Cooperatives
FAO	Food and Agriculture Organization
EEC	European Economic Community

Chapter I Introduction

§1 Purpose of Study

1. Purpose of Study

The purpose of evaluation study on "Sericultural Research Center (SRC) Project" is to study;

(1) Whether the purpose of this project cooperation was achieved or not;

(2) to make clear the reasons for success or failure of the project, and

(3) to use lessons of the project to the improvement of other projects at present and in future.

2. Detailed Purpose of Evaluation Study

Purpose of this study is to know following matters.

(1) Technology of production of "high quality silk for warp, that is silk from cocoon of Bivoltine Silkworm", was transferred to Thai technicians or not.

(2) Technology transferred is maintained and further developed by Thai side or not.

(3) What was the impact of this cooperation on development of sericulture in Thailand and improvement of economies of farmers.

§2 Members of Study Team and Itinerary

1. Members of Study Team (Sericulture Project)

Thai-side : Dr. Neungpanich Sinchaisri
(Professor of Kasetsart University)

Japan side : Members of JICA study team:
Kanji Endo (Technical Advisor of the Association for International Cooperation of Agriculture and Forestry)
Dr. Kazuo Hazama (Director of Sericultural Science Institute)
*Katsuhiro Ohta (Overseas Agricultural Development Association)
*participated only in study in Japan.

2. Itinerary

JICA preparation missions were dispatched to negotiate on execution of this study to Thailand in September and November 1987. Based on the result of this negotiation, joint evaluation study was executed in June-July 1988, as shown in Table 1.

Table 1 Itinerary of evaluatioh study on Sericulture

Date	Date of week	Items of Study
6.19	Sun.	Japanese mission arrived to Bangkok
20	Mon.	14:00 General meeting (at DTEC)
21	Tue	09:20 Group meeting (at Chulalonkorn University)
22	Wed	09:15 Meeting of Sericultural group (at Kasetsart University)
		10:00 Courtesy call to Director of Agricultural Department and Study on Sericultural Research Institute
23	Thu	10:00 Study of Thai silk Association
		11:00 Study of Thai silk Development Section of Textile Industry Division, Ministry Industry
24	Fri.	10:00 Meeting on field survey (at Kasetsart University)
25	Sat.	—
26	Sun	Dr. Hazama arrived to Bangkok
27	Mon.	08:30 Left Bangkok, arrived Nakhonratsima
		13:30 Nakhonratsima Sericultural Research Center (Study)
28	Tue.	09:00 SRC (Observation)
		10:30 Study of Farmers;
		(1) a.m. Mr. Somsak, Tanonkak Village
		(2) p.m. Mr. Bumma, Prammai Village
29	Wed.	09:00 Left Nakhonratsima arrived Khon Kaen
		10:30 Study of Khon Kaen Sub center (Sericultural Experiment station)
30	Thu.	09:00 Study of Ubol Ratana Land Settlement Office
		13:30 Study of farmers;
		(3) Mr. Charesarn, Ban Dong Village
7. 1	Fri.	08:30 Left Khon Kaen, arrived Pechabun
		12:30 Observation of Training Center of Chul Thai Silk Foundation
		14:00 Study of Chul Thai Silk Co.
2	Sat.	07:00 Observation of silkworm rearing house of Chul Thai Silk Co.
		09:30 Study and Observation of Chul Thai Silk Co.'s Factory
		13:30 Left Pechabun arrived to Bangkok
3	Sun.	
4	Mon.	10:40 Dr. Hazama left Bangkok
		10:30 Study of Commodity Standard Division, Ministry of Commerce
		14:00 Study of Sericultural Research Institute, Ministry of Agricultural and Cooperatives
5	Tue.	10:20 Study of Thai Silk Industry Co. Ltd. (Jim Thompson)
6	Wed.	10:00 Report to JICA
		18:30 Meeting on Schedule and Report Making
7	Thu.	Left Bangkok, arrived in Tokyo

Table 2 Place visited and person Interviewed

Organization	Position and Name
Ministry and Agriculture & Cooperatives	Director, Dr. Rirsk Sayamanonda
Department of Agriculture	Deputy Director, Ampoule Senanarong
Sericulture Research Institute	Director, Sompoti Akapanthu
	Deputy Director, Narongrit Vichichan
Ministry of Industry	Chief, Preeda Thamkasem
Textile Industry Division	
Thai Silk Development Section	
Ministry of Commerce	Director, Pathom Panijayanusondi
Commodity Standard Division	
Silk Inspection Section	Chief, Suwimol Tikhinanond
Thai Silk Association	President, Payung Israngkum
Thai Silk Industry Company (Jim Thompson)	Managing Director, W.M. Booth
	Production Manager,
	Surindr Supasavasdebhambu
Nakhonratsima Sericultural	Director, Parn Pannengpet
Research Center	
Silk Reeling Group	Chief, Chanya Pannengpet
	Agricultural Scientist
	Peerapon Chaosattakul
	A.S., Phuchong Pechmont
Soil Science Group	Chief, Monthon Sevatanont
General Affair	Chief, Worapa Ngarmpasit
	A.S., Pornthop Petmont
	A.S., Kanung Buachum
Khon Kaen Sub center	Director, Chaiyonge Samrantin
	Officer, Sitnarong Unsit
	Officer, Apirong Chouchia
Ubol Ratana Land Settlement Office	Officer, Ratchanee Sudjet
	Officer, Mana Messang
Chul Thai Silk Foundation	Chairman, Suvanee Cunvong
Chul Thai Silk Company	President, Suvanee Cunvong

Table 3 Places and Names of Farmers Interviewed

Address	Name
(1) Tano Bankak Non Tambonchabok, Muang Amphol Nakhon Chanwat Ratchasima	Somsak Sribuarawd
(2) Prangmai Non Sombun Saen Sang Nakhon Chanwat Ratchasima	Bumma Sismunt
(3) Dong Ubolrat Khon Kaen	Charesarn Somkit

§3 Methodology of Study

We visited organizations and farmers in the tables and interviewed persons concerned. The interviews were based on prepared questionnaires. We made observations on technology of sericulture, silk reeling etc. at the SRC, Sub centers, Land Settlement Office, private enterprises and farmers.

§4 Summary and Recommendations

1. Summary of Study Results

1) Domestic production of warp, which was one of the purposes of Sericultural Research Center Project, reached 57t, in 1987.
With the increase of demand for Thai silk, the demand for warp increased too. Although only 1/6 – 1/5 of warp consumed is supplied domestically, there was no production of warp before the project started. There are two reeling factories of warp using domestic Bivoltine cocoon in Thailand now. We could say that the purpose is almost achieved.

2) The transfer of technology needed for introduction of Bivoltine Silkoworm was almost achieved at the end of the cooperation.
This transferred technology has been maintained and in some area further developed, e.g. breeding of new varieties of silkworm and mulberry, development of budgrafting method for counter measure to root rot disease.

3) During the cooperation term, extension of technologies to farmers was not satisfactory. However, the Bivoltine silkworm rearing technology is well penetrated into sericultural farmers now.

4) There are three routes of extension of sericultural technology to farmers. But key persons of each route came from the SRC or the graduates of SRC training course. It shows that

they came from same origins. Private training center is receiving instruction directly from SRC, too.

5) With Thai-silk-boom, sericulture is expanding rapidly in recent years. Income of sericultural farmers, in particular, bivoltine silkworm rearers, is higher than farmers cultivating other crops, especially in North East Thailand. Then desire to introduce or expand sericulture is increasing among farmers.

6) Based on above observations we conclude that the cooperation has achieved its purpose.

7) We found out following problems.

(1) Administration systems and extension systems on sericulture are too complicated. Moreover, it seems that there is no organization responsible to coordinate their activities.
Technologies through different route of extension can reach to same village and farmer. Rearing of bi-and-poly-voltine silkworms are carried out in same household in some villages.

(2) In Thailand, there is few high educational institution or such research institute on basic sericulture science like National Sericultural Experiment Station of Japan on sericulture.
In the SRC, transferred technologies are maintained and still being improved but few remarkable advance is seen.
Same technologies are transferred to bivoltine silkworm rearing farmers in different areas. Adoption of technologies to local condition is needed. It seems that these fact are due to the insufficiency of basic knowledge of sericultural science.
We think it is necessary to build up high research capability by Thailand itself for the future development of sericulture in Thailand.

(3) After the termination of cooperation, replacement of machines and supply of spare parts became a serious constraint to carry on the work at SRC. Thai government is making effort to promote the domestic production of machinery and equipments, but the quality is still poor. The replacement with them is difficult.

(4) By the termination of the cooperation, dispatch of expert, providing of technical information from Japan, the training of personnel in Japan were discontinued due to the financial situation. It is quite difficult to get information through Japanese sericultural literatures.

(5) Most of Japanese experts on sericulture have poor ability on foreign language.
Then the language barrier was seen already during the cooperation. It made communication between Japanese experts and Thai counterparts difficult. After the termination of the cooperation, the phenomenon is seen that Japan, who proud of most advanced country in sericultural research can not contribute technical information to Thailand. Most of staff of SRC received the training in Japan and they speak good Japanese, but in future we can not expect the new staff to learn technology by Japanese language. Effort of Japanese

experts to improve their English capability is necessary.

(6) The reeling factory has many problems to be improved.

2. Problems and recommendations

As mentioned above purpose of this project was achieved. But, following problems are remained to be solved:

1) Problems of silkworm disease.

(1) Stimulated by Thai silk boom, farmers are willing to increase their scale and cycle of rearing too rapidly and are tending to ignore the danger of disease out-break.

(2) Bivoltine silkworm should be reared separately with polyvoltine silkworm to prevent the contamination of disease. But, both varieties are reared in same household in some village. And the Khon-kaen sub center distributes both varieties to farmers.

(3) There was one independent pathology group was in SRC. But after the termination of cooperation, it was divided into two; mulberry and silkworm groups. As the disease is most important problem of sericulture, pathology area must be strengthen.

(4) It is necessary to design the rearing houses for young and grown silkworm and cocooning house separately to prevent contamination, and to make rearing works simple.

2) Necessity to build up expertise of Thai staff

As mentioned above, the establishment of higher educational and research institutions is desirable to break through the stagnant state of sericultural research in Thailand.
And the library of the SRC which is indispensable to scientific study should be strengthened.

3) Problems after the termination of cooperation

After the termination of cooperation, dispatch of experts, provision of machinery and equipment from Japan, and acceptance of trainee to Japan were all discontinued.
Then supply of technical information decreased and replacement of machinery or supply of spare parts became difficult.
Thai government should promote domestic production of these materials.

4) Problems of language barrier

(1) There were language barrier problems in this cooperation as mentioned above.

Operation of this kind of cooperation project only by JAPANESE is seemed to be unsuitable in foreign country.

(2) Japanese scientists publish their works in Japanese only. Staffs of the SRC do not read the Japanese literature, They read English literatures from India, Korea, etc.
Japanese side must consider these facts.

5) Complexity of the government sericultural administration system

There are many ministries are involved in sericulture in Thailand. No coordination organization exists.
About extension work, three routes are existing. Then in villages some confusions are seen.;
We saw bivoltine and polyvoltine silk worms were reared in same household.
The establishment of coordinate function is needed.

6) Other problems

(1) Increase in qualified seed production is needed.

(2) Rearing of young silkworm

Cooperative young silkworm rearing is seemed unsuitable in Thailand.
For commercial sericulture, it is recommendable to develop a different type of sericulture which consists of selling the young worm instead of seed distribution.

(3) Reeling factory

In general the technology of reeling has many defects to be improved, in particular, factories must pay more attention on quality control of end product.

Chapter II Outline of Project Cooperation

§1 Background of the Project

Silk industry has long been a traditional industry in North East Thailand. However, its productivity has been low and there was almost no remarkable technological development although the Thai government made good no effort to encourage the industry to become a promising export industry, and to improve the income of sericultural farmers in North East region.

In the era of King Chulalongkorn, Sericultural Department, Central Sericultural Experiment Station in Bangkok and several local sericultural experiment stations were established.
In 1903, Dr. Kametaro Toyama and some 20 Japanese experts were invited to Thailand to introduce Japanese technology of sericulture.
They stayed for 5 years, but there was no significant success.

In 1960s, Thai silk became well known to the world, and demand for it increased. At that time, warp for silk was not produced in Thailand. 100t of warp was imported annually. Thai government invited three Japanese experts (Ohtani, Kawai, and Hayashida). They worked at Ubol Sericultural Experiment Station.

Taking the occasion of visit of Japanese Minister of Agricultural and Forestry to Thailand, in 1967, Thai government proposed a new cooperation project.

Native silkworm varieties in Thailand are polyvoltine. It is difficult to produce standard warp from the cocoon of polyvoltine silkworm. Rearing technology of bivoltine varieties and technology of reeling warp of bivoltine cocoon were to be introduced from Japan.

Responding to this request Japanese government sent a "Basic Study Team on Agricultural Development in Thailand (headed by Shuji Ishikura)" in February 1968.

Thai Authority proposed a draft plan of "Sericultural Development Project in North East Thailand" to Japanese team for its consideration.

Japanese mission agreed with the Thai Authority that the draft plan should be carried out. 1969, "Survey Team on Sericultural Development in Thailand (headed by Seinosuke Ohmura) was dispatched to work out a concrete plan with Thai Authority. The team worked out the concrete plan and produced the Record of Discussion (R/D).

The Project started April, 1969.

§2 Process of Project Cooperation

1. Term of Cooperation

Originally, term of cooperation was set for three years. Extension was made twice, and then, following up cooperation was added.
Total period of cooperation was 11 years.

(1)	First stage	(Initial)	1969. Apr.-1972. Mar.
(2)	Second stage	(1st extension)	1972. Apr.-1975. Mar.
(3)	Third stage	(2nd extension)	1975. Apr.-1978. Mar.
(4)	Fourth stage	(follow up)	1978. Apr.-1980. Mar.

2. Outline of First stage Cooperation

2-1 Purpose of Project

In R/D, the purpose of the project described as follows;
For the development of sericulture in North East Thailand;

1) Establishing the Sericultural Research and Training Center in Korat (Nakhkonratchasima), introduces new sericultural technology and train Thai technicians and extension workers.

2) Produces and distributes excellent silkworm seed and mulberry saplings. Three sericultural experiment stations in North East Region shall be developed as sub centers of the SRTC, and they form applicable technology to North East regional condition, and produce and distribute excellent seed and mulberry saplings.

3) Extends modern technology of sericulture to pilot villages
(a core of extension of technology to farmers)

The purpose above are same to the purpose of the project Thai government originally proposed to the Japanese team in Feb., 1968.

2-2 Outline of Cooperation Program

For attaining the above purpose, Japanese government cooperates in the following activities.

1) Dispatch of Experts: on Breeding of silkworm.
Mulberry cultivation.
Silkworm rearing.
Pathology.

2) Provision of materials: Machinery for cold storage.
Machinery and tools for silkworm rearing and seed production.
Instrument for pathological experiment.
Equipment for study of mulberry and silkworm disease.
Machinery for mulberry cultivation.
Reeling machinery.
Calculator.
Audio-visual aid.
Technical documents.
Vehicles.

3) Acceptance of trainees: Training of counterparts in Japan

Thai government take responsibility for:
Provision of land, buildings, administrative and technical staff, operation cost, etc.

3. Outline of second stage cooperation

3-1 Extension of cooperation term

Thai side requested the extension of cooperation term, and both sides agreed of 3 years extension to March, 1975.

3-2 The Second R/D

Addition of following items was made in R/D of 1972.

1) Extension of terms (Three years)
2) Establishment of one additional satellite sub center.
3) Number of pilot farmer families is set to 10.
4) When Thai government initiates "The third country training", Japanese government co-operates it.

3-3 Program of the extension term

1) Center; Continuation of research, parents silk worm seed production, training of staffs of sub centers and local instructors.
2) Sub Centers; Production and distribution of silk worm seed.
3) Establishment of pilot farmer groups at Pimai, Nakhonratchsima. Prasart and Surin.
4) Third country training at SRTC

4. Outline of third stage cooperation

4-1 Extension of cooperation term

Thai government requested re-extension of the project in 1974.
Three more years extension was agreed.

4-2 The third R/D

Mar. 1975, the third R/D was signed.
However, no further item was added in the Third R/D.

5. Outline of fourth stage cooperation

In 1977, evaluation study was done. The study team recommended 2 years follow up work. No new addition or change was made in follow up work.

Table 4 Amendment of Cooperation Program

1st stage ('69-'72) R/D Organization	2nd stage ('72-'75) R/D Content of cooperation	3rd stage ('75-'78) R/D	4th stage ('78-'80) Follow up
1. SRTC	1) Introduction of new technology 1. Improvement of silk worm varieties 2. Mulberry cultivation 3. Silkworm rearing 4. Pathology 5. Reeling 2) Training of technicians of extension workers	no change 1) Parent seed production 2) Third Country Training	Completion of unachieved items 1) Technology diagnosis & protection of worm disease 2) Mass production of seed & improvement of seed incubation technology
2. Sub Center	1) Forming of appropriate technology for local condition 2) Production & Distribution of seed & mulberry sapling	1) One subcenter was added	3) Improvement of reeling technology
3. Pilot farmer Group	Extension of technology to farmers	Number of Groups was set (10)	

§3 Achievement of the Project

1. Achievement during the cooperation term

Dr. Sugiyama, leader of experts at the end of cooperation, reported on the achievements during the cooperation term in his general report (in Japanese language) (Mar. 1980, JICA).

1-1 Details of the project

1) Dispatch of experts; Long term 22
Short term 23
Total 45

2) Acceptance of trainees; 39

3) Provision of materials; 554 million yen

Table 5 Major Granted Equipment and Materials

Year	Amount (mil yen)	Equipment and Materials
1969	68	Rear equipment, experimental apparatus, refrigerator, mulberry cultivation equipment
1970	55.4	Chilling facilities (for silkworm seed), raw silk reeling machines, mulberry cultivation equipment
1971	53	Same as above
1972	49	Sericultural equipment and tools, vehicles, raw silk reeling and chilling equipment
1973	55	Same as above
1974	57	Sericultural equipment and tools, pebrine examination equipment, farm tools, fertilizers
1975	41	Sericulture equipment and tools, mulberry cultivation equipment, audio visual tools, fertilizers
1976	47	Sericulture equipment and tools, testing tools, fertilizers
1977	100	Mulberry cultivation equipment and tools, equipment and tools for sericulture, reeling and pebrine examination
1978	15	Sericulture equipment and tools
1979	14	Same as above
Total	554.4	—

1-2 Achievements in research

Following technologies were systematized.

1) Cultivation and harvest of mulberry field (for young silkworm and grown silkworm).
2) Charting up of rearing standard of young and grown silkworm.
3) Breeding of silkworm varieties for practical use.
4) Charting up of standard process of seed production (including charting up of rearing standard for parent stock).
5) Reeling technology of warp.

And, these results are utilized by technicians and farmers.

1-3 Training and guidance to technicians & etc.

1) Daily on the job training of counterparts.
2) Training of counterparts in Japan.
3) Farmers and agricultural workers training.
   4 times a year according with rearing season of 1 month duration.
4) Special training of staffs of local sericultural experiment stations on particular problems.
5) Training of the third country's officials.
   Twice; 1971 and 1975, 6 month each, Laos technicians.
   No third country training was made since then because of uncertainty of diplomatic relation with Laos.

1-4 Production and distribution of silk worm seeds

Table 6 Production and distribution of silk worm seed

Varieties of Silkworm		Production (moth)**	Distribution (moth)**	Note
Bivoltine	P2	51,655	14,225	4 years after the start of project, seed distribution began
	F1	373,366	261,922	
		*450,490	168,380	
	F2	111,279	105,422	
		1,224	1,790	
		988,014	551,739	

* Silkworm seed produced and distributed by sub center

** The unit for counting of silk worm seed, 1 moth = 400 seeds
(or 1 box -- 50 moths or 20,000 seeds)

1-5 Activities of Sub centers

1) Production and distribution of silkworm seed and mulberry saplings.
(Polyvoltine seed were not distributed)
2) Technical guidance to sericultural farmers.
11 pilot villiges were established.
3) Guidance of reeling technology;
Automatic reeling machine was renewed in 1979.
Guidance to private reeling factories was going well.

2. Problesm left

1) Root rot diseases problem was not solved yet.
Grafting on resistant varieties stock was used as the major counter measure.
2) Insufficient disinfection of rearing house of farmers.
3) Unification of rearing quantity of farmers.
4) Breeding of excellent F2 varieties of silk worm.
Production of seed at SRTC was not sufficient to fulfill the demand.
And F1 hybrid from overseas were being imported, particularly by large scale farmers.

§4 Activities of Thai-side

1. First stage

Following the agreement described in R/D Sericulture Research Division, Department of Agriculture, decided that the main station at Nakhonratsima (Korat) to be the Head Center for the technical cooperation.

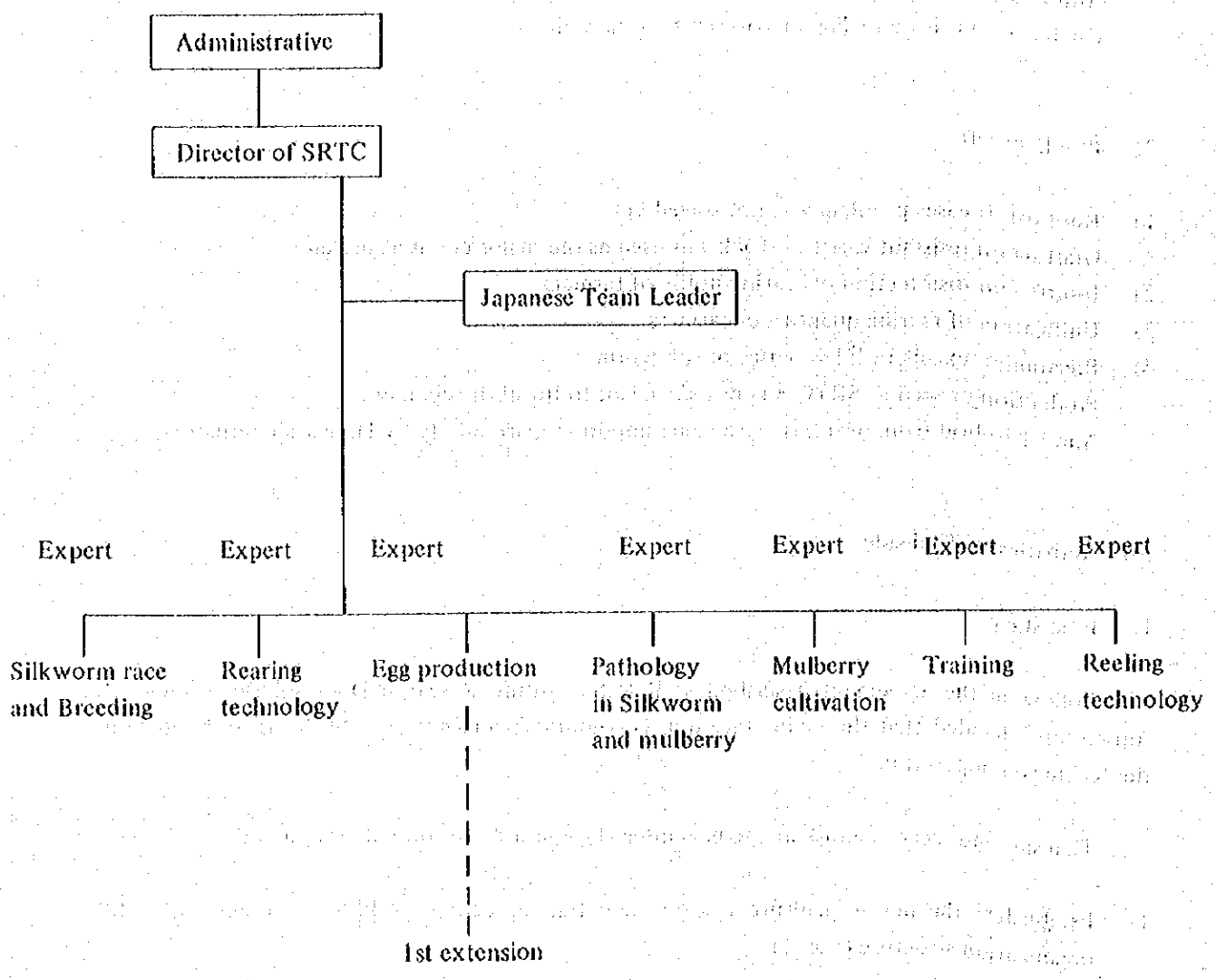
Thai side has faced the task at the beginning stage in order to provide the facilities.

1-1 Established the new sericulture research and training center, Nakhonratchasima with the organization structure (Fig. 1)

1-2 Preparation of the 275 rai of land for use of the center.
Building:
- Building for administrative office, scientific lab. and library.
- 5 rearing houses and 1 training building.
- Underground water tank for water supply.
- Building for cold storage for bivoltine seeds.
- Lodging house and dormitory for the staffs and trainees.

Mulberry field;
- Area for leaf supply to silkworm research and training activities.
- Area for mulberry research nursery for keeping young sapling.

Fig. 1. Organization of SRTC at initial stage divided into 7 sections



1-3 Recruitment of the working staffs

– by pulling existing staff working in other sericulture experimental stations in North East.
= by employing the new administrative staff to give general service to technical staff and experts.

1-4 Operation cost

It was, in general, a difficult task at that time to convince the Budget Bureau to finance fully activities on Thai-side (4 times of normal budget) through the normal fiscal year. However, Budget Bureau paid good attention to this center and made effort to provide the maximum support.

The technical cooperation at the 1st stage was somewhat delayed due to the limited budget support and construction process. This might be one of the reasons for extensions of the co-operation projects. However, the pioneer staff both Japanese and Thai side under the serious situation utilized all existing facilities for the cooperation work.

1-5 Training program

At the first stage of cooperation, training program was provided to;
– Government officials, new staff of the center and extension workers, Department of Agriculture Extension (DOAE) in the North East
– and farmers were trained
– 4 times a year
– 30-35 days a course
– expected number of trainees was around 120/year

1-6 Annual meeting of research and other cooperation activities would be held for reporting the results and publishing in the form of Technical Bulletin.

2. Second stage (1st extension stage)

2-1 More provision of facilities

The next task of administration work and budget was faced again in order to provide reeling facilities. Water treatment before supplying to reeling machine was the critical in term of quality, hard water with high calcium content required additional budget.

2-2 Research under the guidance of experts, areas of research were designed in relation to original structure of work.

Mulberry:	– Varieties selection, reproduction, field management, pruning and fertilizing.
Silkworm seed:	– Research on seed production, cold storage, artificial hatching and incubation in Thailand condition.
Silkworm and mulberry disease and pests:	– Mainly concentrated on root rot disease of mulberry, pebrine, viruses and fungus disease of worms as well as the parasitic fly, the only serious insect pest for silkworm bivoltine races seem to be preference for the fly.
Silk reeling:	– Research, training and testing in this area were made to produce the grealitied wraps with reeling machine designed for individual farmer to produce warp or doupion silk (for weft only). Additionally, to cooperation with breeding program to check the cocoon and Silk filament greality.

2-3 Technical service and cooperation with other agencies.

– Technical service for other stations to help usual farmers or large scale farmers.
– PWD land settlement members
– ARD farmers
– Pilot farmer group
– Chul Thai Silk Co., and other large scale sericulture firms
– Military base
– Forestry station in the South

2-4 Operation Cost

– More budget were allocated to support, in the later stage,
– Number of buildings in research and training service
– More technical staff at Head Center (Korat) and other 4 sub centers.

3. Third stage (2nd extension stage)

Most of activities on Thai side were based on R/D.

The main working discipline of counterparts was to follow the guidance of Japanese experts and learn the new technology from them. It was quite successful in the first stage but some problems appeared at the later term of extension. Individual attitude of Japanese experts and language barrier might be the main constraints.

Chapter III SRC after the Termination of Project Cooperation

§1 Activities on Japan-side

1. Expost-evaluation study

JICA dispatched "Evaluation Team on Economic and Technical Cooperation" to Thailand in January 1984.

The team made evaluation of 5 projects including this one.

The summary of study results on this project is was as follows:

(1) Administration and maintenance of SRC was good.

(2) In the area of research, results were got on breeding of new varieties of silkworm, protection from pest and disease etc. But the technology of SRC is extended rather to big scale farmers who use silkworm seed provided by the center than small farmers who produce silk for their domestic use only.

(3) Training, and production and distribution of silkworm seed and mulberry saplings were being carried out.

(4) Target of production of warp was 100t but the production was only 26t.

(5) This project needed 11 years, but this kind of projects requires generally longer terms.

(6) The increase of sericulture in North East Thailand was the result of this cooperation project.

(7) Report pointed out that there were three problems in the project. These are as follows;
   a. Three years term of first stage was too short.
   b. The target placed only on was thought to be too narrow.
   c. Counter measure to root rot disease was not sufficient.

(8) As conclusions; the report said that the replace of equipment and follow up were needed for measure to root rot disease.

2. Execution of after care work

2-1 Dispatch of an after care survey team

JICA dispatched of an after care survey team to Thailand in July 1984. The purpose of sending the team was to survey the present state of projects which were terminated several years ago, and to recommend our two government the replacement of materials, supplying of parts and dispatching of experts if these seemed to be necessary.

2-2 Execution of after care work

Based on the result of above mentioned survey, JICA provided 8,324,000 yen of materials and dispatched one short term expert to this center in 1984.

8,324,000 yen was for parts of reeling machinery.

Other 23,111,000 yen for refrigerators for silkworm seed production was provided from JICA in 1984.

§2 Activities on Thai-side

1. Management and operation of SRC

1-1 Change of name

The name of the center was in 1985 as follows;

(Old name) Nakhonratchasima Sericultural Research and Training Center (SRTC)

(New name) Nakhkonratchasima Sericultural Research Center (SRC)

This change is due to restructuring of whole administrative set up sericulture of Ministry of Agriculture and Cooperatives.

Details are described in Chapter V, Results of Evaluation

1-2 Assignment of personnel

At the end of cooperation	38
1987	42

Therefore, number of personnel increased slightly after the termination of the project cooperation.

1-3 Budget of SRC

1979	4,000,000 Bht
1980	4,500,000 Bht
1988	6,000,000 Bht

Above figures show that the budget for the Nakhonratchasima Center had increased after the termination of the project cooperation, too.

2. Activities after termination of cooperation

Main problems which seemed to interfere success of the project, came up;

(1) no training schedule in Japan for new staffs.
It gave the new staff discouragement and loss of chance to gain more knowledge;

(2) no way of receiving the technical information from Japan; and

(3) no spare parts supply for maintaining machines or sophisticated instruments were provided through Tokyo procurement.

Under this circumstance, SRTC (SRC) made great effort to continue the works with unsatisfactory facilities. The situation was same in the Khon Kean Sub center.

The policy of SRTC seemed to be redirected to new functional direction. Cooperative research with other agencies, e.g. with rural development implementation service and inter departmental project among agencies (PWD-DOA-USAID and BAAC) and some projects and contract research with FAO, EEC and private sectors.

The main research activities were done (with ARD-DOAE) under severe restriction (budget for SRI increased at 2-7% a year, but the increase were mainly for the increase of salary). For the past few years, SRTC silkworm seed was distributed with charge 100B/box, but actual cost of production was 260 B/box)

§3 Outline of historical process of SRC Project

Table 7 Outline of Historical Process of SRC Project

Years	Process of the Project
1967	Minister of Agriculture and Forestry, Mr. Kuraishi, visited Thailand. Request to cooperate was offered from Minister of Agriculture, Mr. Prakartsahakorn
1968	Preparatory Survey mission was dispatched, Presented the plan for sericultural development of N.E. Thailand by Thai side, Japanese side agreed with it.
1969	Sericultural development survey mission was dispatched (R/D was signed) (decided 1969-72, cooperation). Cooperation started.
1969	Guidance team dispatched.
1970	Guidance team dispatched.
1971	R/D for extension (three years to 1975)
1972	Guidance team dispatched.
1973	Guidance team dispatched.
1974	Evaluation team dispatched; Re extension of 3 years was decided (R/D to 1978).
1975	Negotiation of Plan team dispatched
1976	Guidance team dispatched;
1977	Evaluation team dispatched; Joint Survey Decided termination of project on March, 1978, and 2 years follow up
1978	Guidance team dispatched
1979	Guidance team dispatched
1980	March, 1980, expert Mr. Sugiyama's General Report submitted.
1981	Evaluation team (on particular country) dispatched.
1983	Evaluation team on economic and technical cooperation in Thailand dispatched.
1984	After care survey team dispatched.
1984	After care works.

Chapter IV Outline of Evaluation Study Results in the past

§1 Evaluation Study in the past

Evaluation study in the past are as follows;

Year	Purpose of studies
1. Evaluation studies by Japanese side	
1) 1974, Nov.	Results of cooperation 1969-1974
2) 1977, Sep.	Results of cooperation 1975-1977
3) 1984, Jul.	Present state in 1984
4) 1985, Jan.	Result of cooperation of whole term and state in 1985
2. Evaluation study by Tahi side	
1984	Research report on Danish, German and Japanese assistance to agricultural development in Thailand: Comparative study

§2 Reports of the Past Evaluations

1. Japanese Evaluation Reports

1-1 Outline of evaluation

1) Study in 1974 was done just before the termination of the second stage cooperation. It was reported that almost all of targets were achieved except for establishment of extension bases.

2) *Study in 1977 was done just before the termination of the third stage cooperation. It was reported that more than 100% of targets in the Center and 70-80% of targets in the sub centers were achieved.

However, it was pointed out also that further cooperation was needed in following areas; technology of diagnosis and control of silkworm disease, massproduction of seed and their proper handling, and improvement of productivity of reeling. Based on this report, follow up cooperation was done until 1980.

*This evaluation study was carried out Jointly by Thai and Japanese teams. Thai team was consisted of representatives of DTEC, Budget Bureau and Department of Agriculture and

Cooperatives. Japanese team consisted of Ministry of Agriculture and Forestry and JICA.

3) Study in 1984 was done after about four years of the completion of this project.
The purpose of this study was to survey the activities of the centers after the termination of cooperation and the present state, and to judge whether some after care work was needed or not.
In this report following matters were mentioned;

(1) in research; numbers of practical technologies were systematized.
(2) in training; numbers of trainee
(3) in seed production; F1 of bivoltine silkwors seed was satisfactory produced.
(4) in sub centers; F1 seed production and inspection system of pebrine disease was established.

And following unsolved problems were pointed out.

(1) Identification of pathogens of root rot disease and clarification of the mechanism of occurrence were not yet achieved.
(2) Because of difficulty of getting chemicals for disinfection, bad yield (cocoon production) occurs in farm with bivoltine hybrid.
(3) Bivoltine silkworm rearing is gradually extended to farmers. But sufficient attention has not paid on difference in economies among sericulture farmers, especially between large and small farmers.

4) In 1985 study was done as a part of "Evaluation Study on Economic and Technical co-operation in Thailand."
In this report following keypoints were mentioned;

(1) The outline of the cooperation was very satisfactory.
(2) The center and the sub centers were being operated smoothly by Thai side.
(3) But the production of warp was only 26t while the target was 100t.
(4) Silkworm seed production and distribution was unsatisfactory because of the trouble of refrigerators.
(5) High yield variety of mulberry, Noi, was multiplied and distributed to the farmers.
(6) Expansion of sericulture in North East Thailand was a positive impact by this cooperation.

But, this report pointed out that

(1) The efforts of cooperation was concerned only on warp production. They thought that the cooperation had to cover wider activities.
(2) Counter measure to root rot disease was not insufficient yet.

Based on studies in 1984 & 1985, the report recommended that refrigerators should be improved and some Japanese experts on root rot disease should be sent to Thailand.

1-2 Summary of Japanese evaluation studies

The reports above concluded without exception that the targets of the cooperation were

achieved as a whole.

But only measures to protect mulberry from root rot disease were not well developed yet.

In 1974, some development of resistant varieties was reported, and these varieties had used as stocks in grafting.

After the termination of cooperation, variety Noi was selected and was distributed widely.

But, an effective control measure of root rot disease was still under research.

2. Outline of Thai Evaluation Report

There is only one Thai evaluation report on this project, that is;

"Research Report on Danish, German and Japanese Assistance to Agricultural Development in Thailand; A Comparative Study".
(Khien Theeravit and others, Asia Institute, Chulalonkorn Univ. 1984)

This report contains evaluation results of 15 Japanese economic and technical cooperation projects in Thailand.

The Thai Japan Sericultural Development Project is one of them.

2-1 Summary of evaluation

The report mentioned following as achievements

1) Japanese experts played an important role, especially, experts of 1st stage cooperation carried out their job very eagerly. And Thai counterparts obtained much knowledge and technique from them. But in the second stage and after, Japanese experts' performances were not amazing commpared to that of 1st stage experts. And Thai counterparts were not satisfied with the work of some Japanese experts.

2) In a breeding of silkworm varieties, remarkable progress was seen in first stage. Counterparts got the ability of reproduction. Transferred technology of breeding was just appropriated.

3) Productivity of raw silk reeling was improved satisfactorily. Import of raw silk (warp) decreased to 20% of initial amount in these 11 years.

4) The project gave impacts to sericultural farmers and villages (in particular and settlement area).

2-3 Problems pointed out

Following problems were pointed out

1) Poor communication abilities of Japanese experts

(1) Evaluation reports were written only in Japanese, Thai experts could not understand.
(2) Report on the know-how about root rot disease was not given to Thai side.
(3) Supply of silkworm varieties from Japan was stopped suddenly without explanation. It was thought that the introduced varieties were not pure race.

We think that above critics are because of poor communication ability of Japanese experts. Thai counterpart could not understand how Japan side expert were thinking, and criticized them as mentioned in (2) and (3).
According to the survey reports in 1974 and 1977;
At that time, no good know-how about root rot disease by Japanese side, and Japanese experts gave up the research on the disease itself.
Silkworm varieties introduced at the beginning of the project were hybrid races, because it was thought that Japanese pure race of bivoltine silk worm could not be reared successfully under tropical condition.
The cause of poor communication was language problem, in this project, transfer of technology was carried out by Japanese language.
Thai counterpart who learned Japanese, could not understand the explanations by Japanese experts of such complicated matters as (2) and (3).
A lesson to be learned from above is that the transfer of technology in Japanese language in foreign country is not successful.

2) Production of silk worm seed was thought to be satisfactory succeeded at the end of co-operation, but, later on, some serious disease of silk worm happened occasionally.

3) Machinery and equipments can not be produced in Thailand, except for some simple tools.

4) After termination of the cooperation, Thai technicians have had no chance to receive the training in Japan.
In near future, staff trained in Japan will leave the center. The technical level of this center will not be sustainable.

Chapter V Results of the Evaluation Study

§1 Transfer of Technology in the SRC

The center changed its name and structure, but its activities did not change very much from its initial design.

Technologies transferred during cooperation are well succeeded and after the termination of project cooperation the center made some development of technology.

1-1 Change of name and structure

1-1-1 Present Name; Nakhonratsima Sericultural Research Center

1) During the term of cooperation the name of center was Sericultural Research and Training Center (SRTC)
The name was amended 3 years ago.

2) At the beginning of the cooperation, only one SRTC was established in Korat (Nakhonratsima). And 4 sub centers were established in Khon Kaen, Udon Thani, Mukdaharn and Ubol.

3) With development of sericulture, additional 2 new centers were established as research institutes in Udon Thani and Sri Sa Ket.

4) Under the control of these 3 centers, 12 sericultural experiment stations (so called sub centers) were established (as 4 satellite stations to each center); Nakhonratsima SRC is for research concerning bivoltine silk worm. Udon Thani SRC is for research concerning bivoltine × polyvoltine hybrid silk worm, and Sri Sa Ket SRC is for research concerning polyvoltine silk worm. (Figure 2.3.)

1-1-2 Structure of present research system

1) The SRTC had 7 groups in the cooperation time.
Now SRC has 5 groups (Figure 4.)

2) Major changes are as follows;

(1) Two groups; Training and seed Production, became a section of other group.
(2) Pathology and Breeding were divided into mulberry and silk worm groups
(3) Soil Science group was newly established.

3) Sericultural Division of Ministry of Agriculture and Cooperatives was reorganized and

became Sericultural Research Institute.
And its extension activities were transferred to the Department of Agricultural Extension (DOAE)
It seems that with these reorganization institutes under the SRI became research institutes.

1-1-3 Staff and Budget of SRC were already explained in Chapter III.

1-1-4 Contents of works

1) The works of the SRC is almost same as the work of the SRTC, Biggest change is addition of the soil science group as mentioned earlier.

2) Research seems to be emphasized, but the training and seed production are maintained in the centers.

3) At the time of cooperation, numerous projects were done in the center, and more than 80 topics were going on in center in these days.

Figure 2 Share of works of 3 centers and sericultural Experiment Station (S.E.S) under them

1. Nakhonratsima - SRC
   Share of works: Bivoltine silkworm
   S.E.S. under this center
   - Khon Kaen S.E.S.
   - Mukdaharn S.E.S.
   - Ubol S.E.S.
   - Chieng Mai S.E.S.

2. Udon Thani - SRC
   Share of works: Hybrid (bixpolyvoltine) silkworm
   S.E.S. under this center
   - Sakhon Nakorn S.E.S.
   - Nong Kai S.E.S.
   - Buriram S.E.S.
   - Loei S.E.S.

3. Sri Sa Ket - SRC
   Share of works: Polyvoltine silkworm
   S.E.S. under the this center
   - Roi Ed S.E.S.
   - Puttaisong S.E.S.
   - Surin S.E.S.
   - Chaiyaphun S.E.S.

Figure 3 Location of SRC and SES (sub-centers)

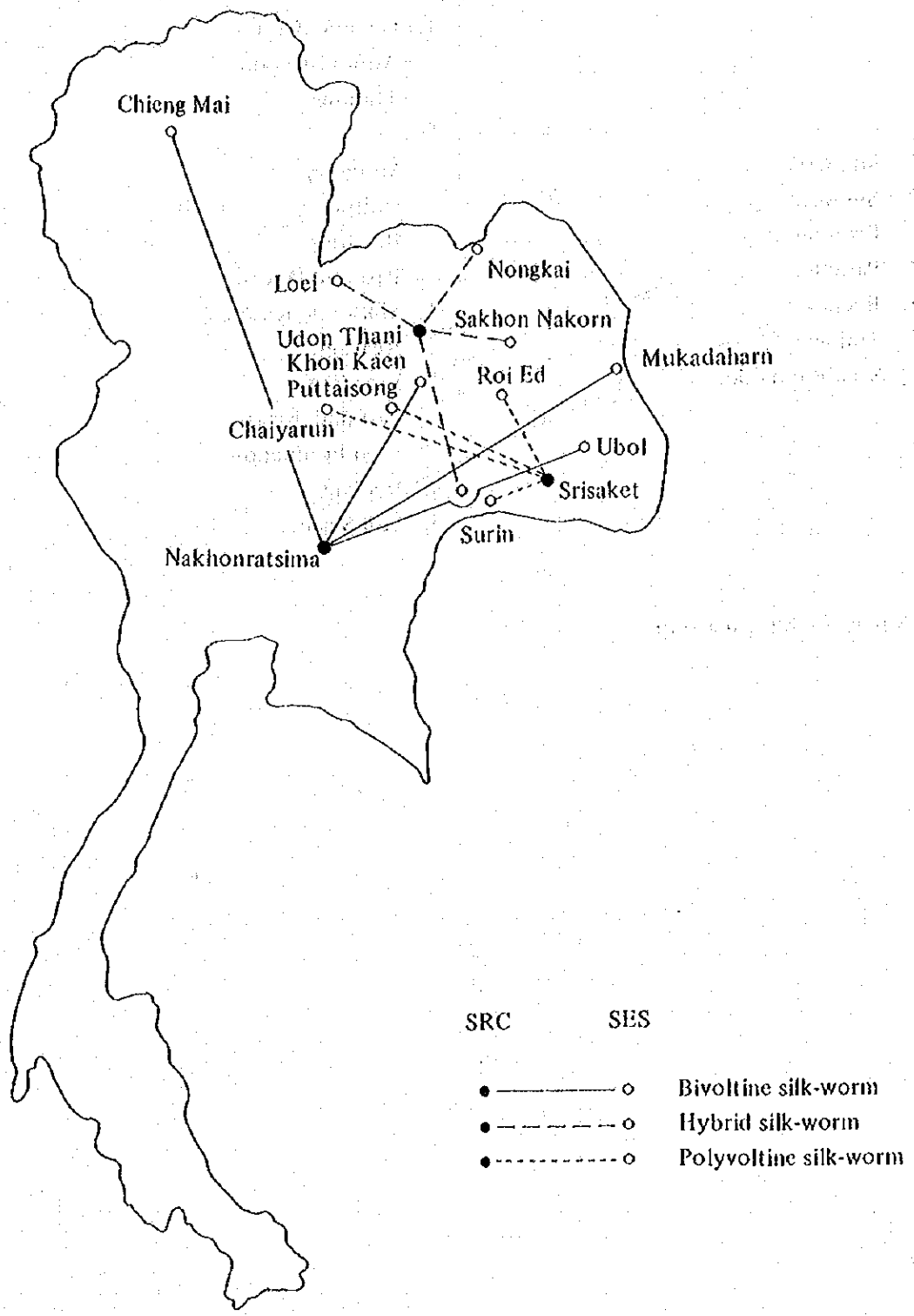
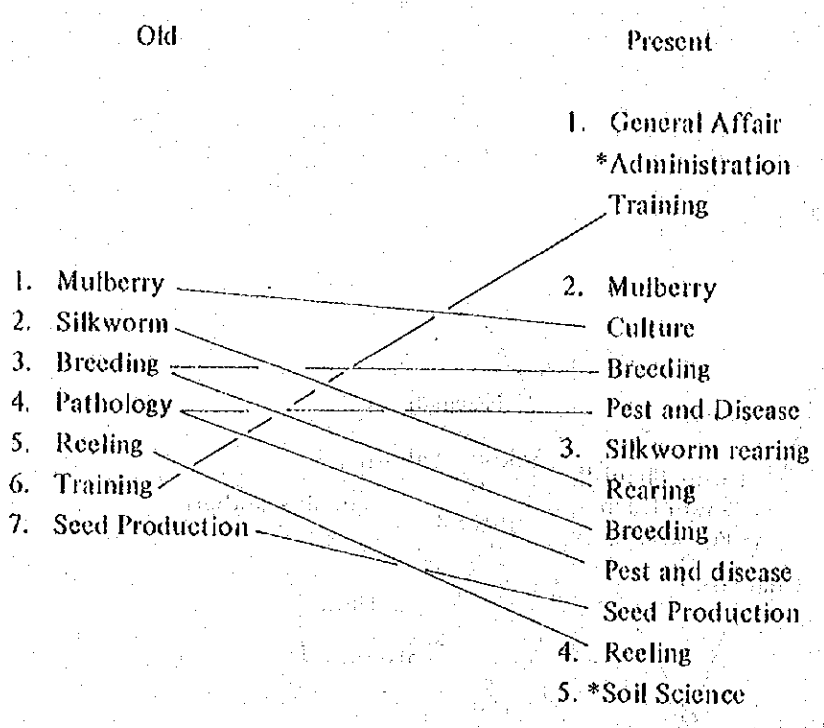


Figure 4 Comparison of old and present structure of SRC



*Newly established group

4) Training is going on as shown in Table 8.

Table 8 Result of Training in SRC

Year (Time of training)	Classification of Trainee									Total
	PWD Officer	Extens. Officer	Sericu. Officer	ARD Officer	Teacher	Farmer	ARD Farmer	Student	Chul Thai Silk staff	
1979(2)	23	50			1					74
1980(3)	11	107	5							123
1981(12)	58	167	74		3	1		36		339
1982(5)	10	81	12	24	2	7		9		145
1983(8)	7	124	24	30	3			46		234
1984(5)	4	96	21	27	31	1				180
1985(5)		36	26	30	1	21				114
1986(4)	1	45		1	2	25	20		2	96
1987(2)		50		*36						86
Total	114	756	162	148	43	55	20	91	2	1391

Note: *ARD officer + ARD farmer, details are not shown.

(1) Training are mainly for government officers, and the number of farmers is small. In sub center, they do not train farmers except for special case. Training of farmers is carried on by extension officers who used to be trained from SRC. In the Land Settlement Area, the training of farmers is carried on by Land Settlement Office.

(2) Training are usually carried out 4 times a year.
Number of trainees are 40/time.
Term of training is about 30 days (= from young silkworm rearing to mounting).

5) Breeding of new varieties of silkworm and seed production.
Center bred new varieties; Pureline 4 varieties and Hybrid 2 varieties (see appendix)
Each sub center multiplies seed and distributes these seeds to farmers.

1-1-6 Maintenance of materials provided from Japan.

Buildings and facilities are maintained almost in good condition and some improvements (for example vent of rearing house) are carried out by staff.
On machinery, there are many materials inusable.
Main reason of it are as follows.

(1) Most of materials are made in Japan, and these are too expensive to replace.

(2) In the some cases no more spare are available even in Japan since the same models of machinery are out of date in Japan now.

(3) Except for simple ones, machinery are not produced in Thailand.

1-1-7 Relation with other organization.

1) Each SRC controls 4 sericultural experiment stations. The S.E.S. are doing, adaptability test of the technologies developed in SRC.

2) The Nakhonratsima SRC trains officers of extension service, land settlement and other organization.
This SRC send personnel to these organizations as their staff.

3) This SRC also provides one lecturer to the Training center of Chul Thai Silk Foundation.

2. Present State of Sericultural Experiment Stations (Sub centers)

2-1 Change in sub center

2-1-1 Sub centers at the time of cooperation

During the terms of cooperation, each SRC had 4 sub centers as explained earlier.
Activities of sub centers were seed production, growing mulberry sapling and their distribution to farmers.

2-1-2 Present State of Khon Kaen sub center

As shown in the Figure 2.12 S.E.S. are working as satellite stations of the SRC.

1) Structure: Kohn Kaen sub center has 7 group; Administration, Breeding of silkworm (includes seed production), production of mulberry sapling, Training, Technical service and Research.

2) Number of staff is 10, permanent workers 18, temporary workers 20-35.

3) Budget of Khon Kaen sub center is 2,311,375 Bht. (includes personnel expense 500,000 Bht.) in 1987.

4) Breeding of silkworm; produce Bivoltine × Bivoltine silkworm seeds and Khon Kaen sub center does not produce bivoltine × Polyvoltine seed, but giving service to distribute bi × poly hybrid seed produced from Udon Thani SRC to ARD and DOAE.

5) Production of mulberry saplings;
The sub center distributes saplings of Noi and Yai Burirum varieties. From 1988, the sub center began to distribute bud for grafting use.

6) Training; Training is done only on special request for officers of other government organizations, students, and for person requested by international organizations and by private sectors etc.
2 ~ 3 persons per course, and training term is one month. Only 4 persons were trained last year.

7) Technical service
Staff of sub centers go to villages, schools etc., to teach about sericulture technology.

8) Research
On mulberry; Collection of varieties
Method of bud grafting etc.
On silkworm; Breeding Test of silkworm varieties in cooperation with Nakhonratsima SRC.

9) Distribution of mulberry graft saplings and seed.
Distribution of 820,000 mulberry graft saplings / year
Distribution of silkworm seed

Bivoltine varieties	515 Boxes
Hybrid (Bi × Poly)	52 Boxes
Polyvoltine varieties	1,156 Boxes

10) Distribution of technical documents 1,253 copies
Works of sub center significantly increased very much.

11) After the termination of cooperation the activities of the sub centers are developed very much by the effort of Thai Government.

3. Transfer of technology in the center and the sub centers and its maintenance

3-1 Transfer of technology until the end of cooperation

On the performance of transfer of technology until the end of cooperation, we described already in Chapter IV.

3-2 Sustainability of transferred technology

3-2-1 Sericulture Research Center

1) On the research, the level of research is maintained almost same as one in the cooperation period.

2) After the termination of the cooperation, following outcome of new varieties are bred.

Mulberry	1 variety	Nakhon Ratsima	60
Silkworm	4 varieties	Nakhon Ratsima	1
		"	2
		"	60-1
		"	60-2
	Hybrid	"	Hybrid 1
		"	Hybrid 60

3) An example of modification of transferred technology is observed.
The vent of rearing house was initially on the ceiling inside the rearing house. They shifted the vent to outside the house. By this modification the room temperature is lower now.

4) Production of silkworm seeds is increasing year by year.
It is supposed that the production reaches to 10.000 box in 1988. This means that the rearing of bivoltine silkworm has increased in villages.

5) On the reeling; All products of reeling are thrown silk and marketing in this form.
SRC buys 17t of fresh cocoon now. The amount of purchase is near to the capacity reeling of SRC, that is 20t.

6) Building and facilities provided from Japan, in general, have been maintained and managed in good condition.
However, some machineries such as refrigerator, tractor, reeling machine etc. were made in Japan and are very difficult to replace with new ones.
And by the rapid change in the models of Japanese machineries, spare parts of donated machineries became unavailable. Then many machinery became useless. Besides, it, following facts were observed.

(1) Musks for disinfection are identified as war material in Thailand.
(2) Quality of domestic paper is not good to use as materials for rotary cocooning frame. Then, they can not be purchased in Thailand.

7) After the termination of the cooperation, supply of technical information stopped. Japanese information are written in Japanese, then Thai technicians can not read them. After the termination of the cooperation, training of Thai officers in Japan stopped. These conditions may retard progress in research on sericulture.

8) Transferred technologies are disseminated considerably well through training (government officers and farmer) and instruction in the farms. As the result production of bivoltine silkworm cocoon increased (production of warp 57t, in 1987).
Two private warp production factories are existing and establishment of new one is under consideration.

3-2-2 Problems of research in center and sub center

1) After Japanese experts left the center, Thai staff maintained the technology transferred and carry out them.
The level of research is still being the same as at the end of cooperation, and any new development has not found out because of the lack of new information and of insufficient knowledge of basic science. This condition will not be improved without support of more basic educational and research institutes in the future, re-adjustment of curriculum in vocational school, college or university should be strengthened.

2) Cocoon production using bivoltine silkworm is more profitable than other crop production, especially in North East Area, then numbers of farmers who pay attention to the sericulture are increasing, of sericultural region, Adoption of technologies to each local condition will be strongly needed.
For this purpose, however, strengthening of basic research capacity is necessary too.

3) At the cooperation period, Group of Pathology was the independent one. The reason for it was that the control of disease was thought to be the most important technology in tropical zone.
After the reform of organization, pathology group was divided into mulberry and silkworm groups.
This doesn't mean the low profile of pathology research. But, root rot disease is not yet solved, and in future, increase of disease is expected since sericultural area expand. Enlargement of and strengthening of pathology sections are essential.

4) Khon Kaen sub center produces of bivoltine silkworm seed and does not rear of polyvoltine silkworm. But the sub center distributes polyvoltine silkworm seeds. There is a great danger of occurrence of pebrine disease.

§2 Present State of Extension of Technology to Farmers

1. Extension system of technology to farmers is very complicated as will be described in §3 Sericulture Promoting Policy of Government. With expansion of sericultural area and with increase in number of sericultural farmers, mixing up of bivoltine and polyvoltine will easily occur. Actually, a farmer, during field surveyed, was found rearing bi-and polyvoltine silkworm at same time.

2. Extension of technology of mulberry cultivation.

Guidance by government organizations penetrates well among farmers.

1) Native varieties "Noi" and "Pai" are mainly distributed. Nakhonratsima 60 is used in some part.
In root rot disease occurring area, varieties have been replaced with "Pai".

2) Plant density of mulberry differs between non mechanized farm and mechanized farm, but usually, number of plant/rai (1,600 m^2) are varies from 860 ~ 1,600.

3) All farmers use fertilizer. Insect control using organo-phosphorus insecticides is carried out among some farmers as well as herbicide is also applied for weed control.

4) Cutting is low-cutting. Harvest is shoot harvesting. Yield/rai is about 3,000 kg in shoot.

5) Among new farmers, fortunately, root rot disease is seldom found out.

3. Extension of technology of silkworm rearing

Guidance by organizations concerned is well done. But the technology instructed by them is almost same in different locations.

1) Varieties recommended is all K1 × K8 (bivoltine)

2) In general "cooperative rearing house of young silkworm" is not established.
Most farmers buy incubated seed from the center (or the sub center) and rear them in same rearing house from young worm stage to mounting. But there are some farmers who rear young silkworm, grown silkworm and mounting in separated houses.

3) Many rearing houses are large scale (10 boxes/cycle) and are screened with fine-mesh-net to protect parasitic fly.

4) Most of rearing stand is made of wood with three shelves.
Shoot of mulberry is supplied 3 times for daily feeding.

5) Disinfection is done by 3% formalin spray.
Damages by "Nohbyo (grassarie), rats and lizards commonly occur.

6) Yield of cocoon of bivoltine varieties is 25-25kg/box.
Cocoons are sold back to the SRC in the case of farmers purchasing seed from the SRC.

7) In general, farmers still prefer overlapping rearing.

4. Relation between Farmers and Center

Relation between farmers and the center is very close in the case of bivoltine silkworm rearing farmers.

Grafts of mulberry and silkworm seed are supplied by the center, and many farmers sell cocoons to the center.

Farmers receive technical guidance from the center.

§3 Outline of Sericulture Promotion Policy of Thai Government

1. Complexity of organizations concerning sericulture promotion administration

We are surprised about the complexity of administrative organizations of government concerning sericulture promotion.

1-1 Extension of sericultural technology is carried out by three lines of governmental organizations.

That is; Sericultural Research Institute (SRI) of the Ministry of Agriculture and Cooperatives, DOAE of same Ministry and Land Settlement Division of PWD.

Research is exclusively done by SRI. Administration on reeling is under the Ministry of Industry.

Marketing and export are under the Ministry of Commerce.

No organization exist to coordinate these works.

There is "Silk Promotion Board", in which representatives of Ministries and private sectors discuss sericultural policy.

1-2 Complexity of Sericultural Technology Extension Administration

As shown after (§3, 2, of this Chapter), extension administration system is too danger to confuse farmers on silkworm rearing.

2. Sericulture Promotion Policy of Concerning Organizations

Outline of each organizations works are as follows;

2-1 Sericultural Research Institute (SRI)

1) Management of the SRC and the sub centers
2) Breeding and seed production of bivoltine varieties are carried out only in SRI line.
3) Budget of SRI in recent years

Year	Amount of Budget	Ratio to previous year
1985	32,449,700 Bht	– %
1986	33,167,700 Bht	102 %
1987	34,092,900 Bht	103 %
1988	39,407,300 Bht	116 %

2-2 DOAE

1) Extension of technology to polyvoltine silkworm rearing farmers, training and provision of materials.
2) DOAE has training centers and seed production centers for polyvoltine silkworm and train farmers.

2-3 Land Settlement Division, PWD

1) Land Settlement Division encourages the settlers to rear bivoltine silkworm.
2) Supplying young silkworm.
3) Training of settlers.
4) Subsidizing purchase of materials to 15 settlements.

2-4 Thai Silk Development Section, Ministry of Industry

1) Quality inspection and price setting of thrown silk.
2) Factories of sericultural materials are receiving subsidies from ARD.

2-5 Commodity Standard Division, Ministry of Commerce

Inspection of exporting silk products and issuing certificates.

2-6 Silk Promotion Board

Examination of silk promotion policy

2-7 Thai Silk Association

1) A body of 167 exporters to promote export
Advising on policy
Inspection of silk and silk products brought by exporters.

3. Sixth National Social and Economic Development Plan (1986-1990)

Sericulture promotion program was specified first time in National Economic Development Plan and targeted to increase silk production 7% per year.

§4 Results of Study on Private Enterprises

We studied on reeling, Chul thai Silk Co. and on weaving and marketing Jim Thompson Thai Silk Company.

1. Chul Thai Silk Company

1-1 The company has a reel factory which produce 79-80% domestic warp.
The factory handles only cocoon of bivoltine silkworm.
To stabilize materials (= cocoons of bivoltine silkworm) the company has two ways as follows;

Company itself has mulberry fields and rearing houses, and employes farmers who rear silkworm using the companies facilities.

In other way, company makes contract with farmers who get package loan from bank tied up with company. They do sericulture using their own facilities and sell cocoons to the company.

These farmers rear only the bivoltine silkworms.

Receiving the aid of Netherland's government, the company established Chul Thai Silk Foundation.

This foundation has a training center, the farmers mentioned above are trained in the center.

1-2 Reeling

1) Producting of thrown silk is 36t/year, that is about 63% of domestic warp production (= 57t).

2) Price of warp is set by government as follows;
1st class 1,250 Bht/kg 2nd class 1,100 Bht/kg
3rd class 900 Bht/kg

3) Buying price bivoltine cocoon by Chul Thai Silk Co., is 100 Bht/kg on average.

4) Ratio of cocoon v.s. to silk yarn is about 6:1

5) The company buys raw materials from farmers in North East Region and surrounding area of the factory.

6) Whole products are sold to domestic weavers.

1-3 Training Center

1) Training center is neighboring to factory and is located in suburbs of Petchabun city.

2) The company established a foundation.

3) The center began its activities in October 1987.
In 1987, training are carried out three times. Term of 1 course is 35 days. Target of training are farmers who rear bivoltine silkworm and sell cocoons to the factory. Number of trainees is 64/course, Applicants are about 3 times of trainees. 4 courses of training are usually planned in one year. In 1988, 6 course are already conducted.
The center charges each trainee 7,700 baht for the whole course including accommodations and field trip.

4) The company mediate the package loan from banks to farmers 120,000 baht per head to begin sericulture. This amount includes charge of training, 7,700 baht.

5) Most of graduates from the center begin sericulture.

6) Lecturers of training course are Chairman of foundation, the President of Thai Silk Association, Professor Neungpanich Sinchaisri of Kasatsart University and Mrs. Worapa Ngarmapsit, Chief of general affair of Nakhonratsima SRC.

7) Training is composed with lecture and practice. In practice one skilled instructor teaches every ten trainees.

8) Many trainees told us they were recommended to participate in training by villages cooperatives, or by their own interest.

9) This center is useful in the first place to the company to secure its raw materials. But it contributes to the increase of the warp production in Thailand, too.

1-4 Sericultural Technology

1) Mulberry fields of the company was formerly severely infected with root rot disease. The resistant variety "Kunpai" is selected.

Planting is 1 row planting, but for the convenience of tractor farming, double row style is designed.
Cutting form is short cutting. Shoots are harvested three times a year by shoot cutting on same field.
There are irrigation facilities. Management of field seems to be excellent.

2) Most of mulberry field of individual farmers are newly developed and management of them is not good. And damages by drought are seen.

3) Only bivoltine varieties are reared. Seeds are supplied from the center, or are imported from Japan, Korea and Taiwan.

4) Cooperative young silkworm rearing is done until 2nd growing stage.
Silkworm is distributed to farmers at early 3rd growing stage.
Disinfection is done perfectly.
The Company is constructing three air conditioned rearing houses now, a part of which is already used.
Young silkworm is reared by box rearing resembling to "Tenryu rearing method" in the house.

5) Rearing from growing silkworm to mounting is done in farmers' houses.
Those farmers who are employed by the company large scale rearing house (10 boxes/cycle). But mounting is done in other separated house.
Farmers spread nets on the three shelves of wooden rearing stand, and rear silkworms on the nets by feeding worms with mulberry shoots.
Matured silkworm larvas are picked up, and are placed on the rotary cocooning frames. Frames used are invented by the company.
Rearing house of individual farmers are medium scale (6-7 boxes/cycle).
Structure of them and the ways of rearing are similar by designed.
They intend to rear 6 cycles a year.
They are guided by the company's Instructors.
There is no problem about company's guidance now, but in the future, there is a possibility of increasing number of sericultural farmers beyond the capacity of company.

1-5 Reeling Technology

1) Main reeling machinery are Multi-ends-reeling machines.
1 set of automatic reeling machine was introduced recently. They say they have a plan to introduce more in future.

2) Besides reeling machinery, cocoon drying facility, cocoon boiling machine, rereeling machine, twisting machine (Italian style), etc. are introduced but most of them are of old type. They are thinking for replacement.

Not only the replacement, but also development of basic technology for realization of full use of them, is needed.

3) High hardness of water for reeling is a problem, company uses an ion exchange resin for softening water, but not fully succeeded yet.

4) As a whole, fundamental of quality control is lacking.
For example, from boiling cocoon to twisting are carried out in same house, then thrown silk or raw are polluted by dust.

2. Thai Silk Industry Company (Jim Thompson)

2-1 Activities of Thai Silk Industry Company (Jim Thompson)

The company is the biggest weaver and dealer of Thai silk.
The company has pride in that they made effort to improve Thai silk and promoted export of Thai silk for 30 years or more, and let the world know "Thai Silk".

2-2 Purchasing of materials

1) Warp used by the company is mostly imported. Main suppliers are China and Brazil.

2) Weft used is domestically produced from polyvoltine silk yarn. The company has 7 buying stations. The duty of station managers are buying weft from farmers.
Buying stations are located in following places.

(1)	Chiang Rai	North Thailand
(2)	Sakhol Nakhon	North East Thailand
(3)	Khon Kaen	North East Thailand
(4)	Surin	North East Thailand
(5)	Chayaphum	North East Thailand
(6)	Burirum	North East Thailand
(7)	Pak Thong Chai (near Nakhkonratsima)	North East Thailand

(see Fig. 4)

3) Price of weft are as follows;

1st class (Light)	700 baht/kg
2nd class (Rather heavy)	620 baht/kg
3rd class (Heavy)	450 baht/kg

4) Inspection of purchased materials is done only by touch and observation.

5) Company explained:

The reasons for purchasing domestic raw materials are;

(1) they are usable very easily, and there is no waste;
(2) as company's policy, they promotes rural development; and
(3) yellow silk production is important for poor farmers to get some incomes.

6) The reason for not using domestically produced warp is that quality of domestic warp is not uniform.
They think that it is too early to export warp of Thailand to Japan.
The company concentrates its effort on exporting silk and silk products.

2-3 On the quantity of export

Quantity of export described in statistic is less than the quantity purchased by tourists as souvenirs.

2-4 The company's assessment of the SRC

SRC is contributing to technical side of sericulture. By breeding mulberry varieties, SRC is contributing to polyvoltine silkworm rearing, too.

§5 Socio-Economic Impact of the Project

1. Expansion of Sericulture

1-1 State of extension of sericulture
Sericulture of Thailand has been developed rapidly in recent years.

Production of raw silk has increased as shown in Table 7.

Table 7 Trend of Sericulture in Thailand

Area of mulberry field year	Area of mulberry field	Number of sericultural farmers	Production of raw silk	Raw silk production per household
1971	397,803 rai	233,990	443,114t	1,89kg
1975	455,103	335,365	637,109	1,90
1980	421,150	367,869	842,000	2,17
1988	216,888	359,056	949,44	2,64

The production of raw silk increased more than 100t in recent years.

The increase of production was mainly due to the increase of per household production of raw silk. It means the sericultural technology of farmers has been improved very much.

Table 8 Production and Import of Raw Silk

Item	1982		1983		1984		1985		1986		1987	
	Quantity	%	Quantity	%	Quantity	%	Quantity	%	Quantity	%	Quantity	%
	t		t		t		t		t		t	
Import	488.76	100.00	432.78	100.00	368.09	100.00	429.53	100.00	589.37	100.00	1,071.84	100.00
Warp	175.24	35.85	164.02	37.90	138.04	37.50	163.19	37.99	229.76	38.98	369.44	34.47
Weft	313.52	64.15	268.76	62.10	230.05	62.50	266.34	62.01	359.61	61.02	702.40	65.53
Production	821.18	100.00	819.28	100.00	832.52	100.00	968.23	100.00	994.65	100.00	–	–
Warp	24.94	3.04	25.67	3.13	31.38	3.77	38.75	4.00	45.21	4.55	57.24	–
Weft	796.24	96.96	793.61	96.87	801.14	96.23	929.48	96.00	949.44	95.45	–	–

Percentage of domestic production in total warp:

1982	12.45%
1983	13.46%
1984	18.52%
1985	19.19%
1986	16.44%
1987	13.42%

1-2 Production and Import of silk thread

Production and imports are shown in Table 8, Comparing 1982 and 1986.

(1) Domestic production shows clear increase.

	1982	1986	Increase
Total thread	821 t	994 t	173 t (21.1%)
Warp	25 t	45 t	20 t (80 %)
Weft	796 t	949 t	187 t (23.5%)

(2) Imports: shows clear increase too.

	1982	1986	Increase
Total thread	489 t	589 t	101 t (20.6%)
Warp	175 t	229 t	54 t (30.9%)
Weft	314 t	360 t	46 t (14.6%)

1987 was the visit Thailand year, then import of raw materials reached 1.8 times of 1986. Domestic production of warp reached 57t in 1987.

Table 9 Export of Thai Silk

Kinds	1982		1983		1984		1985		1986		1987	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
		mll. Bht.		mill. Bht.		mill. Bht.		mill. Bht.		mill. Bht.		mill. Bht.
Thai Silk (m^2)	726,811	151.61	788,922	170.49	714,224	159.26	835,554	196.51	1,079,061	249.56	1,307,036	306.35
Silk Products (piece)	591,459	81.56	595,181	76.17	609,928	78.74	450,301	73.21	690,924	109.21	1,028,109	159.45
Thai *Jurl (m^2)	7,346	3.05	9,450	4.34	8,892	4.86			14,542	7.14	11,660	5.92
Thai Jur Products (piece)	139	0.02										
Total		236.24		251.00		242.86		269.72		305.81		471.72

*Juri is the fabric of mixture of silk and other fiber.

1-3 Exports of Thai Silk

Export of Thai Silk shown in Table 9.
In comparison of 1982 and 1987.

(1)	Thai Silk cloth increased,	in quality	79.8%
		in value	102.6%
(2)	Thai Silk products increased,	in piece	73.8%
		in value	95.5%

Persons concerning Thai Silk experts we interviewed, estimated that export shown in the table is only 30-35% of the actual export.

President of Thai Silk Associations estimates that one tourist take out about 3 yards, and total quantity is about 254 million yards.

1-4 Reeling and weaving factories

According to the explanation of the Thai Silk Development Section of the Ministry of Industry, there are 4-5 processing factories including;

Chul Thai Silk Co., and Bumma (Udon Thani),

and 64 weaving factories in Thailand.

2. Impact on economy of farmers

The average income of farmers in North East region is estimated about 5,000 baht per annum.

About the farmers being surveyed this time are as follows;

(1) Case 1. Large scale farmer, who cultivates 230 rai of mulberry field.
Rearing only bivoltine silkworm, 700 boxes/year.
Sold 2,400 kg of cocoon, worth 240,000 baht.

(2) Case 2. Medium scale farmer, who cultivates 15 rai of mulberry field.
Rearing bivoltine silkworm (90%) and polyvoltine silkworm (10%) 5 boxes/year.
Production of cocoon per box is 20-30 kg.
Assumed sold value; 20,000-30,000 baht.

(3) Case 3. A farmer who cultivates 80 rai of mulberry field and operates the works of 3 friends.
Rearing only bivoltine silkworm 36 box/year.
Cocoon is sold to Land Settlement Office.
Yield per box is 25kg. Price is 101-105 baht/kg sold cocoon, 90,900-94,500 baht/year.
Borrowing 45,000 baht from his brother, started 2 years ago and already paied back total

amount borrowed sum, and got 45,000 baht of profit in first year of silkworm rearing.

(4) 86 farmers graduated from Chul Thai Silk Foundation's Training Center are surveyed by the company.
The results are shown in Table 10.

Table 10 Distribution of income of graduates

Income	Distribution	Number of Farmers
Baht	%	
Under 10,000	15.12	13
10,001-20,000	20.03	18
20,001-30,000	22.10	19
30,001-40,000	23.26	20
40,001-50,000	6.98	6
50,001-60,000	3.48	3
above 60,001	8.13	7

Notes: Total income of all farmers mentioned in table. 2,863,798.52 Baht Average income 34,092.84 Baht

(5) Statistics of Ubol Rat Land Settlement Office is shown in Table 11.

In the area of Land Settlement, Farmers are recommended to cultivate 4 rai of mulberry field.

As mentioned above, sericultural farmers get higher income in general. This is the reason for recent sericulture boom.
Several settlements where sericulture was introduced, and failed to develop sericulture disappeared from the settlements.
It cannot be said that sericulture always increases income of farmers. But in these days, resistant varieties of mulberry and silkworm are improved, Rearing technology was progressed significantly.
By these improvement, sericulture became stable.
It is thought that these improvements exist in the background of the boom.

Table 11 Change of Sericulture of Settlers

Year	Number of Settler	Bearing Quantity of Bivoltine Silkworm	Production of Cocoon	Amount of Selling of Cocoon	Yield of Cocoon per Box	Income of Settlers per Head per year
		Box	Kg	Baht	Kg	Baht
1976	11	12	349	17,349	29.0	1,577
1977	30	149	1,858.5	100,969	12.47	3,366
1978	60	332	5,952.1	353,958	17.92	5,899
1979	90	472	7,717.4	525,056	16.35	5,834
1980	90	409	4,688.3	310,790	11.46	3,454
1981	50	282	4,832.8	374.924	17.13	7,498
1982	50	343	6,024.0	480,041	17.56	9,601
1983	50	273	6,038.0	519.281	22.09	10,386
1984	60	299	7,230.7	615,417	24.20	10,257
1985	65	351	7,502.8	679,055	21.37	10,447
1986	70	442	10,334.3	962,026	23.30	13,743
TTL.		3,364	62,520.7	4,938,865	18.59	

3. Development of reeling and weaving industry and marketing

3-1 Development of reeling and weaving industry

(1) Several reeling factories exist, and two of them process warp.
One is Chul Thai Silk Co. in Petchabun, and another is Bumma Co. in Udon Thani. All warp is produced in these 2 factories.
The share of former in total warp production is 70-80% and that of latter is 20-30%. Chul Thai Silk Co. produced 36t and Bumma produced 17t in 1987.
These production of warp become possible in this country by introduced the technology of bivoltine silkworm rearing from Japan.

(2) There are 64 weaving factories in Thailand.
The biggest one is Thai Silk Industry Co. Ltd. (Jim Thompson)
Details of the activities of these factories are described already.

(3) Trainees of the Chul Thai Silk Foundation's Training Center come from North East and Central Thai region.
These areas are the production areas of bivoltine silkworm cocoon.

Jim Thompson has 7 buying stations mainly in north east region, only one is located in North region.

These activities of main factories are plotted in Figure 5. From the Figure, we can recognize the difference of production area of bivoltine and polyvoltine.

3-2 Activities of dealers

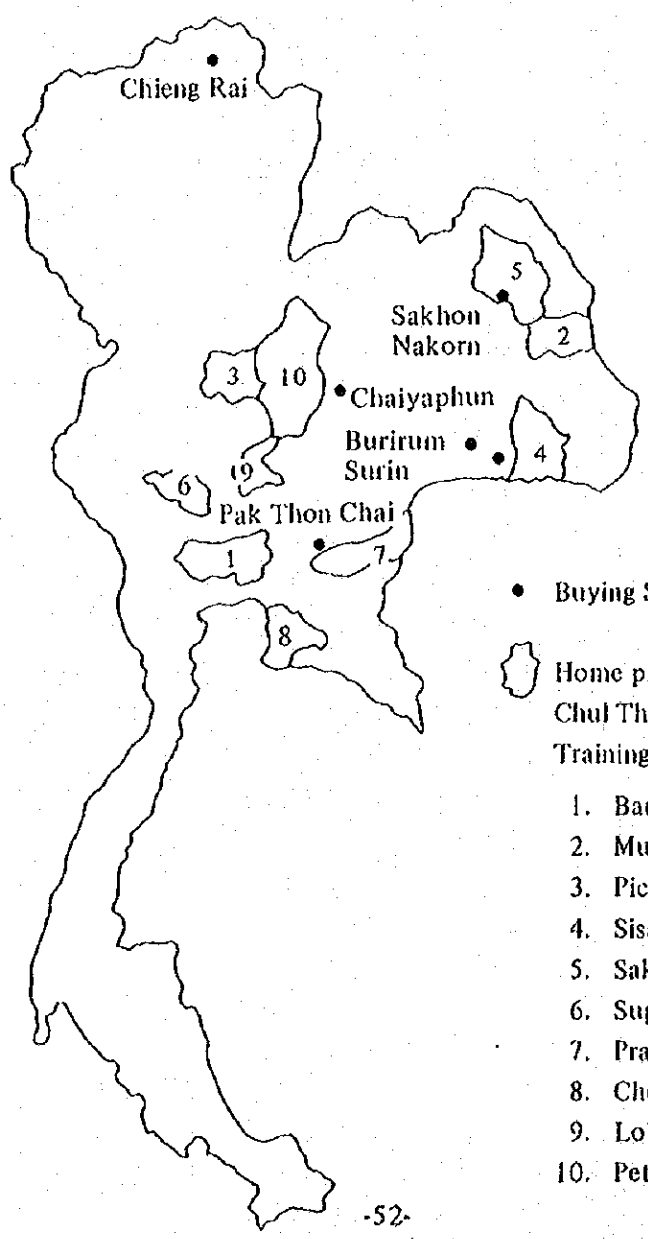
In the case of weaving factories, they buy raw silk or thrown silk. In the case of reeling factories, they buy cocoon of bivoltine silkworm, usually farmers bring cocoon directly to the factories (including SRC).

Price of thread are shown already.

Small weaving factories usually buy raw silk or thrown silk through some dealers.

Figure 5 Activities of Private Enterprises

Regions trainees has come from	No. of trainee
1. Bangkok and Pratumtani	3
2. Mukdahan	4
3. Pichit	1
4. Sisaket	1
5. Sakhon Nakon	1
6. Suphanburi	1
7. Prachinburi	1
8. Chonburi	1
9. Loburi	3
10. Petchabun	280



- Buying Station of Jim Thompson

Home provinces of Trainees of Chul Thai Silk Foundation Training Center

1.	Bangkok and Pratumtani	3
2.	Mukdahan	4
3.	Pichit	1
4.	Sisaket	1
5.	Sakhon Nakon	1
6.	Suphanburi	1
7.	Prachinburi	1
8.	Chonburi	1
9.	Loburi	3
10.	Petchabun	280

Chapter VI Conclusion and Recommendation

§1 Bases of the Evaluation

Evaluation of this project must be based on following two view points:

(1) Is transfer of bivoltine silkworm rearing technology achieved or not?
This will be devised in to; a) transfer of technology during the term of the cooperation and b) sustainability of the transferred technology in Thailand.

(2) Has transferred technology contributed to the development of sericulture of Thailand or not?
This will be judged by following points.

a) Has sericulture of Thailand developed?
b) Has SRC contributed to this development?
c) Is Japanese cooperation contributed to the activities of SRC?

§2 Transfer of Technology in SRC

1. Achievement of transfer of technology at the end of cooperation.

1) This cooperation was extended the term twice, and was planned to finish in March, 1978. The report of evaluation survey in September 1977 pointed out following facts:

(1) About areas of Research, Training and Extension, target are achieved more than 100% in SRC and 70-80% in Sub centers (See Chapter IV). But Root rot disease remains unsolved.

(2) Areas needs cooperation in future are a) Diagnosis of silkworm disease and disease control technology on farms.
b) Technology for mass production and protection of silkworm seed; and c) raising up of productivity of reeling.

2) Mr. Sugiyama described in his general report in September 1989;

a) Targets were almost achieved in mulberry cultivation, silkworm rearing, seed proudction, control of pest & disease, reeling and training. (see Chapter IV)

b) But Root rot disease of mulberry disinfection, uniformity of rearing quantity and Breeding of excellent F2 variety of silkworm are still to be solved.

3) Judging from these reports and report of Chulalongkorn University (See Chapter IV),

it seems the technology for rearing bivoltine silkworm was almost transferred to Thai counterparts at the termination of the cooperation.

2. Maintenance and development of technology transferred

1) Facts found

(1) Level of research has been maintained at the same level as in the period of the cooperation.

(2) After the termination of the cooperation Thai experts bred one variety of mulberry (Nakonratsima 60), silkworm varieties 60-1, 60-2, and 2 varieties of hybrid (Nakonratsima hybrid 1 and 60).

(3) Thai experts made some modification transferred technology and use it. For example: Improvement of vent on ceiling and rearing stand.

(4) Seed production increased year by year, and production and distribution of 10,000 box are expected in 1988.
Production of biviltine silkworm's cocoon will increase in the future.

(5) All product of SRC is thrown silk. Quantity of product is 2.8t/year. This amount is near to the capacity of production of SRC, 3.3t.

(6) Buildings, facilities and materials are maintained and managed generally in good condition. But some machineries and equipments are not used or are underutilized because of the reasons mentioned earlier.

(7) Root rot disease of mulberry is remaining unsolved. Some disease of silkworm of unknown origin occurs in some place.

(8) After the termination of cooperation, we saw some modest development in research area as mentioned above, but we found out a few remarkable progress in research area of the SRC.
By termination, technical information from Japan stopped and training of Thai experts in Japan stopped too.
Even if received Japanese information, most of them are written in Japanese, and they cannot understand the contents.
Perhaps these facts are retarding the progress of research. But we can point out one important factor retarding the progress of research. That is the lack of basic science knowledges on sericulture. In Thailand, there are few university which has sericultural course, and there is no research institute which carry out basic sericulture science. In these condition any leading scientist on sericulture doesn't grow up.

(9) Thai government are making effort to extend the transferred technology to farmers through training and instruction on field, as the promotion of the production of bivoltine cocoon.

3. Activities of the Sub center (Khon-kaen)

1) At the time of cooperation, main work was seed production. But from several year ago the Sub center began research, too.

2) Collection of mulberry and study of the characters of them, study of suitability of between varieties to bud grafting for control of root rot disease, breeding of root resistant varieties are carried out in the sub center. Comparative experiment of bred strain are also carried out in the sub center.

3) As the technical service, distribution of graft, silkworm seed, education and training and instruction on field are carried out by the Sub center.

§3 Extension to Farmers

The system of extension to farmers very complicated. At present condition, duplication of farmers and regions rearing bivoltine silkworm and polyvoltine silkworm is very rare. But, with the expansion of sericulture, confusion of technology, infection of disease etc. may occur. At present, the rearing technology of center are delivered well to farmers rearing bivoltine silkworm. Rather, it can be said, the technology delivered is too uniform, and the modification to adapt each local condition is needed.

§4 Effect of Cooperation on the development of Sericulture in Thailand

1. Development of Sericulture in Thailand

1) As described in Chapter V. Sericulture developed rapidly in Thailand in recent years.
The reason of it is that reputation of Thai silk has rison up in world wide and demand for Thai silk has increased rapidly.
Another side, increase of income of sericulture farmers stimulates the farmers to increase cocoon production.

2) In particular, production of cocoon of bivoltine silkworm, became very profitable by increasing yield by improvement of technology and price setting by government.
Two factories reeling warp exist already and they say new one is under planning.

3) Enterprises have or intend to have mulberry fields and rearing houses, or endeavor to secure the contract farmers.

The Chul Thai silk Co. established the foundation to train farmers who will be contract farmers.

4) Export of Thai silk increased remarkably in recent years. Value of exports increased more than two times during 1982 to 1987. Export volume of silk product increased 1.8 times.

2. Contribution of the cooperation to the development of sericulture in Thailand.

1) At the beginning there was no cocoon of bivoltine silkworm, and all warp consumed was imported.
In these days, Thailand imports about 400t of warp but domestic warp production research 57t, and trend of increase is seen.

2) Income of bivoltine silk worm rearing farmers is much higher than the case they cultivates other crops. Then, desire to rear bivoltine silkworm is remarkable.

3) Warp production factories, are established already as mentioned above.

4) These facts became possible by introduction and fixing of new technology which did not exist in Thailand before the cooperation.

5) The Ministry of Agriculture and Cooperatives, the Ministry of Industry, the Ministry of Commerce, the Land Settlement Office, the Thai silk Association and Private Enterprises all recognize above contribution of the cooperation.

6) In particular, the work of the project leader in the first stage of the cooperation, Dr. OMURA is highly appreciated. It seems that the impression of him was strong to Thai officials and counterparts.

§5 Problems and Recommendations

1. Problems on SRC and Recommendations

1) Transfer of technology and Problem of language barrier

Linguistic capability of Japanese sericultural experts is poorer than experts in other fields. Japanese technology of sericulture is surely high, but in the case of transfer it to foreign people, transfer is not achieved unless using language understandable to them.
This project cooperation was carried out mainly with Japanese language. And many Thai experts concerning sericulture speak Japanese well. But we can't expect it coming Thai sericulture experts to command Japanese. It will be an obstacle to the future cooperation.
From the interview with Thai officers that even in the past cooperation report in Japanese

or transfer of technology in Japanese made insufficient understanding between both sides of experts.
Both side, especially Japanese side have to realize this point.

2) Difficulty of replacement of materials and supply of spare parts

As materials for sericulture are not produced in Thailand and frequent model changes of machinery are made in Japan. The replacement of materials and supply of spare parts became difficult.
Japanese government, in after care work donated some materials. But this kind of after care work cannot be repeated again and again. Effort of Thai side to replace these by domestic products must be encouraged.

3) Stop of technical information from Japan

After the termination of the cooperation, exchange of experts and provision of publications are stopped. Then the information on progress of technology in Japan stopped.
And, even if Thai side purchase these, information written in Japanese is very difficult to understand. Then Thai experts must depend on English information from India, China, Korea and some International organization.
And Thai government send experts to these countries to study sericultural technologies. This is the problem of information of Japan (not only in area of Sericulture).

4) Necessity of strengthening of pathology area

At the cooperation period, pathology group was independent one. But, now, pathology group is divided into two groups, mulberry group and silkworm group. It could not be said improper itself. But considering that the most important problem of sericulture is disease of silkworm, the effort to strengthen this area is desirable.

5) Treatment of Polyvoltine Silk worm seed in Khon Kaen Sub center

Khon Kaen Sub center produces and distributes polyvoltine silkworm seed. In addition, sub center also distributes polyvoltine silkworm seed which are provided from other centers. This is very dangerous since pebrine may appear. It is necessary to improved present management.

2. Issues in Development of Sericulture and Recommendations

1) Necessity of developing basic knowledge of experts

As mentioned in 1.-2-, 1)-8), education and research on basic Sericulture Science is needed.
In this country there is no university or Research institute to mandate basic Science of

Sericulture. This condition is very different from Japanese situation. We are informed by Thai experts of anxiety to getting excellent successors in future. If the expansion of sericulture is expected, effort to train excellent experts should be done by Thai side itself.

2) Domestic Production of materials

As mentioned above, replacement with domestic products is needed.

3) Complicity of Administration (includes Extension) System

As mentioned above, administration system on Sericulture is too complicated. Simplification of it should be examined.

4) Too rapid increase of cocoon production by strong desire of farmers

Because of the fact that income of rearing bivoltine silkworm is remarkably high, the tendency is seen that unskilled farmers expand their scale of rearing, ignoring fundamental instruction.
This is a big problem since there is a danger of destroying their household economy at once, by severe occurrence of disease or unbalance of demand and supply of mulberry leaves. Reasonable instruction are urgently needed.

5) Problems of Quality Control in Reeling Factory

As mentioned above factory is lacking fundamental idea of quality control. It should be improved.

3. Thai silk or Silk of Thai

Under the condition of world wide silk boom, demand of Thai silk is increasing. The improvement of quality is being promoted. And new products has developed too. But, on the other hand, we feel the quality of traditional simplicity disappearing. This fact is seen in Japan, e.g. in the case of "Tsumugi", too. In other way, according to the multiplication of consumers needs, new raw materials are being sought, and demand for thread of special properties is increasing. In these current of silk production, the time will come to ask.

"Produce Thai silk" or "produce the Silk of Thai"?

APPENDIX

1. Number of Staffs and budget support of SRC 61
2. Results of research on Silkworm races and Mulberry varieties 61
3. Silkworm seed production in SRC 62
4. Number of Farmers involving bivoltine rearing 63
5. Fig; General conditions for Sericulture in Northeast 63
6. Ubolrat Land Settlement 64
7. Number of Reeling factories 64
8. Source of supply of Silk yearn for the Thai Industry 1987 65
9. Sousing Raw Silk Supplies in the commercial Hand Weaving Sector 66
10. Record of Discussion (1969) 66
11. References 71

1. Number of Staffs and budget suppoer of SRC

Year	No. of staffs	Fiscal year budget (mil. B)
1979	38	4.0
1980	38	4.5
1985	38	4.5
1987	42	5.0
1988	42	6.0

2. Results of research on Silkworm races and Mulberry Varieties

1) Breeding

(1) Silkworm new hybrid from SRC
Nakonratsima 60/1
Nakonratsima 60/2
Nakonratsima hybrid 60

(2) Mulberry new hybrid
Nakonratsima 60 (hybrid)

2) Characters of Silkworm varieties

(1) Nakonratsima 60/1 (korat No. 13)
Race: Japanese
Volitinism: bivoltine
Cocoon Color: White
Cocoon Shape: Peanut shape
Larval stage: 20-21 days
Cocoon shell percentage: 20.4%
Fresh cocoon weight: 505 g/1 egg batch from 1 month (425 eggs)
Length of cocoon filament: 1,000 m.

(2) Nakonratsima 60/2 (korat No. 6)
Race: Chinese
Volitinis: bivoltine
Marking: normal marking
Cocoon color: white
Cocoon shape: Round or oval shape
Larval stage: 19-20 days
Cocoon shell %: 18.9%
Fresh Cocoon weight: 1175 g/1 egg batch (400 eggs)

Length of cocoon filament: 1,000 m

(3) Nakonratsima hybrid 60
Hybrid: Triple cross hybrid
Japanese (K1 × K15) × Chinese (K × P)
(White) (Yellow)
Volitinism: Bivoltine
Cocoon color: yellow
Cocoon shape: oval shape
Larval stage: 20-25 days
Cocoon shell %: 20%
Length of Cocoon filament: 1,000 m

3) Characters of Mulberry variety

Mulberry Nakonratsima 60

Hybrid: Single cross Japanese (shukakuichi No. 18) × Thai (Kaeu Chonabot)
Duration of breeding and testing: 6 years
Leaf Production: 22.5t/hector/year
Leaf Ration: < 50%
Drought resistance: good
Multiplication: bud grafting with native variety as stock (not normal cutting)
Disease resistance: high resistance to gowdery mildew but not to root rot
Leave shape: oval

3. Silkworm seed production in SRC

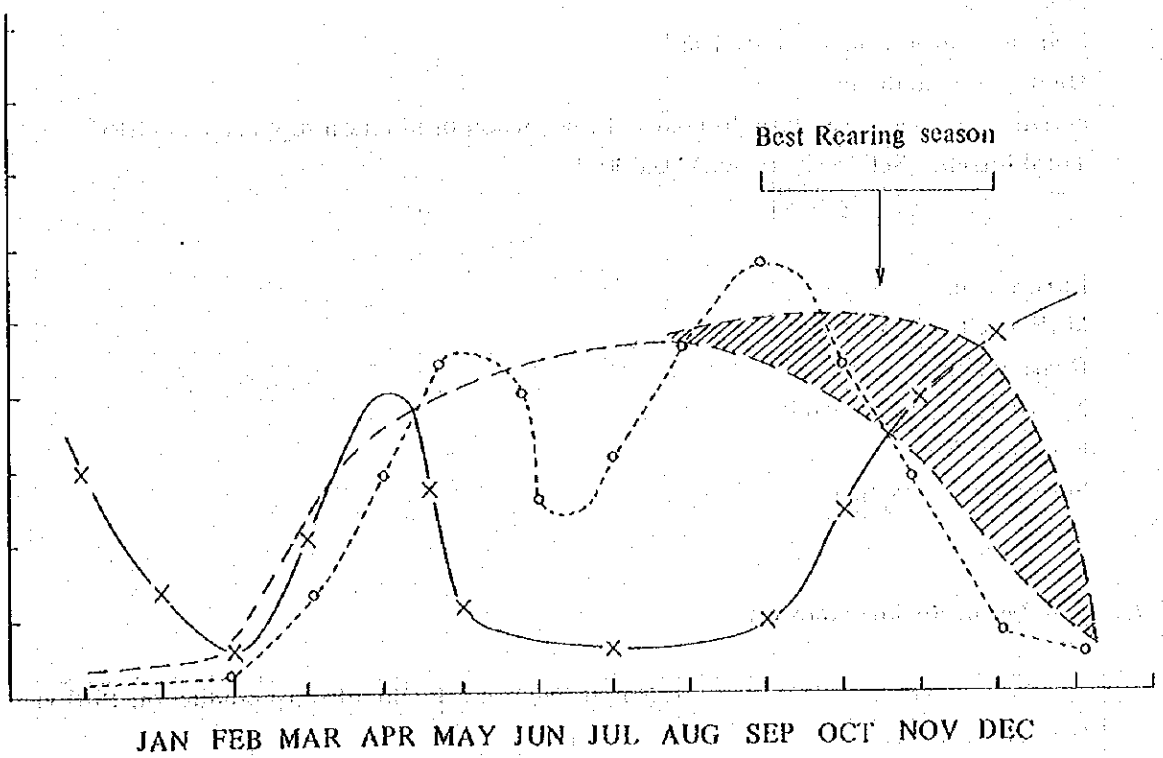
Year	Boxes (1 boxes or sheet = 50 moths)
1985	1,670
1986	2,260
1987	6,450
1988	10,000

SRC can purchase fresh cocoon in maximum capacity of 20t
SRC sell egg 100 B/box input cost 260 B/bos
160 B being subsidized by Government

4. **Number of Farmer involving bivoltine rearing**

Sectors	No. of Farmers (1987)
Government	600
Private Company	70
and contract farmers	359
	400 (plan for 1989)

5. **Fig; General conditions for Sericulture in the Northeast**



General rainfall pattern

Time available for rice cultivation

Mulberry leaf production

time available for silkworm Rearing

Area of more mulberry leaf production

6. **Ubolrat Land Settlement**

PWD
Sericulture
No. of Farm family
Old group 93
New group 43
Total 136
Average income 10,000 B/y

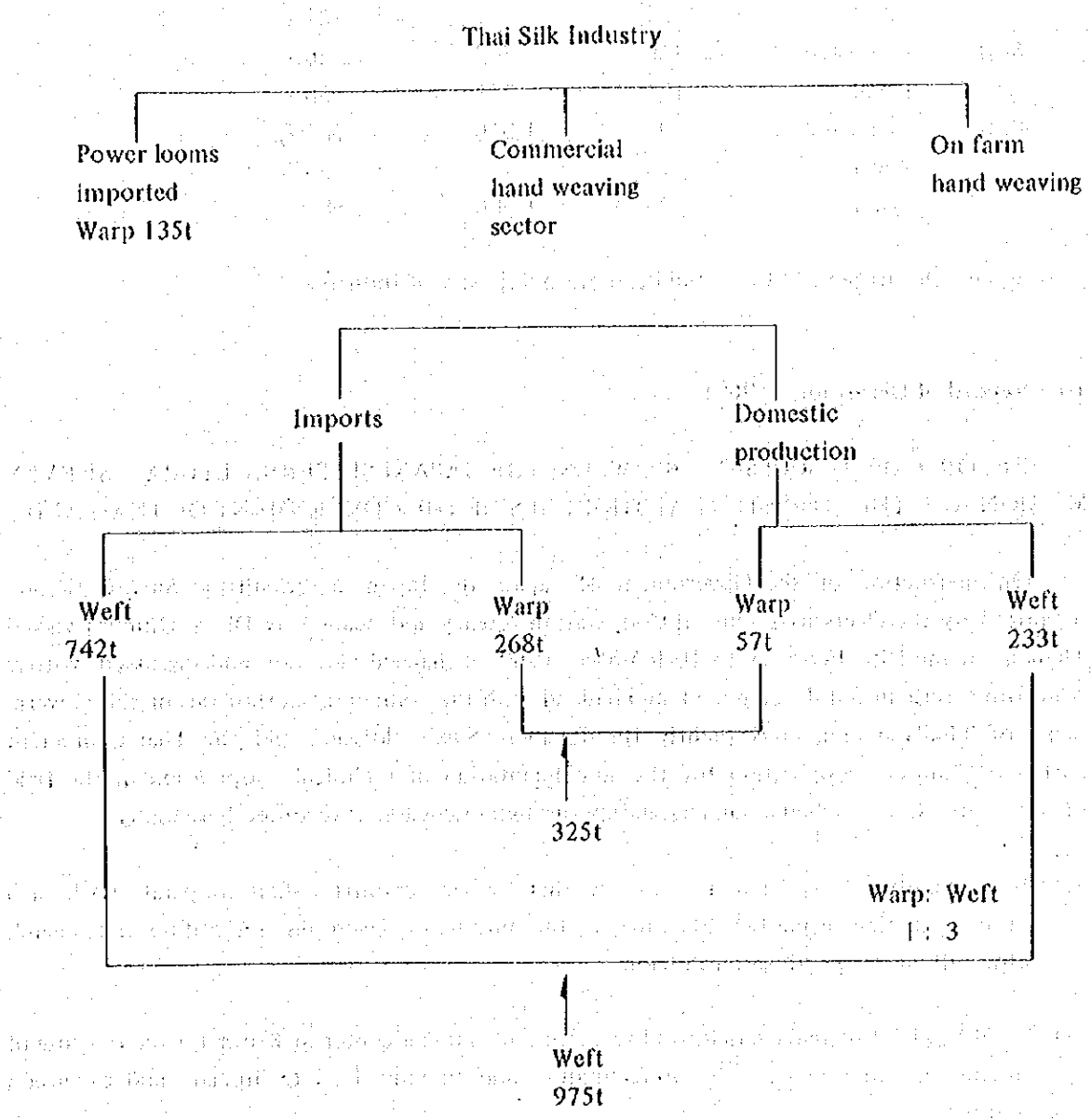
Dong
Somchit Rungeseepanya start 1987
High school graduate
activity: 5 cycles/year with 36 boxes of egg cocoon production supplied from SRC
Total income (Sell fresh cocoon) 90,000 B
(20 Kg/box)

Future Plan
Mulberry field area 6 rai
Rearing house
No. of egg 60 boxes/cycle
No. of cycle 6
Set up rearing factory

7. **Number of Reeling factories**

Sectors	No. of Factories	No. of warp production 1987 (t)
Government	1	4
Private	3	
Chul Thai silk (Petchaboon)	1	36
Bomma Co. (Udorntani)	1	17
Thai silk Project (Nakornratsima)	1	Under construction
Total	4	57

8. **Source of supply of Silk yearn for the Thai Industry 1987**



9. Sousing Raw Silk Supplies in The commercial Hand Weaving Sector

Product	Source	1986 (t)	1987 (t)	% change
Warp	-imported	132	268	+103%
	-local	45	57	+27%
Weft	-imported	360	742	+106%
	-local	171	233	+36%
Total	-imported	492	1,010	+105%
	-local	216	290	+34%
	-total	708	1,300	+84%

Serce: Department of Industrial Promotion, Ministry of Industry

10. Record of Discussion (1969)

RECORD OF DISCUSSION BETWEEN THE JAPANESE SERICULTURAL SURVEY MISSION AND THE COMPETENT AUTHORITIES OF THE GOVERNMENT OF THAILAND

On instruction of the Government of Japan, the Japanese sericultural Survey Mission organized by the Overseas Technical Cooperation Agency and headed by Dr. S. Ohmura visited Thailand from 18th February to 10th March, 1969, exchanged views on and discussed matters concerning sericultural development in Thailand with the competent authorities of the Government of Thailand and, consequently the Japanese Survey Mission and the Thai competent authorities mutual cooperation for the implementation of technical cooperation in the field of sericulture, have reached an understanding through discussion as recorded here under;

1. It was mutually agreed to recommend that the two countries shall cooperate with each other in implementing the following for the purpose of developing sericulture in Thailand, especially in the north eastern region.

(1) Establishment of main sericultural research and training center at Korat for the purpose of introducing modern sericultural techniques and training Thai technicians and extension workers.

(2) Consolidation of three extension local sericultural stations, under the guidance of the above mentioned center, which shall formulate techniques adaptable in the region and engage in the production and the distribution of well selected silkworm eggs and mulberry scions.

(3) Extension of modern techniques to certain villages which shall become the core for technical extension to sericultural farmers.

2. In accordance with laws and regulations in force in Japan, the Japanese authorities shall take

necessary measures to provide at their own expense the service of the required Japanese experts as listed in Annex I through the normal procedures under the Colombo Plan Technical Cooperation Scheme.

3. In accordance with laws and regulations in force in Japan, the Japanese authorities shall take necessary measures to provide at their own expense equipment and machinery as listend in Annex II through the normal procedures under the Colombo Plan Technical Cooperation Scheme.

4. In accordance with laws and regulations in force in Japan, the Japanese authorities shall take necessary measures to grant training in Japan to Thai technicians engaged in this Project through the normal procedures under the Colomb Plan Technical Cooperation Scheme.

5. The equipment and machinery referred in Annex II shall become the property of the Government of Thailand upon being delivered c.i.f. at the port of Bangkok to the competent authorities. The equipment and machinery referred to above shall be utilized exclusively for the purpose of the Project under the technical guidance of the Japanese experts.

6. The Thailand competent authorities shall take necessary measures to provide at their own expense;

(1) Thai technical and administrative staffs.

(2) Land and buildings as well as incidental facilities.

(3) Supply or replacement of equipment and machinery necessary for the implementation of the Project by mutual agreement between the two parties concerned.

(4) Means of transportation in Thailand for the equipment and machinery provided by the Government of Japan.

The Thai competent authorities shall also bear the expense necessary for the installation, operation, and maintenance of the above equipment and machinery as well as all running expenses necessary for the implementation of the Project.

7. The Thai compertent authorities shall be responsible for operation and all administrative matters pertaining to the function of the Project, while the Japanese experts shall closely cooperate with the Thai competent authorities and give technical guidance pertaining to the implementation of the Project.

8. To lead this Project successfully, there shall be frequent consultations between the Thai and

Japanese competent authorities.

9. The period of the Japanese cooperation in the implementation of the Project will be for the three years. The above period may, however, be extended for a further specified period by multural agreement of the two parties concerned.

10. The understanding as recorded heretofore shall, subject to formal review by the respective competent authorities, survey as the rules on which the present cooperation is to be implemented.

Bangkok, March 7, 1969

Dr. Seinosuke Ohmura,
Head,
Japanese Survey Mission

Dr. Phit Panyalakshana
Deputy Director-General
Department of Agriculture
Ministry of Agriculture

Witnessed by Mr. Keizo Kawaguchi
First Secretary,
Embassy of Japan

Witnessed by Mr. Xujati Pramoolpol
Deputy-Director-General
Department of Technical and
Economic Cooperation,
Ministry of National Development.

Annex I JAPANESE EXPERTS DISPATCHED BY THE GOVERNMENT OF JAPAN TO WORK IN THAILAND ON THE FOLLOWING FIELDS:

1. Silkworm breeding
2. Mulberry cultivation
3. Silkworm rearing
4. Pathology
5. Filature

Note: 1) Each expert will work for three years.
2) Extension of staying for each expert may be made, if necessary, under the consideration of both parties concerned.
3) Additional experts may be available at request.

Annex II EQUIPMENT AND MACHINERIES

1. Cooling machineries for:
   a) Seed storage rooms
   b) Rearing rooms
   c) Incubation rooms
   d) Laboratories

2. Silkworm Rearing and Egg producing Equipment: –
   1) Mulberry leaf cutting machines
   2) Floss removers
   3) Steel rearing trays and stands
   4) Sizing reels
   5) Power sprayers
   6) Others

3. Pathological laboratory equipment: --
   1) Pepbrine identification equipment
      a) Moth grinders
      b) Electric centrifuges
      c) Phase microscopes
      d) Others

   2) Equipments for Mulberry and Silkworm diseases
      a) Microscopes
      b) Autoclaves
      c) Electric incubators
      d) Drying sterilizers
      e) Microtomes

f) Automatic distillation apparatus
g) Microscopic projector
h) Others

4. Equipments for mulberry culture;–
   1) Farm machineries
      a) Tractors with accessories
      b) Trailers
      c) Others

   2) Irrigation equipment
      a) Sets of sprinkler
      b) Others

   3) Soil laboratory equipment
      a) Set of soil survey equipment
      b) Set of soil analysis equipment
      c) Others

   4) Meteorological equipments
      a) Recording thermometers
      b) Rain gauges
      c) Others

5. Filature machineries: –
   1) Cocoon drying machine
   2) Cocoon boiling machine
   3) Selectary reeling machine
   4) Multiple ends reeling machine
   5) Automatic reeling machine
   6) Rereeling machine
   7) Set of raw silk testing machine
   8) Thread-playing machines
   9) Boiler
   10) Others

6. Calculation machines

7. Audio-visual equipment: –
   1) Cameras
   2) Movie camera
   3) Tape recorders
   4) Movie projector

5) Others

8. Reference books and periodicals

9. Transportation facilities:--
   1) Microbus
   2) Mini trucks
   3) Others

Note: Necessary items not mentioned in this Annex may be requested later.

11. References

1. Thai silk Guide Book: The Thai silk Association (E)
   (E) = document in English
2. Annual Report 1987: Jim Thompson Thai silk Company Ltd.
   1988.2.12 (E)
3. Documents of JICA: (J) = document in Japanese.

1) 1967, Guidance on sericultural technology in Thailand (A. Ohtani) (J)
2) 1969, Report of survey mission on Sericultural development in Thailand (J)
3) 1970, Report on Performance of cooperation works on sericulture in Thailand (J)
4) 1970, Mulberry cultivation in Thailand (K. Kawai) (J)
5) 1971, Report of guidance team on sericultural development project in Thailand 1970 (J)
6) 1972, Report of guidance team on sericultural development project in Thailand 1971 (J)
7) 1973, Report of guidance team on sericultural development project in Thainalnd 1972 (J)
8) 1974, Report of cooperation work on sericultural development in Thailand (J)
9) 1975, Summary Report on the Technical Cooperation Project for the Sericultural Development in Thailand (J)
10) 1975, Evaluation Study report on Thai sericultural development Project; 1974 (J)
11) 1975, Report of negotiation team on Sericultural development project in Thailand. (J)
12) 1976, Report of guidance team on sericultural development project in Thailand (J)
13) 1976, Report on Japanese Guidance Team for 1976 on Thai Sericultural Development Cooperation Project (E)
14) 1977, Report of evaluation team on Thai sericultural development cooperation project (E)
15) 1978, Sericultural Development Cooperation in Thailand (S. Ohmura) (J) (E)
16) 1980, Report of guidance team on Thai sericultural development project and Indonesia sericultural development project (J)
19) 1980, Integrated report of expert of Thai sericultural development project (J)
20) 1984, Evaluation study report on Economic and Technical Cooperation (General) 1983 (Thailand) (J)
21) 1985, Report of survey team on After care programme of Thai sericultural development (J)

22) 1986, Year book of JICA; 1985 (J)
23) 1987, Detail of Economic and technical cooperation work. (1954 – 1985) vol. 1. Asia International Organization (J)
Note: (J) = Written in Japanese, (E) = Written in English

4. Research report on Danish, German and Japanese assistance to agricultural development in Thailand: a comparative study. (Khiep Threeravit & Others, Asia Institute Chulalongkorn Univ.) (E)

5. Statistical data were provided from

1) SRI. Ministry of Agriculture and Cooperatives
2) Thai silk Development Section, Ministry of Industry
3) Silk inspection Section, Ministry of Commerce
4) Thai Silk Association
5) Nakonratsima Sericultural Research Center
6) Khon Kaen Sericultural Experiment Station
7) Ubolratana Land Settlement Office
8) Chul Thai Silk Company
9) Jim Thompson Thai Silk Company

REPORT OF JOINT EVALUATION STUDY ON JAPAN'S ECONOMIC AND TECHNICAL COOPERATION IN THAILAND

—Khon Kaen Institute for Skill Development Project—

March, 1989

Department of Technical and Economic Cooperation (DTEC)
Japan International Cooperation Agency (JICA)

PREFACE

The Japanese Government decided to conduct an evaluation study jointly with the Government of The Kingdom of Thailand, as the first case of joint evaluation, on the Sericultural Research Center Project, the Khon Kaen Institute for Skill Development Project and the New Village Development Program and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Thailand a study team headed by Dr. Kenzo HEMMI, Professor of Asia University, comprised of members from Mr. Kanji ENDO, Dr. Jinichiroh YABUTA, Mr. Joh CHIBA and JICA staff concerned from June to July, 1988.

The team held discussions with concerned officials of the Government of The Kingdom of Thailand, and conducted field surveys. After the team returned to Japan, further studies were made and the present report was prepared.

I hope that this report will contribute to the promotion of Japan's Economic and Technical Cooperation with Thailand and to the enhancement of friendly relations between two countries.

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

March, 1989

Kensuke Yanagiya

Kensuke Yanagiya
President
Japan International Cooperation Agency

Mr. Kensuke Yanagiya
President
Japan International Cooperation Agency

Dear Mr. Yanagiya:

On behalf of the team for the Evaluation of Japanese Aid Projects in North-east Thailand, I take pleasure in submitting to you its report. The Evaluation was conducted both in Japan and Thailand during June 19th to July 22nd and September 18th to 24th, 1988, following preparatory work carried out both in 1987 and earlier last year.

The Evaluation was performed jointly by a Japanese team led by me and the Social Research Institute, Chulalongkorn University, led by Dr. Amara Pongsapich, Director of the Institute, in accordance with the Scope of Work agreed upon between Mr. Wanchai Sirirattna, Director General of DTEC and Dr. Kenzo Hemmi on September 23th, 1987. The purpose of the Evaluation is stated in the first page of the following report, Summary and Recommendation. The Scope of Work and the list of the members of the team are appended to the report.

The report consists of four parts: Summary and Recommendation; the Report on the Sericultural Research Center Project; the Report on the Khon Kaen Institute for Skill Development Project; and the Report on the New Village Development Program. Although it lacks details of the evaluation of above individual project or program, the Summary and Recommendation is a self-contained report. Dr. Amara Pongsapich will submit the same set of the reports to the Department of Technical and Economic Cooperation, Royal Thai Government.

To produce this report required advice and assistance from many people and organizations. Names of those individuals are too many to list. The list of the names of the government organizations to which those individuals belong is attached to this report. I am extremely grateful to Dr. Amara and her staff for their cooperation and participation. We asked them to participate in this Japanese-Thai experts joint evaluation with very short notice. They performed their parts whole heartedly. We became good friends soon after we started our work. I have never experienced such a successful joint work like this.

Our work is done. I sincerely hope that this report contributes both to furtherance of friendly relation between our two nations and to improvement of Japanese official aid in the future. The work was educational and challenging to us. We learned very much. Thank you for giving this opportunity of working on this very important project.

Sincerely
Kenzo Hemmi
Leader, Japanese Team

INTRODUCTION

Because of its location, its long and strong historical relation in various fields with Thailand, and increasing size of its economy, Japan has long been the biggest supplier of Official Development Aid to Thailand. Of total bilateral aid received in 1986 Japanese Official Development Aid occupies 66.6%, Thailand has been the second or the third biggest recipient of Japanese Official Development Aid in the last several years. How Japanese Official Development Aid to Thailand has been utilized merits wider attention. However, almost all reports or documents on Japanese aid projects or programs have been published either in Japanese or in Thai. Audiences of these were too limited. Moreover, evaluation in the past were mainly done by either of our two governments. There have been frequent criticism of Japanese aid by Thai scholars which were interpreted by those who were in charge of these aid as ones which may have been caused by their misunderstanding. There is a need to have an independent joint evaluation of these projects and programs by experts of our two countries where the result is published in an international language, English.

In its 5th and 6th National Economic and Social Development Plans, the Royal Thai Government (RTG) places a larger weight on the importance of developing Northeast Thailand which has been far less developed than Central Thailand. Although Japanese aid used to concentrate in Bangkok area, it has concentrated in Northeast Thailand in recent years. It is pertinent to take up projects and programs in Northeast Thailand as subjects of the first trial of our joint evaluation. However, majority of Japanese aid to Northeast Thailand are still on going. Only three of these are completed. We took up these three: the Sericultural Research Center (SRC) Project, the Khon Kaen Institute of Skill Development (KISD) Project, and the New Village Development Program (NVDP Phase I and II). The NVDP covered not only Northeast but also North and South. However, major part of the program was carried out in the Northeast.

We think that economic development is an endless process of social and economic change which includes institutional change, human development, technological change, investment and market expansion. The process includes various efforts to adjust its economy to changing environment. Each aid project or program is merely a stepping stone in this endless process. It is very important to learn lessons from earlier stepping stones for use of later, coming stepping stones. Economic development is a learning process too. Evaluation of aid projects or programs is an effort to learn lessons and make use in following projects or programs. At the end of this report we present lessons we learned from these projects in the form of recommendation.

This is the report of evaluation of Japan's economic and technical cooperation in Thailand. Cooperation means that each project or program is a concerted effort of our two nations for development of the area or sector concerned. This is not simply an act of transferring capital or technology from the aid giving nation to the recipient. Our evaluation covers the area beyond the acts of transferring capital or technology specified in the agreements concerned between our two governments.

The Acknowledgements

The conduct of this review has only been possible with the support and assistance of a large number of people. A large number of staff in government agencies, both in Japan and Thailand, contributed information and otherwise assisted the review team. The willing assistance of each of these staff is acknowledged.

The government agencies concerned are as follows;

- Department of Technical and Economic Cooperation
- National Economic and Social Development Board
- Sericultural Research Institute, Ministry of Agriculture and Cooperatives
- Silk Inspection Section, Department of Commerce
- Department of Labour
- Khon Kaen Institute for Skill Development
- National Institute of Skill Development
- Accelerated Rural Development, Ministry of Interior
- Community Development Department, Ministry of Interior
- Textile Industry Division, Ministry of Industry

- Japan International Cooperation Agency
- Economic Cooperation Bureau, Ministry of Foreign Affairs, Japan
- Embassy of Japan, Bangkok
- Overseas Economic Cooperation Fund

List of Members concerned

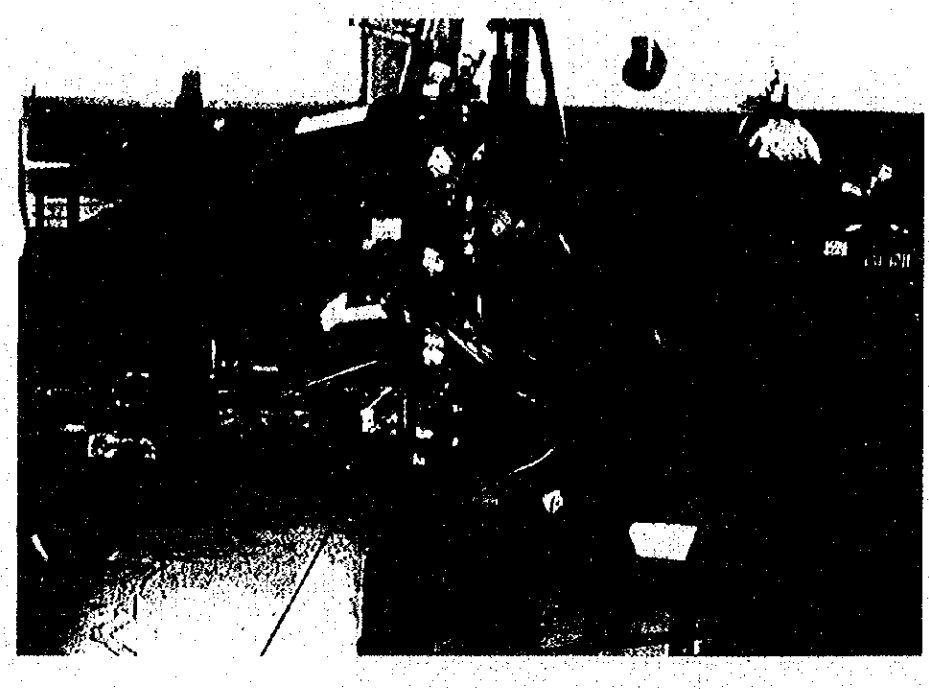
Japanese-side

-- Dr. Kenzo HEMMI	Team leader
-- Mr. Kanji ENDO	Researcher
-- Dr. Junichiro YABUTA	Researcher
-- Mr. Joh CHIBA	Researcher
-- Mr. Katsuhiro OHTA	Researcher
-- Mr. Kazuo HAZAMA	Researcher
-- Mr. Inohiko KOSUGA	JICA
-- Mr. Shinichi SUZUKI	JICA
-- Mr. Makoto AOKI	JICA
-- Mr. Yukihisa SAKURADA	JICA
-- Mr. Kiyoshi NISHIKAWA	Ministry of Foreign Affairs
-- Mr. Katsuhiko HOSAKA	Ministry of Foreign Affairs
-- Mr. Katsusuke IHARA	Ministry of Foreign Affairs
-- Mr. Nobuo HAZEYAMA	OECF
-- Mr. Katsunori SAWAI	OECF

Thai-side

-- Dr. Amara Pongsapich	Team leader
-- Dr. Charit Tingsabadh	Researcher
-- Dr. Neungpanich Sinchaisri	Researcher
-- Ms. Kobkul Phutaraporn	Researcher
-- Ms. Abha Sirivongs Ayudhaya	Researcher
-- Ms. Ratana Jarubenja	Research Assistant
-- Ms. Nitaya Kataleeradabhan	Research Assistant
-- Mr. Verapong Paditporn	Research Assistant
-- Mr. Damri Rungsuk	Research Assistant
-- Ms. Sunee Chomkhwa	Research Assistant
-- Mr. Wanchai Sirirattna	DTEC
-- Mr. Pichet Soontonpipit	DTEC
-- Mr. Sumethee Srisuchart	DTEC
-- Mr. Krisda Piampongsant	DTEC
-- Mr. Kittipan Kanjanapipatkol	DTEC
-- Ms. Pisamai Kanobdee	DTEC
-- Mr. Voravud Tomon	DTEC

—Khon Kaen Institute for Skill Development Project—



CONTENTS

PREFACE
Letter of Transmitter ..... (i)
The Acknowledgements ..... (iii)
List of Members concerned ..... (iv)

Khon Kaen Institute for Skill Development Project

Chapter I
§ 1 Introduction 1
§ 2 Members of Study Team 1
§ 3 Government's Employment Policy 1

Chapter II
§ 1 History of the KISD 3
§ 2 Training Curriculum 6
§ 3 Composition of Trades 7
§ 4 Criteria for Selection of Trainees 9

Chapter III
§ 1 Training Performance of the KISD 23
§ 2 Characteristics and their Effect of KISD Training: Focus on Pre-employment 25
§ 3 Response of the KISD to Changing Local Skill Needs 30
§ 4 A Result of Interviewes to New Applicants, Trainees, Ex-trainees, Instructors and Local Industries 32

Chapter IV
§ 1 Local Demands for Skill Labour 42
§ 2 Labour Stituation in the Northeastern Region 42
§ 3 Job Opportunity of KISD's Trainees 43
§ 4 KISD and the Labour Market Trends 46
§ 5 Demand of Labour Market and Response of the Trainees 47

Chapter V
§ 1 Management and Operation of the KISD 48

Chapter VI
§ 1 Socio-economic Impact of the KISD 50

Chapter VII
§ 1 Assessment and Recommendations from the Viewpoint of Thai Development 56
§ 2 Assessment and Recommendations from the Viewpoint of Thai-Japanese Cooperation 60

Annex I Tentative Proposals for Assistance from the Japanese Government for Establishing an Institute for Skill Development in the Northeast of Thailand 65
Annex II Work Schedule at KISD 80
Annex III Name of Interviewees 81
Annex IV Reference Statistics 84
Annex V Glossary 88

LIST OF TABLES AND FIGURE

Table

2-1 List of national and regional institutes for skill development 4

2-2 Change in composition and enrollment of pre-employment training courses of Khon Kaen Institute for Skill Development 7

2-3 Training targets 8

2-4 Number of trainees in quota from the 16 Provincial Labour Offices (excluding Khon Kaen Province) 9

2-5 Number of trainees in quota from other agencies 10

2-6 KISD pre-employment training courses 11

2-7 Number of applicants and enrolled trainees in pre-employment training by year 12

2-8 Number of trainees in pre-employment training by year and course of training 13

2-9 Location of local enterprises for in-plant training for 1984 and 1988 14

2-10 Number of trainees in the up-grading training by year and courses of training 16

2-11 Number of trainees in rural mobile training by year and courses of training 18

2-12 Number of trainees in rural mobile training by year and province 19

2-13 Number of trainees in non-technical training by year and courses of training 20

2-14 Number of trainees in the three prefered courses of the non-technical training in 1987 by province 21

2-15 Number of graduates of KISD Programs 22

3-1 Pre-employment trainees of the KISD by category of enrollment, 19th class, 1988 ... 24

3-2 List of training courses and their duration, 1988 28

3-3 Enrollment in the KISD by type of training 31

3-4 Number of trainees in the rural vocational training programme in 1988 by training courses 32

3-5 Number of applicants for the first 6 sections by order of their popularity, in the year 1986 and 1988 33

3-6 Training courses chosen by interviewed applicants 34

3-7 Profile of ex-trainees interviewed 38

4-1 Number of industrial establishments and employment by year and region 42

4-2 Job availability for KISD ex-trainees according to a KISD survey 44

4-3 Number of employment ex-trainees by the four major course fields 44

4-4 Number of trainees by four major course fields 45

4-5 Employed ex-trainees classified by location of employment 45

4-6 Attitude of ex-trainees on the extent of demand for local worker by local entrepreneurs 46
6-1 Application to enrollment ratio of the KISD by year 51
6-2 Application to enrollment ratio in pre-employment training at the KISD, (June 28, 1988) by courses of Training 51
6-3 Structure of the labour force by region, 1986 52
6-4 Labour force structure in the northeast region 53
6-5 Work status of ex-trainees who had jobs at the time of the KISD Questionaire Survey (1986) 54

Figure 1 Number of courses in up-grading training, 1979-1988 17

Chapter I

§1 Introduction

As a newly industrializing country, Thailand today is now entering world economic systems. This means that its agrarian sector has to undergo some changes especially to meet labor market requirements: unskilled labor must develop into skilled one or even semi-skilled, to be transferred to the industrial sector. Already since 1960 the Department of Labour, Ministry of Interior had set up several training programs which provided disadvantaged people with vocational basic experiences. This service took a more serious form in 1969: The creation of the National Skill Development Programs to prepare working-aged youth for the growing industrial sector. Such programs started in 1975 and expanded in various regional big towns (Ratchaburi, Chonburi and Lampang), being funded by United Nations Development Programme, The Asian Development Bank and the Israeli Government.

The Khon Kaen Institute for Skill Development (KISD) followed in 1979, under the cooperation between the Thai and Japanese Governments.

§2 Members of Study Team

1. Dr. Jinichiro Yabuta
   Senior Regional Planner
   International Development Center of Japan.

2. Ms. Kobkul Phutaraporn
   Chulalongkorn University Social Research Institute

3. Ms. Ratana Jarubenja
   Chulalongkorn University Social Research Institute

§3 Government's Employment Policy

"... Thailand's economy is facing the problems of rapid changes resulting from local emerging factor and the problem of how to adapt to the new economic system in response to the world situation. Meanwhile, economic structure, as well as its growth rate, tend unprecedentedly to be unable to fully utilize the present labour. Moreover, the agricultural sector having once absorbed a huge volume of labour, began already to have certain difficulties such as limited amount of lands resulting in a shifting of occupation. Agrarian labour seems to drift increasingly to a different sector, while industry itself has to cope with new problems and tendencies. This consequently leads to both open and seasonal unemployment."

Dr. Sanoh Unaeul's statement above, during a seminar on "Direction and Policies of Employment"(1) clearly reveals "Man and Work" problems during this transitional period for Thailand to be among newly industrializing countries. Thereby, the Sixth Economic and Social Development Plan, with an emphasis on social development to face immediate labour shortage, has built a quality and skill development project, consisting of 4 main programs on: Education Development and Training, Health Promotion, Moral and Cultural Development, Labour Administration and Development. The latter essentially aims at easing problems of unemployment and meeting labor market demand by producing skilled labour, so that future employees would enjoy a better life after having their skill upgraded. This implies an enhancement of social securities, public welfare, a more efficient labour mechanism and management, including a standardized skill.

In view of attaining nation's greater progress as well as solving accumulated economic and social problems the Sixth Development Plan has two purposes: maintaining economic growth at a 5% rate, to cope with the future entry into labor market of at least 3.9 millions persons; and developing improved quality of life for the people to contribute to the nation's progress and well-being.

The Labour Administration and Development Plan, in order to reach its goal, seeks therefore more cooperation among various educational and training units, such as the KISD now at work in the northeastern region, giving short term training to people in the 17 provinces. The Institute is therefore shouldering a responsibility as a development's change agent.

(1) Human Resource Planning Division, National Economic and Social Development Board, Report of a National Scientific Seminar on Direction and Employment Policies, organized by NESDB in cooperation with the Department of Labour and ILO-ARTEP at the Pattya Palace Hotel, on June 3-5, 1983.

Chapter II

§ 1 History of KISD

On 1976, the last year of the Third National Development Plan, the Labour Department submitted a proposal to NESDB to include labour development project in the Fourth National Development Plan. One of the objectives of the plan was to establish institutes for skill development in different regions of the country. There were 6 objectives in the project:

1. Promote manpower development prior to entrance into the labour market.
2. Raise existing skill standard.
3. Encourage business and industrial sectors to get involved in skill development activities.
4. Promote the skill development appropriate to labour market demand.
5. Provide skill testing facilities according to an established standard.
6. Promote manpower development to provide jobs and improve income in the poor and sensitive areas.

The Cabinet approved and included the proposed project in the Fourth National Development Plan for the following reasons.

1. Short vocational training will help eradicate economic and social problems simultaneously. A number of out-of-school youth will have the opportunity to be trained and get job.

2. Skill standard will be raised to help reduce the labour conflicts, which is believed to have been caused by unskilled labour force.

3. Unemployment and crime incidents will be reduced.

4. The project will help support expandjng business and industrial sectors by providing skilled labour.

5. Industrial investment will be supported by a skilled manpower base.

In the meantime, regional development became a matter of increasing concerns for Royal Thai Government. While the national economy grew at an annual rate of 7.2% in the 1970's, income disparity was widening between under-developed and developed part of the country. Hence, unskilled labour kept being pushed out from rural to urban areas, Bangkok in particular, and absorbed mostly in the unstable and low income jobs which were not necessarily directly productive. Among five regions of Thailand, the northeastern region has been the poorest and suffering from the heaviest pressure of population increase on land.

After National Institute for Skill Development (NISD) was established at Bangkok in 1969, Department of Labour launched into the development of regional ISD. One or two of them

were set up for each region; Ratchaburi for the central, Lampang for the northern, Khon Kaen for the northeastern and Songkhla for the southern region. In the 1980's the ISDs were developed in Chonburi for the central, Nokhon Sawan for the northern, Ubon Ratchatani being underway for the northeastern and Surat Thani being planned for the southern region (see Table 2-1).

Khon Kaen was chosen for the Northeast Institute of Skill Development because Khon Kaen was the regional center where industrial, commercial, and administrative activities concentrated.

The Labour Department requested the Japanese Government for its assistance in establishing the Institute of Skill Development. A bilateral agreement was signed by the two governments on February 7, 1977. There were two parts in the agreement: (1) grant aid, and (2) technical cooperation.

Table 2-1 List of national and regional institutes for skill development

Year of Establishment	RISDs							
	NISD	Ratchaburi	Chonburi	Lampang	Khon Kaen	Songkhla	Nakhon Sawan	Total
Year of establishment	1969	1976	1977	1977	1979	1980	1982	
Number of graduates[1]								
Total	6,245	1,873	1,870	1,635	1,532	1,386	1,009	15,550
Pre-employment	1,458	373	354	394	485	262	187	3,513
Upgrading	2,121	800	830	544	322	392	412	3,300
OJT/RVT[2]	682	258	268	347	441	194	170	2,360
Non-technical	1,984	442	418	350	284	538	240	4,256
Donor agencies	UNDP ILO	UNDP ILO ADB	UNDP ILO ADB	UNDP ILO ADB	JICA	GTZ	UNDP ILO	

Source: National Institute for Skill Development, Department of Labor.

Note 1) October 1984 – September 1985, in persons.

Note 2) On-the-job-training/Rural vocational training.

1. Grant Aid: The Japanese Government provided grant aid for the training unit. The building valued approximately 70 million baht and 30 million baht was provided for all the necessary equipment. The ceremony when the grant aid was officially given took place on February 23, 1979.

2. Technical Cooperation: In the first phase, additional equipment were provided at approxi-

mately 16 million baht. In addition 40 million baht were made available for the cost of travel and training of the Department of Labour personnel associated with KISD during the 4 year period. The assistance terminated in December 1981.

During the second phase, both Japanese and Thai governments saw the need to improve training curriculum of certain skills to fit local conditions. The assistance was extended until March 1982 where the Japanese experts were made available in four areas: (1) television and radio repairing, (2) plumbing and sanitary installation, (3) diesel and gasoline engines, and (4) carpentry.

In addition, KISD requested for an expansion of the plumbing and sanitary installation programme with assistance of Japanese experts who provided service to KISD for 2 years until April 1984.

Thus, during 1979-1984 Japanese experts were made available at KISD to help set up curricula of the training programmes. After 1984 curricula were also reviewed and adjusted to fit local and changing conditions enabling KISD to maintain efficient service to the need of the northeastern people.

The initial project plan is shown in Annex 1 Tentative Proposals for Assistance from the Japanese Government for Establishing an Institute for Skill Development in the Northeast of Thailand, Department of Labour, 1976. When KISD Project was prepared, a great attention was paid to the potential comparative advantages of KISD over other education and training institutions already existing in Kohn Kaen, including University of Khon Kaen and Khon Kaen Technical College, both being under the Ministry of Education. An observation then was that while these existing institutions kept producing highly educated manpower through systematic lectures, the educated manpower did not often satisfy the private companies which demand specific skills ready for use in their plants. It was also pointed out that the existing institutions charged a considerable amount of tuition which most of ordinary rural families could not afford.

Thus, KISD was proposed primarily to provide the rural youth with opportunities for the skill training which was practical, affordable and brief, so that KISD inspired those economically and geographically handicapped to be more competitive in participating in the national as well as regional labour market.

In order to enable the training to be both practical and brief, KISD was proposed to conduct training on the basis of Module of Employable Skills (MES), which was a minimum mix of skills applicable to actual workshops.

§2 Training Curriculum

Two main activities of KISD are vocational training and skill testing.

1. Vocational Training

The following training programs are going on or under the planning of KISD.

- Pre-employment training
- In-plant training
- Skill up-grading
- Non-technical training
- Rural mobile vocational training

(1) Pre-employment training: This training program is to prepare people to enable them to enter the labour force. Most participants include those young people (ages 16-25 years) who leave school and are poor. Trainees in this program provide themselves with the money for equipment of personal use and the additional expenditure of 300-600 baht a month as well as the expense for actual training and living costing around 800-1,000 baht a month.

(2) In-plant training: There are two types of in-plant training as follows:

1) On-the-job training: Graduates of pre-employment training are given opportunities to work in factories and/or related enterprises. The on-the-job training enables trainees to work in real situation, improve skills, and develop work relations with other workers. If trainees are able to adjust and work in good terms with employers, the opportunities for employment after training would also improve.

2) In-plant promotion training: This type of training provides an opportunity for the workers already in service to participate in the training curricula at their factories. Indistrial establishments offer about 36-42 hours to provide input to up-grade their workers' skill.

(3) Skill up-grading: This program provides opportunities for individuals already in the labour market to up-grade their skills and learn new technology. Higher and more specialized skills are usually provided by this program in the form of evening classes totalling about 40-70 hours.

(4) Non-technical training course: General separate training courses are offered from time to time. Courses include training of simple repair works and services activities such as domestic help and restaurant attendents.

(5) Vocational training for rural areas: Mobile training facilities are also available for villagers living in the sensitive bordering areas. Requests are made by provincial offices for specific training courses of about 42-60 hours.

2. Skill testing

Individuals in the labour market are given opportunity to improve efficiency and acquire the skills suitable to changing domestic and international labour demand. There are two activities of skill standard testing and certification and skill competition.

§3 Composition of Trades

Proposed composition of trades is similar to those of other regional ISD's; automobile repair, agricultural machines, sheet metal/welding, machinery, electricity/electronics and architecture/construction (see detail in Table 2-2). In the northeastern region as well, use of motor vehicles is fast increasing as roads are improved and agricultural machines start to be introduced. Rural electrification is planned to be accelerated with an expected result of quick diffusion of electric appliances in rural area. The government policy to intensify development of regional cities including Khon Kaen is anticipated to increase construction demand. These trend has warranted the focus on the six trades as proposed.

Table 2-2 Change in composition and enrollment of pre-employment training courses of Khon Kaen Institute for Skill Development

		1979	1980	1981	1982	1983	1984	1985	1986	1987
Automobile repair	Gasoline engine	15	30	34	32	32	28	32	32	36
	Diesel engine	15	30	34	31	32	31	32	32	36
	Car body repair	–	–	44 1)	29	32	30	32	31	34
Agricultural machines		21	40	38	39	32	36	41	35	38
Sheet/metal welding	Arc & gas welding	41	79	73	84	86	81	88	85	91
	Sheet metal	–	15	10	–	–	–	–	–	–
	Plumbing	–	–	19	20	30	26	26	27	22
Machinery	Lathing	10	28	22	28	27	29	39	29	26
	General fitting	10	28	28	34	32	27	35	23	24
	Machine fitting	–	10	18	–	29	30	29	29	30
Electricity/ Electronics	Wiring/Repair	21	48	59	63	62	59	53	64	64
	Frig./Aircon. repair	–	20	24	23	26	25	31	35	38
	Radio/TV repair	–	–	21	24	24	28	40	37	44
Architecture/ Construction	Carpentering	15	26	19	23	18	18	22	28	21
	Furniture making	16	26	18	29	24	29	26	28	24
	Masonry	35	36	29	21	33	25	26	25	23
	Architect. drawing	–	–	–	–	–	–	21	20	19

Source: Khon Kaen Institute for Skill Development.

Note 1) Car body repair and painting.

Table 2-3 Training targets

Workshop	Training course	Training targets	Number of trainees
Automobile	Gasoline engine	Perform disassembly and assembly and other maintenance work of gasoline engine	15
	Diesel engine	Perform disassembly and assembly and other maintenance work of diesel engine	15
	Chassis	Perform maintenance of body including electric system	15
	Inspection	Perform simple inspection of automobiles	15
Agricultural machine	Farming machine	Repair farming machines	10
	Other machine	Repair other agricultural machines	10
Sheet metal, Welding	Sheet metal	Perform simple work of factory sheet metal, chasing sheet metal, automobile sheet metal and metal painting	20
	Electric welding	Perform electric welding in downward, sideway and upward postures	20
Sheet metal, Welding	Gas welding	Perform gas welding in downward, sideway and upward postures	20
	Plumbing	Perform interior plumbing	10
Machinery	Lathe	Perform tapering, screw cutting, eccentric cutting and other lathe work	20
	Finishing, assembly	Perform simple assembly of jigs, tools and machines	20
	Various machines	Perform work on drilling machine, shaping machine, milling machine, grinding machine, etc.	10
Electric, Electronics	Electric work	Perform interior wiring work	20
	Electric equipment	Repair coils of transformer and motor	10
	Radio, TV	Assemble and repair radio and TV	10
	Airconditioner	Perform repair and service work of airconditioner, refrigerator and other home electric applicances	10
Architecture	Architectural carpentering	Perform simple construction work of small-scale general wooden building	10
	Frame work carpentering	Perform processing and assembly of frame work, assemble and dismantle of scaffolding	10
	Carpentering	Manufacture and paint furniture	15
	Plastering	Perform work of reinforcing rods, assembly, cement mortar, plaster wall, bricks, blocks, tiles, etc.	15
Total			300

Training targets have been set for each trade (see Table 2-3). Similarly with other IDS's KISD has started to conduct pre-employment, upgrading and non-technical training.

§4 Criteria for Selection of Trainees

KISD trainees are selected based on Khon Kaen regulations in April and November every year. Three channels are available (see Tables 2-4 and 2-5).

1. Provincial channel: Each provincial labour office in the northeastern region is entitled to send applicants to the training programmes. The objective is to have equal distribution among the provinces within the quota totalling each time about 120-160 trainees. But in practice, the number of trainees depends on the number requested by each provincial labour office (see Table 2-4).

Table 2-4 Number of trainees in quota from the 16 Provincial Labour Offices (excluding Khon Kaen Province)

Provinces	1986		1987		1988	
	No. of quota	No. of enrolment	No. of quota	No. of enrolment	No. of quota	No. of enrolment
1. Kalasin	4	4	7	8	5	4
2. Chiyaphum	8	6	15	14	14	8
3. Nakorn Panom	3	1	5	2	3	3
4. Nakhon Ratchasima	11	10	39	18	21	16
5. Buriram	5	5	5	2	5	2
6. Mugdaharn	9	6	5	5	7	7
7. Mahasarakham	4	3	5	4	4	3
8. Yasothorn	5	5	4	1	8	3
9. Roi-et	5	5	4	4	4	3
10. Loei	3	2	3	2	4	3
11. Srisaket	5	2	4	2	–	–
12. Sakon Nakorn	6	6	5	5	9	7
13. Surin	4	3	3	2	4	3
14. Nong Kai	4	3	4	3	3	2
15. Udorntani	11	10	6	4	4	3
16. Ubol Ratchatani	4	4	8	2	7	2
Total	91	75	122	78	102	66

Source: Khon Kaen Institute for Skill Development

2. Cooperating agency channel: Many government and some non-government agencies also help selected trainees participate in the programmes, totalling 120-160 persons per year. The agencies include, the Supreme Command Headquarters, the Girl's Guide Association of Thailand, Department of Local Administration, the Agricultural Land Reform Office, Pearl S. Buck Foundation, the Vocational Department Program for Sensitive Area (see Table 2-5).

3. General application: In addition, trainees may be admitted to the training courses through open application without having to go through the above mentioned two channels by directly applying for KISD in Khon Kaen.

Table 2-5 Number of trainees in quota from other agencies

Sources of quotas[2]	1986[1]		1987[1]		1988[1]	
	No. of quotas given	No. of enrolments	No. of quotas given	No. of enrolments	No. of quotas given	No. of enrolments
1. The Supreme Command (reserves)	10	6	10	8	10	7
2. The Khon Kaen Land Reform Office	7	6	3	3	3	3
3. The Vocational Development Program for Sensitive Area (Loei Province)	10	5	10	8	9	7
4. The Pearl S. Buck Foundation	2	2	4	6	3	5
5. The Vocational Development Program (Nugdaharn Province) Mugdaharn	5	4	2	2	3	3
6. Son of the Territorial Force Volunteer	10	9	10	9	10	8
7. Provincial Industrial Office (NE Region)	–	–	4	4	–	–
8. Charity Foundation for Development	–	–	–	–	4	4
9. 16 Offices of the NE Provincial Labour (Excluding Khon Kaen)	91	75	122	79	102	66
Sub-total	135	107	161	118	144	103
KISD (general application)	171	187	178	202	134	164
Grand total	306	294	339	320	278	267

Source: Khon Kaen Institute for Skill Development

Note 1. This data included number of trainees only in the first period of the application of the year.

2. Sources of quota may be varied on the request of the agencies, but No. 9 is permanent source.

Table 2-6 KISD Pre-employment training courses.

Training courses	Pre-requisite	Training period		
		KISD training (month)	In-plant training (month)	Total (month)
1. Gasoline engine	grade 6	6	2	8
2. Diesel engine	grade 6	6	2	8
3. Car body repair	grade 6	6	2	8
4. Agro-machine	grade 6	6	2	8
5. Sheet metal welding	grade 6	6	2	8
6. Plumbing	grade 6	6	2	8
7. Lathe operation	grade 9	6	2	8
8. General fitting	grade 9	6	2	8
9. Mechanical fitting	grade 9	6	2	8
10. Electrical wiring installation and electric equipment repair	grade 9	6	2	8
11. T.V. and radio repair	grade 9	6	2	8
12. Refrigerating and air conditioning repair	grade 9	6	2	8
13. Carpentry	grade 6	6	2	8
14. Furniture making	grade 6	6	2	8
15. Technical masonry	grade 6	6	2	8
16. Architecture drawing	grade 9	11	4	15
17. Furniture painting	grade 6	6	2	8

Source: Khon Kaen Institute for Skill Development

§5 KISD Activities (1979-1988)

1. Pre-employment Program

Since 1979 this program has been the most important activity fulfilling the first objective which is to prepare people for the labour market. From 1979-1988 there are 12,233 applicants but in order to provide a quality training program, the number of trainees during the past 9 years is only 4,301 persons or 35.1% of the applicants (Table 2-7). In addition not all of the trainees complete the program, some leave after the training in KISD and some others during the in-plant training period (see Table 2-7).

Table 2-7 indicates that between 13.4% to 21.6% of the trainees leave before completing the program in KISD (first 6 months period). Average drop-out ratio for 9 years is 14.2% of the

Table 2-7 Number of applicants and enrolled trainees in pre-employment training course by year

Year	No. of Applicants	No. of trainees enrolled	No. of graduates		No. of dropped-out	
			in KISD training courses	in in-plant training	during training courses	during in-plant training
1979	1,843	199 (10.8)	167 (83.9)	150 (75.4)	31 (15.6)	18 (9.0)
1980	1,288	416 (32.3)	337 (81.0)	302 (72.6)	79 (19.0)	35 (8.4)
1981	922	490 (53.1)	413 (84.3)	365 (74.5)	77 (15.7)	48 (9.8)
1982	1,013	480 (47.4)	408 (85.0)	356 (74.2)	72 (15.0)	52 (10.8)
1983	1,203	519 (43.1)	407 (78.4)	333 (64.2)	112 (21.6)	74 (14.3)
1984	1,284	502 (39.1)	425 (84.7)	403 (80.3)	77 (15.3)	22 (4.4)
1985	1,804	574 (31.8)	475 (82.8)	447 (77.8)	99 (17.2)	28 (4.9)
1986	1,441	550 (38.2)	476 (86.5)	449 (81.6)	74 (13.4)	27 (4.9)
1987	1,440	571 (39.7)	470 (82.3)	–	–	–
Total	12,238	4,301 (35.1)	3,601 (83.7)	2,793 (64.9)	611 (14.2)	304 (7.1)
	$\bar{x}$ = 1,360	$\bar{x}$ = 478	$\bar{x}$ = 400	$\bar{x}$ = 310		

Source: Khon Kaen Institute for Skill Development

trainees. During 1979-1987, 3,601 persons or 83.7% of the trainees graduated from KISD.

During the 9 years, the trainees who left before completing the in-plant training of 2 months were 7.1%. Reasons for dropping-out during in-plant training include need of income. Even though KISD charges no tuition fee, trainees need money for food and other necessity. Those who left during on-the-job training period left because they acquired jobs. Experiences gained from the 6 month training program in KISD enable trainees to have sufficient skills to work.

Table 2-8 include number of trainees in the 17 courses during 1979-1987. Vocationtal training which was most popular were welders (gas and electrical) and electrician totalling 708 and 503 persons or 16.5% and 11.7% of the total trainees respectively. Car service course was opened for one year only in 1981 and metal sheet was opened in 1980 and 1981. Course programs were opened based on local needs, availability of equipment, and market demand.

2. In-plant training

In-plant training are available mostly in Khon Kaen (see Table 2-9). In 1984 and 1988, the percentage of in-plant training in Khon Kaen Province are 56.6% and 57.3% respectively. Otherwise, the enterprises offering in-plant training are scattered in the 17 provinces of the northeastern region. Khon Kaen is selected for in-plant training by many trainees in the program because:

Table 2-8 Number of trainees in pre-employment training by year and courses of training

Courses	Year																		Total	
	1979 (1)	1979 (2)	1980 (1)	1980 (2)	1981 (1)	1981 (2)	1982 (1)	1982 (2)	1983 (1)	1983 (2)	1984 (1)	1984 (2)	1985 (1)	1985 (2)	1986 (1)	1986 (2)	1987 (1)	1987 (2)	(1)	(2)
1. Gasoline engine	15	9	30	23	34	21	32	22	32	25	28	25	32	25	33	26	36	27	271 x=30.1	203 (74.9)
2. Diesel engine	15	12	30	22	34	26	31	24	32	21	31	25	32	27	32	27	36	32	273	216 (79.1)
3. Agro-mechanics	21	15	40	24	38	28	39	28	32	21	36	34	41	38	35	28	38	32	320	248 (77.5)
4. Car body repair	–	–	19	15	29	22	32	21	30	26	32	24	32	24	31	25	35	24	280	157 (75.5)
5. Car service	–	–	25	17	–	–	–	–	–	–	–	–	–	–	–	–	–	–	25	17 (68.0)
6. Arc & gas welding	41	34	79	61	73	58	84	69	86	54	81	61	88	75	85	72	91	79	708	563 (79.5)
7. Sheet metal	–	–	15	8	10	7	–	–	–	–	–	–	–	–	–	–	–	–	25	15 (60.0)
8. Plumbing	–	–	–	–	19	16	20	13	30	19	26	18	26	19	27	19	22	13	170	117 (68.8)
9. Lathe operation	10	7	28	17	22	14	28	21	27	16	29	25	30	27	29	26	26	23	229	176 (76.9)
10. Mechanical fitting	–	–	10	7	18	15	–	–	29	14	30	23	29	22	29	25	30	25	175	131 (74.9)
11. General fitting	10	7	28	18	28	23	34	26	32	19	27	25	35	26	23	17	24	19	241	180 (74.4)
12. Electrical sections	21	14	48	38	59	47	63	47	62	48	59	50	63	52	64	60	64	52	503	408 (81.1)
13. Refrigerating & air-conditioning	–	–	20	18	24	16	23	20	26	14	25	13	31	25	35	32	38	32	222	170 (76.6)
14. Radio & TV repair	–	–	–	–	21	17	24	18	24	20	28	20	40	34	37	26	44	35	218	170 (78.0)
15. Carpentry	15	12	26	18	19	15	23	14	18	8	18	12	22	13	18	12	21	15	180	119 (66.1)
16. Furniture making	16	13	26	15	18	12	29	10	24	16	29	23	26	21	28	17	24	16	220	153 (69.5)
17. Technical masonry	35	27	36	29	29	20	21	12	33	17	25	23	26	19	25	24	23	17	253	188 (74.3)
18. Architecture drawing	–	–	–	–	–	–	–	–	–	–	–	–	21	16	20	*	19	*	*	
Total	199	150 (75.4)	416	298 (71.6)	490	365 (74.5)	480	356 (74.2)	519	333 (64.2)	502	397 (79.1)	574	447 (82.3)	550	447 (82.3)	571	–*	4,301	2,793

Source: Khon Kaen Institute for Skill Development

Note (1) = number of enrolled trainees

(2) = number of graduates

* = 12 monthes course, not finished yet

(1) Khon Kaen has many factories and business enterprises,

(2) Close proximity to KISD makes supervision by trainers easy. The total number of trainees completing the curriculum in full was 2,793 persons or 64.9% of the total (see Table 2-7).

Table 2-9 Location of local enterprises for in-plant training for 1984 and 1988

Location of local enterprise	No. of trainees engaged in in-plant training			
	1984	%	1988	%
Khon Kaen	103	(56.6)	145	(57.3)
Nakorn Panom	3	(1.6)	11	(4.3)
Burirum	7	(3.8)	8	(3.2)
Ubol	9	(4.9)	3	(1.2)
Srisaket	3	(1.6)	2	(0.8)
Nakhon Ratchasima	6	(3.3)	21	(8.3)
Kalasin	4	(2.2)	5	(2.0)
Mukdaharn	8	(4.4)	7	(2.8)
Udorn	21	(11.5)	7	(2.8)
Surin	3	(1.6)	2	(0.8)
Mahasarakharm	5	(2.7)	9	(3.6)
Chaiyabhum	2	(1.1)	19	(7.5)
Yasothorn	2	(1.1)	8	(3.2)
Bangkok	2	(1.1)	1	(0.4)
Roi-et	2	(1.1)	2	(0.8)
Sakol Nakorn	2	(1.1)	--	
NongKai	--		2	(0.8)
Saraburi	--		1	(0.4)
Total	182	(100.0)	253	(100.0)

Source: Khon Kaen Institute for Skill Development

3. Skill Upgrading

There are 25 courses offered during 1979-1988. But not all of them are offered every year. General fitting is an example of a course which is offered only once in 1979. Furthermore, in 1982 there are only 2 courses offered, i.e., masonry and measuring instrument. After 1983, 11-19 courses are offered each year. The total number of trainees in the program is 2,815 and the number graduated is 2,058 persons or 73.1% (see Table 2-10).

Figure 1 illustrates the change in number of the courses offered during 1979-1988.

4. Rural Mobile Vocational Training.

This program started in 1984 to enable villagers to acquire skills for farm repair needs and/or for employment. The 2 courses offered in the first year are radio repair and construction work. In 1988 the number of courses offered is 11 courses. The five most popular courses offered during 1984-1988 are:

(1)	electrical wiring installation	729 trainees (24.9%)
(2)	small agro-machine repairing	639 trainees (21.8%)
(3)	bicycle repairing	397 trainees (13.6%)
(4)	iron sheet for rain water collection	329 trainees (11.3%)
(5)	construction work	293 trainees (10.0%)

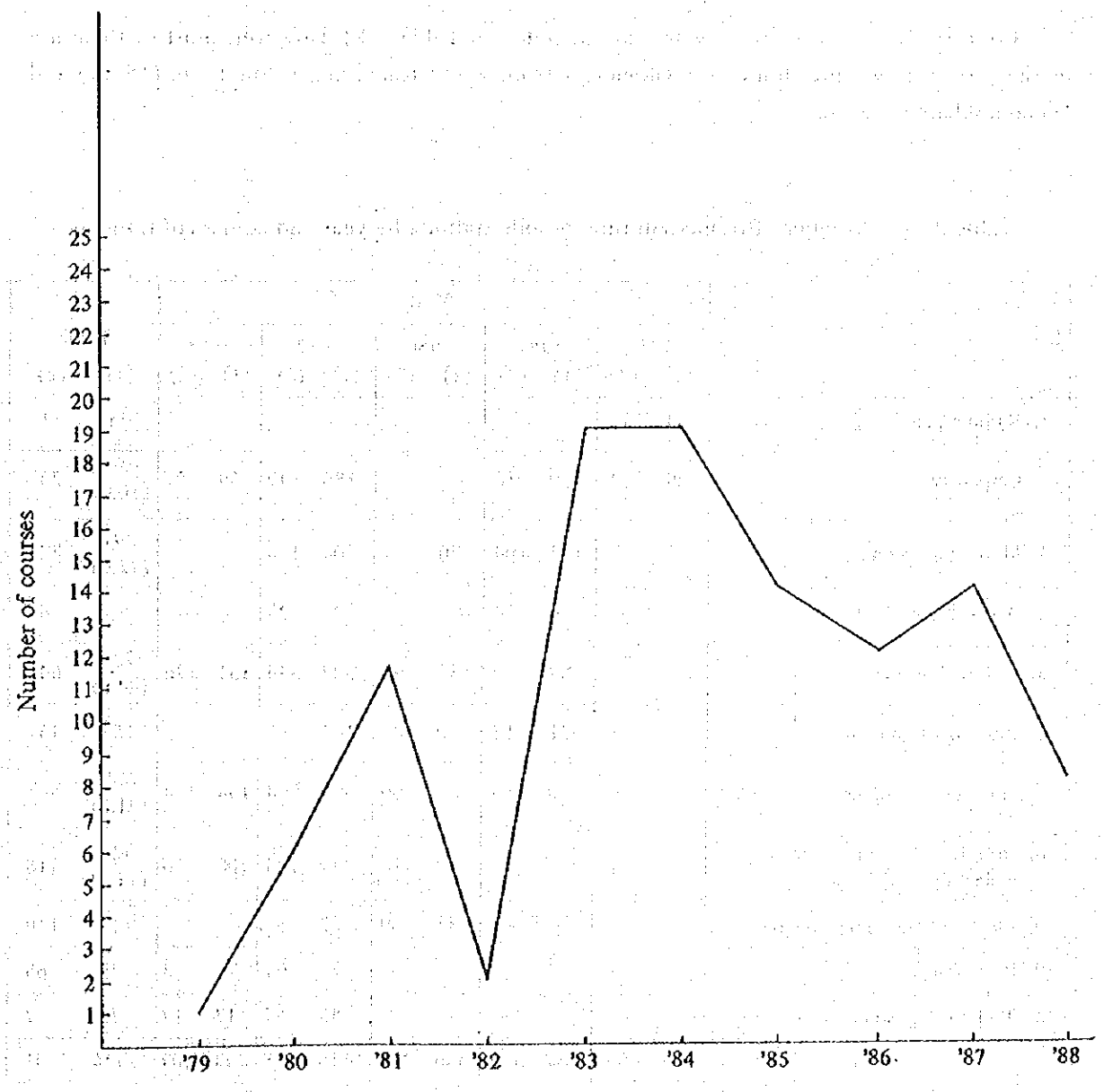
Table 2-10 Number of trainees in the up-grading training by year and courses of training

Up-grading courses	Year																				Total	
	1979		1980		1981		1982		1983		1984		1985		1986		1987		1988			
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
1. General fitting	16	15	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	16	15
2. Masonry	–	–	21	19	21	15	122	122	–	–	–	–	–	–	–	–	–	–	–	–	164	156
3. Carpentry and furniture making	–	–	18	13	–	–	–	–	11	11	11	5	–	–	–	–	17	17	–	–	57	46
4. Blue-print reading and drafting	–	–	20	13	33	20	–	–	18	9	24	20	44	34	19	14	39	16	12	11	209	137
5. Engine tune up	–	–	16	16	12	5	–	–	33	31	44	32	48	36	10	4	25	15	26	20	214	159
6. Lathe operation	–	–	15	8	12	11	–	–	28	11	11	6	12	6	–	–	–	–	–	–	78	42
7. Arc-welding and gas-welding	–	–	15	10	52	34	–	–	60	42	69	44	32	26	23	13	40	26	–	–	291	195
8. Car first aids	–	–	–	–	13	6	–	–	31	22	–	–	–	–	–	–	20	14	–	–	64	42
9. Refrigerator repair	–	–	–	–	15	10	–	–	32	22	40	28	16	10	12	6	30	24	14	6	159	106
10. Electrical wiring installation	–	–	–	–	30	11	–	–	59	47	51	44	37	25	–	–	20	18	12	6	209	151
11. Auto-Electrical	–	–	–	–	13	5	–	–	50	32	26	22	14	13	–	–	16	14	–	–	119	86
12. T.V. Repairing	–	–	–	–	–	–	–	–	12	8	53	40	20	16	12	9	39	30	14	9	150	112
13. Standard thread turning	–	–	–	–	13	7	–	–	18	10	12	12	12	8	13	6	–	–	–	–	68	43
14. Light instrument	–	–	–	–	48	47	–	–	–	–	73	73	–	–	–	–	–	–	–	–	121	120
15. Measuring instrument	–	–	–	–	–	–	27	25	18	13	14	8	–	–	–	–	–	–	–	–	59	46
16. Small engine	–	–	–	–	–	–	–	–	28	26	32	22	16	12	12	5	35	22	38	21	161	108
17. Plumbing	–	–	–	–	–	–	–	–	33	29	20	18	14	7	13	9	24	13	–	–	104	76
18. Single phase motor	–	–	–	–	–	–	–	–	29	18	30	22	–	–	14	5	–	–	–	–	73	45
19. Technical masonry	–	–	–	–	–	–	–	–	31	17	12	11	20	7	–	–	48	33	12	11	123	79
20. Spur gear cutting operation	–	–	–	–	–	–	–	–	10	6	13	9	–	–	–	–	–	–	–	–	23	15
21. Structural composition	–	–	–	–	–	–	–	–	–	–	–	–	–	–	26	24	–	–	–	–	26	24
22. Frame for concrete work	–	–	–	–	–	–	–	–	11	3	33	33	–	–	–	–	–	–	–	–	44	37
23. Factory machine repair	–	–	–	–	–	–	–	–	–	–	–	–	96	90	10	8	44	21	38	38	188	157
24. Motor control	–	–	–	–	–	–	–	–	–	–	34	26	20	16	–	–	11	15	–	–	65	47
25. Electronics	–	–	–	–	15	7	–	–	15	8	–	–	–	–	–	–	–	–	–	–	30	15
Total	16	15 (93.7)	105	79 (75.2)	277	178 (64.3)	149	147 (98.7)	527	365 (69.3)	602	475 (78.9)	401	306 (76.3)	164	103 (62.8)	408	268 (65.7)	166	122 (73.5)	2,815	2,058 (73.1)

Source: Khon Kaen Institute for Skill Development

Note (1) = number of enrolled trainees
(2) = number of graduates

Figure 1 Number of courses in up-grading training, 1979-1988



Source: Khon Kaen Institute for Skill Development

During 1984-1988 the total number of trainees in this program is 2,924 persons and the number of graduates is 2,491 persons or 65.2%. In general it should be noted that rate of increase in the number of trainees is very high especially in 1987 (see Table 2-11).

Popular courses are electrical wiring (382 persons) small agro-machine repairing (314 persons) and bicycle repair (204 persons). It is not possible for the evaluation team to judge if the quality of the training programs have attracted a large attendance.

Courses offered in other provinces are included in Table 2-12. However, most of them are in the provinces within about 100 kilometers from Khon Kaen, i.e., Udon Thani (15.8%) and Mahasarakham (11.4%).

Table 2-11 Number of trainees in rural mobile training by year and courses of training.

Course	Year										Total	
	1984		1985		1986		1987		1988			
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
1. Radio repair	44	31	–	–	–	–	–	–	–	–	44	31
2. Carpentry	29	19	19	18	–	–	186	149	59	51	293 (10.0)	237
3. Motorcycle repair	–	–	123	104	70	51	204	188	–	–	397 (13.6)	343
4. Arc-welding	–	–	30	24	–	–	25	23	–	–	55	47
5. Electreal wiring	–	–	84	79	132	96	382	344	131	126	729 (24.9)	645
6. Block-brick making	–	–	21	18	30	27	103	92	–	–	154	137
7. Small engine repair	–	–	110	86	61	49	314	294	154	134	639 (21.8)	563
8. Iron sheet for rain water collection	–	–	–	–	32	28	189	134	108	56	329 (11.3)	218
9. Electrical equipment repair	–	–	–	–	31	29	82	81	–	–	113	110
10. Pipe filting	–	–	–	–	–	–	75	65	24	23	99	88
11. Technical masonay	–	–	–	–	–	–	55	55	17	17	72	7
Total	73	50	387	329	356	280	1615	1425	493	407	2924	2491

Source: Khon Kaen Institute for Skill Development

Note 1 = number of enrolled trainees
2 = number of graduates

5. Non-technical Training

Since 1979 there are 16 courses offered but not all of them are offered every year. In 1980 only artificial flower making course is offered for 20 trainees and in 1983 only restaurant attendance course is offered. For 1979-1988 Table 2-13 indicates the total of 7,619 trainees with 96.3% having graduated.

Table 2-12 Number of trainees in rural mobile training by year and province

Provinces	Year										Total	
	1984		1985		1986		1987		1988			
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
1. Udontani	–	–	64	48	108	83	204	194	86	58	462 (15.8)	383
2. Chaiyabhum	–	–	–	–	–	–	229	204	12	10	241	214
3. Roi-et	–	–	–	–	–	–	179	143	21	21	200	164
4. Ubon Ratchathani	–	–	–	–	–	–	87	77	–	–	87	77
5. Nakhon Ratchasima	–	–	–	–	–	–	27	22	–	–	27	22
6. Sakon Nakorn	–	–	–	–	–	–	62	66	84	84	146	144
7. Khon Kaen	–	–	137	122	–	–	197	174	49	48	383 (13.1)	344
8. Nakorn Phanom	–	–	–	–	–	–	67	63	–	–	67	63
9. Yasothorn	–	–	–	–	–	–	54	41	36	22	90	63
10. Surin	–	–	–	–	–	–	50	50	32	32	82	82
11. Buriram	–	–	186	159	–	–	61	50	–	–	247	209
12. Kalasin	–	–	–	–	–	–	84	73	56	29	140	102
13. Mukdahan	29	19	–	–	–	–	88	82	102	90	219	191
14. Mahasarakham	–	–	–	–	248	297	85	53	–	–	333 (11.4)	250
15. Nongkai	–	–	–	–	–	–	48	48	15	13	63	61
16. Srisaket	–	–	–	–	–	–	30	30	–	–	30	30
17. Loei	44	31	–	–	–	–	63	61	–	–	107	92
Total	73	50	387	329	356	280	1615	1425	493	407	2924	2491

Source: Khon Kaen Institute for Skill Development

Note (1) number of enrolled trainees

(2) number of graduates

Table 2-13 Number of trainees in non-technical training by year and courses of training

Courses	Year																				Total	
	1979		1980		1981		1982		1983		1984		1985		1986		1987		1988			
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
1. Steamed power control	45	41	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	45 (0.6)	41
2. Agro-machine care	28	22	–	–	–	–	15	14	–	–	–	–	–	–	–	–	–	–	–	–	43 (0.6)	36
3. Construction and building training	81	81	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	81 (1.1)	81
4. Artificial flower making	–	–	20	15	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	20 (0.3)	15
5. Car service	–	–	–	–	–	–	38	38	–	–	–	–	51	50	27	25	59	59	–	–	175 (2.3)	172
6. Restaurant attendants	–	–	–	–	–	–	18	16	220	190	99	88	25	21	75	73	486	450	38	37	961 (12.6)	875
7. Foreman training	–	–	–	–	–	–	–	–	–	–	18	15	24	19	67	66	28	26	–	–	137 (1.8)	126
8. Receptionist training	–	–	–	–	–	–	–	–	–	–	25	23	–	–	–	–	77	76	–	–	102 (1.3)	99
9. Car driver training	–	–	–	–	–	–	–	–	–	–	73	58	–	–	–	–	–	–	24	24	97 (1.3)	82
10. Cleaning	–	–	–	–	–	–	–	–	–	–	–	–	195	194	–	–	–	–	–	–	195 (2.6)	194
11. Domestic-help	–	–	–	–	–	–	–	–	–	–	–	–	–	–	249	248	3983	3901	349	324	4,581 (60.1)	4,473
12. Seminar in safety in plant	–	–	–	–	–	–	–	–	–	–	–	–	–	–	45	45	31	31	–	–	76 (1.0)	76
13. Child care training	–	–	–	–	–	–	–	–	–	–	–	–	–	–	52	52	784	753	–	–	836 (11.0)	805
14. House-wife training	–	–	–	–	–	–	–	–	–	–	–	–	–	–	24	24	11	11	–	–	35 (0.5)	35
15. Abroad house-wife training	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	86	86	53	39	139 (1.8)	139
16. Hotel service training	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	34	31	–	–	34 (0.4)	31
17. Secretary training	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	59	58	59 (0.8)	58
Total	154	144	20	15	–	–	71	68	220	190	215	184	198	184	539	533	5579	5424	523	482	7,619 (100.0)	7,338 (96.3)

Source: Khon Kaen Institute for Skill Development

Notes (1) = number of enrolled trainees
(2) = number of graduates

In 1987 the number of trainees is 5,579 persons or 73.2% of the total enrolled trainees from 1979-1988. For other years, the number of trainees ranges from 20 to 540 persons. The most popular courses offerred in the year 1987 are domestic help totalling 60%, restaurant attendant (12.6%) and child care (11%).

Table 2-14 indicates the courses offered in different provinces. Domestic help is attended by trainees in Sakon Nakhon (26.7%) Nakhon Ratchasima (13.3%), Khon Kaen (12.6%), and Nakhon Phanom (8.5%). Restaurant attendant has most trainees in Udon Thani (25.5%) Kalasin (21.2%) and Buriram (19.8%). And, child care is most popular in Nakhon Ratchasima (46%) Kalasin (13%) and Sakon Nakhon (11.6%).

Non-technical courses offered are through joint efforts between KISD and the provincial labour offices. Most courses are requested by the provincial offices.

In terms of total figures during 1979-1987, 15,448 persons graduate from KISD (Table 2-15). Thus, we can say KISD has helped unskilled labour become semi-skilled. It is undeniable that certain degree of skill improvement has been observed through the efforts of KISD.

Table 2-14 Number of trainees in the three prefered courses of the nontechnical training in 1987 by province

Province	Courses		
	Domestic help	Restaurant attendents	Child care
Sakon Nakhorn	1,065 (26.7)	42	91 (11.6)
Nakhon Ratchasima	528 (13.3)	44	361 (46.0)
Roi-et	136	64	29
Kalasin	351	103 (21.2)	102 (13.0)
Surin	95	33	25
Srisaket	155	50	–
Khon Kaen	500 (12.6)	39	–
Nakorn Panom	339 (8.5)	–	–
Ubon Ratchathani	194	28	–
Udon Thani	263	124 (25.5)	–
Nong Kai	108	–	–
Yasothorn	59	–	80
Mukdaharn	134	30	–
Mahasarakham	175	–	–
Loei	88	–	–
Burirum	–	96 (19.8)	–
Total	3,983	486	784

Source: Khon Kaen Institute for Skill Development

Table 2-15 The number of graduates* of KISD Programs

Programs	1979-1987
	Number
1. Pre-employment*	3,601
2. Skill up-grading	2,058
3. Rural vocational mobile training	2,491
4. Non-technical	7,338
Total	15,448

Source: Khon Kaen Institute for Skill Development

Note: *include number of trainees who finished perfectly (trainees who were trained until completing the in-plant training period)

Chapter III

§1 Training/performance of KISD

1. Common Features of KISD Pre-employment Trainees

Those between age 16 and 26 are eligible to participate in the pre-employment training, but their ages are mostly lower than 20 years old. Fifty percent of them are from Khon Kaen Province according to provincial quota while the rest comes from all other provinces in the northeastern region (see Table 3-1). Most of the parents of trainees are farmers with the farmland of 20 rai or so which is said to be barely sufficient for the parents to afford cash remittance of about 1,000 baht per month to their children participating in the training for 6 month. Parents are not poor at northeastern standards, but not rich either. Some of trainees drop out during the training course due to financial difficulty. However, rate of drop-outs has been declining substantially in recent years as shown below, presumably as income level of farmers is gradually increasing.

Rate of drop-outs from KISD Pre-employment Training

Year	(%)	Year	(%)
1979	24.6	1983	35.8
1980	26.5	1984	19.7
1981	25.7	1985	18.6
1982	25.8	1986	12.8

Source: Khon Kaen Institute for Skill Development

Many trainees are really potentially unemployed or underemployed. Some of them are provided with fellowship of 750 baht per month by government agencies such as Ministry of Interior and the military in case they are from the areas under land reform project, on condition that they go back to their communities.

KISD is well meeting the demand of these young people as majority of them come to KISD because it provides free training and free dormitory and chance is great to get job, while a number of them comes to KISD because they have not been able to enter higher education.

Being from poor families under pressing needs of getting job, they are mostly serious and diligent, according to the observation of local industries and KISD instructors. Some industries appreciate them as easy to control, because they are diligent and aware of working with other workers in group. However, some of instructors see KISD trainees as inferior to those in technical college of other Regional Institute Skill Development (RISD) in terms of basic knowledge. KISD trainees are said to be more difficult than those in other RISDs to train especially at the start of training. Local industries observe ex-trainees of KISD as being slower than those of

Table 3-1 Pre-employment trainees of Khon Kaen Institute for Skill Development by category of enrollment, 19th class, 1988

	Total	Changwat Khon Kaen	Labor Offices in Northeast	Military and Land Development Office 1)	Foundation 2)
Total	278	134	102	32	10
Automobile repair	48	13	27	6	2
Gasoline engine	16	5	8	2	1
Diesel engine	16	4	8	3	1
Car body repair	16	4	11	1	–
Agricultural machines	16	4	9	1	2
Sheet metal/Welding	48	29	11	8	1
Arc & gas welding	36	19	11	6	–
Plumbing	12	10	–	2	–
Machinery	42	20	14	4	4
Lathing	15	4	10	1	–
General fitting	12	6	3	1	2
Machine fitting	15	10	1	2	2
Electricity/Electronics	64	25	32	5	2
Wiring/Repair	32	13	13	4	2
Frig./Aircon. repair	16	8	8	–	–
Radio/TV repair	16	4	11	1	
Architec./Construction	60	43	9	8	–
Carpentering	12	7	3	2	–
Furniture making	12	8	2	2	–
Masonry	12	7	2	3	–
Architectural drawing	12	9	2	1	–
Painting	12	12	–	–	–

Source: Khon Kaen Institute for Skill Development.

Note 1) Comprising categories for the ex-soldiers, the children of voluntary soldiers and the youth in villages under the projects of Land Development Office.

Note 2) Pearl S. Buck Foundation and other foundation.

technical colleges in catching up with on-the-job training, finding the parts to be repaired in maintenance work and determining the ways to repair or assemble machines and other objects. An underlying factor should be that children in the northeastern region have more limited opportunities than those in other regions to get sufficient basic education.

§2 Characteristics and their Effect of KISD Training: Focus on Pre-employment

Training of KISD, pre-employment training in particular is characterized by its practice orientation, stressing on basic skills and limited period of training.

On average, 77% of training is spent for practice, especially repeated practice of basic skills. The follwing shows the proportion of practice in training period by trade.

Automobile repair	Gasoline engine	68%
	Diesel engine	69%
	Car body	77%
Agricultural machines		75%
Sheet/Metal welding	Arc & gas welding	76%
	Plumbing	80%
Machinery	Lathing	87%
	General fitting	86%
	Machine fitting	85%
Electricity/Electronics	Wiring/Repair	66%
	Refrigerator/Airconditioner repair	72%
	Radio/TV repair	71%
Architecture/Construction	Carpentering	76%
	Furniture making	83%
	Masonry	88%

Source: Khon Kaen Institute for Skill Development

Recently, a greater emphasis has been given to strengthening the capability to make anything usable and tangible or to integrate various skills or components than to sharpen specific skills. Test piece making has been often practiced. Furthermore, group exercise is now stressed to make and assemble anything usable.

The practice orientation of KISD is appreciated by trainees, ex-trainees and local industries. Some trainees say that practice is interesting but lectures are difficult. Some ex-trainees say that the skills trained in KISD are applicable to the fields other than that of KISD training, for example, mechanical fitting or lathing to be applied to airconditioner repair. Some local industries say that ex-trainees of KISD are better than those from other training institutions in assembling components into a product.

A policy of KISD is to let trainees be equipped with the basic skills only as reflected in its course curricula. As an example, an outline of the curriculum of gasoline engine car repair is shown under:

Subject	Lecture (hrs.)	Practice (hrs.)
Orientation and safety	8	–
Tools and machines	10	14
Drawing	8	–
Principle of internal combustion engine	24	–
Assembly and repair of:		
engine	24	152
engine accessories	27	60
power train system	35	84
wheel and tyre	9	18
suspension system	11	44
steering system	15	66
brake system	29	68
Basics of electricity	15	–
Battery and services	9	20
Engine electricity system	43	56
Body electricity system	24	44
Evaluation	12	31
Total	303	657

Source: Khon Kaen Institute for Skill Development

The policy emphasis on basic skills is also appreciated by ex-trainees and local industries. Some ex-trainees say that training is by its very nature to provide the basic knowledge and skills which they have to develop later through work experience. Some local industries say that on-the-job training through good guidance, in firm testing or rotation could enhance the basic skills trained in KISD and KISD does not have to do more than that. According to these local industries, KISD trainees can start working at assistant level about 3 months after joining factories.

The in-plant training for 2 months following right after the training within KISD plays a significant role in bridging basic skill training and real works. KISD emphasizes in-plant training in terms of application of skills, strengthening social discipline and learning human relations in workshop. KISD has a list of the companies which offer in-plant training in the northeastern region. The in-plant training began since the beginning of KISD project, but it was sometimes misused by some local industries in an attempt to make use of in-plant trainees as cheap labor. KISD staff together with JICA experts made great efforts to let local industries understand the real meaning of in-plant training and find reliable counterpart industries. The present list of companies is an outcome from such efforts. One of the successful examples is the in-plant training being conducted in a workshop owned by an ex-trainee of KISD.

In-plant training is the most important channel of introducing/securing job for trainees. Sixty percent of trainees are estimated to get job in the companies where they participate in

in-plant training. Companies of in-plant training are all located in the northeastern region. Thus in-plant training promotes employment of trainees within the region. Trainees tend to participate in the in-plant training especially in the provinces they are from. However, companies are cautious about too much expectation on the in-plant training in consideration of maintaining product quality and factory efficiency. Practice orientation and the emphasis on basic skills are reflected in relatively limited period of training.

In accordance with the basic policy of the Department of Labour to let its training institutions specialized in maximum outputs of skilled workers in a minimum period, the period of training courses of regional ISDs are fixed at 10 months in principle. Especially in KISD, most of courses are conducted within 6 months only, so that two courses are possible to be held in a year (see Table 3.2). At the beginning, the period was designed to be even 3 months only in some courses such as plumbing and masonry, although the period of these courses was extended to be 6 months with recommendation of JICA experts in 1980 and 1981.

However, most instructors except some, such as those of masonry, think that 6 months are too short to train skills, which are diversifying especially in recent years. Many instructors say that 6 months can be reasonable to produce the semi-skilled or repairmen but too short to meet with an increasing demand for the skilled or those working in modern manufacturing industries. Many ex-trainees say "course could be longer so that we could learn more before becoming workers".

On the other hand, ongoing trainees are satisfied with 6 months, presumably because of financial reason. Local industries also agree with 6 months in the sense that they need workers with the basic skills which 6 months course can just provide. Some of them say that workers have anyway to be re-trained in the workshop. This response might be a consequence of the value system of local industries found out by a past survey of KISD to give importance on the workers' morals first of all followed by punctuality, honesty and lastly the skills.

When KISD was established, an important background of limiting training period was the need to subdivide skills to a maximum possible extent so that KISD could cope with then overall economic development policy with emphasis on labour intensity. This has led the national and regional ISDs to emphasize short and narrowly specified courses. However, instructors and JICA experts who have directly been involved in training activities tend to be interested in more intensive and longer course particularly in view of the need to strenghthen the ability of trainees to apply.

Efforts are thus being made in KISD to maintain the compatibility of "short and narrowly specified course" and "long and broad course". One of the major efforts is the rotation of trainees among interrelated courses practiced since 5 years ago. Some combinations of trades for rotation include plumbing-welding-masonry, diesel and engine-gasoline, engine-agricultural machines and carpentering-plumbing-painting-masonary-electric wiring. The last combination is not exactly a rotation but an arrangement to let trainees observe the whole process of building.

This rotation is based on the recommendation by ILO aimed at a balanced training from a number of different instructors and strengthening the applying capability needed especially in small workshop.

Table 3-2 List of training courses and their duration, 1988

	KISD training (month)	In-plant training (month)
Pre-employment training		
Gasoline engine repair	6	2
Diesel engine repair	6	2
Car body repair	6	2
Agro machine repair	6	2
Arc and gas welding	6	2
Plumbing	3	2
Lathing	6	2
General fitting	6	2
Machine fitting	6	2
Wiring and electric repair	6	2
Refrigerator/Airconditioner repair	6	2
Radio/TV repair	6	2
Carpentering	6	2
Furniture making	6	2
Masonry	6	2
Architectural drawing	11	4

Source: Khon Kaen Institute for Skill Development

Table 3-2 (Continue)

Upgrading training: 36 course, 42 – 60 hours

Upgrading training

Automotive and agro-mechanics workshop	hours
Small engine	60
Engine tune-up	60
Auto-electrical	60
Diesel injection pump and injector	60
Car body filling	60
Car first aids	60
Machine workshop	
Lathe operator	60
Maintenance machine tool	42
Measuring instrument	60
Spur gear cutting operator	60
Flat position arc welding	60
Horizontal position arc welding	60
Semi-automatic electric machine	60
Oxy-Acetylene gas welding mild steel	60
Pumping and sanitary install	60
Electrical and electronics workshop	
Electrical wiring installation	60
Three phase motor	60
Single phase motor	60
Electric motor control	60
Refrigerating circuit	60
Building construction workshop	
Construction drawing	60
Blueprint reading	60
Construction control	60
Drafting	60
Wood working machine	60
Block-brick making	60
Construction cost estimation	60
Machanical reading	60
Technical masoury	60
Finishing technic	60

Non-technical training	hours
Airconditioning	31
Agro machine operation	60
Handicraft (flower making)	36
Car body repair	36
Agro mechanics	60
Restaurant attendents	21
Foreman	39
Receptionist	22
Car driver	35
Office keeping	20
Chief of foreman	30
Food & beverage servicing	24
Housekeeping	61 to 81
Baby sitting	72
Domestic help	42
Secretary	36
Rural vocational training	
Radio/TV repair	60
Carpentry	60
Motorcycle repair	56
Arc welding	56
Wiring	42
Car body repair	48
Masonry	56
Wood working	56
Repair of electric applicances	60
Carpentering	56
Plumbing	56
Plastering	56

Before the rotation started, KISD somehow reorganized its training courses; grouping of cultivating machine and other agricultural machines, grouping of arc welding and gas welding, grouping of wiring and electric repair and termination of vehicle inspection and sheet metal.

It should be noted, however, that there is a critical comment by some economists that the present practice of KISD with emphasis on the ability of trainees to apply skills to a variety of needs may have overlooked an increasing need to establish the skill/work system for production of goods on standards so that goods can be competitive in national and foreign market.

§3 Response of KISD to Changing Local Skill Needs

During the period of 9 years since KISD was established, Thai economy has grown in an accelerated manner at both the national and local levels. KISD has been trying to adjust itself to the changing needs of skill under the national economic expansion. Major efforts of KISD include the introduction of new skills in the pre-employment training, the growing emphasis on upgrading training and the expansion of rural vocational training, which is often called mobile training.

Some examples of new skills introduced in the pre-employment training include the method of producing cement-made wood in the masonry course. In the northeastern region and elsewhere, demand for the cement-made wood has been expanding due to the intensified shortage of cheap and long-lasting natural woods to be used for gardens and the like. In the course of carpentering, an emphasis has been given to concrete rather than wooden building in response to the expanding demand for concrete building construction in major urban areas of the northeastern region. In the course of agricultural machines, engine repair is now given emphasis because in rural areas buffaloes have been quickly replaced by engines for the security and maintenance reasons.

KISD plans to keep adjusting its training courses. Some of the adjustments being considered are introduction of the skill training related to the aluminum window frame for which demand is expanding, the strengthening of the gasoline engine car repair course with an emphasis on the repair of electronic parts which start to prevail in the northeastern region as well, the diversification of TV/radio repair course to cover the repair of video, cassette tape, word processor and electronic machine control, and the expansion of the motorcycle and water pump repair in the course of gasoline engine.

Despite the basic policy of Labour Department to give a priority on upgrading in NISD and pre-employment in RIDS, including KISD, a growing demand for upgrading training is perceived in the northeastern region, as well. The proportion of upgrading training in the total enrollment is the lowest in KISD as shown below.

Proportion of upgrading in total enrollment (1984/85)

National ISD	34%
Ratchburi ISD	43%
Chonburi ISD	44%
Lampang ISD	33%
Khon Kaen ISD	21%
Songkhla ISD	28%
Nakhon Sawan ISD	41%

Source: National Institute for Skill Development

But in KISD, the enrollment of upgrading training has been increasing relative to that of pre-employment training; the average ratio of 1 to 2.9 during the period 1979-1982 and 1 to 1.3 during the period 1983-86 (see Table 3-3). Underlying factors to this change should be changed not only in production technology but in fast diffusion of modern manufactured products in the northeastern region. It is also said among local industries that supply of semi-skilled workers is more or less sufficient while real skilled workers are far from sufficient.

Table 3-3 Enrollment of Khon Kaen Institute for Skill Development by type of training

	Total	Pre-employment	Upgrading	Non-technical	Rural vocational
1979	369	199	16	154	0
1980	541	416	105	20	0
1981	767	490	277	0	0
1982	700	480	149	71	0
1983	1,266	519	527	220	0
1984	1,392	502	602	215	73
1985	1,660	574	401	298	387
1986	1,609	550	164	539	356
1987	8,191	571	408	5,579	1.615
1979-87	15,795	4,301	2,649	7,096	2,431

Source: Khon Kaen Institute for Skill Development

Upgrading training of KISD is made use of by the local industries sending their workers to KISD every year, the small workshop owners and the other local training institutions, both public and private, without the adequate equipment and machines which enable their trainees to practice skills. Some local industries oblige their workers to attend the KISD upgrading training as a condition for them to become foremen. On the other hand, there are some critical views into ongoing practice of the upgrading course. Firstly, upgrading in KISD is not necessarily relevant to the real needs of local industries, although it may benefit workers to be equipped with higher skills. Medium/Large industries which can afford a substantial number of workers to attend in the

upgrading course in one time say that upgrading in the factories would be more useful. Secondly, some local industries believe that recruitment of highly skilled workers is easier and less costly than upgrading of existing workers. Some government officials suggest that upgrading can be encouraged by cost sharing of beneficiary companies. In this case, some incentive would be necessary to let the companies to share the costs.

The rural vocational training started in 1984, which was after the phase-out of JICA, and expanded rapidly until now (see Table 3-3). Table 3-4 shows the list of the rural vocational training conducted in 1988. Among other regional ISD's, KISD is now the most active in the rural vocational training to cover an extensive area of the northeastern region. Some of the successful examples are fitting course at local industries, reading architectural drawings in villages, repair of motorcyles and agricultural machines in villages and training of construction workers at many Tambon. The rural vocational training receives high demand in spite of the condition on recipient village/industry to bear its cost except that of instructors and transportation.

Table 3-4 Number of trainees in the rural vocational training programme in 1988 by training courses

List of courses	No. of trainees
Carpentering	59
Electrical wiring installation	131
Small engine repair	154
Iron sheet for rain water collection	108
Pipe fitting	24
Technical masonry	17
Total	493

Source: Khon Kaen Institute for Skill Development

However, there are some failure cases, too. Rural vocational training is not easy to apply to the fields which need heavy machines or equipment for training. It cannot be effective either in such fields that need a considerable period of training, e.g., repair of TV. Some central government officials are critical of the rural vocational training because such activities are being done by other agencies also and it is better to avoid duplication. This comment may have its own validity, but it cannot be denied that the rural vocational training of KISD actually receives high demand at the local level and helps KISD to be known more to communities. One might as well think that the duplication is justifiable as long as demand exceeds the total capacity of the government to help developing skills.

§4 A Result of Interviews to New Applicants, Trainees, Ex-trainees, Instructors and Local Industries

1. New Applicants

Our study was undertaken incidentally during the period of new application. Seven hundred

and ninety-one applicants are registered in 17 trades of which the 6 most popular ones are: electrical (95 persons or 12.0%), diesel engine and welding (88 trainees or 11.1%, respectively) refrigerator and air conditioner repair (86 or 10.9%) and television-radio repair (77 or 9.7%). This order has not changed during these two years as shown in the Table 3-5.

Table 3-5 Number of applicants for the first 6 trades by order of their popularity, in the year 1986 and 1988

Trade	1986		1988	
	Number	Percent	Number	Percent
Gasoline engine	46	(9.1)	63	(8.0)
Diesel engine	70	(13.8)	88	(11.1)
Electrical	70	(13.8)	95	(12.0)
Air-Conditioner repair	50	(9.9)	86	(10.9)
TV-Radio repair	66	(13.0)	77	(9.7)
Welding	48	(9.5)	88	(11.1)
Total	506	(100.0)	497	(100.0)

Source: Khon Kaen Institute for Skill Development

Data on the 13 applicants interviewed can be summarized as follows:

(1) Ages
- 16 – 17 years old : 4 persons (30.8%)
- 18 – 20 years old : 5 persons (38.4%)
- 21 – 24 years old : 4 persons (30.8%)

(2) Parents' occupations
11 out of 13 applicants have their parents growing rice and cassava. The other parents are either truck drivers or janitors. These cultivators produce rice only for household consumption while cash income is collected from cassava or maize growing, on an average land holding of 15-25 rai.

(3) Education
Of the 13, 8 applicants have passed the elementary school (61.5%). The rest have finished the third year of the secondary school, 3 of whom are taking twilight course.

(4) Work experience
9 applicants (69.2%) have told that they are working. Four among them only help in the agricultural field, while 5 are employed in their own town. Nearly all working applicants has elementary education while the non-working applicants are among the higher educated group, and some of them just finished school this year.

(5) Origin

Most of those interviewed (61.5%) live in Khon Kaen and the rest came from Mahasarakham, Loei, Khorat, Kalasin and Udon Thani

(6) Information channel of applicants

Applicants received the news about the KISD through various channels. Most of them are given information by their friends being once/now trained in KISD, while some by letters from friends living in the KISD's neighbourhood, all these totaling 38.5%. Interestingly, 38.5% hear the news about KISD from radio and get interested. Two applicants receive the information from the Labour Office of their province. Only one person hear directly from a KISD official who gives the information at the school. The KISD having been rendering this service ever since 1986, a number of those having completed their schooling prefered to join KISD instead of continuing their studies elsewhere, which would be costly and take longer time.

(7) Number of times applied

Three of them failed more than once in the entry test. Yet they are all ready to try again in the following year.

(8) Training sections chosen

Regarding training course chosen, car body repair is the first choice (3 out of 13 or 23.1 per cent), the second is gasoline engine and plumbing (15.4 per cent each) (see Table 3-6).

Table 3-6 Training courses chosen by interviewed applicants

Training course	Interviewees	
	No.	%
Car body repair	3	23.1
Diesel engine	1	7.7
Gasoline engine	2	15.4
Plumbing	2	15.4
Welding	1	7.7
Electrical	1	7.7
General fitting	1	7.7
Masoury	1	7.7
Lathe operation	1	7.7
Total	13	100.0

Source: Khon Kaen Institute for Skill Development

All of them foresee jobs to be found easily in the future, once being trained in these desired trades. Four persons already have work as helpers or employees. An observation is that some applicants appear to imitate their friends without a clear reason. Such applicants are found among persons who have just finished the 3rd level of secondary school, having no experience in work of any kind.

(9) Expectation of future

Only two of those interviewed hope to open a small shop in the village. Five of them wish to venture for a job in Bangkok and Samutprakarn, or in the central region which, they thought, would offer larger possibilities. Four applicants never dream of going to Bangkok because of its high cost of living and employment difficulty and their reluctance to go far from home at this young age. The other two applicants prefer to work in big enterprise anywhere to obtain greater experiences.

2. Trainees

The 10 trainees interviewed provide some interesting data.

(1) Ages

– 18 – 20 years old (50.0%)

– 21 – 25 years old (50.0%)

(2) Parents' occupations

80 per cent of them came from rice growing families, holding 10-30 rai of lands on average.

(3) Education

60 per cent of the interviewed have passed the secondary education, while 20 per cent have reached the pre-university level and the other 20 per cent have completed their primary education.

(4) Work experience

They mostly (50%) help their parents in the rice fields; 40 per cent already experience other work, of whom 2 trainees have indiscriminatingly done various jobs to help the family. Nearly all the interviewed live in a large family with more than 5 children. Two of them have 12 brothers and sisters.

(5) Origin

Nearly half of the interviewed (40%) have their home in Khon Kaen. Other trainees come from Chaiyaphum, Udon Thani, Mahasarkham and Mukdaharn.

(6) Information channel of trainees in application

Four among those interviewed have entered KISD under the special quota for the north-eastern provinces, military units and nongovernmental foundations, while other sources of

information include friends, radio, school and KISD announcement.

(7) Number of repeated applications

Three trainees among those outside the KISD's quota have tendered their application more than once. One has repeatedly chosen, for three times, the same welding section.

(8) Motivations of selection

Nearly all the trainees freely make their choices for the following reasons:

They think that it is easy to set up their own business.

(Carpentry)

– by prospect of vast job possibilities; since the courses covered various knowledges, each course is seemingly useful as a future occupation.

(Mechanics)

– by a past experience in the field which appear important nowadays as well as in the future, and therefore is no problem in finding job.

(Electronics)

– by a wish since childhood; a job could easily be found. Besides, for this case an employment contract has already been signed and work would start once the training completes.

(Diesel engine)

Generally speaking these trainees make their choices according to the market: pipe and sanitary installation, air conditioning repair, furniture making, car body repair and car painting, and welding.

(9) Expectation of future

All interviewed have desirable types of employment in their mind, and hoped to set up eventually their own business in their villages. Yet they all agree that this training alone is insufficient to realize such dream. They would need more than 3 year experience as apprentice; some even need at least ten years of apprenticeship (car body repair and car painting).

A very interesting common point is that they mostly realize their own mind and needs. 7 out of 10 trainees interviewed come from really poor and large families, and are unable to continue in an ordinary school although intellectually disposed. They have to start earning money earlier. They feel thus determined to succeed well in this training by putting all their attention and responsibility during very limited time of pre-employment training, inspite of certain difficulties of comprehension owing to their low education level. Yet, in our observation, the KISD seems to succeed considerably in making trainees grasp a fundamental idea and they would one day step up as entrepreneurs themselves.

(10) Attitudes towards the KISD

1) About the programs

They all feel positive towards the KISD: both the courses and instructors are satisfactory. Except two cases (in car body repair and air conditioning repair respectively), respondents find training period to be too short. They suggest at least 10 months training at the KISD with in-plant training for not less than 3 months.

2) About equipment and tools

Most of them are satisfied. Comparing with other training institutions, the KISD seemed well and sufficiently equipped for all the trainees. However, certain sections such as air conditioning repair and TV. – radio repair, used too old fashioned tools to cope with an advancing market.

(11) Expected places of employment

Eight, out of 10 trainees, intend to work in their own town, while the other two foresee a better chance in Bangkok or Samutprakan where factories are easy to find. However, 3 among 8 trainees definitely reject any idea of going to Bangkok where life is so expensive and they knew nobody. Living in the vicinities of their home town thus are perceived much easier.

3. Ex-trainees

26 ex-trainees interviewed are already working. 19 of them have started to use their skill immediately after the completion of training, while the other have only after 3 months or a year (see the Table on ex-trainees' profile).

Remarks from findings

1) Expected future

Most of the trainees interviewed see a bright future in owning an enterprise, while those ex-trainees already working for more than 4 years prefer old job. Only the ex-trainees having started working for 1-3 years, who need greater experience, wish to move to larger enterprise with higher capacity machines and tools so that they could upgrade their skills. Only 2 ex-trainees (7.7%) hope to set up an enterprise. They seem to become more realistic, with time and experiences.

2) Attitudes toward owning an enterprise

Five enterprise owners interviewed appear to have necessary abilities and willingness: the enthusiasm to expand more knowledges and experiences is found among sufficiently educated people (Four having completed pre-university schools. Two of them passed a university entry examination, but were too poor to study there and only one of them had finished the school 2 years ago). Most of all have negative attitude toward being employee,

Table 3-7 Profile of ex-trainees (26 person interviewed)

Items	Profile of ex-trainees	Number	%
Ages	1. less than 20	1	3.8
	2. 21 – 25	17	65.4
	3. 26 – 35	6	23.1
	4. more than 35	2	7.7
Places or origin	1. Khon Kaen	19	73.1
	2. Other provinces in the Northeast region	6	23.1
	3. Northern region	1	3.8
Parents' occupation	1. Rice farming	22	84.6
	2. Others (non-agricultural)	3	11.5
	3. No answer	1	3.8
Employment status	1. Employees (government civil servants)	6	23.1
	2. Employees (private enterprises)	15	57.6
	3. Self-employment	5	19.2
Income	1. Daily salary (50-80 baht)	6	23.1
	2. Monthly salary	20	76.9
	1. 1,200-2,000	5	19.2
	2. 2,001-2,500	3	11.5
	3. 2,501-3,000	5	19.2
	4. 3,001-4,000	3	11.5
	5. 4,001-6,000	4	15.4
Length of service in the enterprise	1. Less than 6 months	4	15.4
	2. 7 – 11 months	1	3.8
	3. 1 – 2 years	5	19.2
	4. 3 – 4 years	13	50.0
	5. More than 4 years	3	11.5
Source of information about the KISD	1. Friends	10	38.5
	2. Radio	1	3.8
	3. Relatives	4	15.4
	4. Personal contact with employers	6	23.1
	5. Employers (enterprises)	2	7.7
	6. Provincial Labour Offices	3	11.5
Plans for the future	1. Continue to work at the same enterprise	7	26.9
	2. Go abroad to earn more money	3	11.5
	3. Go to Bangkok or bigger enterprises after having wider experiences	6	23.1
	4. Expand one's own shop	4	15.4
	5. Set up one's own shop	2	7.7
	6. Need up-grading training	3	11.5
	7. Take a chance of employment in the governmental sector	1	3.8
Comments on KISD	1. Duration of training being too short	8	30.8
	2. More emphases on theories	6	23.1
	3. Adjusting course or subjects to the present market	7	26.9
	4. Satisfied, No comment	5	19.2
Choice of training sections	1. Diesel engine and gasoline engine	6	23.1
	2. Lathe operation	6	23.1
	3. Welding	4	15.4
	4. Electrical	4	15.4
	5. Refrigeration and airconditioning repair	1	3.8
	6. T.V. and radio repair	1	3.8
	7. Masonry	1	3.8
	8. Metal fitting	1	3.8
	9. Agro. mechanics	1	3.8
	10. Pipe fitting and sanitary installation	1	3.8

apart from or because of possessing a creative mind and considerable capital. Some also help start a small business. For instance one of those interviewed own a bicycle service shop in the village, having started as small gas-dealer. He also hope to expand the shop since it is favorably located.

3) Attitudes toward the KISD

Ex-trainees mostly (80.8%) feel the need to have the KISD courses revised. 30.8 per cent suggest longer terms for various trainings: 8-12 months for every trade in KISD, and 3 months for in-plant training. This longer duration would not make them much more skilled, but more experienced. Thus the KISD's short-term training appear to be insufficient for a really adequate practice.

The next group, though less in number, suggest a modernization of certain courses according to labor demand and technological changes. While 26.9 per cent criticize the KISD for teaching of theories, 23.1 per cent preferred more emphasis on theories. It is generally said that KISD ex-trainees are more practical and vocational school ex-students are more theory oriented. But it is also said that in the long run the latter greatly surpasses the former in the ability of adapting theories to practices.

4. Instructors

The 11 instructors interviewed belong to the following sections:

- Pipe and sanitary installation
- Agro-mechanics
- Carpentry
- Furniture making
- Machinery
- Electrical
- Electronics
- Machinist
- TV and radio repair
- Diesel engine
- Architecture drawing
- Car body repair

They expresses opinions on:

(1) Courses

Being experts in their field these instructors find the KISD training period being too short. Preferably 8 months at the KISD and 2 more in the in-plant training are recommended by them.

(2) Equipments

They share the trainees' opinion about the KISD: equipments in certain fields are outdated, such as diesel engine, TV and radio repair, agro-machine, air conditionner and refrigerator. Some of equipments are unable to meet the market requirements, while the others are set in the workshop unused.

(3) Trainees quality and chances of employment in the instructors' opinion

Instructors find their trainees considerably good and believe that 60 per cent of them would be immediately engaged in job. The major fields of labor demand in the northeastern region, as they mostly stated, include welding, carpentry, furniture making and masonry, whereas diesel and gasoline engine were the nation-wide demand.

As for the trainees, those having completed a KISD programme tend to frequently move from one job to another. The reason however is not the difficulty in finding employment. The real motive is perhaps their need to get more work experience. However, this presumably creates problems for the local enterprises recruiting KISD graduates.

5. Local Industries

Industries in the northeastern region (17 provinces) are the regional labor market to absorb both skilled and semi-skilled workers from either the KISD or other vocational establishments. Moreover, the industries are directly cooperating with these institutions by admitting trainees for the in-plant training.

According to the data acquired, those enterprises having such contact with KISD appear to be mostly in Khon Kaen and other 2-3 big towns (Udorn, Korat, etc.) Table 2-4 shows that in 1984 56.6 per cent of trainees enrolled in the on-the job training in Kohn Kaen and 57.3 per cent in 1988. The enterprises cooperating with KISD ranged from small ones (working rooms or shops with more than 3 employees, radio shop for instance; most of them are privately owned and more interested in skill than certificates), to big companies employing 70 to 800 workers, such as the Khon Kaen Fishing Net Factory, the Decha Fishing Net Producer, the Raja Factory (producing Tilling machines), the Phoenix Pulp and Paper Company and the Kow-Yoo-Ha Company.

Our case studies included 4 big enterprises having regular relations with the KISD, comprising 2 private factories (the Khon Kaen Fishing Net Company and the Kow-Yoo-Ha Company), a public enterprise (the Electric Generating Authority of Thailand Khon Kaen Zone) and a big industry (the Phoenix Pulp and Paper Company).

The first 2 factories have always been most actively collaborating with the KISD, since the trainees are seriously and practically trained. To be more precise, KISD trainees are found to possess only elementary knowledge and cannot immediately be useful in the factory. They all need to begin from the beginning. Nevertheless, both enterprises partially appreciate the KISD

achievement: these trainees could adapt themselves more readily to the work, comparing to those from other vocational establishments. They admit that KISD's trainees are hard working, perseverant, obedient and apt to new knowledges, whereas other vocational students have feeling of superiority in being more educated and tend to show inferiority in these qualities.

The need for more theory courses for the benefits of KISD's trainees intensifies when they are faced with great difficulties in trying to understand English technical terms and often fail even to name correctly the tools used in factories due to their low education.

As for the labor market in the northeastern region, the two companies foresee a possible decrease in the pre-employment and worker trainings demand, because industries are now so advanced and modern machines and installed so that the workers trained in high technics would be indspensible. Furthermore, various local industries are faced with the shortage of skilled workers since they preferred works in Bangkok or abroad.

Chapter IV

§1 Local Demands for Skilled Labour

In the Sixth National Economic and Social Development Plan, it is expected that the demand for skilled workers in the northeastern region will grow to a certain extent due to the government's policy to decentralize industries. Although technological change could mean more mechanization for enterprises, the demands for labour, the skilled workers in particular, is not much affected by the technological change. The effects for unskilled labour are more likely to be felt. What is expected is that unskilled workers will face fewer employment opportunities, while the demand for the skilled and semi – skilled will grow instead. Therefore, it is logical to emphasize the pre-employment training course for meeting the human resources demand during the present Sixth National Development Plan.

§2 Labour Situation in the Northeastern Region

It is quite clear that due to a growth in the national economy, the total number of enterprises has increased markedly. In the year 1985, the total number of enterprises is 21,411 with 122,813 employees. Two years later, there are 23,444 enterprises with 129,354 employees in total (see Table 4-1).

Table 4-1 Number of industrial establishments and employees by year and region

Regions	1985		1986		1987	
	No. of establishments	No. of employees	No. of establishments	No. of employees	No. of establishments	No. of employees
Bangkok	41,056 (33.4)	774,746 (45.3)	41,784 (35.8)	850,273 (58.1)	54,986 (41.4)	1,122,771
North	17,466 (14.2)	167,301 (9.8)	18,096 (15.5)	167,593 (11.5)	18,306 (13.8)	202,866
Northeast	21,411 (17.4)	122,813 (7.2)	22,900 (17.6)	125,555 (8.6)	23,444 (17.7)	129,354
South	15,518 (12.6)	145,359 (8.5)	15,845 (13.6)	145,273 (9.9)	16,226 (12.3)	165,440
Centre	27,545* (22.4)	500,001 (29.2)	18,246 (15.6)	173,726 (11.9)	13,476 (14.7)	217,693
Total	122,996	1,710,226	166,871	1,462,240	132,342	1,833,124

Source: Technical Supporting Branch, Institute for Skill Development, Department of Labour

In the national total number of enterprises, the northeastern region accounts for 17.7 per cent in 1987. It is also to be noted that in terms of enterprise size, small scale enterprises with 1-19 workers account for more than 85 per cent of the national total, while the percentage in the northeastern region is quite high, i.e., 95.3 per cent of the regional total.

The average enterprise size in the northeastern region is only 5.5 workers per enterprise.

§3 Job Opportunity of KISD's Trainees

One can say that KISD is contributing to reducing potential unemployment in the northeastern region and sending skilled/semi-skilled workers to the national labour market with its center in Bangkok. It has once been pointed out that KISD does not attain its objective in the sense that trainees tend to drain out from the northeastern region. But this is not necessarily a correct observation. Without KISD, Bangkok would have to absorb more unskilled/unproductive workers or the northeastern region would have to suffer from heavier burden of the young unemployed/underemployed without skills to get productive jobs.

Propensity of trainees to get job within the northeastern region is quite high. They know that skill demand is growing in rural areas and that getting job and living are actually difficult in Bangkok, while a number of trainees wish to go to Bangkok, especially large factories offering high wages. Some of trainees get job in Bangkok and its vicinities, including Samut Prakan and Chonburi. Local industries admit that a number of skilled workers leaves their industries for Bangkok. Local industries are in this case used as a stepping stone for those willing to go to Bangkok.

Based on a questionnaire survey conducted by KISD on its graduateds during the period 1979-1986[1] it is found that of the 1333 effective samples, there are 786 persons or 63.7 per cent can get job after graduating from KISD. It means around 64 per cent have job experience, but only 448 persons or 57 per cent of the extrainees who have job experience have job at the period of the questionnaire survey (see Table 4-2).

With reference to the ex-trainees who have no job, both of having never got job and having no job during the period of the questionnaire survey, we can not say that all of them are unemployed. Some may be family workers or do the other works which may not relate to the skill they have learned from KISD.

(1) KISD conducted its own evaluation survey in 1986. 2000 questionnaires were sent to ex-trainees and 1376 answers were returned back to KISD. But only 1333 questionnaires were filled up perfectly. KISD sent all of the questionnaires to CUSRI to recompute by computer. The quantitative data used in this report referred to the result from CUSRI ANALYSIS.

Table 4-2 Job availability for the KISD ex-trainees according to a KISD survey

Job experience since graduation	Job at present		
	Total	On job at present	No job at present
Have job experience			
Total	786 (100.0) (63.7)	488 (57.0)	338 (43.0) (43.1)
in 1 place	321		
2 places	236		
3 places	92		
more than 3 places	137		
Have no job experience till now	447 (36.3)	–	447 (56.9)
Total	1,233 (100.0)	488	785

Source: KISD questionnaire survey

Note: There were 100 respondents out of 1,333 without answer to this specific question, thus only 1,233 respondents were analyzed.

As to the job opportunities by category of training course, it is found that chance of employment ranks the highest in mechanics, electric, engine and carpentry (see Table 4-3).

Table 4-3 Number of employed ex-trainees by the four major course fields

Courses	No. of employed ex-trainees	%	No. of unemployed ex-trainees	%	Total	%
1. Machanic	159	(32.1)	336	(67.9)	495	(100.0)
2. Electric	76	(29.2)	184	(70.8)	260	(100.0)
3. Engine	99	(27.2)	265	(72.8)	364	(100.0)
4. Carpentry	55	(25.7)	159	(74.3)	214	(100.0)

Source: KISD questionnaire survey

When we consider the whole period (1979-1987), the total number of KISD trainees is 4,301, of which the field of mechanics account most. In this field welding is most popular.

Table 4-4 Number of trainees by four major courses fields

Fjeld major	Number	Percentage
Mechanics	1,548	36.0
Engine	1,097	25.5
Electrics	943	21.9
Carpentry	713	16.6
Total	4,301	100.0

Source: KISD

But while the numbers of engine major is second highest, this field have been least employed. This fact is elaborated also through the interviews of the instructors who said that due to the stable number of the enterprises for engines the demand for this kind of labour training have come to a saturating point. The ways out for these ex-trainees are seeking employment in other regions or starting one's own business in local communities.

Looking at the presently employed ex-trainees in the questionair result, most 40.5% are in Khon Kaen province, a large number (38.5%) spread all over the northeastern region's 17 provinces, 11% in Bangkok and nearby provinces, 6.7% in other regions and 2.0% in foreign countries. It is clear that Khon Kaen and the other northeastern provinces are the main ex-trainees absorption. (See Table 4-5)

Table 4-5 Employed ex-trainees classified by location of employment

Location of Employment	No.	%
Khon Kaen	181	40.5
The rest of northeastern region	172	38.5
Bangkok	36	8.1
Provinces nearly Bangkok	13	2.9
Other provinces	8	1.8
The rest of kingdom	9	2.0
Foreign countries	9	2.0
No answer	20	4.2
Total	448	100.0

Source: KISD questionnaire survey

Concerning labour dentands of local enterprises, although most presently employed ex-trainees are in Khon Kaen and other northeastern provinces, it is quite surprising that nearly half of the respondents (48% or 640 out of 1,333 samples) think that the local entrepre-nueres may need fewer local workers (see Table 4-6). Taking this answer into consideration, there

are uncertainties of employment for the unemployed ex-trainees.

Table 4-6 Attitude of ex-trainees on the extent of demand for local workers by local entrepreneures

Extent of demand	No. of respondents	Percent
Very much	32	2.4
Much	103	7.7
Moderate	411	30.8
Little	408	30.6
Very little	232	17.4
No answer	147	11.0
Total	1,333	100.0

Source: KISD questionnaire survey

As for the ex-trainees' preference in employment location, most prefer to start their job for the first 2-3 years near their home communities and then change to other jobs in other areas within the northeastern region rather than in Bangkok or other regions.

Among the presently employed ex-trainees, only 36.4% (163 out of 448 samples in Table 4-2), say KISD certificates are used for getting jobs, while 42.0% (188 samples) say education certificates are used. The reason is that KISD certificates are not yet authorized by government as equivalent to those from other vocational institutions. Some enterprises do not acknowledge it. Under this circumstances, many ex-trainees with the formal education at a low level only could not easily get jobs that may be consistent with their skills.

§4 KISD and Labour Market Trends

At present, there are 3 ways through which KISD could monitor the trends of labour market. They are the following:

(1) Follow-up graduated trainees with reference to the field of skill, employment opportunities, labour demand in enterprises. This follow-up survey started since 1986, but the computation of the collected data is yet adequately be done.

(2) Coordinate with provincial labour offices in identifying existing labour supply, and also with provincial industrial offices and related offices in identifying types of the enterprises and factories that require certain kind of technicians.

(3) Survey opinions of the trainees who are just back from in-plant training with reference to

labour of the factories where in-plant training is undertaken, and their problems in real job experience. There are usually detailed answers on each sub-field so that the contents of curriculum, training methods etc., can be more adapted to the needs.

Another means to monitor the labour market is the annual job placement day, on which many enterprises and workers come to meet in one place.

§5 Demand of Labour Market and Response of the Trainees

There are differences between demand of labour market and response of the trainees. For example, KISD finds that there are clear trends of market demands for construction workers and furniture craftmen in the northeastern region. Those trained in these fields very soon get employed. But situation is that the trainees who select these majors are few, compared with those in majors such as engine, electrics and mechanics.

What KISD could do is to give more attention to public relations for a better understanding of its roles and activities. The present KISD radio program of 30 minutes, which started in 1986, could be further utilized for this purpose. In fact many trainees come to know about KISD through the program.

In conclusion, the demand for skilled labour in the northeastern region is expected to increase due to the government policy in the Sixth Plan which aims at regionalization of industries. How such new trends could be monitored is a very crucial factor for KISD to adapt and respond.

Chapter V

§1 Management and Operation of KISD

In general, KISD has been able to maintain good performance of training under the local and national environment which has been changing after JICA phased out. Nonetheless, there are some points to be improved in its management and operation, if KISD is to be more effective in attaining its objectives. These points are:

(1) Training of instructors
(2) Maintenance and renewal of training, equipment and materials
(3) Issue of certificate
(4) Monitoring capability, and
(5) Coordination with other related institutions at the regional/provincial level

(1) Although KISD suffered from shortage of instructors during its beginning period, there is now a sufficient number of full-time instructors. Instructor-to-trainee ratio of KISD is larger than other local training institutions. In terms of quality, too, most of them have rich experience as practitioner or trainer, the willingness to teach and the ability to catch up with technological changes. The adequate quality has been insured by a stiff selection through written, practicing and oral examinations by NISD for three days. Wage of instructors is within the range of 3,000 to 6,000 baht which is more or less at the best prevailing level and competitive in attracting the skilled, if their fringe benefits and employment stability are also taken into account.

However, KISD can presently afford to send only 3 to 10 persons of its instructors for 2 weeks once in a year in order to upgrade their skills. Many instructors see the present system of instructor training as insufficient. Some of them make trip to Bangkok at their own cost to observe new product shows and expose themselves to modern skills. Insufficient instructor training would cause drain-out of existing staff and outdating of training contents. Some of the ideas being discussed in KISD are to provide longer period of upgrading training at NISD for all instructors, to organize nationwide seminar for the instructors of regional ISDs in respective fields of skill and the institutionalization of dialogue between instructors and local industries.

(2) Maintenance of equipment is one of the most common problems in Thailand and other developing countries. The problem is particularly serious in the institution like KISD because the equipment are vitally important to enable practice-oriented training. Virtually no problem of equipment was felt during the beginning four years, but now the problem is pointed out by management staff and instructors. Simple and cheap tools have not been modernized in keeping pace with renovation in the market. Some machines such as diesel engines are underutilized due to the shortage of spare parts. Only black and white TV is used for training although color TV is rapidly prevailing. In addition to these problems, it is

pointed out that some of the Japanese-brought machines are not relevant to the local conditions in terms of precision, fuel cost and use. Basic reason for the problem is inadequate maintemance budget which is 2.8 million baht or about 35% of the total KISD budget at present. In 1986 total budget was 7.8 million of which 3.8 million was for salary, 2.8 million for material equipment, 1.1 million for public utility, and 0.1 million for land and building.

(3) An emerging problem is the issue of certificate. In recent years, the certificate by KISD for graduates of pre-employment training does not effectively work in ensuring job in large companies and government agencies. For example, Electricity Generating Authority of Thailand recruits only college graduates and up since 3 years ago. Certificate of KISD is out of the system of school career. In local small private companies, graduates of KISD can easily get job only with the certificate of KISD. It seems that KISD will sooner or later be pressed to determined whether it should target the skilled workers to be employed in medium/large industries or the semi-skilled workers to be employed in small local workshops or to start their own businesses. If the skilled workers in medium/large industries are aimed at, institutional arrangements would be necessary at the central level to link the training/education systems under different government line agencies in terms of issue of certificate.

(4) Another problem is the monitoring capability of KISD. In order to improve its training activities, a system is indispensable to continuously monitor the changing needs of skills, labour demand structure, and response of trainees and extrainees. KISD has conducted a survey on its ex-trainees who graduate from KISD during the period 1979 to 1986 taking about 1,300 samples. This type of survey should more frequently be conducted and possibly with a larger size of samples, in addition to the present effort of instructors to visit their extrainees and local industries on informal basis and look into the needs for new skills to be trained.

(5) The last problem is the coordination between KISD and other related institutions at the reginal/provincial level. The government decision in 1988 to transfer KISD from the control of Khon Kaen Province to the direct control of the Department of Labour should be useful to increasing the efficiency in management of KISD itself. In the meantime, the provincial government could contribute more to KISD in coordinating activities of related agencies and institutions under different ministries/departments such as Ministry of Education, Ministry of Industry and Department of Community Development since various central government agencies have their branches in Khon Kaen City being the leading regional city of the north-eastern region. Arrangement to set up a forum for practical public/private dialogue at the provincial level would also be a task to possibly be tackled by the provincial government. A seed for such forum would be the case in which ex-trainees including foremen of local industries often visit KISD to get technical advice from its instructors.

Chapter VI

§1 Socio-economic Impact of KISD

It is no doubt that KISD provides a large number of young villagers in the northeastern region with the access to industrial labour market. Number of applicants has been more of less 3 times as much as enrollment of the pre-employment course and reaches 5 times in some fields such as automobile repair and electricity/electronics repair (see Tables 6-1 and 6-2). In these fields, skill demand has rapidly been expanding in the rural areas and opportunities of stable employment or self-employment are large. A number of applicants try to get into KISD even repeatedly.

Specifically speaking, KISD has been contributing to Thai development in three aspects: (1) provision of job opportunities especially through pre-employment training; (2) meeting with needs for the skills diversifying both in the northeastern region and the country, especially through upgrading training; and (3) stimulation of the local-demand-based economic activities in the northeastern region.

(1) Provision of job opportunities is, of course, the primary aim of KISD. Northeastern region has 500,000 unemployed or 23% of the national total and 1.4 million of seasonally inactive labour force or 45% of the national total (see Tables 6-3 and 6-4). Compared with this large number of unemployment and underemployment, the enrollment of KISD may only be marginal but it has been playing a vital role in reducing unemployment/underemployment in the northeastern region by providing concrete skills to the people of which the number is smaller than that of potential skilled workers but larger than that of actual demand for skilled workers. A smaple survey conducted by KISD reveals that 64% of ex-trainees have ever been able to get job, though, of the 64%, 43% are off the job at the time of the survey presumably because of the discontinuity of work experiences. In fact, turn-over of the young semi-skilled is quite high. According to the KISD staff, the pre-employment training is presently aimed at providing basic skills, teaching how to work in a team and strenghtening the capability to learn by trainees themselves through on-the-job training after getting job. These aims are considerably attained, according to the judgements of local industries and ex-trainees.

Table 6-1 : Applicants to enrollment ratio of Khon Kaen Institute for Skill Development by year

Year	Pre-employment	Upgrading
1979	9.26	1.00
1980	3.10	1.01
1981	1.86	1.12
1982	2.11	1.00
1983	2.32	1.44
1984	2.56	1.34
1985	3.14	1.69
1986	2.62	1.31
1987	2.52	1.61
1979-87	2.88	1.52

Source: Khon Kaen Institute for Skill Development

Table 6-2 Applicants to enrollment ratio in pre-employment training at KISD, (June 28, 1988) by courses of training

Radio/TV repair	5.25
Agro-machines	5.13
Automobile repair (gasoline)	4.81
General fitting	4.60
Lathing	4.07
Automobile repair (diesel)	3.88
Wiring and electric repair	2.97
Arc and gas welding	2.36
Furniture making	2.06
Machine fitting	1.83
Architectural drawing	1.67
Car body repair	1.56
Painting	1.17
Furniture making	1.17
Carpentering	1.08
Plumbing	0.80
Masonry	0.75

Source: Khon Kaen Institute for Skill Development

Table 6-3 Structure of the labour force by region, 1986

(000 persons)

	Population	Labour force	Employed	Unemployed	Seasonally inactive
Whole Kingdom	52,500	23,646	18,303	2,152	3,200
Northeast	18,357	7,557	5,637	499	1,429
North	10,517	5,194	3,985	342	868
South	6,526	2,637	2,212	268	158
Central	11,729	5,645	4,431	471	743
Bangkok	5,371	2,613	2,038	572	2
Whole Kingdom	100.0	100.0	100.0	100.0	100.0
Northeast	35.0	32.0	30.8	23.2	44.7
North	20.0	22.0	21.8	15.9	27.1
South	12.4	11.2	12.1	12.5	4.9
Central	22.3	23.9	24.2	21.9	23.2
Bangkok Metropolis	10.2	11.1	11.1	26.6	0.0
Whole Kingdom		100.0	77.4	9.1	13.5
Northeast		100.0	74.6	6.6	18.9
North		100.0	76.7	6.6	16.7
South		100.0	83.9	10.2	6.0
Central		100.0	78.5	8.3	13.2
Bangkok Metropolis		100.0	78.0	21.9	0.0

Source: National Statistical Office. Report of the Labor Fource Survey.

Table 6-4 Labour force structure in the northeastern region

(000 persons)

	1979	1986	%-Mix in 1986	Growth rate, 1979-1986
Total	4,841.7	7,179.7	100.0	1.483
Employees	990.2	1,649.8	22.9	1.666
Self-employed & employers	2,404.7	3,051.3	42.5	1.269
Unpaid family workers	1,446.8	2,478.6	34.6	1.713
Agriculture	3,504.6	4,933.7	68.7	1.408
Employees	334.3	498.9	6.9	1.492
Self-employed & employers	1,969.5	2,301.1	32.1	1.168
Unpaid family workers	1,200.8	2,133.7	29.7	1.777
Non-agriculture	1,337.1	2,246.0	31.3	1.680
Employees	655.9	1,150.9	16.0	1.755
Self-employed & employees	435.2	750.2	10.4	1.724
Unpaid family workers	246.0	344.9	4.9	1.402

Source: National Statistical Office, Report of the Labour Force Survey, Round 1 (Jan. – Mar. 1986)

(2) Local skill upgrading is the second and increasingly important aim of KISD. Although the shortage of industrial employment opportunities still persists in the northeastern region as past ex-post reports have pointed out, medium-scale industries, or large-scale industries at northeastern regional standard, are eager for good skilled workers which are difficult to retain in the region. Rapid industrialization of Thailand in recent years also calls for more skilled workers nationwide to engage in modern export manufacturing and in repairing the modern manufactured goods which have been quickly penetrating into rural areas. In future, manufacturing industries will gradually be dispersed from the Bangkok Metropolitan Region to acquire cheap labour and lands. Skilled workers will be more in need then. Rather, there is an indication that the availability of skilled workers and middle managers is an increasingly important factor to determine location of the new investments by those industries which look for the opportunity to move out of the Bangkok Metropolitan Region where labour cost of good skilled and managerial workers is sharply rising.

At present, KISD is a few institution in the northeastern region being capable of training skilled workers on the basis of intensive input of instructors and training equipment. Few other technical college and private/public vocational school can afford this. Upgrading course which so far attracts participants from not only local industries but other vocational schools proves that KISD is a center of instructor/machine intensive skill training in the northeastern region. In fact, effective skill development cannot be attained by lectures alone.

(3) Stimulation of local-demand-based economic activities was not an explicit objective of KISD project at the beginning, but the potential function of KISD to foster the skilled self-employed makes it possible for KISD to contribute substantially to realizing business opportunities for small-scale non-farm activities in rural areas. In the northeastern region, too, growth of agriculture has been raising peoples income and creating opportunities for small construction, repair and processing industries to grow in rural areas. Table 6-4 shows that the non-agricultural self-employed which accounts for 10% of the total employment in the northeastern region is one of the fast growing segments in the region. Dream of most of trainees in KISD's pre-employment course is to set up their own workshop in their home town/village. According to a survey of ex-trainees of KISD (see Table 6-5), about 4% of the ex-trainees with employment run their own business. It is also a policy of the central government to support small entrepreneurs for the purpose of employment creation and rural development.

Table 6-5 Work status of ex-trainees who had job at the time of the KISD questionnaire survey (1986)

Work statue	No. of respondents	Percent
Employees	295	65.8
Self-employ	17	3.8
Government officer	49	10.9
Public enterprise	23	5.1
No answer	64	14.4
Total	448	100.0

Source: KISD Questionnaire Survey

(4) An important socio-economic impact has been given by the rural mobile training which started in 1984. This training involves trainers and equipment in various branches (see Tables 2-7 to 2-8), to serve inhabitants of the 17 provinces for a training duration of 42-60 hours. During 1984-1988, 2,924 persons are enrolled with considerably good result: 85.2 per cent having succeeded. The 5 top popular fields of skill were: electrical installation wiring (729 trainees or 24.9% of the total), small agro-mechanics repair (639 or 21.8%), motercycles repair (397 or 13.6%) and roof gutters making (329 or 11.3%).

According to most of those interviewed, the program is successful, since trainees are carefully selected among those capable of learning and utilizing their knowledge afterward. For instance, applicants in small engine repair are, after the training, able to do certain minor repairs themselves without relying on the repairshops in large cities. Besides, a greater number of these trainees are already adults with the work experiences long enough for them to grasp new advices.

Similar service of the KISD's is the non-technical training program covering 17 branches.

These courses are not given every year and offered only if requested from provincial labour offices. The service started in 1979 with only 1-3 branches, to which several others are gradually added, the year 1987 saw an expanded number of 10, the most important branch being domestic help (4,581 trainees or 60.1% of the total 7619 enrolled trainees in non-technical training during 1979-1988). These ex-trainees' performance is to the satisfaction of their employers.

The KISD is hence playing a very useful role in this region, inspite of its limited ability to carter for a huge number of local people in need of these services. A part of agricultural labour having been trained can step more firmly into the industrial sector where they earn a higher income for themselves and their families. This means a better life for many household.

Chapter VII

§ 1 Assessment and Recommendations from the Viewpoint of Thai Development

The assessment of KISD has been done in the light of its objectives, the performance in achieving objectives, and handling obstacles.

Objectives of KISD

1. Improving labour efficiency before entering labour market.
2. Upgrading skilled labours.
3. Encouraging participation of industrial sector in labour development.
4. Developing skill to be suitable for the requirement of market.
5. Developing and testing skill in accordance with a common standard.
6. Improving labours's career and income in the areas faced with security problems.

1. The Performance of KISD

The performance of KISD has generally been in line with its objectives. The reasons are as follows:

(1) Concerning the pre-employment training course, the KISD has annually provided skills for 478 unskilled labours on average between 1979-1987. During these years, there are 1,360 applicants on annual average to the training. Although the number of enrolled trainees is relatively low compare with the rate of unemployment in the northeastern region (for example, the number of unemployment in 1986 was 498,800 according to the survey of National Statistic Office, KISD was able to provide training for only 550 applicants).

However, the KISD effectively supports a number of unskilled workers to enter the labour market. Without the KISD those young pelple would have had few chance to improve their skill. They must have either gone back to farm or taken unskilled jobs. Through the interviews, we find that the results of the training are quite satisfactory in the opinion of both the ex-trainees and the local entrepreneurs. The local entrepreneurs consider that the KISD trainees are better trained than those of other vocational schools.

(2) There a continuity in improving and testing labours' skill.

(3) A non-technical training is designed for the rural youth to improve skill level before entering labour markets, particularly with little requirement of skill level and training time. Training courses are conducted upon request of provincial labour office within the region. There are three highly popular courses: Domestic help, restaurant service, and child care. Labour demand in these three areas are high at present due to an increasing number of working housewives.

(4) Rural mobile vocational training has been conducted since 1984 by sending instructors into rural areas. About 70 to 500 local people participated in the course in average years, (except in 1987 when the number of participants is as high as 1615). These courses also provide local people with some technical knowledge to repair their agricultural equipment by themselves. On the other hand, there is another implicit aim, which is to diversify the chances of villagers to earn money with simple skills. For reaching this objective, the KISD has to take into consideration that the process is costly, time-consuming and needs heavy in-put of man-power. This may give unnecessary burden on KISD. Nevertheless, mobile training courses introduced KISD and its activities to rural people, in order to acknowledge them of KISD which is available for providing technical knowledge when needed.

(5) Concerning an opportunity for KISD's trainees to get jobs. According to a survey by KISD in 1986, 33.6% of 1333 people have jobs then while 64% of them have at least once got job. This means 30% of them have temporarily no job although they have got job in the past after graduating KISD. Training courses which provide a high opportunity to get jobs range from mechanics, electrical, engine and building and construction.

2. Attitudes toward KISD's Performance

(1) There is a contradiction between objectives and practice in the KISD's training courses. While the KISD is aimed at developing unskilled labours to be semi-skilled labours, through the training curriculum with an emphasis on providing specific skills in narrowly defined many fields, another objective is to foster the trainees' own abilityto apply and integrate various skills and knowledge. The achievement of this objective requires longer training-time and more flexible courses. There was a suggestion that an appropriate time for the training in KISD should be 10 to 12 months, and another 2 to 4 months for on-the-job training.

(2) There is a lack of systematic cooperation between KISD and other agencies. A cooperation with provincial labour offices is necessary in order to get information about labour movements and a desire for mobile training courses. Moreover, a cooperation with other agencies in conducting mobile training course has also been insufficient. It would be more useful to share resources with other offices such as Department of Community Development, Department of Industrial Promotion and Department of Vocational Education. It is encouraging in this regard that, in 1988, the Ministry of Interior takes initiative to set up a provincial subcommittee to coordinate various related agencies involved in skill development at the provincial level.

(3) Although the content of training courses has been adjusted regularly, it still generally depended much on the initial design framework agreed between KISD and Japanese government; for example, training -- time and a broad content of courses. At a level of pre-employment for those entering labour market, the content of courses should be classified in a more flexible manner so that trainees are able to gain sufficient knowledge without

wasting too much time, and opportunities for up-grading their skills.

(4) KISD should have stronger function to survey labour demand as well as to cooperate with other agencies and the local enterprises. Inadequate surveys would result in producing the workers who do not match the labour demand and thus a high unemployment rate of trainees after graduating from the KISD.

(5) There is a problem in training equipment. During the period of nine years since the establishment of KISD, some equipment have been deteriorating although there is an effort in repairing by trainers. Moreover, some training equipment have also been out-of-date, for example, radio, television, automobile, and agro-machine. This problem is applicable not only to the KISD but to other institutions for skill development, including NISD which was established 10 years before the establishment of KISD.

(6) The quality of instructors has to be taken into consideration. If training courses' objective is to prepare trainees to the extent that they can have the skills which really meet the market need, the Department of Labour should have a stronger capability to continuously retrain and upgrade the regional instructors.

(7) At present, management in KISD office is at a level which enables it to carry on its tasks.

(8) There has been considerable cooperation with provincial industrial offices, provincial commercial offices and provincial labour offices in order to find the local enterprises who are willing to accept trainees for in-plant training activities. However, problem is a lack of the personnel to make contact with those enterprises. Such contacts have been made mostly by letters and follow up activities have therefore been relatively low.

3. Roles of KISD in Future

(1) While the main objective of the KISD training should be the production of the semi-skilled labours and the skilled since the industrial sector will be expanding into the region, a more emphasis must be put on the up-grading training.

(2) Rural mobile training should be continued especially in needy areas and in the courses requested by the people without emphasis on the quantity only in terms of number of those trained.

(3) There should be a closer cooperation between KISD and local enterprises for the adjustment of courses to be suitable for changing demand. This must be done by organizing seminar annually. Certain budget provision for this activity is required.

(4) Up-grading training courses might as well be gradually undertaken at local enterprises, so that both instructors of KISD and labours in those enterprises are introduced to various

new technologies.

(5) Since instructors engage themselves in a wide range assignment of jobs, training courses and their time-table should be made clearer.

(6) Quality should be more emphasized than quantity, although it is unnecessary for the KISD to be a highly specialized agency as the objective of its establishment is to develop labour skills before entering labour markets.

4. Comments on Japanese Assistance in the KISD Project

(1) The project has been pre-designed between the central government and the donor and may not exactly fit the needs or requirement of the local recipients. An example is the building which has been designed to be operated with costly air conditioning, due to the lack of adequate communication among those at all levels.

(2) Although curriculum has initially been developed on the part of RTG and the final decision has been made on the Japanese part, the curriculum in general covers vast topics which could be reduced. If curriculum is more flexibly designed, the training period could be more appropreate according to different field of skills. At present KISD is revising the curriculum to offer a more concrete skill training.

(3) In the initial period communication between Japanese experts and Thai counterpart was difficult. Most Japanese experts were not fluent in English and knowledge transfer was not complete. In the future experts should be able to transfer knowledge completely.

(4) At present KISD equipment are deteriorating and out-dated. Many need to be replaced. The replacement may be locally made and need not be Japanese-made, particularly from the viewpoint of the availability of maintenance spare parts.

5. Recommendations for Future Assistance

(1) Direct beneficiaries should be more consulted and allowed to manage the aid to fit local conditions best. This include both equipment, building and training programes.

(2) Experts should be qualified both in terms of technical knowledge, communication skills, and social adjustment ability.

Conclusion

Skills development training is essential to the human resource development of the country. The Sixth National Development Plan identifies human resource and labour force development

as one of the objectives. Both government and non-government agencies work together in providing vocational and short course training for self-employment. Since skill development training has been one of the main activities of the Department of Labour, the recommendation here is especially for the Department of Labour to be given the responsibility to act as the central institution cooperating with other agencies in skill development and short-course training. The cooperation will also facilitate centralization and dessemination of information among related agencies.

In the northeastern region, KISD has been able to function relatively well. The Japanese assistance has been instrumental in enabling KISD to build up the infrastructure and the capability in terms of developing workshop system and formulating workshop discipline in the initial phases. At the same time alteration and adjustment to the Thai sociocultural setting has also been made, though only, to an extent possible within the framework of original bilateral agreement.

§2 Assessment and Recommendations from the View of Thai-Japanese Cooperation

It can be concluded at present that:

(1) KISD is well-sustained and localized to be active in adjusting itself with changing environment since JICA phased out.

(2) Job opportunities are still insufficient in the northeastern region for the ex-trainees of KISD, but KISD does contribute to reducing unemployment/underemployment of the region by providing trainees with opportunities to get job in the national labour market which is recently fast expanding.

(3) Instructors are now sufficient to enable KISD to be the center of intensive practice-oriented skill training in the region, although upgrading of instructors should be reinforced.

(4) KISD maintain high reputation among local industries and the demand for its pre-employment training is as high as before.

However, new problems are emerging. They are firstly, the outdated or obsolete equipment and materials for training; secondly, the increasing difficulty for ex-trainees of KISD to get job in modern large/medium industries which become more demanding than before in educational background of the workers to be recruited; thirdly, the inadequate capability of KISD to monitor changing needs and labour market for the purpose of further improving its activities; and forthly, the greater need of coordination among various institutions engaged in skill development, training, education and industrial promotion at the provincial level.

From the viewpoint specifically of Japanese cooperation, the followings can be pointed out:

(1) The team of JICA experts has paved the way to sustained development of KISD particularly through adjusting the original plan agreed between two governments to the existing realities in terms of real skill requirements for target workers and through transferring not only practical training method using equipment and job sheets but also training attitude; skill practice by instructors, preparation and structuring of each training session and two-way communication between instructors and trainees.

(2) In addition, the group is appreciated by the present KISD staff for its invisible but valuable contribution to the introduction of discipline, efficiency and consistency in the administrative management especially at middle level.

In view of these concluding remarks, it should be worth considering that:

(1) Further strengthening and upgrading of the projects implemented and assisted in the past are at least as important and effective as creating new projects in so far as the past assisted projects are well-sustained and localized as seen in the case of KISD.

(2) Whereas some say that Japanese assistance is intensive in physical components and disoriented toward institution building, the case of KISD demonstrates that buildings and machines are effectively utilized as long as host agency is viable and willing to sustain its project and that Japanese technical cooperation can make intangible contribution to increasing management efficiency of existing institutions. This aspect might as well be highlighted more in attaining a more effective cooperation between Thailand and Japan.

ANNEX

ANNEX I

DEPARTMENT OF TECHNICAL AND ECONOMIC COOPERATION
Krung Kasem Road, Bangkok, Thailand
Cable: DTEC.
TEL.: 817555

No. 1704 (1)/11272

The Department of Technical and Economic Cooperation presents its compliments to the Embassy of Japan and has the honour to request, on behalf of the Department of Labour for the Government of Japan's assistance for Establishing an Institute for Skill Development in the Northeast of Thailand Project under the Technical Cooperation Schemes of the Colombo Plan.

Enclosed herewith are 5 copies of the project request for the Government of Japan's consideration.

The Department of Technical and Economic Cooperation avails itself of this opportunity to renew to the Embassy the assurances of its highest consideration.

DEPARTMENT OF TECHNICAL AND
ECONOMIC COOPERATION

August 5, B.E. 2519

Encls.

The Embassy of Japan,
Bangkok

cc : The Colombo Plan Bureau,
12, Melbourne Avenue,
Colombo 4, Sri Lanka

DEC-II.CP
Tel. 2811031

RBC/P1

TENTATIVE PROPOSALS

FOR ASSISSTANCE FROM THE JAPANESE GOVERNMENT FOR ESTABLISHING AN INSTITUTE FOR SKILL DEVELOPMENT IN THE NIRTH EAST OF THAILAND

DEPARTMENT OF LABOUR
MINISTRY OF INTERIOR

THAILAND

TABLE OF CONTENTS

	Page
Justification for the Project	68
Government's National Economic Plans	68
Existing Educational Vocational Institutions in North Eastern Thailand	69
Enrolments in Vocational Schools In the Period – Table 1	70
Enrolment in Vocational Schools and Mobile Trade Training – Table 2	70
Mobile Trade Training Schools (M.T.T.S)	71
Proposed Thai/Japanese Project	71
Work Plan	72
ANNEXES	80

Background and Supporting Information

1. Justification for the Project

This Project Document is a request from the Government of Thailand (to the Government of Japan) for assistance to establish a Regional Vocational Training Centre in Khon Kaen for the further development of skills training activities to the rural sector in the North Eastern Region of Thailand, and, as an attempt to diversify the economy in this Region by encourging new industrial development. In order to stimulate industrial development in Thailand, the Board of Investment (BOI) have fixed industrial promotion zones throughout the Country and three of these zones are fixed for the North Eastern Region of Thailand.

Although there are 17 vocational educational schools in this Region, there are no industrial skills training institutes. Vocational Education is considered to be an integral part of a continuing overall general education system without specializing in any particular field of trade or craft. On the other hand, industrial skills training is essentially aimed at providing the practical skills and knowledge required for tenumverative employment and, for upgrading skilled tradesmen and for training the unemployed and retraining the redundant. Skills training as implemented by the Department of Labour is geared to the needs of the employee and the employer. The Training Institute's close liaison with the employers and workers ensures that training is relevant to employment needs. The Department of Labour is also responsible for the establishment of National Trade Standards which are essential for establishing levels of skills attainment acceptable for employment.

2. Government's National Economic Plans

According to the National Economic Development Board population projections it is estimated that the population of Thailand by 1976 will be 43.6 million, which is an increase of approximately of 6 million people during the Third Five Year Plan (1971-1976) at an average increase of approximately 3% per year. This rapid increase of population creates social and economic and political problems due to the lack of adequate education and training and employment opportunities. The strength of the labour force in 1970 has been assessed to be over 14 million and a projected increase in the labour population is estimated at 2.5 million by 1976. The Government is currently preparing the Fourth Five Year National Plan for 1977 to 1981, and, due to the current social, economic and political situation in Asia and the recession in trade in general, the problems of adequate education, training, and employment, are being further aggravated, and, being aware of this, Government contribution is expected for establishing at least three other Institutes for Skill Development in the Northeast lower North and the South of Thailand.

In a seminar held in Khon Kaen in September 1975, sixteen Governors from the North Eastern Provinces (estimated at 12 million people in 1970 and the highest birth rate in Thailand

of 3.3% per year) expressed their concern that 90% of the labour force in this region were involved in farming only, and, they proposed that a serious attempt must be made to promote small and large scale industrial development in the North Eastern Region in order to diversify the activities of the economy.

One of the recommendations proposed by the Mission in 1972 was that a Multi-purpose Workshop be set up in the Northeast to be run by the Department of Labour through the Regional Labour Office there. The intention being that the workshop will take care of the needs for employable skills not being met by other vocational training institutions or by industry. This workshop was to be established as soon as possible, and, it was recommended that there should be close liaison between the workshop and the employers in preparing relevant training programmes for apprenticeship, in-plant and on-the-job training.

The mission's recommendation anticipated a very substantial expansion of industry in the Northeast Region and that "hundreds of thousands of new employments have to be generated", and, the worker must be given employable skills to fit the job, and, that the output from the Vocational Schools will be unable to meet the skills training required.

3. Existing Educational Vocational Institutions in North Eastern Thailand

(1) The University of Khon Kaen was established in September 1965 and has faculties in Agriculture, Engineering, Medicine, Nursing, Education, and Science. The number of graduates is approx. 5,000.

(2) There are 17 Vocational Schools covering the North Eastern Region. The student output and courses implemented are listed on table 1 page 4.

(3) There are 16 Mobile Trade Training Units implementing courses in auto-mechanics, electrical, radio and T.V. repairmen, welding and sheet metal. (Student output Table 2 page 5).

Table 1

Enrolment in the Vocational Schools in the Period 1973 to 1976, by Trade and Year, Projections

Trade	Enrolment			
	1973	1974	1975	1976
Building and Construction	1,809	1,604	1,406	1,223
Auto-Mechanics and Diesel Mechanics	731	850	962	1,031
Electricians	363	413	519	720
Industrial Design	135	162	162	162
Radio and Tele Communications	398	420	470	565
Metal, Work, Machine Shop	646	598	691	713
Sheet Metal Work, Welders	506	719	764	831
TOTAL	4,588	4,766	4,974	5,245

Source: Department of Labour

Table 2

Enrolment in Vocational Schools and Mobile Trade Training Units in the North East Region in 1972, by Trade

Trade	Enrolment 1972	
	Vocational Schools	Mobile Trade Training Unit
Construction and Building	1,943	–
Auto-Mechanics	643	592
Electricians	363	174
Radio and Tele-communications	353	–
Radio Repairmen	–	360
Radio and T.V. Repairmen	–	12
Metal Work, Machine Shop	528	–
Sheet Metal Work, Welders	506	261
TOTAL	4,327	1,399

Source: Department of Vocational Education

4. Mobile Trade Training Schools (M.T.T.S.)

The MTTS's are under the Adult Education Division of the Ministry of Education. The programme began in 1965 to provide occupational and home making skills for the rural out-of-school youths and adults. It is mainly directed to primary school leavers who do not continue in formal education.

Skills training is offered in a variety of trades such as:—

(a) Auto-Mechanics
(b) Electrical
(c) Carpentry
(d) Sheet-Metal & Welding
(e) Radio & T.V.
(f) Book-keeping and typing
(g) Dress-making & trailoring
(h) Hair dressing & cosmetics
(i) Cooking

Courses implemented are of 300 hours duration spread over 5 months and cover basic specific skills. More advanced skills training courses are offered to those taking an additional 300 hours of training.

There are 41 MTTS in Thailand and this project was developed with the assistance of U.S.O.M. The Regional Polytechnic Schools served originally as the coordinating centres for the MTTS's and assisted with training.

Proposed Thai/Japanese Project

It is tentatively proposed by the Department of Labour that during the Government's Fourth Five Year Plan, that is between 1977 and 1981, that additional Regional Institutes for Skill Development should be established for the further development of skills training activities to the reral sectors of Thailand. It is proposed that at least three additional Institutes should be established; one in the Northeast, one at Nakorn Sawan and, another in Southern Thailand, probably Heavy Yai or Songkla.

5. North Eastern Regional Institute for Skill Development

It is proposed to locate the Institute in Khon Kaen to serve the provinces in the North Eastern Region of Thailand.

Khon Kaen is being planned to be the centre of all the commercial, industrial, and ad-

ministrative activities in the Northeast part of Thailand.

It is estimated that the total population in the North Eastern Region will be approximately 14.6 million by 1976 as compared with 12,365,000 in 1970. It should be noted that the population in the Northeast amounts to more than 35% of the total population in Thailand.

6. Objectives of the North Eastern Regional Institute for Skill Development

The North Eastern Regional Institute is proposed to serve the fast growing North Eastern Region of Thailand, and, it will be planned to contribute to the training requirements of the unemployed, untrained semi-skilled and skilled manpower for stimulating the development of the local economy, and, to encourage self-employment and industrial and rural development in general.

7. Immediate Objectives

(a) With the advice of NISD staff and Japanese experts, the detailed overall planning of the Northeast Institute for Skill Development.

(b) The training of instructors and administrative personnel to staff the centre.

(c) The preparation of detailed equipment lists for each workshop.

(d) Prepare a full range of training and re-training courses relevant to the employment needs of the Region for skills training, upgrading, and foreman/supervisory training, trade testing standards, etc.

(e) Preparation of training aids for the various training courses such as technical literature, models, drawings, etc.

8. Quantitive Terms

In quantitive terms the project objectives are to provide the Northeast Region of Thailand with skilled manpower for employment in a variety of engineering and building skills and to contribute to a more effective utilisation of the investments made by industry, agriculture, and other services in developing further employment opportunities.

Work Plan

Timing of all the activities to be undertaken by the project will depend on a number of

factors including the joint approval of the Government of Thailand and the Government of Japan on it, and, when the centre should be established.

9. Tentative Work Plan

	Project Activities	Location	Starting Date	Duration
a.	Detailed planning of the centre's construction	Japan/ Bangkok	1976	12 months
b.	Preparation of equipment lists	Bangkok	June 1976	3 months
c.	Start of construction of the centre	Northeast	January 1977	10 months
d.	Equipment procyrement	International	February 1977	9 months
e.	Equipment installation	Northeast	October 1977	3 months
f.	Staff and Administrative Training	NISD	April 1977	9 months
g.	Start of Training Courses	Northeast	January 1978	Continuous
h.	Fellowships (24) Duration 3 to 10 months	Japan	From 1977 spread over 36 months	
i.	Introduction of National Trade Testing Standards	Northeast	From 1978	Continuous
j.	Arrival of Expert Project Manager	Bangkok/ Northeast for planning	From 1976	42 months
k.	Expert Auto/Agro Mechanics	Northeast	October 1977	30 months
l.	Expert Welding/Sheet-Metal	Northeast	October 1977	30 months
m.	Expert Machine Shop/Fitting	Northeast	October 1977	30 months
n.	Expert Electrical/Electronics	Northeast	October 1977	30 months
o.	Expert Building Construction	Northeast	October 1977	30 months

10. Government of Thailand Inputs

Lands

The Royal Thai Government has already provided approximately 30 rais of land in the North Eastern Province for the establishment of the North Eastern Regional Institute for Skill Development.

Recurrent Costs

As with the Thai/UNDP/ILO phases 1 and 2 projects the Government's contribution will

include the approval of budget for the implementation of the projects' activities including the recurring expenditure for salaries of the Thai personnel employed at the Instutute and the consummable materials required for training and administration and other general renning costs of the Institute. The recurrent costs will increase each year from 1977 until the Institute reaches its maximum training output in 1981 (see Government's Inputs). Recurrent costs will be adjusted to reflect any increases in staff salaries and consummable material.

As the training activities of the Institute increases during the second & third year of operation the staff will eventually consist of:–

(1)	Director	1
(2)	Deputy Director	1
(3)	Chiefs of Workshops	5
(4)	Professional & Technical Staff for in-plant, trade testing and foreman training, etc.	6
(5)	Auto/Agro Mechanic Senior Instructors/instructors	8
(6)	Electrical/Electronics/Senior Instructors/Instructors	7
(7)	Sheet-Metal/Welding Senior Instructors/Instructors	8
(8)	Construction -- Building/Carpentry Senior Instructors/Instructors	8
(9)	Administration and Supporting Personnel	14
(10)	Drivers, cleaners, guards	10
	Approx. Total	68

It is estimated that the total staff by 1981 will be 73. Estimated recurrent costs for the North Eastern Regional Institute for Skill Development are approx. 15 million Baht for the period of five years.

Training Courses

Training courses to be implemented at the Institute will be flexible and of short duration similar to the ones implemented at the NISD and other Regional Training Institutes. There will be a gradual build-up of number of trainees from approximately 300 in 1978 until approximately 700 in 1981.

Courses will include the basic engineering and building trades ones and upgrading and in-plant training courses. (See Annexes for estimated numbers to be trained at NISD, Ratchaburi, Cholburi, Lampang, Khon Kaen, Nakorn Sawan and Songkla).

11. Description of the Government of Japan's Inputs Construction of the north Eastern Regional Institute for Skill Development (1977)

(1)	Administration Block	Approx.	2,500,000	Baht
(2)	Workshops and classrooms	Approx.	14,000,000	Baht
(3)	Canteen facilities	Approx.	500,000	Baht
(4)	Dormitories	Approx.	3,000,000	Baht
(5)	Staff housing	Approx.	2,000,000	Baht
(6)	Security fence	Approx.	860,000	Baht
	Estimated 1977 Total cost approx.		23 million	Baht
		= U.S.	$1,150,000	

It is tentatively planned that the construction of the Skills Training Institute commence in January 1977 with completion in October/December 1977. The estimated costs for the Institute are based on available information at the time of drafting this project proposal. The cost of building the Ratchaburi Regional Institute is used as a guide for determining the construction and equipment costs, and, additions have been made to reflect the continuing escalation in these costs.

Assignment of Experts from Japan

Job description for the project manager and five experts will be submitted following discussions with the appropriate Japanese Government officials.

Total Expert Component:-

	Location	Starting Date	Duration
a. Project Manager	Bangkok/ Northeast	July 1976	42 months
b. Expert Auto/Agro Mechanics	Northeast		30 months
c. Expert Welding/Sheet Metal	Northeast		30 months
d. Expert Electrical/Fitting	Northeast		30 months
e. Expert Electrical/Electronics	Northeast		30 months
f. Expert Building Construction	Northeast		30 months
g. Consultants			6 months
		Total	198 months

The project manager of consultants may want to visit Bangkok and Northeast periodically during 1976 and 1978 on an advisory capacity to assist with the overall planning of the Institute. The project manager may then wish to assume full-time status as from October 1977, just prior to completion of construction of the Institute, and, for planning the staffing and initial start of

the training courses.

Equipment Component -- Estimated Costs

Skills training equipment for the following workshops:--

(a) Automotive/Agro Mechanics Workshop
(b) Welding/Sheet Metal Workshop
(c) Machine Shop/Fitting Workshop
(d) Electrical/Electronics Workshop
(e) Building Construction Workshop

Vehicles and other training and audio-visuals will be required.

To establish a similar regional skills training institute in Ratchaburi, Thailand in 1975, the estimated costs of the equipment for the workshops and for training aids were approximately U.S. $650,000. Due to the continuing escalation in equipment procurement costs, it is estimated that at least an additional 20% will be required, and the cost of equipment for the Northeast Institute 1977 is estimated at U.S. $780,000.

Equipment procurement can be spread over two years with the initial introduction of basic courses in the first year to the gradual build-up of the full-range of courses in the second year.

Fellowship Component

Twenty-four fellowships are requested for the instructing and administrative staff for the Northeast Institute.

Duration of fellowships requested will vary from 3 months duration for the Director and Chiefs of Workshops to 10 months duration for the instructors. It is requested that Director and Chiefs of Workshops should attend special seminars with the Japanese experts in Japan before the experts are assigned to Thailand. This would give both groups from Japan and Thailand the Opportunity to orientate each other about themselves and training procedures.

12. **Tentative Fellowship Programming**

Field of study/training	Total		1977		1978		1979		1980		1981	
	No.	m/m	No.	m/m	No.	m/m	No.	m/m	No.	m/m	No.	m/m
1. Voc. Training adm.	1	3	1	3								
2. Chiefs of Workshop	5	15	5	15								
3. Auto/Agro Mechanics	4	40			2	20	1	10	1	10		
4. Electrical/ Electronic & Air-Cond. Mechanic	6	60			2	20	2	20	2	20		
5. Welding	3	30			1	10	1	10	1	10		
6. Machine Shop	3	30			1	10	1	10	1	10		
7. Construction	2	20			1	10	1	10				
Total	24	198	6	18	7	70	6	60	5	50	--	--

1. **Estimated Number of Trainees for all Regional Institutes for Skill Development**

Training/Project	1977	1978	1979	1980	1981	Total
Grand Total	5,500	6,600	7,300	8,150	8,600	36,100
1. Bangkok Institute	4,300	4,500	4,500	4,500	4,500	22,300
2. Regional Institutes	1,200	2,100	2,800	3,600	4,100	13,800
2.1 Ratchburi	(700)	(800)	(900)	(900)	(900)	(4,200)
2.2 Cholburi	(400)	(600)	(700)	(900)	(900)	(3,500)
2.3 Lampang	(100)	(400)	(500)	(600)	(700)	(2,300)
2.4 Khonkhaen	–	(300)	(400)	(500)	(700)	(1,900)
2.5 Nakorn Sawan	–	–	(300)	(400)	(500)	(1,200)
2.6 Songkla	–	–	–	(300)	(400)	(700)

2. Estimated Number of Applicants for Trade Testing

Training/Project	1977	1978	1979	1980	1981	Total
Grand Total	400	700	850	950	1,000	3,900
1. Bangkok Institute	300	400	400	400	400	1,900
2. Regional Institutes	100	300	450	550	600	2,000
2.1 Ratchaburi	(50)	(100)	(100)	(100)	(100)	(450)
2.2 Cholburi	(50)	(100)	(100)	(100)	(100)	(450)
2.3 Lampang	–	(50)	(100)	(100)	(100)	(350)
2.4 KhonKhaen	–	(50)	(100)	(100)	(100)	(350)
2.5 Nakorn Sawn	–	–	(50)	(100)	(100)	(250)
2.6 Songkla	–	–	–	(50)	(100)	(150)

3. Estimated Personnel Required

Training/Project	1977	1978	1979	1980	1981	Total
Vocational Training	583	661	731	774	829	
1. Bangkok Institute	367	382	382	382	382	
2. Regional Institutes	216	279	349	392	447	
2.1 Ratchburi	(73)	(79)	(88)	(88)	(88)	
2.2 Cholburi	(63)	(64)	(73)	(88)	(88)	
2.3 Lampang	(40)	(48)	(52)	(64)	(73)	
2.4 Lhonkhaen	(40)	(48)	(48)	(52)	(73)	
2.5 Nakorn Sawan	–	(40)	(48)	(52)	(73)	
2.6 Songkla	–	–	(40)	(48)	(52)	

4. Budget-Estimated Recurrent Costs (Baht Million)

Training/Project	1977	1978	1979	1980	1981	Total
Vocational Training	61.94	64.68	75.28	57.28	43.42	302.55
1. Bangkok Institute	37.04	16.53	15.92	16.71	17.53	103.58
2. Regional Institutes	24.90	48.15	59.41	40.57	25.94	198.97
2.1 Ratchaburi	(9.07)	(4.65)	(5.48)	(4.98)	(5.22)	(29.40)
2.2 Cholburi	(12.25)	(4.30)	(4.43)	(5.01)	(5.22)	(31.21)
2.3 Lampang	(1.58)	(13.51)	(3.00)	(3.68)	(4.12)	(25.89)
2.4 Khonkhaen	(2.00)	(3.05)	(3.15)	(3.16)	(4.12)	(15.48)
2.5 Nakorn Sawan	–	(22.64)	(18.45)	(3.46)	(3.47)	(48.02)
2.6 Songkla	1	1	(24.90)	(20.28)	(3.79)	(48.97)

Annex II

Work Schedule at KISD (26 June – 6 July 1988)

26 June : Travelled to Khon Kaen

27 June : Interviewed director and administrative staff of KISD

28 June : Interviewed new applicants and ex-trainee working at Khon Kaen University

29 June : Interviewed instructures and trainees at KISD

30 June : Interviewed manager of the Kho yoo Ha Company Ltd.
(This company relate to automobile service and repairmen)

1 July : Interviewed ex-trainees working at the Kho Yoo Ha Company Ltd.

2 July : Interviewed manager of the Khon Kaen Fishing Net Company Ltd. and ex-trainees working in this enterprise.

3 July : (Sunday off) Collecting interviewed data

4 July : – The Pheonix Pulp and Paper Company Ltd.
(Interviewed administrative staffs and ex-trainees working in this plant)
– Interviewed Director of Khon Kaen Electricity Generations Authority of Thailand and ex-trainees working in this enterprise

5 July : Interviewed ex-trainees operating their own enterprises
– Car repair (2 shops)
– Car auto-air repair
– Radio repair shop
– Welding shop

6 July : Back to Bangkok

Annex III

Name of Interviewees

1. Khon Kaen Institute for Skill Development

1.1 Administrative staff

Name	Position
1. Mr. Somchart Lekhalawan	Director
2. Mr. Kabin Trithip	Chief of Training and Coordinating Section
3. Mr. Panich Chitchieng	Chief of Auto Mechanics Section
4. Mr. Kasem Vises	Chief of Machine Section
5. Mr. Raywat Kamnonsin	Chief of Building Construction Section
6. Mr. Tanapol Charoensuk	Chief of Electrical and Electronics Section
7. Mr. Suwicha Sriabhanon	Training and Coordinating Staff
8. Ms. Kayoon Kanarungrueng	Training and Coordinating Staff
9. Ms. Wanida Jaree	Training and Coordinating Staff

1.2 Instructors

Name	Division
1. Mr. Nony Wongsuparp	Plumbing
2. Mr. Boontam Arbnak	Furniture Making
3. Mr. Tongdang Kaewkamtong	Agricultural Machine
4. Mr. Prasert Tunyacharoen	Welding
5. Mr. Bunjong Jetiyanond	Electronical
6. Mr. Surat Palanunta	Carpentry
7. Mr. Arun Sornpanya	Agricultural Machine
8. Mr. Kosit Thaware	Mechinist
9. Mr. Damrong Tipsingha	Electrical
10. Mr. Somboonsuk Nakirak	Diesel Engine
11. Mr. Panom Punsoke	Architecture Drawing

1.3 On-goin trainees

Name	Field
1. Mr. Supot Hankam-ouy	Carpentry
2. Mr. Tantawan Nagkam	Machinist
3. Mr. Samniang Poynok	Machinist
4. Mr. Suwan Siribamrung	Electronics
5. Mr. Sitisak Pratangtani	Diesel Engine
6. Mr. Rittikrai Potipassa	Pipe and Sanitary

7.	Mr. Satan Atiratana	Furniture Making
8.	Mr. Atisak Depajit	Car Body Painting
9.	Mr. Prajak Choekamhod	Welding
10.	Mr. Sirat Chamnongnit	Refrigerating

1.4 New applicants

	Name	Field
1.	Mr. Sumrit Unnongkung	Car Body Repair
2.	Mr. Ratana Kaomim	Diesel Engine
3.	Mr. Leuchai Pakam	Car Body Repaire
4.	Mr. Tawee Sakotra	Car Body Repair
5.	Mr. Prasat Srikratum	Gasoline Engine
6.	Mr. Charoensin Muang nil	Plumbing
7.	Mr. Tawee Saiban	Plumbing
8.	Mr. Samarn Bunjunang	Welding
9.	not recorded	Gasoline Engine
10.	not recorded	Electrical
11.	not recorded	General Fitting
12.	not recorded	Masonry
13.	not recorded	Lathe Operation

2. Ex-trainees

2.1 Private employees

		Field
1.	Mr. Somsak Nondang	Pipe and Sanitary
2.	Mr. Apichart Nakacharoen	Lathe Operation
3.	Mr. Sompong Piensupong	Welding
4.	Mr. Somjit Sontom	Lathe Operation
5.	Mr. Supan Koteyota	Agricultural Machine
6.	Mr. Sombat Bhumibutra	Gasoline Engine
7.	Mr. Songkran Pengmo	Sheet Metal
8.	Mr. Somporn Chantasorn	Welding
9.	Mr. Rungsarit Damcharoen	Lathe Operation
10.	Mr. Wasna Suwanchala	Electrics
11.	Mr. Wibul Palabraksa	Diesel Engine
12.	Mr. Supan Sornwinit	Diesel Engine
13.	Mr. Sanga Promsoda	Gasoline Engine
14.	Mr. Paisant Senamoutri	Diesel Engine
15.	Mr. Somkiat Kaewrakchoung	Lathe Operation
16.	Mr. Watana Punnoi	General Fitting

2.2 Public enterprise

1. Mr. Somsak Chansom	Motor Control
2. Mr. Sompong Duangsri	Masonry
3. Mr. Prayong Bunsri	Electrical Equipment Repair
4. Mr. Panus Chaibun	Gasoline Engine
5. Mr. Pichai Hongka	Electrics

2.3 Shop owners

1. Mr. Manun Buntasuti	Refrigeratering Repair
2. Mr. Prayat	Engine/Lathe Operation
3. Mr. Somkiat Kamma	Radio/TV Repair
4. Mr. Sompong Permwilai	Lathe Operation
5. Mr. Singtong Promsoda	Sheet Metal

3. Local enterprises

1. Manager of Kow Yoo Ha Company LTD.
2. Director Manager of the Phownise Pulp and Paper Co., LTD.
3. Director of Khon Kaen Electricity Generating Authority of Thailand
4. Manager of Khon Kaen Fishing Net Co., LTD.

4. National Institute for Skill Development

Name	Position
1. Mrs. Amporn Junenanond	Director
2. Mrs. Chariya Khanthavit	Chief Planning and Curriculum Development Branch
3. Mr. Kovit Buratathamin	Staff of Planning and Curriculum Development Branch
4. Mr. Udom Kednaratkul	Chief of Planning and Project Unit

5. National Economic and Social Development Board

1. Mr. Phayap Phyomyon
   Director of Technology and Environmental Planning
2. Mr. Narong Nitayaphorn
   Director of Economic Project Division

Annex IV Reference Statistics

Table A-1

BUDGET OF "KISD"

A.D.	BAHT.
1978	6,251,055
1979	4,215,450
1980	6,919,030
1981	5,618,055
1982	6,645,765
1983	7,362,645
1984	7,180,000
1985	7,558,080
1986	8,087,220
1987	6,969,080

Source KISD

Table A-2 Number of Personnel involved in the KISD compare with other ISD by year (1981-1986)

ISD	1981		1982		1983		1984		1985		1986	
	off	per	off	per	off	per	off	per	off	per	off	per
NISD	176	89	178	99	159	90	160	94	166	104	146	90
Ratchaburi	38	40	35	41	35	41	41	40	45	43	44	43
Cholburi	37	35	35	42	43	41	43	45	41	47	44	49
Lampang	35	34	35	27	43	38	44	39	45	43	46	43
KhonKaen	33	41	37	44	37	46	37	50	41	48	39	50
Songkhla	30	22	38	29	40	33	39	37	39	37	39	41
Nakornsawan	–	–	–	–	21	7	29	29	40	33	40	37
Total												

Source : National Institute for Skill Development, Department of Labour
Note : off = official
per = permanent employees

Table A-3 Number of personnel involved in the KISD in fiscal year 1988 by Type of work

Type of work	Official	permanent employment	Total
1. Director	1	–	1
2. General Administration	10	26	36
3. Training Coordination	7	–	7
4. In-plant Training	6	–	6
5. Automobile section	4	7	11
6. Machinery section	6	8	14
7. Architecture/Construction section	4	6	10
8. Electricity/Electronic section	5	6	11
Total	43	53	96

Source: KISD

Table A-4 Number of trainees from 1979 to 1986 separated by Institute for skill Development (for all of activities)

ISD	1979	1980	1981	1982	1983	1984	1985	1986	Total	%
NISD	6,186	5,484	6,481	7,746	7,944	7,795	8,626	8,395	58,657	(48.9)
Rachburi	1,009	1,195	1,468	1,536	1,834	2,002	2,498	2,240	13,782	(11.0)
Cholburi	1,469	1,402	1,531	1,867	2,084	1,961	2,415	2,548	15,277	(12.2)
Lampang	910	983	1,129	1,692	2,071	2,108	2,109	1,949	12,951	(10.3)
Khon Kaen	197	868	1,108	1,610	1,917	2,184	2,071	2,629	12,584	(10.1)
Songkhla	–	–	82	541	935	1,468	1,872	2,067	6,965	(5.6)
Nakornsawan	–	–	–	–	144	625	1,338	2,818	4,925	(3.9)
Total	9,771	9,932	10,691	14,992	16,929	18,143	20,929	22,655	125,141	

Source: National Institute for Skill Development, Department of Labour

Table A-5 % of graduates from ISD from 1979 – 1986 separated by ISDs (for all of activities)

ISD	1979 %	1980 %	1981 %	1982 %	1983 %	1984 %	1985 %	1986 %
NISD	82.8	87.2	85.8	78.8	77.2	75.0	72.4	73.2
Ratchaburi	77.8	68.9	80.2	68.9	68.7	66.7	75.0	63.2
Cholburi	80.0	87.6	84.1	75.7	74.4	76.1	77.4	76.3
Lampang	66.9	74.9	74.0	61.9	68.2	76.9	77.5	78.9
Khon Kaen	44.7	82.8	58.6	74.8	59.6	70.2	74.0	77.1
Songkhla	–	–	–	63.8	60.0	69.4	74.0	74.4
Nakornsawan	–	–	–	–	69.4	68.2	75.4	83.2

Source = NISD, Department of Labour

Table A-6 Staff of KISD in fiscal year 1988

Position		Number
1. Director		1
2. Administration section		36
2.1 Chief	1	
2.2 Secretariat	3	
2.3 Monetary, building and vehicle	6	
2.4 Permanent employees	26	
3. Training Coordination Section		7
3.1 Chief	1	
3.2 Planning and evaluation	2	
3.3 Enrollment and coordination	2	
3.4 Audio visual	2	
4. In-plant section		6
4.1 Chief	1	
4.2 In-plant training	2	
4.3 Non-technical training	3	
5. Auto Mechanic section		11
5.1 Chief	1	
5.2 Auto-engine	2	
5.3 Agro-machine	1	
5.4 Permanent employees (trainers)	7	
6. Machine section		14
6.1 Chief	1	
6.2 Machinery	3	
6.3 Sheet metal and welding	2	
6.4 Permanent employees	8	
7. Building construction Section		10
7.1 Chief	1	
7.2 Carpentry	2	
7.3 Construction	1	
7.4 Permanent employees	6	

Annex V

GLOSSARY

1. Activities of the KISD

1.	ฝึกเตรียมเข้าทำงาน	Pre-employment training
2.	ฝึกยกระดับฝีมือ	Up-grading training
3.	ฝึกในกิจการ	In-plant training
4.	การทดสอบฝีมือ	Trade testing

2. Courses Trained in the KISD

1.	ช่างประปา	Plumbing
2.	ช่างปูน	Masonry
3.	ช่างสี (อาคารและเฟอร์นิเจอร์)	Painting (Building paint and furniture paint)
4.	พนักงานอัดฉีดรถยนต์	Car service
5.	ช่างเชื่อม	Welding
	ช่างเชื่อมไฟฟ้า	Arc welding
	ช่างเชื่อมแก๊ส	Gas welding
6.	ช่างโลหะแผ่น	Sheet metal
7.	ช่างยนต์ดีเซล	Diesel engine
8.	ช่างยนต์เบนซิน	Gasoline engine
9.	ช่างกลการเกษตร	Agro-machines
10.	ช่างเคาะพ่นสีรถยนต์	Car body repair
11.	ช่างไม้ก่อสร้าง	Carpentry
12.	ช่างไม้ฝีมือครุภัณฑ์	Furniture making
13.	ช่างกลึง	Lathe operator
14.	ช่างเครื่องมือกล	Mechanical fitting
15.	ช่างปรับ	General fitting
16.	ช่างซ่อมวิทยุโทรทัศน์	Radio and TV repair
17.	ช่างซ่อมเครื่องทำความเย็นและเครื่องปรับอากาศ	Refrigerator and air-conditioning repair
18.	ช่างปรับแต่งเครื่องยนต์	Engine tune-up
19.	ช่างไฟฟ้าในรถยนต์	Auto-electrical
20.	ช่างบำรุงรักษารถยนต์	Car first aids
21.	ช่างเครื่องมือวัด	Measuring instrument
22.	ช่างกลึงเกลียวมาตรฐาน	Standard thread turning
23.	ช่างกลึงเรียว	Taper turning

24.	ช่างกัดเฟืองตรง	Spur gear cutting operator
25.	ช่างซ่อมบำรุงเครื่องจักรกลโรงงาน	Maintenance machine tool
26.	ช่างปรับแต่งปั๊มหัวฉีดเครื่องยนต์ดีเซล	Diesel injection pump and injection mechanic
27.	ช่างโป๊วสีรถยนต์	Car body filling mechanic
28.	ช่างเครื่องยนต์เล็ก	Small engine mechanic
29.	ช่างเชื่อมไฟฟ้าท่าราบ	Flat position arc welding
30.	ช่างเชื่อมไฟฟ้าท่าขนานนอน	Horizontal position arc welding
31.	ช่างเดินสายไฟฟ้าในอาคาร	Electrical wiring installation
32.	ช่างสายอากาศโทรทัศน์	T.V. antenna
33.	ช่างวงจรไฟฟ้า AC และ DC	AC/DC electrical circuit
34.	ช่างวงจรเครื่องทำความเย็น	Refrigerating circuit
35.	ช่างมอเตอร์ยกเดี่ยว	Single phase motor
36.	ช่างมอเตอร์ยกสามสาย	Three phase motor
37.	ช่างทรานซิสเตอร์	Transistor
38.	ช่างอ่านแบบ	Blueprint reading
39.	ช่างเขียนแบบ	Drafting
40.	ช่างติดตั้งสุขภัณฑ์	Sanitary installation
41.	ช่างต่อท่อประปา	Pipe fitting
42.	ช่างเครื่องจักรกลงานไม้ครุภัณฑ์	Wood working machine
43.	ช่างประเมินราคาก่อสร้าง	Construction cost estimation
44.	ช่างเทคนิคการเคลือบผิว	Finishing
45.	ช่างทำอิฐบล๊อค	Block brick-making
46.	ช่างทำรางน้ำฝน	Iron sheet for rain water collection
47.	ช่างซ่อมอุปกรณ์ไฟฟ้า	Electrical equipment repair
48.	ช่างปูนเทคนิค	Technical masonary
49.	ช่างควบคุมหม้อน้ำ	Standard power control
50.	ช่างทำดอกไม้ประดิษฐ์	Artificial flower making
51.	พนักงานเสริฟอาหาร	Restaurant attendants
52.	อบรมหัวหน้างาน	Foreman training
53.	พนักงานต้อนรับ	Receptionist
54.	พนักงานขับรถ	Car driver
55.	ผู้ช่วยแม่บ้าน	Domestic help
56.	อนุบาลเด็ก	Child care
57.	พนักงานโรงแรม	Hotel service

58.	อบรมแม่บ้าน	House-wife training
59.	เลขานุการ	Secretary
60.	ช่างไม้ก่อสร้าง	Carpentry