International promotion and human resource development in infrastructure maintenance technologies and systems

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One of the important goals of SIP is to internationally promote the technologies it has developed and the knowledge it has acquired. In addition to communicating Japanese technological excellence to the rest of the world by such means as proposing international standards for infrastructure maintenance, there is a high level of potential for contributing to developing countries in Asia and Africa that will face similar issues in infrastructure maintenance in the near future. The technologies that are being developed at SIP are also suitable for needs in other countries, and some of them can be expected to be deployed overseas. In this paper, we will focus mainly on international promotion activities under a project in which the authors are participating, which is a comprehensive study for development of the road infrastructure management cycle and its domestic and overseas implementation (representative: Koichi Maekawa, the University of Tokyo).

Summary of international promotion activities

The four main areas of activities for international promotion in this project are as follows: (1) Creating bases for information and research on infrastructure maintenance in Asia; (2) Compilation and communication of information on infrastructure maintenance; (3) Implementation of infrastructure asset management systems in Asian nations; and (4) Study of international standards concerning infrastructure asset management.

For international promotion, it is important to have a base. We are cooperating with Thammasat University in Thailand, which is a counterpart in this project, as an overseas base. We are involved in several endeavors for communicating information, such as holding seminars in various countries (seminars have already occurred in Thailand, Vietnam, Cambodia, and Myanmar successfully), and organizing special sessions at international conferences and symposia in Asia related to structural engineering and concrete engineering.

We are engaged in promoting the implementation of infrastructure asset management systems in three countries, based on their levels of infrastructure development and maintenance technology; these are Thailand, Vietnam, and Myanmar. Our efforts toward implementation of maintenance technologies and systems are ongoing, based on the concept of asset management including life cycles of assets, in accordance with the economic situation of each country as well as the above conditions.

With regard to international standards, even before this project was begun, Japan proposed standards regarding life cycle management of concrete structures in ISO/TC 71 (Concrete, reinforced concrete, and prestressed concrete). Adding the concept of asset management to this could make it a widely shared international standard, in addition to enhancing the presence of Japan.

JICA activities for road and bridge maintenance

JICA is currently engaged in technical cooperation projects that contribute to capacity building in the operation and maintenance of road and bridge infrastructure in 19 countries (Table 1). In many developing countries, new road construction is the priority, and little funding is budgeted for maintenance. Minor damage is left unrepaired until large-scale repair or even renovation work is needed, creating a vicious cycle that gives rise to additional costs. Awareness of maintenance tends to be low in the first place, and JICA is implementing measures aimed at establishing the PDCA cycle of maintenance in order to promote a shift from corrective maintenance to preventive maintenance. In addition, government officials who will become leaders in building their countries' infrastructure can come to Japan for human resource development based on the transfer of expert knowledge and technologies. We provide training on various subjects in about six courses every year, and about 150 people participate every year to learn Japanese expertise.

Table 1. Number of technical cooperation projects implemented

Southeast Asia	Southeast Asia	Central Asia	Africa	Central and South America	Total
6 projects (1)	5 projects (1)	2 projects	5 projects (2)	1 project	19 projects (4)

(Numbers in parentheses indicate projects to be started in FY 2017.)

Core human resource development for road asset management

Road asset management is structured according to the PDCA cycle, including maintenance work, and its functioning is based on establishment of the cycle. In the area of road asset management, JICA is involved in strategic planning and implementation of technical cooperation projects, short term training programs, and long term training (international student) programs, with the goal of making a contribution to human resource development in developing countries (Fig. 1).

This will include implementation of training (short term and long term) programs in collaboration with universities and other institutions that are engaged in cutting-edge research

in this field in the SIP project. In the training program, large numbers of personnel will be trained intensively through training courses that are specifically designed for each country in response to their respective issues. Thereafter, the goal will be to provide continuous human resource development through issue-based training to share general, wide-ranging knowledge. The long term training (international student) program will include education and research suited to the situation of the respective countries with regard to promoting asset management and extending the service life of infrastructure, and participants will be supported so that they can serve in leadership positions after returning to their home countries. Hokkaido University and Nagasaki University, which are participating research institutions in the SIP Infrastructure Program, will admit participants from Cambodia and Laos in FY 2017; and the University of Tokyo plans to provide a training program for Vietnam in asset management in FY 2017. JICA intends to expand the long term training program to more countries and more cooperating universities in FY 2018, and JICA will continue to pursue further collaboration with the participating institutions of the SIP project.

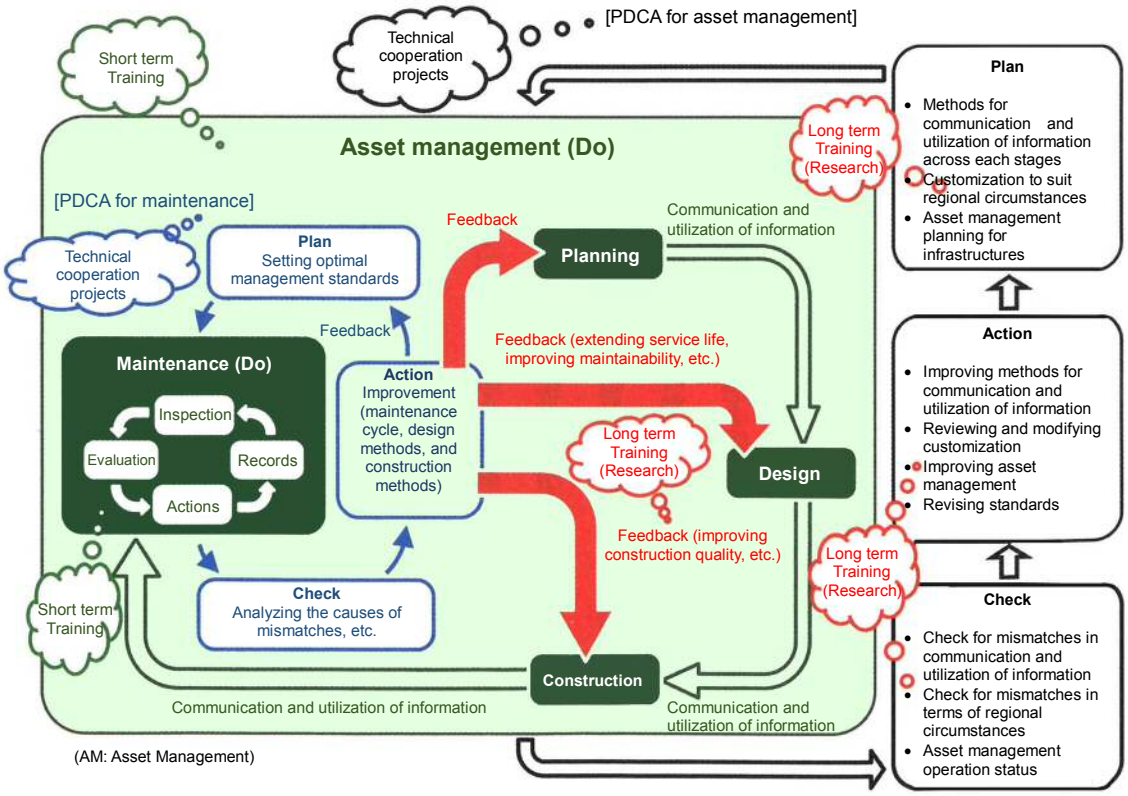

Fig. 1. Effective input to help promote asset management

Reference

(1) Yokota, H. and Nagai, K.: ISO and international promotion of concrete structure management in the Strategic Innovation Promotion Program (SIP), JSCE ISO Journal, Vol. 27, pp. 12-18, 2017.