Chapter 1
Overview

I JICA Project Evaluation

1. Background to Project Evaluation

To ensure that aid is implemented effectively, efficiently and accountably to the public, there is a need to actively identify, formulate and implement quality projects which meet the needs of developing countries and regions. Once cooperation has been completed, the impact of the project must be evaluated and the lessons and recommendations gathered from the results reflected in project follow-ups and the formulation and implementation of new projects. It is also vital to work to enhance projects, as well as to publicize their results.

In line with this approach, JICA set up the Evaluation Study Committee in July 1981 to examine how JICA projects are assessed, working to address such areas as the development of evaluation methods. Serving as a specialist division for conducting a variety of evaluations, the Evaluation Division was established in the Planning Department in April 1988 to conduct assessments of JICA projects. In 1994 JICA introduced a methodology known as Project Cycle Management (PCM) into project-type technical cooperation with a view to implementing projects based on a systematic management method (JICA Project Cycle Management-JPCM). JPCM is currently utilized in other types of JICA project for such purposes as gaining insight into on-the-ground needs, positioning projects and identifying objectives, thereby playing a useful role in appropriate project management. The Evaluation Division was reorganized in April 1990 to become the Evaluation and Post-Project Monitoring Division, and again in October 1996 to become the Office of Evaluation and Post-Project Monitoring. With the objective of strengthening the framework for feeding back evaluation results into projects, in January 2000 the Office of Evaluation and Post-Project Monitoring was integrated into the Planning and Evaluation Department, under which various evaluations are currently being implemented.

JICA also works to publicize information on its projects: for example, evaluations upon completion of projects, as well as post-project evaluations, are included in Annual Evaluation Reports, which have been published annually since FY1995 with a view to disclosing information and improving project transparency.

2. Objectives of Project Evaluation

As the organization conducting technical cooperation and grant aid cooperation projects of Japan's Official Development Assistance (ODA), JICA provides supplementary support where necessary based on examination of the effectiveness, impact and sustainability of the projects. JICA also conducts evaluations in various forms for the purpose of feeding back the lessons and recommendations derived from evaluation into the project cycle and enhancing future projects (see Figure 1).

Furthermore, JICA publicizes the evaluation results from the perspectives of maintaining transparency in its projects and increasing the understanding of the general public toward ODA.

3. Position of Evaluation in Projects and the Project Cycle

As can be seen in Figure 1 below, JICA implements various types of evaluation in the project cycle as a beneficial means for effective and efficient project implementation.

4. Forms of Project Evaluation

JICA works toward the appropriate management and implementation of projects by conducting evaluation and monitoring at various stages of the project cycle. In recent years, JICA has been working in particular to enhance both ex-ante and interim evaluation with the view to implementing more effective projects that respond appropriately and flexibly to the needs and changes in the environment of the partner country.

JICA also carries out post-project monitorings through overseas offices in order to understand and verify the state of projects upon completion of cooperation and to study and determine the need for supplementary support.

(1) Ex-ante Evaluation

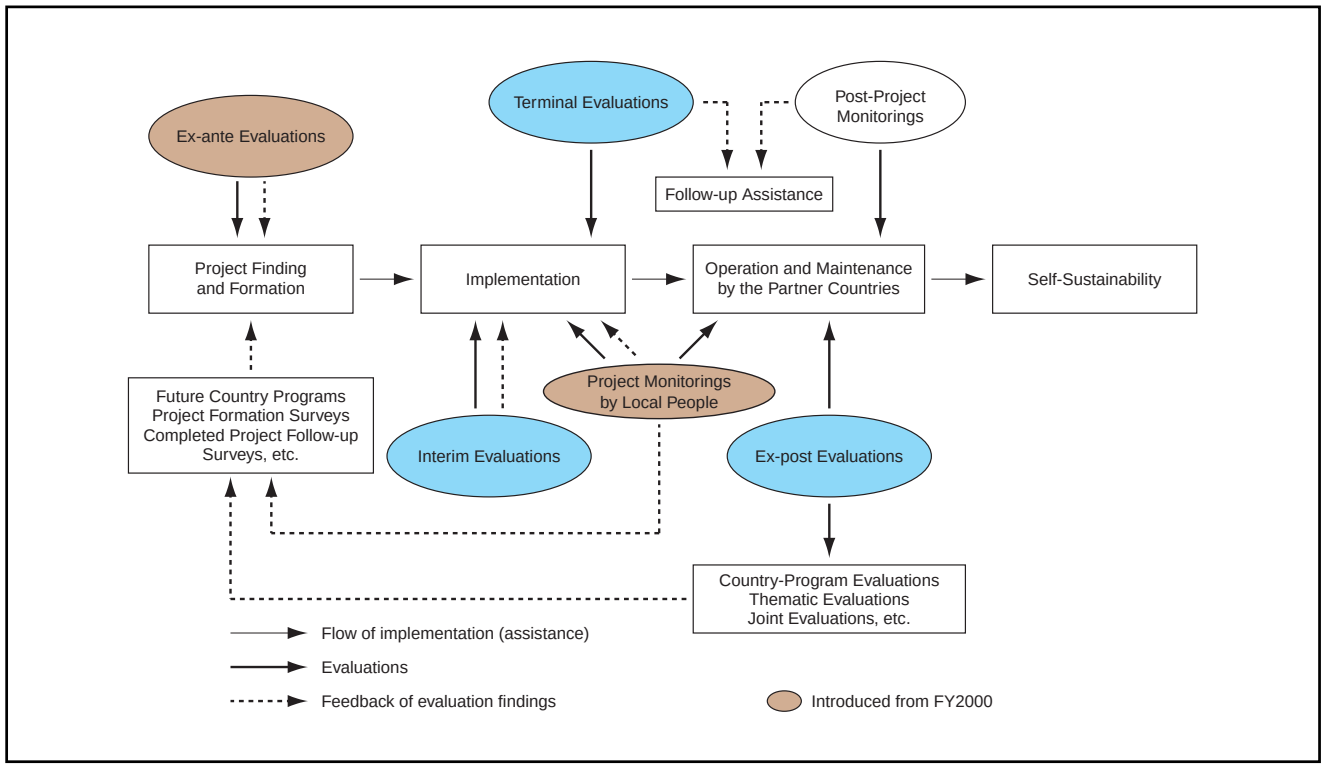
Ex-ante evaluation is undertaken during the stage in which the details of project-type cooperation or grant aid cooperation are being considered based on the request of the partner country.

JPCM

In general, projects go through three processes: planning, implementation and evaluation. By learning from the results of evaluation, as well as the experience and know-how gained, and feeding these back into future projects, a repeat of the same mistakes can be avoided. The method of appropriately managing this cyclic series of planning, implementation and evaluation is known as Project Cycle Management (PCM).

JPCM refers to the type of PCM introduced by JICA. Using JPCM, the various factors necessary for implementing a project, such as inputs, activities, project goals, and the indicators and external factors regulating them, as well as the various logical mutual relations among them, are arranged into a Project Design Matrix (PDM). Based on the PDM, the relevance, state of progress and impact of the project are verified and evaluated at each stage of pre-project examination, implementation and evaluation.

Figure 1 Project Cycle and Evaluations



In the evaluation, the relevance of the project formulated by the candidate partner country and the needs for cooperation for the project, as well as details of cooperation and the anticipated impact of the project are all examined and considered. Introduced as a trial experiment from FY2000, the project implementing divisions are the main conductors of this type of evaluation. The results of ex-ante evaluation are used to select and formulate projects in which cooperation has a higher impact.

Indicators are also employed in ex-ante evaluations to measure the efficiency of cooperation. These indicators are used as an important standard in measuring the efficiency of cooperation in the various evaluations undertaken following the initiation of cooperation.

(2) Interim Evaluation

Focused on project-type technical cooperation, interim evaluation is undertaken during the interim period of cooperation on five criteria (efficiency, effectiveness, impact, relevance, and sustainability). The division implementing the project conducts the interim evaluation following the monitoring of project activities in terms of these five criteria, including changes in external factors, for the purpose of determining whether there is a need to alter existing plans. The results of the interim evaluation are used to draft and reassess cooperation plans in order to make them more effective and efficient.

(3) Terminal Evaluation

Terminal evaluation is undertaken jointly at the time of completion of cooperation with the relevant organization in the partner country. Using five criteria of evaluation, research and analysis is conducted in various areas, most notably efficiency, effectiveness, and sustainability of the project. Evaluation is undertaken for the purpose of determining whether it is possible for JICA to complete its cooperation, or there is a need to provide follow-up in the form of extended cooperation or other endeavor.

Terminal evaluation is conducted either by the division responsible for implementing the project or by the overseas office, which have jurisdiction over the project, using local consultants and other personnel.

The timing of terminal evaluation is outlined below.

i) Project-type technical cooperation

In principle, all projects, approximately six months before the end of the period of cooperation

ii) Acceptance of trainees (Third-country training, In-country training)

In principle, all projects, approximately one year before the end of the period of cooperation

iii) Dispatch of experts (Expert team dispatch, Research cooperation, Pivotal support for important policies)

In principle, all projects, four to six months before the end of the period of cooperation

iv) Grant aid (General grant aid projects)

In principle, projects involving large sums of money, within one year of completion

v) Dispatch of Japan Overseas Cooperation Volunteers (JOCVs) (Team dispatch)

In principle, all projects, four to six months before the end of the period of cooperation

(4) Ex-Post Evaluation

Ex-Post evaluation is undertaken for the purpose of deriving lessons and recommendations that contribute to effective and efficient future JICA projects. The examinations focus on five evaluation criteria, most notably on impact, relevance, and sustainability. Following the completion of cooperation, evaluation is conducted on projects that have passed a certain time period, focusing on all phases from the formulation of the plan of the project through to the operation and management undertaken by the partner country side.

The results of ex-post evaluation are reflected in JICA's country-program implementation plans, and used to identify and formulate new projects. Furthermore, JICA holds seminars locally after conducting country-program evaluations and others in order to feed back the results of evaluation to those involved widely in the partner country and in the project itself.

Ex-post evaluation is undertaken by the Office of Evaluation and Ex-Post Monitoring and overseas offices. The various types of evaluation are outlined below.

i) Country-program evaluation

Assessing the projects with JICA cooperation in the country on a cross-sectoral basis, the overall impact of JICA cooperation and implementation problems in the country are analyzed, and lessons and recommendations for future cooperation to the country are offered. The results of evaluation are reflected in improvements in future country-programs and methods of cooperation for the country.

ii) Thematic evaluation

Focusing on the themes of specific sector, major issues (such as environment, poverty and women's issues) and project schemes, the impact and challenges of JICA cooperation are analyzed, and lessons and recommendations are offered for cooperation on the themes. Studies are also conducted on effective methods of cooperation on the themes. The results of evaluation are reflected in sector- and issue-specific efforts.

iii) Third-party evaluation

Third-party evaluation is undertaken in order to ensure transparency in JICA projects and neutrality in evaluation, and to enable high-quality evaluation from a wide-ranging perspective based on the extensive knowledge and expertise of eminent persons. In this process, external experts (scholars, journalists, NGO members, etc.), who also understand development assistance and JICA projects, are requested to conduct evaluations.

iv) Joint evaluation

Joint evaluation is carried out together with relevant organizations in the partner country or with other donors. In joint evaluations undertaken with partner countries, JICA and the partner country work toward reaching a common awareness of the impact and challenges of JICA cooperation and other issues. In addition, the evaluations also play a useful role in acquiring evaluation methods from and building evaluation capacity in the partner country. Joint evaluation with other donors is an effective way of mutually studying evaluation methods and strengthening linkages.

v) Evaluation by external organizations

External development assistance research institutes, consultants and other personnel with planning, information gathering and analysis capacities and with an extensive knowledge on development assistance and technical cooperation are commissioned to conduct evaluations in order to enhance the quality and neutrality of the evaluation.

vi) Ex-post evaluation by overseas offices

Overseas offices, which have a comprehensive knowledge of a specific country's developmental needs, conduct ex-post evaluation using local consultants and other personnel well acquainted with the social, economic, cultural and other various circumstances in the country. Through such evaluation, overseas offices gain an insight into and analyze the impact and challenges of past project cooperation in a country, thereby contributing to strengthen their capacities to identify, formulate and implement projects, which are essential to the country-specific approach initiated by JICA.

(5) Post-Project Monitoring

Post-project monitorings are implemented through overseas offices for the purpose of gaining an understanding of the present state of projects for which the JICA cooperation had been completed a certain period of time ago. The monitorings focus on three cooperation schemes: project-type technical cooperation, grant aid and equipment provision. The results of the monitorings are used as the key reference when considering supplementary support such as expert dispatch and provision of spare parts.

(6) Project Monitoring by Local People (Introduced from FY2000)

In recent years there has been a considerable increase in participation-type projects which focus on directly benefiting local residents. As a result, local NGOs and experts active in regions undertake monitoring activities on the impact and contribution of a project from the viewpoint of the beneficiaries, such as the residents in the areas for which the project is implemented. The results of monitoring are used to both reassess the details of cooperation for the project and to improve methods for identifying and formulating new projects.

5. Evaluation Methods

Having expressed the summary of a project into a Project Design Matrix (PDM), JICA undertakes evaluation and monitoring in accordance with the standards of evaluation as follows.

6. Standards of Evaluation

The evaluation standards employed by JICA are based on five criteria outlined in the Principles for Evaluation of Development Assistance adopted in 1991 by the Development Assistance Committee (DAC) of the Organization for Economic Cooperation and Development (OECD). The relationship between the PDM and the five evaluation criteria is shown in Figure 3.

(1) Efficiency

Refers to productivity in project implementation. Studied from a number of perspectives, including whether inputs have transformed without difficulty into results; the details, methods and period of cooperation; the timing of inputs; appropriateness of costs; and coordination with other donors.

(2) Effectiveness

Refers to the state of implementation of project goals developed at the beginning and, sometimes, amended during the cooperation period. Studies are conducted on the extent to which project goals have been achieved, or whether they are expected to be achieved.

(3) Impact

Refers to the direct and indirect, positive and negative impacts caused by implementing the project, including the extent to which the overall goal has been attained. Studied from an array of perspectives, including economic, social, political, technological and environmental. Also includes not only impacts that were expected at the beginning, but also those that were unexpected.

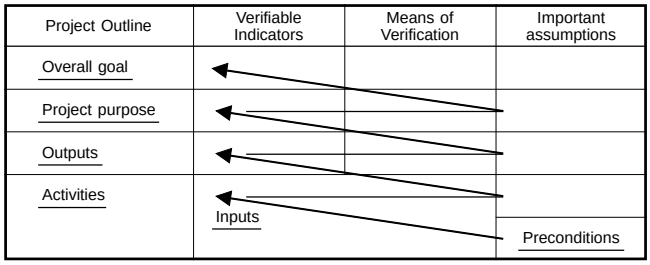
(4) Relevance

Refers to the extent to which the orientation of project goals are consistent with the needs of the partner country (government, beneficiaries). Studies are conducted on whether the project results, project goals and overall goal are attuned to the needs of the partner country.

(5) Sustainability

Refers to the extent to which the project can be developed alone by the partner country, and the benefits generated by the project can be sustained under the partner country's policies, technology, systems and organizations, and financial state.

Figure 2 Project Design Matrix (PDM)



Verifiable indicators
Criteria for objectively measuring project activities, impact, project goals, and achievement of the overall goal

Means of verification
Source for acquiring the data and information assigned as the verifiable indicators

Important assumptions
External conditions that are essential for ensuring the success of the project, but that cannot be controlled by the project

Preconditions
Conditions which must be satisfied before the project can get underway

Overall goal
Long-term goal expected to be achieved between 3-5 years after completion of the project

Project purpose
Goal expected to be achieved through implementing the project upon completion of cooperation

Outputs
Items that must be realized in order to achieve the project goals

Activities
Cooperative action to be inputted, such as with personnel, capital and equipment, in order to generate project outputs

Inputs
Essential elements for undertaking project activities, including the personnel, capital, equipment, facilities, etc., to be supplied by the donor and partner countries

Logical composition of the PDM

PDM is composed of a set of logical relationships: Results are attained when activities and external conditions are met; project goals are attained when outputs and external conditions are met; and the overall goal is attained when project goals and important assumptions are met (see arrows in Figure 2 above).

7. Application of Evaluation Results

Evaluation plays its role only when the results are utilized to enhance and improve the project implementation and the transparency. Based on this recognition, JICA effectively applies the results of evaluation in a number of ways (see Figure 4).

Firstly, in terms of application, results are used in the drafting of country-programs and the formulation of new projects. They are also used as important information and data when considering supplementary support to projects that are subject to evaluation. The results therefore play a useful role in implementing more effective and efficient projects.

Since FY1995 JICA has annually published the Annual Evaluation Report which outlines the details of evaluation results. In doing so, JICA provides accurate information on JICA projects to the people of Japan and works to improve transparency in JICA projects and increase the understanding of the people toward ODA. Since FY1998, JICA has uploaded a summary of the Annual Evaluation Report onto the Internet in its efforts to provide information to a wider number of Japanese people.

The results of evaluation are also fed back into the partner country. JICA works to promote understanding of JICA projects among the people involved in the partner country by, for example, hosting local evaluation seminars. The sharing of evaluation results between JICA and the partner country not only serves to promote the planning and implementation of more effective and efficient projects based on the common awareness of both parties, but also contributes to building the partner country's capacity to formulate, implement and manage projects.

JICA also sends information on JICA evaluation activities to other donors at the DAC Working Party on Aid Evaluation and in DAC workshops, etc. and actively participates in exchanges of information and opinions on evaluation results and methods. These efforts play a useful role in a number of areas, including strengthening linkages with other donors and improving evaluation methods.

Figure 3 Five Evaluation Items and Project Design Matrix (PDM)

<table>
<tr><th></th><th>Efficiency</th><th>Effectiveness</th><th>Impact</th><th>Relevance</th><th>Sustainability</th></tr>
<tr><td>Overall goal</td><td></td><td></td><td rowspan="2">Positive and negative changes propagated directly or indirectly, as the result of project implementation.</td><td rowspan="3">Relevance of outputs, project purpose and overall goal to the priority needs and concerns of the partner country at the time of evaluation.</td><td rowspan="4">The extent to which the partner country's institutions can continue to pursue the project benefits after external aid is terminated.</td></tr>
<tr><td>Project purpose</td><td></td><td rowspan="2">The degree to which the outputs have contributed to the achievement of the project purpose.</td></tr>
<tr><td>Outputs</td><td rowspan="2">The extent to which inputs have been converted into outputs.</td><td></td></tr>
<tr><td>Inputs</td><td></td><td></td><td></td></tr>
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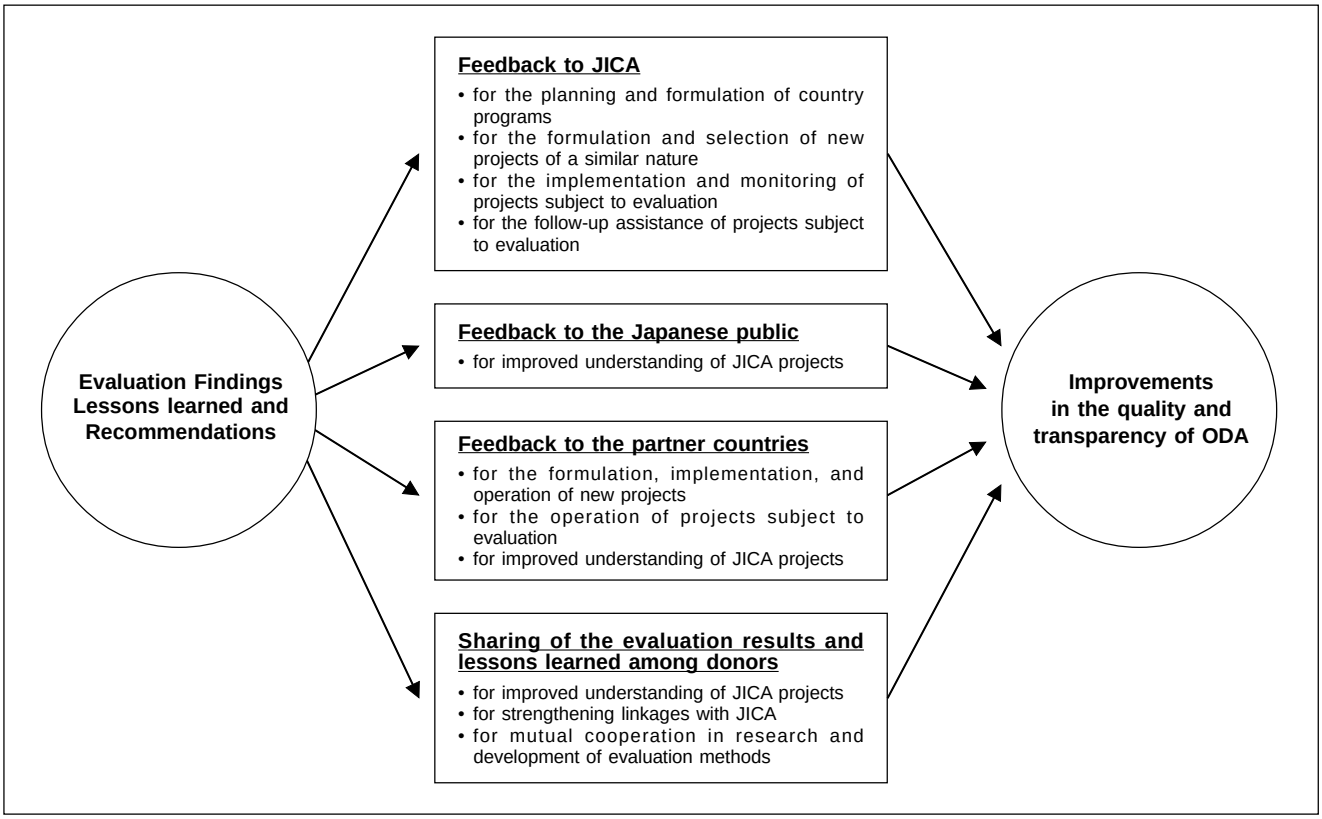
Figure 4 Utilization of Evaluation Findings



Ⅱ Present Challenges and Future Efforts in JICA Project Evaluation

In recent years, with the background of harsh economic conditions and other factors affecting Japan, it has become increasingly important to implement assistance effectively and efficiently. The significance of ODA and the future shape of assistance from Japan have been actively debated in a number of occasions, including the Council on ODA Reforms for the 21st Century, an advisory body to the Ministry of Foreign Affairs, and recommendations to switch the thrust of ODA from quantity to quality have been tabled. These discussions have reaffirmed the role and importance of evaluation as an effective means of improving ODA quality and ensuring transparency, and highlighted the need to strengthen evaluation systems and expand and improve evaluation activities.

Amid such circumstances, in March 2000 the Aid Evaluation Reviewing Panel of the Ministry of Foreign Affairs (chaired by Saburo KAWAI, Chairman of the International Development Center of Japan) compiled recommendations on specific reform measures for addressing existing ODA evaluation challenges and issues into the Report on Reform of Japan's ODA Evaluation System. The Report outlines four objectives of ODA evaluation: to ensure accountability, to support the implementation and management of ODA, to improve the effectiveness of ODA through feedback of evaluation results, and to increase national understanding of ODA and promote participation in ODA activities, and makes the following recommendations.

* To establish a feedback system across the entire scope of ODA among the Ministry of Foreign Affairs (MOFA), JICA and the Japan Bank for International Cooperation (JBIC)
* To make active use of academic experts, private auditors, NGOs, consultants and other specialists
* To expand the framework for implementation of evaluation by Japanese embassies/consulates-general and JICA/JBIC overseas offices in order to gain a more comprehensive understanding of local needs, responses, etc., on a regular basis
* To enhance evaluation of programs for accepting trainees, expert dispatch programs, and JOCV programs
* To develop human resources for conducting evaluation
* To establish a consistent evaluation process from pre-project to interim and post-project evaluation
* To set evaluation indicators for measuring the goals and effectiveness of individual projects

In order to implement projects with greater effectiveness and efficiency with the understanding of the people of Japan, JICA is actively working to enhance and strengthen its evaluation systems based on these recommendations.

1. Establishment of a Consistent Evaluation System from Ex-ante Project to Post-Project Evaluation

The establishment of a consistent evaluation system from the pre-project planning stage to project completion based on various objective indicators is required in order to appropriately analyze, measure and determine the relevance of implementing a project and the project impact, as well as to suitably reflect the results in improving programs. To this end, there is a need to collect basic data, understand the needs of the beneficiaries, and to set evaluation indicators at the ex-ante project evaluation stage, with a view to monitor and evaluation to be conducted later.

In December 1999, JICA established the ad hoc committee on setting indicators in the preparation stage of the projects for its subsequent evaluations. The committee started the discussion on the orientation of ex-ante project evaluation in JICA projects, methods for setting evaluation indicators and modes of publicizing the results of ex-ante project evaluation. Consequently, it was decided that JICA should try to set quantitative result indicators in conducting ex-ante project evaluation, and to enhance baseline studies for this purpose. In FY2000, JICA will implement ex-ante project evaluation on a trial basis, as well as produce guidelines for ex-ante project evaluation. The results of ex-ante project evaluation will also be publicized.

2. Research and Development of Evaluation Methods

While JICA has long undertaken evaluation applying five evaluation criteria, it also actively carries out research and development of evaluation methods for the purpose of implementing more relevant evaluation.

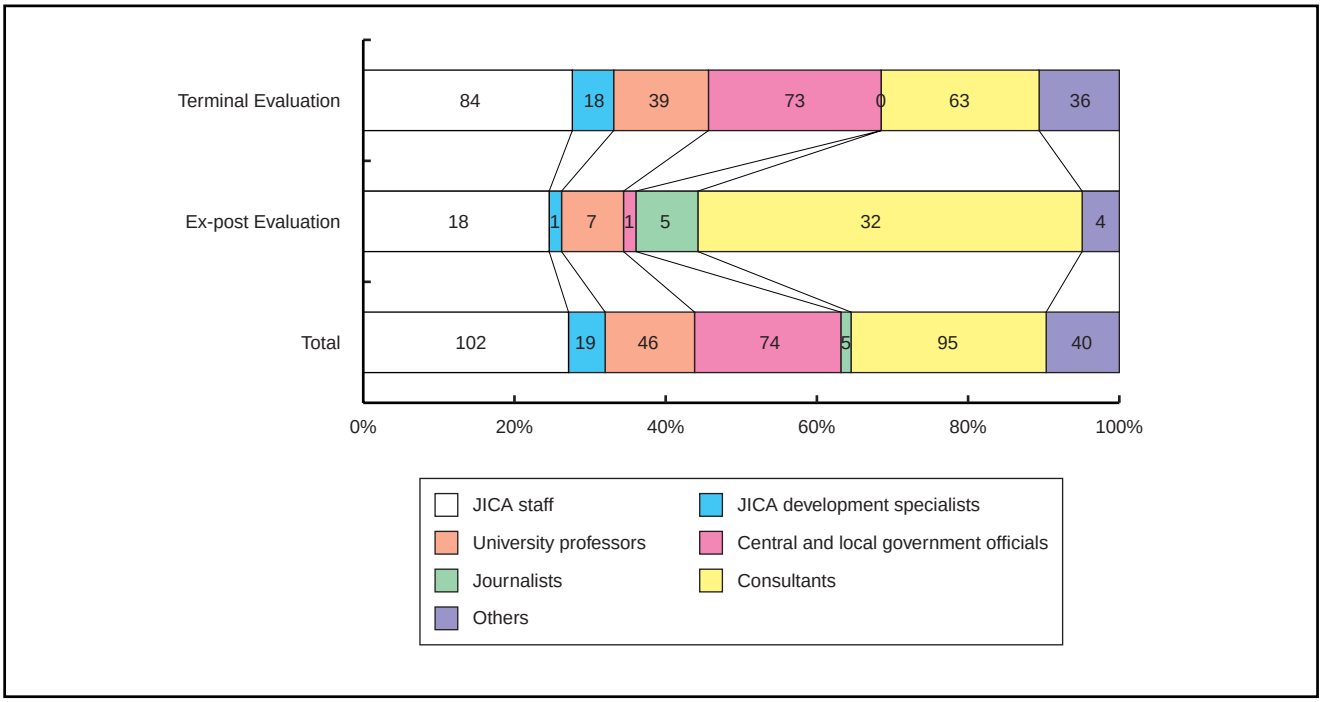
In FY2000, JICA is conducting research and studies relating to "participatory evaluation methods" which focus on the impact on beneficiaries of projects, as well as on ex-ante project evaluation methods and enhancing feedback of evaluation results.

Further, JICA is working to improve evaluation methods at the country and sector level by implementing country-program project evaluation and thematic evaluation.

3. Promotion of Third-Party Participation in Evaluation

Ensuring neutrality in evaluation is imperative in implementing evaluation that is highly credible. JICA actively employs not only internal staff, but also third parties (including academic experts, NGOs and journalists with detailed knowledge of development assistance and JICA projects) in

Figure 5 Evaluation Survey Participants (Occupational Share)



various evaluation studies, such as third-party evaluation and country-program project evaluation. In this way, JICA works to implement highly credible, high-quality evaluation from an objective perspective.

Of the 372 total participants (excluding interpreters) involved in the evaluation studies (conducted in FY1998) outlined in the Report, there were 253 (68%) external participants, excluding JICA staff and JICA Development Specialists.

In FY2000, JICA also introduced grassroots monitoring by local NGOs and other organizations, in which the NGOs and experts of developing countries monitor what impacts have been generated by project implementation from the perspective of the local residents. In this way, the opinions of partner countries at the grassroots level are actively used in enhancing projects.

4. Enhancing Feedback of Evaluation Results

Evaluation plays its role only when the lessons and recommendations, as a result of evaluation, have been used in improving JICA projects and in enhancing their transparency.

In January 2000, the Office of Evaluation and Post-Project Monitoring was integrated into the Planning Department to create the Planning and Evaluation Department. Under the umbrella of the Department, the Office implements various evaluation studies, and tries to strengthen the system for feeding back evaluation results into the planning and implementation section of JICA, for example by reflecting on the country-programs. In FY2000, JICA has been implementing studies and research on developing systems for feedback of evaluation results.

In September 2000, a DAC Working Party on Aid Evaluation workshop entitled "Evaluation Feedback for Effective Learning and Accountability" is held in Tokyo. JICA will make further efforts to strengthen the feedback system in future by holding such discussions and exchanging views with other donors and officials from partner countries.

5. Publicizing the Results of Evaluation

Since FY1995 JICA has annually published the Annual Evaluation Report, which contains the results of terminal evaluation and ex-post evaluation. In FY2000, JICA will upload the entire Report onto the Internet as part of its efforts to provide more information to the general public.

Ⅲ Evaluated Projects Included in This Report

This report contains the results of all terminal evaluations and ex-post evaluations implemented by JICA in FY1998.

In FY1998, evaluation studies were conducted on 184 cooperation projects, of which there were 93 terminal evaluation studies on 94 projects (of which 27 studies on 27 projects were undertaken by overseas offices), and 29 ex-post evaluation studies on 90 projects (of which 18 studies on 35 projects were undertaken by overseas offices).

Tables 1, 2, and 3 below provide a breakdown by region, cooperation type and sector classification.

Table 1 Projects Covered by JICA evaluations (regional share)

	Asia	Middle East	Africa	Latin America and the Caribbean	Oceania	Europe	Total
Terminal Evaluations	50	7	15	19	2	1	94
Ex-post Evaluations	44	8	15	3	20	-	90
Total	94	15	30	22	22	1	184

Table 2 Number of projects covered by JICA evaluation (by type of cooperation)

		Terminal Evaluation	Ex-post Evaluation	Total
Acceptance of Trainees	Training in Japan	-	3	3
	In-country Training	2	-	2
	Third-country Training	17	10	27
Dispatch of Experts	Individual Experts	-	5	5
	Expert Team Dispatch	10	-	10
	Research Cooperation	3	-	3
	Pivotal Support for Important Policies	1	-	1
	Revitalization Cooperation	-	1	1
Provision of Equipment		-	1	1
Development Studies		-	4	4
Project-type Technical Cooperation		43	21	64
Grant Aid		18	39	57
Dispatch of Volunteers	Japan Overseas Cooperation Volunteers	-	5	5
	Senior OverseasVolunteers	-	1	1
Total		94	90	184

Table 3 Projects covered by JICA evaluation (sectoral share)

	Planning and Administration	Public Works and Utilities	Agriculture, Forestry and Fisheries	Mining and Industry	Energy	Human Resources Development	Public Health and Medicine	Others	Total
Terminal Evaluation	4	21	30	9	3	10	15	2	94
Ex-post Evaluation	-	45	18	10	-	7	10	-	90
Total	4	66	48	19	3	17	25	2	184

Ⅳ Summary of Evaluation Results

This section organizes the evaluation results shown in this report for each of the five evaluation criteria (efficiency, effectiveness, impact, relevance, and sustainability) and presents the main lessons and recommendations for future implementation of new projects. It also includes the state of follow-up measures for certain projects based on these lessons learned and recommendations.

1. Results of Evaluation by Each of the Five Criteria

(1) Efficiency

On the whole, the projects subject to evaluation in this report were introduced appropriately and for the most part according to plan, and efficient cooperation was implemented. This section presents the factors that promoted efficiency in project implementation as well as the factors that hindered it.

Since factors promoting and hindering efficiency in training programs and grant aid differ from those in other aid schemes, they were divided into the following three groups for evaluation.

1) Project-type technical cooperation, Experts dispatch programs, JOCVs dispatch programs

The first important element in promoting efficient technology transfer is close mutual understanding with the counterparts. In the expert team dispatch program to Tanzania to the Dar es Salaam Power Distribution Maintenance Project, all counterparts gathered with the experts every day and views were shared at the workplace on problem points and methods of resolution. It was pointed out that this led to increased enthusiasm among the counterparts and was also useful toward the efficient implementation of technology transfer. It also was related that, thanks to the deepening of mutual understanding between experts and counterparts in the Cooperation to Support the Formulation of Key Government Policies on Industry in Poland (Pivotal support for important policies), the needs on the Polish side were accurately grasped amid volatile conditions during the period of Poland's transition to a market economy. This made it possible for appropriate responses and advice to be offered.

From the standpoint of accurate grasp of needs, the Community Development and Forest/Watershed Conservation Project (Project-type technical cooperation) in Nepal is a good example of efficient cooperation with JOCVs. Under this project, participatory development methods were used and activities consistent with residents' needs were performed. First, JOCVs visited the target villages and accurately grasped the resident's needs. Then, long-term experts provided assistance in technological aspects. Thus, efficient technology transfer was made possible.

In order to respond appropriately to the partner country's needs, there were also many projects that pursued coordination with other aid schemes implemented by JICA and cooperation with other aid organizations. One example of coordination with another JICA aid scheme that is worthy of special note is the Science and Mathematics Education Manpower Development Project (Project-type technical cooperation) in the Philippines. This project was implemented as a core project under the Package Cooperation for Science and Mathematics Education Manpower Development in the Philippines, which was implemented as comprehensive cooperation that strategically combined grant aid, project-type technical cooperation, individual experts dispatch, country-focused group training, and JOCV dispatch. From now on, as JICA strengthens its country-specific approach, the experience gained through this package cooperation will likely become useful in actively promoting cooperation that effectively combines JICA's various aid schemes to tackle important development issues in each partner country.

The Higher Education Development Support Project (Project-type technical cooperation) in Indonesia is an example of cooperation with another aid organization. This was a joint Japan-U.S. project aimed at improving the level of higher education in the regions of Sumatra and Kalimantan. Japan cooperated in engineering while the U.S. cooperated in the basic science and management area. Under this project, the educational and research capabilities of teachers were improved effectively by university teachers studying in higher degree programs in Indonesia using yen loans.

There are also projects that set effective models of technology transfer. Under the Kafue National Park Management Plan Project (Expert team dispatch program) in Zambia, conventional one-to-one technology transfer was replaced by team-to-team transfer. It was observed that although this took some extra time and effort, it also served to arouse a sense of teamwork among the counterparts and in the end this type of transfer became the basis for the efficient implementation of work. It was also mentioned that training through preparation of actual park administration plans was effective for counterparts to securely learn techniques.

In contrast to these factors promoting efficiency, factors that hindered efficient technology transfer were also pointed out. Such factors on the Japanese side include the late local arrival of provided equipment and problems in recruiting experts. Inhibiting factors on the partner side include insufficient numbers of counterparts and a delay in the construction of facilities. Meticulous planning is crucial to preventing such problematic factors from occurring. However, when such factors do occur, both Japan and the partner country make efforts to devise means of limiting their impact as much as possible. In the case of The Project for Promotion

of Population Education Phase II (Project-type technical cooperation) in Turkey, the necessary number of experts could not always be dispatched in a timely fashion due to slow progress in their selection, while construction of facilities on the Turkish side was delayed. Nevertheless, it was reported that these factors were overcome by effectively linking the reception of counterparts for training in Japan to local instruction by experts.

Poor ability to cover local costs on the partner country side also had an impact on the smooth implementation of project activities. Local cost was difficult to secure under the Kilimanjaro Agricultural Training Center Project (Project-type technical cooperation) in Tanzania, due to a policy of austerity based on structural adjustment policies, and under the National Institute of Animal Health Project Phase II (Project-type technical cooperation) in Thailand, due to the Asian economic crisis. In the case of the Joint Study project on Soft Clay Foundation (Research cooperation) in Thailand, the worsening domestic economy was accompanied by delays in the construction of expressways for which the application of construction methods developed under the project was planned. Thus, the results of using this construction method could not be analyzed within the cooperation period.

There were also cases where the partner country shouldered a considerable portion of the local cost. For example, the Mongolian side bore several times the initially planned cost at the Institute of Geology and Mineral Resources (Project-type technical cooperation), while the Indonesian side expended a development budget roughly three times the amount covered by JICA in the Higher Education Development Support Project (Project-type technical cooperation). What these two projects share in common is the fact that the partner country's government placed extremely high priority on the development in question and placed great importance on the project. These examples demonstrate that accurately grasping the partner country's needs helps secure the appropriate expenditure of local costs.

2) Training programs (Third country training programs, In-country training programs)

Third country training programs and in-country training programs are often implemented with the goal of propagating the fruits gained through project-type technical cooperation and other cooperation by Japan to neighboring countries or throughout a particular country. Therefore, counterparts who have been cultivated through the cooperation often work as instructors of the programs. Training implementation systems have been developed to a certain extent, and therefore there are almost no examples of problems reported in training implementation systems. The In-country Training Programme on Improved and Sustainable Agricultural Productivity for Women Farmers implemented in Kenya is an example that demonstrates a partner country's high implementation ability. This training was implemented using facilities and equipment provided under the Jomo Kenyatta University of Agriculture and Technology (JKUAT) project. Efforts were made toward efficient implementation; for example, the JKUAT lecturers, who were developed under this project, conducted preliminary studies in order to grasp the needs of the trainees and the results were reflected in the formulation of an appropriate training curriculum.

On the other hand, training programs, especially third country training programs, have their own particular problems of insufficient language ability and widely varying degrees of knowledge and experience among trainees. Since the trainees are not all at the same level, there are obstacles both to the smooth progress of classes and the trainees' understanding and acquisition of the contents of their training. In addition, difficulties may arise in putting together curricula that are consistent with the trainees' needs. Regarding disparities in knowledge and experience among trainees, no regional differences could be seen and this is an issue common to third country training programs. However, regarding language ability, in particular among third country training programs implemented in Asian regions, English proficiency was cited as a problem. This is thought to have been caused by the fact that, unlike Central and South America (Spanish and Portuguese) and Africa (English and French), the native languages of trainees enrolled in third country training programs implemented in Asia differed considerably from the training language (English).

3) Grant aid

In all of the projects subject to this evaluation, equipment procurement as well as facility construction was implemented and completed according to the original plan and has been handed over to the partner country. Under the three-phase Project for the Improvement of the Facilities of Primary Schools in Viet Nam, implemented from FY1994-FY1996, 118 primary schools were built over a wide area covering nine provinces. Efforts by the Japanese side, including the preparation of illustrated construction guidelines and the implementation of classes for Vietnamese construction foremen, were helpful in constructing a large number of schools, securing a certain level of quality in a short period of time.

In many projects, project design was formulated so as to adjust to the local technology level and enable maintenance, administration and parts exchange by the partner country's side. Based on such consideration, the utilization of local enterprises and local procurement of building materials were implemented to the greatest degree possible in the Project for Rural Electrification for Asesewa and Yeji Areas in Ghana. Under the Project for the Reconstruction of the Tuasivi Hospital in Samoa, the provision of equipment, based on local needs, that was not too technologically advanced, but of a level that could be maintained and managed by the Samoan side, resulted in full utilization of said equipment.

Factors cited as hindering efficiency are mainly delays in construction on the partner country's side. In the case of the Project of Upgrading of New Rabaul Airport (Tokua) in Papua New Guinea, construction undertaken by the Papua New Guinea side, including paths around the control tower and parking lots, fell behind schedule. As a result, there was an eight-month lag from the time Japan handed over the airport facilities until the opening of the airport.

(2) Effectiveness

Project goals include the development and propagation of new technologies corresponding to the situation in partner countries and improvement of the training capability of implementing organizations in partner countries. Nearly all of the projects evaluated in this report are deemed to have been effective toward achieving the intended objectives.

The National Institute of Animal Health Project Phase II (Project-type technical cooperation) in Thailand is an example of a project with the goal of developing and propagating new technologies. Under this project, effective methods of eliminating the five major animal diseases, including swine fever and brucellosis, were clarified from a scientific viewpoint and standard diagnosis manuals were created. Through these efforts, diagnosis methods were made consistent. The standardized diagnosis technology is also being reflected at animal farming sites through the training of technicians of medium standing and extension activities. The goal of the Telephone Outside Plant Construction Center Project (Project-type technical cooperation) in Indonesia was to upgrade the training capability of the implementing organization in the partner country. By improving construction standards and methods and upgrading instructors' capabilities, it became possible to implement training courses for telephone line construction supervisors. As a result, the Center was able to receive ISO 9001 certification and Indonesia's telephone line technology moved closer to international levels.

The intended objectives have also been achieved for the most part in training programs and grant aid projects. In training programs, training with content that is consistent with the expectations of trainees is implemented through an accurate grasp of their needs by the training implementing organization and the preparation of suitable curricula based on the results of this understanding, and trainees are fully acquiring expertise and skills in various sectors. The various facilities and equipment provided under grant aid projects are also by and large being used appropriately, and the intended objectives are being met. For example, in the case of the Project for the Reconstruction of the Tuasivi Hospital in Samoa, in the three years since the handover of the new hospital, the number of patients has risen to 1,800-2,000 per month, a 125% increase over pre-reconstruction days, and the number of beds utilized has increased by 70-74%. Due to the increased diversity of examinations made possible by the provision of equipment, the number of examinations has increased by 150%. As a result, Tuasivi Hospital became able to receive patients who previously had to go to the national hospital on Upolu Island, where the capital is located, and is now established as the key hospital on Savai'i Island.

On the other hand, there are also projects where progress is hindered by administrative delays and budget restrictions resulting from political and economic conditions in partner countries and technology transfer is not fully completed within the initial cooperation period. During the cooperation period of the Panama Nautical School Upgrading Project (Project-type technical cooperation), a plan to move the partner country's implementing organization came up and caused difficulties in the installation of some of the large equipment until the organization's move was completed. As a result, the counterparts did not reach the level where they could fully use this equipment for practical training. Regarding this project and other projects where technology transfer has not been completed, various forms of follow-ups are being implemented to ensure that the intended goals are achieved.

(3) Impact

The evaluated projects have generated impacts in a variety of sectors. This section introduces examples of impacts and is divided into four areas: institutional aspects, technology propagation, raising residents' consciousness and other areas.

1) Institutional aspects

There are examples of the partner country's implementing organization improving its capabilities through Japan's cooperation, thereby elevating its status as an organization, and after proving the effectiveness of the transferred technology, becoming accepted into the country's system.

One example of this is the Fisheries Technical Training Project (Project-type technical cooperation) in Morocco. Through this project, the capabilities of fisheries center instructors were improved, and educational facilities were developed. As a result, two Maritime Occupational Qualification Centers were promoted to the status of Institute of Maritime Fisheries Technology. The project's implementing organization, the Institute of Maritime Fisheries Technology of Agadir, was also promoted to the status of Special Institute of Maritime Fisheries Technology.

In the Productivity Development Project (Project-type technical cooperation) in Thailand, through achievements in productivity improvement activities for enterprises, the Foundation of Thailand Productivity Institute (FTPI), the project implementing organization, has begun to participate in the policy drafting for productivity in the National Economic and Social Development Board. Under the Tianjin Drug Quality Control Project (Project-type technical cooperation) in China, thanks to the drastic improvement of efficiency and reliability of tests at the Tianjin Institute for Drug Control, the Institute was appointed for setting standards of 15 drug items concerning the production and examination methods in the 2000 edition of the Chinese Medical Standards.

Examples of technology transferred under a project being incorporated into a new system include the National Tuberculosis Control Project Phase II (Project-type technical cooperation) in Nepal. Under this project, Directly Observed Treatment, Short Course (DOTS) workshops with participation by residents were implemented in order to increase residents' awareness of tuberculosis measures. The usefulness of DOTS workshops was recognized and they were adopted as part of the National Tuberculosis Program (NTP) of Nepal. Another example in the area of health is the Project for the High Institute of Nursing, Cairo University (Project-type technical cooperation) in Egypt. Through this project, a

perspective of nursing that sets great store on basic human needs was established and "the strengthening of the nursing system" has been incorporated into Egypt's health policies.

2) Technology propagation

The propagation and retransfer of technology developed and technology transferred to counterparts through projects is pursued through training and other activities. For example, textbooks and other educational materials produced by the Istanbul-Tuzla Vocational and Technical High School Project (Project-type technical cooperation) in Turkey were used for vocational training for its own students, and the school is also holding training sessions during the summer holiday for vocational teachers from all over the country. It is also working to propagate vocational technologies by implementing training aimed at human resources in the private sector. Numerous types of socioeconomic impacts through these kinds of propagation activities have been reported. In the Kilimanjaro Agricultural Training Center Project (Project-type technical cooperation) in Tanzania, trainees completing training at the Center who used the improved techniques they learned at the Center to grow rice have roughly doubled their yield. As a result, they have become able to repair their homes and obtain better medical and educational services. In the Dairy Product Manufacturing Technology Development Project, Inner Mongolia (Project-type technical cooperation) in China, as a result of training for people involved in the dairy industry at the Inner Mongolia Institute of Agriculture and Animal Husbandry, techniques for manufacturing a yogurt drink transferred under the same project have been established in the Inner Mongolia Autonomous Region. It was also reported that a manufacturing shift from the old traditional home production for self-consumption to production for product sales has come to be promoted. Under the Mine Safety and Environment Training Center Project (Project-type technical cooperation) in Chile, many people related to the mining industry have raised their awareness of mining safety and pollution caused by mining through training at the Center. As a result, from 1994 to 1998, Chile's mining accident index fell from 23.7 to 9.5.

In third country training programs, which have the goal of propagating technology transfer from Japan to neighboring countries, trainees are utilizing the expertise and experience acquired through training after they return to their native countries and strive to further transfer the acquired technology to their colleagues. Although there are some trainees who are unable to fully use the fruits of their training due to poor facilities in their own countries, in the case of Vegetable Crops Production (Third country training program) in Brazil, some of the trainees have applied their training achievements to the formulation of national vegetable production plans in their home countries, and are thus contributing to the development of the relevant sector in their home countries.

3) Raising residents' consciousness

The implementation of some projects has led to changes in the perceptions of local residents. Through the construction of elementary schools under the Project for the Improvement of the Facilities for Primary Schools (phase III) (Grant aid) in Viet Nam, a conscious desire has arisen among teachers, parents and local communities to support the schools with their own efforts. This has led to a desire amongst the children to keep their schools clean and has affected their manners. The Water Induced Disaster Prevention Technical Center Project (Project-type technical cooperation) in Nepal and the Forest Protection Research Project in the Ningxia Hui Autonomous Region (Project-type technical cooperation) in China are serving to spread heightened awareness of disaster prevention and understanding of the importance of forest protection among the general public. Through the Cooperation for Filaria Control in Samoa, information on preventing the spread of diseases carried by mosquitoes was disseminated to the residents and a sanitation campaign to prevent filaria was advanced.

There are also projects where raising residents' consciousness occurred from the viewpoint of gender. The activities of the Community Development and Forest/ Watershed Conservation Project (Project-type technical cooperation) in Nepal were carried out while giving consideration to the socially vulnerable such as women and those in low occupational castes. As a result, the desire of women to participate in village development projects rose and even the men began to positively recognize women's participation. Through village development projects concerning income generation and literacy education, women's solidarity, confidence, interest in the outside world and place in the home were improved. Women in rural areas were also the subjects of the in-country training program on Improved and Sustainable Agricultural Productivity for Women Farmers in Kenya. It was reported that by acquiring new knowledge and technical skills, women who completed the training have gained respect and trust within the household, and have been entrusted with work of higher responsibilities therein.

4) Other socioeconomic impacts

Many impacts have emerged in other areas, including economic and technological aspects. The completion of bridges under the Project for the Construction of Small Scale Bridges (Grant aid) in Ghana has reduced the loss of harvested crops by 5-20% because the crops can be transported to the markets more easily by using the newly constructed bridges. Since the products can now be sold at the markets in a fresh condition, it has become possible for them to be sold at higher prices, and some farmland areas in some districts have expanded by 10-15%. In the regions involved in the cooperation under the Malaria Control Program (Grant aid) in Tanzania, the ratio of mosquitoes carrying malaria dropped from 17.4% in 1988 to 1.1% in 1994, and the malaria infection rate dropped between 25-30% from past rates.

Under the Project for the Improvement of the Facilities for Primary Schools Phase III (Grant aid) in Viet Nam, construction technology and educational materials production technology were transferred from Japanese contractors to Vietnamese contractors through the construction of primary schools. This transfer contributed particularly to an improvement in the level of construction in provincial areas.

(4) Relevance

Almost all projects evaluated herein are consistent with the development needs of partner countries even at the time of evaluation implementation and their high relevance and importance were recognized. In many cases of third country training programs, in which degree of relevance is a major element in determining whether to extend the cooperation period, recommendations were made to extend cooperation based on high needs.

The impact of the Asian economic crisis was seen also from the standpoint of relevance. In the case of the Productivity Development Project (Project-type technical cooperation) in Thailand, in relation to the economic crisis, the Government of Thailand implemented the Industrial Restructuring Plan as a five-year plan. The project's implementing organization now has the important mission of a coordination and implementation organization in productivity improvement areas under the Government program and its relevance is increasing. On the other hand, there are also projects that decreased in importance due to the economic crisis. In the case of the Project of Training in Industrial Pollution Prevention Technology (Project-type technical cooperation) in Indonesia, the Government of Indonesia made an economic relief program a priority issue. At the time of evaluation, it was pointed out that as a result of this, the priority of pollution prevention policies became relatively lower.

(5) Sustainability

Most of the projects evaluated herein have been deemed sustainable. Under the National Actualization Center for the Teachers of the General Directorate for the Industrial Technological Education Project (Project-type technical cooperation), along with its transition of government industrial policy from protectionism to trade liberalization, the Government of Mexico fully recognized the importance of the Center in the cultivation of mid-level technicians in leading-edge technology sectors. It assigned human resources equipped with managerial and operational capability and has raised the budget allocation each year despite severe fiscal conditions. All counterparts are now able to implement training on their own, and sustainability is considered high in institutional, financial and technological aspects. This example demonstrates that if a project is extremely relevant to the point that it forms the foundation of a country's national policy, then as in the case of efficiency, priority in the partner country's governmental budget can be secured even under difficult financial conditions. While weakness of financial backing is the number one factor lowering sustainability, the question of how to accurately understand the partner country's needs is also an important element in ensuring sustainability past the conclusion of cooperation.

The technological aspects of sustainability have been sound for the most part. Counterparts' capabilities have improved through Japan's cooperation and the counterparts have continued working for the same organizations. Training manuals and other educational materials produced under projects aimed at improving training capabilities have also become indispensable to firmly establish the transferred technologies.

Working together with NGOs and other organizations is effective for increasing sustainability and expanding and propagating the fruits of cooperation after the conclusion of cooperation. In the Project for the Management of Forest Nurseries (Grant aid) in Senegal, the Ministry of Environment and Nature Protection supports seedling cultivation throughout the country in both management and technical aspects. At the same time, the project has also been initiated in collaboration with local organizations and NGOs, which have heightened the willingness to participate of local residents. Therefore, it has been reported that sustainability can be fully expected.

The report on the National Tuberculosis Control Project Phase II (Project-type technical cooperation) in Nepal states that, in extending Directly Observed Treatment, Short Course (DOTS) strategies, there is a need to further promote cooperation with NGOs and other organizations. In projects such as these two, in which cooperation with NGOs and other organizations is possible, it is desirable that this kind of collaboration is pursued with a focus on post-conclusion sustainability.

2. Lessons learned and Recommendations

(1) Participation of stakeholders of partner countries in cooperation

In order to implement a project efficiently and effectively, the formulation of a plan consistent with the beneficiary's needs is important. For this purpose, dialogue with a wide range of stakeholders who will be affected by the project is indispensable. This includes not only the staff of the partner country's implementing organization but also local residents. Working with JOCVs, local NGOs and others, and holding meetings and workshops for residents are effective for grasping the needs of the residents. Through these kinds of dialogue, active participation in the project by the counterparts and stakeholders as well as the securing of the partner country's budgetary contribution can be expected. In addition, the stakeholders will become able to participate in the project while sharing the same enthusiasm for its goals. Obtaining the participation of a wide range of stakeholders from the planning stage in this way contributes greatly to increasing the quality of aid, including improving the partner country's ownership, formulating plans of appropriate scale and content without wastefulness, and securing sustainability. From now on, it will be necessary to attach even greater importance to the opinions and voices of the various stakeholders.

(2) Cooperation focusing on sustainability after conclusion of cooperation

From the planning stage of cooperation, it is desirable that sufficient consultation is made with the partner country regarding sustainable operation by the partner country after the implementation and conclusion of cooperation and that support is given as needed to reinforce the operation system.

As can be gathered from the results of these evaluations, the greatest factor hindering sustainability is the insufficient operational funds of projects. It is therefore necessary to

incorporate the strengthening of the operational and administrative aspects of implementing organizations into the contents of cooperation. In projects in sectors such as water supply and irrigation in which residents (farmers) take initiative in maintenance and administration, and operating funds are secured through collection of usage fees from residents (farmers), dialogue with residents (farmers) from the planning stage is indispensable to raising sustainability. At the same time, support must be given toward the formation of resident (farmer) organizations.

In technology development projects, the degree of propagation of the technology developed through the project is important in achieving high cooperation impact. When the organization that developed the technology differs from the organization that is to propagate it, it is important to build close mutual working and cooperative relationships between the organizations from the cooperation planning and implementation stages.

(3) Reinforcing the WID/Gender standpoint

Consideration for WID (Women in Development)/gender has been tackled at JICA since the establishment of the Study Group on Development Assistance for Women in Development in 1990. There are projects, such as the Community Development and Forest/Watershed Conservation Project (Project-type technical cooperation) in Nepal and the In-country Training Programme on Improved and Sustainable Agricultural Productivity for Women Farmers in Kenya, which were implemented from the standpoint of WID/gender. However, in order to implement more effective projects, it will be necessary to further incorporate the WID/gender standpoints from the planning stage. Already, various manuals have been created at JICA for the purpose of WID/gender consideration. It is essential that project plans are formulated to ensure that women's needs are fully grasped through further utilization of these manuals in preliminary studies, and that WID/gender considerations are continued through the project implementation, monitoring and evaluation stages. When so doing, consideration for women's participation in organizations' decision-making processes and improving women's access to resources and opportunities are important elements in achieving a substantial effect toward women's advances in economic and social activities.

(4) Improving third country training programs, Forming ex-trainee networks

One factor indicated as hindering the implementation of efficient training in third country training programs was differing levels of trainees. Poor English proficiency in particular was cited as a problem in training courses in Asian regions. Since poor language ability not only prevents trainees from fully understanding and digesting training content, but also leads to decreased enthusiasm, more thorough examination of language ability is needed. It will also be necessary from now on to consider making the description of General Information (GI) and selection more strict, in order to select trainees possessing a certain level of work experience and knowledge to meet qualification of applicants

In addition to stricter applicant selection, it is also necessary to work on curricula in order to offer training that matches trainees' levels. The implementation of training divided into groups to match the technology level of each participating country and the establishment of common portions and selective portions of curricula should be effective toward implementing training suited to trainees' levels.

When considering the contents of training, it is important to assemble courses that match the level of technology and the state of facilities available in the participating country and are more practical and applicable, so that the knowledge and skills acquired through training can be fully utilized and propagated. For this purpose, the building of an information gathering mechanism for fully grasping the impact of past training, including follow-up studies of the activities of ex-trainees, is indispensable.

After returning home, it is not an easy task for trainees to independently maintain and upgrade the skills they acquired through training. Joint implementation by JICA and training implementation organizations of consultation missions and follow-up seminars in countries participating in training helps ex-trainees maintain and upgrade the acquired skills, while at the same time is useful from the standpoint of grasping local needs and technology levels and preparing more effective training curricula. Moreover, ex-trainees are also human resources who are assets to Japan. Relationships between ex-trainees and JICA should be further strengthened in order for Japan to implement more effective and efficient international cooperation in the future. Therefore, it is desirable that JICA consider an organizational effort in the formation of information networks and human resource databanks with ex-trainees.

(5) Strengthening public relations activities

Since JICA projects are funded by taxes paid by Japanese people, it is important to actively provide information to the people and promote understanding regarding the impact and actual conditions of these projects. Although in general, there is often an impression that Japan's assistance is composed of large-scale infrastructure development, as written herein, human resources development and technical cooperation implemented by JICA in a wide range of sectors are producing various impacts. Technical cooperation sounds simple, but it is no easy task to transmit technical information while transcending differences in culture, climate and education and promoting trusting relationships. The accurate informing of the actual circumstances of JICA projects, including the difficulties of operations in developing countries, leads to the people's heightened interest and understanding in JICA. From now on, this notification will also be important to JICA's promotion of assistance of the public participatory type.

Public relations activities should be stepped up not only to Japanese people, but also to the people of countries receiving Japan's aid and donor countries and international organizations. There is no small number of cases where public relations activities regarding projects served to heighten local residents' interest in the project and promote active participation. Public relations also lead to increased sustainability. By actively

carrying out public relations activities related to project results, the development of partnerships with other donors can also be expected.

3. Follow-up

As a result of evaluation, the necessity of follow-up has been recommended in order to achieve project goals or pursue sustainability of cooperation impact. In such a case, the possibility of follow-up measures is considered for each project at JICA. In the case of projects evaluated in this report as well, various types of follow-ups are being implemented based on evaluation results.

(1) Extension of cooperation period

Extension of cooperation period is implemented mainly for project-type technical cooperation and third country training programs. Extension of project-type technical cooperation periods is ordinarily implemented in cases where project goals are not fully achieved within the original cooperation period or in order to secure a project's sustainability. The cooperation period has been extended for three such projects evaluated this time. Third country training programs are extended when countries participating in training exhibit a high need for the training offered through the program. The cooperation period has been extended for four training courses evaluated this time.

(2) Follow-up cooperation

When the intended results have not been completely achieved in project-type technical cooperation, the extension of cooperation is limited to that part. Follow-up cooperation was implemented for 12 of the projects evaluated herein.

(3) Formation and implementation of new projects

In some cases, new projects are begun in order to expand and propagate the effects of JICA cooperation throughout the partner country and neighboring countries. Sometimes the aid scheme is changed. For example, new project-type technical cooperation is begun using facilities provided through grant aid, or a third country training program is implemented to spread the fruits of Japan's technical cooperation including project-type technical cooperation. New projects begun based on projects evaluated in this report include five cases of project-type technical cooperation (including Phase II cooperation), six third country training programs and one in-country training program.

(4) Facilities and equipment repair, Provision of spare parts

In some cases, the functions of facilities and equipment provided through project-type technical cooperation and grant aid are not fully enjoyed due to difficulty in maintenance and administration in connection with the severe financial situation of the partner country or damage inflicted by natural disaster, and the technology transferred by Japan ceases to be utilized. In such cases, JICA gives support toward ensuring the project's sustainable development by providing facilities and equipment repair, spare parts and other items. JICA provided facilities and equipment repair and/or spare parts for two of the projects evaluated this time.

(5) Dispatch of experts and JOCVs, Acceptance of counterpart trainees in Japan

In order to ensure sustainability in project-type technical cooperation, expert dispatch programs, grant aid and other cooperation, there are cases where complementary cooperation is necessary in such forms as instruction and advice regarding project operation and equipment maintenance. In such cases, JICA gives support toward ensuring the project's sustainability by implementing dispatch of experts and/or JOCVs, or accepting counterpart trainees in Japan. Among the projects evaluated this time, JICA dispatched experts for four projects, dispatched JOCVs for one project and implemented a training program in Japan for accepting counterparts in one project.

Ⅴ Summary of Each Evaluation Study

1. Terminal Evaluation

(1) Asia (Southeast Asia)

Indonesia:

Agricultural Extension and Training Methodology
(Third country training program)

Agriculture is a major industry in developing countries in the Asia-Pacific region. The dissemination of agricultural technology to people working in the industry is indispensable to raising agricultural productivity and promoting agriculture in the region. From 1979 to 1989, Japan implemented project-type technical cooperation under the Middle Level Agricultural Technician Training Project in Indonesia to train agricultural technicians and disseminate agricultural technologies. In order to effectively utilize the results of this project for agricultural development of other developing countries, Japan implemented this program for trainees from the Asia-Pacific countries over five years from FY1990 to FY1994, and extended the period of cooperation from FY1995 to FY1999.

Although there were problems with the training such as varying ability of trainees, the Indonesian organization implementing the training program was highly capable of its management. The training was carried out appropriately. Since agriculture in the countries of the Association of South East Asian Nations (ASEAN) is similar to that of Indonesia, the trainees from ASEAN countries seem especially able to effectively utilize the techniques and knowledge they obtained through training in their own countries.

The development of human resources with sufficient knowledge regarding the dissemination of agricultural technology is still lagging behind in the participants' countries. The necessity of this program is immeasurable, especially in South Asia and Indochina. In addition to carrying out this training, the Agency for Agricultural Education and Training is implementing training in the agricultural sector targeting trainees from other countries under its own budget. Since it has secured human resources and budget and has sufficient organizational management capability, it is hoped that the agency will continue to carry out this training independently.

Pest Surveillance and Forecasting
(Third country training program)

In Asian countries, the possibility of worsening crop damage caused by diseases and pests is high, and there is a great need for technologies for predicting their outbreaks. Therefore, this training program was implemented at the Pest and Disease Forecasting Control Center established through grant aid provided by Japan for the purpose of transferring to neighboring countries the technology for predicting outbreaks of crop-damaging diseases and pests that was transferred through Japanese project-type technical cooperation.

Although there were problems with some participants' English skills, the project was carried out efficiently, on the whole, thanks to the maximum efforts of the Pest and Disease Forecasting Control Center, which included appropriate revision of the curriculum, high-quality lectures and educational materials, and the setting up of appropriate training items. Returning to their home countries after the training, many of the trainees have been actively working in related fields, such as implementing training of local technicians to spread the fruits of their own training and promoting research on crop protection.

The Pest and Disease Forecasting Control Center possesses complete facilities for the implementation of training as well as experienced instructors. The Ministry of Agriculture also intends to continue this training, although there is financial uncertainty regarding the budgetary measures that the national government will take.

Irrigation and Drainage Engineering
(Third country training program)

Since increases in food production and its stable supply are important issues in countries of the Asia-Pacific region, the dissemination of irrigation and drainage technology had been in demand. To fill this need, this training was implemented in order to disseminate the technologies to the Asia-Pacific countries that had been transferred to the Irrigation Engineering Service Center (IESC) of the Republic of Indonesia through grant aid and project-type technical cooperation by Japan.

Under its practical curriculum matched with the current state of irrigation and drainage in each country, the training was implemented efficiently and the participants fully learned the techniques in this area. After returning home, they use and diffuse these techniques at their workplaces. Some trainees also utilize the text that was used in their training in their everyday work.

In these ways, the objectives of the training were achieved. Moreover, the implementing agency has high sustainability in terms of funds, technology and organization. Therefore, further cooperation by Japan toward the continuation of training is deemed unnecessary.

The Higher Education Development Support Project
(Project-type technical cooperation)

To respond to the worsening shortage of human resources

in Indonesia in its rapid industrialization, a joint Japan-U.S. project aiming to increase the level of higher education by having professors in active service obtain high academic degrees was formulated at universities in the Sumatra and Kalimantan provinces. This project was implemented with Japan responsible for engineering fields and the U.S. in charge of basic sciences and business administration.

Through this project 227 master's degrees and one doctorate were achieved. These numbers comprised roughly half of the number of higher educational degree holders at the universities enjoying the cooperation. Moreover, as a result of the improvements in research activities and administration at the universities, practical engineering education could be carried out at the universities, which in turn led to improvement in educational capability. In addition, joint research and contracted research with enterprises contribute to ensuring the development of universities' financial independence and the development of local industry, and the experience and results serve as considerable stimuli to other universities.

The Development of Appropriate Technology for Multi-Story Residential Building and Environmental Infrastructures for Low-income People
(Project-type technical cooperation)

In Indonesia, the rapid increase of the urban population on Java, an island which comprises less than 7% of the country's total land yet is home to about 60% of Indonesia's entire population of 200 million, has been creating an increasingly serious housing shortage. Because of this, attention has been given to the construction of medium-rise apartment buildings as a measure to respond to urban housing demands while making use of limited land and existing infrastructure.

Under these conditions, at the Research Institute for Human Settlements (RIHS), which has a record of Japanese assistance from 1980 that includes individual experts dispatch, grant aid and third country training programs, Japan implemented project-type technical cooperation in order to develop appropriate technology regarding the construction of medium-rise apartment buildings based on this series of cooperation activities.

Through this project, counterparts became aware of the importance of cooperation among each technology field involved in the construction of apartment buildings and a comprehensive research and development implementation system was established at the RIHS.

Although the construction of experimental housing fell behind schedule due to changes of the construction sites, huge budget cuts in the Indonesian government caused by the economic crisis in the country and other factors, the final proposal on the construction of apartment buildings is currently being put together and the objectives of this project is considered to have for the most part been achieved. The low-priced medium-rise housing design plans compiled by this project have actually been employed for the construction of apartment buildings at Sumedang, a town on the outskirts of Bandung.

Moreover, based on the results obtained from this project, new guidelines for apartment building construction are to be prepared.

Although there is financial uncertainty regarding the RIHS system due to the instability of the national economy, the system has high sustainability in terms of its institutional, technical, and personnel aspects. This project's activities should serve to sustain these current conditions.

The Telephone Outside Plant Construction Center Project
(Project-type technical cooperation)

Indonesia has the lowest percentage of telephones in use among ASEAN countries, and the poor state of its telephone situation had been an obstacle to its economic development. In addition, the absence of standards for telephone line design, construction, material used, and the inadequacies of the construction supervision made the probability of telephone line breakdowns extremely high. Therefore, Japan implemented project-type technical cooperation regarding the development of standards for telephone line construction, construction management, and the cultivation of construction supervisors.

While influenced by factors such as the economic crisis during the second half of the cooperation project, the project was on the whole appropriately and efficiently operated through close mutual cooperation between Japan and Indonesia. Although there were some disparities among technical fields, the project goal of cultivating telephone line construction supervisors was mightily achieved through proper implementation of supervisor training courses, which is the project's greatest activity. Furthermore, through this project, the Telephone Outside Plant Construction Center obtained the ISO 9001 certification and brought Indonesia's telephone line technology closer to international standards.

In these ways, the project's objectives are being steadily achieved, and most teachers (counterparts) continue to stay at the center. Therefore, there is a high probability that from now on the Center will continue to operate independently, and thus there will be no need for extension of the cooperation period or follow-up cooperation.

The Irrigation Engineering Service Center Project
(Project-type technical cooperation)

From 1981 to 1987, Japan implemented cooperation with the Construction Guidance Service Center focusing on construction management technology. However, since areas such as designing and maintenance management were not initially subject to the cooperation, the Indonesian government reorganized the Construction Guidance Service Center, which focused on construction techniques, to create the Irrigation Engineering Service Center (IESC), which handles the whole realm of irrigation technology. Japan provided cooperation to IESC in order to improve Indonesia's irrigation technology standards based on a consistent technological system.

Even though there had been delays in budgetary measures because of the economic crisis in Indonesia, the technology transfers to the counterparts were completed for the most part, and the counterparts independently held seminars and training sessions. Furthermore, they built their capacities to a level, which enabled them to work out their own training program for 1998-1999. Guidelines on irrigation technology were drawn up through this project, and the IESC established a system in which they can continue to develop activities to disseminate irrigation technologies through training.

In this way, although this project is expected to accomplish its objectives, a two-year follow-up cooperation that centers on dissemination activities at the local level has been implemented to enable the IESC to appropriately respond to the Indonesian government's Three Year Urgent Plan for Irrigation Expansion (1998-2000).

The Research and Development for the Multispecies Hatchery Project
(Project-type technical cooperation)

Development of aquaculture is an important challenge in Indonesia. Shrimp breeding had been conspicuous in Indonesia's aquaculture, and seed production grounds had been dominated by shrimp hatcheries. Since this situation was fragile when faced with market, environmental and other changes, Japan implemented project-type technical cooperation with the goal of developing and disseminating multispecies seed production technology suited to Indonesia's regional characteristics.

Through this project, the Central Research Institute for Fisheries (CRIFI) of Indonesia enhanced facilities and equipment. In addition, the Institute's level of research and technology development in the fields of seed production, fish diseases and dissemination improved, and the institute became Indonesia's center for research and dissemination regarding marine fish seed production.

From now on, if the seed production technology developed through this project can be systematized for application, it is expected that local residents can escape the danger of shrimp monoculture and be able to realize an increase in income and job creation in a relatively short period of time. Therefore, there is a need to implement follow-up cooperation of roughly two years in order to prepare manuals for seed production techniques and to package the technologies that also include the cultivation of parent fish in the package.

Training in Industrial Pollution Prevention Technology
(Project-type technical cooperation)

Economic development in Indonesia in recent years has brought increase in its industrial activity, and the increase in turn caused pollution problems such as contamination of the atmosphere and rivers. Rivers in the metropolitan area had especially serious water pollution problems due to drainage because most small and middle-sized businesses that dominate the industrial sector were not equipped with proper waste disposal facilities. The Indonesian Government made efforts to prevent industrial pollution, but there was a lack of technical experts to guide the pollution prevention effort. Hence Japan implemented technical cooperation with the goal of strengthening the functions of the Agency for Industrial Research and Development (BPPI) and the Institute for Research and Development of the Chemical Industry (BBIK), which is under the jurisdiction of BPPI, and cultivating experts in industrial pollution prevention.

As a result of this project, industrial pollution prevention efforts were advanced through the rapid improvement in technical and administrative support abilities of BBIK. BBIK became able to plan and implement seminar programs and training for third parties, and its accuracy of industrial waste analyses was improved. More than 120 factory visits have been implemented as part of on-the-job training, and it can be said to a certain extent that this project has also had the effect of promoting the prevention of pollution to private companies.

In this manner, this project's objectives have on the whole been achieved. However, in order to make these industrial pollution prevention activities even more effective in the future, it is necessary for BBIK to gain more practical experience and to implement the appropriate guidance and counseling to the factories.

The Project for Strengthening District Health Services in Sulawesi
(Grant aid)

In Indonesia, public and quasi-public health centers, sub-stations for midwives and basic medical facilities are maintained in each region and village, providing basic healthcare services in local areas that do not have hospitals. However, on mountainous Sulawesi islands, where development has been lagging behind, healthcare standards were extremely low due to the lack of diagnostic and medical equipment, medical vehicles to make rounds and other resources at their facilities.

For this situation, Japan announced the Global Issues Initiative (GII) on Population and Aids in February 1994, and a part of the GII, this project was implemented with the goal of providing support for strengthening Sulawesi's regional health and medical systems.

The project conducted detailed basic studies at the plan formulation stage, and, based on the needs of each medical institution and the local residents, suitable medical equipment was selected. This medical equipment was distributed to all 728 regional medical facilities on Sulawesi. Though medical institutions vary, the medical equipment is being used effectively for the most part, demonstrating that the project goal of providing regional health and medical facilities on Sulawesi with suitable medical services has been achieved.

The project for Equipment Supply to the TV Training Center
(Grant aid)

Indonesia's national television station Televisi Republik Indonesia (TVRI) is playing a large role in raising living standards, especially those of residents of regional communities where development is lagging behind, through the spread of government policy and Indonesian language, the broadcast of children's educational programs and the diffusion of family planning.

However, its lack of technicians was conspicuous, and a sufficient broadcasting system had not been developed. For this purpose, Japan upgraded equipment for training through grant aid to the TVRI Training Center (TVTC), which is the training center for TVRI's television technicians.

The equipment provided has already been utilized for actual training. In the six training courses using new digital instruments, 96 technicians have completed their training to date. Five new training courses are scheduled to be set up in the future. The trainees who acquired program production skills using digital instruments raised their levels of enthusiasm and creativity toward program production. From now on technicians completing training are expected to utilize their abilities such as the spirit of teamwork and creativity acquired at the TVTC in their work for TVRI to produce high quality programs.

Due to the small number of maintenance personnel at TVTC who are proficient with digital instruments, it is also desirable that transfer of digital technology from experts to TVTC's maintenance personnel will be promoted to ensure that the provided digital instruments will be utilized even more effectively.

Laos:

The Joint Japan-WHO Technical Cooperation for the Primary Health Care Project
(Project-type technical cooperation)

As part of the assistance for democratization promised by then-Minister for Foreign Affairs of Japan Taro Nakayama when he visited Laos in 1990, and in response to the World Health Organization's (WHO) sounding on collaborative cooperation in Laos around the same time, Japan implemented the Primary Health Care (PHC) Project based on the Expanded Programme on Immunization (EPI) as a joint project with the WHO.

This project, while taking a mutually cooperative approach with the WHO, was on the whole implemented efficiently through the unerring support of the people involved and the heightened awareness and enthusiasm of the counterparts. Through the establishment of a revolving fund system for medicine and a regular house call examination system, development of a basic framework for health and hygiene education for village residents, instruction for examination technicians at hospitals and examination rooms and other efforts, PHC services in Khammouan Province are improving and targets have been on the whole achieved. Moves can also be seen within the Laotian Ministry of Health to develop PHC nationwide based on the comprehensive PHC model created through this project.

From the outset of the project, technology exchange with neighboring Thailand, which has advanced PHC, health and medicine technologies, has progressed. It will be necessary for Japan, Thailand and Laos to make such cooperation official through a trilateral cooperation project that will continue to be implemented and expanded after the current project is completed.

The Project for Improvement of the Solid Waste Management System in Vientiane Urban Area
(Grant aid)

Waste was hardly ever collected from the Laotian capital of Vientiane. The uncollected waste was thrown away or left in drainage ditches and the Mekong River and gave rise to disease, pests and bad smells, which became a serious environmental and sanitation problem. In order to improve the city's waste disposal abilities and sanitation environment, Japan implemented grant aid.

With the appropriate management of the work process, the construction of a final waste disposal area and waste collection machinery shop, and installation of waste treatment machinery was completed in the scheduled time period. The Lao side has begun to use the machinery and facilities. As a result, the waste collection process and waste treatment in the final disposal area has improved greatly, and the living environment of the residents in the targeted area has improved.

As the implementation body for this project, the Vientiane Municipality government has put effort into obtaining a substantial budget allocation and personnel arrangement. The maintenance of the machinery has also been implemented properly. In addition, the Municipality has been striving to establish the machine parts management system and the fee collection system, as well as increasing the number of contractors. The results are sustainable because of the steady efforts made by the Lao side.

Malaysia:

The Malaysia External Trade Development Corporation
(Project-type technical cooperation)

In parallel with economic developments, 50% of Malaysia's total export revenue now comes from industrial products. To respond to this change in the export structure, in 1991, the Malaysia External Trade Development Corporation (MATRADE) was established to take responsibility of export promotion in Malaysia. Under these circumstances, Japan implemented project-type technical cooperation to strengthen the functions of MATRADE and to support proper business administration.

The construction of the facilities was a little late on Malaysia's part, but because of the dispatch of experienced and

enthusiastic experts, and the placement of excellent counterparts, technology transfer to MATRADE is almost complete. During the implementation of the project, Malaysia's export revenue has been increasing steadily. In addition, diversification of export items and the market can also be observed. Through the activities of this project, the expectations of private enterprises toward MATRADE have improved. From 1993 to 1996, MATRADE's corporate membership has more than doubled.

The transfer of technology to MATRADE is complete for the most part. Also, neither extension of the cooperation nor follow-up cooperation are necessary because MATRADE has already achieved a certain level of sustainability.

Philippines:

The Medium-Rise Housing Construction for Low Income Families
(Expert team dispatch program)

In the Philippines, the concentration of population in urban areas and soaring land prices are making the supply of housing for low-income residents a serious issue. From 1993 to 1998, the national government adopted a National Housing Plan that intended to supply 1.24 million housing units for low-income residents. With the goal of improving medium-rise apartment building construction design and building techniques at the National Housing Authority (NHA), Office of the President, which implemented the plan, Japan carried out a mini-project for technical cooperation. Through the project, which involved carrying out studies of existing medium-rise apartment buildings, the formulation of standard specifications and standard designs, the construction of test buildings and the announcement of the mid-term report through seminars, sufficient conditions of technology transfer to NHA employees have been attained. The fruits of this project have begun to be applied to the business independently carried on by the NHA, and the standard design and specifications developed through the project are being considered for full-fledged introduction.

In order to further promote medium-rise housing construction from now on, it is desirable that the NHA work to provide information on medium-rise housing for low-income households and cooperate closely with other housing provision organizations and that Japan dispatch experts in fields such as building construction management, structural design, maintenance management and cost planning.

The National Center for Transportation Studies
(Follow-up cooperation, Project-type technical cooperation)

In order to cope with the worsening transportation situation in the Philippines, Japan implemented project-type technical cooperation through the Transport Training Center (TTC) for seven years beginning in April 1977 at the University of the Philippines (UP). Later, the Government of the Philippines, based on the results of the project and using the TTC as the core, decided to establish the National Center for Transportation Studies (NCTS), which expanded training functions and combined research and science departments. In response, Japan implemented project-type technical cooperation for five years starting in April 1992 and carried out follow-up cooperation for two additional years.

Under this project, effective collaboration among agencies concerned in Japan and other forms of JICA aid was pursued through collaboration among Japanese government and academia (the Ministry of Construction, the Ministry of Education and university representatives) in a domestic assistance mechanism as well as a Third Country Training Program (TCTP) (FY1993-FY1997) implemented at the NCTS. The NCTS turned out an accumulated total of 30 masters of transportation engineering and transportation planning. In addition, because experts in transportation issues are being continuously cultivated through the holding of advanced training courses for central ministries and agencies, local governments and others as well as the holding of regional seminars, it is judged that the project has achieved its objectives. Moreover, the fruits of studies and research at the NCTS are being passed on to society through the announcement of study and research findings, the construction of information networks, policy proposals for improving transportation environment and analysis of traffic accidents, and other ways.

In 1993, the NCTS formally became part of the National Engineering Center (NEC) of the University of the Philippines, and it is expected to become a university department with newly established undergraduate and doctoral courses by 2002. Through the establishment of the headquarters of the newly inaugurated Transportation Science Society of the Philippines (TSSP) and the Eastern Asia Society for Transportation Studies (EASTS) within the NCTS, the Center's potential for playing a central role in ASEAN regarding the field of transportation is increasing, and it is considered to have high potential for independent development.

The Project on Enhancing Vocational Training
(Project-type technical cooperation)

In the early 1990s, the national economy of the Philippines had been sluggish. In particular, the increasing unemployment was a serious problem, and in 1991, the unemployment rate was 10.6%. If underemployed persons are included, this figure balloons to 30%. Creating employment opportunities was the most important issue on the agenda. Under these circumstances, Japan implemented project-type technical cooperation with the intended goal of developing and improving the vocational training implementation system at the Technical Education and Skills Development Authority (TESDA) to contribute to the improvement of the standards of technical abilities of the laborers.

The content of this cooperation project was the introduction and application of new software called Training Management Cycle (TMC) to improve vocational training abilities. For Japan's project-type technical cooperation, this new type of cooperation was different from traditional cooperation specified in hardware technology. For this reason, at the start of the cooperation, it was a continuous process of trial and error.

However, thanks to active discussions between the Japanese side and Philippine side in the project management committee and high levels of ambition and enthusiasm from counterparts, the technology was transferred as planned. The counterparts understood the basic concept of TMC, and implemented seminars under the guidance of experts for several hundred managers and instructors from local vocational training centers. At present, counterparts are able to independently develop curricula and teaching materials for the training of managers and instructors. It can be said that the project goal has been achieved.

From now on, it is desired that the functions of the TESDA are strengthened further and that strong leadership is demonstrated in order for the TMC method to spread and be applied throughout the Philippines.

The Science and Mathematics Education Manpower Development Project
(Project-type technical cooperation)

Human resources in the science and mathematics field that support advancements in industry are indispensable for sustainable economic growth. However, these human resources are lacking in the Philippines. The need to improve science and mathematics education at the primary and intermediate levels was considered as one of the country's top priority issues. In 1988, Japan cooperated in the effort by implementing grant aid to establish the Science and Mathematics Teacher Training Center (STTC) within the University of the Philippines. Together with this, from April 1994, Japan implemented project-type technical cooperation to enhance the functions of the STTC. This project assumes a comprehensive cooperation approach with a strategic combination of an expert dispatch program, country-focused group training, and the dispatch of Japan Overseas Cooperation Volunteers (JOCVs). Such programs were placed at the core of the Package Cooperation on Improvement of Education in Science and Mathematics at the Primary and Secondary Levels in the Philippines.

The STTC has been implementing training of instructors in the teaching of science and mathematics from all over the country. When the scores of tests conducted before and after the training programs were compared, it was found that the scores of the participants in all subjects had increased. The intended project goal of improving the STTC's abilities of training teachers in primary and intermediate levels of science and mathematics was achieved for the most part. Also, while spreading from the regional to the local level, the training program has contributed to the nationwide improvement of the capabilities of teachers in primary and intermediate levels of science and mathematics education. It is anticipated that the impact of this cooperation will continue to grow in the future.

The Philippines government is strongly aware that the improvement of science and mathematics education is an urgent issue, and the Philippines government continues trying to secure a budget for the implementation of training programs.

Singapore:

Intelligent Systems for Management Information Systems Managers
(Third country training program)

In the Asia-Pacific region, advanced information processing (intelligent) systems are being introduced, but it is still in its initial stages. In Singapore, since their introduction in 1983, intelligent systems have shown remarkable development, and the Japan-Singapore Artificial Intelligence Center (JSAIC), which was established through a project-type technical cooperation from Japan, has made a contribution to development in these fields. Given this background, and with the aim of transferring the results of this technical cooperation to neighboring countries, third country training program has been implemented at JSAIC.

Through enhanced facilities and a high level of management training capabilities at JSAIC, this training has been implemented efficiently, and over the course of four years a total of 80 information technology middle managers from 20 countries in the Asia-Pacific region have completed the training. After returning to their home countries, the trainees have capitalized on and made active use of the knowledge and techniques they have acquired in such areas as the improvement of the computer systems and the introduction of intelligent systems to the organization to which they belong. However, there are also trainees who cannot capitalize on the results of their training due to a lack of facilities in their own countries.

Countries participating in the training program are those in which intelligent systems are in an early stage of development. Due to the fact that there is high potential for development and the range of areas to which such technology could be applied is very wide, there is a great need for such training. Accordingly, it is hoped that this training will continue henceforth. However, it is necessary to devise training contents whereby the results of such training can be put to practical use in each country, through the implementation of training which is divided depending on the technical level of each country, or training which is essentially the same, but for which the technical level of contents is differentiated.

The Koban System of Japan and Its Adoption as the Neighbourhood Police Post System
(Third country training program)

From the early 1980s, Singapore has implemented the Japanese police box (Koban) system and has improved it to suit Singaporean society. The country has gone on to create a safe society that is lauded throughout the world. Of the Asia-Pacific countries, there are many which are currently either introducing the police box system or are deliberating on introducing it, and in Singapore, where there is much general know-how concerning the establishment and spread of the police box system, training has been implemented aimed at trainees from these countries.

Over the course of four years, 79 police executives from

23 countries in the Asia-Pacific region have participated in this training. The training had been held over a period of 10 to 13 days in Singapore, and since FY1996 it has added another week in Japan. The purpose of this enriched training is to understand the police box systems in both Japan and Singapore. The level of understanding of the trainees concerning the contents of the training was high, and trainees have highly evaluated the usefulness in their own countries of the knowledge they have acquired. After returning to their home countries, the trainees have capitalized on their training and made active use of the knowledge acquired to prepare plans for future regional police activities and the introduction of the police box system in their own countries. There are also cases where trainees have gone on to be put in charge of the introduction of the police box system and cases where the police box system has actually been introduced in their own countries.

Most of the organizations to which trainees belong hope to continue to dispatch personnel to this training project, and there is a great need for such training in neighbouring countries. In addition, since the training capabilities of Singapore are high, it is hoped that the training will be continued with an effort to improve its contents.

Thailand:

Sustainable Agricultural Production in the Tropics
(Third country training program)

Japan and Thailand signed the "Partnership Program for Assistance to Developing Countries" in August 1994. The program aimed for sharing the development experience of both countries with Least Developed Countries (LDCs) including those of Indochina. Against this backdrop, in 1995, the first training was implemented for participants from Cambodia, Laos and Viet Nam with the goal of contributing to the promotion of sustainable agriculture that is considerate of resources and the environment.

In this project, cooperation among related organizations was strong. Besides, thanks to an able team of instructors, suitable educational materials and the establishment of training subjects, the trainees fully understood and acquired techniques for sustainable agricultural production. The level of achievement of training goals was high. Although there were limitations on the budget and the amount of textbooks written in their native languages, trainees returned home and are now active in their home countries in related fields. They are contributing directly to the development of sustainable agriculture.

Thus, this training program was implemented efficiently, and its effects are being manifested. However, considering the vast need that the countries of Indochina still exhibit for this kind of training and Thailand's tight financial situation, this cooperation should be continued even after its five-year period under the original plan is completed.

Enhancing Women's Role in Rural Development
(Third country training program)

Women are playing a large role in agricultural production in Asian countries. In such countries, it is important to pay attention to the role of women while advancing rural development. This training project for women from Asian farming villages was implemented with the goal of improving rural life by developing their abilities and improving agricultural techniques.

While a total of five short-term experts from Japan were dispatched as training instructors, two female extension leaders from Kasetsart University were received for training in Japan. Through this scheme, the project worked to strengthen the training implementation mechanism on the Thai side. Over the four-year period from FY1995 to FY1998, knowledge and techniques regarding utilization of local resources, organization of rural women and methods of disseminating agricultural technology were transferred to 75 trainees.

The trainees evaluated this training project highly. Nevertheless, from now on, it will be necessary to monitor the state of activity of trainees after returning to their home countries. There is also a need to consider implementing JICA's in-country training in Thailand.

Development of Construction Technology for Low-Cost Housing
(Expert team dispatch program)

In Thailand, the construction boom brought about by rapid economic development has made a variety of problems apparent, including a sudden rise in the cost of building materials and manpower and a lack of labor. Thus the gap between supply and demand continued to expand. Under these circumstances, Japan implemented this project aimed at the development of pre-fab technology for the National Housing Authority (NHA) of Thailand, an organization supplying housing for those with low incomes in Thailand, in order to develop housing construction at low cost.

Under this project, through the appropriate dispatch of Japanese experts and placement with highly capable counterparts, technical transfer has been smoothly implemented. However, due to the economic crisis, which afflicted Thailand in the midst of this cooperation, it became necessary to reconsider the original plan and suspend a part of the project activities.

Due to the impact of the economic crisis in Thailand, the volume of housing construction has sharply decreased, and the demand for pre-fab housing construction has also been forced to be stagnant. However, it is hoped that from now on the NHA will overcome these difficulties with experiences accumulated through the years and a highly technological and capable staff to promote construction of model housing and eventually provide low-cost housing.

For the Japanese side, it will be necessary to consider

dispatching experts to provide support on the technical aspects and the training of NHA staff in Japan.

Soft Clay Foundation
(Research Cooperation)

Thailand, a country that depends on road transportation for 80% of its personnel transport and 90% of its goods transport, is facing serious problems concerning the subsidence of its roads and damage to paved surfaces. This damage, which is the result of the wide distribution of soft foundation with high water content, is found in the central region of Thailand, including Bangkok. However, since the by-pass construction project of its main roads and the first inter-city highway construction in Thailand were scheduled and measures to address soft foundation were of top priority, Japan implemented research cooperation to contribute to the development of construction techniques well suited to the unique soft foundation of Thailand.

The techniques developed through this project were applied to the actual expressway construction, which extends over 130 km. The results of the research in this project were reported and disseminated through seminars to researchers and technicians of universities, research institutions and the private sector in Thailand and its neighboring countries. In response to the results, a joint research program has also been launched among Thailand, Japan, France, and Indonesia.

In the future, it is necessary to analyze and evaluate the final impact of these techniques by monitoring the construction site applying the newly developed techniques. Since the technical capabilities of the Road Research Development Center, the Thai side's implementing organization, do not measure up to the level where they are able to evaluate results on their own, technical assistance from Japan is believed to be necessary.

The Project to Enhance the Capacity of the Faculty of Engineering at Thammasat University
(Project-type technical cooperation)

From the late 1980s the Thai economy experienced rapid growth, but this swift growth in the industrial sector brought about a chronic shortage of engineers and technical experts, thus raising concerns that this dearth would create an obstacle to the further growth of the Thai economy. In order to tackle this situation, in its Seventh National Economic and Social Development Plan (1992-1996) the Government of Thailand adopted the development of human resources in science and technology as a key issue, and progressed with its policy of expanding education in engineering. In line with this plan, Japan implemented project-type technical cooperation, aiming to cultivate instructors for the newly established Faculty of Engineering at Thammasat University.

The result of this is that the counterparts (instructors) have acquired satisfactory educational capabilities at an undergraduate level and the Faculty of Engineering of Thammasat University continues to produce a stream of superlative graduates out into the Thai industrial world as engineers. During the implementation of the project, the degree of difficulty for entry into the Faculty of Engineering of Thammasat University rose as indicated by entrance exam scores, and it is believed that this was caused by the rising popularity of the university among students. In addition, educational exchanges between Thammasat University and universities in Japan as well as cooperation between industry and the academia were promoted.

However, concerning the level of research ability required to take on teaching duties at the graduate level, it is necessary to further improve the capabilities of the instructors, especially those in Chemical Engineering Studies and Machine Engineering Studies whose dispositions were delayed. Therefore, it is necessary to implement a two-year follow-up aimed at the above-mentioned faculties.

The Project for Strengthening of Food Sanitation Activities
(Project-type technical cooperation)

In response to the increase in demand and advancements in manufacturing process technology, Thailand has been expanding its food industry rapidly. However, the small and medium-sized manufacturers did not always have sufficient knowledge about how to ensure safety and appropriate quality control during the manufacturing process and lacked sufficient awareness of food safety for the consumers. For this reason, Japan implemented project-type technical cooperation to plan for sustaining and improving Thai people's health by ensuring food safety and quality control maintenance.

The results of the project show that the proportion of drinking water and milk, the food products targeted for this project, that did not meet safety standards decreased greatly. For example, the proportion of ice that did not meet safety standards fell from 76.9 % in 1994 to 9.1% in 1996. Similarly, the proportion of bottled drinking water dropped from 30.9% in 1993 to 12% in 1997 and milk decreased to 4.7% in 1996 from 7.1% in 1993. The strengthening of testing technology was deemed absolutely necessary for the improvement of hygiene control and was adopted by the food manufacturers. Consumers purchased the products under safer conditions by checking the labels and registered marks on the products.

The Thai side is expressing the desire to spread the project's success to neighboring countries through technology transfer. In order to raise the functions of the Thai side to a level at which it will be possible to transfer the technology, the cooperation was extended for another year.

The National Institute of Animal Health Project Phase II
(Project-type technical cooperation)

In Thailand the decline in productivity due to domestic animal diseases was a major factor hindering the promotion of livestock breeding. Japan responded to this situation by building the National Institute of Animal Health (NIAH) with grant aid, and supported the strengthening of its functions through project-

type technical cooperation. Based on the outputs of the cooperation, Japan implemented Phase II with the goal of improving the diagnostic technology of Regional Veterinary Research and Diagnosis Centers (RVRDCs) through the standardization of diagnostic methods and promoting systematic and effective epidemic prevention at the national level.

Under this project, standard diagnosis manuals were created, standardization of diagnosis methods at the national level was achieved at the NIAH, and diagnosis technology was established. Transfer of this technology to the RVRDCs was completed, and project objectives were fully achieved. The standardized diagnosis technology is also being reflected on farms thanks to the training of technicians of medium standing and extension activities.

While financial uncertainty lingers at the NIAH and the RVRDCs, there is high sustainability in terms of institutional aspects. From now on, it is expected that contributions can be made toward improving the diagnosis technology of neighboring countries through third country training programs using NIAH facilities and other efforts.

The Research Project on the Quality Development of Fishery Products
(Project-type technical cooperation)

Processed marine products are important exports for Thailand. Improvement of quality was an issue in promoting their development as exports. At the same time, although processed marine products are also an important source of food for the people of Thailand, leftover harmful substances such as additives and chemicals posed a health problem for Thai consumers. For this reason, Japan implemented project-type technical cooperation in an effort to improve quality management techniques at each stage of fishery processing.

Through this project, fishery product analysis technology and quality management systems were transferred to the Thai side, and through the publication of technical information on quality management and the implementation of factory inspections, the number of fishery product processing plants approved as fulfilling Hazard Analysis Critical Control Point (HACCP) standards increased. In addition, the Fish Inspection and Quality Control Division (FIQD), which received the transferred technology, is currently recognized as Thailand's most reliable fishery product inspection organization by many countries that import processed marine products manufactured in Thailand.

Due to the high retention rate of counterparts who have received technology transfer and the positive outlook for the maintenance of the current level of budget allocation, sustainability is anticipated. The expected targets were on the whole satisfactorily achieved, and it is thought that extension of cooperation and follow-up cooperation will not be necessary.

The Productivity Development Project
(Project-type technical cooperation)

In 1962, the Thai Government established the Thailand Management Development and Productivity Center (TMDPC), and since then has been promoting productivity enhancement and management development. However, in recent years, the TMDPC's facilities and human resources became insufficient because of increasingly severe competition among neighboring countries and diversification in industry. To respond appropriately to this situation, Japan implemented project-type technical cooperation with the intended goal of strengthening the functions of TMDPC's facilities and spreading the productivity movement nationwide.

During this project, after the start of the cooperation, TMDPC was reorganized into the Foundation of Thailand Productivity Institute (FTPI) and most of the counterparts were changed. However, the dispatch of experienced and enthusiastic experts and the high-level capabilities of counterparts speeded up the technology transfer process. At FTPI, a total of 46 staff members were trained and went on to steadily achieve good results as instructors in the productivity movement. In addition, as a result of its achievements, since 1999, the FTPI has been participating in the policy drafting for productivity in the National Economic and Social Development Board.

The originally intended project goals have been achieved. However, the economic disaster in 1997 has caused Thailand to pay more serious attention to improving productivity. In order to augment leadership of the FTPI, it is desirable to implement follow-up cooperation to further cultivate human resources and strengthen the organization of the FTPI.

Viet Nam:

The Cho Ray Hospital Project
(Project-type technical cooperation)

In the health and sanitation climate of Viet Nam, medical services were lacking both quantitatively (medications and medical care equipment) and qualitatively (experienced doctors and nurses). With this background, Japan has implemented project-type technical cooperation aimed at strengthening the function of medical care and medical training, focusing on a core hospital in southern Vietnam, the Cho Ray Hospital, which has received technical cooperation from Japan before.

Referrals to this hospital from southern Viet Nam increased from 7,155 cases in FY1994 to 9,482 cases in FY1998 (in FY1997 the number of referrals was 14,445), and the number of cases referred to medical specialists in southern regions rose from one in FY1994 to 436 in FY1998. In addition, the number of patients admitted to the hospital from southern Viet Nam reached 28,154 in FY1998. The same hospital has also provided training each year from FY1994-1997 to approximately 150-170 persons engaged in medical-related work in the southern regions, and in FY1998 this figure reached 333.

In this way, the goals of this project have on the whole been achieved. However, to support the educational and training

functions at the Cho Ray Hospital and to utilize the results of this project for strengthening the functions of hospitals in the southern region, JICA's in-country training program at this hospital started in FY1999.

The Project for the Improvement of the Facilities of Primary Schools (Phase I and II)
(Grant aid)

Under the slogan, "Education for All," the Government of Vietnam has adopted the improvement and enrichment of primary education as a top-priority agenda and is aiming for complete implementation of primary education by 2000. However, there has been a distinct dearth of primary education facilities owing to the dilapidation of school buildings as well as the damage caused by typhoons. In view of such circumstances, Japan extended grant aid to build 30 primary schools in the Red River Delta region and 40 primary schools in the North central coastal region as well as provide educational materials.

The implementation of this project has made far-reaching improvements to the primary education environment of six provinces in the Red River Delta and North central coastal regions. Although there were some schools which, prior to the project's implementation, conducted lessons in three shifts because of a lack of classrooms, nowadays, this problem has been completely resolved and some schools are even switching to a full-time schooling system. Furthermore, since the school buildings constructed under this project were designed to hold up well against typhoons and floods, residents are also able to use them as shelters in times of natural disaster.

The scale of the facilities was determined, with the intention of the Vietnamese Government, based on the number of children at the time when the basic design survey was carried out. However, Vietnam is showing signs of a declining child population brought about by the permeation into society of its declining birth rate policy, some primary schools have not attained the number of pupils originally estimated. Therefore, when decisions are being made on the scale of schools for the third and fourth projects planned for the future, careful consideration should be taken such as calculating the number of school entrants from the population census and the birth rate.

The Project for the Improvement of the Facilities of Primary Schools (Phase III)
(Grant aid)

Emphasizing the development of human resources driven by the transition to a market economy, Vietnam has highlighted "Education for All" as a national objective. However, the lack of primary education facilities and the degradation of existing facilities have compelled Vietnam to undertake two-shift and three-shift lessons, which have in turn created an impediment to improving enrollment and graduation rates. As a result, Japan has provided grant aid to improve 45 primary schools in three provinces in the central coastal region (Quang Binh, Quang Tri, Thua Thien Hue).

This project was completed on schedule, and the facilities and education materials provided were fully utilized as soon as they were handed over to the Viet Nam side. In some districts, three-shift lessons have been abolished, and the educational environment dramatically enhanced. The establishment of elementary educational facilities has led to a heightened awareness and desire for education among children, teachers, parents and local communities, as well as contributing to the steady progress of human resources development for the purpose of nation-building.

At the same time, one issue that remains is guaranteeing the provision of repair costs and other expenses for the purpose of maintaining and further enhancing the education environment.

(2) Asia (East and Southwest Asia)

Bangladesh:

The Project for Balancing, Modernization, Rehabilitation and Expansion of the Chandnighat Water Treatment Plant
(Grant aid)

The majority of Bangladeshi people use unsanitary water for everyday life, such as shallow wells, rivers and ponds. Accordingly, 80% of all diseases in Bangladesh can be attributed to the water. Especially in the capital Dhaka, development of a source of water supply has lagged behind the rapid growth of its population. As a result, Japan implemented grant aid for the purpose of providing a stable drinking water supply for residents of the capital Dhaka, in which a large population is concentrated, by renovating and expanding the existing Chandnighat water treatment plant, which is the capital's only clean water facility for surface water.

Repair work on the facility was completed in line with the original project schedule, before being handed over to the Bangladeshi side. Despite the fact that work was completed with no major problems, fetid and colored water has been supplied due to sudden worsening of the water quality at its water source, which was unable to be expected initially. Distribution periods have been unstable, because of frequent blackouts caused by rapid increase in electric power consumption.

Since water-supply projects underpin the foundations of the lives of citizens, the operation of the facility will continue in the future. However, there is a need for the Bangladesh side to investigate future measures for the stable supply of clean water.

Bhutan:

The Paro Valley Agricultural Development Project
(Grant aid)

In Bhutan, 41.4% of gross domestic production (GDP) is accounted for by agriculture and stockbreeding industries. Furthermore, 82.2% of the working population is involved in these industries. The agriculture and stockbreeding industries are by far the most important industries in the country. Since

the majority of the land is composed of mountainous regions and there are hardly any flatlands, the productivity of these industries is remarkably low. For this reason, Japan implemented grant aid with the intended goal of establishing a base for agriculture in the Paro Valley, the Government of Bhutan's most important development area.

This project was planned according to the general policy of maximizing the use of already existing agricultural bases and making only minor changes to the production and social forms that are already in application. As a result, the scale and contents of the project were well-suited for the circumstances. The 29 km of irrigation canals that were repaired supplied 418 hectares of farmland with a steady flow of water. Rice, vegetables and fruits had better harvests, and farmers have increased their production of winter vegetables and fruits, which would provide them with more cash income. In addition, the two bridges that were constructed are an important means of transportation for the local people. The farm roads that were built along the riverbanks are enlivening the economic activities in the Paro Valley.

In this manner, the project has contributed extensively to the agricultural development of the Paro Valley. From now on, it is necessary to consider implementing technical cooperation for the maintenance of the facilities and irrigation water management.

China:

Prevention of Air Pollution
(In-country training program)

In China, air pollution is spreading along with rapid economic growth. Through development studies, Japan has carried out investigations of the current state of air pollution as well as technology transfer regarding proposals for preventive measures.

In addition, this training program was carried out in response to the insufficient cultivation in China of managers and engineers at the regional level involved in the prevention of air pollution.

This training program was implemented efficiently against a backdrop of increasing interest in environmental issues in China. Trainees understood the contents of their training well, and many of them have been proposing and implementing actual air pollution prevention measures after completing training. In addition, because people in all regions participated in the training, mutual understanding between the central and local authorities regarding air pollution prevention further improved. That the holding of training was widely reported domestically also led to increased awareness among the general public regarding air pollution.

China is also carrying out training in this field independently, and it is hoped that future cases of this type of cooperation will be carried out in the form of more advanced and detailed training. Moreover, it is important for cooperation for environmental issues in China to take account of collaboration with on-going programs, such as the Japan-China Environmental Model Cities Plan and the Environmental Information Network Plan, with the Japan-China Friendship Environmental Protection Center at their core.

The Research Center of Mineral Resources Exploration Project
(Project-type technical cooperation)

Following the economic growth in China, there was a massive consumption of mineral resources, which produced a remarkable shortage in the supply of domestic mineral resources. China, with its vast size, is believed to have a large potential amount of mineral resources buried underground. If exploration-related technologies were advanced by comprehensive use of science and technology, they would contribute to the discovery of all kinds of mineral resources. Against this background, through the Chinese Academy of Sciences, where the Research Center of Mineral Resources Exploration was newly established, Japan implemented project-type technical cooperation for the transfer of exploration techniques for mineral resources.

The system of the newly formed Research Center of Mineral Resources Exploration was not well-coordinated as an organization, so the counterparts were not fully stationed in the first two years. Furthermore, the project did not make much progress during that period because of budgetary problems, delays in reconstruction and preparation of the laboratory, difficulty in acquiring geographical and geological information and the illness of the person responsible for the project, among other things. From the third year of this project, things started to go on track. The development of a research system and improvement of analysis and measurement progressed at the Research Center for Mineral Resources Exploration. In addition, the Chinese side understood the importance of basic science and communication between technicians and scientists.

However, influenced by stagnant activity at the beginning of the project, the technology transfer on investigation of the predicted amount of underground mineral reserves and potential grounds for exploration was insufficient. Because it is necessary for the Center to be able to explore mineral resources on its own, the period of cooperation was extended for another two years.

The Tianjin Drug Quality Control Project
(Project-type technical cooperation)

Tianjin City is one of the major regions for production of medicines in China, and every year a significant volume of herbal medicine and synthetic medical products from Tianjin are sold both domestically and abroad. The Government of China has made efforts to strengthen the quality control of medical products through its seventh and eighth five-year plans. The Government is, however, yet to fully meet international standards. Because of this, Japan implemented project-type technical cooperation to ensure medicine safety and effectiveness through improvements in quality control and testing technology.

Through this project and with the appropriate guidance

from experts, testing at the Tianjin Municipal Institute for Drug Control has drastically improved. The technology for antibiotic drug testing, microbiological testing, methods of biochemical testing, quality exams for herbal medicines, bioassay, and other testing was sufficiently transferred, and the environment for the testing procedures is now much more enriched as a result of the provision of equipment. The number of commissioned tests from drug manufacturers in China increased considerably from 197 in 1994 to 2,130 in 1997. As a result, the Institute has become China's highest ranking drug testing center. In addition, as the efficiency and reliability of tests were significantly enhanced, the Institute was appointed for setting standards of 15 drugs, concerning the production and examination methods, in the 2000 edition of the Chinese Medical Standards.

The Tianjin Municipal Institute for Drug Control has improved its survey technology and the examination and research environment, and with sustainability anticipated, it has been decided that follow-up is not required.

The Dairy Product Manufacturing Technology Development Project, Inner Mongolia
(Project-type technical cooperation)

In China, the correction of disparities between industrializing coastal provinces and inland regions is a priority item in its State Development Planning. The Autonomous Region of Inner Mongolia has been actively processing dairy products since olden times. However, its hygiene management and production technologies were underdeveloped, and its dairy products on the market were low in quality. In order to carry out modern dairy product research and development based on traditional dairy products in the Autonomous Region and to promote the dairy product industry through dissemination of this research and development, Japan implemented project-type technical cooperation at the Inner Mongolia Institute of Agriculture and Animal Husbandry.

Using well maintained facilities and equipment, technologies for collecting, separating, identifying and storing useful microorganisms for traditional dairy products, as well as all technologies for manufacture, hygiene management and quality control of basic dairy products were transferred to the counterparts. The capacity for instruction regarding the training of local diary industry technicians is also rising at the Inner Mongolia Institute of Agriculture and Animal Husbandry. People involved in the dairy industry who underwent training at the institute mastered techniques for manufacturing a new product (a yogurt drink) and have brought their test samples to urban markets on an experimental basis. Thus, a new center for technology development and training regarding dairy products has taken shape in northern China, and a manufacturing shift from the old traditional home production and consumption to production for product sales has come to be promoted.

From now on, it will be necessary for the Inner Mongolia Institute of Agriculture and Animal Husbandry to strive for financial independence through producing high-income products such as creams and butter for hotels and accepting contracts for the development of and research on dairy products.

Forest Protection Research Project in Ningxia Hui Autonomous Region
(Project-type technical cooperation)

Since 1987, reforestation has been advanced in the Ningxia Hui Autonomous Region of China, including target areas of the Project for the construction of Three-North Shelter Belt System. However, in recent years, certain insects that are harmful to the forest, predominantly the long-horned beetle, have been recognized, and the blighted trees amount to 40,000 cubic meters annually. As a result of this, the Government of China established the Forest Protection Research Center in the Autonomous Region and requested project-type technical cooperation from Japan for the research and development of technology to check the damage caused by insects to forests.

The Center was newly established for this project, and despite some shortcomings in its management operation, it grasped the actual state of the damage being caused to the forests by the insects, and its research on the ecology in which these insects breed and technology to keep them under control has been progressing at the Center. Improvements have also been seen in the counterparts' research capabilities, and 27 of their research papers have been published in a collection of the Center's research treatises. The importance of forest protection has been widely promoted to the general public, and the fruits of the Center's activities are now held in high regard even by the Central Government Forestry Division.

It was decided that the Center would remain as a permanent organization even after the completion of the project. Since fine-tuning to the systemization of pest control technology and the development of a research management system are essential for the further sustainability of the Center, it has been decided that Japan will provide follow-up cooperation for two years.

The China Energy Conservation Training Center in Dalian
(Follow-up cooperation, Project-type technical cooperation)

In 1979, the Government of China formulated a plan to contain energy consumption in 2000 to twice that of 1980, and established the Energy Conservation Training Center in Dalian. In 1992, Japan initiated project-type technical cooperation for the development of human resources in the energy conservation field at the Center. After the completion of the five-year cooperation period, Japan continued to implement follow-up cooperation.

As a result of the follow-up cooperation, the accumulated number of participants enrolled in the Center's training program more than doubled from 1,068 participants by March 1997 to 2,336 participants by November 1998. In addition, the results of energy diagnosis at the factories increased greatly from five companies in March 1997 to 25 companies in November 1998. In this way, the functions of the center were strengthened. The businesses that underwent the Center's diagnosis were able to achieve a reduction in their expenses through energy conservation. Further, the practical ability of counterparts also

improved remarkably, and they are now able to respond to the various needs of businesses by offering diagnoses, improvement proposals and training.

The Computer Software Technology Training Center
(Project-type technical cooperation)

Under the Eight Five Year Plan, China deemed the development of its computer software technology to be an essential policy. Therefore, given the importance of cultivating software technicians, who are scarce, Japan implemented project-type technical cooperation at the Computer Software Technology Training Center in order to enhance software development capacities and promote industrialization.

Technology was transferred efficiently, with long- and short-term experts dispatched and equipment supplied with appropriate quantity and quality in a timely manner. Furthermore, as a result of the efficient use and deployment of the external personnel as counterparts, there were a wide variety of lecturers at the Center and the creation of human resource networks with external organizations. Not only does the Center provide high-quality training for systems development technicians and management technicians, but is also implementing a considerable amount of basic training which originally was not scheduled. Moreover, the economic impact can be evidenced: for example, some of the corporations that dispatched trainees to the Center have begun to produce goods for export abroad applying the technology acquired through their training.

In this way, the goals of the project were accomplished. Since the Center has developed the infrastructure for implementing training programs that meet the demands of the market, neither an extension of the cooperation period nor a follow-up is required.

Mongolia:

The Institute of Geology and Mineral Resources
(Project-type technical cooperation)

Mongolia is famous worldwide for its mineral resources, and the mineral industry is expected to be the driving force behind the country's economic growth. Until 1990, the Mongolian government had been receiving aid from the former Soviet Union and countries in Eastern Europe for research on mineral and petroleum resources. However, after the breakup of the former Soviet Union, the aid received from the former eastern block countries has greatly decreased. Under these conditions, Japan has implemented project-type technical cooperation in order to improve geological surveys and natural resource detection techniques related to underground natural resources at the Institute of Geology and Mineral Resources.

Inputs made by the Japanese side and Mongolian side in the project were ideal in terms of quality, quantity and timing, and technology transfers went smoothly on the whole. The Mongolian counterpart's technical skills remarkably increased, and the capabilities of the Institute of Geology and Mineral Resources on mineral resources detection and analysis had improved. As a result of this, the Institute of Geology and Mineral Resources received analysis requests from other research institutes, universities and companies in the mineral industry. The research results from this project have also been published in academic journals and have been officially released through international seminars. In the future, this project's research results will spread to Mongolia's mineral industry, and the advance of the country's mineral resource development can be expected.

In this way, this project is expected to achieve its goals by the end of the period of cooperation. Since it is thought that the Institute of Geology and Mineral Resources' sustainability would be high even after the end of this cooperation, it has been determined that an extension of the period of cooperation and follow-up cooperation will not be necessary.

Nepal:

The Water Induced Disaster Prevention Technical Center Project
(Project-type technical cooperation)

In Nepal, because of steep topography, heavy rains during the rainy season and other natural phenomena, each year there are many cases of landslides, earth and rock avalanches, flooding and other disasters that cause great damage to human lives and property. To respond to this situation, Japan built the Disaster Prevention Technical Center (DPTC) through grant aid and implemented project-type technical cooperation with the goal of strengthening the DPTC's functions for responding to disasters.

The project met all of its goals regarding technology development, training, databases and public awareness activities, and established the status of the DPTC as a guiding organization in the fields of flood damage and landslide damage prevention. The project also has contributed to the strengthening of mutual cooperation among Nepalese organizations involved in the prevention of flood damage and landslide damage. Moreover, the training and other activities conducted at model sites contributed to heightening prevention awareness among technical staff of related ministries and agencies, local residents and others.

From now on, in order to promote the propagation of the technology developed through the project, it will be necessary to prepare technical guidelines by the end of the cooperation period and promote further cost reduction of disaster prevention technologies.

The Primary Health Care Project
(Project-type technical cooperation)

Nepal formulated a new health policy in 1991 with the goal of reducing the infant mortality rate and the maternal mortality rate as well as improving the people's health. Based

on this policy, Japan implemented this project with the goal of expanding rural community health and medical services, and also implemented one year of follow-up cooperation after completion of the original cooperation period.

In this project, nearly all the experts were dispatched from the Saitama Prefectural Government, and continuity and uniformity of the project were maintained. Although there are some communities where primary health care (PHC) system has not yet been established, the target districts of the project Bhaktapur and Nuwakot-are becoming models of PHC in Nepal. Moreover, in each district, the development of PHC infrastructure is advancing, for example, as shown by the people's awareness toward working to address PHC being raised in entire communities.

As evidenced by the case of Nuwakot, sustaining PHC activities in hill communities with undeveloped infrastructure and a lack of human and financial resources is not an easy task. However, the awareness of controlling one's own health by oneself is being cultivated among the people in the target areas through this cooperation project, and therefore further development of PHC activities is expected in the future.

The National Tuberculosis Control Project Phase II
(Project-type technical cooperation)

For His Majesty's Government of Nepal's National Tuberculosis Program (NTP), Japan built the National Tuberculosis Center (NTC) with grant aid, and in Phase I of this project carried out cooperation toward the development of measures against tuberculosis centering around the NTC. Based on these results, Japan implemented Phase II of the project with the goal of strengthening the NTP and expanding the Directly Observed Treatment, Short-course (DOTS) implementation zone.

Through preparation and revision of an outline of tuberculosis countermeasures, various guidelines, reporting methods and training manuals, etc., the project contributed to the strengthening of the organizations and systems for implementing the NTP. Introduction of DOTS in the model regions also achieved considerable results in terms of strengthening the NTP and improving tuberculosis treatment, and the effectiveness was high.

However, in order for this project to hold sustainability and to distribute its results throughout Nepal, further support for the NTP, including strengthening at the regional level is indispensable and follow-up cooperation has been implemented.

The Community Development and Forest/ Watershed Conservation Project
(Project-type technical cooperation)

In the remote hilly regions of Nepal, forest quality has deteriorated due to excessive use of forest resources, and the environment continues to worsen. Because independent efforts by residents and the improvement of their living conditions are essential to promoting environmental conservation in remote hilly areas, Japan implemented project-type technical cooperation aimed at improving the natural environment through the promotion of villages and upgrading land productivity in the remote hilly districts of Kaski and Parbat, with particular consideration for the poor and women.

Effective activities were carried out by the project through cooperation between JOCVs and local NGOs. The residents of the areas covered by the project came to a full understanding of suitable and sustainable development and conservation of village resources. They also improved their capacity to put this understanding into practice and are steadily making their way toward the improvement of the natural environment as well as the upgrading of land productivity.

The Nepal side is starting to apply the results of this project to other regions. Although the infrastructure needed to sustain the activities of this project is being developed, the continuous securing of funds for activities and further support from the Government of Nepal will be necessary.

Pakistan:

Civil Air Transport Project
(Third country training program)

When airline accidents occur there is a high potential for tragic disaster. Continuous training of personnel is indispensable to securing airline safety. Because such training requires advanced high-tech equipment and the skills to operate it, there are many developing countries that are unable to implement training on their own. For this reason, a third country training program for Asian and African airline personnel that could be participated in free of charge was implemented at the Pakistan International Airlines (PIA) training center, which had trained its own employees as well as those of other airlines since its establishment. Training started in FY1987 with an initial period of five years. Due to high demand, the cooperation period has been extended twice since then. Currently, training is being carried out on a five-year schedule that commenced in FY1995.

Over the four years from FY1995 to FY1998, a total of 78 trainees from 21 African and Asian countries have completed training under this program, acquiring advanced expertise and skills regarding air transportation. It can be said that the goals of the training were achieved. According to a questionnaire of trainees, an average of about 70% of trainees over the four-year period responded that the contents of the training matched their expectations and nearly all responded that the contents were practical. In addition, due to the importance and special nature of expertise and skill in this field, there is a high probability of trainees staying in the industry, and it is anticipated that the skills acquired through this training will be used effectively toward instruction of junior personnel and improvement of airline safety.

Although the need for this kind of training remains high, PIA's training center also implements separate training programs for Asian and African airline personnel on a commercial basis, and each country's airline companies are carrying out and participating in the necessary training programs through their

own efforts. Therefore, training should be entrusted to the PIA training center's regular training course (commercial basis) and it is appropriate that the JICA training program end in FY1999 as originally scheduled.

Operation and Maintenance of Construction Machinery
(Third country training program)

Through Japanese grant aid and project-type technical cooperation since 1986, Pakistan's Construction Machinery Training Institute (CMTI) has accumulated skills as the country's training institution for construction machine operation and maintenance. In general, infrastructure development is a pressing task for developing countries, and the cultivation of human resources well informed about construction machines and their maintenance is becoming indispensable. To spread this accumulated expertise to the countries of Asia and Africa through cooperation by Japan, a five-year third country training program scheduled from FY1995 was implemented at the CMTI.

Over the four courses through to FY1998, a total of 73 trainees from 18 Asian and African countries have completed training, acquiring an advanced and wide range of expertise and skills from the basic to the applied. It can be said that the goals of the training were achieved, as according to a questionnaire of trainees, an average of over 95% of trainees over the four-year period responded that the contents of the training matched their expectations and the contents were practical. In addition, after returning home, many of the trainees have assumed manager positions concerned with construction of infrastructure, housing and irrigation, and are utilizing the expertise and skills acquired through this training within their organizations and at the workplace in the instruction of technicians and machine operators.

The original five-year training period of this program was scheduled to end in FY 1999. However, because the need for this kind of training is high, it is hoped that countries eligible for training will be reselected, for example, by including countries that have not yet had applicants for training, and training will be continued.

Sri Lanka:

The National Plant Quarantine Services Project
(Project-type technical cooperation)

The achievement of food self-sufficiency and the acquisition of foreign currency via the export of farm products is the overriding national policy goal of Sri Lanka. However, due to inadequacies in the quarantine system, the threat of the infiltration of disease and pests has increased, while the export of farm products is subject to various restrictions imposed by importing countries. Given such circumstances, Japan set up the National Plant Quarantine Services (NPQS) facility with grant aid and continually provided project-type technical cooperation in order to equip the NPQS with an efficient and effective plant quarantine system.

Under the project, the facilities as well as the machinery and materials provided through grant aid have been put to effective use, and the counterparts have acquired basic skills in the examination and control of crop disease and pests. The project's activities also enabled NPQS to deepen its ties with other quarantine stations, and Sri Lanka's plant quarantine business continues to improve. Moreover, the counterparts gained a deeper understanding of the importance of plant quarantine through this project, and have been promoting review of the entire plant quarantine system, including the maintenance of its legal system and its organizational structure.

For future sustainability, it is expected that the Sri Lankan side will continue efforts toward the sharing of knowledge and technology among relevant institutions, improvement in access to latest technical information, the establishment of a system for maintaining and repairing machinery and materials, and securing a budget.

(3) Middle East

Egypt:

International Training Program for African Nurse Leaders
(Third country training program)

In the African region, the extreme lack of nurses meant that the cultivation of instructors in the field of public health and nursing was an especially urgent issue. To cooperate in this field, Japan had been implementing grant aid cooperation and project-type technical cooperation to Cairo University on a continuous basis. Consequently, to make use of the results of this cooperation in the cultivation of nurses in African countries, Japan implemented a third country training program starting from FY1985. The training was then extended twice for five year periods in FY1990 and FY1995.

In the four-year period from FY1995 to FY1998, a total of 115 people received training, 75 from 18 African countries and 40 from Egypt. The trainees learned the basics of nursing education and studied practical techniques. The training program offered a balance among lectures, practical training and workshops to enable trainees to properly acquire knowledge and practical skills. In addition, in the six-week training period, the training program was implemented appropriately and effectively by a team of instructors that included staff from the Ministry of Health and Population.

The objectives of this program have been fully achieved. However, there remains a great need for the cultivation of nurses in African countries. This training program should be continued owing to the fact that the Egyptian Ministry of Health and Population has sufficient management capacity to prepare, implement and report on the training programs.

Welding Technology
(Third country training program)

Since the improvement of welding technology was

becoming an issue in the Arab Republic of Egypt, Japan, since 1985, has dispatched experts and provided related machinery and materials to the Central Metallurgical Research and Development Institute (CMRDI). JICA cooperated in the establishment and management of the Welding Research Center (WRC; today's Welding Research Department) of the CMRDI. Subsequently, for five years since FY1989, Japan implemented a third country training program at the WRC focusing on African nations, for whom fostering welding technicians was becoming an urgent issue, as part of its Japan-Egypt triangle cooperation to African countries, and in 1994, extended the training program for another five years.

A total of 91 trainees from 13 countries participated in the five courses that have been held since FY1994. The training institute's operational capacity is high, and the training was efficiently conducted, with existing teaching materials and training equipment being put to use. The trainees sufficiently acquired various kinds of welding technology that, when they returned to their home nations, this technology was applied to the workplace and transferred again.

The participating nations in this training program hardly have any opportunity to involve themselves in training in the field of welding in their home countries, and since it is not easy for them to maintain and improve upon the technology gained through the program upon their return home, it is vital, in the future, that Japan considers holding follow-up seminars that focus on trainees who have returned home.

The Project for the High Institute of Nursing, Cairo University
(Project-type technical cooperation)

The sufficient supply of qualified nurses is a national goal in terms of health administration in the Arab Republic of Egypt. As a result, this project was implemented, with its base at the High Institute of Nursing of Cairo University, with the objective of working toward cultivating instructors for nursing education and improving the quality of nursing education.

This project aimed to improve the disposition of nursing instructors toward their work by frequently holding workshops as well as promoted their eagerness to produce teaching materials and students' self-study through the provision of equipment and materials for the production of teaching aids and nursing books. The nursing books provided under the project are not only used by students of Cairo University, but are widely used by people from outside the university as well. Furthermore, a perspective of nursing that puts great importance on basic human needs was established under this project, and one could say that the fact that "the strengthening of the nursing system" has been incorporated into Egypt's health policies is also worth mentioning.

Since counterparts' stability has increased, activities for the sustained strengthening of nursing education will probably be possible through the self-help efforts of the Egyptian side.

Jordan:

Systems Engineering
(Third country training program)

Japan implemented project-type technical cooperation "Computer Technology Development and Training Center" in Jordan from FY1990 to FY1994, with the intended goal of developing human resources in the information field. Since the facilities of the Center and the human resources were prepared well through the cooperation, Japan then implemented a third country training program from FY1993 to FY1997 at the same center to target various other Middle East countries' trainees. The implementation of the program was a response to the growing need for expert knowledge and technical skill in the systems engineering field.

Through the project-type technical cooperation, the technology was transferred successfully to the Jordanian side. In addition, the training program was implemented effectively, because of the high-quality training implementation system, abilities and enthusiasm of the Jordanian side. The trainees, upon returning to their home countries, were able to apply their newly-acquired knowledge and technical skills to their work. It can be said that the effects of the training program are very high.

There is a high demand for the training program from neighboring countries. The Center, excluding this training program, implements 17 training programs and 35 courses. (The Center is financially independent, and has relatively high stability of the staff.) In this manner, the Center's training implementation capabilities are high. Since the demand for the training program from neighboring countries is still high the cooperation period was extended for three years until FY2000.

Morocco:

The Fisheries Technical Training Project
(Project-type technical cooperation)

For seven years since 1987, Japan had implemented the Fisheries Training Project at the Institut de Technologie des Pêches Maritimes d'Agadir in order to train Moroccan officer-level fishermen and has significantly contributed to improving the system for training fishermen in Morocco. Subsequently, owing to the fact that expanding training for fishermen at the middle-high level and the retraining of instructors to train fishermen and of fishermen were becoming cause for serious concern, Japan implemented project-type technical cooperation aimed at improving the training syllabus and strengthening the training functions at the Centre de Qualification Professionnelle Maritimes (CQPMs), which is equivalent to Japan's fisheries high schools.

It is foreseen that preparation of the curriculum and training guidelines at the CQPMs will be completed within the period of cooperation, as Japanese inputs were by and large implemented at appropriate levels of quality and quantity and in a timely manner. The process of the preparation aimed to

elevate and standardize the educational content at CQPMs and enabled instructors specializing in the fishing industry to attain levels where they are able to independently conduct lectures and offer on shore and maritime practical training. Owing to the fact that this project brought about improvements in their educational capabilities, two CQPMs were promoted to the status of Institut de Technologie des Pêches Maritimes, and the progress in the quality of training and fishery activities is resulting in high recognition of CQPMs graduates in the private sector.

However, the implementation of follow-up cooperation for the next two years focusing on the fish processing sector, to which the transfer of technology is inadequate, is advisable owing to the fact that practical training is still in its initial stages because of Morocco's falling behind with the development of training facilities in this sector.

Syria:

Improvement in the Quality Inspection for Veterinary Drugs
(Expert team dispatch program)

The promotion of the livestock industry has become a large issue in Syria, as it aims to improve the rate of food self-sufficiency. However, there was a lack of technicians able to implement measures to combat disease, malnutrition and sanitation problems of domestic animals. Hence, Japan dispatched experts for the improvement of quality controls of medical products for animals.

The project has gained technological support from the Japanese National Veterinary Assay Laboratory (NVAL) and the Research Institute for Animal Science in Biochemistry and Toxicology (RIAS). The transfer of technology has proceeded smoothly thanks to eager participation of the counterparts in this project. They have reached a stage whereby putting to use the quality control machinery and materials donated by JICA, they are now able to perform quality controls on their own, thus realizing the goal of this project. The improvement in quality control technology in the Syrian animal medical quality control management department has produced an impact in the form of improvements in the quality of medical products in Syria as well as growth in the animal medical products industry.

As a result of this project, the level of technology of the Syrian side has reached a sufficient level so that they are able to conduct animal medical quality controls. It would be advisable for Japan to provide future support, such as accepting people for training, as necessity dictates due to technological innovations.

Turkey:

The Project for Promotion of Population Education Phase II
(Project-type technical cooperation)

The Government of Turkey has been implementing various family planning projects since the 1960s to help reduce the high population growth rate which stands at approximately 2.5% per year. In the five years from 1988, Japan provided cooperation in the production of audio visual teaching materials for family planning projects in the form of project-type technical cooperation entitled the Project for Promotion of Population Education. In light of the results of the project, Japan implemented Phase II of the project in order to establish the Information, Education, and Communication (IEC) activity model based on local needs.

The strengthening of the functions of communications centers, technology transfer for the production of high quality teaching materials, and cultivation of people who disseminate family planning took place as part of this project. Through these efforts, family planning and mother and child health education activities have been strengthened in two model areas, and it can be assessed that for the most part, the objectives of this project have been achieved. The Turkish population growth rate has been reduced from 2.5% in the late 1980s, when Phase I was initiated, to 1.4% in 1997. Japan's cooperation has in part contributed to that result. In addition, the technology for producing teaching materials that was transferred in this project has been highly appraised by the international community, and there have also been requests for coproducing the teaching materials. In the future, Japan hopes to contribute to disseminating family planning and reducing the high population growth rate by systematically coordinating with the various activities that are being developed in Turkey in this field. Japan also hopes to implement third country training programs in order to re-transfer the technology transferred through this project to neighboring countries.

(4) Africa

Djibouti:

The Project to Supply Potable Water in Rural Areas
(Grant aid)

Djibouti is composed mainly of deserts and mountainous regions, with a limited amount of water sources that can be tapped. As a result, water supply to local residents is in an inferior condition. The Government of Djibouti has placed the development of water resources and the provision of water for everyday use in rural villages as priority challenges, and Japan provided grant aid to Djibouti for the purpose of improving the water supply conditions in rural areas.

The construction of facilities was completed on schedule within the work period, all villages are provided with generators, and there has been steady progress in replacing water pumps. The gathering of local women at the water supply facilities to collect water has enabled greater communication among the residents, and some villages have experienced increasing populations as a result of the improvement of water supply conditions. At the same time, some water supply facilities are not being sufficiently utilized due to a lack of fuel and a lack of water volume as a result of the dry season.

A water utilities charge for the beneficiaries of the water

supply facilities is indispensable in order to maintain and manage the facilities appropriately in the future. It is also imperative to earnestly conduct enlightenment activities targeting local residents.

Ghana:

Laboratory Diagnosis of Yellow Fever and Other EPI Viral Diseases (Polio and Measles)
(Third country training program)

Japan began technical cooperation with the University of Ghana's Faculty of Medicine in 1968. Since then, through grant aid and project-type technical cooperation, the Noguchi Memorial Institute for Medical Research (NMIMR), affiliated with the University's Faculty of Medicine, was established, and Japan has supported the strengthening of their capabilities. With a background of such achievements, Japan and the World Health Organization (WHO) embarked on their first multi-bilateral cooperation project from FY1991 to FY1995. While great success was expected from the third country training program's implementation of Vaccine Potency Testing and Polio Diagnostic Procedures, the overwhelming influence that yellow fever has had in recent years in the sub-Saharan African region prompted Japan to decide to implement a new third country training program to make yellow fever disease a central issue in a three-year plan beginning in FY1996.

In the two years of FY1996 and FY1997, a total of 22 trainees from 11 African countries, including Ghana, completed the training. The fully equipped NMIMR facilities and an established training management system by the previous third country training program (FY1991-1995) allowed the training to be carried out in an efficient manner. From the results of surveys that were implemented during training, it was determined that the understanding and learning ratios of the program are high. However, some countries from which the training participants came lacked resources and materials, making it very difficult for them to thoroughly apply the skills they obtained through the training. The eradication of yellow fever, polio and measles in these countries still remains a problem.

The need for the training is high, and the training implementation abilities of the NMIMR are exceptional. However, because it will be financially difficult to maintain training with the Ghanaian side's independent budget, Japan should continue supporting implementation of the training course.

The Project for Rural Electrification for Asesewa and Yeji Area
(Grant aid)

The Government of Ghana has drawn up a state electrification plan aiming to provide electricity across the nation by 2020 as part of its state development policy and has just undertaken to provide electricity to 110 district capitals. As the second business center in the Eastern Region, Asesewa is one of Ghana's most preeminent and largest market places, but because it is some distance away from the regional capital, it had always been without electricity. Japan implemented grant aid for the electrification of the area in order to promote agricultural production and increase its distribution to neighboring areas.

This project was designed taking into consideration the basic nature of Ghana's existing technology and the ease of maintenance control, and has made immeasurable efforts to use Ghana's domestic construction contractors as well as procure resources locally. At present, of the 21 target villages, a mere 471 of the households in Asesewa village have started receiving electricity owing to the fact that only five months have passed since the completion of the power distribution station. However, the plan is that the remaining 20 villages will be supplied with electricity in due course. The supply of electricity has revitalized business activities at Asesewa village such as the influx of traders from outside the area. Furthermore, residents are able to enjoy an improved standard of living resulting from benefits such as increased safety brought about by the spread of night-lighting as well as improved access to information by listening to the radio for longer periods of time.

The plan in the future is to have the developed electricity power facility managed and run from the electricity payments made by its users and the Electricity Company of Ghana Ltd.'s (ECG) regional budget.

The Project for Construction of Small Scale Bridges
(Grant aid)

Local roads comprise 60% of Ghana's road network. Most of the bridges across these local roads are constructed with wood, and many have collapsed and been washed away. Even the bridges that still remain have low durability, thus placing the vehicles that pass over them at risk. Ghana is troubled with various problems pertaining to these bridges, other than those mentioned above. The poor quality of bridges hinders efficient transportation of Ghana's major agricultural products such as cacao and timber to the markets. Consequently, the rural economy was staganted. Under these circumstances, Japan implemented grant aid with the intended goal of activating the rural economies in Ghana through the improvement of local road networks, including the construction of seven small-scale bridges.

Of the seven small-scale bridges that were built, only one is not fully functional because of incomplete construction of connecting roads built by the Ghanaian side. The remaining six are functional and open for use. The opening of these bridges enabled people to travel to areas all year round that were previously inaccesible during the monsoon season owing to people travelling by boat on the rivers. Access to the market and cities was significantly improved. Better accessibility to the markets has reduced the postharvest loss of crops, expanded farmland areas and increased the number of middlemen. In regions where access to hospitals has been made possible, the number of patients consulting doctors has increased. Although it has only been five months since the completion of these

bridges, the residents living near these bridges are already enjoying the improvements in their living standards.

Kenya:

Improved and Sustainable Agricultural Productivity for Women Farmers
(In-country training program)

In Kenya, 75% of the nation lives on small farms, and farming is a woman's responsibility by tradition. Therefore, dissemination of appropriate agricultural technology to the rural Kenyan women became an urgent issue for increasing agricultural productivity, which is a national goal of Kenya. As a separate project, the Jomo Kenyatta University of Agriculture and Technology Project was implemented whereby facilities were provided through grant aid and project-type technical cooperation. During the course of this project, JICA has implemented the training of experienced instructors, and the research and dissemination of the appropriate technology in the agricultural and industrial fields in Kenya. In utilizing the instructors, facilities and farming machinery at the University, Japan implemented in-country training program, targeting women of farming villages.

In a five-year period, 242 female farmers received technical training. Thirty percent of these trainees made use of the knowledge and technical skills gained through the training to increase their income. Some trainees retransferred the technology to other female farmers in their own village, who also increased their farm income. In addition, the women who have acquired new knowledge and technical skills have gained respect and trust within the household. Some trainees were even appointed to leader positions in the village.

The needs of the female farmers regarding the training are still high, and this training program should be continued.

The Population Education Promotion Project Phase II
(Project-type technical cooperation)

In Kenya, during the early years of independence, there was on average a 3.8% rapid increase in the population per year. This sharp increase in the Kenyan population hinders the sustainable development of the economy, and gives rise to social and environmental problems. In response to this, the Government of Kenya has labeled population control as the most important and urgent issue on its agenda and has been working actively to better the situation. Under these circumstances, Japan has supported the development of teaching materials contributing to population/family planning education through project-type technical cooperation called the Population Education Promotion Project. In addition, in order to ensure that the results of this project continue to be developed, Japan implemented Phase II of the project starting from 1993 for a five-year period.

Under this project, technology for producing videos and printed teaching materials as well as high standard publications was transferred, and the television program on measures against AIDS that was produced during the cooperation period won the Grand Prize in the UNDP category. In addition, because video materials produced through the cooperation were shown at the national assembly, other ministries and agencies, and international organizations, the project activities were widely recognized. Through the integrated activities of the model communities (i.e., income generation, hygiene improvement, public education with "folk-media" song and dance initiatives, etc.) the health services for local residents have improved greatly, and the intended goals of the project have been achieved at a high standard.

This project can now technically be maintained independently. However, financial difficulties still remain for managing the project. It is necessary to consider certain measures such as taking advantage of the technology that has been transferred for producing teaching materials in order to produce them on a commercial basis.

Malawi:

Community Health Sciences Project
(Project-type technical cooperation)

Infant mortality caused by infectious diseases is high in Malawi, and the early detection of infected patients and the establishment of measures have become major issues. Against such a backdrop, Japan provided project-type technical cooperation for the purpose of strengthening the functions of the Community Health Sciences Unit (CHSU) and to reduce mortality rates in model regions (especially mortality rates of infants five years and under).

As this project was the first time that project-type technical cooperation had been implemented in Malawi, there was scarce mutual knowledge of the organizations, systems and national characteristics of both Japan and Malawi, and as a result the project was implemented amidst many difficulties. Such problems as the non-deployment of counterparts and frequent transferring existed, but CHSU investigative functions were strengthened, and capacities improved to the extent that a research report was compiled.

The transfer of research technologies is almost complete, although further enhancement of the surveillance system (system in which data on the outbreak of specific diseases is sent from the model region to the CHSU, and, following compilation of the data by the CHSU, the results are disseminated throughout the model region) is required, as well as assistance from the perspectives of budget and human resource development. Accordingly, the cooperation was extended for another year.

The Research Project for Small-Scale Aquaculture of Malawian Indigenous Species
(Project-type technical cooperation)

In Malawi, the fisheries industry is extremely important, because this industry provides the nation with 70% of the animal protein intake. However, in recent years, the decrease

in the number of spawning grounds, decrease in the fish catches due to overfishing, and the increase in the population have led to a significant decrease in the yearly consumption of fishery products per capita. In addition, in 1992, it became forbidden to introduce foreign fish species into Lake Malawi in order to preserve indigenous species. Under these circumstances, Japan implemented project-type technical cooperation with the intended goal of promoting small-scale aquaculture of Malawian indigenous fish species.

This project provided the necessary facilities and equipment for acquaculture research such as a model hatchery and testing instruments. Also, suitability of three fish species for aquaculture was judged. The Malawian counterparts not only gained knowledge and technical skills, but were also able to adopt a research-oriented attitude that placed emphasis on basic skills and on-the-site experiments. They have improved their research abilities greatly, and it can be said that the project objective has been achieved.

Based on the results of this project, it is desired that in the future, Phase II cooperation be implemented immediately after the first cooperation period is completed, in order to develop techniques for small-scale aquaculture of Malawian indigenous fish species.

Senegal:

The Nursery Establishment Project
(Grant aid)

Located at the southern forefront of the Sahara desert, Senegal has experienced a 20% reduction in its forest resources over the last 20 years, as a result of a decline in rainfall, high consumption of wood and charcoal resources, and the degradation of vegetation due to excess grazing. Against such a backdrop, Japan established nurseries in five locations with grant aid for the purpose of building capacity in seedling production, conserving forest resources through reforestation, and protecting the natural environment.

The establishment of nurseries has led to a significant improvement in seedling production capacities, and now systematic seedling production is being implemented.

Reforestation projects in which the seedlings from the nurseries are utilized have been initiated in collaboration with local organizations and NGOs, and reforestation activities are beginning to permeate through to local regions. Teachers and children from neighboring schools participate in tours to the nurseries, which in turn serve as means for environmental education where the children can learn about the significance of reforestation and the production of seedlings.

Individual experts dispatched as advisors on seedling production offer guidance on the management of the nurseries, which has helped to heighten the local residents' awareness toward getting involved in reforestation activities. As a result, from now on independent development can be fully expected.

Tanzania:

The Extension Program of the Bagamoyo Irrigation Development Project
(Expert team dispatch program)

The Tanzanian Coast Region is blessed with the fertile lowlands along the rivers and lakes. However, because irrigation and production techniques have not been developed, agricultural productivity is low and the province was one of Tanzania's poorest. For this reason, Japan implemented the Expert team dispatch program for three years starting from November 1990. The project's results included an increase in the yield of rice crops. Based on this success, the government of Coast Region began constructing an expanded pilot farm, and Japan continued to implement the Expert team dispatch program.

The development of irrigation facilities and the implementation of training for farmers raised the level of irrigation agriculture technology and heightened awareness of irrigation agriculture. Irrigation associations were formed by these farmers, and with each harvest, an implementation cost for the project was imposed (irrigation costs, tractor costs, agricultural chemical and fertilizer costs, etc.). Through the introduction of irrigation rice farming, rice crop yield was increased greatly, from the usual 1.5 tons per hectare obtained from the traditional rain-fed paddy fields to an average of 5.5 tons with a maximum of 7.4 tons. In addition, farmers who attended training classes increased their yields of rain-fed cultivation to 2.5 tons. Along with the increase in the amount of rice harvested came higher income for the farmers, their living environments and schooling situations for their children improved.

In this way, the project has had considerable results. However, the pump irrigation method introduced by this project is costly, and in terms of sustainability and general use, there are difficulties involved in its diffusion as a small-scale irrigation method for small Tanzanian farmers. If such a project is implemented in the future, it will be important to formulate a plan that uses appropriate technology that can be applied locally and at low cost.

Dar es Salaam Power Distribution Maintenance Project
(Expert team dispatch program)

Dar es Salaam is at the center of Tanzania's industry and economy, and for the development of Tanzania's social and economic activities, a stable supply of electricity to the city is absolutely vital. However, although the supply of electricity to the city is taken on by the Tanzania Electric Power Supply Company Limited (TANESCO), due to the fact that TANESCO's distribution facilities are poor and maintenance management is insufficient, blackouts occurred frequently. This project was therefor implemented, aiming at the improvement of TANESCO's maintenance management technology.

Under this project through the energetic and appropriate guidance of experts and the highly motivated efforts of their

counterparts, maintenance management technology for distribution lines has been effectively transferred, and TANESCO's technology level has significantly improved. Tanzanian counterparts have not only acquired skills for maintenance technology, but have also acquired the fundamental working customs of considering how best to proceed independently. With the improvement of TANESCO's maintenance management technology, the voltage of the area in question has been stabilized, and the problem of blackouts resolved. The citizens of Dar es Salaam have an increased confidence in TANESCO.

Through this project, the technical capabilities of TANESCO have improved, and since the donated equipment is compatible in a tropical environment, it is thought that through the self-support efforts of TANESCO, it will be possible to continue the maintenance activities of the distribution network.

The Kilimanjaro Agricultural Training Center Project
(Project-type technical cooperation)

Since the 1970s, Japan has implemented various types of cooperation targeting the Kilimanjaro Region in order to establish and disseminate irrigated rice cultivation technology. As a result, in the model fields rice harvest per unit area has increased, and the irrigated rice cultivation techniques have spread to neighboring areas. The effects of the cooperation are extremely remarkable. To spread the effects throughout Tanzania, Japan implemented this project to strengthen the training functions of agricultural technicians in the field of irrigated rice cultivation.

The quality and the timing of the dispatch of long-term and short-term experts were appropriate. The provision of the machinery was also well-timed. In addition, the counterparts were stationed, and the facilities were supplied based on the plan. Furthermore, from the investigation results of the counterparts and trainees who have completed its training program, it can be said that the project objective is almost achieved. As a result of the training, the standard of the irrigation and rice cultivation techniques of the agricultural technicians have improved greatly. The technological impact is large because the technology is being spread and transferred from trainees, who have completed the program, to neighboring farmers.

The center has become Tanzania's most important rice cultivation training institution. Though financial problems are hindering the training center's move towards sustainability, if the counterparts learn to apply their newly gained knowledge and technical skills to the actual problem-solving process, the possibility of achieving sustainability will be heightened. However, in order to support improvement of its training contents through monitoring impacts of the training, it is necessary to extend the cooperation period for another two years.

Zambia:

Kafue National Park Management Plan Project
(Expert team dispatch program)

In Kafue National Park, the oldest and most expansive national park in Zambia, the unique ecosystem had changed and it was feared that rare animals could further decrease in number or become extinct through an increase in poaching and logging by people living in close proximity to the park. This was due to the fact that there was no coherent management plan in implementation for the park. Japan had dispatched Japan Overseas Cooperation Volunteers (JOCVs) and an expert in wildlife and vegetation survey, but in order to compile a management plan for the park which took into account the symbiosis with the people living in proximity to the park, this project was launched.

Through on-the-job training, Zambian counterparts acquired the skills to undertake environmental research and compile a plan for the national park, and completed the final management plan for Kafue National Park. It is of great significance that this management plan for the national park, in contrast to other plans compiled by foreign experts, was compiled entirely by the hand of Zambian staff, with support from Japanese experts. The compilation of this National Park management plan represented a large step forward, and it is hoped that in the future this plan will be put into action. However, the fiscal situation of the Government of Zambia is serious, and it is unlikely that the compiled National Park Management Plan will be implemented with the funding of the government alone.

In the future, in order to move forward with the implementation of this plan it is indispensable that not only Japan, but other donor countries, NGOs, the tourism industry, and citizens of the region, etc., concentrate their efforts together.

The Project for Improvement of the Department of Pediatrics and Child Health of University Teaching Hospital
(Grant aid)

Twenty-three Urban Health Centers (UHCs) conduct basic health activities for the citizens of Lusaka, the capital of Zambia. Due to the insufficient consultation techniques of people involved in medical services at UHCs, there seemed to be a tendency among the citizens of Lusaka to directly go to the University Teaching Hospital (UTH), a tertiary medical care facility, instead. As a result, the UTH not only became over-crowded and old, but was also failing to function as a tertiary medical care facility. For this reason, Japan implemented grant aid in order to strengthen the service of the UTH.

The UTH's services were strengthened after the new construction of the pediatric ward for outpatients and the isolation ward, and the improvement of the medical care equipment. The pediatricians were able to perform advanced treatments through the use of the rooms for the seriously injured and the emergency room. Moreover, with the reinforcement of the referral system (that involves the transferring of patients to

the appropriate medical institution according to the degree of their injuries, as well as the notification of the medical institution closest to the patient's residence at the time of his hospital leave regarding his necessary information calling for their attention) of the government of Zambia, there has been a decrease in the number of patients waiting to be examined in pediatrics and a partial alleviation of crowding of inpatients' wards.

However, due to the inefficiency of UTH's outreach activities (guidance and training programs for the medical care system employees at UHCs), there is an urgent need to improve the UTH outreach center, including clarification of responsibilities and the role of staff as well as budgetary measures.

Côte d'Ivoire:

The Project of Construction of Primary Schools
(Grant aid)

The Republic of Côte d'Ivoire aimed to raise its gross attendance rate of elementary education to 90% by the year 2000. However, due to insufficient funds, there had been a delay in the construction of school facilities which resulted in a shortage of classrooms, and there had been cases where the government substituted rented warehouses for classrooms or the parents of the pupils leased them voluntarily. This situation led to a poor learning environment and a heavy financial burden on the parents, which contributed to the fact that no increase in the attendance rate had been attained. For these reasons, Japan conducted the transfer and reconstruction of the leased elementary schools with grant aid.

During the three years from FY1995 to FY1997, 390 classrooms were built in 72 schools. Through the construction of these new strong buildings with sufficient facilities, the elementary education environment in the target regions improved drastically. The facilities constructed in FY1995 (111 classrooms in 17 schools) are all being put to use, and those constructed during FY1996 (138 classrooms in 22 schools) in which the electricity and water lines constructed by the government of Côte d'Ivoire have been completed are beginning to be utilized. Because the remaining facilities constructed during FY1997 (153 classrooms in 32 schools) were handed over to Côte d'Ivoire in March 1999, their immediate use is expected. These new school buildings are more beautifully constructed than other schools, and there have been improvements in the both the students' and teachers' desire for education, the rate of attendance, and the number of students.

However, since a sufficient number of beneficiaries, such as teachers and local people, did not participate in the planning and implementation stages of the project, there is a lack of intention among them to maintain and manage the buildings as theirs, and the Côte d'Ivoire government's guidance for appropriate maintenance and management is expected.

(5) Latin America and the Caribbean

Brazil:

Vegetable Crops Production
(Third country training program)

Through project-type technical cooperation, Japan transferred vegetable production techniques to the National Vegetable Research Center (CNPH). In favor of spreading these techniques to countries in Central and South America, Japan implemented this third country training program.

In four years from FY1995 to FY1998, 48 people participated in this training. The training was evaluated highly by the trainees, because the training management abilities of the CNPH, where the training took place, were good and what the training grasped was in accordance with the trainees' needs. The trainees were able to apply the skills they acquired though the training in their own countries. After returning to their home countries, the trainees taught these skills to fellow workers at affiliated facilities and vegetable producers. Some even drew up plans for state vegetable projects applying the outcomes of the training.

On one hand, there is a significant need for this training. In the past four years, 4.6 times the number of applicants competed for places on the course. On the other hand, it will be financially difficult for Brazil to continue the training on its own. Under these circumstances, the cooperation period is extended for the next five years in order to give more people the opportunity to participate in this training.

Forest Watershed Management
(Third country training program)

Japan had implemented project-type technical cooperation and dispatch of experts to the Forestry Institute of Sao Paulo (IFSP) since 1976, and IFSP has become a famous research facility in Latin America. Through the technical cooperation IFSP accumulated forest management technology such as forest hydrology and remote sensing. In order to transfer this technology to Brazil's neighboring countries, Japan implemented a third country training program in IFSP from FY1990 through FY1994 and carried out another five-year training program starting from FY1995 through FY1999 to an expanded range of target countries.

In the four series of training sessions of FY1995-1998, there were 54 participants from 12 countries in Latin America and Portuguese-speaking countries in Africa. Most of the participants highly evaluated the training program thanks to IFSP's excellent staff, high level of technology and well maintained forest for training. The ideal mixture of theories, experiments, field work and case studies facilitated active participation of the trainees to the program, and contributed to the effective transfer of knowledge and techniques. After having returned to their home countries, the trainees have been applying the knowledge they have gained from the training to the projects of their respective organizations such as reforestation and agroforestry system experiments.

In addition to the fact that IFSP hopes to continue this program, there has been a high demand for it, resulting in four times as many applicants as there are spaces available. If necessary, any revision of the curriculum will be carried out, and the continuation of this program is preferable.

Improvement of Livestock Parasitosis Synthetic Diagnosis

(Expert team dispatch program)

In Bahia State in the northeastern region of Brazil, the livestock industry has developed on a large scale and over a wide area, but due to the outbreak of diseases caused by poor nutrition management, the productivity rate is low. In view of this fact, Japan implemented technical cooperation (in comprehensive parasite diagnosis for facilitating livestock disease research) at the Federal University of Bahia (UFBA), which plays a role in providing information about livestock diseases within the state.

Through the implementation of this project, a reference laboratory of the highest standard has been developed at the Faculty of Veterinary Medicine at UFBA to make diagnoses of parasitic diseases, and Brazilian counterparts have also acquired the newest knowledge and technology for diagnostic of parasitic livestock diseases and have thus improved their capabilities. As a result, more precise means of diagnostis technology have been established for parasitic diseases with the help of applied parasitology, biochemistry and immunology. Currently at the Veterinary Medicine School based on the diagnostic technology established through this project, guidance to breeders of livestock and a disease diagnostic service at the laboratory are being developed and are also contributing to reducing the risk of contamination.

The organization, facilities and human resources of UFBA have improved. Concerning the financial element, not only has the university received a budget from the Federal Government of Brazil, but has also collected resources from other groups involved with the livestock industry. Especially the Veterinary Medicine School has the ability to develop independently, due to the supply of equipment and sufficient technology transfer through the project. However, continuous cooperation is desirable in order to support research concerning the application of established and disseminated diagnosis technology.

Occupational Health

(Expert team dispatch program)

As a result of sudden industrialization, the problem with sanitary conditions for Brazil's labor workers had grown worse, causing it to become a social problem. In 1990, the Government of Brazil established the Center for the Studies of Workers' Health and Human Ecology (CESTEH) as a comprehensive research and guidance facility for gauging conditions in the workplace, inspection of protective supplies, prevention of diseases acquired at work, such as medical poisoning and pollution induced lung disease. However, being in the initial stage of its institutional development CESTEH was still short of technical expertise and skills. As a result, this project has brought about the transfer of skills for establishing methods of measuring conditions in the work place, health examination methods and methods for improving the work environment.

Long-term as well as short-term experts were dispatched in a timely manner. The transfer of skills progressed in an efficient way, and skills were completely transferred in the fields of measuring conditions in the work place and health examination. However, in the field of improving the work environment, because the methods the project introduced to CESTEH were new to them, the transfer of skills stopped at the basic stages. Follow-up measures should be considered to improve the counterparts' abilities to apply the skills.

CESTEH is an organization with high stability of counterparts, and in financial respects it is receiving support from the Ministry of Health's affiliate, the Oswald Cruz Foundation (FIOCRUZ). In the future, the enrichment of CESTEH's active role as an extra-departmental organization can be expected.

The Project of Sustainable Agricultural Development and Natural Resources Conservation in Cerrados

(Project-type technical cooperation)

Of the Cerrado region which occupies approximately 25% (about 200 million hectares) of the land area of Brazil, 170 million hectares are suitable for agricultural use and hold an important position in the agricultural development policies of the country.

From the 1980s the Cerrado region has achieved a rapid expansion in area of crops and production quantities, focusing on cereal crops such as rice and soybeans. However, the fact that sufficient consideration had not been given to the environment had an adverse effect on the ecosystems of flora and fauna and the soil environment, and such problems as lower layer soil compaction and hardening due to continuous cropping became apparent. Due to this fact, Japan instituted this project-type technical cooperation in order to support sustainable agricultural development, which places importance on management and preservation of natural resources in the Cerrado region.

Through a joint research between Japan and Brazil, technical transfer has progressed smoothly and effectively, and technology for sustainable use of eco-systems in agricultural development in the Cerrado region has been established. The research and management capabilities of the Cerrados Agricultural Research Center (CPAC) have been improved. It can be said that the goals of this project have been completely achieved, since CPAC is now in a position for the Brazilian side to be able to continue research and produce results independently after the cooperation project is over. The technology developed through this project has already started to be disseminated to farmers in the Cerrado region, and the project is promoting the stable expansion of the Cerrado

agricultural development area and the development of the regional economy, in addition to contributing to the succession of the culture and family farming of indigenous people.

To solve the global food problem in the 21st century, it is possible to apply the results of this project not only to the Cerrado region, but also to the whole soybean production area in South America, and it is expected that the results will make a large contribution.

Chile:

Mineral Processing and Metallurgy
(Third country training program)

The Republic of Chile, one of the world's leading copper producers, was striving to modernize its technology of metallurgy and improve productivity. Over the course of twelve years since 1976, Japan has twice carried out a project-type technical cooperation at the Mining and Metallurgical Research Center (CIMM). The first of these was intended for development of research and cultivation of human resources in copper refining techniques; and the second was aimed towards the transferring of prevention technology for the atmospheric and water contamination caused by the mining industry. With this as a background, Japan implemented a third country training program originally planned for a five-year period starting in FY1995 to enable the cooperation results to spread to other Latin American countries.

During the four terms held until FY1998, 51 participants from 13 Latin American countries including Chile, the host country, completed this training. The majority of trainees have found that the content of the training matched the objectives and expectations of this program, and they are applying their newly acquired knowledge after having returned home. The organizations from which the trainees were dispatched gave good evaluations concerning this training and have stated that their organization's technology and quality of production have improved.

Although the majority of the organizations that the trainees belong to hope for the continuation of this training, the host of this program, CIMM, has been privatized. For this reason, it is appropriate to complete this government-run training in FY1999 as planned.

Improvement of Operation at Copper Oxide Leaching Plant
(Expert team dispatch program)

Chile is one of the largest copper producing countries in the world. However, in the waste water after the copper has been leached, many copper and iron ions remain, which were stored in a waste water dam or simply expelled naturally, and concerns had arisen regarding the low profitability of copper oxide leaching plants and the influence on the environment. Against this background, this project was implemented through technology transfer of mine drainage treatment using iron-oxidizing bacteria to the National Mining Enterprise (ENAMI) aiming to increase the metal extraction rate and improve operations of the leaching plant and reduce the burden on the environment.

Through this project, Chilean counterparts acquired the technology and knowledge for the mine drainage treatment using iron-oxidizing bacteria, and this oxidation system was sufficiently transferred at the copper oxide leaching plant.

In the future, it is expected that the Chilean side will go on to prove the effectiveness of the mine drainage treatment using iron-oxidizing bacteria, and the technology will be applied to all of ENAMI's copper oxide leaching plants. In particular, as the environmental related regulations are developed in Chile, it is necessary to stringently manage waste water treatment at copper oxide leaching plants and there is a great expectation that the treatment system using iron-oxidizing bacteria will expand its application further, which is advantageous from its technological, economic and environmental aspects.

The Mine Safety and Environment Training Center Project
(Project-type technical cooperation)

Environmental conservation is now an important issue in Chile brought about by the economic development in recent years. There was a pressing social need to formulate appropriate measures to deal with environmental degradation resulting from development of mines, especially since mining is Chile's principal industry. At the same time, because preventive measures have been insufficient, there have been frequent outbreaks in small and medium sized mines, and securing the safety of working environments has also become an issue. In light of such circumstances, Japan has provided project-type technical cooperation aimed at improving the ability to carry out training in the Mine Safety and Environment Training Center.

A training system for the field of mine maintenance and preventing pollution caused by mining has been established at the Mine Safety and Environment Training Center. Having acquired the technology to maintain mine safety, prevent environmental pollution and carry out chemical analysis, counterparts not only hold training courses at the center, but also hold courses themselves at locations outside the center such as mining company offices and small scale mines, etc. Up to now, more than 3,700 people have participated in training courses and seminars held by the center. From FY1994 to FY1998, Chile's disaster frequency indicator fell from 23.7 to 9.4, and the continued implementation of this training is expected to bring about further lowering of this indicator.

In this way, the goals of this project have, for the most part, been achieved, and because the potential for sustainability of this center is high, it will not be necessary to extend or carry out follow-up cooperation of any sort. However, it is anticipated that both JICA and Servicio Nacional de Geología y Minería (SERNAGEOMIN) will continue to make use of the center for disseminating technology and knowledge to developing countries.

Colombia:

The Development of the Disinfestation Method by Vapor Heat Treatment
(Expert team dispatch program)

From the 1980s in Colombia with the stagnation of the international price of coffee, the export of tropical fruits for cash crops to replace coffee, such as pitaya, mango and papaya, was promoted. Linked to this, the Government of Colombia placed great expectations on the establishment of technology to prevent disease and pests in these tropical fruits, and this project was implemented aiming to establish vapor heat treatment (VHT) for the pitaya fruit.

Several problems occurred on this project, including water stoppages because of poor facilities and rotten test fruit specimens, and eating damage by the South American fruit fly, which was not originally targeted by the test. However, due to high capability and volition by the counterparts, there was a good transfer of technical systems for the VHT of fruit flies.

Colombian counterparts have made practical use of the technology and equipment they have acquired, and have been working on VHT tests on fruits other than the pitaya, and it is thought that they will continue with sustainable development independently. In the future, in order to further promote the export of pitaya, it will be necessary for Colombian counterparts to disseminate crop protection technology to producers and exporters.

Honduras:

The Technology Development Project on Irrigation and Drainage
(Project-type technical cooperation)

The agenda of the National Development Plan (1990-1994) of Honduras prioritized the diversification of crop varieties and the establishment of a stable food supply. For this goal, it became a pressing issue to establish agricultural production technology for the dry season, and to disseminate irrigation agriculture. Japan implemented project-type technical cooperation to set irrigation and drainage standards that would suit Honduras' situation.

The counterparts gained knowledge and technical skills pertaining to the three fields: irrigation and drainage planning, irrigation facilities and irrigation agriculture. The project constructed small-scale irrigation facilities in the demonstration areas, that helped the counterparts gain technology at each level of investigation, surveying, designing and construction of the facilities. However, many of the counterparts were contract workers of a short period of service, and it was inevitable that the technology was transferred in fragments.

By the end of the project, provisional technological standards and technology manual for the three fields are expected to be completed, and the project's objective should be achieved. The provisional technological standards that are being prepared during the project are considered to be the first draft of the national standards. If these technological standards are utilized in the future, they should have a large effect.

This project itself does not need an extension of the cooperation period. However, to encourage the Government of Honduras to approve the proposed technological standards, it may be necessary to implement a follow-up by individual experts or by the local JICA office.

Project to Improve the Metropolitan Hospital Network
(Grant aid)

In the Tegucigalpa metropolitan area, the only public hospital equipped with emergency and obstetrics departments was Hospital Escuela. Therefore, patients, mostly low-income people, were concentrated at the Hospital Escuela, and the hospital could not completely function in its primary capacity as a tertiary referral medical institution. Because of this situation, Japan drew up a master plan for improving health and medical services in Honduras based on development studies, and based on this master plan implemented grant aid aimed at enhancing health and medical services in metropolitan area emergency and obstetrics departments.

Under this project, an obstetrics ward at San Felipe Hospital and three emergency clinics in the suburbs were built, medical equipment was provided, and the health and medical services in Tegucigalpa metropolitan area emergency and obstetrics departments were expanded considerably. The number of patients at San Felipe Hospital's obstetrics department and emergency clinics exceeded the figures predicted in the planning phase. Thus, the project's goals were on the whole achieved.

At present, the budget for this project cannot be said to be adequate, due to the diversion of part of the budget by the Government of Honduras toward measures for recovery from damage inflicted by Hurricane Mitch in October 1998. However, it is anticipated that this situation will improve.

Mexico:

Hydrotreating of Heavy Oil Fraction for the Ecological Plan
(Research cooperation)

In Mexico, the large-scale air pollution in metropolitan areas is a major problem, and for environmental improvement it is absolutely necessary that a source of low sulfur fuel oil be secured. However, more than 50% of the crude oil produced in Mexico is super heavy oil that is high in sulfur, so a process of hydro-desulfurization was necessary. In such circumstances, this project was implemented at the Instituto Mexicano del Petróleo (IMP) aiming to achieve an improvement in research capabilities for the development, regeneration and efficiency appraisal of a high efficiency catalyst to be used for hydro-desulfurization.

Through this project, a system has been established whereby it is possible to conduct research and development on

a high-efficiency catalyst, from basic research to efficiency evaluation. In particular, the research capabilities of IMP have largely improved with regard to basic research into catalysts, development of high-efficiency catalysts and regeneration of these catalysts. However, due to the effects of structural reform at IMP, the assignment of Mexican counterparts has been delayed, and technology transfer for evaluation of catalyst efficiency has not yet been completed due to time limitations.

To apply the results of this project in the validation and industrialization phases, and in order to contribute to the oil refining business and the improvement of the environment, a follow-up will be necessary through expert dispatch programs.

Efficient Use of Waste Water for Agriculture Purposes
(Research cooperation)

In Mexico, the lack of water resources and deterioration of water quality have become a problem, and especially in rural areas where miscellaneous household waste water has contaminated the water resource, it has become a vital problem for agricultural industries to use it. For this reason, at the Instituto Mexicano de Tecnología del Agua (IMTA), Japan implemented a joint study to develop technology for the disposal of waste water to improve the quality of water used on farms.

As a result of limitations on Mexico's budget, the establishment of a waste water disposal plant was delayed by a year. With the endeavor of Japanese experts, the researchers of the IMTA were able to acquire the latest knowledge and technology, which increased the researchers' capabilities. In the future, the IMTA needs field verification of the study results attained from this joint study, and it needs to research and develop the technology that could be widely applied in rural areas.

Owing to financial pressures, it would be hard for the IMTA to secure the budget to continue their research, but society's expectations of the dissemination of results of this joint study are strong. It is anticipated that, in collaboration with the Mexican government, the IMTA will endeavor to implement high quality research and training that makes effective use of its experimental facilities.

The National Actualization Center for the Teachers of the General Directorate for the Industrial Technological Education Project
(Project-type technical cooperation)

Since around 1985 in Mexico, formerly protectionist industry policies have been changing toward trade liberalization and acceptance of foreign investment, and the development of an industrial power that is competitive in the international market became a pressing need. Under these circumstances, the Government of Mexico embarked upon the improvement and modernization of technical education at the high school level to respond to the effectuation of NAFTA (January 1994) as well as the revolution in the industrial world. To support this initiative, Japan implemented project-type technical cooperation at the Centro Nacional de Actualízación Docente (CNAD) for the re-education of technical training instructors in the field of leading-edge technology (mechatronics).

Mexican counterparts are now able to correct and revise their own curriculum for training, and compile their own teaching materials and texts. The training course was introduced in November 1996, and as of February 1999, 118 people have completed the course over five terms. Currently, the sixth and seventh terms are underway, thus showing that the goals of the project are being met. Trainees who complete the course having acquired a fixed number of credits and passed a graduation presentation are granted a diploma "Especialización CNAD-Cenidet." Those who complete the course return to their place of employ and take part in the cultivation of middle level technicians in the mechatronics field.

The sustainability of CNAD is high, due to the support of the Government of Mexico and the improvement in the capabilities of Mexican counterparts. However, to firm up results of cooperation with Japan to date, and in order to further disseminate these results to neighboring countries in the region, it is desired that cooperation be realized to the fullest extent possible concerning the requests of the Mexican side, for example, that the individual expert dispatch program be conducted, the technical training program be held in Japan, and a third country training program be implemented.

Panama:

The Panama Nautical School Upgarding Project
(Project-type technical cooperation)

Sea transport is the industry that holds the thread of life for Panama's economy. Panama has many ships sailing under flags of convenience and the administration of the Canal reverts to the country in December 2000. An important task for Panama will be cultivating and securing human resources who possess advanced sea transport skills and expertise. Accordingly, Japan implemented project-type technical cooperation with the goal of improving the content of such education and training at the Panama Nautical School (ENP), Panama's only national organization for training merchant vessel crew members.

Under this project, the machines needed to implement ship crew education that conforms to the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) were provided. The revision of exercise syllabi using these machines, the preparation of manuals, the transfer of operating and maintenance skills, and utilization for classes have on the whole been completed. However, during this cooperation, a plan for the relocation of the ENP was instituted, and the machines provided could not be installed before completion of the relocation. Therefore, regarding some of the machines, the counterparts have not yet reached the stage where they can fully utilize them for exercises.

As Panama's only national organization for training merchant vessel crew members, the ENP is expected to continue

to turn out outstanding human resources who meet the demands of sea transport related industries. It will be necessary to implement follow-up cooperation for 17 months regarding the items of technology transfer not completed due to the late installation of machines.

The Forest Conservation Technical Development Project
(Project-type technical cooperation)

In Panama, the destruction of forests has continued due to excessive logging and disorderly cut-and-burn farming, and that caused concern over deteriorating land quality, exhaustion of forest resources and negative impact on the canal. Based on these conditions, Japan implemented project-type technical cooperation with the goal of upgrading the training implementation capabilities of the Training Center for the Management of Renewable Natural Resources (CEMARE), a center for training in the management of natural resources, and conserving and restoring Panama's forests.

Through this project, a series of training implementation mechanisms, including those for research, production of educational materials and implementation of training, were developed at CEMARE. A total of 75 training courses were carried out in three years from 1996, with 1,157 trainees attending. As Panama's lone forestry training center, CEMARE's existence is extremely significant. The data useful for forest conservation collected by CEMARE is being used for university courses, seminars and other non-training purposes. CEMARE is also working to spread reforestation by implementing training not only for government personnel but also for farmers and private reforestation companies.

Although CEMARE's training implementation mechanism has for the most part been established, in order to further promote forest conservation activities, follow-up cooperation for 18 months will be necessary. This is because certain tasks remain; these include the development of sustainable farming technologies for farmers and the improvement of the curriculum to meet the needs of the trainees.

Paraguay:

The Rural Development Project in the Region South of Pilar
(Project-type technical cooperation)

Since the great flood in 1983, the region south of Pilar in Ñeembucu Department where the Paraguay and Parana rivers meet had suffered chronic flood damage due to the decline of natural drainage functions. About 70% of those engaged in agriculture and stockbreeding in this region are small farmers, and many of these farmers were suffering from decreased productivity and worsening living conditions. Based on this situation, Japan implemented project-type technical cooperation for agricultural infrastructure building and the instruction of farming techniques.

Technology transfer to counterparts by experts was implemented steadily, and a basis for sustainable agricultural development was built in the region south of Pilar. The improvement of drainage facilities and roads in the pilot site had the effect of bringing down the cost of shipments of agricultural goods and increasing the number of visits by brokers. The drainage techniques for wetlands transferred via this project and a sufficient number of technicians trained for operating heavy machinery had a positive impact on various construction work carried out by Paraguay's Ministry of Public Works and Communications.

However, regarding maintenance and administration of the drainage facilities, the activities of the newly created irrigation associations were still in the trial and error stage. Therefore, in order to strengthen the irrigation associations and establish systems for liaising with related organizations, there is a need to implement follow-up cooperation for 21months.

Project for Water Supply in the Rural Oriental Sector
(Grant aid)

In Paraguay, the rate of accessibility to rural water supply in 1995 was as low as 11%, and especially in the eastern region, where 90 percent of the population resides, most of the water sources are from hand-dug shallow wells and springs. During the dry season, not only do water shortage conditions continue throughout, but the water supply is also vulnerable to polluted water from the surface. As a result of this, with the goal of improving the eastern rural region's water supply conditions, water facilities were improved in four municipalities in Itapua Department through grant aid.

Through the construction of water supply facilities, the citizens of the four target municipalities were able to get sanitary tap water which improved living standards. In the future, it is expected that the incidence of diseases will also drop. The excavation equipment used in the project has been effectively used in other locations even after the excavation work for the project was completed, and has contributed to expanding the number of people to whom water is supplied.

Maintenance and administration of the water supply facilities is covered by the water charges collected, and the potential for the sustainability of the water supply facilities is high. Achieving the understanding of the citizens in the planning stages of this project regarding the maintenance and administration system, was instrumental to the smooth collection of these fees.

Peru:

Earthquake Engineering and Disaster Mitigation Planning
(Third country training program)

Through seven years of project-type technical cooperation from June 1986, Japan established the Japan-Peru Center for Earthquake Engineering Research and Disaster Mitigation at National University of Engineering. Later, in order to spread

the technology transferred and accumulated through this project to Central and South American countries that frequently incur damage due to earthquakes, Japan implemented a third country training program from FY1989 to FY1993, which it later extended by five years.

In the five years from FY1994, 148 trainees from 12 countries completed training and acquired expertise and skills in seismic engineering and disaster prevention planning. As a result of implementing effective training using the facilities and equipment provided through project-type technical cooperation, nearly all FY1998 trainees fully met the training goals and responded that they were satisfied with its contents. In addition, 70% of trainees responded that they used the expertise and skills they acquired during training in their work, while 30% said their employment conditions improved after returning to their home countries.

The regions of Central and South America have time and time again experienced tragedy caused by large earthquakes. Due to the sizable needs for this type of training, the continuation of this program is desirable.

(6) Oceania

Papua New Guinea:

The Project for Upgrading of New Rabaul Airport (Tokua)
(Grant aid)

Papua New Guinea's old Rabaul Airport was the central airport servicing East New Britain Province and neighboring islands. However, in September 1994, it suffered damage due to the eruption of a nearby volcano. For this reason, the Government of Papua New Guinea closed the airport and used Tokua Airport (New Rabaul Airport), situated about 45 kilometers to the southwest as an alternative airport. Due to problems with Tokua Airport in terms of convenience and safety, Japan carried out emergency development of Tokua Airport's facilities and equipment.

Although this project was carried out under extremely severe conditions that included the implementation of construction while still maintaining airport functions, under excellent construction supervision, construction by the Japanese side was completed within the scheduled period. Due to the worsening financial situation of the Government of Papua New Guinea, construction undertaken by the Papua New Guinean side (development of paths around administrative buildings and the control tower, the parking lot, etc.) fell behind schedule. Nevertheless, Tokua Airport opened in October 1998 and is operating for the most part with facilities and equipment as planned. At Tokua Airport, safety, reliability and convenience of air transportation have all improved and regular domestic flights are on the whole operating on schedule.

Tokua Airport, in the same way as the now closed Rabaul Airport, is now fully functioning as a major airport of Papua New Guinea, and an important mode of transportation of everyday goods for the residents of East New Britain Province and neighboring islands.

Samoa:

The Project for Upgrading of the National University of Samoa
(Grant aid)

Since becoming independent in 1962, the Government of Samoa has been making efforts in the field of education. Development of the organization and facilities of the University has been the government's first priority. The National University of Samoa was established in 1983 and is the country's only national university. However, because the development of the organization, facilities and equipment were not progressing, the University could not meet the demands of developing human resources within the country appropriately. As a result of this, Japan implemented grant aid to expand the facilities and equipment of the University.

This project conducted a study through interviews with 30 educators to verify the specific needs of higher education in Samoa. Based on this, distinctive cultural features of Samoa were also taken into consideration, and the design plan was developed appropriately. The expanded facilities and equipment have been in use since the day after the handing over ceremony to Samoa in September 1997. The personnel and professors are excellent and enthusiastic, and the University has gained much higher evaluation.

In FY1998 in relation to this project, the University's administrators participated in training in Japan on maintenance and administration of the facility and, in FY1999, there was a plan for the University President to visit Japan to make an inspection of Japanese university facilities and administration, and discuss exchange programs with the universities in Japan. In the future, while efficient management at the University is expected, improvements in the maintenance and administration of audiovisual equipment is still needed to be carried out.

(7) Europe

Poland:

Cooperation to Support the Formulation of Key Government Policies on Industry
(Pivotal support for important policies)

When Poland was trying to make the transition to a market economy, it was faced with the urgent tasks of formulating industrial policy and developing various systems. From 1993, Japan has dispatched industrial policy experts to Poland to offer policy proposals. In order to help Poland put industrial policy into practice on a wider scale and more concretely, Japan implemented this cooperation project for the formulation of key government policies.

Technology transfer was carried out through this project in the areas of small and medium enterprise promotion, industrial technology development, and industrial development and strategy. The experts on long-term assignments accurately

grasped Poland's needs during this period of flux due to changing systems and offered timely and flexible responses and advice. Based on this advice, the counterparts prepared numerous policy proposals, some of which have already been approved at Cabinet meetings. The counterparts have clearly improved their ability to draw up policy proposals in the aforementioned three areas, and it has been concluded that the project has attained its objectives.

On the other hand, due to the fact that new demands have arisen (e.g., topics of regional development) during the cooperation period of this project, there is a need for consideration of future cooperation in these areas.

2. Ex-Post Evaluation

(1) Country-Program Evaluation: Bangladesh:

This evaluation aimed at producing recommendations to improve JICA's future aid strategy for Bangladesh through the comprehensive evaluation of JICA's aid activities in the country since its independence in 1971, including verification of the suitability of the selected priority sectors and issues or, in other words, the suitability of aid policies and analyses of poverty and gender.

At the time of independence in 1971, Bangladesh suffered absolute shortages of food supply and infrastructure comprising the basis for development. The Government of Bangladesh and foreign donors placed emphasis on the development of infrastructure, ranging from both agricultural and rural development to the development of the electricity, natural gas, transport and transportation, and flood control measures, with the priority development targets of "poverty reduction" and "economic independence". They also promoted the industrialization of state enterprises.

Following the second half of the 1980s, while the emphasis on infrastructure development has remained unchanged, the priority of development has gradually shifted from the agricultural and industrial sectors to the social sector, focusing on education against the background of an improved food supply self-sufficiency rate and a change of the industrial development policy from state enterprise-led development to private enterprise-led development. Throughout these years, agricultural and rural development has been the main target of JICA's assistance with "transport and transportation" and "flood control measures" also designated as priority sectors. These coincide with the priority sectors for the Government of Bangladesh and other donors. Based on the positive impacts of various development projects so far, JICA's cooperation has a fair share of the positive achievements in each sector. Even though it would have been preferable for greater emphasis of aid to be placed on the educational sector, JICA has been providing appropriate aid for Bangladesh in terms of both (i) priority sectors and project selection and (ii) achievement of positive impacts considering the advantages and shortcomings of its own aid system in regard to the character of its aid schemes, availability of experts and relative advantages/ disadvantages of Japanese technologies, etc. In short, JICA aid for Bangladesh so far is judged to have steadily contributed to the development of the country.

The average annual GDP growth rate in Bangladesh from 1988 to 1998 was 4.7% (annual GNP growth rate per capita of 3.1%). However, the ratio of the poor has little improved since 1991-1992 despite the acceleration of economic growth. The stagnant ratio of the poor can be attributed to the fact that the benefits of economic growth have not spread to poor people in rural areas, who are the most important targets for poverty reduction, because (1) the main beneficiaries of economic growth are people above the poverty line in urban areas, (2) the growth of employment has not sufficiently absorbed the surplus labor and (3) the number of landless farmers and farmers cultivating extremely small areas of farmland has been increasing in rural areas. Given this situation, JICA should tackle future aid aimed at the poor and poor areas by promoting (1) rural development projects including the development of rural industries, literacy education, and vocational training; (2) training programs to increase employment opportunities for women in rural areas; (3) technical cooperation for the enforcement and qualitative improvement of compulsory primary education; (4) literacy education and vocational training for adults in urban areas; (5) projects to improve access to hygiene services; and (6) projects to strengthen local administrative bodies, through enhanced collaboration with NGOs. In addition to these microscopic attempts to reduce poverty, macro-level technical cooperation, including the dispatch of advisors on economic policies, is required to ensure a sustainable increase of income.

JICA projects in Bangladesh related to Women in Development (WID) have so far been, in every field, either conventional projects targeting only women or projects which have separate roles for men and women. While this approach should be continued in the future because of its advantage of providing more opportunities for women, it may have restricted the areas in which Bangladeshi women can participate in development. If the purpose of providing training for women is to assist the economic independence of women as well as to increase household income, real effects cannot be anticipated unless the norms surrounding gender are included in the aid perspective in addition to providing opportunities for women to learn production skills. These norms relate to the resources and capital required for production, management techniques and participation in rural markets monopolized by men. As the emphasis of development projects has been shifting towards rectification of the gender gap, it is necessary to include improvement of the gender structure, i.e. improvement of the unfair access to resources and opportunities between men and women, in the scope of even aid projects which primarily target women. Moreover, in order to achieve a real increase of employment and income, these projects must be implemented as part of the development of rural infrastructure in a balanced manner.

(2) Thematic Evaluation

Sri Lanka:

Women in Development (WID)/Gender

The importance of the role played by women in development has been emphasized in recent years on such occasions as the International Conference on Population and Development in 1994, the World Summit for Social Development and the Fourth World Conference on Women in 1995. Although JICA has long been committed to gender care in its projects since the establishment of the Study Group on Development Assistance for WID in 1990, there has been virtually no evaluation of the actual state of gender consideration in JICA projects and its effects. Against this background, evaluation featuring five projects in Sri Lanka was conducted to produce recommendations for the more effective inclusion of the gender perspective in future JICA projects.

Among the five evaluated projects, the Dental Education Project at the University of Peradeniya was the most prominent in terms of the gender perspective. The fact that female experts were dispatched to prepare a curriculum suitable for the needs of women and that the male experts fully understood the importance of the gender standpoint contributed to making this project highly distinguishable in terms of gender. Positive effects were also assured by the active use of workshops from the project formulation stage to improve awareness of gender issues among all people involved, including those on the Sri Lankan side.

When the composition of experts and counterparts in any project is male-dominated, there is a tendency for the idea that men are solely responsible for productive labor to be formed. What is important is the equal provision of technical guidance and work assignments for men and women. This leads to the advancement of gender equality. Women should be encouraged to participate in development activities through the establishment of groups to play even a peripheral role at the beginning in view of nurturing their leadership abilities to gradually make inroads into the core activities and positions of a project. It is also essential during the project implementation period for ODA-related personnel in partner countries to be made aware of the importance of the gender standpoint.

In the case of male-dominated organizations, it is often the case that there is a lack of understanding that women can also play an active economic role because of women's exclusion from the decision-making process. The gender balance should always be taken into consideration when selecting the decision-making members of organizations, including a steering committee established to implement a project. The closer the gender ratio is to even, the easier it is to formulate and implement a project which reflects women's needs.

As most of the projects evaluated this time lacked gender-based data, it was extremely difficult to evaluate them from the viewpoint of gender. This suggests the importance of gathering and compiling gender-based statistics and other data at all stages of a project, from initial planning to evaluation, to allow time-series analysis so that the activities under a project can be reviewed based on the analysis results of these statistics and other data.

Kenya:

Wildlife Conservation

The protection of wild animals constitutes an area for which JICA can actively provide assistance in the coming years as it contributes to the conservation of biological diversity. In addition, the development of ecotourism provides a means of income. Japanese cooperation for the protection of wild animals in Kenya combines grant aid with the dispatch of experts and JOCVs. This evaluation was conducted to verify the effects of this collaboration between different aid schemes and to acquire lessons and recommendations for future cooperation.

In this cooperation, vehicles and construction equipment for the protection of wild animals were provided by grant aid in three national parks (the Nairobi National Park, the Tsavo West National Park and the Tsavo East National Park), where JOCVs have long been assigned to provide guidance on maintenance of equipment. The experts have provided guidance on the maintenance of equipment, etc., managed by the Kenya Wildlife Service (KWS), the project implementing agency on the Kenyan side. Such collaboration is found to have greatly contributed to the effective use of the equipment provided and the realization of the project effects.

The respondents of an interview conducted as part of the field survey state that illegal hunting has almost ceased to exist in these three national parks. In the case of the Tsavo East National Park in particular, the once prominent illegal hunting of wild elephants is said to have greatly declined in recent years. Following the progress of road construction and improvement, law enforcement to prevent illegal hunting has become much easier to implement and the safety of tourists has been improved, contributing to the growing satisfaction of tourists.

Cooperation centering on the provision of equipment for the protection of wildlife, the subject issue of this evaluation, is believed to constitute a model case in the midst of the diversification of aid for the protection of the natural environment. Even though the provision of equipment to support protection activities is only a small part of the overall activities to protect wildlife, the availability of such equipment has had a great impact on improving the morale of KWS staff and improving the efficiency of their activities. Meanwhile, there is a limit for Japan's continuation of the type of cooperation involving the provision of equipment and the problem of equipment deterioration will soon become a reality. From the long-term point of view, therefore, it is essential to shift the focus of cooperation to improvement of the management system and the fee collection system of the KWS together with the commercialization of its vehicle maintenance and repair shop.

Zambia:

Sustainability of Grant Aid Projects

Japanese grant aid has mainly been provided for those countries of which the income level is relatively low among developing countries and JICA is responsible for "preliminary studies," "promotion of aid implementation" and "follow-up work" for grant aid for general projects, grant aid for fisheries, food aid and grant aid for increase of food production. Grant aid means Japanese funding for the procurement of equipment and the construction of facilities, etc., undertaken by the governments of partner countries. Although partner countries are primarily responsible for the effective utilization of the equipment and facilities to achieve the intended development effects, it has become increasingly important for Japan to ensure the prospect of the self-reliant development of grant aid projects under an approach which emphasizes results in line with "the changing emphasis from quantity to quality" for Japan's ODA. Against this background, two projects featuring "health and medical care" and "water supply" in Zambia were evaluated to verify the state of self-reliant development and for JICA to learn lessons in connection with future Japanese grant aid.

In general, the facilities and equipment provided under the two projects subject to evaluation have been effectively used, contributing to the improvement of medical services and the provision of clean water for local people. It appears that this success can be attributed to the facts that, in the case of the medical equipment provided under the health-related project, does not require high operation skills or advanced maintenance skills, enabling repair by local technicians and that, in the case of the water supply project, a participatory program designed to organize local people, to provide education on hygiene and to strictly collect the water charge was simultaneously implemented through collaboration with a local NGO which was assisted by the Department for International Development (DFID) of the UK right from the beginning of the water facility construction work under the project.

Grant aid mainly comprises the provision of funding for the development of "infrastructure" which forms the basis for other development projects. From a comprehensive viewpoint, the prospect of the autonomous development of any project is quite limited unless there are proper arrangements in terms of the organization, manpower and budget, etc. to manage the project implementation process, backed by sufficient ownership of the project implementation body or the beneficiary (beneficiaries) of the project. Particularly in regard to LLDCs of which the financial and organizational bases are quite fragile, there have been few cases where the required project management system has been fully established simply by means of the autonomous efforts of the partner countries. Now, when aid quality is demanded more than ever, determining to what extent expecting the partner country to support itself is realistic and effective in the long term, and what type of cooperation is necessary to aid the sustainability of the development of the partner country have become important to settle on the content of cooperation. The necessary measures include the selection of equipment which can be repaired locally, preparation of manuals, participation of local people from the project formulations stage and education activities featuring local people, etc. Although the implementation of some measures is found to be difficult within the framework of grant aid, JICA should be able to respond to most requirements by combining grant aid projects with various types of technical cooperation. Collaboration with other aid organizations and NGOs should also prove effective and such collaboration must be continuously sought for JICA's future aid efforts.

(3) Third-Party Evaluation

Singapore and Malaysia:

Industrial Projects

JICA has long contributed to human development in Singapore and Malaysia through such various aid schemes as the dispatch of experts, acceptance of trainees and project type technical cooperation to assist the industrialization efforts of these two countries. For the present evaluation, Mr. Hiroshi AOKI, a journalist with considerable front-line experience in reporting on international cooperation, was commissioned to head the study to identify the cooperation effects, particularly the social impacts, through interviews with many counterparts (including ex-trainees), government officials and entrepreneurs in these countries.

As a country with few natural resources like Japan, Singapore has been implementing an industrialization policy which emphasizes the building of international competitiveness while promoting industrial development, the main components of which are the information industry and high productivity, following the model of Japan.

Japan conducted the Japan-Singapore Institute of Software Technology (JSISI) Project for ten years from December 1980. At the beginning of this project in 1980, there were only 850 software engineers in Singapore. During the ten years of the project, however, the JSISI sent out some 1,400 trained engineers to the information industry, contributing to the phenomenal annual growth of 38% of the industry throughout the 1980s. The number of JSISI graduates up to the present exceeds 3,000.

Following the ASEAN Human Resources Development Centre Initiative proposed in 1982, Japan conducted the Productivity Development Project (PDP) from June 1983 to May 1990. Wide-ranging activities were conducted under the PDP, ranging from the preparation of training manuals and textbooks to the holding of seminars and the improvement of profitability through the introduction of the 5S [seiri (organization), seiton (tidiness), seiso (cleaning), seiketsu (sanitation) and shitsuke (discipline)] movement at model factories. As a result, the productivity improvement movement spread to every industry in Singapore.

These two projects which were almost simultaneously implemented in the 1980s constituted a strong driving force for Singapore to change its industrial structure from a labor-

intensive type to a knowledge-intensive type under the leadership of Prime Minister Lee Kwan Yew. Even though the fact that Singapore is a unique city state proved to be advantageous, the combination of clean, strong leadership and commitment, in other words, good governance and ownership, was the basis for the successful outcome of the cooperation provided by Japan and other donor countries.

In Malaysia, Prime Minister Dr. Mahathir Mohamad, who assumed the position in 1981, promoted the so-called Look East Policy, implementing an industrialization drive focusing on household electrical appliances, automobiles and semiconductors. Under the above-mentioned ASEAN Human Resources Development Centre Initiative, Japan conducted the Centre for Instructors and Advanced Skill Training Project (CIAST), aimed at training skilled workers and engineers essential for the industrialization of Malaysia, from August 1982 to March 1991. By the end of 1993, as many as 10,826 people had undergone training at the CIAST. The production value of the electric and electronic manufacturing industries in Malaysia exceeded that of agriculture, forestry and fisheries for the first time in 1987. By 1989, the industrial structure had dramatically changed with the export value of household electrical appliances and semiconductors, etc. exceeding that of palm oil and crude oil. In the face of such a rapid transformation of the industrial structure, however, the contents of vocational training and the fostering of skilled workers lagged behind.

The Government of Malaysia then sent a large number of Malays to study at technical colleges and science courses at universities in Japan using yen loans, etc. to learn new technologies. Some of these students were recruited by Japanese subsidiaries on their return to Malaysia to learn business management and technical operations at the front-line and eventually become entrepreneurs running their own businesses. Such development illustrates the fairly successful domestic training of engineers as well as human resources development abroad, notably in Japan, based on Malaysia's own initiative.

Egypt:

Maritime Education and Training

JICA has been extending its cooperation for the Arab Maritime Transport Academy (AMTA) in Egypt for nearly 20 years under various aid schemes. The present evaluation was conducted to verify the effects of this long-standing cooperation for the AMTA and also to learn lessons and to produce recommendations for future cooperation in the field of seamen training against the background of the need to promote further cooperation by Japan for the Middle East and Africa as part of the follow-up for the 2nd Tokyo International Conference on African Development (TICAD II) held in Tokyo in October 1998. Mr. Katsutoshi KAMATA of the Nikkan Kogyo Shimbun (Daily Industrial Newspaper) Ltd. was commissioned to conduct the evaluation from the viewpoint of "Effects of ODA in the eyes of the taxpayers."

Many of the 24 counterparts trained under the project type technical cooperation still work for the AAST&MT, which is the successor of the AMTA, some 20 years after the commencement of cooperation. The total number of persons trained at the AMTA (now AAST&MT) now exceeds 60,000, including those from other Middle Eastern and African countries, and 146 persons from 31 countries in Africa attended a third country training program in the ten year period from FY1985 to FY1994. The training vessel provided under the grant aid was used 37 times for ocean training in the period from February 1992 to March 1999 and a total of 1,333 persons received training at sea. A voyage lasting four to five months to the Mediterranean or the Red Sea was involved on 14 occasions.

The AAST&MT has a well developed management system and functions as a training institution for seamen and its educational and training activities have been well coordinated. The equipment provided by Japan, including a training vessel, has been well maintained and fulfills its purposes.

The newly prepared Aid Program for Africa by Japan following the TICAD II calls for "the provision of assistance for 2,000 African people to undergo training under South-South cooperation in the next five years." A shortage of seamen is expected to occur in Africa in the coming years and there is, therefore, a strong need for manpower development in the maritime sector in African countries. In response, it is strongly hoped that Japan will restart the third country training program, which ended in FY1994, as part of said program. It will be extremely important for JICA to actively publicize past examples of its aid in order to enhance the understanding of and cooperation for Japan's ODA on the part of the Japanese public.

Kenya and Tanzania:

Agricultural Projects

Mr. Shinichi TAKEDA, a journalist working for the Kahoku Shimpo and with considerable experience in reporting on international cooperation in the field, was commissioned to act as the team leader and overall coordinator for an evaluation study emphasizing identification of the impacts (particularly the social impacts) of JICA's cooperation for rice cultivation in Kenya and Tanzania.

Moshi in Tanzania is situated on the southern slope of Mt. Kilimanjaro (elevation of 5,895 m) and some 1,100 ha of paddy fields and 1,200 ha of dry farmland with irrigation channels constructed with aid provided over 20 years from 1978 are spread in the nearby Lower Moshi area. Prior to the provision of aid, the yield of local rice of natural rain-fed farmland was approximately 2 tons/ha. However, the introduction of the intensive cultivation of rice variety IR54 (locally called Japani) and the improvement of rice cultivation techniques has increased the yield to 6 - 7 tons/ha. While the GNP per capita in Tanzania is currently around US$210 (¥22,000), some ¥45,000 - ¥50,000 net profit is produced per crop in the project area from an average cultivation area of 0.5 ha. As a result, some 500 ha of farmland has been voluntarily created in neighboring areas to the project area in the last 10 years or so and the local rural

population has doubled in 20 years. In Kilimanjaro Province in which Moshi is located, rice cultivation using IR54 has spontaneously spread to cover 4,200 ha of land and rice production in the province has increased five-fold in the last five years to 55,000 tons/year.

In Kenya, four JOCV members with an assignment period of two to three years each were dispatched to Siaya on the shore of Lake Victoria to supervise rice cultivation from 1978 to 1987. With the introduction of an intensive cultivation method and a high yield variety, the local rice yield trebled. Following the provision of a rice cleaning machine, the last JOCV member left the village, terminating the link between the village and Japan and leaving the operation and maintenance of the machine to the villagers. In 1998, the villagers spent the huge sum of 0.7 million Kenyan shillings (approximately ¥1.4 million) out of the funds accumulated over the years from charging a rice cleaning fee as advised by the JOCV members to purchase exactly the same rice cleaning machine as that originally provided. As of 1999, 180 villagers are engaged in the cultivation of rice on 80 ha of paddy fields and the rice cleaning volume is as large as more than 2 tons/day. Some 300 farmers outside the village also use this machine.

Africa frequently suffers from severe drought. While dry field farming is the traditional form of agriculture in Africa, the fallow period has become increasingly shorter due to the rapid population increase, causing progressive deterioration of the soil. Unlike dry field farming, paddy rice has the advantage of using the same farmland every year and, therefore, rice cultivation could prove to be the key to a sufficient food supply for Africa in the 21st century. There is unlimited scope for Japan, which calls itself a country of rice and which has advanced rice cultivation skills and a rice culture, to provide assistance for the development of rice cultivation in Africa.

Assistance for the agricultural sector would be a simple matter if it only entailed the provision of funds and facilities. However, crops only grow in harmony with the land and other environmental conditions. Unless the skills to grow crops are rooted locally, fine facilities are useless. While facilities eventually deteriorate, skills remain forever. Education and extension activities to pass skills on to local people are, therefore, the most appropriate forms of assistance. The great achievements in Lower Moshi and the history of grassroots assistance in Kenya are the first steps towards achieving this goal. "It is essential to encourage the start of rice production in Africa and to assist its subsequent growth from a long-term perspective of 10 or even 20 years without insisting on short-term achievements." These words of the people who worked so hard in the field must be taken seriously.

Senegal:

Vocational Training

Senegal is a priority country in Africa for Japan's ODA and is also a priority country for the DAC's New Development Strategy. This evaluation was conducted to learn lessons and make recommendations for the formulation and implementation of sustainable cooperation for human resources development in Africa in the coming years and was commissioned to Mr. Takuo KAWADE of the Mainichi Shimbun whose work has often involved verification of the impacts of public works in Japan. The subject project is the Japan-Senegal Technical and Vocational Training Centre Project which is a representative human resources development project conducted by JICA in Africa.

The objective of the Project was to establish the Japan-Senegal Technical and Vocational Training Centre (CFPT) to train core technicians dealing with industrial equipment (in the electric, electronic and machine industries) in Senegal through the transfer of technology to counterparts who in turn will conduct technical and vocational training to provide trainees with basic knowledge and skills in these fields. This objective was fully achieved through Japanese cooperation lasting for a decade.

At present, CFPT graduates mainly work in the maintenance department of various enterprises and are often responsible for the monitoring of the latest machinery. Some have been appointed to the position of manager of small and medium-scale enterprises. Their work morale, basic academic knowledge and skills are duly appreciated by their employers and they receive reasonable wages.

What is remarkable about the CFPT is that with the first acceptance of trainees from neighboring countries in 1990, it has become one of the best three training centers in French-speaking African countries (21 in total), enjoying a good reputation in not only Senegal but also in French-speaking Africa.

Since the end of Japan's cooperation period, the CFPT has actively continued and expanded its activities with Senegalese staff, overcoming its financial difficulties.

Japan should give follow-up assistance priority to the CFPT and other projects which have maintained sustainable development based on autonomous efforts, producing a number of impacts. In this way, further impacts can be anticipated, ensuring a high level of investment effects.

Paraguay:

Vocational Training Center

The Paraguay Vocational Training Center (CEV) was selected as a typical example of Japan's cooperation for human resources development to contribute to economic development in South America and Mr. Takaaki NAGASAWA of Jiji Press, Ltd. was commissioned to conduct the evaluation, from the broad perspective of a third party, of the factors facilitating and inhibiting the positive impacts of cooperation for the training of core engineers who will comprise the basis for South American economic development.

It has been 15 years since the handing over of the CEV to the Paraguayan side in 1983 after a technical cooperation period

of five years. The education system emphasizing guidance for and discipline among students which was established with the assistance of Japanese experts is now firmly rooted. With the excellent management capability of Mr. Piera, the Principal, and very committed teaching staff who strictly enforce equipment maintenance, the management of the CEV has been very smooth except in the financial aspect. In all aspects, the CEV has been reborn as Paraguay's own project.

The original objective of the CEV at the time of its opening in 1979, i.e. the training of junior technicians who can make a living in the labor market by providing vocational training for those who have only completed primary education for one reason or another in a short period of one year, has been fully achieved and this basic philosophy of the CEV has been actively upheld throughout the years under the leadership of the Principal and the teaching staff.

However, the CEV has been very slow to respond to the needs of the MERCOSUR, particularly to needs in the technological field, as it is trailing behind the changing circumstances of the times in terms of equipment renewal and the advancement of teaching techniques, etc. Although the Paraguayan side hopes for renewed Japanese cooperation for Phase II of the CEV, the Government of Paraguay must firstly achieve a consensus within the government on a uniform basic policy for the training of engineers in response to the age of the MERCOSUR.

The Government of Paraguay commenced a review of the educational system in 1993 and an experimental new educational system started in FY1998. There was also a political change from the Wasmosy Administration to the Cubas Administration in August 1998 and the new administration is currently conducting a full policy review with the main focus on the restructuring of government finance. Even if Japan plans the provision of some kind of assistance for the CEV, it must carefully monitor the outcome of the educational reform prior to making any concrete move.

Fiji and Papua New Guinea:

Training Program

This evaluation was commissioned to Professor Isami TAKEDA of Dokkyo University who is a specialist on international relations in Asia and Oceania to verify how the third country training program conducted in Fiji, the leading country in the South Pacific, and in Papua New Guinea which has a strong need for human resources development, has contributed to the human resources development of island countries in Oceania, and also to examine the training needs of and the direction for future Japanese cooperation for Oceania.

The third country training on telecommunications held in Fiji has trained 298 people from Asia and Oceania in 15 years. Both the trainees and their superiors highly praise the training and say that the training targets have been fully achieved. 88% of the trainees say that the knowledge and skills acquired through the training are actively used on their return home. Some trainees have eventually become managing directors or teachers, indicating the strong social and economic impacts of the training program. As the telecommunications sector is characterized by the exceptional speed of technological innovation and vigor of the private sector, it is desirable to leave training on the latest technologies to the private sector with the public sector providing training on policy planning and administration to complement the training provided by the private sector.

The third country training program on coastal fisheries development held in Papua New Guinea has trained 235 people from Asia and Oceania in 15 years. The training is highly praised by the trainees themselves and by their superiors as 93% of them assess it as either "good" or "very good." Ninety percent of the trainees say that the knowledge and skills acquired through the training are actively used for their work.

While there is a common impression that Japan's ODA offers large-scale infrastructure development, the two third country training programs evaluated this time have proved quite successful for the practical training of fisheries-related personnel and telecommunications specialists in island countries in Oceania, albeit in an unspectacular manner.

The trainees who have participated in third country training programs should be considered valuable assets for Japan. However, JICA is facing the problem that it is difficult for JICA to follow up the activities of the trainees after their return to their own countries because of institutional, personnel and budgetary constraints. The relationship between ex-trainees and JICA should be strengthened in order to crate a manpower bank for Japan and for the effective as well as efficient implementation of Japan's ODA.

(4) JICA/Overseas Economic Cooperation Fund (OECF) Joint Evaluation

Thailand:

Eastern Seaboard Development Program

Japan has provided active assistance for the Eastern Seaboard Development Program which was promoted by the Government of Thailand as one of the highest priority tasks of the National Socioeconomic Development Plan since the 1980s through JICA and OECF (presently the Japan Bank for International Cooperation (JBIC)). In view of their involvement, JICA and OECF conducted joint evaluation of their cooperation efforts for the East Coast development. Because of the different evaluation viewpoints adopted by these two organizations, JICA's evaluation placed emphasis on the learning of lessons for future regional cooperation centering on industrial development. The main subject of the evaluation by JICA was the Development Study on the Laem Chabang EPZ/GIE Industrial Promotion.

The project in question was implemented in a timely fashion one year before the opening of the Laem Chabang Industrial Park, and contributed to the decision on the basic concept for the development of the planned industrial base. By

1997, all the available plots in the Laem Chabang Industrial Park had been taken up, achieving the objective of the project, i.e. the attraction of non-polluting, export-oriented labor-intensive industries other than heavy and chemical industries. Total investment of 75 billion baht (more than 80% of which was foreign capital) has been made in the Laem Chabang area by the private sector, creating jobs for 48,000 people, of which more than 80% are employed by joint ventures between Japanese and other foreign enterprises. As a result, the transfer of technology to local enterprises has been greatly accelerated. Meanwhile, the construction of a hospital, school, shopping center and golf course around the industrial park has contributed to the development of the region.

An industrial park cannot be expected to be successful unless it attracts private enterprises. The timing for the creation of an industrial park must be carefully decided through an advance, in-depth survey on the market conditions as the development prospects of such a park are largely determined by the economic trends of the country in general and the area surrounding the park in particular. As the Laem Chabang Industrial Park offers favorable site conditions, such as proximity to a major port and its location within a 20 km radius of the provincial capital where basic social infrastructure is in place, most enterprises moving into the industrial park have expressed their willingness to stay. This finding emphasizes the importance of including the living environment for employees in the selection of an industrial park site.

The burden of selling plots can be lessened by placing the sales emphasis on attracting such key tenants as assembly makers and member enterprises of local financial groups. Creating a strategy to attract them as new industrial activities by key tenants in the park will attract the relocation of supporting industries and groups of small and medium-scale enterprises around the industrial park, likely contributing to the development of local industries.

(5) Evaluation by Overseas Offices

1) Asian (Southeast Asia)

Indonesia:

Radio and Television Training Centre
(Grant aid, Project-type technical cooperation)

Radio and television play an important role in the promotion of national unification and modernization in Indonesia, an island country with great geographical and cultural diversity. Japan provided grant aid for facilities and equipment for the Multi-Media Training Centre (MMTC) in FY1982, followed by project-type technical cooperation from FY1983 to FY1992 to improve the MMTC's capability to train broadcasting engineers. In the meantime, the provision of additional equipment and the replacement of old equipment were conducted in FY1990 with grant aid. The engineer training function of the MMTC has been greatly enhanced through the provision of the latest training facilities and equipment and improvement of the training capability of the counterparts. The number of people attending training courses at the MMTC steadily increased from 72 in 1985 to 204 in 1992 and further to 252 in 1998. The course completion rate also improved from 81.2% in 1985 to 97.5% in 1992 and 98.9% in 1998.

The MMTC has become the central organization to train key personnel in the broadcasting sector and it is expected to extend the scope of its training activities in response to recent technical innovations, including digitization.

Myanmar:

Urban Water Supply Project
(Grant aid)

The extreme water shortage, including a shortage of drinking water, in the arid area of Central Myanmar caused a serious problem of declining health and hygiene. Even though water supply was partially available in urban areas, the fiscal difficulty and population increase worsened the water supply situation. In order to improve this situation, Japan provided grant aid in FY1981 and FY1985 to improve the water supply facilities in 11 cities located in the arid area of Central Myanmar and surrounding areas which faced a severe water shortage. In FY1995, spare parts for the water supply facilities were provided under a follow-up cooperation. As a result of the improved water supply facilities, some 690,000 people living in these 11 local cities began to receive a sufficient supply of clean water and the health and hygiene conditions of these people were improved. Accordingly, the labor productivity in these cities was also increased.

Although the Myanmar side has sometimes struggled to replace deteriorated parts of the equipment, it has properly maintained the equipment to the extent that all of the water supply facilities are still in working order today. Nevertheless, the provision of spare parts under a follow-up cooperation is highly desirable in view of the severe aging of the equipment and facilities provided by Japanese grant aid in the past and the frequent breakdowns of the water pumps due to the unstable power supply.

Philippines:

Cooperation for Sewage Treatment in Baguio City
(Grant aid)

The rapid urbanization of Baguio City, a tourist city, without the accompanying development of urban infrastructure led to the discharge of untreated sewage to rivers, contaminating the river system in the catchment area. In FY1984, Japan provided grant aid for the construction of a sewage treatment plant to urgently solve this problem. As the Baguio side could not proceed with the planned construction of a sewerage network because of the deteriorating financial situation of the city, in turn caused by typhoon damage, Japan provided further grant aid for the development of the sewerage network in FY1991 and FY1992.

This sewarage network covers 63 districts of the city's 129 districts and the daily treatment volume of sewage now stands at 5,556 m^3 which is proof that the sewage treatment system

constructed under a Japanese grant aid project is fulfilling an important function in the city. The Biological Oxygen Demand (BOD) value of Balili River to which the treated sewage is discharged has also improved.

The maintenance conditions of the sewage treatment facilities and equipment are generally good. It is hoped that the Philippine side will seek to further increase the sewage treatment volume and to consolidate the operation system by means of implementing the continual improvement of the sewerage network, encouraging households to connect to a sewer and improving the sewage charge collection system, etc.

2) Asia (East and Southwest Asia)

China:

Project for Promotion of Computer Systems at National Railway Management College
(Project-type technical cooperation)

The railway network in China began to rapidly expand from the second half of the 1980s, making computerized railway management and the training of senior executives and engineers an urgent necessity. Japan provided technical cooperation from 1987 to 1991 for the transfer of railway management skills using computers for the purpose of training senior railway executives and engineers at the National Railway Management College, followed by after-care cooperation for one year from 1994.

When the technical cooperation was first provided, the introduction of computers for the railway management system in China was an epoch-making event. As such, the project greatly contributed to raising the standard of railway technologies in China. The improved railway management skills resulted in such positive effects as increased railway passenger and freight transportation volumes and a longer freight transportation distance.

Although the system introduced under the project was an advanced system at that time, the insufficient renewal of program software despite the rapid development of computer technology in subsequent years has led to a decline of the training need for this system. As part of the administrative reform as well as internal reorganization of railway operation, the National Railway Management College merged with Northern Jiaotong University in 1997. For cooperation in those fields using computers, the technological advancement of which is extremely rapid, careful analysis is required to select the most appropriate method of cooperation as the transferred technologies may become obsolete to meet new needs after only several years.

India:

Elisa Reader and Elisa Washer Supply Project
(Provision of equipment)

Since it was first discovered in Madras in 1986, the number of AIDS patients in India has been steadily increasing every year. While the largest cause of infection is sexual contact (with 74.1%), blood transfusions are reported to account for 7% of all cases. Under these circumstances, Japan provided 20 units of AIDS testing equipment for Maharashtra State, which accounted for some 55% of all HIV positive patients in India and which showed the highest HIV infection rate through blood transfusions, for the purpose of securing safe blood to prevent HIV infection through blood transfusion.

At the 20 blood centres which received the said equipment, the HIV blood testing capability has naturally improved and the collection of safe blood has become possible. Consequently, the risk of HIV infection through blood transfusion in the state has declined dramatically and the risk of Hepatitis B infection through blood transfusion has sharply fell.

The project has proven to be very effective. However, it is desirable that JICA consider the provision of additional equipment in view of the persisting need for blood testing equipment in India while verifying the equipment maintenance system in India.

Sri Lanka:

Automobile Engineering Training Institute
(Grant aid, Dispatch of experts)

Transport and transportation in Sri Lanka mainly relies on roads, and the number of vehicles on the road sharply increased following the liberalization of imports. However, many local garages were small and the level of vehicle maintenance skills was not particularly good, resulting in an increase of the number of road traffic accidents caused by poor maintenance. Under these circumstances, Japan provided grant aid for the establishment of the Automobile Engineering Training Institute (AETI) and also dispatched experts to develop the training curriculum and to transfer advanced automobile maintenance skills.

Sixty-nine mechanics completed the training course in 1989 with 1,058 mechanics, i.e. 1.5% of all employees of garages in Sri Lanka, having since been trained at the AETI. The level of satisfaction among employers regarding the skills of these mechanics is very high. The AETI now provides a short-term course to upgrade the skills of existing mechanics (some 300 attend the course every year) and training commissioned by enterprises (approximately 10 cases a year), indicating that the project represents an example of an effective tie-up between Japan's grant aid scheme and technical cooperation scheme.

It is, however, necessary for the AETI to improve its management by strengthening its relationship with industrial circles if it is to properly provide training in response to the market needs in the coming years.

One important lesson for the future implementation of similar projects is inclusion of the improvement of the management capability in the scope of technology transfer to secure the prospect of the self-reliant development of partner countries.

Appropriate Technology Research and Development Centre
(Project-type technical cooperation)

The Government of Sri Lanka has been trying to foster small and medium-scale enterprises and to vitalize small-scale farming in order to develop rural areas and has established the Appropriate Technology Research and Development Centre (ATRDC) as part of its efforts. Japan has provided project-type technical cooperation to assist the manufacture of small machinery and parts and the development of low cost energy resources (wind power and fuel cells) at the ATRDC and to spread the achievements of the ATRDC to rural areas.

From 1995 up to the present, approximately 900 enterprises/factories out of a total of 5,981 enterprises/factories in Kurunegala where the ATRDC is located have enjoyed some type of service provided by the ATRDC and 120 Training College graduates have undergone further training at the ATRDC's Center Workshop. Many of these have established their own factories or are employed by factories, illustrating the positive impact of the project on the development of local industries.

Following the change of the industrial policy of the Government of Sri Lanka from the protection of domestic industries to market liberalization, low cost machinery has begun to be imported, eroding the price competitiveness of many types of the equipment and energy sources developed under the project. As the project involved the comprehensive transfer of technology, ranging from clarification of the needs for development, training and extension, the ATRDC is continuing its activities in those areas which are not in competition with imported products, such as the manufacture and improvement of special equipment and parts, etc., using the transferred technologies despite difficult conditions in terms of manpower and finance. As technological needs are continually changing, the continuous development of projects to sufficiently respond to changing needs demands conscious efforts to improve the general capability of the implementing organizations of projects, including the clarification of needs, development, training and extension instead of simply focusing on the transfer of technology in a specific area.

3) Middle East

Jordan:

Project for Improvement of Solid Waste Management in Major Local Areas
(Grant aid)

In view of the unhygienic situation in areas in Jordan where waste collection was not conducted because of a shortage and deterioration of waste collection vehicles in addition to the problems at final disposal sites of bad odor and natural combustion due to simple dumping instead of more hygienic landfill, Japan provided the necessary vehicles and equipment to improve waste disposal operation in local cities and rural areas under a grant aid project.

At the time of evaluation, all equipment provided under the project is fully utilized and waste disposal operation in the project areas has greatly improved. The expansion of the collection areas and increase of the collection volume have improved the environment and hygiene in the project areas, enhancing the beautification of urban areas. Positive effects are also observed at disposal (landfill) sites in the form of an improved state of hygiene and reduction of bad odor.

At present, while no major problems are observed from both the financial and technical aspects of waste collection operation, the required volume of spare parts is expected to increase with the aging of the vehicles and equipment in the coming years. In this context, it is desirable that the Jordanian side review the current waste disposal charge collection system to ensure adequate funding to cover the maintenance cost which will certainly increase.

Saudi Arabia:

Cooperation for Saudi Arabian Standards Organization
(Dispatch of experts)

Saudi Arabian Standards Organization (SASO) is the sole standards organization in Saudi Arabia and is responsible for the preparation, approval, and revision of national standards. Since 1980, Japan has dispatched more than 140 individual experts to SASO's Laboratories to conduct the technology transfer based on the standards system in Japan.

Despite such problems as the frequent transfer of counterparts and insufficient communication between the Japanese experts and counterparts, the cooperation method combining the provision of equipment and the acceptance of counterparts for training in Japan with the dispatch of experts playing a central role has proved to be quite effective, Generally the technology transfer has been carried out smoothly. With technical cooperation over a long period of time, the ability of the counterparts to prepare, manage, measure and test standards has shown marked improvement while the specialties of the Laboratories have been advanced as well. The counterparts have been able to learn not only measuring techniques but also know-how on planning and schedule control.

In the coming years, SASO will find it necessary to replace its analog equipment with digital equipment. Japan's provision of assistance for the further improvement of SASO's technical strength through the dispatch of short-term experts and other means while linking to the third country training program for "Safety Requirements for Electric Appliances," which is currently being implemented at SASO is desirable.

Turkey:

Istanbul-Tuzla Vocational and Technical High School Project
(Project-type technical cooperation)

Japan conducted project-type technical cooperation to improve the standard of training at the Tuzla Vocational and

Technical High School to assist the Government of Turkey, which was facing an urgent need for the training of electrical, electronic and computer engineers in particular as a result of the country's rapid industrial development.

The quality of the education at the school has markedly improved with the use of the teaching curriculum and textbooks prepared under the project and the school has become a model for the education of engineers in Turkey. The ability of the counterparts has also improved and most of the 61 draft textbooks prepared by them during the project period and the 27 books prepared and published without outside assistance following the completion of the project have subsequently been approved as proper textbooks by the Ministry of Education. The curriculum has also been approved and is now used by other technical high schools.

The Tuzla Vocational and Technical High School is trying to extend the latest technologies transferred from Japan to other parts of the country by means of organizing summer training courses for teachers of technical high schools throughout the country and training courses for personnel in the private sector. Given the limitations of the school in terms of its budget and manpower strength to constantly follow the development of new technologies, it is desirable that Japan assist its efforts from the side by seizing appropriate opportunities.

4) Africa

Malawi:

Ground Water Development Project
(Grant aid)

When this project was implemented, there was an urgent need in Malawi for the construction of water supply facilities for domestic and agricultural purposes in the face of a severe water shortage caused by drought and bad weather. The project involved the construction of wells in northern Kawinga, the area with the strongest need for such facilities. Spare parts were provided under follow-up cooperation in FY1995.

With the construction of wells, people in the project area have been able to obtain a sufficient quantity of clean water and the positive impacts of the project include the elimination of a water shortage in the dry season, an improved standard of hygiene, shortening of the time required by women and children to fetch and carry water and a reduction of water-borne diseases. As people in northern Kawinga are starting to permanently settle, agricultural productivity has improved together with improvement of the household economy.

Maintenance of the wells in the post-project years has been somewhat difficult because of the unavailability of spare parts for the French water pumps selected for the project in Malawi or neighboring countries and also because of the funding shortage on the part of the Government of Malawi. However, the provision of spare parts under follow-up cooperation in FY1995 has ensured that most of the wells are in working order today, more than 10 years since the completion of the original aid project.

Airport Equipment Maintenance Project
(Revitalization cooperation)

Lilongwe International Airport in Malawi was opened in 1982 with a Japanese yen loan. The Special Assistance for Project Sustainability (SAPS), which was conducted by the Overseas Economic Cooperation Fund (OECF) 10 years later, recommended the urgent rehabilitation and repair of the aged facilities and equipment and the assignment of a sufficient number of airport personnel for the safety of the airport. In response, a follow-up project was implemented by Japan for two years from 1993 to rehabilitate the functions of the airport.

The replacement and rehabilitation of the guidance system and the renewal of facilities and equipment under the follow-up project upgraded the facilities and equipment at the airport to international standards, improving the reliability of the airport. The maintenance skills of airport personnel were also improved to successfully achieve the project objectives. The assured reliability of aviation has contributed to a shortening of the travel time between Malawi and other countries and the promotion of trade and tourism together with the general economic growth of Malawi.

From the financial viewpoint, however, the operation and maintenance of Lilongwe International Airport are facing problems because of the low level of income resulting from the relatively small number of flights using the airport. In addition, not many of the counterparts to whom skills were transferred are currently working at the airport due to relocation and retirement, etc., indicating a need for Japan to provide after-care for the training of personnel on equipment maintenance and radar operation.

Tanzania:

Malaria Control Program
(Grant aid)

In Tanzania, where there is a nationwide hazard of malaria, which constitutes a serious threat to public health and the economic growth of the country, Japan implemented the Malaria Control Programme under the grant aid in two cities, i.e. Dar es Salaam and Tonga, which are centers for socioeconomic activities in Tanzania and which are areas strongly affected by malaria.

The program involved the construction of drainage ditches for a total length of 461,749 m, regular aerial spraying of insecticide, the scattering of polyethylene beads on 14,727 toilets and distribution of 26,494 insecticide-treated mosquito nets at cost price. As a result of the program, the proportion of malaria-carrying mosquitoes among all mosquitoes in those cities declined from 17.4% in 1988 to 1.1% in 1994, and the malaria contraction rate also declined by 25-30% from the previous level.

When providing cooperation for malaria control, it is important to strengthen the capability of municipal authorities responsible for the actual implementation of malaria control measures from the viewpoint of ensuring the continuity of

control activities. In addition, the ownership of local people must be built up by means of encouraging their active participation in local malaria control activities.

5) Latin America and the Caribbean

Mexico:

Mineral Processing Plant Operation Technology
(Project-type technical cooperation)

Mexico is promoting the modernization of the mining sector in its National Development Plan. As part of the modernization drive, the Comisión de Fomento Minero (CFM) prepared a modernization plan for its 17 mineral processing plants to improve the low productivity of small processing plants amidst the sluggish market for silver, a major mining product in Mexico. Under these circumstances, Japan conducted a development study and then provided project type technical cooperation for the Parral Mineral Processing Plant, one of the 17 plants run by the CFM, for the modernization of its operation.

Immediately prior to the implementation of the project, the new Mining Law was promulgated, abolishing the CFM. As a result, the project implementation body was changed to the Consejo de Recursos Minerales (CRM). Despite a delay in the assignment of counterparts due to this change, the introduction of Japan's mineral dressing management technology and the installation of modern instruments increased the actual yield at the Parral plant to a level of 8% to 10% higher than the national average and substantially improved the refined ore quality. The increased actual yield reduced the amount of dressing agent used and the amount of heavy metals accumulated at the slag dam, reducing the negative impacts on the environment. The transferred technology has now been extended to major mines throughout Mexico by personnel trained under the project and it is hoped that further extension to small mines will take place in the coming years.

At present, there is an ongoing process in Mexico of merging or combining small mining operations with large-scale operations and the importance of the Parral processing plant which serves small and medium-scale mines is declining. As a result, it is becoming difficult to secure the quantity of ore required to maintain the operation profitability. If this trend continues, it will be difficult for the Parral plant to secure sustainability in the future.

6) Oceania

Samoa:

Project for Reconstruction of Tuasivi Hospital
(Grant aid)

Samoa is situated almost at the center of the South Pacific and is an island country consisting of two main islands, Upolu and Savai'i, and other smaller islands. While Tuasivi Hospital on Savai'i Island was the main hospital on the island at the time of this grant aid project, its medical services were of a limited nature because of the deterioration of its facilities and equipment. Japan provided grant aid for the reconstruction of the hospital.

As a result of the project, Tuasivi Hospital has become capable of accepting local patients who used to be sent to the national hospital in Apia, the capital on Upolu Island. The number of patients treated has increased by 125% to 1,800 to 2,000 per month compared to the pre-project period and the bed occupancy rate has also increased by 70% to 74%. The number of tests carried out has increased by 150% as many new types of tests have become possible. The reduced burden on the health service in terms of time and cost has expanded the access of islanders to health services, generally improving the situation of health care on Savai'i Island. As the concentration of patients at the national hospital has been reduced, the project has contributed to improving the efficiency of the medical care system in the entire country.

The main factor for such positive impacts of the project is that the scale of cooperation was realistically and adequately designed based on proper verification of the maintenance capability and end user needs at the preliminary study stage.

Cooperation for Filaria Control
(Japan Overseas Cooperation Volunteers, Senior Overseas Volunteers, Training in Japan)

Filaria is a common disease in Samoa and a joint study conducted in 1964 by the World Health Organization (WHO) and UNICEF recorded a detection rate of as high as 21%. In collaboration with WHO, Japan has been continually providing technical cooperation since FY1976, mainly involving the dispatch of Japan Overseas Cooperation Volunteers (JOCVs), to assist the activities of Samoa to eliminate filaria.

Through the cooperation, the basic skills of the counterparts for filaria control have shown a marked improvement and the filaria detection rate has dropped to 1.1%, showing the considerable contribution of the project to an improved state of health of the Samoan people. In addition, the environmental beautification movement to prevent filaria has made it easier to control dengue fever which is carried by the same type of mosquito which carries filaria.

The long-lasting efforts of JOCVs and others have upgraded the technical skills of the Health Department's staff, who are now capable of conducting filaria eradication activities without external aid. It is hoped that the Samoan side will promote the filaria examination program based on self-help efforts in the coming years with assistance from the WHO.

Project for Reconstruction of Clinics
(Grant aid)

The Government of Samoa prepared a plan for the construction of local clinics to improve the country's medical services and Japan provided grant aid for the construction of a clinic at Leulumoega on Upolu Island and Sataua on Savai'i

Island. As the Sataua Clinic was severely damaged by a cyclone in 1990, Japan provided grant aid for the reconstruction of the clinic in FY1991. The proximity of the clinic site to the sea is believed to have been a possible contributing factor for the extensive damage, illustrating the importance of careful site selection in such countries as Samoa which face severe natural conditions.

Both of the clinics were found to be providing services which meet the medical needs of local people. Coupled with the fact that these clinics also provide emergence medical care assistance for the airport, port and factories nearby, it appears safe to conclude that the project objectives have been achieved. In the case of the Leulumoega Clinic, this clinic sends medical teams to nearby villages to provide medical services at the grassroots level through collaboration with local women's groups in addition to providing treatment at the clinic. The construction of these two clinics has greatly contributed to improving the health of local people, who had previously experienced difficulty in accessing medical services. The Leulumoega Clinic has also contributed to alleviating the excessive concentration of patients at the national hospital in the capital of Apia, on Upolu Island.

Samoa and Tonga:

Cooperation in the Fields of Transportation and Traffic
(Grant aid, Training program)

The development and maintenance of an efficient transport and transportation system is an important task for island countries in Oceania to proceed with socioeconomic development while overcoming such disadvantages as widely scattered islands, geographical isolation from the rest of the world and a small national land area and domestic market. In this context, Japan has provided grant aid for Samoa and Tonga for the construction of port facilities and assisted human resources development in these countries by means of providing opportunities for nationals to attend training in Japan as well as a third country training program.

In Samoa, the Mulifanua and Salelologa port, whose facilities were improved under the project, are now accessible by large ferries conducting three return trips a day between Upolu Island and Savai'i Island, the two main islands of Samoa. The number of passengers and vehicles using this ferry service substantially increased from 120,000 persons and 14,400 vehicles in 1983 to 414,000 persons and 36,000 vehicles in 1998, indicating its major contribution to increased activities in the domestic transportation sector. The similar improvement of the facilities of Port Apia under the project resulted in an increase of the cargo handling volume from 180,700 tons in 1986 to 258,631 tons in 1997. As the long-standing planned establishment of a port management authority since the time of project implementation has now been finally approved, it is expected that this authority will ensure an improved port management service and its economic sustainability.

In Tonga, a multi-functional tugboat provided under the project helps ships to safely come along side and depart from a pier, reducing the risk of damage to the hull of ships in the wharf. In addition, this tugboat is also used for disaster relief activities to deal with incidents involving a collision, grounding, ship fire and waste oil spillage, etc. and the safety around the wharf has been significantly improved. As a result, the number of ships calling at Queen Salote Wharf gradually increased from 122 in 1993 to 149 in 1997 and is expected to steadily increase in the future.

As maritime transport is an important sector for the economic development of Oceania, Japan's continual provision of cooperation in this sector, including port management, is desirable from the long-term perspective.

Ⅵ State of Efforts toward Items Recommended in the Last Year's JICA Evaluation Report

One of the important purposes of JICA evaluations is that evaluation results are fed back into cooperation in order to improve them. This section introduces the state of JICA's current efforts regarding the major lessons and recommendations cited in last year's evaluation report that should be considered when forming and implementing new projects.

While the lessons and recommendations mention follow-ups, which can be addressed immediately and items for improvement that are already being tackled, they also include the introduction of new systems and other tasks that necessitate ample discussion over a long period of time. Therefore, although lessons and recommendations cited in last year's evaluation report are not always reflected in cooperation at the present stage, these lessons and recommendations will continue to be considered in promoting the betterment of JICA projects.

1. Reflection in country-specific assistance approaches

In last year's evaluation report, there were numerous recommendations on the direction of JICA's future cooperation regarding the countries and sectors evaluated. Strengthening of the country-specific approach is currently being pursued at JICA. From the standpoint of effective and efficient cooperation implementation in each partner country, these recommendations are being reflected in the finding and formation of effective projects in the relevant country or sector through the dispatch of project formulation advisers, policy advisors and others.

(1) Cooperation in the agriculture sector in Zambia

In the thematic evaluation of agriculture in Zambia, it was pointed out that there are possibilities that the worsening of rural society stratification and poverty could occur along with the progress of Zambia's transition to a market economy. Therefore, it stated that an analysis of current conditions based on community residents' diversification and gender is necessary, and observed that agricultural products sales, road infrastructure and other elements of the distribution sector will become important objects of future cooperation. In response, JICA dispatched project formulation advisers who are currently working to formulate effective projects based on understanding and analysis of the current state of poverty in the country. In addition, experts in road policy sectors were dispatched and are now implementing support in the area of policy regarding road infrastructure development.

(2) Cooperation in the waste disposal sector in Honduras

In the thematic evaluation of waste disposal in Central America, it was pointed out that to get sanitation businesses on track, it will be necessary to develop a system for sanitation enterprises, secure financial resources and make considerations for efficient collection systems and suitable disposal systems. In response, JICA established a waste disposal improvement program and an improvement program for waste disposal equipment repair plant. This was done within one of its country-specific development issues for Honduras titled "Ensuring a Sanitary Living Environment," and is implementing development studies, follow-up cooperation for grant aid, country-focused group training, third country expert dispatch and other cooperation are being implemented.

(3) Cooperation in urban transportation and urban planning sectors in Thailand

In the joint evaluation of urban transportation and urban planning in Thailand, it was pointed out that the need is increasing for human resources cultivation regarding the so-called "software" aspects of management and urban redevelopment methods in Thailand's urban transportation and urban planning sectors. In June 1996, JICA initiated Development of the Method of Urban Development (Project-type technical cooperation) with the goals of developing urban development methods adapted to Thailand's socioeconomic conditions and training courses on urban development, and is supporting the cultivation of human resources in these sectors.

(4) Cooperation in the agriculture sector in Nepal

In the country evaluation of Nepal, it was pointed out that in the agriculture sector, development in the distribution of agricultural and livestock farm products will become important in the future in order to further promote the establishment and development of various technologies improved and upgraded through past JICA cooperation. For this purpose, from March 2000, JICA has been implementing the Agricultural Marketing Development Project, a development study on the development of distribution.

(5) Establishment of the Middle East Region-specific Assistance Committee

In the third party evaluation of the energy sector in Jordan, it was pointed out that in regions such as the Middle East that have undergone numerous changes through history in the international situation and relations among neighboring countries, it is necessary to fully take into consideration the historical and socioeconomic situation in formulating cooperation plans and cooperation conditions, and that the advice of regional experts is important. In response, JICA established a Middle East Region-specific Assistance Committee in FY2000, and provided a mechanism for obtaining advice from experts on the Middle East in the formulation of country-specific project plans for countries in the Middle East.

(6) Keeping track of the moves of other aid organizations when selecting cooperation sectors

In the thematic evaluation of advanced education in the agriculture sector in Indonesia and Thailand, it was pointed out that information about the moves of other aid organizations is indispensable in selecting cooperation sectors, because in some countries, similar requests may be made of multiple aid organizations at the same time. At JICA, development issues in country-specific project implementation plans are set and common perceptions with the partner country regarding future efforts shared through the holding of policy consultations and seminars with the counterpart organizations. Efforts are also being made to understand trends among other donors.

2. Sharing ideas with people involved on the partner country's side regarding the contents of cooperation

It was also mentioned that obtaining a clear common perception regarding project activities and their necessity among people involved, through holding workshops at the time of preliminary studies conducted prior to the start of cooperation, was useful toward effective and efficient project implementation. In the preliminary study stage, JICA holds local workshops for people involved in an effort to formulate suitable programs that are consistent with local needs based on shared perceptions concerning project purposes and activities. In grant aid projects such as the Project of Improvement of the Equipment for the Recollection and the Treatment of Solid Waste in the Metropolitan Area of Asunción in Paraguay, a software component scheme introduced in FY1998 was used to support the formulation of project plans.

3. Strengthening the preliminary study system

The importance of information gathering in the preliminary study stage in the formulation of suitable project plans was cited. In grant aid cooperation, study period and the number of study team personnel are adjusted in accordance with project contents, and local consultants are employed as appropriate in carrying out the gathering and analysis of the information necessary for formulating plans. When it has been determined that it will be difficult to gather and analyze the sufficient information necessary for considering the project in question within the framework of the preliminary study for grant aid cooperation, the implementation of a development study is considered. Conversely, when implementing a development study in a case where future grant aid cooperation can be assumed, JICA relates information to relevant departments in JICA and other aid organizations during implementation of the study, and makes efforts for good coordination between the development study and grant aid cooperation.

In addition to thorough collection of information, in FY2000, an appraisal system was introduced for project-type technical cooperation and grant aid in order to strengthen project examination and study functions at the formulation stage and realize more effective project formulation and implementation. Appraisal will set up preconditions for implementation, equipment and personnel input on the part of the partner country, the partner country's implementation mechanism, goals to be achieved and other items as important subjects, and will check these rigorously. The goals to be achieved will be set as much as possible according to quantitative indicators. If there is more than one organization involved, such as the implementing organization(s) and the organization(s) to which the counterparts belong, then special care shall be given during appraisal regarding each organization's area of jurisdiction and the locus of the responsibilities. In order to ensure that a shared perception of the project-to-be is developed, a steering committee, comprised of working members of each organization, will be held every month or so where the state of activities is notified to the people involved. Projects in sectors where privatization is expected in the near future, as well as projects aimed at the transfer of specific technologies that are likely to become obsolete soon, shall also be considered very carefully through appraisal.

4. Strengthening interim evaluation

It is very important for the smooth implementation of a project that both sides continue to reconfirm the state of execution of the partner country's budget and the problems of project implementation that were agreed to broadly before initiation of cooperation. For this purpose, a recommendation was made to strengthen the mechanism for interim evaluation. At JICA, in FY2000, project-type technical cooperation technical guidance teams were changed to focus on interim evaluation. The studies will utilize Japanese consultants and local consultants to evaluate project efficiency, impact and relevance based on the originally set Project Design Matrix (PDM). Through strengthening of this interim evaluation, it will be possible to more appropriately carry out project progress management and grasp problems in implementation. Moreover, it will be possible to reconsider and modify the project framework by adapting to project progress and changes in needs.

5. Strengthening feedback of terminal evaluation results of training programs

One of the important roles of evaluation is that its results are fed back in order to improve the cooperation. From this standpoint, it was recommended that, in order to ensure that results of terminal evaluation of training programs are appropriately fed back to training implementing organizations and lead to the implementation of more effective and efficient training, it is important to have a member of the training implementing organization present for evaluation. In response, JICA decided to bear the travel cost when necessary to gain the participation of the training implementing organization in terminal evaluation of training in an effort to strengthen the evaluation results feedback mechanism.

6. Strengthening the support mechanism on the Japanese side

Strengthening the support mechanism within Japan was recommended for the purpose of more effective and efficient project implementation in partner countries.

(1) Strengthening the monitoring system

In order to implement more effective and efficient cooperation, it is thought that in the future there will be more cases of cooperation involving a combination of JICA's various types of aid schemes. It was suggested that in cases where multiple aid schemes or JICA departments are involved, consolidating collaborative relationships and centralizing the monitoring system at JICA headquarters are important. In order to promote its country-specific assistance approach, in January 2000 JICA changed its structure to one based on regional departments. This ensures cooperation involving a combination of aid schemes, to be monitored appropriately by the relevant regional departments.

(2) Establishing the Domestic Support Committee

The construction of a domestic support mechanism with a high-powered organizational structure and technicians as its members is extremely important in the effective and efficient implementation of projects. In project-type technical cooperation, it has been customary to establish domestic support committees comprised of universities and other related organizations to provide organizational support for considering operation content and planning, the selection of experts and other matters. In setting up the committee, efforts are made to ensure that committee members function more as representatives of their respective organizations than as individuals so that backing from these organizations can be received. Domestic support committees are also set up whenever possible when implementing expert team dispatch programs.

(3) Diversification of human resources

In order to secure highly competent human resources who have ample insight regarding international cooperation, JICA is working to enhance its recruiting system including public advertisement for hiring experts.

(4) Strengthening the functions of JICA overseas offices

The most basic organization for making JICA's country-specific aid approach a practically effective one is the JICA overseas office. Therefore, JICA is continually making efforts to strengthen the functions of these offices. JICA employs knowledgeable people locally to work as overseas expert coordinators in an effort to upgrade the monitoring functions of the office. In addition, JICA implements training both in Japan and abroad for locally hired staff in order to improve their capabilities.

7. Improving Youth Invitation Programs

Youth Invitation Programs are comprised of local orientation[1)], a shared program[2)], a sectoral program (including a Tokyo program[3)] and a regional program[4)]), a field trip, evaluation and "aftercare" following return to the home country. The overall program is implemented with the cooperation of cooperation organizations in Tokyo and other regions. Last year's evaluation report included the results of thematic evaluation of Youth Invitation Programs for six ASEAN countries. This evaluation measured the impact of and identified problems in implementation of the programs, and offered lessons and recommendations which would contribute to future program improvements. JICA is now working on the following improvements to Youth Invitation Programs in response to these results.

(1) Program improvements

In order to increase the efficiency of training and exchange programs in Japan, JICA is reconsidering the contents and duration of local orientation based on the perception that the enhancement of local orientation programs is important. JICA is also working to enhance the content of the training seminar that is part of the Tokyo program, through getting an understanding of the needs of participating youth. Whenever possible, school visits are included in regional programs in order to promote development education for Japanese youth. In addition, through the Ministry of Education, JICA requests the cooperation of prefectural Boards of Education, universities and other organizations. Moreover, regarding the regional program's homestay, which is the centerpiece of the Youth Invitation Program, JICA has decided to strengthen its family recruiting system and to arrange homestays that match young people with families in the same business in order to promote human resources development through international exchange.

JICA is also working to expand the sectors covered by the program in accordance with needs. In FY1999, JICA implemented a program in a new sector under the Japan-ASEAN Youth Friendship Program in which participants from disabled persons welfare groups interacted with Japanese people who have disabilities. JICA will continue its efforts to accurately grasp needs and implement effective programs.

(2) Strengthening the implementation system

In the program planning phase, JICA works to promote information exchange and closer discussion among related organizations in order to ensure program consistency and effective and efficient implementation. Currently there are many cases in which the implementing organizations of the Tokyo and regional programs differ. However, JICA is now considering increasing the number of regionally integrated cases that are entrusted entirely to regional organizations.

Aftercare plays a very important role in terms of gathering information related to program creation, exchange and the strengthening of relationships with "alumni" associations in each country consisting of ex-participants. For this reason, further enhancement of the dispatch of aftercare teams from Japan is planned. JICA also plans to continue attending a liaison committee groups together the Youth Invitation Programs alumni associations in ASEAN countries and providing support to these associations.

Finally, to strengthen the program operation system, JICA will work to actively utilize Japanese youth who have participated in past Youth Invitation Programs.

(3) Improving recruitment of participants on the partner country's side

When selecting participants, JICA is working to take into account the regional distribution, male-female ratios, public-private sector ratios and other factors in order to gain participation by youth from a wide range of regions and career backgrounds. In its aftercare studies, JICA is also requesting partner countries to select youth who are proficient in English and match the relevant sectors, in order to implement efficient training and exchange programs.

8. Implementing effective research-type projects

The evaluation report pointed out that in order to promote the exploitation of the results of research-type projects in the real society, it is important to gain participation in the early stages of the project by persons actually involved in the field. Forming permanent functional research networks with other research institutions was also cited as important toward continuing the research activities.

These recommendations were reflected in the Education and Research Capability Building Project of Hanoi Agricultural University in Viet Nam (project-type technical cooperation), which started in September 1998. Under this project, local farmers and others involved in agriculture were actively sought for participation in studies of actual conditions pertaining to crop-producing land, vegetable processing plants, wholesale markets, pig farms, agricultural testing and research institutes and other subjects, and the project is working to promote practical research at the university. In order to arouse the teacher's interest and enthusiasm, workshops for teachers are held five times a year and an annual workshop with Can Tho University in the south is also held. The results of these workshops are distributed to individuals involved and related organizations. Furthermore, in order to ensure the continuation of research activities after completion of cooperation, JICA is carrying out systematic cooperation through a consortium led by Kyushu University and will work towards academic exchange through the Japan Society for the Promotion of Science (JSPS).

9. Improving cooperation methods in principal sectors

(1) The education sector

In the thematic evaluation of elementary school construction in West Africa, it was pointed out that, though Japan had so far only offered cooperation to the primary education sector in the "hardware" area of elementary school construction through grant aid, and that it is desirable that a step forward be taken to offer "software" cooperation as well toward the propagation of primary school education, including the preparation of educational statistics and the improvement of teacher quality.

Regarding cooperation in software areas, proposals for pilot projects that combine hardware and software aspects are planned for the Study on Regional Educational Development and Improvement Project in Indonesia, a development study currently underway. JICA is also seeking out effective and organic cooperation through joint projects in which Japan provides hardware cooperation and another donor provides software cooperation.

The evaluation also pointed out that cooperative working relationships with NGOs and residents' organizations are indispensable to elementary school construction projects, partly because these relationships help reduce construction costs and promote residents' participation. The evaluation recommended that it would be worth considering the possibility of cooperation in a form of providing building material, if conditions were appropriate. In this regard, JICA is keeping a close eye on actual conditions in partner countries and working to improve projects by implementing cooperation to provide building material when possible.

(2) The forestry sector

It was recommended that in cooperation involving the conservation and restoration of forests, because growing trees requires a long period of time and forests have public functions, the formulation, implementation and management of forest management and rural development projects should be carried out with the active participation of local residents based on the local government's forestry policy. In response, JICA is now supporting forest management and rural development activities by residents at the village level in the Forest Conservation and Afforestation Project Phase II in Laos (project-type technical cooperation).

In some forestry projects, privately owened land must be chosen for the project. Last year's evaluation report pointed out that, in order to ensure project sustainability in such cases, it is important to obtain full understanding of the project's content and significance from the owner providing the land. For this purpose, care is being taken in preliminary studies, especially in social forestry projects, to investigate general land ownership in the project region, who has the right to use the land and who will be implementing reforestation.

(3) The health sector

It was pointed out that the scope of hospital cooperation projects can be expanded beyond the hospital involved by investing the hospital with functions for educating and training other medical institutions. In response, in the Bach Mai Hospital Project (Project-type technical cooperation) in Viet Nam, which began in FY1999, the strengthening of functions for educating and training other medical institutions in the northern Viet Nam region was included in the cooperation contents.

(4) The fishery sector

It was mentioned that the proper management of natural resources is extremely important to the sustainable development of projects involving the fishery sector. Therefore, JICA gives full consideration to resource management and the environment when implementing projects in this sector. For example, JICA has dispatched resource management experts to fishery training

projects and water pollution and mangrove forest conservation experts in aquaculture projects. The contents of the Coastal Aquaculture Course (Third country training program) implemented in the Philippines from FY1994-FY1998 were revised in full consideration of resource management, and in FY1999 a new third country training program titled Responsible Aquaculture Development Course was initiated.

(5) The agriculture sector

The evaluation report cited integration of agricultural conservation technologies (cultivation techniques, etc.) and engineering conservation technologies (construction techniques), and coordination and cooperation with bureaus in charge of propagation as important for effectively spreading the results of agriculture sector projects at the level of individual farmers. At present, in cooperation in irrigation and drainage areas, for example, the transfer of farm management and cultivation technologies is also being carried out as necessary. JICA is also inviting people in charge at related bureaus as members of steering committees and otherwise working to further strengthen relationships with the bureaus involved.

The importance of deepening the awareness that, in development studies and grant aid cooperation, the real "project" starts at the time construction of facilities is completed and fully considering tie-ins with technical cooperation was also pointed out. In response, in the Japan-China Agricultural Technology Center Project in China, the study teams for both the grant aid portion and the project-type technical cooperation were dispatched simultaneously in an effort to coordinate the timing and scale of both cooperative projects.

10. Sustainable utilization of equipment

It was recommended that in order to sustainably use equipment provided, proper selection and fostering ownership of the partner country regarding equipment management should be promoted. For grant aid, JICA is making efforts in basic design studies to enhance as much as possible the efficient selection of equipment with appropriate specification and the verification of aftercare mechanisms. It is also supporting sustainable use of equipment by providing spare parts and other follow-up services when necessary. In project-type technical cooperation, JICA takes into consideration the ease of maintenance when selecting equipment, and to improve awareness of independent management on the part of the partner country, takes such measures as consulting with the partner country every time a study team is dispatched.

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1) Participants hear explanations of the training program to be offered in Japan and their trip and study Japanese conversation.

2) Participants hear lectures on culture, economics and history to enable a general understanding of Japan, and also study the Japanese language.

3) This is divided into a sector-specific program and a training seminar. In the sector-specific program, lectures and training are given in each sector, visits are made to related facilities and participants learn about conditions in Japan. The training seminar provides a forum for exchange with Japanese youth of the same age group involved in the same sector and exchanging views on a variety of subjects.

4) This is divided into a sector-specific program and a homestay program. In the sector-specific program, young people meet with their Japanese peers in regions outside Tokyo, attend lectures and receive training in the sector each participant is specialized in, and visit related facilities. The homestay program allows participants to stay in a Japanese home and experience the Japanese way of life and customs.

Ⅶ Results of Development Study Follow-up Studies

In development study projects, JICA supports the formulation of development plans for various public projects that play a role in the social and economic development of partner countries. In the process, it transfers planning and formulation methods and investigation and analysis techniques to the partner country. The study report that is prepared is used later when the government of the partner country determines policy for social and economic development and when international organizations and donor countries consider financial or technical cooperation.

Since FY1984, JICA has been implementing follow-up studies with the goal of clarifying points for improvement in development study implementation, through understanding current conditions and state of utilization and project formulation after development study implementation and organizing this understanding in a systematic way.

This section presents the results of follow-up studies implemented in FY1999.

1. Studies subject to follow-up

All past development studies (1,636 cases).

2. Study results

(1) Master plan studies, etc. (Master plan studies, basic studies, China factory modernization studies)

1) State of utilization

These studies account for 627 (38.3%) of the 1,636 cases subject to follow-up study.

Of these, 373 (59.5%) are master plan studies, 91 (14.5%) are basic studies and 109 (17.4%) are China factory modernization studies. The remaining studies in this group (studies on systems and software aspects focusing on the preparation of guidelines and manuals, aftercare studies, etc.) account for 54 cases (8.6%).

Of these 627 cases, 556 (88.7%) are being used effectively in forms such as the realization of projects proposed in reports and reflection in national development programs, and are in an extremely healthy state of utilization.

2) State of utilization by region, study type and sector

A look at utilization by region reveals utilization rates[1)] of 90% in Asia, 87.5% in the Middle East, 78.3% in Africa and 89.1% in Central and South America. As for studies in Oceania, Europe and studies covering more than one country, utilization rates fluctuate sharply because of the small number of cases.

Master plans are the most effectively utilized type of study, at 90.1%. The utilization rates for basic studies, China factory modernization studies and other studies are 89.0%, 86.2% and 83.3%, respectively.

Utilization rates by sector are 92.1% for social development, 93.3% for agricultural development and 83.2% for mining and industry development.

3) Details of progress and utilization

The results of development studies are used in a variety of ways, for example, when formulating national development plans and national projects, when the next study stage has been implemented based on the development study in question and specific plans for new projects are taking shape, and when fund procurement is achieved with an aim of bringing a project to reality.

Among projects proposed in the report that have been realized or for which specific plans have been made, many are cases where the next study stage is implemented and fund procurement realized within five years after the study is completed. Whether or not the study results are utilized seems to depend on the degree of consistency with later national development plans and the level of priority of the project.

4) Delayed, terminated and voided projects

Of the 33 delayed cases, 11 were delayed less than five years after completion of the study, 12 were delayed 5-10 years and 10 were delayed more than 10 years. Of the 38 terminated or voided cases, most were cases where the study had been completed more than 10 years before; 2 were terminated or voided within five years after completion of the study, 2 were terminated or voided after 5-10 years and 34 were terminated or voided after more than ten years.

Reasons for project delay, termination and voiding include decrease in the project's level of priority in the partner country's development, change in development policy and other policy-related reasons; factors resulting from the contents or scale of the proposed project; difficulty in procuring funds from foreign countries; the occurrence of natural disaster(s); and instability in public order and/or political situation.

5) Possibilities for raising utilization rate

It goes without saying that in order to improve the utilization rate of development study results, the project proposed in the study must be consistent with national plans of the partner country's government and be seen as a high priority. One way to raise utilization rate is to review unrealized projects whose development studies have already been completed and implement supplementary studies and other next-stage studies of the cases among these projects which are deemed to have potential for realization.

(2) Feasibility studies, etc. (Master plan studies + feasibility studies, feasibility studies, detailed design studies)

1) State of realization

These studies account for 1,009 (61.7%) of the 1,636 cases subject to follow-up study.

Of these, 743 (72.7%) are feasibility studies, 252 (25.0%) are master plan studies + feasibility studies and 23 (2.3%) are detailed design studies.

Of these 1,009 cases, 591 (58.6%) have produced or are in the process of realizing projects.

2) State of realization by region, study type and sector

Project realization rate[2] is highest in Asia at 63.5%, followed by the Middle East at 61.1%. It is 50.7% in Central and South America and 44.9% in Africa.

The most frequently realized type of study is of course detailed design studies, whose implementation is a prerequisite for project realization, at 78.3%. Next come master plan studies + feasibility studies at 65.5% and feasibility studies at 55.6%.

Project realization rates by sector are 69.1% for social development, 58.9% for agricultural and fishery development and 37.2% for mining and industrial development.

3) Details of realized projects and projects in process of realization

The 591 cases of realized projects and projects in the process of realization consist of: 264 realized projects, 154 partially realized projects, 127 projects being implemented and 46 in the process of realization.[3] A look at the process of project realization in these cases reveals many cases where the next study phases (e.g., detailed design study, engineering services, etc.) are implemented and fund procurement has been realized within five years of the completion of the study. Although in many cases the funds are procured from Japan in the form of yen loans or grant aid, there are also cases where funds are procured from international organizations or other donor countries, and cases where the partner country itself or the private sector provides the funds.

Factors promoting realization of projects proposed in development studies include the proposed project's priority level, beneficial impact, degree of consistency with national development plans and the project implementation mechanisms.

4) Cases in preparation for realization

There are 181 cases in preparation for realization, ranging from cases whose development studies have just been completed to those that are still pending more than 10 years after study completion. Of these cases, 51.9% are pending less than five years after completion of the study, 29.3% from 5-10 years and 18.8% for more than 10 years. Cases in preparation for realization include cases where a realization plan is certain to be or has already been requested; cases where request is under consideration or under preparation; and cases where a specific realization plan has not been formulated. Also among these are cases where the specific implementation plan regarding next-stage study and funds procurement are being carried out.

5) Delayed, interrupted, terminated and voided projects

There were 114 cases of delayed or interrupted projects and 123 cases of terminated or voided projects. Of the delayed or interrupted projects, 12 were delayed or interrupted less than five years after completion of the development study, 24 were delayed or interrupted for 5-10 years and 78 were delayed or interrupted for more than 10 years. Thus, about 70% of the delayed or interrupted projects have been that way for over 10 years. As for terminated and voided cases, one was terminated or voided within five years after completion of the development study, nine were terminated or voided after 5-10 years and 113 were terminated or voided after more than 10 years. The latter group accounts for 90% of these cases, a greater proportion than that for delayed and interrupted projects.

Reasons for non-realization of projects proposed by development studies include decrease in the project's level of priority in the partner country's development, change in development policy and other policy-related reasons; difficulty in procuring funds from foreign countries; tight financial conditions facing the partner country's government; and worsening of the economic situation in the partner country. Other factors that greatly hinder project realization include the occurrence of natural disaster(s), outbreak of civil war, and instability in public order and/or political situation.

6) Possibilities for raising project realization rate

One way to raise the realization rates of projects proposed in the feasibility and other study results, aside from discovering and formulating good new proposals, is to push forward development study cases that are being delayed or interrupted. There are more than a few development study cases which still remain in preparation for the realization phase, 5-10 years after the completion of the development study, which are likely to be further delayed or eventually terminated. Some delayed and interrupted cases have been in that state for a long time after study completion and are deemed unlikely to be revived as long as there is no prospect for procurement of funds. Therefore, another way to improve project realization rate of development study results is to consider measures for clarifying factors hindering project realization and for promoting project realization for cases still under preparation for realization more than five years after development study completion, and to formulate supplementary studies and other measures necessary for promoting project realization for cases with future potential.

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1) Utilization rate (%) = (No. of cases in progress of utilization or utilized / Total no. of cases) X 100

2) Project realization rate (%) = (No. of case where projects are already realized or in process of realization / Total no. of cases) X 100

3) Cases where source of funds has been established

Table 4 Outline of Study Results (Total number of studies: 1,636)

Object of study	Study type	Number of studies	State of application	Number of studies
Master plan studies	Master plan studies	373	Completely or partly activated	556
	Basic studies	91		
	Modernization of Chinese industry	109	Activation under preparation	33
	Other	54		
	Total	627	Total	589
Feasibility studies	Feasibility studies	734	Fully activated	264
			Partly activated	154
	Master plan studies + Feasibility studies	252	In operation	127
			Activation in progress	46
	Detailed design studies	23	Activation under preparation	181
	Total	1,009	Total	772