

Formation of the Asian Center for Research on Earth Resources and Environment for International Research Associates and Graduate Students — JSPS International Training Program at Kyushu University —

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1. Background

Kyushu University has actively promoted strategic international exchange activities in conjunction with two mainstays for an international strategy of an "Asian-focused approach lead by historical and geographic necessities" and the "Formation of global knowledge bases." In such a manner, Kyushu University, as an "Open university for Asia," has continued academic activities in Asia.

The Faculty of Engineering has conducted international training programs organized by the Japan International Cooperation Agency (JICA) and other organizations over the last 40 years, in the hope of developing human resources in the areas related to energy resources and the environment which are critical to Asia. For example, approximately 400 trainees from 36 countries completed the international geothermal training program over a 30-year period between 1970 and 2001. The International Special Program on Environmental Systems PhD Program was established as an extension of the above in 2002 in support of helping approximately 70 international students in Asia to complete their doctorates. Students have served overseas internships over the last twenty years and approximately 120 students have been dispatched to Asian and Oceania field sites.

Serious problems facing human beings such as problems as the exhaustion of resources are threatening the global environment. In particular, the rapid increase in resource and energy consumption in developing Asian countries is diminishing resources and damaging the global environment. Therefore, cooperative studies and activities hold the key to solving problems generated in Asia and

efforts in cooperation with research institutes around the world are required. In Asia, concerns about the destruction of the global environment as a result of industrial activities are also rising in the midst of intensifying competition for resources. An awareness of this situation, for example, matters related to reduce greenhouse gases causing global warming, is increasing in advanced nations. However, there is also growing competition among Asian nations because they have a strong need for resources and for economic development.

In particular, a rapid increase in resource and energy consumption in Asian countries is casting a shadow over the sustainability of human activities, but Japan should play a role in contributing in achieving sustainability as a member of Asia and as a member of the advanced nations. Therefore, cooperative studies and activities by young researchers hold the key to solving problems in Asian fields. However, it is also important to educate young engineers and researchers who can contribute to finding solutions in the field.

2. Objectives of the Project

For the purposes of an educational research strategy with greater importance given to Asia as well as for global cooperation in the fields of resources and the environment, this project aims to train young Asian researchers including Japanese researchers in international cooperation, by improving facilities for earth resources and the environment in the Faculty of Engineering, Kyushu University as a focal point to connect Asian and worldwide institutes in areas of research and education through

implementation of this project (see Fig. 1).

In the meantime, the Faculty of Engineering, Kyushu University, has worked toward training researchers by encouraging young Japanese researchers and graduate students, including foreign students. In the latter stages of their studies to take the opportunity to do research on matters consistent with this new outlook. However, opportunities for study and research at internationally advanced institutes, which have adapted to great changes in international circumstances in recent years surrounding resources and the environment, have not been available based on the organizational system.

This project aims to promote the training of young researchers and engineers focusing on problems related to earth resources and the environment that Japan should achieve as a member of Asia and as a member of the advanced group of nations, through global cooperation. This project will contribute to the targeted fields of science and technology by strengthening cooperation with four advanced partner institutes linked with our roles to address the problems of earth resources and the environment emerging in Asia so as to grapple with solutions in a joint effort as a member of Asia.

Three departments from the Faculty of Engineering, that are Earth Resources Engineering, Urban and Environment Engineering and Civil and Structural Engineering, applied for the JSPS International Training Program (ITP) for five years from April 2008. This project was adopted as one of the projects from FY2008 in the classification of "Engineering Sciences." The purpose of this project is to promote international activities on research and training by young researchers (Assistant professors, Post graduates and Graduate students) who are investigating problems

related to "Earth Resources and the Environment" that we currently face.

3. Partner Institutes

This project offers research and training based on the establishment of international cooperative relationships to young researchers as an organizational program. More specifically, our objective is to make it possible for departments related to earth resources and to the environment at Kyushu University to become the focal point for training of young researchers who will be in charge of solving the problems of resources and the environment by improving the "partner institute" function that links young researchers in research institutes around the world with those in Japan and other Asian nations.

Four research institutes shown in Table 1 were selected in conjunction with this project to promote the training of young researchers who can solve problems and respond to the challenges from a long-term perspective, and consider past exchange results as well as the cooperative fields needed in the future. They must have qualities in advanced field research related to earth resources and the environment and be able to promote the project through mutual exchange with the applying three departments.

4. Contents of the Research and Training

The following are the objectives of training young researchers in the areas of earth resources and the environment:

- 1) New composite cooperative relationships as shown in the above diagram at the left will be established according to the accumulated exchange results by each professor. More specifically, a management system which offers

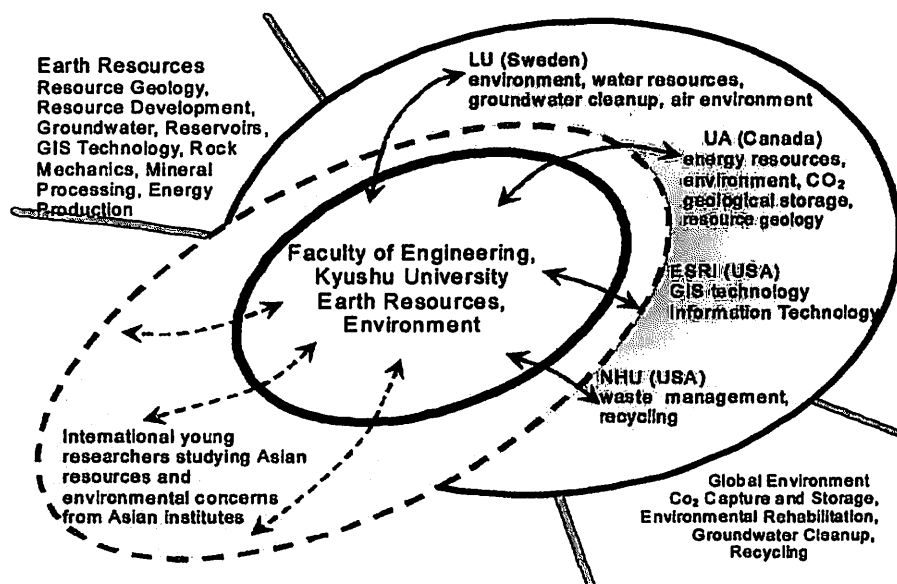


Fig.1 Schematic figure showing the project.

Table 1 Partner institutions.

Institution	Faculty/School/Department	Location (City, State,
Lund University ¹ (LU)	Faculty of Engineering	Lund, Scania, Sweden
Environmental System Research Institute Inc. (ESRI)	International Office	Redland, California, USA
University of Alberta (UA)	School of Mining and Petroleum Engineering	Edmonton, Alberta, Canada
University of New Hampshire (UNH)	Recycled Material Resource Center	Durham , New Hampsure, USA

wide opportunities to conduct field research and training in international advanced research institutes will be established for all young researchers and postgraduate students belonging to the applying university.

- 2) The three departments related to earth resources and the environment at Kyushu University have accepted many international students from Asia and placed an emphasis on international internship education for postgraduate students over the years. Furthermore, students exchange programs with overseas universities have also been established. The dispatch of young researchers and postgraduate students to overseas advanced research institutes will be promoted by organizational dispatch programs such as this project discussed here in.
- 3) This project supports research for young researchers and postgraduate students in the areas of earth resources and the environment in overseas advanced institutes. It strives to instill independence in researchers and students which allows them to carry out research planning, budget planning, schedule management in dispatched institutes, planned research budget use, and publication of research papers at the preparation stage of the dispatch application form.
- 4) This project will form vigorous "bases" for young researchers by systematically providing opportunities for them to pursue their studies and to determine the direction in overseas educational institutes through their dispatch to the training programs and field research planned by the destination educational institutes for one to three months.
- 5) With regard to assistant-professor level young researchers, sufficient prior meetings on the direction and content of research themes will be held with professors who will be sent to institutes so that they can conduct joint research at a level which enables them to publish papers in international journals for the dispatched period of time. (In some cases, a short visit should be carried out

in advance.)

- 6) With regard to postgraduate students, importance is placed on their potential or enthusiasm for inquiry and learning are displayed as well as the energy they devote to tackling global warming issues and other challenges including complex problems related to Asia associated with environmental destruction and depletion of resources.
- 7) A management system which makes it possible to exchange related to common problems of earth resources and the environment to be also beneficial to international students from Asia will be established through cooperation with dispatched institutes. In addition, presentations on research findings concerning earth resources and the environment as well as opportunities for mutual exchange will be held at regular intervals for young researchers with an international symposium to be held in 2012.

5. Project Management

The steering committee comprised of approximately 12 members including professors and officers in charge from the organization of academic supervisors of the Faculty of Engineering has been able to promote this project, young researchers and postgraduate students have selected to be sent overseas to research institutes, and planning and management of workshops and symposiums have been conducted in collaboration with overseas research institutes (see Fig. 2).

Four overseas research institutes have been selected in conjunction with this project. According to longstanding cooperative relationships among professors, a project management system, which flexibly connects young researchers belonging to the applying university to the overseas research institutes, will be provided. More specifically, exchanges with research institutes that have differed from mutual relationships up to now will be promoted to expand new cooperative relationships. In

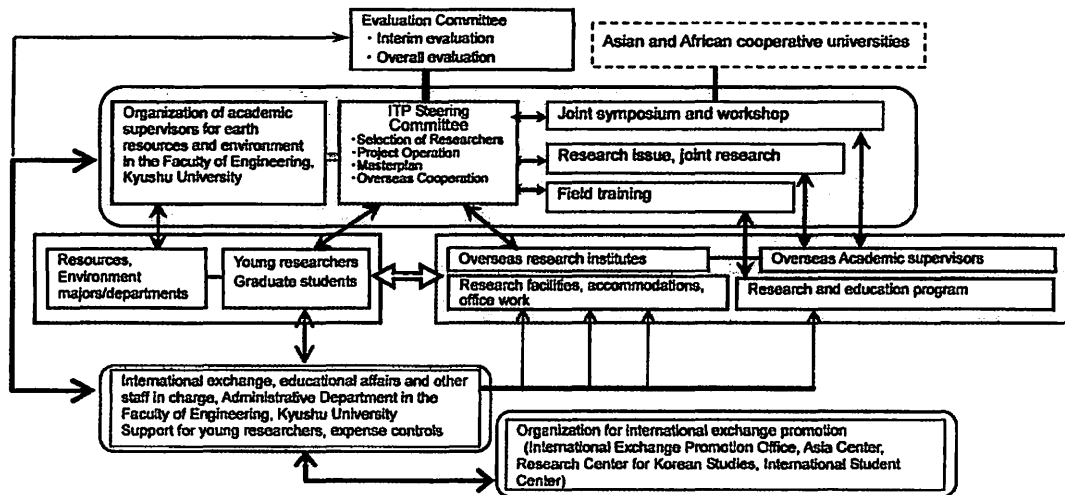


Fig.2 Schematic diagram of operational system for the project.

addition, professors in charge (academic supervisors) will offer advice and support research in consideration of the problems and opinions on improvement by visiting the partner institutes to provide follow up for young researchers dispatched and exchange opinions with professors in the partner institutes.

This university established the organization for international exchange promotion (hereinafter referred to as the "Organization") with its President as the Organization head as an international strategic headquarters system on April 1, 2002 to promote international exchange activities with university-wide efforts. This Organization, which centers on the international promotion office, is comprised of the Asia Center, Research Center for Korean Studies, and International Student Center to conduct planning and drafting of strategic international exchange projects for this university in cooperation with each department, academic institution center and attached laboratory. With regard to the management of this project, the Administrative Department of the Faculty of Engineering, which is the responsible body, will work together in cooperation with the Organization to provide administrative support to young researchers.

The Department of Earth Resources Engineering, Department of Civil and Structural Engineering and Department of Urban and Environmental Engineering in the Faculty of Engineering, Kyushu University will work together to establish the "ITP management committee for young researchers" to manage this ITP program. In addition, guidance for young researchers and postgraduate students and the selection of dispatched persons will be conducted according to the selection standards shown below by exchanging opinions with professors.

1) With regard to young researchers of assistant-professor level, sufficient results, especially whether they

can conduct research at a level which enables them to publish research papers to international journals for the dispatched period of time and whether prior meetings on the direction of research themes have adequately been held with professors in the destination institutes (research academic supervisors) will be examined.

2) With regard to postgraduate students, they will be selected through the application form and interviews which show candidates' potential, enthusiasm for inquiry about learning, and the ability to express themselves in overseas research institutes.

3) Prior to dispatching by this project, English course work, communication with many international students from Asia, and presentations in English in seminars and other opportunities will be improved to enable young researchers and postgraduate students to acquire a cosmopolitan outlook and to improve communication skills as well as to participate in international joint research systems. Professors in charge will offer advice, prior to training, and provide support when necessary, concerning research ethics and clarification of the joint research planning (including paper-writing planning).

6. Present Progress and Future Concepts

We started the project on the JSPS International Training Program (ITP) from April 2008. In FY2008, the first year of the project, three assistant professors and four graduate students were dispatched to four overseas institutes.

Two workshops were held on Oct. 10th, 2008 and Feb. 3rd, 2009 in order to report on their activities in the overseas institutes. Furthermore, The Symposium on Earth Science and Technology was held successfully on Dec. 1st and 2nd, 2008, at Nishizin Plaza, Fukuoka City through a joint planning effort with overseas institutes. Over 100

young participants, including 67 foreign young researchers including graduate students from Asian and African countries, presented their research activities in the area of earth resources and the environment.

We expect that this project will provide an environment for carrying out the training of young researchers who can be a driving force in the training of human resources in the areas of earth resources and the environment and the research associated with resources and environmental technology in Asia, by establishing flexible cooperation with

the four overseas research institutes selected, to strengthen the role of Kyushu University as a research center in Asia.

As for future concepts, three departments mainly aim to unearth various technological and complex problems which affect the exploration and development of mineral resources, mineral processing and recycling, environmental reclamation, and improvement of urban and social systems and solve those problems in cooperation with overseas institutes.