No. 01

Ex-post Evaluation Report

on

The Project on Research Center for Communications and Information Technology of KMITL

February 2006

Japan International Cooperation Agency
Thailand Office

Kaihatsu Management Consulting (Thailand) Ltd.

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Pictures of ReCCIT Activities

1. Main Office of ReCCIT on the 9th -10th Floor of the Office of the President Building, KMITL
2. ReCCIT Logo

3-5 Research Lab facilities and equipment

6-8 ReCCIT academic and research activities

9. Individual booth for academic staff, researchers, and graduate students
10. Evaluation Team interviewing academic staff members
11. Interviewing graduate students

1. Outline of the project		
Country: Thailand		**Project title:** The Project on Research Center for Communication and Information Technology (ReCCIT), King Mongkut's Institute of Technology, Ladkrabang (KMITL), The Kingdom of Thailand
Issue/Sector: Information and Communication Technology		**Cooperation scheme:** Project-type Technical Cooperation
Section in charge: First Technical Cooperation Division, Social Development Cooperation Department		**Total cost:** 966 Million Yen (not including the cost for 9 Long-term Experts, 134 Short-term Experts, 35 Trainees)
Period of Cooperation:	October 1, 1997- September 30, 2002	**Partner Country's Implementing Organization**: King Mongkut's Institute of Technology, Ladkrabang, Ministry of University Affairs (now Office of Higher Education Commission, Ministry of Education
Related Cooperation:	Project-type Technical Cooperation	

1-1 Background of the Project

The Project was the 4th Project-Type Technical Cooperation extended to the King Mongkut's Institute of Technology Ladkrabang (KMITL) since 1961. It was emerging that the needs of researchers and engineers having adequate capabilities to conduct advanced research and development were increased under industrial restructuring in Thailand. Particularly, the needs of human resources in the field of communication and information technology (CIT) were rapidly increasing with the expansion of market and economic growth in Thailand.

1-2 Project Overview

Based on the background information, the Royal Thai Government, in 1966, submitted the request to Japan for implementation of Project-type Technical Cooperation aiming at strengthening KMITL's research capability by establishing a research center for communication and information technology. In response to the requests, the Japanese Government conducted a preliminary study in 1996 and a long-term study in 1997. Based on the results of these studies, the Record of Discussion (R/D) was signed between Japanese Implementation Study Team and KMITL on the Project in July 1997 and in October of the same year the Research Center for Communication and Information Technology (ReCCIT) in KMITL was established.

(1) Overall Goal

KMITL reaches to international level in the field of communication and information technology and related fields (*the Field) at the Research Center for Communication and Information Technology and the Laboratories

(2) Project Purpose

1) The research capability of the Field in the ReCCIT and the Laboratories is strengthened up to international level.
2) The research program of the Field in the ReCCIT and the Laboratories for graduate studies are upgraded to international level.

(3) Outputs

1) More advanced researches in the Field is conducted in the ReCCIT and the Laboratories under the appropriate research management system;
2) The updated facilities/equipment/materials are available in the ReCCIT and the Laboratories.
3) Revised research programs for graduate studies in the Field are conducted in the ReCCIT and the Laboratories.
4) Cooperation in research of the Field is expanded between the ReCCIT and other domestic and international organizations.
5) Administrative management of the ReCCIT is established.
6) Financial source of the ReCCIT is secured.

(4) Inputs	
Japanese side:	
Long-term Experts	9
Short-term Experts	134
Trainees received (Counterpart training in Japan)	35
Equipment Japan Budget Accompany Equipment Local Budget	966 Million Yen
Local Cost	18,182,107 Baht
Thai Side:	
Counterparts	42
Land and Facilities	3200 Square meters on the 8th-10th Floor of KMITL Office of the President Building
Local Cost KMITL DTEC	 61,061,920 Baht 1,796,567 Baht
Training Cost	

2. Evaluation Team

Member of Evaluation Team	Professor Dr. Chaiyong Brahmawong Kaihatsu Management Consulting (Thailand) Ltd.	
Period of Evaluation	3 October 2005 – 28 February 2006	Type of Evaluation: Ex-Post Evaluation

3. Result of Ex-Post Evaluation

3-1. Summary of Ex-Post Evaluation Result

(1) Impact

The impact of the Project was moderate in terms of the attainment of the overall goal. The overall degrees earned at the ReCCIT laboratories in relation to those of the Faculty of Engineering have increased, but not so impressively when comparing between the Project period and the period after Project completion. During the Project period (1998-2002), there were 9 Doctors and 157 Masters, while after the Project completion, (2003-2004), there were 9 Doctors and 139 Master. However, between the 5-year Project period from 1998 to 2002 and the 3-year period after the Project completion from 2003-2005, it is found that the percentage of Doctoral degrees earned increased from 64.3% to 75%, while the percentage of Master's degrees earned increased from 28.7% to 39.8%. These can be seen from Table 3-1 and 3-2 as well. Moreover, the graduate students were increased from the total of 146 (Master 117 and Doctor 29) in 2002 to 159 (Master 112 Doctor 47) in 2003 and to 165 (Master 119 and Doctor 46) in 2004, or averagely 6% increase per year.

There were some unanticipated positive impacts found relating to five aspects: (1) the promotion of academic staffs to higher professional ranks (full professor, associate professors, and assistant professors) as a result of the research work carried out at the ReCCIT; (2) the appointment of faculty member to Senior Researcher by the Thai Research Funds; (3) Knowledge gained from the ReCCIT's research were disseminated to teaching and learning in Thai colleges and universities by both academic staffs and ReCCIT graduates who were regular staffs of various higher institutions before studying at the ReCCIT for their Master degrees and Doctor degrees; (4) The ReCCIT has been regularly visited by ICT researchers, academic and professional staffs of universities in Thailand and neighboring countries, to learn the new developments of ICT contents and innovation as well as research methodology and research techniques and (5) Collaborations between KMITL/Faculty of Engineering and regional universities in "The Information Technology Bridge (IT Bridge) Project in Lao PDR" and collaboration of KMITL to ASEAN University Network – Southeast Asia Engineering Education Network (AUN/SEED-Net) Program. The contributions from ReCCIT to both IT Bridge and AUN/SEED-Net are in the form of human resources and research facilities. Many professors and lecturers from ReCCIT have provided support in many different ways to both IT Bridge and AUN/SEED-Net. Laboratories and facilities at ReCCIT have also been used to conduct research by students from both Projects as well. Since ReCCIT researchers were mainly from the Faculty of Engineering, the research works, experiences, and research skills will certainly be essential parts of the extension of activities in the regional level. This will ultimately bring forth to further collaborations with other universities to help upgrade research and capabilities.

(2) Sustainability
The technical sustainability of the Project is evaluated as high because the ReCCIT staff's technical skills/capability of the Field and Laboratory in doing research and in upgrading research programs are maintained up to the international level. The ReCCIT's researches are continuously and gradually recognized by the research communities both in Thailand and abroad, as evidenced from the increasing number of research work that were published in international journals and the increasing number of the research papers that were accepted and presented in international conferences after the Project period. The average number of research work and publications per year during 2003-2005, was 29.4 papers higher or increased by 26.11% as compared to those during the Project period. Besides, technical skills in maintaining or upgrading the equipment provided by the Project are considered sufficient through observation of staff's capabilities in maintaining and modifying equipment for daily utilization.

The organizational sustainability is evaluated maintained considering that, though the ReCCIT status has not yet been upgraded to a Faculty level as targeted in the Project Agreement, its status as an internal unit within KMITL makes it possible for the ReCCIT to secure personnel, budget, logistics, and other support from KMITL.

The overall financial aspect was evaluated as maintained owing to ReCCIT's capability in securing research funds both from KMITL and other organizations. However, since the ReCCIT's status has not yet been upgraded, the ReCCIT cannot receive its own budgets directly from the Government. This affects on availability of funds for replacement and repair of equipment.

The sustainability of the Project effects, in terms of research and academic activities, is evaluated as high because the overall technical operation and research activities in terms of project activities, and numbers of official collaborations with private ICT industries as evidence with cases of collaborative agreements with international firms in Thailand, Korea, and Singapore, are increasing.

3-2 Factors that have promoted project
(1) Factors promoting impact
There are two factors those have promoted the impacts of the project. The first factor related to the management structure which is based on a Pyramid Structure of research management, in which the head researcher of each ICT field (a professor or highest academic rank staff) is appointed the Research Team Leader, assisted by members of the lower academic ranks as researchers, i.e. associate professors, assistant professors, and instructors assisted by graduate students. The second factor related to the competencies of academic staffs. During the project period, a good background on the knowledge and research skills for researchers in various labs by short-terms and long-terms experts resulted in the expansion of knowledge and research skills which were tremendously helpful in successful continuation of research activities.

(2) Factors promoting sustainability
Factors promoting the project were the organization and also the competencies factors. Factors promoting organization factors were (1) national policies of the Thai government (based on IT2010 Framework) and institutional policies of KMITL and ReCCIT in maintaining strong commitment to carry research activities of the Project, and (2) the ReCCIT research management model, the Pyramid Structure. Two factors promoting competencies were upgraded research skills and promotion of academic staff to higher ranks in their professional career path. The promotion of academic staff to higher ranks helps contribute the project sustainability because in order to be promoted to a higher academic rank, an academic staff is required to submit quality research work and publications. Thus, the research works are incentive for academic staff to join the ReCCIT in conducting research projects in the field of their specialization.

3-3 Factors that have inhibited project
Inhibiting factors consist of the rejection in promoting the ReCCIT to be an official agency, the shortage of funds for replacement and repair of equipment.

The rejection of the Ministry of Education to approve the proposed upgrading of the ReCCIT to be an official agency of KMITL as stated in the Project agreement prohibited the ReCCIT to receive its own budgets from neither KMITL nor the Royal Thai government. The budgets must be provided through the Faculty of Engineering and the Faculty of Information Technology.

The lifetimes of equipment and research facilities are limited. The needs for the replacement and repairs of equipment in the Labs are increasing. After the termination of the Project, the ReCCIT was able to take care of the limited repair of the equipment through the allocated budget. No budget was not earmarked for the repairs or replacement of high cost equipment. Annual budgets were provided for operation cost or general use.

3-4. Conclusion

From the evaluation of all aspects of the Project, it may be concluded that the impacts of the Project, both anticipated and unanticipated are moderate. KMITL/ReCCIT has achieved its overall goal to reach to international level in the field of communication and information technology and related fields. Doctor degrees and Master degrees earned are increasing, the research activities are progressing well and the research works were published in both national and international journals and presented in both national and international conferences.

The overall sustainability of the Project in terms of technical aspects is high, while that in terms of organizational and financial aspects are maintained. The ReCCIT staff's technical skills/capability of the Field and Laboratory in doing research and in upgrading research programs is maintained up to the international level, and their technical skills in maintaining or upgrading the equipment provided by the Project are sufficient. Although the ReCCIT is still an internal organization within KMITL, yet the ReCCIT has been keeping a strong commitment to support the effects/activities of the Project. The ReCCIT's research activities were operated under an efficient operational management based on a Pyramid Structure of research management. The ReCCIT also increased research activities and personnel development, regardless of the slight decreasing number of research personnel and graduate students and financial supports for equipment maintenance and repairs and overall operational costs.

3-5. Recommendations

For JICA:

JICA may need to review the Project period to ensure sustainability. Since the development of ICT is extremely rapid, for new innovations of ICT, the research requires higher levels of skills, times, and financial supports than it was originally thought. Although the Project aimed at providing advanced research, due to the limited time and funds, most research projects were just the beginning and need to continue to higher-level research activities for in-depth investigation.

For KMITL:

1) KMITL should develop a definite guideline or measure for submission to the Royal Thai government to ensure sustainability of the Project in providing adequate financial supports and to take necessary actions to help the Project activities sustainable. As the study reveals, there was not adequate budgets for maintenance and replacement of expensive research equipment and facilities.

2) KMITL may seek cooperation with foreign universities and industries to provide assistance in the areas of short-terms experts to the ReCCIT; short visits by ReCCIT researchers to jointly conduct researchers, and to upgrade research laboratories equipment and facilities for some of the 14 Labs.

3-6. Lesson Learned

1) The research management model, the Pyramid Structure, was proven very efficient in conducting research works at the ReCCIT. After Project completion, more research projects were conducted by the ReCCIT staff and their graduate students by implementing this Pyramid model. This can be further developed and implemented in other universities and research centers in Thailand and other Asian countries.

2) During the Project, most expensive equipment, hardware and software were directly procured from Japan. When some of the equipment breaks down, it is very difficult to find an agent to repair it as the techniques of local resources are sometimes inadequate.

3) The discontinuation of short-term and long-term experts disrupted some on-going research activities at the ReCCIT. A measure to ensure the continuity of technical experts from other countries is a must during the time Thai researcher's skills are developing.

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Chapter 1
Outline of the Ex-post Evaluation Study

1.1 Background and the Purpose of the Study

The Japan International Cooperation Agency (JICA) Thailand Office has decided to conduct an ex-post evaluation of the Project on the Research Center for Communications and Information Technology (ReCCIT) of King Mongkut's Institute of Technology Ladkrabang (KMITL), which was completed 3 years ago (September 2002). (Hereinafter referred to as "the Project"). The results of this study will help contribute to better-informed decision making and be shared by KMITL.

The main objectives of the evaluation study are as follows:

1) To derive lessons and recommendations for the improvement of JICA country programs and for the planning and implementation of more effective and efficient projects.
2) To ensure accountability to tax payers through producing reports in both electronic and printed forms.

The questions specifically related to the Project are:

1) How will the Project be influenced by the transformation into an autonomous university?
2) Are knowledge and skills obtained from the Project practical for the graduates in conducting work?
3) How far has the research of the ReCCIT been acceptable in circles of telecommunication industries, both locally and internationally? (In terms of real application)
4) Are there any changes in the trends of research or curricula in accordance with the rapid advancement of telecommunication services in Thailand and/or at an international level?
5) How far have the activities of the Project been extended in terms of South-South Cooperation or Regional Cooperation?

1.2 Evaluation Team and the Study Period

The members of the Ex-post Evaluation Study Team are as follows:

Assignment	Name	Nationality
Researcher	Professor Dr. Chaiyong Brahmawong	Thai
Assistant Researchers	Mr. Pacharawee Brahmawong Ms. Saracha Chersumran	Thai Thai

The study started on October 20, 2005 and ended February 2006. The work schedule is summarized below:

1) Preparatory Work (October 3-20, 2005)

1.1 Hold a kick-off meeting with the JICA Thailand Office

1.2 Develop an Evaluation Grid

1.3 Consult with the JICA Thailand Office to finalize the Evaluation Grid

1.4 Prepare questionnaires based on the Evaluation Questions in the Evaluation Grid

2) Field Study (October 21-November 10, 2005)

2.1 Conduct evaluation through interviews, field visits, and questionnaires

2.2 Conduct workshop/meeting with stakeholders on the result of evaluation findings

2.3 Prepare Draft Mid-term Evaluation Report

3) Final Study (December 22, 2005-February 2006)

3.1 Submit a Draft Mid-term Evaluation Report

3.2 Review comments from the JICA Thailand Office

3.3 Conduct a supplemental study (if necessary)

3.4 Prepare a Draft Final Report and Draft Summary Sheets

3.5 Submit the Draft Final Report and Draft Summary Sheets

3.6 Review comments from JICA Headquarters

3.7 Submit Final Report and Summary Sheets

Chapter 2
Study Methods

2.1 Outline of the Project

Project Title:	The Project on the Research Center for Communication and Information Technology(ReCCIT), King Mongkut's Institute of Technology, Ladkrabang (KMITL), The Kingdom of Thailand
Project Site:	Bangkok, Thailand
Period of Cooperation:	October 1, 1997-September 30, 2002
Counterpart Agency:	King Mongkut's Institute of Technology, Ladkrabang (KMITL), Ministry of University Affairs (now Office of Higher Education Commission, Ministry of Education

2.1.1 Background of the Project

The Project was the 4th Project-Type Technical Cooperation extended to the King Mongkut's Institute of Technology Ladkrabang (KMITL) since 1961. It was becoming apparent that the needs for researchers and engineers to have adequate capabilities to conduct advanced research and development were increasing under industrial restructuring in Thailand. Particularly, the needs of human resources in the field of Communication and Information Technology (CIT) were rapidly increasing with the expansion of market and economic growth in Thailand.

Based on this, the Royal Thai Government, in 1996, submitted a request to Japan for the implementation of Project-type Technical Cooperation aimed at strengthening the KMITL's research capabilities by establishing a research center for Communication and Information Technology. In response to the request, the Japanese Government conducted a preliminary study in 1996 and a long-term study in 1997. Based on the results of these studies, the Record of Discussion (R/D) was signed between the Japanese Implementation Study Team and the KMITL on the Project in July 1997 and in October of the same year the ReCCIT in KMITL was established.

2.1.2 Framework of the Project

Overall Goal:

KMITL reaches international level in the field of Communication and Information Technology and related fields (*the Field) at the ReCCIT and the Laboratories.

Project Purposes:

1) The research capabilities in the Field in the ReCCIT and the Laboratories are strengthened up to international level.
2) The research programs of the Field in the ReCCIT and the Laboratories for graduate studies are upgraded to international level.

Project Outputs:

1) More advanced research of the Field is conducted in the ReCCIT and the Laboratories under the appropriate research management system;
2) The updated facilities/equipment/materials are available in the ReCCIT and the Laboratories.
3) Revised research programs for graduate studies in the Field are conducted in the ReCCIT and the Laboratories.
4) Cooperation in research of the Field is expanded between the ReCCIT and other domestic and international organizations.
5) Administrative management of the ReCCIT is established.
6) The financial sources of the ReCCIT is secured.

2.2 Stakeholders and Study Methods

Based on the Terminal Evaluation Report of the Project and related documents, the Study Team developed an evaluation plan and prepared interview questions and questionnaires for respective stakeholders as shown below:

Stakeholders	Study Method
Implementing Agency: King Mongkut's Institute of Technology, Ladkrabang (KMITL) - President of KMITL	Interview
Direct Target: KMITL-ReCCIT Counterparts 1) ReCCIT Director 2) Directors, Programs of Graduate Studies 3) Laboratory Heads	Interview and questionnaires
Indirect Target: Graduate Students 1) Master's degree students 2) Doctoral degree students	Interviews
Administrative Personnel: - Secretary and Project Coordinator	Interviews

Chapter 3
Study Results

The results of the study are presented in terms of sustainability, impacts, and analysis of the impacts and sustainability factors.

3.1 Impact of the Project

The impacts of the Project resulting from Project completion in 2002 to present is expressed in three degrees:

Level of Result	Explanation
High	The Project's products or outputs have high impacts on the development of ICT in domestic and international organizations
Moderate	The Project's outputs have moderate impacts on the development of ICT in domestic and international organizations
Low	The Project failed to produce any impacts on the development of ICT in domestic and international organizations

3.1.1 Impacts Attained by Overall Goal: Moderate

Impact attained by the overall goal of the Project can be quantitatively seen via the overall degrees earned in relation to those of the Faculty of Engineering or the number of the graduate students at the ReCCIT, when comparing these numbers between those of during the Project period and after the project completion, as shown by the following discussions.

1) The overall degrees earned at the ReCCIT laboratories comparing to that was at the Faculty of Engineering moderately increased since the Project completion. Statistically, during the Project period (1998-2002), there were 9 Doctors and 157 Masters as shown in Table 3-1. Also, after the project completion from 2003 to 2005, these were also 9 Doctors, but decreasingly 139 Master, as shown in Table 3-2. However, by comparing the total number of degrees earned at the Faculty of Engineering between the 5-year Project period from 1998 to 2002 and the 3-year after the Project completion from 2003-2005, it is found that the percentage of both Master's and Doctoral degrees earned at the ReCCIT laboratories increased. Specifically, the percentage of Doctoral degrees earned increased from 64.3% to 75%, while the percentage of Master's degrees earned increased from 28.7% to 39.8%. These can be seen from Table 3-1 and 3-2 as well.

Table 3-1 **The percentage of degrees earned at the ReCCIT and the Faculty of Engineering during the Project period (1998-2002)**

Doctor Degrees	**1998**	**1999**	**2000**	**2001**	**2002**	**Total**
Faculty of Engineering	0	0	2	5	7	14
ReCCIT	0	0	0	4	5	9
Percentage (%)	-	-	0.0	80.0	71.4	**64.3**
Master Degrees	**1998**	**1999**	**2000**	**2001**	**2002**	**Total**
Faculty of Engineering	61	76	101	144	165	547
ReCCIT	12	23	30	37	55	157
Percentage (%)	19.7	30.3	37.4	25.7	33.3	**28.7**

Source: (1) Internal Statistical Information about ReCCIT requested via Director Office

(2) the KMTL's Graduate School Website http://www.graduate.kmitl.ac.th/

Table 3-2 **The percentage of degrees earned at the ReCCIT and the Faculty of Engineering after the Project period (2003-2005)**

Doctor Degrees	**2003**	**2004**	**2005**	**Total**
Faculty of Engineering	5	3	4	12
ReCCIT	5	0	4	9
Percentage (%)	100	0	100	**75.0**
Master Degrees	**2003**	**2004**	**2005**	**Total**
Faculty of Engineering	146	100	103	349
ReCCIT	65	38	36	139
Percentage (%)	44.5	38.0	34.9	**39.8**

Source: (1) Internal Statistical Information about ReCCIT requested via Director Office

(2) the KMTL's Registration Office Website http://www.reg.kmitl.ac.th/index/index.php

2) The graduate students in ReCCIT from both the Faculty of Engineering and the Faculty of Information Technology were increased from the total of 146 (Master 117 and Doctor 29) in 2002 to 159 (Master 112 Doctor 47) in 2003 and to 165 (Master 119 and Doctor 46) in 2004, or averagely 6% increase per year, as shown by Table 3-3 below. And by considering only the graduate students from the Faculty of Engineering, the number was also increased from the total of 103 (Master 83 and Doctor 20) in 2002 to 111 (Master 89 Doctor 22) in 2003 and to 120 (Master 96 and Doctor 24) in 2004, or averagely 8% increase per year, as shown by Table 3-4 below.

Table 3-3 **The increasing numbers of graduate students in ReCCIT at the end of Project Period (2002) and after the Project Period.**

Graduate Students	End of Project Period	After the Project	
	2002	2003	2004
Master	117	112	119
Doctoral	29	47	46
Total	**146**	**159**	**165**

Sources: (1) the ReCCIT Website www.reccit.kmitl.ac.th\english\menu\about6.htm

(2) ReCCIT Self Assessment Report (2003-4).

Table 3-4 **The increasing numbers of graduate students in ReCCIT from the Faculty of Engineering at the end of Project Period (2002) and after the Project Period.**

Graduate Students	End of Project Period	After the Project	
	2002	2003	2004
Master	83	89	96
Doctoral	20	22	24
Total	**103**	**111**	**120**

Sources: (1) the ReCCIT Website www.reccit.kmitl.ac.th\english\menu\about6.htm

(2) ReCCIT Self Assessment Report (2003-4).

From the above discussion, it is found that KMITL is considered to have moderately achieved the overall goal. The number of degrees earned or the number of the graduate students at the ReCCIT were not impressively increased when compared between during the Project period and after the project completion. Therefore, it can be concluded that the impacts of the Project attained by the overall goal is also considered as moderate.

3.1.2 Unanticipated Impact after Project Completion

(1) Unanticipated Positive Impacts

As a result of research and academic work initiated through the Project, there were the following positive impacts affecting the ReCCIT's staff and graduate students:

1) Academic staffs have been promoted as a result of the research work carried out at the ReCCIT, i.e., four instructors were promoted to assistant professors, three assistant professors were promoted to associate professors, and two associate professors were promoted to full professors based on their research work.

2) One academic member (Professor Dr. Monai Krairerk) was appointed a Senior Researcher by the Thailand Research Funds.

3) Knowledge gained from the ReCCIT's research were disseminated to teaching and learning in Thai colleges and universities by graduates of the ReCCIT who were regular staff of various higher institutions before studying at the ReCCIT for their Master degree and Doctor degrees.

4) The ReCCIT has been regularly visited by ICT researchers, academic and professional staffs of universities in Thailand and neighboring countries. During the period 2003-2004, 13 groups of academic and researchers from foreign countries (nine groups totaling 152 visitors from 23 countries) and Thailand (totaling 26 visitors) visited the ReCCIT. This is an activity helping the expansion of knowledge in ICT. Most visitors visited the ReCCIT to learn the new developments of ICT contents and innovation as well as research methodology and research techniques.

5) Other unanticipated positive impacts of the ReCCIT project were the two regional collaborations between the Faculty of Engineering, KMITL and other regional universities, i.e. The IT Bridge Project[1] in Lao PDR and collaboration of KMITL to AUN-SEED Net Program[2]. More than 10 professors from ReCCIT have contributed to the IT Bridge project. For instance, Dr. Somsak Chumchuay, the former ReCCIT director, has been working at IT Bridge project in Lao PDR since the termination of ReCCIT Project phase one. It is believed that his experiences obtained during the Project are conveyed to IT Bridge. Other professors have offered different expertise as requested by IT Bridge such as the development of questionnaire, course management, research project advisors and subject lecturers. There are currently 35 students studying at the undergraduate level. Moreover, the ReCCIT Laboratories have been used as the visiting site for these students periodically.

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[1] IT Bridge Project: ***Information Technology Bridge Project***: A project aiming to transfer knowledge about information technology to Lao PDR by KMITL.

[2] AUN-SEED Net Program: ***ASEAN University Network – Southeast Asia Engineering Education Network Program***: A network which was established to promote human resources development in engineering in ASEAN.

Since ReCCIT researchers were mainly from the Faculty of Engineering, the research works, experiences, and research skills will certainly be essential parts of the extension of activities in the regional level. This will ultimately bring forth to further collaborations with other universities to help upgrade research and capabilities. ReCCIT has contributed to the AUN-SEED net since 2003 and will continue this contribution until the year 2008. The contribution could be divided into two forms namely; 1) human resource and 2) laboratory facilities. In the form of human resource, there have been seven professors from three laboratories of ReCCIT to supervise the students of AUN-SEED net at the Master's and Doctoral levels. Moreover, there are lecturers of ReCCIT giving lectures on the ICT related topics at the AUN-SEED net. For the contribution in the form of laboratory facilities, the ReCCIT laboratories have been used to train them on the ICT related subjects. Averagely, there are five students from the AUN-SEED net enroll at ReCCIT annually. And there was already one student who graduated at the Master's level from ReCCIT under this collaboration. There are four more students who are expected to graduate at the Master's level next year as well.

3.2 Sustainability

The sustainability of the Project resulting from the Project's completion to present is expressed in the following three degrees:

Level of Result	Explanation
High	It is expected high that the Project benefits are likely to sustain after the discontinuation of JICA's assistance, based on the analysis on the retention of the Project outcomes in terms of technical, organizational and financial aspects.
Maintained	It is expected high but not higher than the above that the Project benefits are likely to sustain after the discontinuation of JICA's assistance, based on the analysis on the retention of the Project outcomes in terms of technical, organizational and financial aspects.
Low	It is expected low that the Project benefits are likely to sustain after the discontinuation of JICA's assistance, based on the analysis on the retention of the Project outcomes in terms of technical, organizational and financial aspects.

3.2.1 Technical Aspect: High

In terms of technical aspect, the Project's sustainability is evaluated as high. This assessment was made based on the following analysis:

1) The ReCCIT's staff technical skills/capacity of the Field and Laboratories in conducting research work and in upgrading research programs are maintained up to the international level, after the Project completion. The ReCCIT's researches are continuously and gradually recognized by the research communities both in Thailand and abroad, as evidenced from the increasing number of research work that were published in international journals and the increasing number of the research papers that were accepted and presented in international conferences Specifically, during the Project period (1998-2002), the average number of research work presented in international conferences and publications published in international journals was 112.6 pieces per year, as shown in Table 3-5. After the completion of the Project, during 2003-2005, the average number of research work and publications per year was 142.0 per year, which was 29.4 papers higher or increased by 26.11% as compared to the average number of publications internationally presented and published during the Project period, as shown by Table 3-6.

Table 3-5 **Number of research publications presented in journals and conferences during the Project period (1998-2002)**

Publications: During Project Period	1998	1999	2000	2001	2002	Total	Average per Year
International Journal	6	8	3	7	11	35	**7.0**
International Conferences	14	81	137	149	147	528	**105.6**
Total	20	89	140	156	158	563	**112.6**

Source: ReCCIT Summary Output and Input Fact Sheet (1997-2005)

Table 3-6 **Number of research publications presented in international journals and conferences after the Project period (2003-2005)**

Publication: After Project Period	2003	2004	2005	Total	Average per Year
International Journal	8	4	7	19	**6.3**
International Conferences	149	135	125	409	**136.3**
Total	157	139	132	428	**142.0**

Source: ReCCIT Summary Output and Input Fact Sheet (1997-2005)

The advanced research projects of the Field were progressing well. The number of research projects was increased from 26 in 2002 to 46 in 2003 (increased by 76.92%) as shown in Table 3-7, and the number of research publications in 2001-2002 was 186 (Technical Report of 2002) while in 2003-2004 it was 187 (ReCCIT-Self Assessment Report of 2004). It increased slightly.

Table 3-7 **The number of completed research projects by Departments' laboratories in 2001-2002 and 2003-2004**

Departments (Numbers of Labs)	2001-2002	2003-2004	No. Increased	%
Department of Telecommunication System (4 Labs)	8	14	6	75
Department of Information Technology (3 Labs)	6	8	2	33
Department of Signal Processing (4 Labs)	6	14	8	133
Cooperation Unit Laboratories (3 Labs)	6	8	2	33
Total	**26**	**46**	**20**	**77**

2) The equipment and facilities provided by the Project have been maintained, upgraded, and used well by the ReCCIT staff. The majority of the lab equipment and facilities are still in use with the exception of some computer software in the Satellite Lab that has been modified to serve research purposes. Their technical skills are therefore considered as appropriate for their daily utilization. (See the list of equipment in ANNEX 5)

3) The technical capability of the staff to modify certain research equipment and software, according to the situations, was observed. For example, modifications of the existing software were initiated by the ReCCIT staff. These modifications were relevant to the Project research activities because it was undertaken for noise reduction and the automatic reading of signals, which promotes the sustainability of the Project effects. So long as the ReCCIT staffs have the ability to modify existing equipment and facilities according to the situations, the research activities will be able to continue without interruptions from minor malfunctions.

Based on the above analysis, the technical sustainability of the Project is evaluated as high because the ReCCIT staff's technical skills/capability of the Field and Laboratory in

doing research and in upgrading research programs has been maintained to be up to the international level.

3.2.2 Organizational Aspect: Maintained

In terms of the organizational aspect, the ReCCIT's sustainability is evaluated as maintained. After the Project completion, there has been an attempt of upgrading the ReCCIT to be a Faculty level. According to ReCCIT Self Assessment Report (SAR) of 2003-4, the status of the ReCCIT was upgraded from a Project level in KMITL to be an internal, Faculty level in KMITL by the approval of the Fifth Institute Council Meeting (5/2542) on July 14,1999 (retroactive to May 22, 1997). Since the Institute Council Meeting in 1999, the ReCCIT's status was equivalent to that of a Faculty with the purpose of conducting sustainable international-standard research activities, to produce quality graduate studies both at the Master's degree and Doctorate degree levels, and to be a center of technology transfer in providing consultancy to industries in the Field. Although, ReCCIT's status has not yet been approved by the Ministry of Education to be an official organization by the laws, the ReCCIT's status as an internal unit with in KMITL makes it possible for the ReCCIT to secure personnel, budget, logistics, and other support from KMITL. As a conclusion, the sustainability in terms of organizational aspect is evaluated as maintained.

3.2.3 Financial Aspect: Maintained

The KMITL's financial support to various projects and organizations such as the ReCCIT was drawn from three sources: the government budget, KMITL incomes, and external resources. In general, the KMITL incomes, obtained by the KMITL's student fees, donations, and interests from investments, are used for the projects not financed by the government budget and for activities of internal organizations. The external financial support is allocated for specially purposes such as research.

In the case of ReCCIT, as it was yet to be established as a governmental agency under the laws, it is not eligible to obtain the budget directly from the government. The budget is therefore provided either from the KMITL's budget or from the government but through the external official organizations.

In evaluating sustainability in terms of financial aspect, three areas were considered: (1) the sources of operation costs/general use for research activities of the ReCCIT excluding equipment, training, and dispatching of experts, (2) KMITL budget allocated to the ReCCIT among the overall financial supports, and (3) the budget earmarked for the maintenance of Lab hardware and software by the ReCCIT.

1) In terms of the sources of operation costs/general use for research activities of after the Project completion, during 2003-2004, the ReCCIT's revenue came from two sources: KMITL and external sources with the total sum of 65,349,780 Baht for two years period or averagely about 32,674,890 Baht per year. Within this amount, 5,200,000 Baht or 7.96% came from the KMITL's income via the Faculty of Engineering and the Faculty of Information Technology, and another 60,149,780 Baht or 92.04% came from external sources via research funding agencies.

Table 3-8 **Financial Support to the ReCCIT from KMITL and External Sources**

Year	Total (Baht)	KMITL (Baht)	%	External Funds(Baht)	%
2003	50,955,780	2,600,000	5.10	48,355,780	94.90
2004	14,394,000	2,600,000	18.06	11,794,000	81.94
Total	***65,349,780***	***5,200,000***	***7.96***	***60,149,780***	***92.04***

Considering the amount of supports from external sources, it shows that the ReCCIT's staffs are capable of seeking research funds to keep research activities going on.

(2) In terms of KMITL's budget allocated to the ReCCIT, among the overall financial supports, the KMITL allocated 2,600,000 Baht per year as shown in the above table. Even though, KMITL could provide averagely less than 10% of the total financial support. But this budget was specially allocated for use by the Office of the Director, which confirmed the KMITL's intention of maintaining the operation of the ReCCIT.

(3) In terms of the budget earmarked for research activities and the maintenance of Lab hardware and software, the ReCCIT allocated the total of 1,740,000 Baht per year. Of this amount, approximately 40% was used for materials and general uses/various expenses. For example, in 2003, 200,246.07 Baht (13%) was used for materials and 405,980 Baht (27%) for general/various expenses. Of the annual budget for research materials and various expenses was therefore 606,226 Baht in total.

(4) Gaining funding from the private sector is the responsibility of each individual Research Lab. The current tendency shows that about 1-3 Research labs have

active funding while most others have very little or none. Local experts in terms of arranging the fund raising campaign for laboratories, have been invited to provide training to the Research Labs on how to gain funding from many sources of funds. "The Technology Roadmap" has been developed as a tool to communicate with the private sector in order to encourage funding. Specific action plans and goals are in the process of being formed. They are expected to be solidified next month.

In addition, the ReCCIT gained financial support and sponsorship from NECTEC and Thai Airways International for publication of proceedings, air tickets, and public relations materials such as the printing of posters and brochures for international conferences to allow the ReCCIT's presentation of research findings.

Based on the above, the ReCCIT has tendency to secure budgets, both from internal and external sources. However, most financial supports were from external sources while the KMITL provided less than one-tenth of the total amount of the ReCCIT's budget. Therefore, the sustainability in terms of financial aspect can be concluded as maintained. (See the details of financial support to the ReCCIT from the KMITL and external sources in ANNEX 4).

3.2.4 Sustainability of the Project's Effects: High

Since the termination of the Project, the following research activities have been further conducted:

1) The overall technical operation and research activities after the Project are in progress through technical support from the academic staff of the Faculty of Engineering and the Faculty of Information Technology who are instructors for Masters and Doctorate programs, heads of research projects and act as researchers themselves.

2) KMITL and the ReCCIT entered agreements with one organization in Korea (ICASE) and one organization in Singapore (Nanyang University) for academic and research cooperation, i.e. the setting up of international conferences (ICCAS □□□□in Korea, ICICS □□□□in Singapore and ICEC □□□□in Thailand.

3) During 2003, seven research projects were conducted under grants given by NECTEC, Asia Pacific Tele-community (APT), and the Office of National Research (ONR) as follows:

Table 3-9 **Numbers of research projects funded by external resources**

Sources of Funding / Year	NECTEC	APT	ONR	TRF
2003	2	1	4	-
2004	2	-	-	3

a) Two research projects were supported by NECTEC: Research and Development in 3rd Mobile Telecommunication System-Phase 3, and ADC DAC for WCDM Systems.
b) One research project was supported by APT on the Evaluation of Electromagnetic Broadband Noise Effect on Mobile Communications Systems.
c) The following three research projects were supported by ONR:
    i) Dielectric for Material Inspections (Wireless Communication Laboratory)
    ii) A High Gain Antenna Using a Circular Ring near the Reflector for Wireless Local Area Network Application (Wireless Communication Lab)
    iii) Integrated Circuits for Signal Processing (Signal Transmission Lab)

During 2004, five research projects were conducted at the ReCCIT through grants from two external sources as follows

a) NECTEC (October 1, 2003-September 30, 2005) provided research funds for the following two research projects:
    i) Wireless Communication Laboratory (Research Project on Antennae for 3rd Mobile Telecommunication System-Phase 2)
    ii) Micro-electronic Devices R&D Laboratory (Research Project on Analog IC for WCDMA Applications)
b) The Office of Research Fund (TRF) provided support for the following three research projects:
    i) Mixed Signal Processing Laboratory (IC for Signal Processing)
    ii) Wireless Communication Laboratory (High Amplifying Rate Antenna)
    iii) Micro-electronic Devices R&D Laboratory (Mixed Analog Signal for W-CDMA)

On the other hand, there were also a few cases of collaboration such as the agreements with international firms including ICASE of Korea, the Nanyang University of Singapore and domestic firms such as the TT&T.

From the above-mentioned evidences, it may be concluded that the sustainability of the Project effects in terms of research and academic activities is high because the overall technical operation and research activities are increasing in terms of project activities and increasing numbers of official collaborations with private ICT industries as evidence with cases of collaborative agreements with international firms in Thailand, Korea, and Singapore.

3.3 Analysis of Factors of Impact and Sustainability

3.3.1 Promoting Factors

Promoting factors include national and institutional policies, the ReCCIT's management structure, and the competencies of academic staffs as mentioned below.

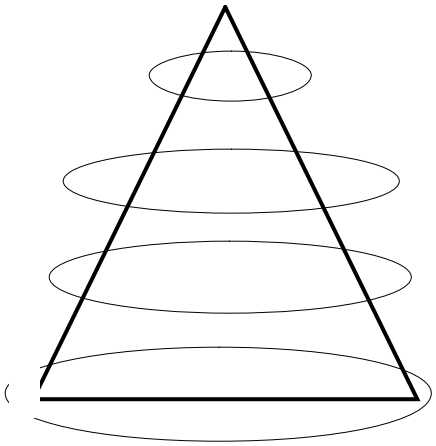
(1) Policies

This is a promoting factor on sustainability. According to the IT2010 Framework established since 2001, the Royal Thai Government encourages the public and private sectors to utilize ICT in all aspects of administration and management. Based on this national policy, the Ministry of Information and Communication Technology (MICT) was established to oversee the development and implementation of ICT in various areas with the emphasis on e-Government. It is now possible for public ICT organizations such as NECTEC and MIC to get adequate financial supports and consequently give blessing to educational institutions such as the KMITL to carry out their ICT development projects and study programs.

At the institutional level, it is clearly stated in the KMITL policy that the KMITL becomes a center of excellence in ICT and the Field. The KMITL's strong commitment to achieve the Project's overall goal has sustained itself to upgrade its capacity towards the international level in the field of communication and information technology and the Field at the ReCCIT and the Laboratories. After the Project completion, the KMITL's policy still puts the ReCCIT research activities in a high priority. Consequently, the operation of the ReCCIT is integrated in the KMITL's Master Plan to ensure smooth and continuous implementation of the ReCCIT academic and research activities.

(2) Management Structure: The Pyramid Model

The management factors promoting the impacts and sustainability of the Project are evidenced from the effective research management structure of the ReCCIT, employing the so-called "Pyramid Structure" in ReCCIT's 14 laboratories. In this Pyramid Structure, the head researcher of each ICT field (a professor or highest academic rank staff) is appointed the Research Team Leader, assisted by members of the lower academic ranks i.e. associate professors, assistant professors, instructors, and graduate students becomes an important promoting factor in ReCCIT's research operation.



(3) Competencies of Academic Staffs

Competencies of the researchers brought positive impact to the ReCCIT and helped boost up the Project's sustainability. During the Project period, short-terms and long-terms experts were very helpful in laying a good background on the knowledge and research skills for researchers in various labs. After the Project Period, the expansion of knowledge and research skills imparted to Thai researchers by Japanese short terms and long-terms experts were tremendously helpful in successful continuation of research activities. The career path of instructors in colleges and university makes it possible for them to be promoted to a higher level in their professional fields based on their research works. At the ReCCIT, after the Project completion, many academic staff members were promoted to full, associate or assistant professor. With higher professional ranks, each will get additional salary on top of their monthly earning, i.e. 11,200 Baht for an assistant professor, 19,800 Baht for an associate professor, 27,000 Baht for a full professor (Class 10 professorship), and 31,200 Baht for a senior professor (Class 11 professorship). This promotion factor encourages academic staff to conduct researches.

Notably, one ReCCIT's founding member was appointed as a Senior Distinguished Researcher by the Office of National Research (OFR). The others were appointed as advisors to various research funding agencies such as ONR, NECTEC, and universities. This factor partially helped the continuation of the researches as it drew research funding from external resources to the ReCCIT after the Project completion.

Moreover, the ReCCIT initiated three more activities on personnel development activities to help keep its academic and research staff abreast of the developments in the field of Communication and Information Technology by setting up the following programs:

a) English training courses for the ReCCIT graduate students and researchers were provided free of charge to improve their writing skills and presentation techniques
b) International conferences are held annually in certain ICT areas such as ICCAS 2004 (The Shangri-la Hotel, August 25-27), ICICS 2005 (Singapore) and ICEC 2005 (Kata Beach Resort, Phuket, July 27-29)
c) Special lectures by internal and external speakers are conducted monthly for each Lab to provide the opportunities for researchers to present the progress of their research work and keep up with the development in their field from invited speakers

3.3.2 Inhibiting Factors

Inhibiting factors consist of the rejection in promoting the ReCCIT to be an official agency, the shortage of funds for replacement and repair of equipment, and rapid development of ICT as mentioned below.

(1) The Rejection in Promoting the ReCCIT to be an Official Agency

One of the inhibited factors was the rejection of the Ministry of Education to approve the proposed upgrading of the ReCCIT to be an official agency of KMITL as stated in the Project agreement. Consequently, the ReCCIT is not in the position to receive its own budgets from neither KMITL nor the Royal Thai government. The budgets must be provided through the Faculty of Engineering and the Faculty of Information Technology. The budget allocation in 2003-2004 showed that this source of fund provided only slightly less than 10% of the total budget per year and accounted for the operating cost at the Office of Director.

(2) Shortage of Funds for Replacement and Repair of Equipment

The lifetimes of equipment and research facilities are limited, and therefore the needs for the replacement and repairs of equipment in the Labs are getting increased. After the termination of the Project, the ReCCIT was able to take care of the limited repair of the equipment through the allocated budget. The annual budget provided by the Faculty of Engineering and the Faculty of Information Technology (2,600,000 Baht) allocated to the ReCCIT was specially for use in the Office of Director. Only the average of 444,932 Baht per year (414,944 Baht for 2003, and 444.920 Baht for 2004) was for general use and the purchase of office materials such as stationeries. Even though, the amount of the external

fund accounted for averagely 90% of the total budget each year. But this source of fund was legally bounded to be used for conducting research only. Therefore, no budget was earmarked for the repairs or replacement of high cost equipment.

3.4 Conclusion

The impact of the Project in terms of the attainment of the overall goal is concluded as moderate. The basis of the evaluation is the outcomes of the ReCCIT's research works completed by academic staff and graduate students; agreements for academic and research cooperation made between KMITL /ReCCIT and some organizations in Thailand and foreign countries; and visits of many groups of academic and researchers from foreign countries to the ReCCIT.

The overall impacts of the Project were considered as moderate as seen from the changes in the numbers of degrees earned, and advanced research projects. The unanticipated impacts were found, but they all were positive. They were related to the promotion of academic staff to higher professional ranks as a result of the research work at the ReCCIT, the appointment of faculty members to be advisors in various public and private ICT industries, and the appointment of a faculty member to a Senior Researcher by the Office of Research. The unanticipated impact also included the fact that the ReCCIT has been regularly visited by ICT researchers, academic and professional staffs of universities in Thailand and neighboring countries, in order to learn the new developments of ICT contents and innovation as well as research methodology and research techniques. The two regional collaborations between the Faculty of Engineering, KMITL and other regional universities, i.e. The IT Bridge Project in Lao PDR and collaboration of KMITL to AUN-SEED Net Program were also other unanticipated positive impacts.

The overall sustainability of the Project in terms of technical aspects is high, while that in terms of organizational and financial aspects are maintained. With regards to technical aspect, the Project's sustainability is evaluated as high because it was found from the analysis that the ReCCIT staff's technical skills/capabilities in the Field and Laboratory in undertaking research and in upgrading research programs, and their technical skills in maintaining or upgrading the equipment provided by the Project are increasing. This also showed by the increasing number of publications at international level.

In terms of the organizational aspect, the ReCCIT's sustainability is evaluated as maintained because of the upgraded status of the ReCCIT, its strong commitment, efficient operational management. The sustainability in terms of financial aspect is evaluated as

maintained, but not high because most financial supports were from external sources while the KMITL provided less than one-tenth of the total amount of the ReCCIT's budget.

The sustainability of the Project's effects in terms of research and academic activities is evaluated as high because the overall technical operation and research activities are progressing well and that the ReCCIT could secure the majority of funds from external sources. In addition, the sources and numbers of official collaborations with private ICT industries are increasing as evidence with cases of collaborative agreements with international firms in Thailand, Korea, and Singapore.

Factors promoting sustainability were related to national and institutional policies, the ReCCIT's management structure and the competencies of academic staffs. Inhibiting factors of the sustainability were the rejection in promoting the ReCCIT to be an official agency, the shortage of funds for replacement and repair of equipment, and rapid development of ICT.

Chapter 4
Recommendations and Lessons Learned

4.1 Recommendations

For JICA:

JICA may need to review the Project period to ensure sustainability. Since the development of ICT is extremely rapid, for new innovations of ICT, the research requires higher levels of skills, times, and financial supports than it was originally thought. Although the Project aimed at providing advanced research, due to the limited time and funds, most research projects were just the beginning and need to continue to higher-level research activities for in-depth investigation.

For KMITL:

1) KMITL should develop a definite guideline or measure for submission to the Royal Thai government to ensure sustainability of the Project in providing adequate financial supports and to take necessary actions to help the Project activities sustainable. As the study reveals, there was not adequate budgets for maintenance and replacement of expensive research equipment and facilities

2) KMITL may seek cooperation with foreign universities and industries to provide assistance in the areas of short-terms experts to the ReCCIT; short visits by ReCCIT researchers to jointly conduct researchers, and upgrade research laboratories equipment and facilities for some of the 14 Labs.

4.2 Lessons Learned

1) The research management model, the Pyramid Structure, was proven very efficient in conducting research works at the ReCCIT. After Project completion, more research projects were conducted by the ReCCIT staff and their graduate students by implementing this Pyramid model. This can be further developed and implemented in other universities and research centers in Thailand and other Asian countries.

2) During the Project, most expensive equipment, hardware and software were directly procured from Japan. When some of the equipment breaks down, it is very difficult to find an agent to repair it as the techniques of local resources are sometimes inadequate.

3) The discontinuation of short- and long-term experts disrupted some research activities. A measure to ensure the continuity of technical experts from other countries is a must during the time Thai researcher's skills are developing.

Annex

ANNEX 1
EVALUATION GRID: JICA-ReCCIT PROJECT

IMPACT					
Evaluation	**Questions**	**Activities**	**Data**	**Data**	**Data Collection**
Main Questions	***Sub-Questions***	**Criteria/ Measures**	**Needed**	**Sources**	**Methods**
1. How far has the ReCCIT and the Laboratories achieved the overall goal in enhancing KMITL to reach international level in the field of communications and information technologies and related fields (*the Field) after the Project completion?	1.1 What is the record of the percentage of degree earned at the ReCCIT laboratories in relation to the total degrees at Faculty of Engineering (from 1998-present)? 1.2 How were the advanced researches of the Field as well as collaborations with public and private sector being supported after the Project termination? 1.3 Was the degree of achievement of the overall goal as great as expected? 1.4 Was the overall goal achieved due to the achievement of the purposes of the ReCCIT Project, i.e. (1)The research capability of the Field in the ReCCIT and the Laboratories is strengthened up to international level, and (2) The research program of the Field in the ReCCIT and the Laboratories for graduate studies are upgraded to international level)? 1.5 Are there any external factors effecting the achievement of the overall goal?	-Description of the results of the discussion with ReCCIT and all concerned agencies -(increase) Number of theses published in international and domestic journals -Number of presentation at international and domestic conferences -Number of obtained doctorate and master degree -Number and amount of research fund granted by external funding organization -Number of full professors -Activity of the Committee and the appropriate research management system is in place -Reputation by related organizations	-Research Reports and theses -ReCCIT annual Report , technical report and Newsletter -Report of Interviews -Record of the Committee meetings	- ReCCIT -CIT Labs -Counterpart staff -Students	-Documentary/ Literature research -Questionnaire -Interviews

ANNEX 1

IMPACT					
Evaluation	**Questions**	**Activities**	**Data**	**Data**	**Data Collection**
Main Questions	***Sub-Questions***	**Criteria/ Measures**	**Needed**	**Sources**	**Methods**
2. Are there any unexpected positive or negative effects of the ReCCIT Project?	2.1What are the unexpected positive effects? 2.2 What are the unexpected negatives effects? 2.3 Were there any measures undertaken to solve the problems or avoid further expansion of negative effects? 2.4 Are there any ripple effects?	Description of the results of the discussion	-ReCCIT Reports and related documents -Report of Interviews	- ReCCIT -Counterpart staff -Other organizations	-Document/ Literature study -Questionnaire -Interviews
3. What are incentives and disincentives to achieve the overall goal?	3.1 What are the incentives for achieving the overall goal? 3.2 What are the disincentives to achieving the overall goal?	Description of the results of the discussion	-ReCCIT Reports and related documents -Report of Interviews	-ReCCIT -Counterpart staffs	-Document/ Literature study -Questionnaire -Interviews

ANNEX 1

IMPACT					
Evaluation	**Questions**	**Activities**	**Data**	**Data**	**Data Collection**
Main Questions	***Sub-Questions***	**Criteria/ Measures**	**Needed**	**Sources**	**Methods**
4. Are there any unexpected positive or negative effects on policy?	4.1 What are the unexpected positive effects on policy? 4.2 What are the unexpected negative effects on policy? 4.3 What are factors that provided positive effects on policy?	Description of the results of the discussion with ReCCIT and concerned agencies	-Research Report -ReCCIT Reports and related documents -Report of Interviews	- ReCCIT -CIT Labs -Counterpart staff	-Documentary/ Literature research -Questionnaire -Interviews
5. Are there any unexpected positive or negative effects or economic impacts on target society?	5.1 What are the unexpected positive effects or economic impacts on target society? 5.2 What are the unexpected negative effects or economic impacts on target society? 5.3 What are factors that provided positive effects or economic impacts on target society?	Description of the results of the discussion with ReCCIT and concerned agencies	-Research Reports -Interviews	- ReCCIT -CIT Labs -Counterpart staff	-Documentary/ Literature research -Questionnaire -Interviews

ANNEX 1

IMPACT					
Evaluation	**Questions**	**Activities**	**Data**	**Data**	**Data Collection**
Main Questions	***Sub-Questions***	**Criteria/ Measures**	**Needed**	**Sources**	**Methods**
6. Are there any unexpected positive or negative effects on organizations and improvement of regulations and legal system?	6.1 What are unexpected positive effects on organizations and improvement of regulations and legal system? 6.2 What are unexpected negative effects on organizations and improvement of regulations and legal system? 6.3 What are factors providing positive effects on organizations and improvement of regulations and legal system?	Description of the results of the discussion ReCCIT and all concerned agencies	-ReCCIT Reports and related documents -Report of Interviews	-ReCCIT -CIT Labs -Counterpart staff	-Documentary/ Literature research -Questionnaire -Interviews
7. Are there any unexpected positive or negative effects on technical movement?	7.1 What are unexpected positive effects on technical movement? 7.2 What are unexpected negative effects on technical movement? 7.3 What are factors providing positive effects on technical movement?	Description of the results of the discussion ReCCIT and all concerned agencies	-Research Reports -ReCCIT Reports and related documents -Evaluation by other organization -Report of Interviews	-ReCCIT -CIT Labs -Other organizations	-Documentary/ Literature research -Questionnaire -Interviews

ANNEX 1

IMPACT					
Evaluation	**Questions**	**Activities**	**Data**	**Data**	**Data Collection**
Main Questions	***Sub-Questions***	**Criteria/ Measures**	**Needed**	**Sources**	**Methods**
8. Are there any unexpected positive or negative effects on women, human rights, and poverty	8.1 What are unexpected positive effects on women, human rights, and poverty? 8.2 What are unexpected negative effects on women, human rights, and poverty? 8.3 What are factors that provided positive effects on women, human rights, and poverty?	Description of the results of the discussion ReCCIT and all concerned agencies	-Research Report -ReCCIT Reports and related documents -Report of Interviews	- ReCCIT -CIT Labs	-Documentary/ Literature research -Questionnaire -Interviews
9. Are there any unexpected positive or negative effects on environmental conservation?	9.1What are unexpected positive effects on environmental conservation? 9.2 What are unexpected negative effects on environmental conservation? 9.3 What are factors that provided positive effects on environmental conservation?	Description of the results of the discussion ReCCIT and concerned agencies	-Research Report -ReCCIT Report -Report of Interviews	- ReCCIT -CIT Labs	-Documentary/ Literature research -Questionnaire -Interviews
10. What are factors that provided positive or negative effects?	10.1 What are factors that provided positive effects on technical movement? 10.2 What are unexpected negative effects on technical movement?	Description of the results of the discussion ReCCIT and concerned agencies	-ReCCIT Report -Report of Interviews	- ReCCIT	-Documentary/ Literature research -Questionnaire -Interviews

ANNEX 1

IMPACT					
Evaluation	**Questions**	**Activities**	**Data**	**Data**	**Data Collection**
Main Questions	***Sub-Questions***	**Criteria/ Measures**	**Needed**	**Sources**	**Methods**
11. What is the impact of research findings in CIT in government and private sectors?	11.1 Has the ReCCIT's research findings been applied by any government agency? 11.2 Has the ReCCIT's research findings been applied by any private sectors?	Description of research findings applied by -governmental agencies -private agencies -NGO	-ReCCIT Report -Report of Interviews	-ReCCIT -Other organization	-Documentary/ Literature research -Questionnaire -Interviews
12. Has any of the ReCCIT Project's research findings been transferred or applied in educational institutions?	12.1 Has the new body of knowledge derived from research findings been added or written in school, college, and university texts? 12.2 Has any further research been conducted by other educational institutions? 12.3 Has any of research findings been used in Teaching and Learning in the Center or in other education institutions?	Description of research findings which were transferred or applied in educational institutions.	-ReCCIT reports and related documents	- ReCCIT -Other organization	-Documentary/ Literature research -Questionnaire -Interviews

ANNEX 1

IMPACT					
Evaluation	**Questions**	**Activities**	**Data**	**Data**	**Data Collection**
Main Questions	***Sub-Questions***	**Criteria/ Measures**	**Needed**	**Sources**	**Methods**
13. Has any of the research findings been used in industries and business?	13.1 Are there any sales of patents? 13.2 Has the findings been used by governmental agencies such as NECTEC or Ministry of CIT? 13.3 Are they any cases of *industries* applying or making use of the Center's research findings to improve their production and service technologies? 13.3 Are they any cases of *business* applying or making use of the Center's research findings to improve their production and service technologies? 13.4 Are they any cases of *NGO* applying or making use of the Center's research findings to improve their production and service technologies?	Describe the results of discussion with ReCCIT and Clienteles -Government agencies -Industries -Business -NGO	-ReCCIT Report and related documents -Report of Interviews	- ReCCIT -Other organization	-Documentary/ Literature research -Questionnaire -Interviews
14. Has the ReCCIT Project contributed to improve institutional capacity of the implementing agency?	14.1 Are there trained staff sufficient for the knowledge on various CIT areas? 14.2 How much has the ReCCIT Project improved knowledge and technology of ReCCIT's staff regarding new CIT models?	Description of the ReCCIT Project's role in improving institutional capacity of the implementing agency	-ReCCIT Report -Report of Interviews -JICA report	- ReCCIT	-Documentary/ Literature research -Questionnaire -Interviews

ANNEX 1

SUSTAINABILITY					
Evaluation	**Questions**	**Activities**	**Data**	**Data**	**Data Collection**
Main Questions	***Sub-Questions***	**Criteria/Measures**	**Needed**	**Sources**	**Methods**
1. Will impacts of the ReCCIT Project continue?	1.1 Will impacts of the overall goal continue? 1.2 Will impacts of the ReCCIT Project purpose continue?	Description of the results of the discussion ReCCIT and all concerned agencies	-ReCCIT Report -Interview Summary	-ReCCIT -Concerned agencies	-Documentary/ Literature research -Questionnaire -Interviews
2. What were incentives and disincentives that have sustainable effect on ReCCIT policy?	2.1 What were incentives that have sustainable effect on ReCCIT policy? 2.2 What were disincentives that have sustainable effect on ReCCIT policy? 2.3 Is ReCCIT policy assistance sustainable?	Description of the results of the discussion ReCCIT and all concerned agencies	-ReCCIT Report -Interview Summary	-ReCCIT -Concerned agencies	-Documentary/ Literature research -Questionnaire -Interviews
3. What were incentives and disincentives that have sustainable effects on economic and financial growth?	3.1 What were the incentives that have sustainable effects on economic and financial growth? 3.2 What were the disincentives that have sustainable effects on economic and financial growth?	Description of the results of the discussion ReCCIT and all concerned agencies	-ReCCIT Report -Interview Summary	-ReCCIT -Concerned agencies	-Documentary/ Literature research -Questionnaires -Interviews

ANNEX 1

SUSTAINABILITY					
Evaluation	**Questions**	**Activities**	**Data**	**Data**	**Data Collection**
Main Questions	***Sub-Questions***	**Criteria/Measures**	**Needed**	**Sources**	**Methods**
4. What were incentives and disincentives that have sustainable effects on ReCCIT's organization and system?	4.1 What were the incentives that have sustainable effects on organization and system? 4.2 What were the disincentives that have sustainable effects on organization and system?	Description of the results of the discussion ReCCIT and all concerned agencies	ReCCIT Report -Interview Summary	-ReCCIT -Concerned agencies	-Documentary/ Literature research -Questionnaire -Interviews
5. Are regulations and legal systems being developed for ReCCIT?	5.1 What are the regulations being developed? 5.2 What are the legal systems being developed?	Description of the results of the discussion ReCCIT and all concerned agencies	ReCCIT Report -Interview Summary	-ReCCIT -Concerned agencies	-Documentary/ Literature research -Questionnaire -Interviews
6. Does ReCCIT have organizational ability to smoothly implement activities?	6.1 Is the allocation of human resources for ReCCIT appropriate? 6.2 What changes in personnel are evidenced after the Project completion resulting from the awareness in the importance of quantity and quality of personnel? 6.3 Is the ReCCIT budget including operating expenses secured? 6.4 Is the process of decision making of ReCCIT operating appropriately? 6.5 Is the ReCCIT Project financially independent, or is financial support continuing?	-Description of the results of the discussion ReCCIT and all concerned	ReCCIT Report -Interview Summary	-ReCCIT -Counterpart staff	-Documentary/ Literature research -Questionnaire -Interviews

ANNEX 1

SUSTAINABILITY					
Evaluation	**Questions**	**Activities**	**Data**	**Data**	**Data Collection**
Main Questions	***Sub-Questions***	**Criteria/Measures**	**Needed**	**Sources**	**Methods**
7. What were incentives and disincentives that have sustainable effects on ReCCIT culture and environment?	7.1 What were the incentives that have sustainable effects on ReCCIT culture and environment? 7.2 What were the disincentives that have sustainable effects on ReCCIT culture and environment?	Description of the results of the discussion ReCCIT and all concerned	-ReCCIT Report -Interview Summary	-ReCCIT -Counterpart staff	-Documentary/ Literature research -Questionnaire -Interviews
8. Were there any positive and negative socio-cultural effects supporting or disrupting the continuation of ReCCIT activities?	8.1 What were the positive socio-cultural effects supporting the continuation of ReCCIT activities? 8.2 What were the negative socio-cultural effects or disrupting the continuation of ReCCIT activities?	Description of the results of the discussion ReCCIT and all concerned	-ReCCIT Report -Interview Summary	-ReCCIT -Counterpart staff	-Documentary/ Literature research -Questionnaire -Interviews
9. Are there more advanced researches on ICT in the ReCCIT and the Labs?	9.1 What were the areas of advanced research expanded from the original Project?	Description of the results of the discussion ReCCIT and all concerned	-ReCCIT Report -Interview Summary	-ReCCIT -Counterpart staff	-Documentary/ Literature research -Questionnaire -Interviews

ANNEX 1

SUSTAINABILITY					
Evaluation	**Questions**	**Activities**	**Data**	**Data**	**Data Collection**
Main Questions	***Sub-Questions***	**Criteria/Measures**	**Needed**	**Sources**	**Methods**
10. How has the ReCCIT been maintaining and updating existing facilities, equipment, materials and infrastructure?	10.1 How were the Labs and equipment being maintained to perform the research functions actively? 10.2 What changes in personnel are evidenced after the ReCCIT Project completion resulting from the awareness in the importance of quantity and quality of personnel?	Description of how the Center maintain the existing infrastructure, equipment, and develop its own staff Compare the list of new infrastructure, equipment, personnel with the previous one.	-ReCCIT Report --List of increased infrastructure, equipment and personnel, and student/graduates -Interview Summary	-ReCCIT - Clienteles	-Documentary/ Literature research -Questionnaires -Interviews
11. Has the financial resources of ReCCIT been secured and increased since the completion of the ReCCIT Project?	11.1 What is the percentage of increased revenue from the Government 11.2 Was there any income resulted from the ReCCIT services or sales of patented products?	Compare the revenue before and after the ReCCIT Project termination	-Budget allocations	-ReCCIT	-Documentary/ Lit. research -Questionnaire -Interviews
12. Are there cooperation in research in CIT being expanded between the ReCCIT and other domestic and international organizations after the completion of the ReCCIT Project?	12.1 What research projects are being conducted after the completion of the ReCCIT Projects? 12.2 What are good examples of cooperation in research with other domestic and international organizations?	Description of the results of the discussion ReCCIT and all concerned	-Research paper -Buddget allocation of KMITL -Future Plan of ReCCIT	-ReCCIT	-Documentary/ Lit. research -Questionnaire -Interviews
13. Are there any other financial supports after the termination of the ReCCIT Project?	13.1 What are those financial supports? 13.2 How much budget is available?	Description of the results of the discussion ReCCIT and all concerned agencies	-Budget allocation -Financial report	-ReCCIT	-Documentary/ Lit. research -Questionnaire -Interviews

ANNEX 2

Questionnaires for Counterparts
On Impact and Sustainability JICA-ReCCIT Project

Name:	**Position:**
Place of Work:	

Please answer the following

Part I: General Information

1. At present, are you still involved in ICT?

❑ Yes. ❑ No.

2. During the JICA-ReCCIT Project implementation, how much did you gain more knowledge and experience?

❑ Very Much ❑ Moderate ❑ Not much
❑ Not at all (Please specify the reasons)

3. After the termination of JICA-ReCCIT Project, have you participated in any ICT activities as part of academic and professional development?

❑ Yes. ❑ Once a year ❑ More than once a year
❑ No. (Please specify the reasons)

4. Did you get involved in conducting research and writing research reports? (You can select more than one)

4.1 During the JICA-ReCCIT period (October 1997-Septermber 2002)

❑ Yes ❑1-5 ❑ ❑More than 6
Please list the research topics:
❑ No. (Please specify your reasons):

4. 2. After the termination of JICA-ReCCIT

❑ Yes ❑1-5 ❑ ❑More than 6
Please list the research topics:
❑ No. (Please specify your reasons:

5. In your opinion, what is the extent in which research findings and outcomes by ReCCIT have been appropriately applied in the real ICT context?

❑ High ❑ Moderate ❑ Low (Please specify the reasons)

6. Have you been involved in ICT curriculum design or participated in ICT training as a resource person? (Select more than one)

6.1 During the JICA-ReCCIT Project period:

❑ Yes. Please list the curriculum or training programs:
❑ No. (Please specify your reasons:

6.2 After the termination of JICA-ReCCIT

❑ Yes. Please list the research topics:

❑ No. (Please specify your reasons:

Part II: Assessment of Impact

1. Achievement of the Overall Goal of ReCCIT and the Labs in making KMITL reach an international level in the field of communication and information technology and related fields

1.1 Please give the percentage of the graduates at the Master's degree and Doctorate Degree Programs as compared to those graduated from the Faculty of Engineering during the year 1998 up to present.

❑ Higher Approximate percentages □ 10 □ 20 □ 30 □ 50+

❑ Lower Approximate percentages □ 10 □ 20 □ 30 □ 50 +

1.2 After the Project termination, are there any research project by ReCCIT or ReCCIT collaboration with outside agencies?

ReCCIT ❑ Yes (Please specify) ❑ No (Please specify the reasons)

ReCCIT Collaboration with Other Agencies

❑ Yes (Please specify) ❑ No (Please specify the reasons)

1.3 Are the JICA- ReCCIT Project successful as expected?

❑ Higher than expected ❑ As expected ❑ Lower than expected

1.4 What were the reasons for success?

❑ Research abilities of researchers which were up to international standards

❑ Research laboratories and research projects were up to international standard

❑ Others (Please specify)

1.5 Please specify external factors supportive to the success of the Project

2. Unanticipated Positive or Negative Impacts of ReCCIT Project

2.1 Were there any positive Impacts of ReCCIT Project?

❑ Yes. (Please specify)

❑ No. (Please specify the reasons)

2.2 Were there any negative Impacts?

❑ Yes. (Please specify)

❑ No. (Please specify the reasons)

2.3 When negative impacts existed, did you take any measure to prevent them?

❑ Yes. (Please specify the methods)

❑ No. (Please specify the reasons)

2.4 ❑ Are there unanticipated side effects?

❑ Yes. (Please specify)

❑ No. (Please specify the reasons)

3. Incentives and disincentives supporting and inhibiting the success of the Project

3.1 Were there any incentives supporting the success of the Proj ect?

❑ Yes. (Please specify)

❑ No. (Please specify the reasons)

3.2 Were there any disincentives inhibiting the success of the Project?

❑ Yes. (Please specify)

❑ No. (Please specify the reasons)

4. Unanticipated Impacts on Policy

4.1Were there any positive unanticipated mpacts on policy?

❑ Yes. (Please specify)

❑ No. (Please specify the reasons)

4.2 Were there any negative unanticipated impacts on policy?

❑ Yes. (Please specify)

❑ No. (Please specify the reasons)

4.3 Were there any factors causing negative unanticipated mpacts?

❑ Yes. (Please specify)

❑ No. (Please specify the reasons)

5. Unanticipated Impacts on economy

5.1 Were there any positive unanticipated impacts on economy?

❑ Yes. (Please specify)

❑ No. (Please specify the reasons)

5.2 Were there any negative unanticipated impacts on economy?

❑ Yes. (Please specify)

❑ No. (Please specify the reasons)

5.3 Were there any factors causing negative unanticipated impacts on economy?

❑ Yes. (Please specify)

❑ No. (Please specify the reasons))

6. Unanticipated Impacts on laws and regulations

6.1 Were there any positive unanticipated impacts on laws and regulations?

❑ Yes. (Please specify)

❑ No. (Please specify the reasons)

6.2 Were there any negative unanticipated impacts on laws and regulations?

❑ Yes. (Please specify)

❑ No. (Please specify the reasons)

6.3 Were there any factors causing negative unanticipated impacts on laws and regulations?

❑ Yes. (Please specify)

❑ No. (Please specify the reasons))

7. Unanticipated Impacts on communication and information technology

7.1Were there any positive unanticipated impacts on communication and information technology?

❑ Yes. (Please specify)
❑ No. (Please specify the reasons)

7.2 Were there any negative unanticipated impacts on communication and information technology?

❑ Yes. (Please specify)
❑ No. (Please specify the reasons)

7.3 Were there any factors causing negative unanticipated impacts on communication and information technology?

❑ Yes. (Please specify)
❑ No. (Please specify the reasons)

8. Unanticipated Impacts on human rights and poverty

8.1 Were there any positive unanticipated impacts on human rights and poverty?

❑ Yes. (Please specify)
❑ No. (Please specify the reasons)

8.2 Were there any negative unanticipated impacts on human rights and poverty?

❑ Yes. (Please specify)
❑ No. (Please specify the reasons)

8.3Were there any factors causing negative unanticipated impacts on human rights and poverty?

❑ Yes. (Please specify)
❑ No. (Please specify the reasons))

9. Unanticipated Impacts on conservation of environment

9.1 Were there any positive unanticipated impacts on conservation of environment?

❑ Yes. (Please specify)
❑ No. (Please specify the reasons)

9.2 Were there any negative unanticipated impacts on conservation of environment?

❑ Yes. (Please specify)
❑ No. (Please specify the reasons)

9.3 Were there any factors causing negative unanticipated impacts on conservation of environment?

❑ Yes. (Please specify)
❑ No. (Please specify the reasons))

10. Impact of research findings in ICT to public and private sectors

10.1 Have any research findings been used in public sector such as NECTEC or Ministry of Information and Communication Technology?

❑ Yes. (Please specify)
❑ No. (Please specify the reasons)

10.2 Have any research findings been used in private sector such as ICT industries?

❑ Yes. (Please specify)
❑ No. (Please specify the reasons)

11. .Impact of research findings in ICT to higher education

11.1 Have any new findings or new body of knowledge been disseminated in books, texts, or journals published by higher educational institutions for teaching and learning?

- ❑ Yes. (Please specify)
- ❑ No. (Please specify the reasons)

10.2 Have additional research activities been conducted as the continuation of ReCCIT research findings?

- ❑ Yes. (Please specify)
- ❑ No. (Please specify the reasons)

11.3 Are there evidences of any other universities integrated ReCCIT findings in their teaching and learning?

- ❑ Yes. (Please specify)
- ❑ No. (Please specify the reasons)

12. Application of ReCCIT research findings in business and ICT industries?

12.1 Were there any sales of patents?

- ❑ Yes. (Please specify)
- ❑ No. (Please specify the reasons)

12.2 Were there any application of ReCCIT research findings by ICT industries in developing new industrial products and services in ICT?

- ❑ Yes. (Please specify)
- ❑ No. (Please specify the reasons)

12.3 Were there any application of ReCCIT research findings by NGO in developing new industrial products and services in ICT?

- ❑ Yes. (Please specify)
- ❑ No. (Please specify the reasons)

13. Contributions of ReCCIT project in improving ICT management in business and ICT industries

13.1 Has ReCCIT project contributed to increasing the number of ICT personnel through education and training in ICT?

- ❑ Yes. (Please specify)
- ❑ No. (Please specify the reasons)

13.2 Has ReCCIT project contributed to increasing the knowledge on ICT of regular staff members?

- ❑ Yes. (Please specify)
- ❑ No. (Please specify the reasons)

Part III Sustainability of ReCCIT Project

1. Sustainability of ReCCIT Project in achieving the overall goal

1.1 Was the overall goal sustainable?

❑ Yes. (Please specify)

❑ No. (Please specify the reasons)

1.2 Were the ReCCIT Project purposes sustainable?

❑ Yes. (Please specify)

❑ No. (Please specify the reasons)

2. Incentives and disincentives on the sustainability of ReCCIT project

2.1 Were there any incentives supporting the sustainability of ReCCIT project on policy?

❑ Yes. (Please specify)

❑ No. (Please specify the reasons)

2.2 Were there any disincentives inhibiting the sustainability of ReCCIT project on policy?

❑ Yes. (Please specify)

❑ No. (Please specify the reasons)

2.3Will the policy on ReCCIT project sustainable?

❑ Yes. (Please specify)

❑ No. (Please specify the reasons)

3. Incentives and disincentives on the sustainability of ReCCIT project on economy

3.1 Were there any incentives supporting the sustainability of ReCCIT project on economy?

❑ Yes. (Please specify)

❑ No. (Please specify the reasons)

3.2 Were there any disincentives inhibiting the sustainability of ReCCIT project on economy?

❑ Yes. (Please specify)

❑ No. (Please specify the reasons)

3.3Will the policy on ReCCIT project sustainable?

❑ Yes. (Please specify)

❑ No. (Please specify the reasons)

4. Incentives and disincentives on the sustainability of ReCCIT project on organization and organization systems

2.1 Were there any incentives supporting the sustainability of ReCCIT project on organization and organization systems?

❑ Yes. (Please specify)

❑ No. (Please specify the reasons)

2.2 Were there any disincentives inhibiting the sustainability of ReCCIT project on organization and organization systems?

❑ Yes. (Please specify)

❑ No. (Please specify the reasons)

2.3 Will the policy on ReCCIT project sustainable?

❑ Yes. (Please specify)

❑ No. (Please specify the reasons)

5. Development of laws and regulations for ReCCIT

5.1 Are there any laws regulations governing ReCCIT?

❑ Yes. (Please specify)

❑ No. (Please specify the reasons)

5.2 Are there any regulations governing ReCCIT?

❑ Yes. (Please specify)

❑ No. (Please specify the reasons)

6. ReCCIT's sustainability to carry out academic and research activities

6.1 Is the staffing of ReCCIT adequate and sufficient?

❑ Yes. (Please specify)

❑ No. (Please specify the reasons)

62 After the project completion,were there any changes in quantity and quality of ReCCIT personnel?

❑ Yes. (Please specify)

❑ No. (Please specify reasons)

6.3 Is the budget allocated to ReCCIT sufficient for operation and research activities?

❑ Yes. (Please specify)

❑ No. (Please specify reasons)

6.4 Is the decision making process for ReCCIT appropriate for effective implementation of its academic and research programs?

❑ Yes. (Please specify)

❑ No. (Please specify reasons)

6.5 Does the ReCCIT project become financially independent or get continuous financial supports?

❑ Yes. (Please specify)

❑ No. (Please specify reasons)

7. Incentives or disincentives affecting ReCCIT's sustainability on cultures and environments

7.1 Were there any incentives supportive to ReCCIT's sustainability on cultures and environments?

❑ Yes. (Please specify)

❑ No. (Please specify reasons)

7.2 Were there disincentives inhibiting ReCCIT's sustainability o cultures and environments?

❑ Yes. (Please specify)

❑ No. (Please specify reasons)

8. Social and cultural factors supporting or inhibiting ReCCIT project

8.1Were there any social and cultural factors affecting the implementation of ReCCIT project?

❑Yes. (Please specify)
❑No. (Please specify reasons)

8.2 Were there any social and cultural factors inhibiting the implementation of ReCCIT project?

❑Yes. (Please specify)
❑No. (Please specify reasons)

9. Additional advanced research in ICT by ReCCIT and the Labs

9.1Were there any plan to conduct advanced research in ICT conducted by ReCCIT and its Labs?

❑Yes. (Please specify)
❑No. (Please specify reasons)

9.2 Has ReCCIT already started advanced research? In what field?

❑Yes. (Please specify)
❑No. (Please specify reasons)

10. Maintenance and Repairs of Building, Facilities, Equipment, Materials, and ICT Infrastructure

10.1 Were Lab equipment and facilities fully maintained for continuous research activities?

❑Yes. (Please specify)
❑No. (Please specify reasons)

10.2 Were there any seminars or training on theories or practices derived from ReCCIT's research findings?

❑Yes. (Please specify)
❑No. (Please specify reasons)

11. Financial Security after the Project Completion

11.1 Were there any budgets allocated from the government directly to ReCCIt

❑Yes. (Please specify)
❑No. (Please specify reasons)

11.2 Did ReCCIT earn any income from the sales of patents or consultancy services?

❑Yes. (Please specify)
❑No. (Please specify reasons)

12. Research collaboration between ReCCIT and Outside Organization Domestic and International

12.1 Were there any more research projects after the Project completion?

❑Yes. (Please specify)
❑No. (Please specify reasons)

12.2 Were there any outstanding researches resulted from the collaboration between ReCCIT and outside domestic and international organizations?

❑Yes. (Please specify)

❑ No. (Please specify reasons)

13. Financial Supports from External Sources after Project Terminations

13.1 After the Project completion, were there any financial supports from external sources in the Thailand?

❑ Yes. (Please specify)
❑ No. (Please specify reasons)

13.2 After the Project completion, were there any financial supports from external sources outside Thailand?

❑ Yes. (Please specify)
❑ No. (Please specify reasons)

ANNEX 3
Interview Questions and Results
For Counterparts of JICA-ReCCIT Project

IMPACT OF RECCIT PROJECT

	Interview Questions	Results
1	What are the progress of ReCCIT implementation after its completion in 2003?	ReCCIT's on-going academic and research activities:: 1) Research Projects: 2003 - 22 Research Projects 2004 - 19 Research Projects 2) International Conferences, Seminars/Lectures: 2003 - 7 times 2004 - 4 times 3) Visitors from Domestic and Abroad 2003 - 10 Groups (114) 2004 - 3 Groups (64 visitors)
2	What are collaboration and coordination between ReCCIT and related public and private sectors, especially in research and development of ICT?	***Domestic:*** With NECTEC, APT, ORF, and ONR ***Foreign countries:*** Japan, Korea, Singapore
3	What are the success and problems in management of ReCCIT project after the completion?	***Successes:*** 1) Research projects in progress and completed as planned; 2) Research findings were published in international journals through peer reviews; 3) Academic Staff were promoted to higher academic ranks such as professorship, associate professorship, and assistance professorship. ***Problems:*** (1) Shortage of funds for replacement and repairs of expensive equipment; (2) Insufficient Financial supports for personnel development, (3) Shortage of external technical experts, (4) Deteriorating hardware and software, (5) Incomplete Research Cycle
5	What are unanticipated impacts, positive or negative, of ReCCIT project?	***Positive:*** No unanticipated impacts. ***Negative:*** (1) Interrupted Research Cycle Due to Limited Project Time

		(2) The Absence of Short-terms and Long term Experts (3) Unanticipated Signal Interferences from New International Airport. (4) Delay of institutionalization of ReCCIT as a Government Official Agency
6	What are the government and KMITL policies related to development and promotion of ICT?	There are clear government policy in the use of ICT in various governmental organizations; KMITL also stated as policy to upgrade professional development and research in the field of ICT.
7	What is the impact of research findings in CIT in government and private sectors?	Not much in terms of the impact of research findings being applied in public and private sectors, except with academic cooperation with NECTEC
8	Has any of the research findings been used in industries and business?	Limited. Some industrial firms seak advices and R&D in material sciences and mobile technology.
9	Have any of the Project's research findings been transferred or applied in educational institutions?	Yes. Mostly through ReCCIT graduates who completed Doctoral and Master's Degree. The knowledge and research findings were transferred to institutions of higher learning where they work as instructors or researchers.
10	What are the recommendations to JICA, the Royal Thai government and KMITL?	1) JICA should provide a definite guideline or measures to the Royal Thai government to ensure sustainability of the Project so that the government feels the obligation to provide supports and to take necessary actions to sustain the project activities after the project termination 2) JICA should seek cooperation with Japanese universities and industries to provide grants in three areas: (1) for short-terms experts from Japan to ReCCIT; (2) short visits by ReCCIT researchers to understudy in Japan, and (3) up-to-date research laboratories equipment and facilities for some of the 14 Labs.

ANNEX 3

SUSTAINABILITY OF RECCIT PROJECT

	Interview Questions	Results
1	Has the ReCCIT been maintaining existing infrastructure, equipment, and personnel?	Yes. ReCCIT was moved to the 9th-10th Floor of the Office of the President Building. Infrastructure, equipment, and personnel have been maintained and keep academic and research activities rolling on.
2	Has the revenue of ReCCIT been increased since the completion of the Project?	Yes. But lower than the project period. During the five year project periods, ReCCIT received funds from three sources: (1) Japan side: JICA provided three categories of financial supports: (1) 200,181,000 Baht as annual supplies of equipment; (2) 25,358,000 Yen for accompanied equipment, (3) 5,677,560 Baht for locally purchased equipment; and (4) 18,182,107 Baht for general use. (2) Thai side: DTEC provided 1,796,567 Baht for smooth management of Project's activities, and KMITL provided 61,061,920 Baht totaling 62,858,487 Baht. After the Project completion, the ReCCIT's revenue comes from two sources: (1) KMITL via Faculty of Engineering and Faculty of Information Technology totaling 2,600,000 annually (7.96%), and (2) external sources (NECTEC, ORF, ONR) totaling 60,149,780 (92.04%) Although during the two years period, the revenue allocated to ReCCIT from KMITL (5,200,000 Baht) was less than the Project period (62,061,920 Baht), ReCCIT's academic and research activities were maintained through financial supports granted by external sources (54, 949 Baht) such as NECTEC, APT, ORF, and ONR making the revenue totaling 60,149,780 Baht.
3	Has the ReCCIT been maintaining research activities after the completion of the Project?	Yes. The research projects maintained by ReCCIT, were 22 Research Projects in 2003 and 19 Research Projects in 2004.
4	What are the factors contributing to or hindering the Project's outcomes?	***Contributing Factors:*** 1) KMITL policy to be a center of excellence in ICT and related fields; 2) Research capacities and profezssional competencies of academic and research staff;

		3) Commitments of KMITL and ReCCIT management to sustain the overall goal of helping KMITL fullfil the overall goal: i.e. "KMITL reaches an international level in the field of communication and information technology." ***Hindering Factors:*** Inhibiting organizational factors consists of shortage of funds for replacement and repairs of equipment, insufficient financial supports for personnel development, shortage of external technical experts, deteriorating hardware and software and incomplete research cycle.
5	. Has the number of clientele been increasing both at the government and private sectors?	No. The clientele remain mostly, through collaboration, NECTEC, APT, ORF, and ONR
6	Are there any outside financial supports in this Project after the project termination?	Yes. From NECTEC, APT, ORF, and ONR.
7	What are the overall sustainability and continuity resulted from ReCCIT project?	Ranging from being "Maintained" to "High" as all academic and research activities are progressing well.
8	What is the sustainability of ReCCIT's overall goal?	Moderate. KIMTL and ReCCIT have been increasing recognized by international community of scholars, especially at the regional levels such as ASEAN, South Asia, and East Asia.

RECOMMENDATIONS:
For JICA:

1) JICA should provide a definite guideline or measures to the Royal Thai government to ensure sustainability of the Project so that the government feels the obligation to provide supports and to take necessary actions to sustain the project activities after the project termination. As was the case of JICA-ReCCIT, there was not adequate budgets for research activities, for maintenance and for repairing of expensive research equipment and facilities;
2) JICA should seek cooperation with Japanese universities and industries to provide grants in three areas: (1) for short-terms experts from Japan to ReCCIT; (2) short visits by ReCCIT researchers to understudy in Japan, and (3) up-to-date research laboratories equipment and facilities for some of the 14 Labs.

For KMITL:

1) Although, ReCCIT has been an internal agency of faculty-level, it remains necessary to be institutionalized as be an official unit of Faculty level in KMITL as indicated in the Agreement. After becoming an official agency, ReCCIT will be able to set up the budge of their own instead of receiving financial supports through other channels;

2) ReCCIT should develop more collaboration and financial supports with domestic and international ICT based institutions and industries for full cycle research projects.

3) Since ICT is in line with national policy, the Royal Thai government, should increase research budget and provide more financial supports to KMITL for high technological equipment and facilities in research laboratories and establish KMITL as the Center of Excellence in ICT.

ANNEX 4
Details of financial support to ReCCIT from KMITL and external sources

From KMITL:
The ReCCIT received equal budgets of 2,600,000 Baht for its operation (administrative and academic activities) and research works in the 14 laboratories from the KMITL via the Faculty of Engineering (2,400,000 Baht) and the Faculty of Information Technology (240,000 Baht) as shown below.

Table 4-1 The ReCCIT Budget for Operation and Research in 2003 and 2004

Year	Operation (Baht)	Research Activities (Baht)	Total (Baht)
2003	720,000	1,780,000	2,600,000
2004	780,000	1,700,000	2,600,000

From External Sources:
External sources providing research funds to The ReCCIT were from NECTEC, Asia Pacific Telecommunity (APT), and the Office of National Research (ONR):

a) External Funds in 2003

In 2003, external research funds were granted by NECTEC (663,334 Baht [1], Asia Pacific Telecommunity (APT) 2,038,380 Baht, and the Office of National Research (ONR) 3,500,560 Baht totaling 6,202,274 Baht.

Table4-2 External Research Funds from NECTEC, Asia Pacific Telecommunity (APT), and Office of National Research (ONR) for 2003

Funding Agencies	Research Projects	Amount of Support (Baht/year)	Research Lab
NECTEC	-Research and Development in 3rd Mobile Telecommunication Systems Phase III; -ADC DAC for WCDM System	**663,334**	Wireless Communication Laboratory
Asia Pacific Telecommunity (APT)	-Electromagnetic Compatibility Laboratory on Evaluation of Electromagnetic Broadband Noise Effect on Mobile Communications Systems.	**2,038,380**	Electromagnetic Compatibility Laboratory
Office of National Research (ONR)	a. Four research projects: -Dielectric for Material Inspections	**3,500,560** 360,560	Wireless Communication Laboratory

[1] NECTEC's total research fund was 46,317,400 Baht for a three years project. The ReCCIT's share was 1,990,000 Baht (663,334 Baht per year)

ANNEX 4

	-A High Gain Antenna Using a Circular Ring near the Reflector for Wireless Local Area Network Application	240,000	Wireless Communication Laboratory
	-Analog Integrated Circuits for Signal Processing Transcetive	2,500,000	Signal Transmission Lab
	-Analog IC for W-CDMA	400,000	Micro-electronics R&D Lab
	Total	***6,202,274***	

b) External Funds in 2004

In 2004, research funds, totaling 4,091,334 Baht, were granted to The ReCCIT researchers from two external sources as below:

Table 4-3 External Research Funds from NECTEC, and Thai Research Funds (TRF)

Funding Agencies	**Research Projects**	**Amount of Support per Year**	**Research Lab**
NECTEC		**951,334**	
	-Research Project on Antennas for 3rd Generation Mobile Telecommunication system-Phase 2)	663,334	For Wireless Communication Laboratory
	-Research Project on Analog IC for WCDMA Applications)	288,000 (Totally 864,000 Baht for three years)	Micro-electronic Devices R&D Laboratory
TRF		**3,140,000**	
	-For IC for Signal Processing	2,500,000 (Totally 7,500,000 Baht for three years)	Mixed Signal Processing Laboratory
	-For High-Amplifying Rate Antennae	240,000	Wireless Communication Laboratory
	-For Mixed Analog Signal for W-CDMA	400,000 (Totally 1,200,000 Baht for three years)	Micro-electronic Devices R&D Laboratory
	Total	***4,091,334***	

ANNEX 5
List of ReCCIT Project Equipment (JFY 1997-2000)

ReCCIT Laboratory	JFY	Equipment	Amount (THB)	QTY
Mobile Communication	1997	RF Channel Simulator HP 11759C	3,580,000	1
	1997	Cell Site Test Set HP8921A	3,180,000	1
	1997	Digital Signal Generator HP ESG-D3000A	1,190,000	1
		Total year 1997	7,950,000	
	1999	W-CDMA Simulation System	4,385,000	1
		Total year 1998	4,385,000	
	2000	CDMA Mobile Station Test Set HP E8285A	2,498,600	1
	2000	Internal Spectrum Analyzer with Tracking	112,000	1
	2000	Generator CDMA Mobile Station Test Software	132,000	1
	2000	op.001	132,000	1
	2000	CDMA Dual Mode Station Test Software op.004	908,000	1
	2000	Digital and Analogue Signal Generator HP E4436	310,000	1
	2000	Digital and Analogue Signal Generator op.UND	110,000	1
	2000	Digital and Analogue Signal Generator op.UNS	119,000	1
	2000	Digital and Analogue Signal Generator op. 100	119,000	1
	2000	Digital and Analogue Signal Generator op. 100	676,000	1
	2000	RF Signal Generator HP E4424	1,544,000	1
	2000	Base and Vector Signal Analyzer HP 8961 OA (E8491+89606A+E1438A)	339,000	1
		Base and Vector Signal Analyzer op.AYA		
		Total year 2000	6,999,600	
		Total cost of equipment of Mobile Communication Lab	***19,334,600***	
Satellite Communication	1997	VHF/UHF Monitor Receiver RR502A	1,423,000	1
	1997	Personal Computer Digital PC 3100	50,000	1
	1997	Ku-and Satellite Receiver System: DX Antenna	420,000	1
	1997	Rain Gauge	245,000	1
	1997	Sunshine Intensity Sensor	377,000	1
	1997	Ka-and Antenna System	279,600	1
	1997	1/2-Digit MultiMeter: KEITHLEY	128,400	1
	1997	LR4110E Recorder(Yokogawa)	138,870	1
	1997	Portable Recorder(Yokogawa)	92,430	1
		Total year 1997	*3, 1 54,300*	
	1998	Synthesized Sweeper	2,012,610	1
	1998	HP83640 HP8648 Synthesized Signal Generator	489,667	1
	1998	Data Acquisition HP34970A	44,289	1
	1998	20-Channel Armature Multiplexer Module HP34901A	13,546	1
		Total year 1998	*2,560,112*	
	1999	Workstation Sun Ultra 10	395,000	1
		Total year 1999	395,000	
	2000	DAQSTATION DX106-1-2/M1	154,000	1
	2000	Wan/ridge/Router ZyXEL Prestige 153X	32,000	1
	2000	Wan/Router ZyXEL Prestige 100WH	17,000	1
	2000	56K External V.90 Fax Modem	8,000	2
	2000	Personal Computer Powell Achilles P3800	38,000	1

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		Total year 2000	249,000	
		Total cost of equipment of Satellite Communication Lab	**6,358,412**	
Wireless Communication	1997	Network Analyzer HP-851 07	6,963,000	1
	1997	Workstation: Sun Ultra Enterprise 2 Model 2300 &	3,157,000	1
		Workstation: Sun Ultra 1 Model 170 w/ 20"		4
	1997	monitor Wide-and Amplifier HP	1,550,000	1
		83050A.HP87422A		
	1998	*Total year 1997*	*11,670,000*	1
		APS Smart UPS 3000VA	54,065	
	1999	*Total year 1998*	*54,065*	2
		Workstation Sun Ultra 10	770,000	
	2000	*Total year 1999*	*770,000*	1
	2000	Time Domain upgrade kit for the HP 8530A	506,000	4
	2000	Memory upgrade for SUN ULTRA 2	124,000	2
	2000	UPS:APC 1000VA	48,000	1
		RF Spectrum Analyzer HP E4403	609,000	
		Total year 2000	*1,287,000*	
		Total cost of equipment of Wireless Communication Lab	***13,781.065***	

ReCCIT Laboratory	JFY	Equipment	Amount (THB)	QTY
Signal Transmission System	1999	RF board and DSP Designer (2User)	3,461,130	1
	1999	Video Measurement Set of TEKTONIX VM700T)	2,111,600	1
	1999	Arbitrary Waveform Gen.(TEKTRONIX	1,080,300	1
	1999	AWG2021) Synthesized CW Generator(HP83711)	896,640	1
	1999	Liert UPS 1000VA	120,000	6
	1999	Digital 8 Camera: SONY	44,400	1
	1999	Network Laser Printer HP Jet2100	33,600	1
	1999	WE7000 Precision Data Acquisition of Yokogawa)	448,600	1
	1999	Spectrum Analyzer(HP-E4403)	410,880	1
	1999	Video Test Signal Generator of TEKTRONIX	393,800	1
	1999	TSG271)	373,000	4
	1999	Step Attenuater Set (HP 8495 + HP 9494)	92,000	1
	1999	Road and Noise Source(HP346C)	67,600	1
	1999	Signal Level Meter (TEKTRONIX)	50,650	1
	1999	Interface Card (HP8241C.HP1 08338)	39,800	1
	1999	SMA Coaxial Fixed Termination(TEKTRONIX)	450,000	5
	1999	PC: ATEC Premier (Pentium III 500MHz w/NEC)	20,400	1
	1999	Color Ink Jet Printer HP-1120C	19,000	1
		lack LaserJet Printer HP-1100	*10,113,400*	
	2000	*Total year 1999*	1,749,000	1
	2000	Portable Spectrum Analyzer: Agilent 8563EC	2,497,000	1
	2000	Noise Figure Test 8971 C op.001	2,256,000	1
	2000	Synthesized Swept-Signal Generator Agilent 83630	300,000	2

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	2000	Double Ridged Wave Guide Horn Antenna: Agilent	156,000	2
	2000	High Performance Power Supply: Agilent 6633	57,000	1
		UPS: APC 3000VA		
		Total year 2000	*7,015,000*	
		Total cost of equipment of Signal Transmission System Lab	***17,128,400***	
Communication Networks	1997	Unix Server HP J210XC basic System	1 ,582,050	1
	1997	Workstation Unix Sun Ultla2 2170	1,005,900	1
	1997	UPS APS Smart 2200VA	113,000	2
	1997	HP VectraVL5/166	55,000	1
	1997	Laser Printer HP Laser Jet 6MP	35,500	1
	1997	X-Terminal HP-Envizexll	635,640	2
	1997	Software C.C,++Compiler HP Unix	163,710	1
		Intel Express 10/100 stackale Hu	245,000	
		Total year 1997	*3,835,800*	
	1998	Workstation HP Kayak XW and Sony WEGA	808,000	2
	1998	ATEC Premier	79,640	2
	1998	HP Laser Jet Printer 2100C	30,785	1
	1998	HP Jet direct Card	22,520	2
	1998	HP Scan Jet 6200C	16,190	1
		Total year 1 998	*957, 135*	
	1999	Op net Modeler Software	2,498,700	1
		Total year 1999	*2,498,700*	
	2000	Personal Computer Powell Achilles P3933	144,000	3
		Total year 2000	144,000	
		Total cost of equipment of Communication Networks Lab	***7,435,635***	
Information Science	1997	Digital Video Camera: SONY Handy cam Vision DCR-PC10EPAV	181,000	2
	1997	Compaq Presario 4830	83,900	1
	1997	Trip lops Stereo Vision System	174,330	1
	1997	LPA Prolog Compiler for Win.95/NT	143,000	1
	1997	PC ATEC	125,000	2
	1997	HP LaserJet Printer 5L	24,500	1
	1997	Scanner: HP Scan Jet 6100C	25.600	1
	1997	Printer: HP Desk jet MOOOC	15,600	1
		Total year 1997	772,930	
	1998	Software for speech recognizer	550,000	1
		Total year 1998	*550,000*	
	2000	Personal Computer Powell Achilles P3933	48,000	1
		Total	*48,000*	
		Total cost of equipment of Information Science Lab	***1,370,930***	

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ReCCIT Laboratory	JFY	Equipment	Amount (THB)	QTY
Multimedia & Virtual	1997	Silicon Graphics Workstation O2	1,396,646	2
	1997	Softimage Extreme FX3D for SGI ver 3.7	1,228,367	2
	1997	Phantom Interface	1,757,759	2
	1997	Cyber Grove CG-22020-R	1,682,635	2
	1997	Pro Dev C-n-undle for C	600,490	2
	1997	Crystal Eyes 2 Eye ware	172,046	2
	1997	World tool Kit	810,880	2
	1997	Isotrak ll	281 ,908	2
	1997	CyerEye CE-200W	195,1 18	2
	1997	Simscript II.5	90,500	1
		Total year 1997	*8,216,349*	
	1998	APS Smart UPS 2200VA	37,795	1
		Total year 1998	37,795	
	2000	World Toolkit Development License for	678,000	1
	2000	Windows NT Upgrade World Toolkit for SGI	570,000	2
	2000	(per license) Cyber Glove System (left hand)	959,000	1
	2000	IRIX 6.5 S/W Upgrade for SGI Workstation	66,000	2
	2000	Ethernet Switch 3 COM Super Stacks 3300	44,000	1
	2000	Personal Computer Powell Achilles P3933	270,000	3
	2000	UPS:APC 2200VA	38,000	1
		Total year 2000	*2,625,000*	
		Total cost of equipment of Multimedia & Virtual Lab	***10,879,144***	
Communication Circuit Design	1998	MS4662A Network Analyzer	1,593,180	1
	1998	MS2663C Spectrum Analyzer	799,947	1
	1998	MS2661 Spectrum Analyzer	549,433	1
	1998	MG3601A Signal Generator	313,053	1
	1998	MG3641 A Synthesized Signal Generator	274,893	1
		Total year 1998	3,530,506	
	2000	Work Station: Hewlett Packard Kayak XM 600	1,098,000	6
		Total	*1,098,000*	
	Total	***cost of equipment of Communication Circuit Design Lab***	***5,726,506***	
Mixed Signal Processing	1997	Cadence 1C Design Software		1
	1997	Sun Ultra Enterprise 4000 Server	31,660,420	1
	1997	Synopsys Software	4,102,206	1
	1997	Network/Spectrum/Impedance Analyzer	4,578,400	1
	1997	Digital Strage Oscilloscope	1,720,400	1
	1997	Signal Generator HP-8648A	370,700	1
	1997	50-OHM Type-N Caliration Kit	317,900	1
		Total year 1997	92,400	
	1998	APS Smart UPS 3000VA		2
	1998	Sun StroEdge Multipack 18.2G	42,842,426	1
	1998	Xilink Primary Package	108,130	1
	1998	Xilink Alliance License	158,045	4
	1998	Sun CD 12Speed Unipack	133,445	1
	1998	FPGA Starter Kit	89,152	5

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	1998	X-Checker Cale	67,265	1
		Total year 1998	18,325	
	1999	Work Station: Hewlett Packard Kayak XM 600	14,136	8
	1999	CD-RW external Yamaha	588,498	1
		Total year 1999	1,360,000	
			19,800	
			1,379,800	
		Tota1 cost of equipment of Mixed Signal Processing Lab	***44,236,362***	

ReCCIT Laboratory	JFY	Equipment	Amount (THB)	QTY
Biomedical Signal & Image Processing	1997	Unix Sun Ultra Enterprise 2-2300	1,240,000	1
	1997	Color Printer Kodak 8650 PS	495,627	1
	1997	ATEC Premier Pro	384,720	3
	1997	Read/Write CD-ROM	73,800	2
	1997	Laser Printer HP Laser Jet 6MP	69,000	2
	1997	Monitor 21 "(NEC Multi syncEl 1 00)	58,720	1
		Color Scanner: HP Scan Jet 6100C	27,500	1
	1997	Film Scanner(Nikon LS1000)	54,700	1
	1997	Sun Ultra Model 170E Creator	1,692,000	4
		Hu: 3com TP 100	50,260	
		Ethernet Interface card: 3com	12,600	
		Total year 1997	*4,158,927*	
	1998	APS Smart UPS 3000VA	108.130	2
	1998	Fuji film Digital Camera DS-300	89,280	1
	1998	Nonlinear Digital Video Editing System	51,835	1
	1998	KODAK 8650 CP Paper	31,413	3
	1998	WACOM Digitizer	14,975	1
	1998	KODAK 8650 CP XLS Paper	3,770	1
		Total year 1998	299,403	
	1999	LCD Monitor: NEC Multisync LCD 2010	462,400	2
	1999	NECMultisyncE1100	450,000	5
	1999	Workstation HP Kayak XM600	199,500	1
	1999	ATEC Premier Pro	264,800	4
	1999	Video Capture CARD NIC	56,400	1
		Total year 1999	*1,433,100*	
		Total cost of biomedical Signal & Image Processing Lab	***5,607,002***	
Electromagnetic Compatibility	1997	Network Analyzer (20GHz) FHP 83621 ,	4,400,000	1
	1997	HP8514, HP Digital RLC Meter: HP 4286A	1 ,300,000	1
	1997	Digital Storage Oscilloscope: HP	1 ,200,000	1
	1997	Digital Frequency Counter: HP 531 32A	200,200	1
	1997	Current Proe: HP 1146A	18,700	1
		Digital Pulse Generator: HP 811 10A, HP 81111 A, HP E3631A	616,000	
		Total year 1997	*7,734,900*	
	1998	RF Noise Analyzer NIS-26723(I)&(II) & Notebook PC TOSHIA TECRA 8000	7,283,333	1
		Total year 1998	7,283,333	

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	2000	EMC Precomplience Systems: Agilent 841 15EM (Agilent E7401A , etc.)	1 ,005,000	1
	2000	EMC Compact Test Systems: Schaffner EST	862,000	1
	2000	EMC-1 Magnetic Field Coil: Schaffner INA702	191,000	1
	2000	Power Quality Analyzer FLUKE Model 43	115,000	1
	2000	UPS:APC 2200VA	38,000	1
	2000	Personal Computer Powell Achilles P3733	141,000	3
	2000	Personal Computer Powell Achilles P3933	144,000	3
	2000	Laser Printer HP LaserJet 1100	17,000	1
	2000	Color Scanner HP5300C	13,000	1
	2000	External CD-RW / HP 8230e	15,000	1
		Total	*2,541,000*	
		Total cost of equipment of Electromagnetic Compatibility Lab	***17,559,233***	

ReCCIT Laboratory	JFY	Equipment	Amount (THB)	QTY
Control and Mechatronics	1997	MATHLA For 5 users	2,763,396	1
	1997	Digital Personal Workstation 433au	3,070,289	3
	1997	Direct Drive Manipulator TS003A	1,217,287	1
	1997	Digital Alpha Server 800 5/400 Unix	1,181,350	1
	1997	Fortran 90 For Unix System	267,007	1
	1997	MATHLA For PC ase	340,671	1
		Test Program(software) for Root: Tokyo Electronics Systems	521, 791	
		Total year 1997	*9,361,791*	
	1998	Digital Oscilloscope	*1,717,000*	*1*
	1998	Pentium II 350MHz ATEC PC	31 6,740	6
	1998	HP Laser Printer 4000NT	131,940	2
	1998	File-server ATEC NEXUS500	91, 770	1
	1998	MATHLA 1 User	71,625	1
	1998	Digital Extended math Library	46,868	1
	1998	Toolbox	42,576	1
	1998	IMSL C Numerical Library	38,612	1
	1998	Data Acquisition System	30,578	1
	1998	Complex Hu 16ports	6,495	1
	1998	Modem Acer56K	3,040	1
	1998	APS Smart UPS 3000VA	54,065	1
		APS Smart UPS 2200VA	37,795	
		Total year 1998	*2,589,104*	
	2000	MS Windows 2000 Server Full (5 clients) AE	20,000	1
	2000	MS Windows 2000 Client Access License MLP 5 AE	2,400	1
	2000	MS Windows 2000 Professional CVPUPAE CD	8,000	1
	2000	MS Office 2000 Professional AE CD	10,000	1
	2000	Low-Cost Multifunction I/O board	52,000	1
	2000	68-Conductor Rion scale 1m	7,000	1

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	2000	Low-Cost 68-pin connector lock for 68-pin products	9,000	1
	2000	Pocket Tachometer	35,000	1
	2000	Laboratory DC Power Supply ANALA APS-1	24,000	2
	2000	Personal Computer Powell Adonis	78,000	2
		Total year 2000	*245,400*	
		Total cost of equipment of Control and Mechatronics Lab	***12,196,295***	
Electro-Mechanical Engineering	1998	HP Unix Workstation	541,965	1
	1998	Soft Library for HP Unix	311,930	1
		Total year 1998	*853,895*	
	1999	Laser Virometer System (3 sets)	9,108,847	1
	1999	Clean booth	1,283,112	1
	1999	Air Spindle	715,753	1
	1999	Humidity Generator	557,012	1
	1999	Vibration Isolating Tale w/ Compressor	233,151	1
	1999	Piezo Driver	116,080	1
	1999	Humidity Meter	101,339	1
	1999	Air Cleaning Unit	74,410	1
	1999	t Function Generator	66,331	1
	1999	Air Compressor	54,213	1
	1999	Piezoelectric Actuator	41,103	3
	1999	Transformer	37,205	4
	1999	Piezoelectric Actuator	980,440	3
		Total year 1999	*4,260,149*	
		Total cost of equipment of Electro-Mechanical Engineering Lab	***5,114,044***	
Microelectronic Devices	1997	Cadence 1C Design Software	8,159.000	1
	1997	Unix Sun Enterprise 3000 Server	2,230,562	1
	1997	Star-Hspice Software	1,853,100	1
	1997	HP Design-Jet 450 Color Printer	95,000	1
		Total year 1997	*12,337,662*	
	1998	Sun Unix Terminal Ultra 10	1,382,680	4
	1998	APS Smart UPS 3000VA	54,065	1
	1998	3Com Hu	29,320	1
		Total	*1,466,065*	
		Total cost *of equipment of Microelectronic Devices R&D Lab*	***13,803,727***	

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ReCCIT Laoratory	JFY	Equipment	Amount (THB)	QTY
Common Use	1997	HPVectraVL5/166	420.000	8
	1997	Mitsubishi Pajero 4WD,3.0.5door	1,064,000	1
	1997	Toyota Hi-Ace Gasoline 5speed	659,350	1
	1997	Copy Machine Canon GP-216	438,500	1
	1997	Color LCD Projector Sharp XG-NVO	210,000	1
	1997	Laser Printer HP Laser Jet 6MP	68,000	2
	1997	Copy Machine Canon GP-215	438,500	1
	1997	binding Machine: LAMIREL	9,000	1
		Total year 1997	*3,307,350*	
	1998	APS Smart UPS 3000VA APS Smart UPS	54,065	2
	1998	2200VA UPS Power Link: Dimon 500VA APS	188,975	6
	1998	Smart UPS 2200VA IEEE,IEE,CD Library	43,360	16
	1998	System STDS/IEEE 7set-43 discs, PC: ACER	37,795	1
	1998	Power 6100 (Pentium III 450MHz) CD-Changer: Pioneer 6 disc 24x, HP Laser jet 2100M printer	2,071,310	1
		Total year 1998	2,395,505	
	1999	Work Station: Hewlett Packard Kayak XM 600	170,000	1
		Total year 1999	*170,000*	
	2000	Color Laser Printer HP Color LaserJet 4550N	103,000	1
	2000	Personal Computer Powell Achilles P3933	48,000	1
	2000	Notebook Computer ATEC Vegus 665	91,000	1
	2000	Personal Computer Powell Achilles P3933	96,000	2
		Total year 2000	508,000	
		Total cost of equipment of Common Use	**6,380,855**	

1. 案件の概要		
国名：タイ王国		**案件名：**タイ・モンクット王ラカバン工科大学（KMITL）情報通信技術研究センタープロジェクト
分野：教育（高等教育）		**協力形態：**プロジェクト方式技術協力
所轄部署：社会開発協力部 社会開発協力第一課		**総費用**：9億 6600万円 (長期専門家 (9名)、短期専門家 (134名)、訓練生 (35名)に対する費用は除く)
協力期間	1997年 10月 1日～ 2002年 9月 30日	**先方関係機関：**KMITL、大学省（現在は教育省）
他の関連協力：	**プロジェクトのタイプ：**技術協力	

1-1 協力の背景と概要

本プロジェクトは、1961年以来継続しているモンクット王ラカバン工科大学(KMITL)へのプロジェクト方式技術協力で、今回で 4期目となる。タイでは、工業化社会の構築に向けて産業構造を変革中であり、高度な知識を有する技術者・研究者の育成が急務となっている。なかでも情報通信技術の分野における人材のニーズは、タイの経済発展と市場拡大が続くなかで、急速に高まっている。

1-2 協力の内容

タイ王国政府は 1996年、KMITLの学内に情報通信技術分野の研究施設を設立することを通じて、KMITLの研究開発能力を強化することを目的とするプロジェクト方式技術協力の実施を日本に要請した。その要請に応えて、日本政府は 1996年に事前調査、1997年に長期調査を実施した。この調査結果に基づき、1997年 7月に日本側調査団と KMITLとの間でプロジェクト実施に関する R/Dの調印が行われた。同年 10月にプロジェクトが開始され、KMITL学内に情報通信技術研究センター（ReCCIT）が設立された。

(1) 上位目標

情報通信技術及び関連分野において、KMITLの ReCCIT及び関連研究室が国際水準に到達する。

(2) プロジェクト目標

1) ReCCIT及び関連研究室の当該分野における研究能力が国際レベルに高められる。
2) ReCCIT及び関連研究室の当該分野における大学院生のための研究プログラムが国際レベルに高められる。

(3) アウトプット (成果)

1) 適切な研究マネジメント・システムの下、ReCCIT及び関連研究室において、当該分野のより高度な研究が実施される。
2) ReCCIT及び関連研究室において、更新された資機材が活用される。
3) ReCCIT及び関連研究室において、改訂された当該分野の大学院生研究プログラムが実施される。
4) ReCCITと他の国内機関との研究協力が拡大する。
5) ReCCITの管理システムが確立される。
6) ReCCITの財源が確保される。

(4)投入（プロジェクト終了時）	
日本側：	
長期専門家	9名
短期専門家	134名
研修員受入	35名
機材供与 日本側予算 携行機材 現地側予算	9億 6600万円
ローカルコスト負担	1,818万 2,107バーツ
タイ側：	
カウンターパート	42名
土地・施設提供	KMITL学長棟事務室 8階～10階　3200㎡
ローカルコスト負担	6,106万 1,920バーツ（KMITL） 179万 6,567バーツ（DTEC）

2. 評価調査団概要		
調査者	Professor Dr. Chaiyong Brahmawong Kaihatsu Management Consulting (Thailand) Ltd.	
調査期間	2005年 10月 3日～2006年 2月 28日	**評価種類：**事後評価

3. 評価結果の概要

3-1. 評価結果の要約

(1)インパクト

上位目標の達成度から、本プロジェクトのインパクトは中程度と評価される。ReCCIT工学部関連研究室において取得された学位数は増加したが、プロジェクト実施期間と終了後を比較するとさほど大きな増加ではなかった。プロジェクト実施期間中（1998-2002年）においては、博士号 9、修士号 157であったが、プロジェクト終了後（2003-2004年）ではそれぞれ9、139であった。しかし、プロジェクト実施中の 5年間と終了後の 3年間で、工学部全体に占める ReCCIT・関連研究室の学位取得割合は、博士号で 64.3%から 75%、修士号で 28.7%から 39.8%と、それぞれ増加した。さらに大学院生数も、2002年の 146人（修士 117人、博士29人）から、2003年には 159人（同じく 112人、47人）、2004年には 165人（119人、46人）と、年平均 6%増加した。

事前に予想しなかった正のインパクトが、5つの点でみられた。すなわち、(1)ReCCITにおける研究活動が認められたことによる、研究スタッフの昇格人事（教授、准教授、助教授へ）、(2)タイ研究基金による、工学部研究者のシニア研究員任命、(3)ReCCITを通じて得られた知識が広まり、タイにおける大学教育に生かされていること、(4)タイ国内外の大学関係者、情報・コミュニケーション技術（ICT）関連の研究者が、研究技術に関する知識習得を目的に ReCCITを定期的に訪れるようになったこと、(5)「ラオス ITブリッジプロジェクト」における KMITL工学部と他の東南アジア地域の大学との共同研究、及び ASEAN大学ネットワークー東南アジア工学教育ネットワーク（AUN/SEED-Net）プログラムに対する共同研究。これらのプロジェクト及びプログラムに対して、ReCCITは人材及び施設の提供を行った。ReCCITの多くの教授陣・講師陣はさまざまな面での支援を行い、研究室をはじめとする諸施設も学生の研究活動に利用された。ReCCITの研究者は主に工学部に所属しているため、研究活動、経験、研究スキルは地域内における活動の拡大に不可欠であることは間違いない。このことは、つきつめるとさらなる研究能力の向上、他大学とのさらなる共同研究の推進につながっていくものである。

(2) 自立発展性

プロジェクトの技術的な自立発展性は、高いと評価される。その理由は、研究開発や研究プログラムの更新において、ReCCIT職員や関連研究室の能力は、現在も国際レベルにあるからである。ReCCITの研究活動は、タイ国内外の研究機関の間で着実に認識されてきている。このことは、プロジェクト後において、国際的ジャーナルにおける ReCCIT研究成果の掲載数が増加していること、国際会議で発表される ReCCIT研究論文数が増加していることからもわかる。2003-2005年の平均掲載数は 29.4本と、プロジェクト実施時と比較して 26.11%増加した。また、プロジェクトを通じて供与された機材の維持管理能力に関しても、日々の維持管理活動を視察した結果、十分であると考えられる。

ReCCITのステータスは（プロジェクトの合意書にあるにもかかわらず）学部レベルに引き上げられたわけではないが、KMITL内の一ユニットとしての位置づけは人材の雇用、予算、ロジスティック等のサポートを受けることを可能とするものである。このことを勘案すると、組織的観点からの ReCCITの自立発展性は、中程度と評価される。

ReCCIT の KMITLや他機関からの研究費確保能力から判断すると、財政面からの自立発展性は中程度と評価される。しかし、ReCCITのステータスが引き上げられたわけではないため、政府から直接助成を受けることはできない。このことが、機材の更新・維持管理に影響を及ぼしている。

全体的な研究活動、ICT産業との共同研究数から判断すると、研究・学術活動から見たプロジェクト効果の自立発展性は高いと評価される。このことは、タイ、韓国、シンガポール企業との共同研究数が増加していることからもうかがえる。

3-2 プロジェクトの促進要因

(1) インパクトの促進要因

インパクトの促進要因としては 2点あげられる。1つは、ピラミッド構造をベースにした運営体制である。この体制において、ICT分野の主任研究員（教授レベル）は研究チームリーダーに任命され、研究員、准教授、助教授、講師、院生の協力を受けている。もう 1つは、研究スタッフの能力である。プロジェクト実施期間中、長期・短期専門家を通じて、あらゆる研究室において研究者としての知識・研究スキルが構築された。このことが、研究活動のさらなる拡大につながっている。

(2) 自立発展性の促進要因

自立発展性の促進要因も、運営体制、研究能力の 2点があげられる。体制面では、第 1にタイ政府の国家政策（IT2010 Framework）と KMITL及び ReCCITの研究推進政策、第 2に前述のピラミッド構造がある。研究能力向上に関しては研究スタッフの昇格人事があり、このことがプロジェクト効果の持続につながっている。昇格するためには、質の高い研究活動と論文掲載が必要である。このように、ReCCITにおける研究活動は研究スタッフが各々の専門分野において研究を行うために、ReCCITに入るインセンティブとなっているのである。

3-3 プロジェクトの阻害要因

阻害要因として、ReCCITの学部昇格がならなかったこと、機材の修理・更新のための資金不足があげられる。

ReCCITの学部昇格見送りにより、KMITLからもタイ政府からも資金を得ることができなくなった。これらの資金は、工学部、情報工学部を通じて配分されるべきものである。

機材・設備の寿命は限られたものであり、その更新・修理のニーズは増してきている。プロジェクト終了後、ReCCITは配分された予算を通じて、限られた範囲で機材の修理を行うことはできた。しかし、高額機材を修理・更新するだけの予算はあてられておらず、通常の機材操作経費のみである。

3-4. 結論

プロジェクトのインパクトについては、事前に予想できたもの、できなかったものあわせて、中程度と評価される。KMITL/ReCCITは、コミュニケーション･情報及び関連分野における研究能力を国際レベルに高めるという目標を達成した。博士号・修士号授与数も増加し、研究活動も活発であり、国内外のジャーナルへの論文掲載や国際会議における研究発表も行われている。

技術面から見た自立発展性は高い一方、組織・財政面からは中程度と評価される。研究プログラムの質を高めるのに必要な研究者の能力は、国際レベルにある。プロジェクトにより供与された機材を維持管理する能力も十分である。組織上、ReCCITはいまだ KMITL内の一部署と位置づけられるものの、プロジェクト効果を維持するための強い意思を持ち続けている。研究活動は、ピラミッド構造のマネジメント体制をベースに進められている。また、研究員数、院生数、機材操作・維持管理のための財政支援はやや減少したものの、その中でも研究活動・人材育成活動を拡大させている。

3-5. 提言 (当該プロジェクトに関する具体的な措置、提案、助言)

JICAに対して：

JICAは自立発展性を確保すべく、プロジェクト期間を見直す必要がある。ICT分野は急速に拡大しており、この分野の技術革新のためには、当初想定していたよりもさらに高いスキル、時間、費用を必要とする。プロジェクトは、より進んだ研究を目的としていたが、時間・費用的な制約のため、多くの研究プロジェクトはまだ始まったばかりであり、さらに高いレベルを目指すべく継続されることが必要である。

KMITLに対して:

(1) KMITLはタイ政府に対し、プロジェクトの自立発展性確保に必要な資金的支援を得、必要な活動を継続するための明確なガイドラインなり方策をとりまとめ、提出すべきである。本調査で明らかになったとおり、高額機材・設備を維持管理するための予算は不十分である。

(2) KMITLは、国外の大学及び産業界との協力関係を模索する必要がある。これにより、ReCCITへの短期専門家派遣を受ける、もしくは ReCCIT研究者の短期派遣を行う等が可能となり、共同研究の推進、14研究室のうち数箇所の機材・設備の更新に道を開く。

3-6. 教訓 (当該プロジェクトから導き出された他の類似プロジェクトの発掘・形成、実施、運営管理に参考となる事柄)

(1) ReCCITの研究運営モデルといえるピラミッド型組織構造は、研究活動を進める上で効果的であることが実証された。プロジェクト終了後、このピラミッド構造の下、ReCCIT職員や大学院生によって多くの研究プロジェクトが実施された。タイや他のアジア諸国の大学や研究機関においても、研究を実施する上で、組織のあり方として参考にすることができる。

(2) プロジェクト期間中、最も高価な資機材であるハードウエア、ソフトウエアは日本から直接調達された。こうした資機材が故障した時、国内の技術力では充分対応できないこととともあり、その場合修理を依頼できる代理店を見つけるのがとても難しくなる。

(3) 短期・長期専門家派遣が継続しなかったことが、ReCCITにおいて進行中のいくつかの研究活動を妨げる結果となった。タイ人研究者のスキルが十分に開発されるまでは、諸外国からの専門家派遣を継続するための方策が不可欠である。