Chapter 2 Effective Approaches for Promoting the Use of Information and Communication Technology

2-1 Goals for the Use of IT

The important issues for the field of information and communication technology are to eliminate the digital divide and to provide digital opportunities in countries and regions, with a focus mainly on developing countries. The goal, therefore, is to use IT in a way that will tackle those challenges.

In addition, since IT is evolving and advancing rapidly, and all types of information are becoming digitized, the goals include the use of IT and digital content for other development issues and also effective and efficient use of IT in international cooperation as a whole.

This report describes specific approaches for promoting the use of IT based on the following four priority fields in Japan's "Comprehensive Cooperation Package to Address the International Digital Divide" announced prior to the July 2000 Kyushu-Okinawa Summit: 1) intellectual contribution to policy and institution-building, 2) development and training of human resources, 3) building IT infrastructure and providing assistance for network establishment, and 4) promoting the use of IT in development assistance. In this report 4) is divided into two areas: "improving efficiency and effectiveness of every sector through the use of IT" and "improving efficiency and effectiveness of development assistance through the use of IT." The latter relates to all the other Development Objectives, but we emphasize this point, because when knowledge is developed into content, globalized, and able to be distributed everywhere simultaneously, it has the potential for generating tremendous improvement in the efficiency and effectiveness of development assistance.

Given the above, five Development Objectives and corresponding Mid-term Objectives have been established as listed in Table 2-1.

Among these five Development Objectives, the following three have IT itself as a direct task and are will directly contribute to eliminating the digital divide and providing digital opportunities: 1. Strengthening Capacity for IT Policy Formulation, 2. Human Resources Development in IT, and 3. Improvement of Communication Infrastructure. The other two are concrete objectives for effectively and efficiently using IT and digital content: 4. Improvement of Efficiency and Effectiveness of every Sector through the Use of IT, and 5. Improvement of Efficiency and Effectiveness of Development Assistance through the Use of IT.

Table 2-1 Development Objectives Chart: Information and Communication Technology

Development Objective	Mid-term Objective
1. Strengthening Capacity for IT Policy Formulation	1-1 Establishment of Telecommunications Policy
	1-2 Establishment of Policy to Foster IT Industry
	1-3 Establishment of Policy to Eliminate Domestic Digital Divides
	1-4 User Protection
2. Human Resources Development in IT	2-1 Development of Engineers and Instructors
	2-2 Development of Policy Makers
3. Improvement of Communication Infrastructure	3-1 Provision of Communication Infrastructure
	3-2 Fostering Internet Service Providers (ISPs)
	3-3 Provision of Access Points
4. Improvement of Efficiency and Effectiveness of Every Sector through the Use of IT	4-1 Promotion of e-Government
	4-2 Promotion of the Use of IT in Every Sector (such as health-care, medicine, education)
5. Improvement of Efficiency and Effectiveness of Development Assistance through the Use of IT	5-1 Dissemination and Transfer of Existing Knowledge
	5-2 Sharing and Creation of Knowledge and Experience
	5-3 Use of IT in Project Implementation

2-2 Effective Approaches for Promoting the Use of IT

Development Objective 1
Strengthening Capacity for IT Policy Formulation

Development Objective 1 Strengthening Capacity for IT Policy Formulation

There are two aspects in goals of IT policies – economic progress and social consideration. The former is to optimize the supply of IT services through free competition, and the latter is to take social factors into consideration such as ensuring fairness for users who are often marginalized at the cost of pursuing economic efficiency and ensuring fairness in conditions of using IT.

Information and communication technology is made up of communication infrastructure, hardware, and software. The market structure and the relationship between the private sector and the government are different among communication services and the hardware and software industries. As a result, contents and directions of policies for promoting these industries are also largely different.

In addition, the field of IT requires not only policies that contribute to the growth of the overall industry on the provider side (such as telecom service providers and companies), but also policies that take into account fairness and protection on the side of the users.

Upon consideration of the above, four Mid-term Objectives have been established as indicated in Table 2-2 next page.

Table 2-2 Strengthening Capacity for IT Policy Formulation: Mid-term Objectives Chart

Goal of Policy		Mid-term Objectives
Economic Goal: Optimization of Supply	Complementary relationship	1-1 Establishment of Telecommunications Policy (Telecommunications Infrastructure)
		1-2 Establishment of Policy to Foster IT Industry (Hardware and Software Industries)
Social Consideration		1-3 Establishment of Policy to Eliminate Domestic Digital Divides
		1-4 User Protection

Mid-term Objective 1-1
Establishment of Telecommunications Policy

Policies suitable to every stage including state-owned enterprises, privatization and introduction of competition are needed.

Mid-term Objective 1-1 Establishment of Telecommunications Policy

The privatization and liberalization process in the telecommunications business takes a variety of shapes depending on the country, even in developed countries. Table 2-3 is a breakdown of the representative models for this process and the countries in which those models are observed.

Table 2-3 Models for the Introduction of Privatization and Liberalization

Model		Outline	countries
1	privatization + perfect competition	• privatization of state-owned enterprises • deregulated market entry	Malaysia, Philippines, New Zealand, Chile
2	privatization + gradual introduction of competition	• privatization of state-owned enterprises • monopoly/duopoly/oligopoly → to liberalization	Japan, England, Argentina, Mexico, Venezuela, Peru, Bolivia, Belgium, the Czech Republic, Denmark, Hungary, Italy, Australia, Hong Kong, Korea
3	liberalization (without privatization)	• continuance of state-owned enterprises • relaxed market entry restrictions	Brazil, Greece, Finland, Sweden, Colombia, India
4	private sector participation (without privatization or liberalization)	• granting concessions to the private sector • BOT (build/operate/transfer)	Thailand, Saudi Arabia, China

Although there are a broad range of models as indicated above, this report will discuss the second model that is observed in many countries including Japan, that is, the gradual process from state-owned enterprises to privatized monopolies to the introduction of the market principle, and will also address policy challenges at each of those stages. The issues commonly observed at each of the stages of this process and solutions for those are summarized as in Table 2-4.

Table 2-4 Issues and Resolutions at Each Stage

Stage	Common Issues	Solutions
State-owned enterprise	• Lack of investment capital • Lack of ability to keep up with technological innovations and increasing demands • Lack of incentive to become more efficient	• Increase profitability of operations • Recapitalization • Improve business operations (improve organization and management)
Privatized Monopoly	• Lack of a competitive environment • Stock held and controlled by the government	• Monitoring of rate setting and quality • Reduction of stock holding ratio →Expansion of private investment and introduction of foreign capital
Introduction of the Market Principle	• Market controlled by providers that dominate the market share (especially former state-owned enterprises) • Inhibited market entry (legal or institutional restrictions)	• Approval and monitoring of connection agreements • Introduction of a system for fair approval and authorization

At the state-owned enterprise stage, the issue of insufficient investment capital is a prominent one. Despite a high expected rate of return on investment in the telecommunications services, sufficient investment has not been made in developing countries[2]. Although privatization can serve as a fundamental solution to this issue, various circumstances such as the political importance of telecommunications infrastructure and job security of the employees at state-owned enterprises often make it difficult to achieve rapid privatization. Under these circumstances, first the business profitability of the state-owned enterprise must be improved in order to effectively use the limited investment capital. It is also important to provide assistance in the formulation of fair and reasonable plans for infrastructure development as well as assistance for sound management[3]. State-owned enterprises are often lacking in the ability to keep up with technological innovations and increasing demands and often do not have incentives to improve their service or to become more economically efficient. This situation results in "waiting applicants", or people who are unable to receive necessary services[4]. When formulating plans for improving infrastructure, it is essential to do it at a scale and with technology that is appropriate from both the short-term and the long-term perspective, while keeping business profitability in mind. Once these conditions are in place, work can be started on readying laws and institutional frameworks for privatization.

[2] According to World Bank, B. Wellenius and P. Stern eds. (1994), despite rate of returns of 20-30% or more, in the latter half of the 1980s investment of only 0.4-0.6% of the GNP on average was made in developing countries.

[3] Here the concept of "policy" is broadened and includes management plans for state-owned enterprises. This is because of the fact that at the state-owned enterprise stage the government's telecommunication policies and the business activities of state-owned enterprises are directly and closely interlocked. Related discussions are included in the Development Objective "Improvement of Communication Infrastructure," however, this objective deals with the specific infrastructure improvements that accompany direct investment.

[4] "Waiting applicants" are the cumulative total of subscribers who cannot use their telephones even though they have completed the procedures for subscribing to telephone service because the phone lines are undeveloped or do not connect.

Even if privatization is not followed through, policy options for issue resolution at the state-owned enterprise stage still remain, including the revitalization of private capital through the granting of concessions as observed in Thailand and China and authorizing market entry for the private sector while state-owned enterprises continue to operate as seen in Northern Europe.

At the stage following privatization, it is important to monitor providers in terms of the quality and charges of communication services. Following the privatization of the state-owned enterprise, the former state-owned enterprise is often allowed to monopolize the market for a specified period of time for various reasons, including allowing it to build up strength prior to introducing competition. When the market principle is not at work, it is essential to monitor whether inexpensive and quality service is being provided, through the approval of rates and business plans. At this stage, stocks are usually held by the government. However, it is necessary to slowly reduce the government's stock holding ratio and to introduce private investment and foreign capital.

At the stage in which competition is introduced, it is important to promote new entries into the market by doing away with regulations and systems that allowed market monopolization by the former state-owned enterprise while creating a fair competitive environment. It is necessary to gradually promote competition and aim for the goal of developing a sound industry by implementing business laws that allow new entry of providers and by allowing market entry of not only domestic capital but also foreign capital. The point for creating a fair competitive environment is eliminating control of the market by the former state-owned enterprise. Simply creating institutional frameworks for introducing competition without creating measures to deal with this point will result in insufficient competition. Because the former state-owned enterprise owns the existing infrastructure, in particular the lines that terminate at the users, in order for new entrant providers to supply end-to-end service they must connect with the former state-owned enterprise. Here it is vital to monitor from a public standpoint whether connection agreements have been concluded fairly. With respect to establishing connection rates and conditions, the government must check obstruction against market entry.

JICA's Activities

JICA's efforts in telecommunications policy have been made mainly through the Dispatch of Policy Advisors. In countries that are at the state-owned enterprise stage, JICA also conducts Development Studies to support the formulation of plans for improving infrastructure. However, JICA does not have much experience of cooperation in both of these areas. In the future, it is important to build effective assistance models that correspond to the stage of the telecommunications market in the target country.

With respect to providing support to the operations of state-owned

enterprises, JICA has dispatched advisors on operation and management frameworks and on formulating plans for improving infrastructure towards Laos. Development Studies have also been conducted to formulate a master plan for development of infrastructure, and advisors on the administration of communications have been dispatched to Laos. If these efforts are well-linked and complement each other, they can be used as model case for cooperation at the state-owned enterprise stage.

As for cooperation in the stage following privatization, JICA has dispatched policy-related Experts to Indonesia and the Philippines. In Indonesia's "Telecommunications Policy Advisor" project, cooperation by Experts included comprehensive efforts such as developing a fair competition environment, establishing rate policies, building a system for interconnection, and a Universal Service Obligation[5].

Mid-term Objective 1-2
Establishment of Policy to Foster IT Industry

The private sector should take a leading role and the government should formulate the minimum necessary policies.
Examples of policies:
- Maintenance of a competitive environment
- Promotion of private investment and foreign capital
- Technological neutrality
- Activities to encourage technology R&D
- Protection of intellectual property

Mid-term Objective 1-2 Establishment of Policy to Foster IT Industry

IT-related industries are defined as hardware and software industries here, and Mid-term Objectives for these have been established separate from those for telecommunications services. As compared with the telecommunications service industry, the dependence on infrastructure and facilities here is smaller and the barriers to market entry are lower, resulting in much different interactions between the government and providers. The bottom line is that the private sector should always play a leading role, applying unnecessary regulations should be avoided, and policies should be kept to the very minimum.

The following are considered to be important for the development of sound IT-related industries:

- Maintenance of an open and active competitive environment
- Promotion of private investment and foreign capital
- Technological neutrality
- Assistance to research and development (R&D)
- Protection of intellectual property

Efforts in the area of policies for fostering the industry include preferential treatment in terms of tax systems and finances to promote investment and industrial activity. It is also important to promote and encourage research and development from a long-term perspective, although it may not contribute to the short-term profitability of private sector companies.

To maintain technological neutrality, although the approaches may differ even among industrialized nations, it is important to promote competition between a wide variety of technologies and to provide and sustain a market environment in which the best technology self-selects, rather than to promote a

[5] Universal Service Obligation (USO) is the obligation to provide good service to all users at an affordable cost.

specific technology through policies[6].

It is important to protect intellectual property rights in order to maintain the incentive for developing new products in the overall industry and to establish status as an international market. In addition, with protection of intellectual property, it is significant to not just introduce regulations and laws, but to strengthen a framework for ensuring that they are actually enforced.

In terms of developing a fair competitive environment, it is important to monitor and arbitrate actions that attempt to control the market through the network externality that is inherent in the field of IT, as was seen in the Microsoft case in the United States.

Furthermore, it is absolutely essential to develop human resources who can formulate policies for fostering the IT industry as mentioned above.

JICA's Activities

JICA has dispatched policy advisors on IT to Thailand and Multimedia Policy Advisors to Malaysia. In both cases, the main goal was to promote research and development activity in the field of IT and advice was made on how the government can best promote technological development through policies. From the perspective of promoting research and development, target countries are limited depending on the level of development.

Finally, since the protection of intellectual property rights is an issue that is not limited to the field of IT but is also dealt with in cooperation frameworks that are related to industrial property rights, this issue will not be discussed here.

Mid-term Objective 1-3
Establishment of Policy to Eliminate Domestic Digital Divides

Mid-term Objective 1-3 Establishment of Policy to Eliminate Domestic Digital Divides

The domestic digital divide is not limited to regional disparity, but there are also disparities with socially vulnerable groups (such as the poor, women, minorities, and disabled persons). Bridging each of these gaps and enabling all persons to equally enjoy the benefits of information and communication technology are important policy issues.

As for regional disparities, it is necessary to establish the frameworks to provide support for the development of infrastructure in rural areas where there is little expected profitability. When the fixed communications network is being operated by a monopolistic provider, it is necessary to ascertain whether fair consideration is being given to rural areas when approving rates and business plans. Meanwhile, in countries that have introduced competition it is important to create frameworks (Universal Service) to provide service broadly to all people. An example of this is in the U.S. where there is a system to collect a

[6] Policies that ensure that compatibility is obligatory are needed from the perspective of eliminating any inefficiency resulting from the co-existence of a wide range of technology standards in the market.

- For regional divides – develop rural infrastructure
- For consideration to socially vulnerable groups – support ISPs for low income earners and the disabled and develop and popularize content that promotes social independence

single, uniform tax from all users and to give as a subsidy to providers who are voluntarily developing infrastructure in rural areas.

In terms of giving consideration to socially vulnerable groups, it is effective to establish systems that publicly support the establishment and operation of ISP services for those in lower income brackets and for the disabled (such as visually or hearing impaired). In terms of policies, it is also effective to **assist in the development of content that can promote social independence** and to **support the popularization of the Internet** through partnerships with NGOs.

JICA's Activities

As previously mentioned, JICA is dispatching Experts as policy advisors in areas including policies to promote the development of infrastructure in rural areas, such as the Dispatch of Experts for "Telecommunications Policy Advisor" project in Indonesia. Also, in formulating master plans for infrastructure development through Development Studies, JICA has carried out cooperation efforts in countries including Viet Nam, Mongolia, and Ethiopia with a focus on expanding communications networks to rural areas. Furthermore, in the new type of assistance "The Study on Enhancement of Info-Communications Access in Rural Communities," JICA has carried out cooperation in contributing to the elimination of the digital divide in rural areas through such efforts as the establishment of pilot Rural Internet Centers (RIC).

JICA's efforts thus far have focused on "hard" aspects such as how to best expand telecommunications infrastructure to rural areas. In the future it is necessary to continue such efforts while also filling the needs in terms of "soft" aspects such as in providing content that of use to socially vulnerable groups and for people living in rural areas as well as content that contributes to social welfare.

Mid-term Objective 1-4
User Protection

- Protection of personal information
- Ethical regulations
- Monitoring of unfair contracts and transactions
- Security maintenance

Mid-term Objective 1-4 User Protection

Protecting the users (individuals and organizations) of IT related services and products is an important policy issue for sound industrial development. Particularly important themes include **the protection of personal information, ethical regulations, monitoring of unfair contracts and transactions, and security response such as protection against unauthorized access.** All of these require more than just the creation of a framework that includes systems and regulations, but also the development of organizational capacity to enforce these. It is also necessary to increase knowledge and awareness on the part of users.

JICA's Activities

Although JICA has almost no track record of cooperation focused on this area, there have been some experience as a component of the cooperation through Experts dispatched as Policy Advisors. In the future as well, **it would be difficult to extend cooperation efforts with focus on this area**, and it is probably more realistic and effective to **carry out cooperation or to make recommendations in order to support telecommunications policies and the development of infrastructure in rural areas.**

Development Objective 1 Strengthening Capacity for IT Policy Formulation

Mid-term Objective 1-1 Establishment of Telecommunications Policy			
Indicators: ①Number/rate of service subscribers, ②Scale of telecommunications industry, ③Degree of liberalization			
Sub-targets of Mid-term Objectives	**Examples of Activities**	**Case No.**	**JICA's Main Activities**
Support for Improvement of Management of State-owned Enterprise ①Decline in number of waiting applicants ②Improved balance of income and expenditures in state-owned enterprise ③Increase in amount invested in infrastructure	◎Support for the formulation of national development plans ○Improvement of the management of the state-owned enterprise △Support for the formulation of policies for the shift over to privatization	10, 12, 15, 18 1, 10, 11, 12, 14 13	Formulation of telecommunications development plans (Development Study) Support for management and operation systems (Development Study/Training) Support for policy formulation (Experts)
Regulations on Private Monopolies ①Decline in number of waiting applicants ②Improvement in capital structure (percentage of government-owned capital) ③Increase in amount invested in infrastructure ④Increase in amount of foreign capital input	○Support for the establishment of a system for regulations on providers (monitoring service levels and established charges) ×Support for the formulation of policies for introduction of foreign capital ×Support for policies that promote private investment	4	Establishment of policies for charges and development of a fair competitive environment (Experts)
Introduction of Market Principle ①Number of new market entries ②Increase in the scale of the telecommunications industry ③Decline in the service charge of communications	×Support for the formulation of policies for introduction of foreign capital ×Support for policies that promote private investment ×Support for deregulated market entry ○Support for the formation of a competitive market (monitoring system on actions by the former monopolistic provider that would block new market entry)	3, 6, 8, 16	Polices for interconnectivity of communication providers, and Industry fostering plan (Experts/Training)

Mid-term Objective 1-2 Establishment of Policy to Foster IT Industry

Indicators: ① Scale of the IT industry, ②Share of IT-related industries, ③Amount of private sector IT investment, ④ Significance of the IT industry in the national economy

Sub-targets of Mid-term Objectives	Examples of Activities	Case No.	JICA's Main Activities
Establishment of Direction and Policy for Fostering IT Industry ①Existence of laws or government policies ②Existence of exclusive organizations	△Advice on the direction of fostering the IT industry ×Formulation of policies on IT-related privatization △Formulation of policies on IT-related investment promotion ×Formulation of policies for introduction of IT-related foreign investment △Support for developing and enforcing laws and ordinances related to information and communication	5, 6, 9	Formulation of basic plans for promoting IT, recommendations related to specific administrative provisions in the IT industry, long-term plans for fostering the industry, and plans to promote research and development (Experts/Training)
Establishment of Systems to Protect Intellectual Property Rights ①Existence of laws related to protection of intellectual property rights ②Existence of exclusive organizations	○Support for developing laws related to protection of intellectual property rights ×Support for establishing and operating organizations for protection	58, 59, 60, 61	Development and enforcement of legal framework (Technical Cooperation Project, Development Study)
Development of Policy Makers (High Level Human Resourses)	○Support and training for development of high level human resources	2, 17, 23	Executives' Seminar (Training)

Mid-term Objective 1-3 Establishment of Policy to Eliminate Domestic Digital Divides

Indicators: ① Regional differences in Internet use, ② Regional differences in fixed and mobile telephone subscription, ③ IT use by vulnerable groups (the poor, disabled, women)

Sub-targets of Mid-term Objectives	Examples of Activities	Case No.	JICA's Main Activities
Establishment of Policy to Promote Development of Infrastructure in Rural Areas ①Increase in user ratio in rural areas	○Support for the introduction of systems to assist rural development (Universal Service)	4, 7, 8, 15	Development of rural communication networks, support for formulation of plans to increase regional information (Experts/Development Study)
Improvement in IT Literacy ①Existence of policies to improve literacy ②Increase in user ratio among the poor ③Literacy surveys	△Promote the use of the Internet △Systems to assist services that provide relief to vulnerable groups	7	Increasing regional information through the use of Regional Internet Centers (RIC) as a base (Development Study)

Mid-term Objective 1-4 User Protection

Indicators: ①Number of claims and handled claims against related organizations

Sub-targets of Mid-term Objectives	Examples of Activities	Case No.	JICA's Main Activities
Development of Laws for User Protection ①Existence of laws or government policies	×Training for related personnel △Development of security systems ×Development of systems to protect personal information ×Development of systems to protect consumers ×Development of systems to prevent unauthorized access	6	
Establishment of Dispute Settlement Organizations ①Existence of exclusive organizations	×Establishment and operation of dispute settlement organizations		
User Education ①Situation of User protection	×Support and training for user education		

Examples of Activities:
◎→JICA has considerable experience
○→JICA has certain experience
△→JICA has experience as a component of projects
×→JICA has little experience

Development Objective 2
Human Resources Development in IT

Mid-term Objective 2-1
Development of Engineers and Instructors

It is important to secure both the quality and quantity of engineers.
Qualitative improvement: Creating or improving certification systems and registration systems
Quantitative expansion: Development of working people. Human Resource Development at the educational stage.

Development Objective 2 Human Resources Development in IT

Mid-term Objective 2-1 Development of Engineers and Instructors

In developing engineers, it is important to **meet both qualitative and quantitative needs by ensuring at least a certain number of personnel with a certain technical level.**

Ensuring the technical level of personnel requires some sort of certification exam or registered engineer systems. For instance, in Japan the Ministry of Economy, Trade and Industry (formerly the Ministry of International Trade and Industry) has been holding its Data Processing Technicians Examination since 1969. Also, the e-Japan framework of the Japanese government includes many project plans such as the Formulation and Popularization of IT Skills Standards, an effort to standardize the assessment standard of high level IT capacity used in determining the proficiency of IT skills while adjusting to international standards and the Promotion of the Asia e-Learning Initiative, which is the mutual authentication and dissemination of skills standards for data processing engineers.

In particular, since the environment surrounding IT sector changes very rapidly, systems must continuously change with the times even after they have become institutionalized. In fact, this system in Japan has undergone two major reviews in 1994 and in 2001 and has added new qualifications in order to reflect industry trends. Accordingly, when considering all the types of cooperation, not only the establishment of systems but also **mechanisms to continuously review contents are required**.

If a framework for objectively and concretely evaluating technical levels according to the conditions at that time is established internationally, it will promote international mobilization and more appropriate treatment of human resources and will eventually lead to the assurance of new human resources.

Although recipient countries tend to want to learn state-of-the-art skills and techniques, it goes without saying that it is important to consider the applicability and cost effectiveness of the training for the recipient country, and assistance should instead be centered on teaching more established skills and techniques.

Meanwhile, from the standpoint of ensuring enough human resources in numbers, two aspects in terms of the target population are necessary to be considered. The first aspect is to **familiarize the adults already active in society with IT**, such as government employees and private sector employees. **IT itself is not the ultimate goal but rather merely a means to achieve other goals**, and since these people already have practice in business, immediate

effects of learning IT skills would be expected. Another aspect is to develop the younger people that will go out into society in the future while they are at the educational stage. From a long-range perspective it is necessary to conduct training for fostering new engineers at the higher education levels, but also more importantly IT should be actively introduced at the elementary and secondary levels in order to enlarge the base population of potential engineers. At the same time, it is important to **continue the widespread development of human resources who have acquired computer literacy as a basic ability**.

It is required to develop instructors to foster engineers. Quality of instructors should be more emphasized than their quantity.

Furthermore, raising education levels **requires instructors who can develop engineers**. Here, we must give consideration to the role and responsibilities of instructors, and **emphasis should be placed on developing high quality instructors** rather than simply increasing those in numbers. There is a wide range of possible cooperation partners, such as vocational schools, polytechnics, institutions of higher education, and research institutes.

IT-related training at the Okinawa International Centre

JICA's Activities

JICA Okinawa International Centre has been holding computer courses and carrying out Multimedia Technology for Education and Communication (MTEC) since it opened in 1985. The initial computer courses started out by using hosts for courses to develop data processing engineers, and over the years the content of the course was periodically reviewed. As a result, from FY1993 the courses were divided equally between hosts and C/S (client servers) and since FY1997 training on hosts has been eliminated and all training has been shifted to C/S. As of 2003 nine types of courses are held 12 times annually, and in them approximately 140 engineers in total are trained every year including: network engineers, web designers, database engineers, system analysts, IT administrators, and IT instructors. MTEC courses began as audio-visual technical courses that were mainly focused on technology for taking and editing photographs and videos. However, following that the creation of educational materials was added, and training has shifted to the present concept of multimedia technology as a means for education and communication. Currently approximately 25 participants are trained every year in fields such as multimedia production for education and digital video production.

Training in the rapidly advancing field of IT **must always be revised in order with the times** so that technical trainings as needed by developing countries can be conducted.

In the rapidly advancing field of IT, the content of technical cooperation must be continuously reviewed.

In the "Human Resource Development in Information Technology" project in Sri Lanka, efforts have been concentrated on developing content developers for WBT (Web Based Training) and IT trainers. In the "Information Technology Training" project in Viet Nam, a training course has been set up for Hanoi University of Science to provide trainer's training such as carrying out cooperation to provide management know-how.

Other recent notable achievements include increased cooperation for higher education institutions such as universities and polytechnics in addition to the research institutes of government agencies. From the long-term perspective of expanding the base of engineers, JICA has been greatly contributing to the development of future engineers.

Coaching of teachers is also increasing at the sites through volunteer projects.

Furthermore, some of the activities of groups such as JOCV and Senior Overseas Volunteers at the actual educational sites have included developing and training teachers as well as students.

Mid-term Objective 2-2
Development of Policy Makers

Mid-term Objective 2-2 Development of Policy Makers

In order to formulate and implement appropriate policies regarding IT, it is important that policy makers understand the significance of IT and the points of concern for promoting the use of IT, that they formulate measures in line with the actual conditions of their countries, and then those are appropriately implemented. To do so, it is necessary to conduct training to improve the capacity of these policy makers.

JICA's Activities

JICA is carrying out projects in this area including: Dispatch of Experts as Advisors to Laos in the "Advisor on Telecommunication Policy to the Cabinet Office" project, to Indonesia in the "Telecommunications Policy Advisor" project, to Thailand in the "IT Policy" project, and to the Philippines and Malaysia in the "Telecommunications Policy Advisor" projects; and through a Development Study in Myanmar in the "Assistance in Structural Adjustment of the Myanmar Economy (IT Industry)" project. In these cooperation efforts, JICA is not simply giving advice or offering the results of Development Studies, but also is contributing to the development of policy makers in those countries through the processes.

Also, the JICA Tokyo International Centre is conducting training on "Telecommunications Policy Advisors." It provides courses on Japan's past experience, background, process, current status, and policies related to the privatization of its telecommunications business for policy makers at the department chief level from agencies that are in charge of telecommunications. Through these courses, JICA is supporting the formulation of regulations and policies that will accompany the privatization of the telecommunications business.

Development Objective 2 Human Resources Development in IT

Mid-term Objective 2-1 Development of Engineers and Instructors

Indicators: ① Supply and demand conditions in each technical field, ② Standards for technical level

Sub-targets of Mid-term Objectives	Examples of Activities	Case No.	JICA's Main Activities
Expansion of Content ①Number of Web pages created in the own country ②Number of times content is accessed	◎Transfer of Web content creation technology ◎Transfer of multimedia content creation technology ○Promote the creation of local content	27, 31, 32, 36, 57 32	Various human resource development (Technical Cooperation Project) Creation of educational content (Technical Cooperation Project)
Development of IT Engineers ①Number of network engineers ②Number of database engineers ③Number of Web engineers ④Number of security engineers	◎Transfer of network technology ◎Transfer of database technology ◎Transfer of Web technology ◎Transfer of security technology ◎Creation of content for technical transfer ◎Use of JICA-Net in technical transfer ×Support for creation of local fonts and FEPs ×Support for technology to create low-cost PCs ○Promotion of the use of open and free software ○Vocational training (technical transfer of skills useful for competing in the industry, occupational skills training) ◎Technical transfer of other special information technologies (including AI, CAD/CAM, GIS, GPS)	19, 20, 32, 33, 36 32, 33,34, 36 32, 34, 36 72 32 21 26, 29, 31, 41	Various group training courses (multiple courses) Various types of human resource development (Technical Cooperation Project) Support for institutions of higher education (Technical Cooperation Project)
Increasing and Improving Educational Institutions ①Number of schools specialized in IT ②Number of IT related instructors	◎Development of facilities for IT-related education ◎Provision of IT-related equipment and materials ○Support for research and development (R&D) ◎Support for degree program courses ◎Development of instructors for IT	31, 32, 36, 46 9, 36 31, 41 24, 32	Various types of human resource development (Technical Cooperation Project) Support for institutions of higher education (Experts/Technical Cooperation Project) Support for educarion IT (Training/Technical Cooperation Project)
Technological Improvement in the Field of Communication ①Number of engineers in communication network maintenance ②Number of engineers in high-speed communication network	○Technical transfer of communication network maintenance ○Support for high-speed communication networks technology.	34, 38	Development of telecommunications engineers (Technical Cooperation Project/Training)

Mid-term Objective 2-2 Development of Policy Makers

Sub-targets of Mid-term Objectives	Examples of Activities	Case No.	JICA's Main Activities
Development of Administrative Human Resources ①Number of personnel to be trained per administrative organization	◎Human resource development training of government officials at the actual working level	9, 13, 22, 23	Dispatch of Experts as Advisors Fostering of government officials (Training)

Examples of Activities:
◎→JICA has considerable experience
○→JICA has certain experience
△→JICA has experience as a component of projects
×→JICA has little experience

Development Objective 3
Improvement of Communication Infrastructure

Development Objective 3 Improvement of Communication Infrastructure

The term "information and communication technology" is broadly used as an extension of the concept of multimedia that has existed for a long time. IT is generally thought of as an amalgamation of data processing, telecommunications, and broadcasting. In particular, these days, as the use of the Internet and network technology has become even more important, there is growing focus on how to effectively use information and communication technology (IT) in all sectors of social activity.

Promoting the further use of IT requires supporting policies, developing human resources, and carrying out activities that are specific to individual sectors – but to make those possible, the communication infrastructure must first be improved. The following is a discussion of the direction of cooperation indicated in each of the following Mid-term Objectives with respect to this Development Objective.

Mid-term Objective 3-1
Provision of Communication Infrastructure

Mid-term Objective 3-1 Provision of Communication Infrastructure

In the case of communication infrastructure, it is necessary to consider the backbone network and access network separately, from the standpoint of the function of the communications network. Moreover, in developing countries, it is necessary to also deal separately with the aspect of infrastructure development in rural regions.

Consideration of three aspects:
- Backbone network
- Access network
- Rural infrastructure

When developing backbone networks, even in developing countries, it is inevitable to progress in the direction of introducing packet communication-based IP networks. Difficulty in predicting the demand for mobile phones and Internet use makes it important to consider how much extra potential communication capacity should be built in the communication network and also makes it a challenge to ensure its reliability.

With respect to access networks, objectives include noise reduction and other improvements in transmission quality, along with accelerating the introduction of fiber optics.

In developing infrastructure in rural areas, important objectives include resolving the issue of regions with no telephones and providing communication infrastructure that contributes to industrial development in the region. Attaining these objectives not only requires a great deal of expenditure, but it is impossible to obtain balanced income and expenditures in the short term through the collection of user fees. Therefore, when implementing these types of measures it is important to make careful and detailed plans that are tailored to the conditions of the recipient country in terms of the pace of implementation, appropriate technology, securing a budget for required expenditures, and the possibility of raising funds for the project.

Mid-term Objective 3-2
Fostering ISPs

Mid-term Objective 3-3
Provision of Access Points

Mid-term Objective 3-2 Fostering Internet Service Providers (ISPs)

Mid-term Objective 3-3 Provision of Access Points

In this area, there are vast differences in needs depending on the development stage of the country and even within the same country the forms of cooperation can be quite different between major cities and rural areas.

For example, in terms of fostering Internet service providers (ISPs), an important objective in countries that are at relatively advanced stages of development or in major cities is to increase the number of access points and accelerate transmission speed. In countries that are at lesser stages of development, however, the government may actually have to take on the function of provider.

In any event, achievement in this area will be measured by the degree to which it is possible to use the Internet.

JICA has considerable experience in developing communication infrastructure, but its share is declining due to the trend of privatization of telecommunications business.

JICA's Activities

JICA's efforts in developing communication infrastructure thus far have included many examples of cooperation as "Telecommunications Network Development Plans" and future activities can continue primarily as an extension of these efforts.

It should be noted, however, that **the percentage represented by this sector in Japan's ODA has been declining because the privatization of the telecommunications business in industrialized nations has also had a great effect on developing countries.** In the future, it will be desirable to have a framework that allows flexible response according to the conditions and needs of the recipient country.

Development Objective 3 Improvement of Communication Infrastructure

Mid-term Objective 3-1 Provision of Communication Infrastructure

Indicators: ①Telephone prevalence rate, ②Number of people able to use the Internet

Sub-targets of Mid-term Objectives	Examples of Activities	Case No.	JICA's Main Activities
Provision of Backbone Network ①Degree of potential communication capacity ②Network reliability	×Introduction of a public communication backbone ◎Increase in communication infrastructure ×Support for the introduction of third generation mobile phones ◎Rehabilitation of old lines ×Installation of VSAT ○Installation of other specific purpose communication networks	44 44, 42 43	Development of telephone networks (Grant Aid/JOCV) Replacement of overhead telephone lines and exchanges (Grant Aid/JOCV) Construction of a network for observation (Grant Aid)
Provision of Access Network ①Transmission quality ②Rate of diffusion of fiber optics	△Promotion of the development of fiber optics ×Installation of Internet Exchanges (IX) ×Support for introduction of IPv6	44	Improvements to telephone network infrastructure (Grant Aid)
Provision of Infrastructure in Rural Areas ①Resolving the issue of regions with no telephones ②Promotion of regional industry	△Increase in telecommunications infrastructure ×Installation of VSAT ×Expansion of communication region through partnerships with the private sector	7, 15	Plans for developing communication networks (Development Study)

Mid-term Objective 3-2 Fostering Internet Service Providers (ISPs)

Indicators: ①Number of people able to use the Internet

Sub-targets of Mid-term Objectives	Examples of Activities	Case No.	JICA's Main Activities
Expansion of Access Points ①Number of access points	×Installation of access points		
High-speed Communication ①Transfer speed ②Areas available with Broadband ③Distance available with Broadband	×Technology transfer of xDSL, FTTH ×Promotion of change to xDSL, FTTH		

Mid-term Objective 3-3 Provision of Access Points

Sub-targets of Mid-term Objectives	Examples of Activities	Case No.	JICA's Main Activities
Provision of Public Access Points ①Number of public access points ②Number of public access point users ③Increase in hours of use at public access points	△Installation of public telephones ×Village phone △Establishment of MCTs (Multipurpose Community Telecenters) △Establishment of Internet kiosks ×Development of IT hardware at public facilities in communities (government agencies and ministries, local governments, educational institutions)	15 7 7	Plans for developing communication networks (Development Study) Promotion of regional expansion of the Internet (Development Study)

Examples of Activities:
◎→JICA has considerable experience
○→JICA has certain experience
△→JICA has experience as a component of projects
×→JICA has little experience

Development Objective 4
Improvement of Efficiency and Effectiveness of Every Sector through the Use of IT

Development Objective 4 Improvement of Efficiency and Effectiveness of Every Sector through the Use of IT

The use of information and communication technology is not limited to industrial sectors such as the electric industry, the software industry, and the communications industry. Through computers and a variety of work systems produced by those sectors, IT is facilitating more efficient office work and activated flow of information through networks inside organizations (intranets) and via the Internet. This facilitation further contributes to rationalization of the work of not only industrial sectors, but also of administrative bodies such as governments and local governments as well as to improving the efficiency of all sectors including agriculture, healthcare and medicine, and education. As for industrial sectors, it is expected that improved work efficiency will increase the international competitiveness of industries and will lead to the creation of new industries.

In using IT, it is clear that simply introducing computers and work systems will not lead to improved work efficiency in administrations and in each sector. When considering the use of IT, it is necessary to proactively introduce IT as one means of improving the efficiency of every sector only following streamlining the work prior to systematization and taking into consideration matters such as the computer literacy of the personnel who will use the system.

This report discusses separately the "Promotion of e-Government," including improving the efficiency of the central government and the digitization of information disclosure and application procedures, and the "Promotion of the Use of IT in Every Sector" in the work front of the public sector and in industry.

Mid-term Objective 4-1
Promotion of e-Government

The maximum potential of e-government is the realization of "e-governance" including participation in policy making and changing interactions between administrative agencies and citizens and the interactions between administrative agencies through the use of IT.

Mid-term Objective 4-1 Promotion of e-Government

Although there is no set definition for the phrase "promoting e-government," the "e-Japan Priority Policy Program 2002" announced by the Japanese government on June 18, 2002 raises the following as specific measures for the realization of an e-government: "electronic delivery of administrative information," "electronic filing of applications and notifications," "digitalization of management of revenues and expenditures," and "electronic government procurement," and "paperless (electronic) administration." Meanwhile, in the "Benchmarking E-government: A Global Perspective – Assessing the Progress of the UN Member States" announced in June of 2002 by the United Nations, assessment was made on such areas as the provision of administrative information, the electronic filing of applications and notifications, and information disclosure.

The UN report also advocates that the **maximum potential of e-government is through "e-governance" in areas such as "participation in**

policy-making" and "changing the interactions between administrative agencies and citizens and the interactions between administrative agencies" through the use of IT. Since e-governance is a wide concept and does not necessarily apply to all types of development assistance, "Using IT as a Means for Citizen Participation in Policy Making" is included here as a sub-target of this Mid-term Objective.

Specifically, IT can be used in administration as follows:

1) As a means of improving the efficiency of internal government processes, work systems can be introduced to improve the efficiency of routine work inside the government and personal computers can be introduced in order to efficiently create the various documents used both inside and outside of the government.
2) By use of electronic filing of applications and notifications, citizens can complete various procedures for the government through the Internet.
3) From the standpoint of good governance, there is a growing demand in many countries for government information disclosure to citizens, and systems can be developed to improve the efficiency of information disclosure.
4) Also from the standpoint of good governance, citizen participation in policy making is needed, and this would be facilitated by gathering and summarizing opinions via e-mail or on websites.

From early stages, governments have used computers for routine work for such processes as accounting procedures and statistical work, and many routine jobs in industrialized nations are carried out through the use of computer systems. Rapidly improving performance and falling prices of computers in recent years have lowered the cost needed to introduce and maintain work systems. In addition, since the cost effectiveness of these systems is relatively easy to see, systems will be introduced first for routine work and for work that can lead to increased revenues.

With respect to the electronic filing of applications and notifications, the first thing that must be done in many cases is to import the existing data into the government system. This is often carried out following improving the efficiency of internal government processes and after disclosing government information on websites.

JICA has frequently cooperated on rationalizing government internal processes, and cooperation involving the use of GIS has increased in recent years.

Meanwhile, since it is not easy to grasp the cost effectiveness of information disclosure and citizen participation in policy making, these areas are often low priorities for the governments.

JICA's Activities

For nearly twenty years, JICA has been carrying out assistance for rationalizing government activities of developing countries. In the field of IT,

this area has been the core of JICA's assistance, along with human resources development. Cooperation on constructing information systems in the field of industrial property rights (patents and intellectual property rights) has been carried out in China, Thailand, the Philippines and other countries since the 1980s. Cooperation involving the use of Geographical Information Systems (GIS) has been increasing in order to efficiently formulate plans such as city planning, river basin management programs, disaster prevention plans, and landmine removal. Introducing the information systems in these fields quickly results in improved work efficiency and the outcome of cooperation can easily be seen. It is therefore expected that this type of cooperation will remain the central focus for JICA in the future.

Cooperation in information systems should be focused on technical guidance prior to introducing the system and advice on the operation of systems created by financial assistance.

However, it is possible that advancements and more widespread use of information systems may result in a situation in which the target of cooperation for developing and providing information systems exceeds the scale of Technical Cooperation Projects. Therefore, **the focus of technical cooperation should be on consulting that includes procedural reviews and human resource development before introducing information systems, cooperation on creating and operating a prototype before introducing the actual system, and advice regarding the operation of systems that are created through financial assistance,** as was the case in the "Institutional and Human Resources Development for IT-related Customs Services Improvement Project in Indonesia" which was carried out by combining Development Study with Loan Aid.

Cooperation involving the use of GIS is found most often as a part of projects for specific fields such as city planning. However, using digital maps created in one field in another can also improve the efficiency of the work. Therefore, **even when cooperation is directed toward a specific field**, it is important to leverage the use of GIS so that it can also be useful to other fields. Since GIS and digital maps have recently come into use in many fields, including education and health care, it is becoming more important to carry out cooperation in terms of both creating digital maps and providing guidance on their use for the countries lagging behind in digital mapping.

JICA has little experience of cooperation in the electronic filing of applications and notifications. In the future, the assistance should target at the fields in which it is easy to see an outcome, such as in electronic procurement, based on progress made in the rationalization and systemization of the internal processes of the recipient governments.

Meanwhile, the use of IT in information disclosure and the promotion of citizen participation in policy making are the area that Japan has also just begun to investigate. Furthermore any assistance in this area needs to proceed with discretion, since it involves the politics of recipient countries. That said, through dispatching advisors at the policy level to sectors such as agriculture and health

care, it will be possible to spread the concept of information disclosure in each sector end then to introduce systems for information disclosure through systemizing the management of internal documents. Also, through disclosure of information and inviting public opinion on websites during Master Plan studies for the formulation of sector-specific development plans, it is possible to demonstrate to the recipient country how citizens can participate in information disclosure and policy making using IT.

Mid-term Objective 4-2
Promotion of the Use of IT in Every Sector

Mid-term Objective 4-2 Promotion of the Use of IT in Every Sector

Using IT makes it possible to improve the efficiency and speed of work in a variety of sectors as well as to expand the content of the work.

Advancements in IT have brought about the development of information systems for not only statistical work and accounting procedures, but for the management of all types of work-related information in a system, in order to improve the efficiency of work in the administrations and companies of industrialized nations. In recent years IT has also been used in “knowledge management” for the sharing and use of knowledge held by individuals and for the creation of new knowledge. In organizations that are advanced in using information systems, a great deal of information flows through information systems, that is becoming so called the “nerve center” of the organizations.

In industrialized nations, the diffusion of the personal computer and the Internet into administrations, companies, and households has led to increased transmission of information by organizations and individuals, and a great deal of information is now available on the Internet. Furthermore the means of distance education have been expanded or changed where there used to be constraints in terms of time and materials. The possible means include video delivery using satellite communications, material distribution (including images) through the Internet, and correspondence education at the university level including the exchange of questions and answers with instructors through the Internet.

In addition, systems are being introduced for forecast of disasters through a network of measurement instruments that are widely distributed in many locations and sectors such as in meteorological observation and river management. They keep possible damage to a minimum by confirming the observed results from those instruments in real time. Even in measuring environmental pollution and managing traffic, the same types of networks (information system) are being introduced to improve the efficiency and speed of work.

The IT literacy of users must be improved in order to promote the use of IT.

The governments of all countries are working on improving the IT literacy of users in order to promote the use of these types of work systems and personal computers.

Meanwhile, little progress is being made in the introduction of information systems in developing countries due to constraints in funding and human resources. So there remain issues such as inefficiency in work and lack

of progress in introducing or using systems for the information sharing. However, in order for developing countries to make advancements it is unthinkable not to use information systems (though the degree of use is a separate issue) and it is necessary to consider the use of information systems in improving organizational efficiency and in sharing and using information.

Finally, the concept of "digital opportunity" maintains that introducing state-of-the-art IT will enable developing countries to shorten the time required to catch up with industrialized nations, so it has become necessary to investigate "appropriate technology" taking the latest technology into consideration.

Use IT for many types of cooperation in various sectors.

JICA's Activities

Computers and information systems are considered to be important means for carrying out efficient work and for storing and using information in fields of cooperation outside of the IT sector such as agriculture, health care and medicine, transportation, and mining and manufacturing. For that reason, JICA is using IT in many of its projects.

There are projects that have the introduction of information systems as their main objective, for example the "Improvement of the Customs System" project in Indonesia (Development Study, started in 1997) and the statistical projects in sectors such as population, agricultural and industrial production, and trade, and the projects related to managing industrial property rights.

E-Learning using JICA-Net and publication of achievement on the website

The use of IT in education and training (e-Learning) includes the two aspects: TV conferencing, TV lectures and video delivery; and creating electronic educational materials. With respect to the former, JICA has been carrying out cooperation using JICA's showcase JICA-Net and cooperation to the University of the South Pacific. JICA-Net is used not only by JICA, but also for seminars sponsored jointly with other organizations such as the World Bank.

As for the latter, educational materials and reports that have been created are gradually being published on the website[7], as was seen in the "Kenya Population Education Promotion Project" where the publication of educational materials on the web was one of the major points of cooperation. Most educational materials are now being created on computers, and it is therefore easy to publish them on websites if they are text-based. To promote this even further and to make it possible for an even broader population to learn from websites, the proper preparations must be made. For instance, it is necessary to create a suitable structure for self-instruction by incorporating such elements as quizzes that can confirm the degree of learning. Even so, reducing the constraints of time and distance will enable the use of educational materials by a broader population will lead to an increased impact of cooperation. The creation of electronic education materials is also thought to be effective from the

[7] As of December 2002, 36 projects have been linked to JICA's website (including completed projects).

perspective of publicizing the impact of cooperation. Therefore, JICA should further carry out as one of the pillars of cooperation the production of educational materials for self-instruction and the proactive publication of those materials on websites.

In projects such as the "China Environmental Information Network Development Project," "The Project for Improvement of the Earthquake and Volcano Monitoring System in the Philippines," "The Project for Rehabilitation of the Effective Flood Control Operation and Warning System in Metro Manila (Development Project)," and the "Upgrading of Meteorological Observation and Forecasting and Environment Monitoring in Mongolia" and in other river basin management programs, JICA is carrying out assistance in partnership with Grant Aid cooperation to link regional bases into a network to gather observation results and provide information.

Even when the use of IT is not a main objective, many projects still have the introduction of computers and networks as one of their required conditions. IT is being used in a variety of sectors, such as the use of GIS in cooperation in mineral resource surveys, disaster prevention plans, city planning, school construction plans, and in landmine removal, and through the computerization of irrigation water management and computer management of shipment to markets.

Development Objective 4 Improvement of Efficiency and Effectiveness of Every Sector through the Use of IT

Mid-term Objective 4-1 Promotion of e-Government

Indicators:①Plans for using IT in governments

Sub-targets of Mid-term Objectives	Examples of Activities	Case No.	JICA's Main Activities
Electronic Filing of Administrative Procedures ①Number of application and notification procedures available online ②Introduction of electronic bidding	×Support for electronic filing of application and notification procedures ×Support for introducing an electronic bidding system		
Streamlining of Government's Internal Processes ①Degree of diffusion of networks between government agencies ②Systemization of administrative work	◎Support for development of administrative systems (e.g. intellectual property rights) ◎Provision of OA equipment ○Support for creating land and regional information using GIS ×Technological support for e-voting	46, 58, 59, 61 63, 56 56, 62, 71	Intellectual property rights (Technical Cooperation Project, Development Study) Provision of equipment and materials (Technical Cooperation Project) Creation of topographical maps and river basin information (Development Study)
Promotion of Information Disclosure ①Number of disclosed information items ②Of the above, the number of digitized items	×Proactive publication of project information ×Research into examples of countries that are advanced in information disclosure		
Citizen Participation in Policy Making	×Citizen participation in development studies ×Proactive publication of the activities of policy advisors		

Mid-term Objective 4-2 Promotion of the Use of IT in Every Sector			
Sub-targets of Mid-term Objectives	**Examples of Activities**	**Case No.**	**JICA's Main Activities**
Promotion of e-Learning ①Rate of diffusion of e-Learning	◎Use of JICA-Net ○Provision of equipment and materials for distance education	72 57, 73	University of the South Pacific (Technical Cooperation Project)
Support for Content Creation	○Support for using IT in educational materials	32	
Promotion of the Use of IT as a Tool for Statistics and Analysis	○Support for developing systems for statistics and analysis ×Support for improving the IT literacy of users ◎Use of JICA-Net	51, 66 72	Population statistics (Development Study) Various schemes
Other Specific Use of IT	×Creating networks for food sanitation and safety ◎Remote sensing (GPS, GIS) ◎Disaster warning systems Distance medicine Environmental monitoring ○Other	 45, 49, 67, 69 43 47, 48, 50	 Resource surveys (Training/Technical Cooperation Project) River basin information system (Grant Aid)

Examples of Activities:
◎→JICA has considerable experience
○→JICA has certain experience
△→JICA has experience as a component of projects
×→JICA has little experience

Development Objective 5
Improvement of Efficiency and Effectiveness of Development Assistance through the Use of IT

Development Objective 5 Improvement of Efficiency and Effectiveness of Development Assistance through the Use of IT

Using IT can improve the efficiency of communication and procedures in any sector. Similarly, in development assistance as well, it can improve the efficiency of technical transfer and training by experts. By using IT, know-how about preparations and results of cooperation projects can be accumulated and provided to related parties in an easy-to-search form. The use of IT is something that can contribute both directly and indirectly to assistance activities.

Mid-term Objective 5-1
Dissemination and Transfer of Existing Knowledge

Mid-term Objective 5-1 Dissemination and Transfer of Existing Knowledge

In order to disseminate and transfer existing knowledge, it is necessary to **"digitize skills and knowledge" and then "disseminate and transfer knowledge through distance training."**

Since digitized data can be revised much more efficiently than analog materials, they offer the advantage of making it easier to refer to knowledge obtained in various situations. In the same way, content is more easily updated.

After digitizing skills and knowledge, disseminate and transfer knowledge through distance training.

Since advancements in technology have made it possible to process voice and image data on relatively inexpensive computers, digital skills should be adopted when creating educational materials. Also, even in cases in which computers are not networked, digitization of resources should be promoted with a prospect of networking in the future.

It is also possible to improve overall efficiency by adopting distance training using IT at the stage of dissemination and transfer of digitized skills and knowledge. Indicators to measure the dissemination and transfer of knowledge through distance training can include the number of conducted distance courses and seminars and the number of web-based training (WBT) courses. It is becoming more and more common to conduct WBT that includes a learning management function in order to disseminate skills and knowledge through distance training, aside from the simple provision of educational materials.

Dissemination and transfer of knowledge through distance training have the advantage of reducing physical and time constraints over the old face-to-face style of training. By utilizing this advantage, the task can be carried out more efficiently as an alternative or complement to the Dispatch of Experts.

Use JICA-Net and create digitized educational materials.

JICA's Activities

JICA's main efforts toward this mid-term objective are centered on JICA-Net. JICA-Net is a framework for carrying out distance technical cooperation. In addition to a TV conference system it has an e-Learning system (with a learning management function) and these can be used separately or together.

JICA is also making progress in creating digitized educational materials for each project. Digitized educational materials have been created for projects that support the use of IT in education, including e-Learning, and for projects to assist R&D, and many of them have been delivered on networks. As these educational materials are able to be distributed much more broadly than the previous analog educational materials, they are always available both inside and outside of projects. Even in projects in sectors such as health care and agriculture that do not have IT as a direct goal, it is becoming common to use computers when creating materials for dissemination and education, for example in printing production work or in digital video programs.

Mid-term Objective 5-2
Sharing and Creation of Knowledge and Experience

Mid-term Objective 5-2 Sharing and Creation of Knowledge and Experience

This Mid-term Objective and Mid-term Objective 5-1 have many common features.

Sharing existing content with other donors and developing countries is one method of widely and efficiently using existing experience and knowledge. Also, when content has been digitized it is also more easily copied for use.

Share, develop, and create content through the use of IT.

At the same time, exchanging and revising data is facilitated through the use of IT, and this makes it possible to jointly develop content in an effective and efficient manner with other donors and developing countries.

Finally, using IT not only makes it possible to share existing content, but

also enables us to partner with other donors to create new knowledge. Workshops and conferences with other donors and developing countries through TV conferencing increase interactive communication and allow enhanced discussions without the restrictions of time or space.

JICA's Activities

At JICA-Net, JICA is partnering with the World Bank to create training materials regarding project evaluation for the staff of development assistance organizations.

In addition, JICA-Net is being used between such organizations as the World Bank and the United Nations Development Programme (UNDP), for joint convening of distance workshops between donors and for discussions on collaboration with other donors.

Mid-term Objective 5-3
Use of IT in Project Implementation

Accumulate and share knowledge and know-how and improve the efficiency of work through the use of IT.

- Introduction of knowledge management systems
- Briefings and training for the overseas offices through JICA-Net

Mid-term Objective 5-3 Use of IT in Project Implementation

In order to effectively utilize knowledge and know-how when implementing projects, knowledge should be first accumulated, and then systematically organized, classified, and appropriately presented. By using IT, the accumulation of knowledge and know-how has become an easier task. This has also made the systematic organization and publishing of accumulated information more efficient than ever before.

Looking at JICA's projects, it has become easier to obtain useful information for reference in all of the processes from project formulation to implementation and evaluation by sharing various examples of past activities. In addition to these, by combining distance discussions and consultations through TV conferencing with the dispatch of study teams, the efficiency of work can be improved.

JICA's Activities

JICA has brought in knowledge management systems, and is making efforts in the systematic organization of knowledge and know-how of every sector and every issue.

There are increasing numbers of distance discussions and consultations, and JICA-Net is being used in briefings with overseas offices prior to or following the dispatch of study teams as well as to prepare for international seminars.

Furthermore, interviews with overseas experts, training for overseas office staff, and seminars on health care management are also being carried out via JICA-Net.

Development Objective 5 Improvement of Efficiency and Effectiveness of Development Assistance through the Use of IT

Mid-term Objective 5-1 Dissemination and Transfer of Existing Knowledge			
Sub-targets of Mid-term Objectives	**Examples of Activities**	**Case No.**	**JICA's Main Activities**
Digitization of Skills and Knowledge ①Increase in and improvement of digitized educational materials	○Packaging of educational materials through JICA-Net ○Systemization of sector-specific knowledge ○Creation of digital educational materials for each project	72	JICA-Net JICA Knowledge Management
Dissemination and Transfer of Knowledge through Distance Training ①Number of distance lectures and seminars ②Number of WBT courses held	○Dissemination and transfer using remote methods (including JICA-Net) ◎Courses using TV conferencing ×Creation of a library on the Internet ○Web Based Training with learning management function	72,73 72 32	Intellectual property rights (Technical Cooperation Project, Development Study) Provision of equipment and materials (Technical Cooperation Project) Creation of topographical maps and river basin information (Development Study)

Mid-term Objective 5-2 Sharing and Creation of Knowledge and Experience			
Sub-targets of Mid-term Objectives	**Examples of Activities**	**Case No.**	**JICA's Main Activities**
Sharing of Knowledge and Experience	×Sharing of existing content with other donors and developing countries ○Joint development of content with other donors and developing countries	72	Monitoring and evaluation (with the World Bank)
Joint Creation of New Knowledge	×Convening opportunities for joint creation between donors (such as workshops) through distance technology ×Partnership discussions with other donors ×provision of opportunities for sharing experiences between developing countries ×Joint research between school networks ×Holding distance global dialogue		

Mid-term Objective 5-3 Use of IT in Project Implementation			
Sub-targets of Mid-term Objectives	**Examples of Activities**	**Case No.**	**JICA's Main Activities**
Systematization of Knowledge and Know-how	○Systematization of sector-specific knowledge		JICA Knowledge Management
Distance Discussions and Consultations	◎Consensus-building through TV conferences	72	JICA-Net

Examples of Activities:
◎→JICA has considerable experience
○→JICA has certain experience
△→JICA has experience as a component of projects
×→JICA has little experience