

1-1 Outline of the Project

1. Brief Introduction of the “Partnership” Project

As an international education nuclear for the establishment of a sound material-cycle society, the Solid Waste Management Research Center of Okayama University proposes the “Partnership” project aiming at developing elite human resources in the solid waste research field to conduct practicable research for tackling solid waste problems, with the collaboration of partner universities from Asia-Pacific regions, local authorities in foreign countries where serious solid waste problems occur, and Japanese local authorities.

Regarding the concrete research activities, this “Partnership” project attempts to clarify the causes of solid waste generation, reduce the quantity of solid waste generation and to establish an alternative solution for solid waste management system for the objective country with regard to the socio-economic situations. The objective research areas are Indonesia (the 1st year), Malaysia, Vietnam, and India (the 2nd year), China and Thailand (the 3rd year) in Asia, and Palau and Guam (the 1st year) in the Pacific region. Cooperating with the partnership universities and local governments’ officials, the history, culture, life-style and custom that related to solid waste generation in the objective countries are to be clarified, respectively. Subsequently, a methodology choosing appropriate system of solid waste technology that have been well developed in Japan would be established. The abovementioned works would be carried out from the research level of solid waste management systems to the practice level, step by step.

As for the prospective outcomes, the establishment of sound material-cycle society through the implementation of 3R Initiatives is one of the Japanese environmental policies advocated to the global society. The implementation of this project would strengthen the leadership of Japan in Asia/Pacific environmental research and policies. In addition, by establishing the solid waste management systems in the “Partnership” project, the collaboration among the local authorities in foreign countries and Japan would be enhanced. The contributions of the international partnerships at a local authority level could be expected.

2. Concepts of the “Partnership” Project

The concepts of this project comprise of four main dimensions.

Concept 1: Research

Okayama University plays the role of the hub for the partnership among several stakeholders, i.e. universities and local governments in Asia-Pacific regions and Japanese Government, and carry out a variety of surveys and research. This project aims not only to carry out not only academic research but also practical research that can be adopted at regional and national levels. This project aims to strengthen the relationship among Okayama University researchers to work as a team to carry out research in the participating country. Within one project, it is expected that expertise would tackle solid waste issues in the well-organized group. By identifying and separating the roles of universities and governments, this project aims to establish a collaborative approach dealing with related issues.

Concept 2: Education

In order to develop elites who would play active roles worldwide, students of Okayama University are expected

in advance to contact the environmental problems in Asian countries. This project is expected to support the students' research in the context of Asian solid waste issues. Also, in order to educate elite students from participating countries, Okayama University conducts a variety of education and research activities and aims at educating students from the case study regions.

Concept 3: Social Contribution

A lot of training workshops and consulting activities would be held for local municipalities in developing countries in Asia, aiming at introducing the Japanese technologies and promoting ESD. Comprehensive information would be provided for private industries, aiming at widen the collaboration among universities, governments and private sectors.

Concept 4: Outcomes Reporting/Succession

The information and data prepared within this project would be accumulated and open to the society, being utilized actively in the forthcoming activities. Accumulating the comprehensive waste data, the Solid Waste Management Research Center of Okayama University aims at playing the role of the information center of integrated solid waste database.

The aforementioned concepts of this project are presented in the following figure.

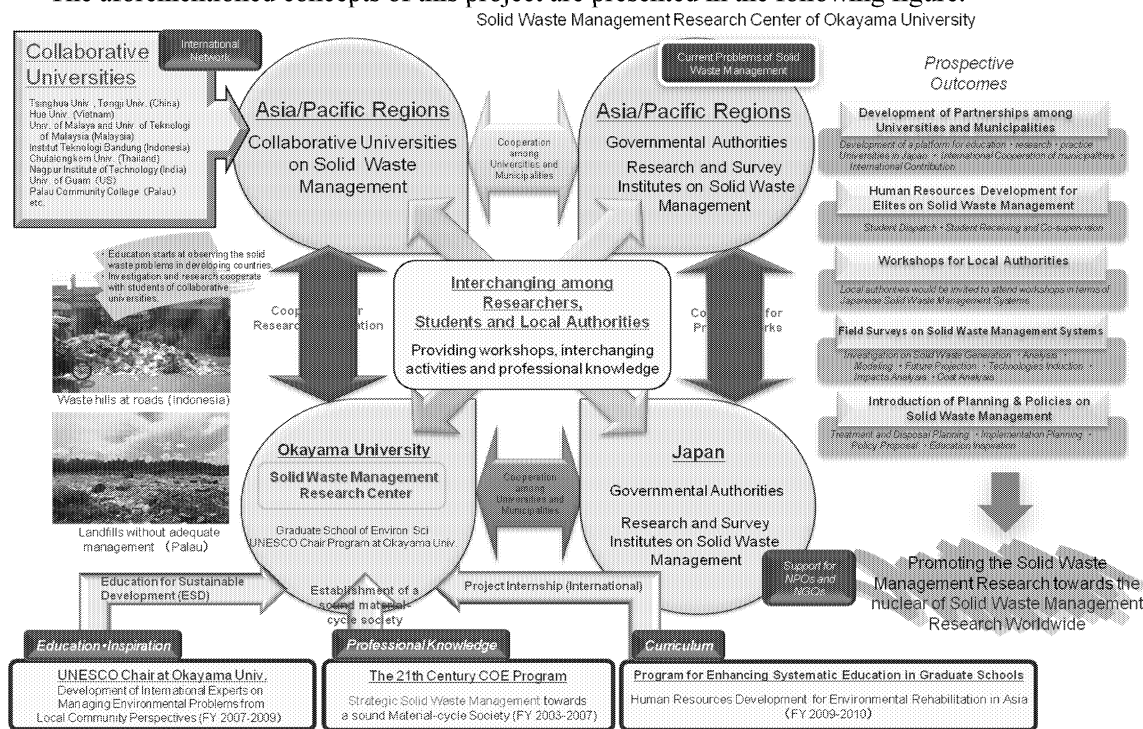


Fig. 1-1 The concepts of the “Partnership” project.

3. Research Collaboration

Primarily, this project focuses on the research and education activities in Asian and Pacific countries, the contents of research collaboration cover the following items:

- Clarification of the solid waste problems through field observations;
- Promotion of the research cooperation among collaborative universities;

- Collaboration with the local authorities;
- Student Interchange / Co-supervision;
- Invitation, interchange, internship, and field observations for local governments' officials;
- Implementation of investigation and research;
- Practice and policy formulation based on the research outcomes.

As for serious solid waste problems, it is appropriate that developing countries would rather tackle the problems using the outcomes from the experienced countries than seek for the solutions by themselves. Based on the research outcomes from Japanese universities and experiences from local authorities, adequate solutions for the contemporary problems could be found, given that the implementation of necessary surveys, research and plans. Nevertheless, in the field of solid waste management, good cooperation networks among Asian countries and Japanese universities are not found till the present. Although “international collaboration” is usually mentioned, at most universities, such concept is still implemented by conducting research at desks indoor. Regarding in-situ research abroad, it is necessary to collaborate tightly with foreign universities in the study, so that concrete and practicable outcomes could be generated. In addition, while solid waste management is one part of the public works, administrative works are required, e.g., the routine clearance works at urban districts, to a great extent. Cooperating with the four stakeholders (universities and governments in/out of Japan), firstly, the in-situ solid waste problems are to be found, then investigations and analyses would be conducted, and consequently, if possible, feasible proposals of the solid waste administration would be made. The abovementioned items are our ultimate goals for this project. In order to achieve the goals of this project, the Solid Waste Management Research Center of Okayama University would be devoted to the above 7 items.

The prospective image of the research collaboration can be presented as Fig. 1-2.

4. Implementation of the Partnership Project and the Supportive Organizations

Regarding the objectives of this project and the conditions for the use of the budget, most of the budget of this project would be spent on the research activities and trip expenses for the faculties, students and local governments' officials at both Japanese and foreign ends. In order to improve the partnerships, field observations in Japan and other Asia/Pacific regions, meetings and seminars would be held frequently. In addition, collaborative research studies would be launched, and students among collaborative universities would be co-supervised under the research activities.

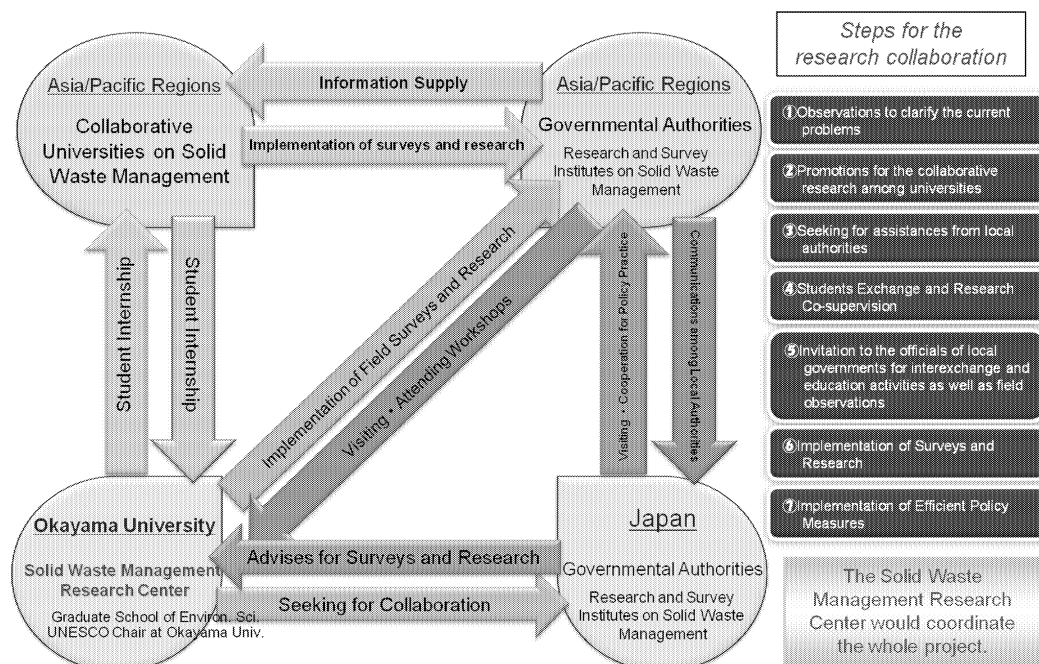


Fig. 1-2 The prospective image of the research collaboration.

Regarding the in-situ field survey, supports and cooperation from local authorities and universities are expected. The required expenditures of the consumables, the meetings, the manpower and the machines/facilities renting for this project would be afforded by the Solid Waste Management Research Center of Okayama University.

In order to promote intensive and deep research/education cooperation, collaborative universities would make formal Memorandum of Understanding (MOU) with Okayama University. With formal agreements, students exchange and interchange activities could be promoted extensively, with less restrictions.

The aforementioned collaboration activities are being conducted as Fig. 1-3 shows.

5. Establishment of the Organization of the Collaborative Groups of the Project

The Solid Waste Management Research Center would make a comprehensive list presenting the local communities, municipalities, NGOs, NPOs and private enterprises that make contributions to the projects. All the supports and collaborations would be appreciated and welcomed. Furthermore, advices from local authorities and NGOs and NPOs are expected.

In order to promote the information interchange among the collaborative groups, this project would hold events in Japan. In the events, the progress and achievements of the project would be presented. Constructive information for foreign countries would be set up and spread worldwide.

Questionnaires in terms of “developing the human resources playing active roles tackling environmental issues worldwide” and “expectation for the university education from the students” would be performed and considered by this project.

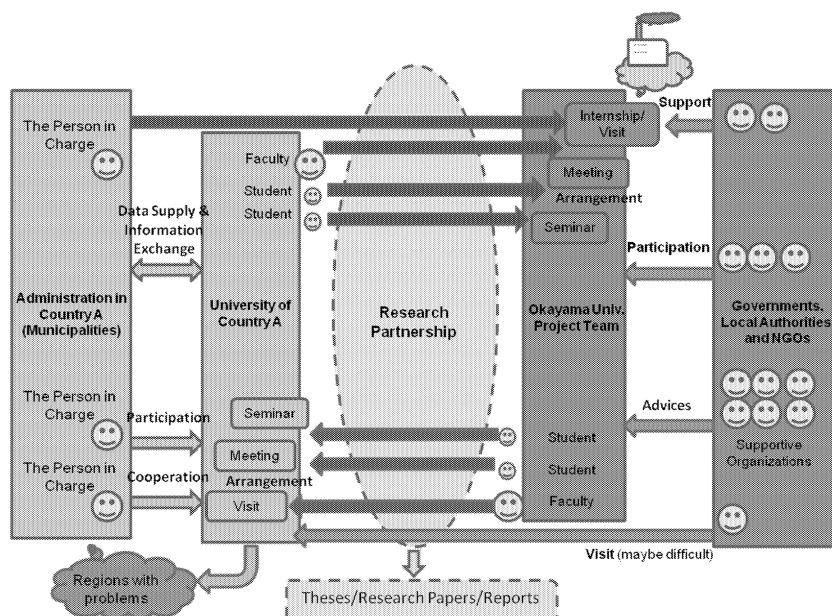


Fig. 1-3 The collaboration partnership among the main stakeholders in this project.

6. Respective Research Study

In the Partnership project, researchers are divided into the Technical Support Group and the International Practice Group. The project promoters would become leaders carrying out individual project. The expertise group working on individual project is called a team.

International Practice Group

The International Practical Group would build partnerships with universities and local authorities of participating countries to work on their project. Few project promoters can work in one subgroup. The project promoters of the Technical Support Group would take active parts in supporting advanced technologies and methodologies to the International Practice Team.

In FY 2010, the Partnership project takes its first step in Palau, Guam and Indonesia. Afterward, research would be conducted in Malaysia, Vietnam, China and Taiwan in FY 2011, and Thailand and India in FY 2012. Based on the connection network with the collaborative universities and the objective local authorities, the university faculties and their students as well as the local governments officials would be invited from the abroad regions, and Japanese solid waste management systems as well as the technologies would be introduced to the foreign partners. Meanwhile, participators on the Japanese end would be sent abroad to conduct field observations, surveys, and research activities.

Technology Support Group

As the above figure shows, the Technology Support Group conducts three studies for biomass reutilization, one for safety management of waste treatment facilities, one for atmosphere/global warming, and one for management technologies, i.e. 5 studies in total within this group. In most developing countries, solid waste is almost being disposed of within their current treatment/disposal systems. In such a case, the introduction of the

transformation from organic waste into feed or fertilizers would be beneficial to both resources utilization and waste reduction. By developing appropriate chemical processes, the utilization of biomass for developing countries is being built. Furthermore, organic agriculture technologies for biomass utilization are being developed.

Regarding the final disposal sites in developing countries, normally sanitary landfills are recommended. However, in fact, open dumping or general landfilling is popular at present, leading to a critical concern of water pollution due to leachate discharge. In addition, slide collapses usually occur at final disposal sites where some waste pickers work and live for picking up waste of resources. The maintenance management of the final disposal sites is an important issue. Concrete topics include improvement of the stability of the slides at landfills, prevention of water pollution from leachate discharge and the related greenhouse gas emission. Studies for the relevant safety management would be carried out.

Still, the origin establishing solid waste management systems is to obtain the accurate data of the quantities of the overall generated solid waste and its respective waste stream. Holistic waste separation and reutilization plans could not be made until the quantities and types of solid waste are clarified. Nonetheless, the analysis of solid waste components is very difficult. Thereby the image processing technology is trying to be induced to extract the attributes of solid waste for estimating the solid waste components.

The sub-projects in the first year are organized as the following figure.

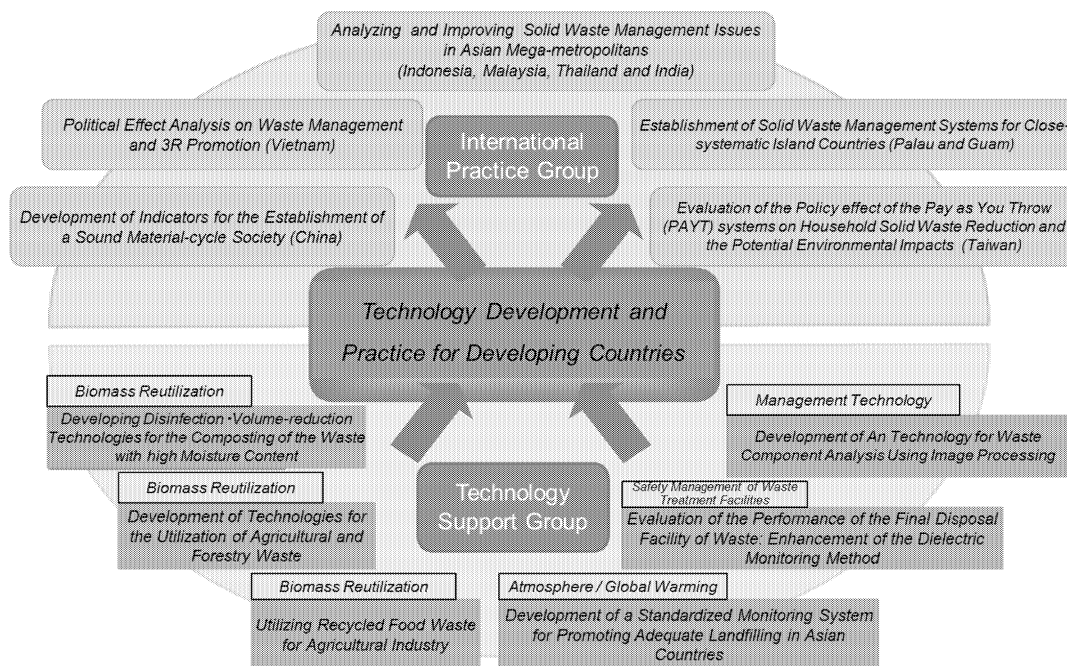


Fig. 1-4 Sub-projects