Thematic Guidelines on Information and Communication Technology, and Broadcasting

【Chronology of Amendment】

Amendment in March 2012:

The contents are updated to meet changes in the situation over the years, and the Guidelines are combined with the Guidelines for Cooperation in the Broadcasting Sector".

Amendment in May 2009

The contents are updated to incorporate statements concerning ODA loans and related projects, as well as the merger of JICA and JBIC, and to meet changes in the situation over the years. The words in the document are also revised, where necessary, for more appropriate expressions.

Amendment in April 2005

1-3 Trends of International Aid

1-4 Trends of Japan's Aid

3-2 Tasks to Consider in Future are updated.

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Thematic Guidelines on Information and Communication Technology, and Broadcasting

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(Broadcasting Appendix)

Preface

These Thematic Guidelines on Information and Communication Technology, and Broadcasting were prepared with a view to marshaling the trends, approaches and methods of cooperation on information and communication technology, and broadcasting, and to show the direction that JICA should take based on these ideas. We expect these guidelines to provide basic information and knowledge for the stakeholders concerned about information and communication technology, and broadcasting, as well as to help in appraising, planning, implementing and monitoring/evaluating of JICA projects.
In addition, we are also looking forward to promoting JICA's basic idea on information and communication technology, and broadcasting by releasing these guidelines through JICA's Knowledge Site.

The ICT (information and communication technology) revolution beginning in the mid-1990s created information society, which brings about potentials of individuals and organizations, promotes socio-economic development, provide individuals with opportunities to participate in society, and improve the quality of people's lives.
Developing countries have had geographical, economic and social constraints, but if people at each level in these countries are given chances to use ICT and have easier access to information and knowledge, development activities there are likely to be considerably more active, bringing in substantial benefits to the people.
For the adoption, use and application of ICT in developing countries, however, there are bottlenecks in terms of costs, technology levels and other aspects. The bottlenecks have created the digital divide between developed and developing countries, and to bridge the divide has become a global issue.
The international society has, with the objectives of promoting development of developing countries and contributing to the prosperity of the overall international society, decided to help them make use of digital opportunities.
The essence of strategies to help developing countries adopt, use and apply ICT is to gain the international support, consider the cost effectiveness and wisely proceed with the adoption. A key is to make maximum use of advantages of their position as countries falling behind in ICT, such as utilizing technologies and digital contents that are available at lower costs than before.
Japan made efforts to develop its communications infrastructure and technology under the industry-academic-government collaboration of industry, and has entered the stage to promote the further use and application of ICT with the high-speed broadband and network infrastructure developed in the previous stage. At present, Japan has gained the following competitive advantages in the global ICT trend:

(1) A high-speed internet environment at low communication fees by international standards
(2) Mobile technology, optical communication technology, device technology and information home appliance technology
(3) Research on technology related to software, information security and human interface
(4) Technology to produce animation and other contents

e-Japan Strategy published in January 2001 has been revised to e-Japan Strategy II (July 2003), IT New Reform Strategy (January 2006), and the current i-Japan Strategy 2015 (July 2009). The latest strategy sets the goal to realize a "Reassuring & Vibrant Digital Society, placing emphasis on electronic government and municipalities, medical and healthcare, and education and human resources.
These Guidelines have been prepared chiefly by members of JICA's Thematic Taskforce for ICT. They collected and analyzed relevant documents and information, and repeatedly discussed and considered effective approaches to development and cooperation policies that JICA should take.

We would be grateful if these Guidelines could help parties concerned with JICA's ICT cooperation engage in assistance to the adoption, use and application of ICT, and share the information and knowledge.

With fast-evolving ICT, the cost-benefit relation is changing all the time. This requires constant reviews and upgrading of effective approaches to and cooperation policies for ICT in developing countries. In passing, the latest revision of the Guidelines deals with information and communication, and broadcasting in independent chapters, but the next revision will include broadcasting in information and communication technology.

JICA Thematic Taskforces for ICT are always prepared to obtain and analyze the latest information, and would be grateful at any time for your inquiries and opinions.

Finally, we gratefully acknowledge helpful cooperation and advice from parties concerned on these Guidelines. We would also like to thank the members of the Thematic Task Force and colleagues acting as liaisons.

March 2012

Schematic Chart for Development Issues

1. Information and Communication Technology

Development Strategy Goals	Intermediate Goals
1. Improvement of ICT policy-making capacity	1-1 Establishment of ICT policy
	1-2 Establishment of ICT industrial development policy
	1-3 Establishment of user protection policy
2. Development of human resources to support ICT	2-1 Professional development of ICT engineers
	2-2 Professional development of ICT policy practitioners
	2-3 Improvement in ICT literacy
3. Development of ICT infrastructure	3-1 Development of ICT infrastructure
	3-2 Development of ICT base
4. Promotion of use and application of ICT	4-1 Application of ICT to individual development issues
	4-2 Effective use of JICA-Net
	4-3 Improvement in efficiency and effect of cooperation using ICT

2. Broadcasting

Development Strategy Goals	Intermediate Goals
1. Improvement of broadcasting policy-making capacity	1-1 Establishment of broadcasting policy
	1-2 Establishment of broadcasting laws and systems
2. Development of broadcasting organizations and human resources	2-1 Professional development of broadcasting policy practitioners
	2-2 Professional development of broadcasting engineers
3. Development of broadcasting facilities and equipment	3-1 Development of broadcasting infrastructure
	3-2 Development of broadcasting contents
4. Application of broadcasting to various fields	4-1 Application of broadcasting to various sectors
	4-2 Use of broadcasting to contribute to improvement in governance

Chapter 1 Overview of Information and Communication Technology

1-1 The Present Situation of Information and Communication Technology

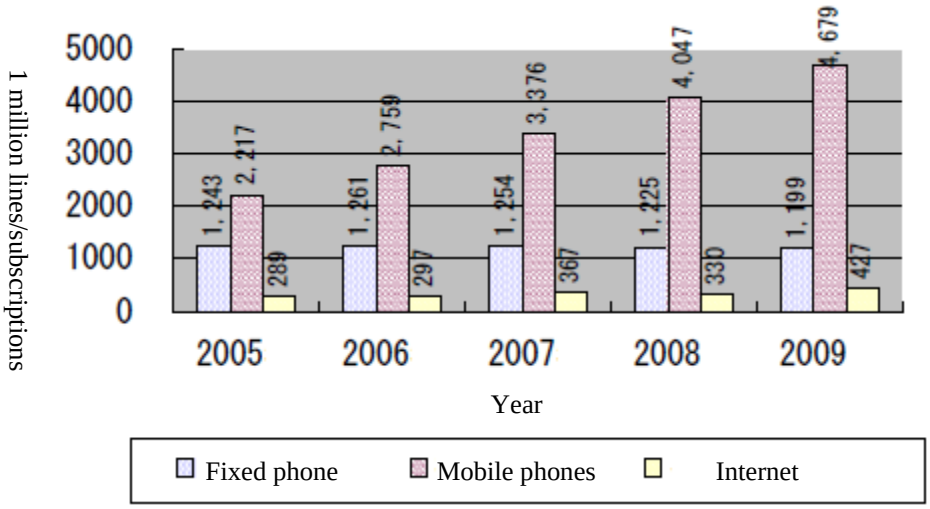
The rapid development and penetration of information and communication technology in the 1990s helped upgrade the industries in countries and regions that adopted the technology, and contributed to an improvement in productivity of their economies. Computers were connected via the Internet and other networks across national borders, the economic activities using the networks were increasingly globalized, which led to cost reductions and shortening of the time required for circulation of information.

In such circumstances, the present situations of dissemination of communication services and "digital divide" (information gap) in the world are outlined as follows.

(1) The Present Situation of Information and Communication Services

Figure 1-1 shows the numbers of subscribers to fixed telephone lines, mobile phone carriers, and the Internet in 2005-09 in the world. The rates of increase in subscribers to these services since 2005 were 96%, 211% and 158%, respectively. The number of subscribers to mobile phone carriers in 2009 totaled 4.68 billion. Subscribers to mobile phone carriers outnumbered those to fixed telephone lines and the Internet both in terms of the number and the rate of increase. Behind the sharp increase in the mobile phone ownership, compared to fixed telephones and the Internet, lie the facts that the prices of mobile phone handsets and call charges have fallen due to price competition among carriers, and that the mobile phone coverage has expanded.

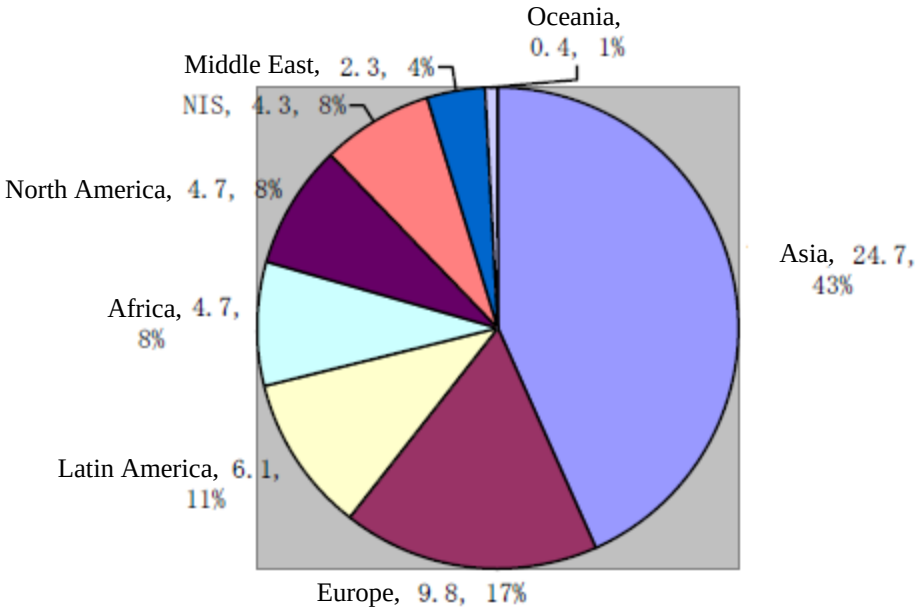
As of 2010, some 3.3 billion mobile phone subscribers out of 4.7 billion in total were in low-income countries, the mobile phone subscription rate also growing more sharply than that in high-income countries (according to documents of the Consultative Group to Assist the Poor (CGAP)).



(Source) Based on the 2011 White Paper on Information and Communication in Japan

Figure 1-1 Numbers of Subscriptions to Fixed Phone, Mobile Phone and the Internet Services

Figure 1-2 shows the number of subscriptions to fixed and mobile telephones in 2009. By region, the number in Asia totaled 2.47 billion, accounting for 43.4% of the total subscriptions in the world, followed by Europe (17.1%), Latin America (10.7%), Africa (8.3%), North America (8.2%), NIS (7.5%), Middle East (4.1%) and Oceania (0.7%).



(Source) The 2011 White Paper on Information and Communication in Japan

Figure 1-2Fixed and Mobile Phone Subscriptions by Region (2009)

The penetration rate varies among countries in each region. In recent years, the penetration rate of mobile phones is higher than that of fixed phones in most countries due to popularization of the former. Table 1-1 shows a comparison between a group of countries with a high penetration rate and that of countries with a low penetration rate. Two representative countries are shown for each group[1]. The rate exceeds 100% in some countries since some people own more than one mobile phone to seek for a wider coverage (area accessible to the services) and a higher "call completion rate" (ratio of successfully completed calls to the total number of attempted calls).

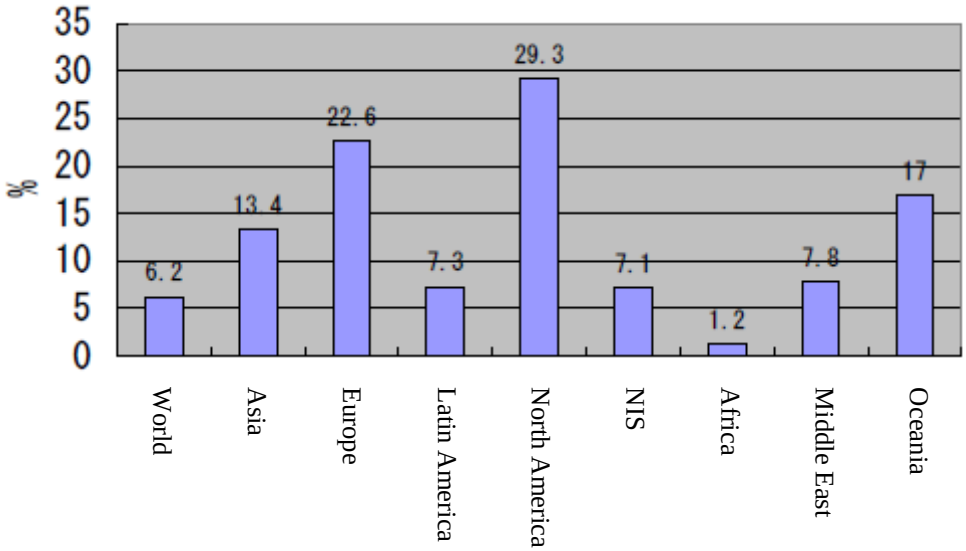
Table 1-1 Comparison of Penetration Rates of Mobile Phones in Each Region

	Countries with high penetration rate		Countries with low penetration rate	
Region	Country	Penetration rate (per 100 population)	Country	Penetration rate (per 100 population)
Asia	Taiwan	110.3	Myanmar	0.8
	Singapore	142.0	Nepal	11.4
Europe	Estonia	189.7	Albania	97.9
	Luxemburg	149.8	Bosnia and Herzegovina	80.7
Latin America	Argentina	116.5	Bolivia	49.8
	Uruguay	104.7	Guyana	38.2
Africa	South Africa	92.2	Central Africa	3.5
	Gabon	96.3	Eritrea	2.2
North America	U.S.A.	87.6	Cuba	2.9
	Canada	64.7	Haiti	32.8
Middle East	UAE	207.8	Yemen	16.0
	Qatar	196.6	Afghanistan	28.0
Oceania	New Zealand	109.6	Solomon Islands	2.1
	Australia	105.6	Kiribati	0.8

(Source) Based on World ICT Visual Data Book 2010

As shown in Figure 1-3, the penetration rate of the Internet per population (the number of subscriptions/population) in 2009 in the world was 6.2%. By region, the rate was highest, 29.3%, in North America, followed by Europe (22.6%), Oceania (17.0%), Asia (13.4%), Middle East (7.8%), Latin America (7.3%), NIS (7.1%) and Africa (1.2%).

[1] The penetration rates are for 2008. (Rates for previous years for some countries)

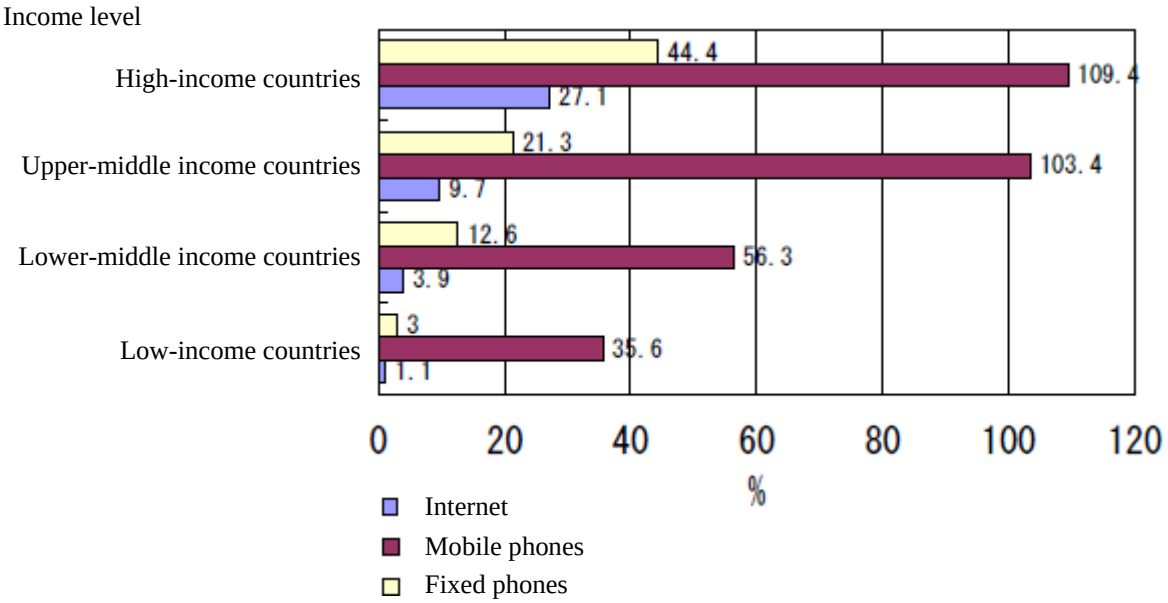


(Source) The 2011 White Paper on Information and Communication in Japan

Figure 1-3 Penetration Rate of the Internet per Population, by Region (2009)

(2) The Present Situation of Digital Divide

Figure 1-4 shows the relationships between the popularization of information and communication services, and income levels in 2009. The figures clearly show that the higher-income countries have the higher penetration rate, suggesting that there is still a conspicuous digital divide.



(Source) The 2011 White Paper on Information and Communication in Japan

Figure 1-4 Penetration Rates of Communication Services, by Income Level (2009)

With the persistent digital divide, new technologies and business models that may dissolve the digital divide have been coming forth.

Mobile Broadband Technology

Mobile broadband is a technology providing high-speed and large-capacity communication services to mobile terminals. As of 2012, the mobile broadband services are widely available in advanced countries, but also in developed countries; voice and data communication via mobile telephones currently widely available, though limited, is expected to be replaced by mobile broadband terminals on the initiative of telecommunication carriers that are eager to supply mobile broadband services. As seen above, the growing diversification of services available for mobile terminals may offer a scenario to bridge the digital divide as the population having access to them increases in developing countries.

Social Network Services (SNS)

Social network services such as Facebook are an online service which users access via mobile telephones. If these social network services and applications are made accessible via mobile phones that have been already penetrated in developing countries, they may contribute to a reduction in the digital divide. The key will be provision of services that take the user convenience into account, such as usage fees and languages for the services.

New Business Models

The emergence of public-private partnership (PPP), base of the economy pyramid (BOP) business and other new business models is highly expected to lead to dissolution of the digital divide. PPP is a scheme whereby a government and private companies jointly construct telecommunication infrastructures.

Optical fibers as a transport medium, wireless access networks and other infrastructures have been built under the government and private partnership. BOP is a new business model targeting people (some 4 billion people) with annual income of less than US$3,000, who account for some 70% of the world population. The model aims to provide them with the economic environment where daily necessaries and services properly circulate.

Examples of BOP businesses include Kenya’s M-PESA, mobile banking services; and “Nokia Life Tools”, mobile phone information service tools, which Nokia supplies in Africa.

Cloud Computing

Cloud computing refers to the delivery of computer-related services to end-users who can have as much or as little of functions and services as they want at any given time even if they do not own

their own personal computers. All they need is a means of access to the network. Since cloud computing, unlike traditional computer services, does not require end-users to own computers, it can substantially reduce the cost of infrastructure development in developing countries and thus is likely to serve as a device to dissolve the digital divide.

While the hope is growing that these new technologies and popularization of services could dissolve the digital divide, there are concerns over the necessity for measures to supply sufficient electricity to meet the demand from increased ICT users, and a possible limitation of the existing information and communication networks themselves. As vicious cyberattacks and large-scale system failures are not uncommon nowadays, it is necessary to consider new countermeasures for information security.

As obvious in the above explanation, dissolution of the digital divide requires multifaceted assistance including the use of new technologies and services, and adoption of new business models. At the same time, measures for information security need to be taken into account.

ICT has been used not just by the private sector but also by governments and other entities in the public sector, helping them improve the efficiency in their services through, for example, computerization of work procedures, websites of ministries and agencies, and on-line services of various applications and notifications. ICT is also used in the social sector in the form of e-learning in the educational sector to contribute to an improvement in the standard of people's living. From the gender perspective, ICT contributes to an improvement in employment of women: the proportion of women is fairly high among system operators. ICT can be counted as an essential tool to help improve the quality of all the economic, administrative and social sectors.

They say that information and communication technology (ICT) will bring about a revolutionary change more than the Industrial Revolutions beginning in the 18th century in England did to society. The "e-Japan 2002 Program" states that, the present IT revolution is bringing about an historical transformation that is comparable to that which occurred during the Industrial Revolution. In much the same way in which the Industrial Revolution transferred agricultural societies around the world into industrialized ones, the utilization of information and telecommunication network technology will dramatically reduce the costs and time for information distribution, as well as make large information exchanges easier. This will result in rapid and dramatic changes in socioeconomic structures on a global scale. With these changes, societies will continue to move from being industrial societies into advanced information and telecommunication network societies, in this way rapidly becoming societies in which information and knowledge are the source for added value.

While ICT is viewed as an important device for economic growth and improvements in the public and social sectors, **a key issue is to develop an environment where anyone who needs it can have access to it from anywhere at a reasonable cost.**

Globally, the present situation affecting ICT has been changing from day to day. The emergence of new mobile devices such as smartphones and tablet mobile phones and a shift to cloud computing can be regarded as major changes noticeably seen in 2011. The diversification of applications of a new generation of mobile devices has a substantial impact on the telecommunication industry as a whole, even leading to a change in the structure of the mobile phone industry. Moreover, since services provided through smartphones are available across national borders, mobile terminals are expected to be more globalized in future.

On the other hand, cloud computing brings about a change that users do not necessarily need to own personal computers and software but are simply required to have Internet access to use services. If cloud computing becomes more popular, it will be possible to reduce the cost of equipment to own and the labor for maintenance and management. It will also change the nature of skills and capacity which users are required to have for the operation of computers.

As for assistance to developing countries, it is necessary to consider the present situation and trends of the technologies seen over the world.

1-2 Definition of Information and Communication Technology

These Guidelines will use the term "Information and Communication Technology" or ICT which is used by the World Bank and other international organizations.

The term "ICT" refers to a concept covering both information technology and communication technology, which are used to input, store, process, convey and output information.

Texts, sounds, images and other forms of information can be transferred, once digitalized, at a faster speed with fewer errors. Digitalized information is connected to a number of terminals and host computers through the Internet, and enables to build an information and communication system with varied and multiple functions. Development of the World Wide Web (WWW) made it possible for computer users to uniformly obtain information of various kinds. The WWW uses hypertext which is a system enabling documents to refer to other documents on the Internet by embedding URLs (uniform resource locators) of other documents in HTML or other markup languages.

As for broadcasting, since the Broadcast Act of Japan defines it as "transmission of wireless communication for direct reception by the public", these Guidelines will be in accordance with this definition.

The term "ICT cooperation" means any assistance in accordance with the development strategy goals: improvement of ICT policy-making capacity, development of human resources to support ICT,

development of ICT infrastructure and promotion of use and application of ICT.

1-3 Trends of International Aid

1-3-1 Kyushu-Okinawa Summit

At the Kyushu-Okinawa Summit in July 2000, the Okinawa Charter on Global Information Society was adopted, and a Digital Opportunity Taskforce (DOT Force) was established to bridge the international digital divide. The DOT force was composed of multi-stakeholders including governments, private sector entities and non-profit organizations (NPOs) of the G8 countries; and governments, private sector entities, business associations and NPOs of other nine countries; and international organizations, including the United Nations Development Programme (UNDP), the World Bank, the United Nations Economic and Social Council, the International Telecommunication Union (ITU), the United Nations Educational, Scientific and Cultural Organizations (UNESCO), the United Nations Conference on Trade and Development (UNCTAD) and the Organization of Economic Cooperation and Development (OECD).

1-3-2 The UN Millennium Summit

At the UN Millennium Summit held in September 2000 in New York, the UN Millennium Declaration was adopted, and UN member states and other countries. agreed to achieve eight Millennium Development Goals (MDGs) by 2015.

The goals comprised 18 targets. In the area of ICT, it was stated that, under one of the goals "developing a global partnership for development", "in cooperation with the private sector, make available the benefits of new technologies - especially information and communications technologies".

1-3-3 The World Summit on the Information Society (WSIS)

In January 2003, the Asian Regional Conference of the World Summit on the Information Society was held and declared the Tokyo Declaration to seek the development of information society while preserving linguistic and cultural diversity in Asia.

The first phase of WSIS, held in December 2003 in Geneva, established a common vision of a global information society at a summit level and adopted the Declaration of Principles and the Plan of Action to put the vision into practice.

The Declaration of Principles defines eleven principles which serve as a key for a global information society, including development of information infrastructures such as "broadband" and "ubiquitous access", human resource development, international cooperation and intra-regional cooperation.

In May 2005, the Tokyo Ubiquitous Network Conference, a WSIS thematic meeting on a ubiquitous

network society, was held and compiled specific measures and recommendations concerning measures to be taken for possible tasks toward realization of a ubiquitous network society. The Chairman's Report compiled at the conference was incorporated in the second phase of WSIS held in November 2005 in Tunis, Tunisia. The second phase confirmed agreements in financial mechanisms for bridging the digital divide compiled in the first phase, and followed up Geneva's Plan of Action and other plans. Both the WSIS Declaration of Principles and the Plan of Action emphasize the importance of development of information and communication infrastructures that allow every person to have access to the services ubiquitously at reasonable costs.

Following the results of the Tunis phase of WSIS, the United Nations established the Internet Governance Forum Secretariat. IGF is a forum for discussion of public policy issues related to key elements of Internet governance, and has held six meetings so far on an annual basis from the first meeting in November 2006 in Athens to the sixth in September 2011 in Nairobi. The Forum will continue to discuss public policy issues related to the Internet in future.

1-3-4 Major Donors' Policies for Assistance in the ICT Sector for Development

Policies of major international donors in the ICT sector for development are shown in Table 1-2.

Table 1-2 Major Donors' Policies for Assistance in ICT for Development

Aid organization	Assistance policy
World Bank (WB)	WB places poverty reduction and promotion of benefits in target countries and regions as the top priority issues for IT-related projects, and provides support focusing on planning and implementing sectoral reform programs for them.
Asian Development Bank (ADB)	ADB’s assistance in the ICT sector is carried out in development of ICT-related infrastructures in rural, mountainous and other areas where telecommunications services are unavailable, and an improvement in the ICT literacy.
International Telecommunication Union (ITU)	ITU focuses on assistance in human resource development, telecommunication policy and regulations upon the principle that ICT is essential for development of politics, economy, society and culture.
United Nations Development Programme (UNDP)	UNDP’s assistance in the ICT sector is carried out in remote education and medical services on the Internet, the environmental management, expansion of opportunities of political participation and other fields by viewing ICT not just as a tool for promotion of economic growth but as an effective means of accelerating

	self-sustainable human resource development and poverty reduction.
Canadian International Development Agency (CIDA)	CIDA considers that development of ICT has an impact on people's life in general, contributes to economic development and an improvement in the quality of life, and leads to sustainable development; cooperates in the fields of development of human resources, institutions and other resources; and provides assistance for development of the environment where developing countries can utilize private capitals.
International Development Research Centre (IDRC)	Setting the use of ICT as its goal together with social and economic fairness, and environmental and natural resource management, IDRC provides assistance so that people and researchers in developing countries can use ICT to solve development issues.
Swedish International Development Cooperation Agency (SIDA)	SIDA provides assistance for effective use of ICT in developing countries on the belief that underdevelopment of telecommunication networks and other ICT-related infrastructures and shortage of human resources make it difficult for developing countries to have access to global information resources and the resultant digital divide threatens their economic development.
U.S. Agency for International Development (USAID)	Based on the recognition that information is the most important element for development, USAID provides assistance so that developing countries can realize healthy development with knowledge and information.

Other than the international donor organizations listed above, private entities have been expanding the scope of their activities in the ICT sector and serving as a driving force for promotion of ICT. The following are selective private entities promoting ICT for development.

M-PESA

Vodafone, a British multinational telecommunications company, launched in 2007 a new mobile-based money transfer service called "M-PESA" in Kenya with support of the U.K. Department for International Development. M-PESA allows users to transfer, pay, deposit and withdraw money with a mobile device. This mobile payment system can be also used for borrowing and repayment of loans, insurances, pensions and other services. Since the handling charges for

money transfer are set low, it satisfies the need of local people who want to frequently transfer a small amount of money. As of May 2010, M-PESA's customers grew to more than nine million, and the service has been made available in Tanzania and other countries.

Shared Access

The shared access is a service making the telecommunication services by mobile broadband accessible at low prices to people who cannot afford mobile telephones. Vodacom runs 4,400 or more franchised mobile phone shops in South Africa and meets the needs of local people. This South-African mobile telecommunications company also contributes to regional promotion through a special mechanism to share a part of its profits to poor areas. As in the case of voice call services, internet cafes are already common in many countries and offer opportunities for Internet access to people with financial difficulties and tourists from abroad. Vodacom runs cheaper internet cafes in Tanzania by using second-hand shipping containers converted to retail premises.

BOP Services

Microsoft, Intel and other large companies are committed to development of new products designed for the bottom of the pyramid (BOP). Nokia offers cheap mobile phones with basic functions in Africa and elsewhere. Nokia's mobile phones are easy to use for people in BOP: their address books are well designed so that multiple owners can use one mobile phone, and more icons are used than in usual mobile phones to make it easier for illiterates to use. "Nokia Life Tools", subscription information service, offers a wide range of real-time information covering healthcare, agriculture, education and entertainment to people in BOP. As of April 2011, over 1.5 million people experienced the service in four countries including Nigeria.

Village Phone

Grameen Telecom is a non-profitable company in Bangladesh established in 1995 with a partial stake in Grameen Phone. It offers telecommunication services to the poverty group in the country. Grameen Bank, a micro finance bank, gives loans to people in rural areas. Making use of the money borrowed, they become subscribers of a Village phone. Once they obtain mobile phones, the subscribers purchase the services from Grameen Telecom and sell them to local people, end-users. Thanks to the system, the penetration rate of telephones has been rapidly increasing in rural areas in Bangladesh.

The programs described above are cases deployed by private entities, not by advanced countries or international aid organizations. In that sense, they are based on the bottom-up approach. It is thus necessary to consider ways of assistance which can facilitate the approach.

Judging from the recent trend of the activities of the private sector seen above and the rapid popularization of mobile phones and evolution of mobile applications, it will become possible to obtain information for daily living and make money transfers and other procedures through mobile phones. It can be assumed that the use of ICT will bring about a considerable improvement of living in developing countries.

1-4 Trends of Japan's Aid

The Government of Japan regards "creating new markets and expanding internationally" as one of its concrete goals in a "New Strategy in Information and Communications Technology (IT)" published in May 2010. Accordingly, the "ICT Policy Task Force for a Global Era" was established, which presented "promotion of building and global deployment of a next-generation infrastructure system incorporating ICT", "establishment of a system to promote the global deployment, improvement of measures related to the financial aspects and promotion of use of ODA funds" and other policies as the direction that Japan should head for in future.

In line with the direction, the "Commission on Approaches to ICT Global Expansion" was formed in January 2011. The Commission adopted three basic principles for global expansion, which are: (i) the switch to ICT industries to capture global market growth; (ii) Japan's international contributions as an advanced "issue-solving" nation; and (iii) the construction of global cooperative relationships.

1-4-1 Japan’s Comprehensive Cooperation Policy

Japan promotes its global measures and cooperation for ICT in accordance with policies listed in Table 1-3.

Table 1-3 Japan's Comprehensive Cooperation Policy

Title	Descriptions
Activities in line with the Asia-Pacific Economic Cooperation (APEC)	The Japanese Government cooperates with promotion and so forth of “universal internet access” and “universal broadband access” that are goals shared by APEC members. At the APEC ministerial meeting on the telecommunications and information industry held in October 2010, the “Okinawa Declaration” was adopted.
Activities in line with the Asia-Pacific Telecommunity (APT)	The Japanese Government engages, through APT, in activities seeking sound development of ICT infrastructure in the Asia-Pacific region. In FY2010, the Japanese Government was committed to ICT-related human resource development of some 100 people, international joint research on remote medical care and other themes, holding of an APT

	development forum and other events in Tokyo. In FY2011, the country arranged to hold ATP meetings in Japan, which include a disaster management workshop.
Cooperation with the Association of South‐East Asian Nations (ASEAN)	The Japanese Government undertakes technical cooperation projects in ASEAN and cooperation for human resources development through dispatch of ICT experts. In 2011, Japan arranged the meeting of ICT ministers which drew up the “ASEAN-Japan ICT Work Plan for 2011”. Moreover, for closer cooperative relationships with ASEAN in the ICT field, the Japanese Government held in 2011 the Japan-China-ROK Workshop for Human Resource Development in ASEAN and the first “Japan-ASEAN Information Security Policy Meeting”.
Participation in activities of the International Telecommunication Union (ITU)	The Japanese Government undertakes cooperation for development of developing countries in the ITU radiocommunication sector (ITU-R), the ITU telecommunication standardization sector (ITU-T) and the ITU telecommunication development sector (ITU-D). The activities of the government also include the holding of the wireless broadband network conference in 2010 and the conference on the use of ICT in medical and healthcare sectors in 2011.
Cooperation with the Internet Governance Forum (IGF)	IGF, a forum discussing Internet-related public policy issues, held its 6th meeting in Kenya in 2011. The Japanese Government will continue to provide cooperation to IGF.
Group of Eight (G8)	The 2011 G8 Summit in France referred to the Internet as a priority issue and confirmed that it is a drive for economic growth. The summit adopted a declaration which included (i) the need to seize emerging opportunities by new services, such as cloud computing, which are driving innovation and enabling growth; (ii) promotion of international cooperation in response to violations of intellectual property, protection of personal information, cyber-property and so forth.; and (iii) development and other matters of an environment in which children can safely use the Internet.
Cooperation with the Organization for Economic Cooperation and	The Japanese Government engages in research and examination of ICT-related and other policy issues as a member of the Committee for Information, Computer and Communications Policy (ICCP). In a meeting held in 2011, ICCP confirmed to continue its discussions

Development (OECD)	about themes including “the future of the Internet economy, such as cloud computing”.
Bilateral policy dialogues and other discussions with Asian countries.	The Governments of Japan and ROK held the first “Japan-Korea Cloud Computing Policy Dialogue” in Korea in 2010 and the second dialogue in the following year. In 2010, the parties agreed on promotion of the comprehensive cooperative relationships. The Japanese Government also signed a memorandum of understanding on co-operation between the Ministry of Information and Communications of Vietnam and the Ministry of Internal Affairs and Communications of Japan, and exchanged notes with the Indonesian Ministry of Communications concerning Cooperation in Information and Communications Field.
Japan-China bilateral cooperation	With the purpose of promoting the cooperative relationships with China which demonstrates considerable growth in the ICT field, the Japanese Government held in 2010 a “Japan-China High-Level Economic Dialog” to discuss Internet Protocol version 6 (IPv6), digital contents and other topics. Through the dialogues, the two countries discuss specific efforts to make in future.
Bilateral cooperation with India	In 2010, the Governments of Japan and India launched a Committee on Japan India ICT Strategy for Economic Growth and discussed a framework to use Japan’s ICT strengths in India so as to further strengthen the cooperative relationships between the countries through ICT.

In addition, the Japanese Government undertakes the following activities in collaboration with ASEAN.

1. As for Japan's public-private ICT mission to Indonesia (August 23, 2011), the Japanese Government proposed "implementation of a project concerning ICT for disaster management", "collaboration in the security field" and "cooperation in the use of ICT in other fields" to the Indonesian Ministry of Communications which in turn proposed fields in which Indonesia sought to use ICT. The two parties agreed to consult with each other and promote specific projects in future. The Japanese Government also proposed to offer "specific cooperation concerning Japan's disaster management system using ICT" to the Indonesian National Board for Disaster Management and the Agency for Meteorology, Climatology and Geophysics.
2. When visiting Vietnam (on October 11, 2011), Japan's senior vice-minister for Public

Management, Home Affairs, Posts and Telecommunications of Japan requested the Minister of Information and Communications of Vietnam to be committed to early implementation of specific cooperation from the Japanese side concerning disaster management, the environment and other fields where ICT can be effectively used, and the building of infrastructures. The Vietnamese side agreed to take a positive step for specific cooperation with Japan.

3. The 12th Session of the General Assembly was held (November 16 - 18, 2011) in Jeju Islands (ROK) and approved the APT Strategic Plan for 2012 - 2014, which included the following objectives:

- Enhance the role of APT as an effective regional organization for telecommunications /ICT
- Widen broadband economies in the Asia-Pacific region
- Develop human resources capacity of the member countries

4. The ASEAN-Japan Summit was held (on November 18, 2011) in Indonesia and adopted the Joint Declaration for Enhancing ASEAN-Japan Strategic Partnership for Prospering Together (Bali Declaration).

- Intensify cooperation in the ICT sector such as the ASEAN Smart Network, and enhance regional cooperation in the fields of emergency preparedness through the ASEAN Coordinating Centre for Humanitarian Assistance on Disaster Management (AHA Centre)
- Promote cooperation in the fields of infrastructure development and emergency preparedness

On December 9, 2011, the Meeting of Information and Communications Ministers from Japan and the ASEAN countries was held in Nay Pyi Taw (Myanmar), where Japan proposed the "ASEAN Smart Network" and announced to implement feasibility studies and offer cooperation in the following fields to realize the network.

- Infrastructure improvements in ASEAN regions (deployment of the technologies and know-how of Japan which is equipped with advanced ICT infrastructure
- Human resources development (for effective use of ICT in various fields)
- Proposals concerning use of advanced ICT (deployment of problem-solution-based use of ICT that is practiced in Japan)
- Proposals concerning institutional aspects
- Promotion of international cooperation concerning information security

1-4-2 Japan's Contributions to Developing Countries

The importance of bridging the global digital divide was indicated in the comprehensive cooperative policies in the ICT sector introduced in Section 1-4-1, the "Okinawa Charter (IT Charter) on Global Information Society" was adopted in July 2000 in the Kyushu-Okinawa Summit, and the "Tokyo Declaration" in November 2000 at the APT Asia-Pacific Summit on the Information Society.

Accordingly, the Japanese Government clearly incorporated, in the Basic Act on the Formation of an Advanced Information and Telecommunications Network Society formulated in 2000 and the "e-Japan Strategy" formulated in 2001, the commitments to promotion of technical cooperation for developing countries and regions, and international cooperation/contribution.

In July 2003, the Japanese Government also formulated the "e-Japan Strategy II" to present its policy to begin with its global partnership in Asia first and expand it to the rest of the world. The e-Japan Strategy II was a comprehensive package of ICT-related policies, including building of a new international relationship centering on ICT, promotion of Asia ICT initiatives, promotion of measures to develop and popularize the broadband network infrastructure, promotion of international circulation of digital contents, development of the foundations for international e-commerce, development of human resources to support ICT, promotion of activities to seek for international standardization and the operation of the network to support ICT-related measures and systems. The strategy also declared that Japan would contribute to the international society by transmitting digital contents of the highest level in the world.

In February 2004, the Japanese Government drew up the "e-Japan Strategy II Acceleration Package", citing the international strategy in the ICT sector in Asia and elsewhere as one of the top priority measures. In line with this, the government was committed to further realization of the Asia IT Initiatives and promotion of the Asia Broadband Plan in order to secure the consistency, connectivity and interoperability of various systems, and increase mutual benefits while countries in Asia were making more use of ICT.

The "e-Japan Priority Policy Program - 2004" published in June 2004 set specific targets for the existing issues, focusing intensively on measures to achieve the targets in 2005 and preparing measures for activities in 2006 and onwards. The target in terms of the international strategy in the ICT sector in Asia was to build cooperative relationships in the ICT sector with six or more countries by 2005 and enhance the circulation of the related information in Asia. The program also referred to, as measures for activities in 2006 and onwards, efforts to bridge the digital divide by taking the initiatives not just within Asia but also in developing countries in other regions. The efforts that Japan was determined to make to ensure prompt implementation of the "e-Japan Priority Policy Program - 2004" were stated in the "IT Policy Package - 2005" published in February 2005.

In May 2010, the "New ICT Strategy" was drawn up to establish a society led by citizens.

The summary of Japan's ICT strategy for the global digital divide is shown in Table 1-4.

Table 1-4 Japan's ICT Strategy for the Global Digital Divide

Date	Descriptions
November 2000	**The Basic Act on the Formation of an Advanced Information and Telecommunications Network Society:**

	The law was formulated for the purpose of promoting swiftly and intensively measures for formulation of an advanced information and telecommunications network society. Article 24 prescribes that Japan will actively undertake technical and other international cooperation actively toward developing regions.
January 2001	**e-Japan Strategy:** The Strategic Headquarters for the Promotion of an Advanced Information and Telecommunications Network Society (IT Strategic Headquarters) established within the Cabinet formulates "e-Japan Strategy" for the purpose of "making Japan the world's most advanced IT nation within five years".
July 2003	**e-Japan Strategy II:** It aims to make active use of IT in seven leading areas, while taking advantage of the infrastructure already developed or being developed. The leading areas concern the building of a mechanism that makes the people feel the convenience of IT, such as healthcare and administrative services. It states to deploy new IT-centered international relations and aims to build comprehensive and cooperative relationships with Asian countries for multi-faceted deployment.
January 2006	**New IT Reform Strategy:** Setting a goal of "realizing a society in which anyone can feel benefits from IT at any time from anywhere, the strategy promotes various efforts under the principles of international contribution and strengthening of international competitiveness.
April 2009	**New Strategy for the New Digital Age (three-year emergency plan):** The strategy focuses on (i) promotion of projects concerning e-government, e-municipalities, healthcare, education and human assets; (ii) industrial and regional vitalization, and incubation of new industries; and (iii) development of digital foundations. As for educational and human asset projects, in particular, the strategy aims to build the world's most advanced education model that is launched for the first time from Japan and can be accepted globally.
July 2009	**i-Japan Strategy 2015:** It cites "new administrative reform" through digital technologies; focuses on e-government, e-municipalities, medical and healthcare services, and education and human assets. It strives to create a citizen-driven, reassuring and vibrant digital society.
May 2010	**New Strategy in Information and Communications Technology (IT):**

	In order to establish a new society where the citizens hold sovereignty, the strategy focuses on (i) enforcing IT revolution within the government to achieve a citizen-oriented electronic administration in the interest of promoting citizens' sovereignty; (ii) recreating bonding in local communities by taking utmost advantage of IT applications; and (iii) creating new markets and expanding them internationally.

1-4-3 e-Japan Strategy, Technological Trend and International Efforts of Japan

The series of the e-Japan Strategies began with a strategy made public in January 2001. The strategy focused its emphasis on the following five intensive goals as the country's top priority policies for the purpose of making Japan the world's most advanced IT nation within five years.

(i) Establishment of an advanced information and telecommunications at the highest level in the world
(ii) Human resources development, and promotion of education and learning
(iii) Promotion of e-commerce and so forth.
(iv) Promotion of digitization of public administration and use of ICT in the public sector
(v) Securing of safety and reliability of an advanced information and telecommunications network

The Japanese Government emphasized the need to deal with objectives that could not be necessarily realized on the initiative of the private sector, while paying attention to the incentive and effective budget allocation and execution. Such objectives include realization of e-government; development of an environment enabling safe use of ICT by securing the information security; bridging the digital divide; research and development of the fundamental technologies; and promotion of international partnerships.

The government subsequently launched the "e-Japan Strategy II" (in July 2003), the "New IT Reform Strategy" (in January 2006), the "i-Japan Strategy 2015" (in July 2009), and the "New Strategy in Information and Communications Technology" (in May 2010) that advocated to establish a new society where the citizens hold sovereignty.

1-4-4 Efforts of Individual Ministries

The Japanese Government has been contributing to sustainable development of the ICT sector in developing countries in collaboration with JICA and other entities by effectively using public funds (ODA and non-ODA). Table 1-5 shows measures that individual ministries and agencies undertook in line with the New Strategy in Information and Communications Technology.

At the 8th APEC Ministerial Meeting on the Telecommunications and Information Industry held in October 2010, the Japanese Government took the initiative to adopt the "Okinawa Declaration" as

show below under the theme of the meeting, "ICT as an Engine for New Socio-economic Growth".

- Develop ICT to promote new growth
- Enhance socio-economic activities through the use of ICT
- Promote a safe and trusted ICT environment
- Promote regional economic integration
- Strengthen cooperation in the ICT sector

Table 1-5 Major International Activities under the New Strategy in Information and Communications Technology

Item	Descriptions	Major ministries concerned
(i) Efforts made in the Asia-Pacific region	To promote the Asia-Pacific region to transform into a knowledge-oriented economy and grow integrally with Japan, the Japanese Government will further the development of ICT infrastructure and infrastructure for electronic commerce; and support the deployment and penetration of Japan's training and evaluation tools for the ICT-related human resources in the region. The Japanese Government will collaborate with other Asian countries in promoting the development and standardization of IT-related fields where Japan excels. The Japanese Government will dispatch missions to the region to give seminars on information security measures and to diagnose the energy-saving performance of plants and data centers there. The relevant governmental agencies will collaborate with one another to discuss specific drafts of agendas to be proposed to the 2010 Asia-Pacific Economic Cooperation (APEC) conference. The agenda will aim at making socio-economic activities, such as environmental, medical and public services and disaster readiness, smart and upgrading infrastructures by applying ICT. The objective will be to advance IT utilization in the APEC region and create deployment opportunities to Japan's IT industries in the Asian countries.	Ministry of Foreign Affairs, Ministry of Internal Affairs and Communications, Ministry of Economy, Trade and Industry
ii) Constructing a common cargo tracking network for international	The Japanese Government will construct a common cargo tracking network for containers and other modes by making effective use of the radio frequencies allocated to international distribution purposes; promoting international standardization	Ministry of Internal Affairs and Communicatio

distribution system	of digital tags used in international distribution; in cooperation with the APEC countries. Such a tracking system will drastically improve the international cargo traceability from the consignor to the consignee. The government will also advance the best optimized production and distribution management all over the world for the manufacturer and facilitate chattel mortgage financing. Also promoted will be green international multimodal transport; enhanced cargo security; and the like.	ns, Ministry of Foreign Affairs, Ministry of Economy, Trade and Industry, and Ministry of Land, Infrastructure, Transport and Tourism
iii) Supporting the establishment of a global ICT consortium	Within FY2010 the related governmental agencies will install a mechanism to investigate and support the establishment of a private-sector-driven global ICT consortium (which will implement developmental investigations, planning for projects, financing, and the like); and will establish specific action plans including the definition of roles of the government and private sectors. The consortium would promote overseas deployment of Japan's IT-related systems.	Ministry of Foreign Affairs, Ministry of Internal Affairs and Communicatio ns, and Ministry of Economy, Trade and Industry
iv) Expanding public procurement market through ICT	The Japanese Government will apply ICT to advancement of the dissemination of information related to the country's domestic public procurement in a consolidated manner in English or otherwise and have a framework established multilaterally to promote sharing of public procurement information by standardizing the format for public procurement information among the US and various European and Asia-Pacific region countries including local governments. In doing so, the government will be furthering the transparency of the public procurement markets of these countries thereby promoting these countries to mutually participate in the public procurement markets of one another. Ultimately, the	Ministry of Foreign Affairs, Ministry of Internal Affairs and Communicatio ns, and Ministry of Economy, Trade and Industry

	government will be promoting Japan's enterprises to enter overseas public procurement markets.	

Chapter 2 Approaches to Information and Communication Technology

2-1 Aims of Information and Communication Technology

Issues in the ICT sector are to bridge the digital divide and provide basically people in developing countries and regions with digital opportunities, so the aims here are to solve these issues. ICT is rapidly advancing and various kinds of information are being digitalized: another aim of the issue is to use and apply these ICT and digital contents to efficiently and effectively solve other development issues and for international cooperation projects.

Specific approaches to ICT-related development issues have been basically classified in accordance with the four mainstays of the Japan's Comprehensive Co-operation Package to Address the International Digital Divide which was published prior to the Kyushu-Okinawa Summit in July 2000 - that is, "raising awareness of IT opportunities and contributing intellectually to policy and institution-building", "developing and training human resources", "building IT infrastructure and providing assistance for network establishment" and "promoting the use of IT in development assistance".

JICA has set intermediate goals for each Development Strategy Goal as shown in Table 2-1, based on the recognitions that ICT is an indispensable tool for social development and that cooperation projects in individual sectors should seek for the greater effects and better efficiency through the appropriate use and application of ICT.

Three of the Development Strategy Goals - "improvement in the ICT policy-making capacity", "development of human resources to support ICT" and "development of ICT infrastructure" - are approaches directly targeting ICT to contribute to bridging the digital divide and providing digital opportunities. The other goal, "promotion of use and application of ICT", on the other hand, aims to put into practice the efficient and effective use and application of ICT and digital contents.

Table 2-1 Schematic Chart for ICT Development Issues

Development Strategy Goals	Intermediate Goals
1. Improvement of ICT policy-making capacity	1-1 Establishment of ICT policy
	1-2 Establishment of ICT industrial development policy
	1-3 Establishment of user protection policy
2. Development of human resources to support ICT	2-1 Professional development of ICT engineers
	2-2 Professional development of ICT policy practitioners
	2-3 Improvement in ICT literacy
3. Development of ICT infrastructure	3-1 Development of ICT infrastructure

	3-2 Development of ICT bases
4. Promotion of use and application of ICT	4-1 Application of ICT to individual development issues
	4-2 Effective use of JICA-Net
	4-3 Improvement in efficiency and effects of cooperation using ICT

The four strategy goals are closely related to one another: promotion of use and application of ICT in developing countries requires the ICT-based infrastructures, as well as human resources for the operation, maintenance and management of the infrastructures. The development effects will get good results only if the four strategies functions in a well-balanced manner.

2-2 Effective Approaches to Information and Communication Technology

Prior to the use and application of ICT, the related infrastructure must be constructed, operated and maintained, which require a considerable amount of investment. While the fast-evolving ICT is becoming more and more useful, users need to continue investments to upgrade the technology which become obsolete in a few years. In this regards, there is a bottleneck in terms of cost performance for developing countries to adopt and use ICT.

On the other hand, the marginal utility that communities and individuals in developing countries can benefit from the use of ICT is substantial since they have faced the considerable limitations of access to information and knowledge due to geographical, economic and social reasons. This is because information and knowledge help developing countries use their limited resources for better purposes, and increase investment in activities to develop their economies and society.

In recent years, however, the cost of ICT facilities has been falling, and systems using ICT and information contents are improving. In addition, mobile terminals and cloud computing are becoming more easily available. It is noteworthy that it is becoming easier, compared to the time of the ICT revolution, for developing countries to adopt the technology.

Developing countries should investigate the cost-effectiveness, obtain assistance offered by the international society, and proceed wisely with adoption of ICT. An effective approach toward an ICT development strategy in developing countries is to make maximum use of advantages as latecomers which can use the advanced technologies at lower prices.

Development Strategy Goal 1: Improvement of ICT policy-making capacity

DSG 1: Improvement of ICT Policy-Making Capacity

It is said that the aims of ICT policy are twofold: an improvement in economic efficiency and social considerations. The former means to promote the realization of optimal supply of ICT through free competition, and the latter to pay attention to social considerations such as fairness among users and

appropriate conditions for the use, which tend to be neglected while seeking for economic efficiency. In addition, policies in the ICT sector needs not just to contribute to the growth of the overall sector which supplies the relevant services and products (telecommunication carriers, companies, etc.) but also to consider the fairness and protection of users of these services and products.
Accordingly, JICA set three intermediate goals as shown in Table 2-2.

Table 2-2 Relationship Diagram of Intermediate Goals:
Improvement of ICT policy-making capacity

Aims of the Policy	Intermediate Goals
Economic (optimization of supply)	Establishment of ICT policy (Communication infrastructure)
	Establishment of ICT industrial development policy (Hardware and software industries)
Social (social consideration)	Establishment of user protection policy

Intermediate Goal 1-1: Establishment of ICT Policy

Intermediate Goal 1-1: Establishment of ICT policy

The process of modernizing and liberalizing information and communication services in advanced and other countries takes various forms. However, these Guidelines will discuss policy issues of each stage of the process seen in the majority of countries including Japan. The process follows the stage from "state-run company" to "monopolization by a private company" and "adoption of the principle of market mechanism". General issues and their solutions at each stage are summarized in Table 2-3.

Table 2-3 Issues and Their Solutions at Each Stage

Stage	General issues	Solutions
State-run company	• Shortage of investment capital • Insufficient capacity to deal with technology innovation and increased demand • Lack of incentives to seek efficiency	• Improvement in profitability of the services • Increase in capital • Revisions to the operation of the services (improvements in

		organizations and management)
Monopolization by a private company	• Absence of competitive environment • Shareholding and control by the government	• Supervision of price-setting and quality • Reduction in the ratio of shareholding by the government ⇒ Expansion of private and foreign investments
Adoption of the principle of market mechanism	• Dominance of the market by enterprises with a large share (former state-run company, in particular) • Obstacles for new entries (legal and institutional restrictions)	• Permissions for connection agreements and supervision • * Adoption of an appropriate permission and authorization system

At the stage of "state-run company", a shortage of investment capital is conspicuous. Although the expected rate of return[1] from investment in the information and communication services is high in developing countries, they fail to make sufficient investment. Privatization of the sector could be a fundamental solution; however, due to various reasons such as the political importance of the telecommunication infrastructure and employment of workers at state-run companies, developing countries have in general difficulty privatizing the ICT sector drastically. In such circumstances, it is necessary first to improve the profitability of undertakings of the state-run companies for the effective use of limited investment capital. For this purpose, it is necessary to draw up an appropriate and reasonable plan for infrastructure development and provide assistance for sound management[2]. Quite a few state-run companies lack the capacity to deal with the technology innovation and increased demand, and incentives to seek for better services and economic efficiency. This is often seen in a backlog problem – a problem causing difficulties for customers to receive necessary services. At the same time, an infrastructure development plan should be formulated in consideration of profitability, from both the short and long-term perspectives, and with a right size and a right

[1] According to "Implementing Reforms in the Telecommunication Sector", B. Wellenius and P. Stern (1997), published by the World Bank, despite high expected rates of return of 20-30% or higher, developing countries invested a mere 0.4-0.6% of their GDP on average in the telecommunication sector in the latter half of the 1980s.

[2] In this section, the concept of "policy" is broadened to include projects operated by state-run public corporations. This is because governmental IT policies and business activities of state-run public corporations are directly and closely linked with each other. This goal, associated with a Development Strategy Goal "Development of ICT Infrastructure", will aim to deal with development of specific infrastructures involving direct investment.

technology. A legal and institutional framework with an eye to privatization should be made only after these conditions have been satisfied. Other than privatization, there are other policy options to solve the issues at the stage of state-run companies, such as the use of private capital by granting concessions (privileges) to particular companies and a scheme as seen in the Northern Europe to allow private companies to enter the market while maintaining state-run companies.

At the stage after privatization, supervision of enterprises concerning the quality and prices of telecommunication services is of importance. In many cases, state-run companies are, after privatized, allowed to dominate the market for a certain transitional period to prepare for market competition. In the situation where no principle of market mechanism works, it is necessary to supervise enterprises in the form of permissions of price-setting and plans for undertakings, and see if they provide quality services at low prices. At this stage, the government holds the shares in the enterprises in many cases. But the government is required to reduce the ratio of shareholdings gradually and, at the same time, aim to invite private and foreign investments.

At the stage where the principle of market mechanism is adopted, the regulations and systems which have allowed the former state-run companies to dominate the market are lifted to encourage new entries. It is also necessary to create a fair competitive environment. Competition is promoted gradually for development of the sound industry by, for example, laying down necessary business laws to allow new entries, and allowing both domestic and foreign capitals to enter the industry. It is particularly important to get rid of the power of the former state-run companies to control the market for creation of a fair competitive environment. The market would not be made competitive enough only with an institutional framework. The former state-run companies have already established various infrastructures including the lines at end-users, whereas newcomers need to have their networks connected to the former state-run companies to supply end-to-end services. In this regard, it is necessary to supervise from the public viewpoint whether connection agreements are concluded in a fair manner. The government concerned is required to investigate if there is any conducts of interference with new entries concerning connection fees and conditions imposed by the former state-run companies.

A key point in ICT policy is to formulate measures to bridge the digital divide. Within a country, there are various levels of the information disparity – not only the gap among regions but the gap affecting the socially vulnerable (people in poverty, women, minorities, the disabled, etc.). It is important to correct the digital divide at various levels and enable every member of society to benefit equally from ICT. An example is Grameen Phone which was co-financed by Grameen Bank to launch in 1997 business to sell mobile phones to women in Bangladesh at low prices. Since these women were given opportunities to start business with one mobile phone only, they managed to establish family business in quite a few villages. Mobile phones were used to check the market prices of agricultural products and to contact their family members who were abroad to work, serving as a

means of independence for women and the disabled who had not had any production means.

As for the regional digital divide, it is necessary to create a framework to provide official assistance to development of the infrastructure in rural areas where the profitability is low. If the fixed-line network is operated by a monopoly company, it is necessary to audit if appropriate considerations are taken for rural areas at the time when permissions are given concerning service charges and business plans. On the other hand, in countries where the market is already competitive, it is important to formulate a framework, such as a universal service system[3] to supply the services to everyone, whereby a certain amount of funds are collected uniformly from users and can be granted as subsidies to enterprises which voluntarily construct the infrastructure in rural areas.

For the socially vulnerable, it is effective to establish a system that officially assists the establishment and operation of Internet service providers which supply services to the low income group and the physically disabled (visual and hearing disabilities, for example). It is also effective to collaborate with NGOs and other entities to subsidize development of digital contents that can promote social independence of the vulnerable or launch measures assisting the popularization of the Internet.

In June 2010, the Japanese Government formulated a New Strategy in Information and Communications Technology, through which it aimed to achieve various goals by FY2020. The strategy regards ICT as a basis for new innovation. The "New Broadband Super Highway (*Hikari no Michi*)" Plan launched in the strategy aims to provide all the households in Japan with the broadband services for the purpose of increasing the economic productivity and realizing a rich society through the use and application of ICT.

As seen above, it is necessary to formulate ICT policies from various perspectives, such as construction of the telecommunication infrastructure, impacts on telecommunication carriers, bridging the domestic digital divide, consistence with the central government's plans and market trends. Thus, it is important, when assisting ICT policies, to examine multifaceted factors, such as assistance to develop a legal foundation including reorganization of frequencies; assistance to the government to formulate strategies for the use of ICT; and regulations on mobile terminals and cloud computing that are having more and more functions.

The business environment affecting telecommunication carriers has been considerably changing as mobile terminals are rapidly popularized. Since mobile data traffic has been significantly growing, the carriers are required to invest in plants and equipment to meet the increased demand. However, the amount of investment required tends to be greater than the revenue from the increased data traffic, so the carriers are obliged to outsource the maintenance and management work or jointly use their telecommunication facilities with other carriers so as to reduce the gap between the increased cost

[3] N. Garnham (1997) defines the universal service as "provision of affordable access to basic voice telephony for all those reasonably requesting it, regardless of where they live".

and revenues. The outsourcing of the network is to reduce the maintenance and management cost by entrusting the maintenance and operation to third parties, and the sharing of facilities is to reduce the costs by borrowing necessary facilities from other parties or jointly using facilities with other parties. This business environment is likely to give room for emergence of businesses specializing in the maintenance and operation of telecommunication facilities, leading to a paradigm shift for carriers. In this regard, it is necessary to propose ICT policies that take into account reorganization of the ICT industry.

JICA's commitments

JICA is committed to cooperation for formulation of an ICT policy chiefly through dispatch of experts on policy advice or technical cooperation. For countries at the stage of "state-run company", JICA carries out technical cooperation for development planning to provide assistance for formulation of infrastructure development plans, though it has not engaged in many projects of this kind so far. In order to consider JICA's commitments in future, it is necessary to build an effective model to meet each stage of the ICT market of target countries.

When tackling the issue of the domestic digital divide in developing countries, JICA has focused on the hardware side of the issue – that is, the issue of how to extend their telecommunication infrastructure to rural areas. In future, however, it is also necessary to improve assistance on the software side – that is, creation of digital contents useful for the socially vulnerable and people in rural areas and contents which can contribute to social welfare.

In this regard, JICA has undertaken a cooperation project, a "Study on Enhancement of Info-Communications Access in Rural Communities in Malaysia", to contribute to bridging the digital divide in rural areas by opening up a pilot regional Internet center.

Intermediate Goal 1-2:
Establishment of ICT Industrial Development Policy

Intermediate Goal 1-2: Establishment of ICT Industrial Development Policy

ICT-related industries have been classified into hardware and software industries, for which intermediate goals have been set, other than those for the telecommunication services. Compared to the telecommunication services, ICT-related industries depend less on infrastructure and facilities, and it is easier for new businesses to enter the market, so the relationships between the central government and enterprises are considerably different. The fact is that the private sector should play the central role, while governments and other parties are required to avoid application of any unnecessary regulations and provide the minimum necessary measures only.

There are some important issues for sound development of ICT-related industries, including:

- Maintenance of an open and active environment for competition
- Promotion of private investment and participation of foreign capital
- Technological neutrality
- Subsidies for R&D
- Protection of intellectual properties

Policy commitments to industrial development include preferential treatment in terms of taxation and financing for the purpose of encouraging investment and industrial activities. It is also important to promote and subsidize, from the long-term perspectives, research and development that does not necessarily generate profits in the short-term perspectives to private companies.

Different advanced countries take different approaches to securing of the technological neutrality. What seems important, however, is to promote competition among various technologies and allow selected and optimal technologies to create and maintain the market environments, rather than promoting specific technologies from the viewpoint of policy makers.

As for protection of intellectual properties, it is important to maintain the motivation of the overall industries to develop new products and establish their status in global markets. It is also important not only to formulate laws and regulations to protect intellectual properties but also to build a system to set them in place.

JICA's commitments

JICA dispatches ICT policy advisors and multimedia policy advisors to developing countries. Both types of advisors are dispatched chiefly to promote research and development activities in the ICT sector and give policy advice on governmental strategies to promote R&D. Because of the nature of R&D, cooperation of this kind is limited to countries at a certain R&D level.

Intermediate Goal 1-3: Establishment of User Protection Policy

Intermediate Goal 1-3:
Establishment of User Protection Policy

Protection of users (individuals and organizations) of ICT-related services and products is an important policy issue for sound industrial development. Important themes include protection of personal information and ethical codes; supervision of unfair contracts and transactions; and security issues such as prevention of unauthorized access. Since it is necessary in any case not just to formulate a framework for systems and regulations but also to build the organizational capacity to enforce them, it is important for relevant organizations to formulate an appropriate policy on information security.

An information security policy normally includes the basic policy and the standards for the relevant

measures. The former aims to present the fundamental approach of the organization concerned to information security measures and its commitments to information security by clarifying protective measures to take, the information assets to protect, conceivable threats, and the reasons of focusing on these factors. The latter aims to present specific actions and standards of judgment necessary to maintain the information security shown in the basic policy, and various other measures to fulfill the basic policy. It should be noted that the information security policy should be reviewed and improved constantly through the PDCA cycle.

JICA's commitments

JICA has undertaken cooperation projects, if not many, through experts on policy advice. Since formulation of the information security policy is becoming more and more important as ICT is prevailing in future, JICA will commit itself to technical transfer, together with cooperation for establishment of legal foundations to protect ICT users and various systems to protect intellectual properties.

Development Strategy Goal 2: Development of Human Resources to Support ICT

Development Strategy Goal 2:
Development of Human Resources to Support to ICT

Human resources development is essential to make the ICT infrastructure effectively function. Personnel to support ICT include engineers who can operate, maintain and administer the ICT infrastructure; content developers and system engineers; and policy practitioners who can make ICT function effectively as a social system. It is also necessary to train and educate users of ICT. In line with this, JICA has set three intermediate goals for development of human resources to support ICT: "professional development of engineers", "professional development of policy practitioners" and "improvement in ICT literacy".

Intermediate Goal 2-1: Professional Development of ICT Engineers

Intermediate Goal 2-1:
Professional Development of ICT Engineers

What is important for professional development of ICT engineers is to secure a certain number of professional engineers at a certain technical level - that is, to secure the quality and quantity of professional engineers.

To secure a certain technical level, it is necessary to prepare schemes such as qualification examinations and a registration system for engineers. In Japan, for example, the Ministry of Economy, Trade and Industry (the then Ministry of International Trade and Industry) launched in 1969 an information technology engineer examination system (ITEE). The e-Japan Strategy of the Japanese Government also includes projects to formulate and disseminate the skill standards for IT professionals (ITSS)and the promotion of “Asia e-Learning”. The former aims to meet the domestic standards with the international ones and the standardization of assessment methods of IT skills, while the latter aims to promote mutual recognition of skills of system engineers and programmers in Asian countries.

In the ICT sector, unlike other sectors, systems and schemes need to be revised constantly since the environment affecting the sector changes drastically. In Japan, the programmer examination system has been revised to reflect the trend in the sector by launching new qualifications and changing the style of certification examinations. It was refurbished in 2009 as a totally new system with 12 examination categories. Thus, any cooperation to professional development of engineers in developing countries needs to take into account not just the “start-up of systems” but a “mechanism allowing revisions of such systems at any time”.

It is important to make balance between the quality and the quantity.

On the other hand, in order to secure the certain number of professional engineers, it is necessary to focus on two target groups. First, it is necessary to penetrate ICT to civil servants and private citizens who are already playing the productive roles in society. ICT itself is not the ultimate goal but a means to achieve other aims. Since these people have work experience, cooperation targeting them is certainly expected to produce prompt outcomes. The other target is a group of people who are still receiving education to enter society. Education of new engineers is of importance in the long term: it is necessary to incorporate ICT in the elementary and secondary education, not to mention in the higher education, so as to expand the bases of future professional engineers and foster human resources with computer literacy which is nowadays regarded as the basic capacity.

Education of educators should focus on the quality rather than the quantity.

Moreover, for a higher education level, it is necessary to train educators who can train future engineers. Taking into consideration the role and responsibility of educators, the focus should be placed on training high-quality educators, rather than unnecessarily increasing the number of educators. Such training of trainers can be carried out at technical schools, polytechnics, advanced research institutions, research institutions and other institutions available in countries subject to cooperation.

JICA's commitments

ICT-related Training at JICA Okinawa International Center

The JICA Okinawa International Center has, since its opening in 1985, provided training on computer and technologies for educational media. Its computer course initially dealt with host computers under a different course name, a training course for system engineers. The course has been revised on a regular basis and, since FY1993, provided training on host computers and client servers (C/S). In FY1997, it abolished curriculums on host computers, focusing on training of C/S since then. In 2005, the course included curriculums on leaderships, negotiations and other human skills, together with technical training, so as to meet the situation of the time, in which the government promoted e-government and outsourcing was becoming a major tool for business activities. In FY2011, the Center offered the following six courses in the ICT training course.

(i) Development of web applications for promotion of e-government
(ii) Strengthening of strategic organizational power for promotion of e-government (A)
(iii) Strengthening of security for promotion of e-government
(iv) System operation and administration for promotion of e-government
(v) Strengthening of strategic organizational power for promotion of e-government (B)

(vi) Building, operation and administration of IP networks for promotion of e-government

As of December 2011, a total of 26 trainees were on the courses of (i) - (iii), and 32 trainees on the courses of (iv) - (vi). In 10 years between FY2002 and 2011, a total of 1,399 persons (including persons scheduled to attend) attended the ICT-related courses. The average number of trainees per year totals some 140.

The contents of technical cooperation in the ICT sector need to be revised constantly because of fast technical innovations.

The contents of training courses for the ICT sector where the technologies are fast-growing need to be revised constantly so as to provide training required in developing countries and to meet changes of the times.

In relation to projects for development of human resources in the ICT sector, JICA has conducted "trainings for trainers" programs, through which it has provided know-how of setting and operation of WBT (Web based training) for content developers and other training courses.

As for host organizations of cooperation, the number of universities, polytechnics and other higher educational institutions has been increasing, together with governmental research institutions.

From the long-term viewpoint to expand the bases for future engineers, it can be said that JICA considerably contributes to development of professional engineers in future in developing countries. Meanwhile, JICA provides Japanese citizens with opportunities to engage in international volunteering activities through, for example, the Japan Overseas Cooperation Volunteer Program and the Senior Volunteer Program. Some Japanese participants in the educational fields engage in training and guidance of teachers rather than students and pupils in developing countries.

Volunteer programs to train educators on site are growing.

Intermediate Goal 2-2: Professional Development of Policy Practitioners

Intermediate Goal 2-2:
Professional Development of Policy Practitioners

It is an undeniable fact that development of policy practitioners has some aspects that are difficult to deal with. While it is easy to say what is correct or incorrect in terms of technologies, it is difficult to evaluate policies in an absolute way.

Japan needs to rely on limited human resources such as ministries and agencies in charge of policy-making (the Ministry of Internal Affairs and Communications, and the Ministry of Economy, Trade and Industry). The human resources on parties concerned with cooperation are not necessarily sufficient compared to human resources for development of engineers and educators.

Moreover, due to the differences of social systems, practices, basic policies and other factors, Japanese models are not necessarily applicable to developing countries to receive cooperation. They may fail to demonstrate useful effects and even provoke disapproval of recipient countries. Thus, it is necessary to build cooperation programs to meet the situation of recipient countries and prepare to revise the programs flexibly when the necessity arises.

It is necessary to take the flexible stance to meet the situations of recipient countries.

JICA's commitments

JICA has carried out projects to dispatch advisory experts, such as "planning advisors for the directors of Minister's Secretariat", "experts on telecommunications policy" and "ICT policy practitioner". It has also carried out technical cooperation for development planning such as assistance to coordinate the economic structure (ICT study group). It is considered that these projects not just provide advice and the findings of researches but also contribute, through the process of giving advice and so forth, to professional development of policy practitioners of the recipient countries.

JICA Tokyo International Center held in FY2010 a training program on "telecommunication policies", addressed to policy practitioners at managerial posts at governmental agencies in charge of telecommunications in developing countries. The program aimed to assist the relevant governments to formulate regulations and policies related to privatization of the telecommunication services by providing the participants with the knowledge of the backgrounds, history, the current situation and various policies involved in privatization of Japan's telecommunication services. The Center also held training courses in FY2010 and 2011 on "standardization of the telecommunication services", "strengthening of the capacity to transmit regional information", "standardization for building of telecommunication infrastructure". A total of 40 trainees completed the courses or the program on "telecommunication policies".

Intermediate Goal 2-3: Improvement in ICT literacy

Intermediate Goal 2-3: Improvement in ICT Literacy

The intermediate goal, an improvement in ICT literacy, includes sub-goals, such as assistance to an improvement in users' literacy; enlightenment of users concerning security of computers and networks; and application of ICT to education. Possible cooperation projects in this category include promotion to increase opportunities to use computers for people living in rural areas and having little chances to have access to the ICT environment, and promotion to make them have access to remote services through networks.

JICA's commitments

JICA has conducted technical cooperation for development planning and provided assistance to formulation and implementation of action plans as well as model projects concerning computerization of regional information based on regional Internet centers (RIC). It has also carried out the following projects to improve ICT literacy in various countries.

- Project for Informatics Curricula Modernization Phase 2 (Bosnia and Herzegovina) (Project period: August 2010 - August 2013)
- E-Learning Management and Utilizing in the Classroom (Jordan) (Project period: August - December 2010)
- Capacity Development of Learning Resources Centers (LRCs) for Science Education utilizing ICT (Jordan) (Project period: March 2006 - February 2009)

Development Strategy Goal 3: Development of ICT Infrastructure

Development Strategy Goal 3:
Development of ICT Infrastructure

Most of the ICT terminology has been widely used in the field of multimedia, so that the nature of ICT is generally understood as the integration of information processing, telecommunications, broadcasting and the like. Now that the use of network technologies - in particular, Internet technology - is becoming more and more important, the key is how effectively ICT can be used in various activities in society.

Policy support, human resources development and specific activities in various fields are necessary for further promotion of the use and application of ICT. But to undertake these activities, communications infrastructure must be constructed first. In this regard, cooperation aiming at the following intermediate goals may be effective to realize this development strategy goal.

Intermediate Goal 3-1: Development of ICT Infrastructure

Intermediate Goal 3-1:
Development of ICT Infrastructure

The communications infrastructure is classifiable in terms of the function into a backbone network and an access network, which need to be examined independently of each other. In the case of developing countries, development of infrastructure in rural areas is another issue that has to be examined separately.

As for development of a backbone network, developing countries are inevitably likely to shift from the IP network under the packet transmission system to the application of the next generation network (NGN) technology as in developed countries. Moreover, as the number of subscribers to mobile phones and Internet providers has been growing sharply, the issue is how much channel capacity should be prepared for the communications network. Another issue is to secure the reliability of the network.

For an access network for the fixed-line communications, one of the goals will be adoption of FTTx (Fiber to the x) to improve the transmission quality. As for mobile access network, adoption of WiMax (Worldwide Interoperability for Microwave Access) that can be also used for high-speed mobile communication will be another option.

For development of infrastructure in rural areas, important goals will be to eliminate areas without the service and develop the communication infrastructure contributing to industrial promotion in the areas concerned. In this regard, because it is necessary to make the considerable amount of investment and also because it will be yet impossible to balance a budget with revenues from the network fees in near future, cooperation projects aiming at these goals must consider the detailed

situations of each country, such as a roadmap towards the goals, technologies to apply, methods to secure necessary budgets and feasibility of the fund-raising. Note that WiMax is useful to provide access for the “last mile” to cover underpopulated areas and areas where it is difficult to lay a wired network due to their landforms.

The advantages and disadvantages of transmission channels are shown in Table 2-4.

Table 2-4 Types of Network Transmission Channels

	Type of transmission channel	Installation location	advantages	Disadvantages	Remarks
Wired	Copper wire	Mainly subscriber network	It is used worldwide at low costs. The traditional copper wire can be used for high-speed communications with xDSL technology.	It is inferior to optical fiber in terms of speed and capacity, and vulnerable to the surrounding electromagnetic environment.	It is suitable for voice communications. If lines are newly constructed, optical fiber is more favorable because of its larger capacity.
	Optical fiber	Backbone network and subscriber network	It allows a high-speed and large-capacity network and is unaffected by the surrounding electromagnetic environment. It is also excellent in flexibility and easy to set in.	Optical signals need to be converted to electrical signals at network nodes. The conversion may result in slow connections.	Services for subscribers’ network include FTTH (Fiber To The Home), FTTC (Fiber To The Cabinet) and FTTB (Fiber To The Building).
Wireless	Microwave	Backbone network	It allows long-distance transmissions only with linking stations at intervals of every several	It is inferior to optical fiber in terms of speed and capacity.	It is suitable to set a long-distant transmission channel on a plain area. More linking stations are required when it is

			tens of kilometers.		used on a rough terrain.
	WiMAX	Subscriber network	It requires no wiring work to connect the line to subscribers' home, so the network can be constructed quickly at low costs. It can be also used for mobile communications.	It is inferior to optical fiber in terms of speed and capacity.	The transmission capacity and speed are improving thanks to technology progress. It can be used for "last mile" for FTTx.
	Satellite	Backbone network	Since it transmits radio waves from the air above, it can help build a network efficiently in a wider region covering scattered areas.	Transmission via satellite may delay. It is inferior to optical fiber in terms of speed and capacity.	Antennas of various sizes are used, including very small aperture terminals (VSAT) and antennas with a large-aperture. It is suitable for mountainous areas where it is difficult to connect through landlines.

JICA's commitments

Since 1987 when JICA conducted an ODA loan project to improve the telephone network in Thailand, it has undertaken a number of grant aid projects and development researches in relation to development of the ICT infrastructure. All these commitments of JICA concerned assistance in developing backbone networks and access networks, or developing the ICT infrastructure in rural areas. It has also carried out a grant aid cooperation project for post-war reconstruction of Iraq starting in 2004, where it restored a backbone network of 1,000km in north and south. The overall backbone network was complete in October 2010.

The form of ICT networks has been shifting from the traditional public switched telephone network (PSTN) to the next generation network (NGN), and experimental tests are being carried out for the new generation network (NWGN) nowadays. Accordingly, it is necessary, in projects to develop the ICT foundations in developing countries, to analyze their existing communications networks and

propose optimal network plans.

Intermediate Goal3-2: Development of ICT Bases

Intermediate Goal 3-2:
Development of ICT Bases

The intermediate goal, development of ICT bases, includes sub-goals, such as development of ICT parks, data centers and bases for public use.

Candidates for ICT bases include computing centers that can provide services of information processing functions; research centers and ICT-related companies that undertake ICT-related researches; and universities offering studies on ICT. It is necessary to develop ICT bases in developing countries and incorporate the function of cloud computing in such bases in future.

Cloud computing is definable as a model, where a service provider owns networks, servers, applications and other computing resources to enable its users to have access to its facilities and conduct necessary computations. In other words, it is a system where users can use necessary services from a provider without possessing computers or other kinds of hardware or applications or other kinds of software of their own. All the users need to prepare is a terminal to access. Since cloud computing makes users free from the costs of purchasing, maintenance and management of any computers or applications, even persons who face the budget constraint or are not familiar with the computer and operations can use the system.

For example, suppose that an ICT base in a developing country is equipped with cloud computing and connected via a network to the municipalities across the country. Then, individual municipalities will neither have to own their own computers nor allocate their personnel to maintain and manage such computers, resulting in a substantial cut in the administrative costs. It is also likely to facilitate the use of ICT nationwide.

There are some issues to solve: since users' data are all cumulated in cloud, if any problem arises with the equipment of service providers in cloud, it will affect the users, too. Moreover, cloud providers need to ensure prevention of information leakage and the security of users' data.

JICA's commitments

JICA conducted the Study on Enhancement of Info-Communications Access in Rural Communities in Malaysia (a development study in January 2002 - March 2003). The study aimed to assist the counterpart to formulate an action plan for computerization of regional information for the purpose of more effective use of its "Regional Internet Centers". The center, located in each state, was open to citizens free of charge and served as a base enabling them to understand the convenience of computers and the Internet. In a project for the Research Center for Communication and Information

Technology (ReCCIT) of the King Mongkut's Institute of Technology, Ladkrabang, (KMITL) in Thailand (a technical cooperation project in 1997 - September 2002), JICA provided assistance to build a research center on the premises of the Institute to improve the postgraduate education and attain the international R&D standards.

JICA is in future required to pay attention to the latest technologies and consider the possibility of adopting cloud computing when it undertakes cooperation for development of ICT parks, data centers and other bases for public use.

Development Strategy Goal 4: Promotion of Use and Application of ICT

Development Strategy Goal 4:
Promotion of Use and Application of ICT

The use and adoption of ICT should be promoted actively because the administrative work and operations in various sectors can be streamlined with only adoption of computers and business systems using computers, and an improvement in the computer literacy of personnel in charge of the systems.

This development strategy goal is based on the recognition that ICT is a tool to streamline the work procedures in industrial sectors, administrative organizations, agriculture, healthcare and medical services, education and other fields; and to facilitate production of products and services with high added values in these fields by vitalizing the circulation of information through the streamlining of clerical work procedures and networks within organizations. Accordingly, JICA set the following intermediate goal: the "application of ICT to individual development issues" , for example, for the use of ICT to promote the strengthening of the governance capacity and the use of ICT in fields related to basic human needs; the "effective use of JICA-Net" which is a technology for distant learning; and an "improvement in the efficiency and effects of assistance using ICT" to disseminate and transfer the existing knowledge and to share and create experience and knowledge.

Intermediate Goal 4-1: Application of ICT to Individual Development Issues

Intermediate Goal 4-1:
Application of ICT to Individual Development Issues

The promotion of e-government itself is not a goal: the ultimate goal is to strengthen the governance through an improvement in administrative efficiency, disclosure of information and the participation of citizens in the process of policy decisions. The term “promotion of e-government” itself has no established definition, but the IT Strategic Headquarters of the Japanese Government cites, in its “Priority Policy Program 2008”, “the electronic provision of administrative information”, “computerization of application and notification procedures”, “computerization of procurement

systems" and "paperless promotion" as specific measures to realize the "e-government".
On the other hand, the "Benchmarking E-government: A Global Perspective - Assessing the UN Member States" published in June 2002 values the "provision of administrative information" "computerization of application and notification procedures", "disclosure of information" and so on.

E-government is a situation where e-governance is realized, including the concepts of "participatory policy planning", "changes in the relationships between administrative organizations and the citizens, and among administrative organizations" to be realized by the use of ICT. "M-government" which uses mobile terminals has been also being studied.

Various United Nations reports refer, as an ultimate form of e-government, to "e-governance" including the "participatory policy planning" and "changes in the relationships between administrative organizations and the citizens, and among administrative organizations" that are to be realized by the use of ICT. However, since "e-governance" contains a fairly wide-ranging concept and thus not all the aspects are necessarily suitable for assistance, these Guidelines focus on the "use and application of ICT to promote the strengthening of governance capacity" as a sub-goal of the intermediate goal. The Guidelines also regard "electrical government" as identical to "e-government".
In passing, m-(mobile-) government is seen as an extension of e-government. It is a form of the effective use and application of ICT, where citizens use cheap and existing mobile communication terminals to easily access a wide range of the public information and services related to, for example, legal, healthcare and medical, education, financial, employment, transportation and security matters.
Specifically, the use and application of ICT to the administration may be classifiable into the following categories:

1. As a "means of streamlining internal operations", adoption of business systems to streamline routine operations within the government and personal computers to efficiently create various documents used within and outside the government;
2. "Computerization of application and notification procedures" to enable the citizens to make various procedures to the government through the Internet;
3. Development of systems for efficient disclosure of information in response to a heightened call for the government to disclose its information to the citizens from the viewpoint of "good governance"; and
4. Coordination of opinions through e-mails and websites to facilitate "participatory policy planning" that is also required from the viewpoint of "good governance".

Computerization of application and notification procedures first requires the retrieval of data on a large number of applications and notifications already submitted to the government into a system for computerization. Thus, the computerization in many cases is carried out after internal operations in

the government have been streamlined and the disclosure of governmental information on websites realized. On the other hand, it is difficult to envisage the effects of the cost of the information disclosure and the participatory policy planning. And developing countries do not necessarily place emphasis on these issues.

Where e-government is concerned, it is necessary to consider the approach of assistance to development in consideration of the situation in Japan which had promoted "e-Japan strategies" for ten years by 2011. Over the ten years, Japan experienced several stages that is, the period to develop the foundation of ICT (e-Japan Strategy), the subsequent period to promote the use and application of ICT (e-Japan Strategy II) and the stage to seek the capacity to reform the structure (New IT Reform Strategy). In the period to develop the foundation of ICT, both the central ministries and agencies, and regional municipalities promoted development of the information and communications infrastructure, so that the initial goals of the strategy were almost all fulfilled. In the period to promote the use and application of ICT, these governmental entities were committed to reforms on social services using the ICT foundations, but the ultimate goal of the use and application of ICT remained unachieved. The stage to seek the capacity to reform the structure aimed to cover the administration services, medical and healthcare, education and other services closely associated with the citizens' everyday life, but the strategy failed to popularize and disseminate the use of ICT fully in society.

In light of Japan's experience explained above, developing countries should explain to the citizens about what e-government will change and, at the same time, educate the citizens about e-government. Moreover, cooperation entities should understand the true needs of the citizens concerning what kind of changes they want before engaging in actual cooperation.

Meanwhile, the emergence of smartphones and other mobile terminals and the progress of new mobile telecommunications technologies, such as 3G and 4G, are likely to realize easier access to a wide range of the public information and services related to, for example, legal, healthcare and medical, education, financial, employment, transportation and security matters, so they should be considered as the first step toward the realization of m-government.

The use and application of ICT to education needs the ICT capacity of teachers, so their capacity needs to be improved first.

"i-Japan Strategy 2015" focused on education as one of its three intensive fields to promote the use and application of ICT, so the ICT environment at schools has rapidly improved. On the other hand, however, it seems to take more time to make all pupils at primary and junior high schools have mobile terminals to use digital textbooks. .

Possible approaches to assistance in promoting the use and application of ICT in the educational sector in developing countries include (i) to aim to improve the ICT literacy of pupils by supplying

computers and other devices to schools; (ii) to aim to diversify the contents of lessons by developing the Internet environment at schools and enabling them to use the networks; and (iii) to aim to arrange classes using electric boards and digital textbooks for better understanding among pupils. Either way, the ICT capacity and teaching ability of school teachers are critical for the successful use and application of ICT in education, so that it is necessary to consider cooperation projects to improve school teachers' capacity in accordance with the situation of the developing countries concerned.

To promote the use and application of ICT in the medical and healthcare sectors, multi-faceted investigations should be made for, for example, the current state of medical institutions, the ICT literacy of medical personnel, the state of IT infrastructure and related legal issues.

In the medical and healthcare sectors in Japan, various systems using ICT have been becoming common in Japan. Such systems include the electronic health record, the remote diagnostic image, the remote pathological diagnostic and the home care systems. Health management services through mobile phones, where experts give advice to individual customers base on their health records, have been becoming a part of peoples' lives, too. Moreover, some medical and healthcare entities are adopting provisionally a system where the elderly and other patients who find it difficult to go to hospital consult with doctors and nurses at a distance through the Internet.

Possible approaches to assistance in promoting the use and application of ICT in the medical and healthcare sectors in developing countries include adoption of the electronic health record system at medical institutions and the remote medical system (remote diagnostic image, remote pathological diagnostic systems). Prior to this, however, it is necessary to see if the medical institutions concerned are ready to take in these systems. If doctors are busy with seeing many patients every day, they may not have time to spare additional patients on the remote system. An improvement in the ICT literacy of doctors and nurses will be a prerequisite for adoption of the electronic health record system. In the same fashion, the telecommunications infrastructure needs to be developed prior to the building of any remote system. Cooperation agencies need to investigate, first of all, the current situation of the ICT infrastructure and medical institutions in the developing countries concerned.

Moreover, it should be noted that legal problems are likely to arise when applying ICT to the medical and healthcare sectors. In Japan, for example, the Medical Practitioners Act requires medical practitioners to see patients in principle on a face-to-face basis, and it takes more time to legally allow nurses and other medical personnel than doctors to give patients professional medical advice.

Therefore, possible approaches to assistance in promoting the use and application of ICT in the medical and healthcare sectors in developing countries include adoption of the electronic health record system at medical institution and the remote medical counseling system in rural areas with no

medical practitioners, but all this will depend on the situation of the telecommunications infrastructure, the ICT literacy and the workload of the medical institutions concerned. Cooperation agencies need to investigate possible approaches from the viewpoints of both medical institutions and patients.

In relation to the use and application of ICT in the environmental sector, a smart grid is an item that enables Japan to demonstrate its technical strength for global warming.

Multi-faceted investigations are required before the use and application of ICT is promoted in the environmental sector. In general, there is a belief that ICT contributes to the CO2 emission reductions. The energy consumption is less for a TV meeting than for a traditional meeting for which participants use transport means and gather at a venue. The CO2 emission is less for on-line shopping than for going out by car for shopping. What should be noted, however, is that the electricity consumption of ICT equipment is considerable, if the coolant system to cool the equipment is also taken into account; adoption of ICT does not necessarily lead to an environmental load reduction.

Even so, ICT is a truly useful device to reduce the environmental load, and a smart grid using ICT can be considered essential for realization of a low-carbon society. A smart grid is an electricity supply system, such as the dispersed power system and secondary batteries, using high-speed telecommunications network technology to supply the electricity of high efficiency, high quality and high reliability, and integrating information about the demand side.

The smart grid system is not effective if it is adopted only in one single country. It produces certain effects on global warming only if it is adopted worldwide - that is, not just advanced but developing countries. Thus, Japan should play a crucial role in an environmental load reduction through the use of a smart grid and other ICT since it has the technical strength in this field.

As for the use and application of ICT in the field of disaster prevention, various commitments have been made by using mobile terminals, and television and radio broadcast. These commitments are based on the experimental rule that familiar tools are the most useful in emergencies, aiming to collect and share information swiftly in emergencies by using ICT tools familiar to many people. This approach, however, requires a system to alleviate telecommunications congestion in emergencies and flexible wireless network technology that does not rely on base transceiver stations.

In relation to the use and application of ICT for disaster prevention, it should be noted that mobile terminals, televisions, radio and other familiar tools are useful in emergencies. The key is to construct a system less prone to telecommunications traffic congestion.

JICA's commitments

For nearly 20 years, JICA has been committed to cooperation for streamlining of the administrative operations of the governments in developing countries. Streamlining of the administrative operations, together with human resources development, has been a mainstay of JICA's activities. For example, it has undertaken cooperation projects to formulate urban plans, plans to administer river basins, disaster prevention plans, mine-clearing plans and various other plans by using the geographical information system (GIS).

In the field of disaster prevention, adoption of technology (IT systems) easily leads to an improvement in work efficiency and thus is expected to remain a major commitment of JICA in future. However, development and provision of an information system could exceed the scope of JICA's technical cooperation project if the contents of the system get more sophisticated and the coverage becomes wider than initially designed. Thus, it is necessary to focus its technical cooperation activities on preparation for full-scale adoption of the system and advice on the operations, such as consulting services for revisions of procedures necessary prior to adoption of an IT system and human resources development, and cooperation for formulation and operations of prototypes.

Cooperation for IT systems should focus on technical advice on preparation for actual adoption of the systems and the operations of the systems designed through financial cooperation.

It is becoming more important to offer cooperation for formulation of electronic maps, together with advice on the usage of these maps.

GIS data produced in cooperation projects are often used for other cooperation projects in specific fields such as urban planning. Sharing such data on electronic maps with various fields can streamline administrative operations, so it is important to take into account the possibility of using maps produced for various other purposes at the time when they are produced. GIS has been used for an increasing number of sectors such as the educational, healthcare and medical sectors, and electronic maps for an increasing number of purposes. Therefore, it is becoming more important to offer cooperation for formulation of electronic maps, together with advice on the usage of these maps, to countries delaying digitalizing maps.

JICA has not undertaken so many cooperation projects for computerization of application and notification procedures, but achieved certain results in the preparatory stage of computerization - that is, streamlining and establishment of IT systems for administrative work procedures - through governmental officers of developing countries who have attended training programs in Japan and carried out action plans based on the knowledge gained in Japan. In light of the progress of streamlining and establishment of IT systems in the governments of recipient countries, the priority should be placed on sectors and fields where cooperation can produce tangible results.

Cooperation activities directly contributing to the use and application of ICT to disclosure of information and participatory policy planning should be carefully conducted partly because promotion of the use and application of ICT in such fields is still in progress in Japan, and partly because cooperation may directly intervene in the politics of recipient countries. Even so, it is still possible to promote ICT in these fields if not directly but gradually: for example, activities may perhaps begin with promotion of the views on disclosure of information by dispatching Japanese policy planning advisors to agriculture, medical and healthcare and other sectors in developing countries. This will facilitate establishment of the management system of internal documents and lead eventually to adoption of the system for disclosure of information. It is also possible to give recipient countries an image of the use of ICT in citizens' participation in disclosure of information and policy planning by disclosing information and calling for public opinions on websites about master plans for development projects for individual sectors.

Intermediate Goal 4-2: Effective Use of JICA-Net

Intermediate Goal 4-2: Effective Use of JICA-Net

When technology and knowledge have been digitalized and are ready for dissemination and transfer, ICT-based remote systems are useful for efficient dissemination and transfer. The number of distant learning courses, distant seminars and web-based training courses is an indicator to measure the degree of dissemination and transfer of technology and knowledge to developing countries. Parties concerned with cooperation should provide not only learning materials but also methods required for management of learners' progress, that is, methods to disseminate technology and knowledge under ICT-based remote systems only.

Dissemination and transfer of knowledge under ICT-based remote systems are superior to a traditional way in that the former is less subject to physical and time constraints. The process of disseminating and transferring knowledge by ICT-enabled remote systems can be made more efficient by complementarily dispatching Japanese experts to or conducting training programs in recipient countries.

A videoconference system that allows participants at a distance to discuss and exchange opinions is applicable for inter-governmental talks and should be used for conferences among top government officials. It is also expected to be actively used for follow-ups of training programs and various projects.

JICA's commitments

ICT can be used chiefly in three education and training (e-learning) fields: videoconference (lectures) and video delivery, digitalization of learning materials, and the use of multimedia learning

materials in classrooms. AS for video delivery, JICA has promoted the use of JICA-Net and also undertaken cooperation for the University of South Pacific. JICA-Net is used not only within the agency but also for seminars jointly held by the World Bank and other donor organizations.
As for digitalization of learning materials, JICA launched a Population Education Promotion Project in Kenya which focused on disclosure on websites of learning materials produced under the project, reports and other information. If learning materials produced are textbooks, it is now easy to release them to the public through websites. However, in order to make them used for self-learning of a wide range of people, it will take reasonable time to prepare to design them suitable for self-learning by, for example, offering short tests that enable them to check their understanding. Even so, if a wider range of people use the learning materials available on websites thanks to little constraints in terms of time and distance, projects such as the one in Kenya are proved to be more effective and also useful to announce the achievements of the cooperation in the developing countries concerned. In this regard, parties concerned with cooperation should promote to produce materials for self-learning and actively make them available on websites.
JICA-Net is a mechanism facilitating distance technical cooperation. It comprises a videoconference system and an e-learning system, each of which can be used independently and jointly.
JICA has been also producing digitalized learning materials for each project. Learning materials produced in cooperation projects using ICT in the educational and R&D sectors are digitalized designed, in many cases, for publication on the networks. Compared to traditional analogue learning materials, they can be delivered to a wider range of people, so that are expected to be used for people targeted by the projects and others. It is now common to use computers to draft learning materials and produce digital video programs for dissemination and enlightenment in projects in the healthcare, agriculture and other sectors which do not directly aim to promote the use of ICT.
JICA-Net undertakes, in collaboration with the World Bank, production of learning materials for training programs on project evaluations for personnel of cooperation agencies.
JICA-Net is also used for workshops and other distant cooperation among donors, and conferences for liaisons with other donors, the World Bank and UNDP.
As an increasing number of remote discussions and conferences have been held in recent years, JICA-Net is effectively used for meetings with local offices before and after dispatches of study teams, and preparation for international seminars.
JICA-Net is also used for interviews to Japanese experts stationed abroad, training programs and seminars for officers at JICA overseas offices, for example, seminars about health management and others themes.

Intermediate Goal 4-3: Improvement in Efficiency and Effects of Assistance Using ICT

Intermediate Goal 4-3: Improvement in Efficiency and Effects of Assistance Using ICT

The existing knowledge and technology need to be digitalized first and then disseminated and transferred under a remote system.

When learning materials are to be revised, the work efficiency is much higher for digitalized data than for analogue contents: if data are digitalized, it is much easier for users to refer to any knowledge obtained in various projects, and for administrators to update the contents.

To share the existing contents with other donors and developing countries is an efficient way of using experiences and knowledge widely available. Digitalized contents are also easy to reproduce for other purposes.

At the same time, the use of ICT makes it easier to exchange and modify data, and also enables to develop effective and efficient contents jointly with other donors and developing countries.

ICT enables not only to share the existing contents with other parties but also to create new knowledge jointly with other donors. Workshops, conferences and other interactions through videoconference with other donors and developing countries will enhance interactive communications and enable the participants to have fulfilling discussions with no constraints on time and locations.

Any knowledge and expertise should be accumulated, systematically sorted and classified, and appropriately presented for the effective use for project implementation. ICT makes it easier to accumulate knowledge and expertise, and also systematically classify and efficiently publish them.

For maximizing the efficiency of assistance using ICT, each donor is required to review and improve its assistance process, procedures and methods of exploring possible future projects using ICT (for example, establishment of ICT-based participatory approaches).

In the case of JICA projects, since the parties concerned can share the information about achievements and problems in various projects implemented, they can easily obtain information useful for the process of formulating, implementing and evaluating projects of their own.

Discussions and conferences in the remote system, such as videoconference, combined with dispatches of study teams to developing countries, can streamline the overall work procedures.

JICA's commitments

In the cooperation fields other than the ICT-related sectors, such as agriculture, medical and healthcare, transport, and mining and industrial sectors, computers and information systems are regarded as a means to streamline business operations, and accumulate and use information. In sum, ICT is used in one way or another in many projects related to these sectors.

Adoption of an information system is set as the primary purpose of some projects in the fields related to statistics of population, agricultural and industrial production and trades, and the management of industrial property rights.

Even projects that do not regard the use of ICT as a mainstay of their activities aim to adopt technology based on computers and the networks in many cases. In sum, ICT is used in various fields, such as GIS for cooperation projects concerning mineral resource exploration surveys, disaster prevention planning, urban planning, projects to construct schools, mine-clearing plans; computerization of the management of irrigation systems; computer-based management of shipping statuses; and so on.

JICA also undertakes programs to dispatch volunteering system engineers to the public sector of developing countries to establish simply work systems and streamline their work procedures. Moreover, JICA has adopted the knowledge management system to proceed with systematic classification of knowledge and expertise in terms of sector and cooperation theme.

Chapter 3 Direction of Cooperation by JICA

3-1 JICA's Basic Stance and Points for Cooperation

In light of JICA's cooperation experiences, lessons learnt, needs of developing countries and technical trends, JICA sets basic cooperation policies as follows:

JICA will:

- When formulating a specific project, confirm its positioning in the context of the overall development and industrial plans of the country concerned;
- Assist self-help efforts of developing countries to effectively adopt and use ICT in its international cooperation;
- Engage in cooperation always aiming to bridge the digital divide and offer a social environment where anyone can use ICT in developing countries;
- Consider the possibility of self-help development in accordance with the situation of the region and country concerned and their development stage, and take an approach suitable for the needs of the region and country in accordance with their priority order;
- When proceeding with a bilateral cooperation project based on policy dialogues, consider the possibility to adopt the industry-academic-government liaison or establish a cooperation system at the grass-roots level;
- When participating in an international aid coordination with various international organizations or other bilateral donors, undertake cooperation in fields or sectors where the cooperation can produce a great impact;
- Undertake cooperation in fields or sectors where Japan's strength and resources can be effectively used;
- Contribute to international dissemination and promotion of international standardization of the Japanese systems;
- Undertake cooperation schemes that can minimize the cost of adoption and use of ICT borne by developing countries, and ensure the achievements and sustainability of the achievements;
- Undertake program cooperation that comprehensively combines various schemes of JICA;
- Consider the possibility of liaisons with activities of OOF, private companies, NGOs and other parties as a means of cooperation;
- For further use of the private-sector initiative, engage in activities to strengthen the capacity of government officials to plan and promote projects, develop ICT-related human resources in collaboration with universities and other entities, and cooperate with private companies in Japan;
- Adopt PPP, BOP and other approaches and assist joint projects of Japanese companies and the ICT sector in developing countries;

- Bear in mind gender issues and assistance to the socially vulnerable, and undertake cooperation that can secure the benefits of a wide range of groups in developing countries;
- Pay attention to cost-effectiveness, upgrading to new technology and possible negative impacts, and consider plans that can lead to sustainable development; and
- Discuss with project implementing organizations about incentives in the form of treatments to prevent counterparts from changing their jobs, or, if it is difficult to do so, mechanisms that allow them to get involved in the project after they have changed their jobs.

The direction of cooperation by JICA and points to note for each Development Strategy Goal is shown below. In pursuit of the goals, the parties concerned should take the linkage among the goals into account and place emphasis on the direction of cooperation for each goal. They are required to be aware of the basic fact that ICT is a tool while promoting its use and application, and find various ways to establish new projects by combining ICT that has certain limitations and other complementary elements. In a Project for Strengthening the Capacity of ITSS Education at Hanoi University of Technology in Vietnam, for example, JICA provided the personnel concerned with the ICT skills and opportunities to learn Japanese, making it easier for the counterparts who completed the training courses to enter the Japanese markets afterwards. In the project, JICA also conducted training on ICT to Japanese experts before they were dispatched to the country.

Development Strategy Goal 1: Improvement of ICT Policy-Making Capacity

Priority goals vary depending on the stage of privatization of the telecommunication services. Countries where a state-run corporation provides the services are likely to need cooperation for the operation and sound business of the corporation to promote the development of telecommunication infrastructure that restricts development of the ICT sector.

For countries where the telecommunication services are privatized, on the other hand, it is necessary to provide assistance for formulation of a comprehensive ICT policy including promotion of development of the regional infrastructure, protection of users of ICT-related services and fostering of ICT-related industries for the purpose of development of industrial activities on the private sector's initiative.

Points to note

Parties concerned with cooperation should give recipient countries advice on effective policies that meet their situations by referring to Japan's ICT strategies, policies in developing countries and

successful cases in the past.

For assistance to formulate a master plan for an ICT policy, it is necessary to prepare a framework to effectively use persons who have experienced administrative work at think tanks, ministers and agencies, and international organizations, and are well versed in the ICT sector.

Development Strategy Goal 2: Development of Human Resources to Support ICT

The primary goals are to increase the number of engineers who can contribute to society as professionals and improve their quality. To achieve the goals, it is necessary to develop human resources by focusing on young people still in higher and vocational education.

In cooperation projects addressed to the fields in administrative, educational and other organizations, ICT should be disseminated and promoted in a manner that can bring about effects on the beneficiaries (for example, end-users at the grassroots level). Thus, it is necessary, in such projects, to strengthen collaboration with efforts to develop human resources at the grass-roots level. For development of policy practitioners, experts will be dispatched to the country concerned to give practical advice.

Points to note

Parties concerned with cooperation should lead each developing country to foster key persons who can promote ICT in the country, and establish a system whereby the country can proceed with development of human resources to support ICT on its own.

Parties concerned with cooperation should pay attention to assistance for formulation of systems and mechanisms necessary for development of human resources to support ICT, and creation of training programs and curriculums of human resources development, as well as learning materials, in each developing country.

Parties concerned with cooperation should pay attention to successful projects in the past and make efforts to disseminate and promote their achievements in various countries and regions.

Parties concerned with cooperation should pay attention to building of a consistent policy covering development of policy practitioners and an improvement in ICT literacy of the policy practitioners and overall citizens.

Development Strategy 3: Development of ICT Infrastructure

In development of ICT infrastructure, the primary focus will be placed on the development of backbone and access networks.

Various developing countries are at various development stages. In cooperation for those at relatively earlier stages, the focus should be placed on development of infrastructure in rural areas. At the same time, since these countries do not necessarily proceed with full privatization, there is room for further cooperation so that it is important to shed light on the needs for cooperation in detail.

Pointes to note

Development of infrastructure requires a vast amount of funds, and developing countries cannot raise such funds in many cases: parties concerned with cooperation should pay attention to fund procurement plans.

Parties concerned with cooperation for the development of infrastructure should provide recipient countries with methods of maintaining and managing the infrastructure independently in future.

Parties concerned with cooperation for those at relatively earlier stages should pay attention to the rationality of their plans for development of infrastructure in rural areas.

Parties concerned with cooperation should pay attention to assistance where there is room to incorporate any changes in technology in future.

Development Strategy Goal 4: Promotion of Use and Application of ICT

Assistance will be given to promotion of the use and application of ICT to the field of disaster prevention activities and related policy planning. Specifically, the use of ICT will be promoted to implementation of project to improve business operations using GIS, real-time supervision of meteorological and environmental information with ICT, and other activities.

Parties concerned with cooperation to organizations training engineers and other personnel should consider incorporating follow-ups to ex-trainees who have completed training programs through

web-based training, mailing lists and electronic bulletin boards.

For cooperation to promotion of small and medium-sized enterprises, the focus will be placed on an expansion of their business connections through the Internet, assistance to consumers to participate in electronic commerce, and assistance for business start-ups in the IT sector.

Emphasis will be placed on cooperation to strengthen the organizational strength by using and applying ICT through, for example, grass-roots technical cooperation schemes, schemes to dispatch volunteers, dispatches of system engineers and provision of personal computers.

For development education, schools in Japan and those in developing countries will be linked through JICA-Net so that both can benefit from the effects of such projects. Moreover, the network to deliver learning materials will be expanded by using JICA-Net. As for the contents to deliver, for effective and efficient development, new contents will be created and the existing ones will be revised by adopting systematic methods of developing learning materials.

Points to note

Given the size of cooperation, financial cooperation is considered to be appropriate for system development, and technical cooperation for improvements, maintenance and operations of the systems developed. As for adoption and upgrading of full-scale systems and equipment, attention should be paid to the fact that the recipient countries need to bear the related costs.

It is considered to be appropriate to adopt the newest technology to developing countries from the viewpoints of globalization of IT networks, maintainability, and cost performance. In such cases, it is important to select system components that can be operated, maintained and managed by the recipient countries on their own after completion of the cooperation projects.

Parties concerned with cooperation for promotion of e-government should make an arrangement to increase the contents in local languages for convenience to users and for the purpose of fostering developers of local contents.

ICT is useful to streamline the services and operation of not only governmental organizations but also private companies and NGOs. Thus, parties concerned with cooperation should consider improving the function of ICT training centers to which JICA has been providing cooperation and having the centers equipped with consulting services to private companies and other parties.

3-2 Issues for the Future

According to the experiences and lessons learned from similar projects in the past, Section 3-1 gives notes to point when JICA engages in priority activities. Section 3-2 classifies and presents issues that JICA should consider in future.

(1) Assistance to privatization of the telecommunication services

Privatization of the telecommunication services is a general trend in developed countries, and the idea has been becoming popular in developing countries, too. Under the current mechanism of ODA, however, it is difficult to offer cooperation to privatized entities. Thus, an issue is to consider adoption of new forms of cooperation by focusing on projects that bring great benefits to society and those that are difficult to promote on a commercial basis, finding out the needs of developing countries among these projects, and establishing a system that enables the recipient countries to carry on the privatized projects.

For example, it can be considered effective to give assistance to the efforts of the governments of developing countries to promote privatization.

It may be also effective to provide financial cooperation to efficiently facilitate realization of the project effects through development of the telecommunication infrastructure which encourages investments for development of the private sector and assistance to an improvement in business operations of the privatized telecommunication services.

(2) Strengthening of distance technical cooperation

As ICT has been rapidly developed and all kinds of information are being digitalized, JICA-Net projects have been carried out for the purpose of making technical cooperation with ICT more effective and efficient.

Distance technical cooperation (JICA-Net) was launched to materialize "establishment of 30 core-IT centers in developing countries, one of Japan's commitments to "Comprehensive Co-operation Package to Address the International Digital Divide" announced in the Kyushu-Okinawa Summit in July 2000. Projects commenced in 2002 in three sites in Japan and three developing countries. The number of offices equipped with videoconference system increased rapidly afterwards, and as of January 2010, JICA-Net can be used in 19 sites in Japan and 65 countries. As the number of the sites with videoconference system has been increasing, the effects of distance technical cooperation are being recognized. The number of distant lectures and seminars, as well as the number of participants, has increased dramatically. The contents for distance technical cooperation have been steadily developed, too.

The infrastructure for JICA-Net has been already developed, so the next issues will be to improve

the quality and utilization of the contents by strategically and systematically developing them, promote the use of JICA-Net in various projects as conducted by the Japan Center, and formulate a mechanism to collaborate with exterior organizations.
As for development of JICA-Net infrastructure, it will be considered to establish JICA-Net bases ultimately at all the JICA offices and to deploy mobile JICA-Net so that the connection from remote places (project sites) can be realized.

(3) Cooperation policy for individual region

An issue is to formulate varied ways of implementing ICT-related cooperation that meet the circumstances of varied regions and accord with these Guidelines. In some regions such as the African region where there are quite a few constraints and conditions, so JICA understands the necessity to make more efforts, parties concerned should study measures to use ICT to heighten the effects of cooperation, including measures for human security and poverty reductions

Chapter 1 Broadcasting

1-1 The Present Situations of Broadcasting

Radio and TV broadcasting are now important information transmission media as a result of rapid technology progress after commencement of their services in the 1920s and the 1930s, respectively. These media are important globally, but particularly so in developing countries. The impacts of broadcasting on them are classifiable into three groups. First, transmission of information to audiences can diversify and broaden the scope of their activities. Second, the media can be used as problem-solution tools and indirectly contribute to solution of other problems faced by people in developing countries. Third, the media, with their public nature[1], can contribute to political and social stability through swift and accurate transmission of information to people. The impacts of the first and second categories are identical to impacts of projects for development of social foundations (infrastructure) such as transport and traffic, and urban planning. The unique feature of the broadcasting sector is its public role as mass media.

(1) Direct impacts - importance as information transmission media –

The most noticeable feature of radio and TV broadcasting is their capability of transmitting information simultaneously to a large number of unspecified people. In regions with a low literacy rate, in particular, radio broadcasting is an effective means to audibly convey information. TV broadcasting, on the other hand, can supply a much greater volume of information simultaneously than print media since they can transmit information visually and audibly, and in a text format. In recent years, the means and methods of broadcasting have been diversified to meet the needs of audiences, thanks to simplification and a decrease in prices of broadcast equipment: community (radio) broadcasting stations have been established to transmit chiefly local information close to local people's lives in local languages (market information, weather, announcements of local governments, etc.).

(2) Indirect impacts - importance as a tool –

Radio and TV broadcasting can be used as an effective tool to promote information activities that help commitments to poverty reductions and other development issues. Radio and TV broadcasting is a particularly effective tool to solve issues related to "education" in a broad sense and can be used to diffuse the correct knowledge of medical and healthcare and basic education. To improve the quality of school education, for example, broadcasting can be used to narrow the rural-urban gap of

[1] The media may refer to information transmission means such as radio, television and newspapers, and radio and TV stations and newspaper companies that transmit information. These Guidelines, however, refer to the former as the “media” and the latter as the “mass media”.

the quality of education, poor access to education and the gender gap in education. Broadcasting also enables people to have access to education from rural areas and home.

(3) Social impacts as the mass media

The mass media can send swiftly and accurately information necessary for many people. The information is not just about truth and knowledge but plays an important and supervisory role in presenting problems in society. The mass media are expected to play their roles to contribute to stability of public order, privatization and political stability, while it is also widely known that they have been taken advantage of, because of their power of influence, for agitation and propaganda in the past and at present.

Many developing countries have only a limited number of media and channels to provide information, so information is highly monopolized by certain groups of people, but the mass media should serve the public interest more. In order to secure the public nature of broadcasting, an environment must be established which enables to secure freedom of expression and people to formulate and develop a market where they can freely exchange information. In order that people can benefit from the mass media, it is also important to have more than one information provider (to secure multiplicity of information) and allow people to select information among many pieces of information (to secure diversity of information). These are, however, associated with the political regime, media culture and other complicated factors, so it is in practice difficult for the mass media themselves or the broadcasting sector to develop an appropriate environment to allow them to play their roles.

1-2 Definition of Broadcasting

1-2-1 Definition of Broadcasting

Paragraph 2, Article 2 of the Broadcast Act of Japan defines broadcasting as "transmission of wireless communications for the purpose of direct reception by the general public"[2], and thus this definition will be adopted in these Guidelines.

Broadcasting is technically a form of communications, so major donors and international organizations generally regard it as one component of the ICT sector: few organizations deal with broadcasting independently and prescribe its guidelines. In Japan, too, the Ministry of Foreign Affairs includes the broadcasting sector in its ICT-related policies, and the Ministry of Internal Affairs and Communications features trends in the broadcasting sector in its "White Paper on Information and Communications in Japan"[3].

[2] In Japan, broadcasting is regulated by the Broadcast Act. In general, the term, "broadcasting", refers to broadcasting based on this Broadcasting Act.

[3] Statistical Database on Information and Communication, "White Paper on Information and Communications in

While many developing countries formulate action plans for the ICT sector in line with their national development plans, they also refer to the broadcasting sector in such action plans. Broadcasting is in particular recognized as important social infrastructure for transmission of public information, cultural promotion, vitalization of economic activities and a tool to solve other development issues in the educational, medical and other sectors. In this regard, emphasis is chiefly placed on development of broadcasting stations and transmitting facilities, and dissemination of users of the media.

Unlike communications, however, broadcasting requires various restrictions because it is addressed to a large number of unspecified people and also has considerable impacts on society as the mass media as shown in Section 1-1. Therefore, these Guidelines feature it in independent chapters. Even so, the line between broadcasting and communications is becoming ambiguous, so the chapters for broadcasting also refer to information that concerns the ICT sector at the moment but is likely to involve the broadcasting sector in future, such as digital broadcasting and Internet broadcasting.

In these Guidelines, cooperation for the broadcasting sector refers to measures to promote the use and application of broadcasting or those assisting developing countries to acquire the relevant technology. The Guidelines also analyze undertakings and projects that do not aim at broadcasting-related goals but involve broadcasting in a part of their achievements or activities.

In passing, broadcasting strictly includes not only TV and radio broadcasting but also announcements in public transport, auto-broadcasting at the premises of train stations and other announcements called “public addresses”, but the Guidelines focus on the major media, TV and radio broadcasting, only.

1-2-2 Types of Broadcasting

(1) TV broadcasting and radio broadcasting

- TV broadcasting

A wide range of technologies are used for the TV broadcasting systems, such as audio and visual information processing, signal processing, and transmission and reception technologies. Thanks to the progress of ICT in recent years, TV broadcasting technology has been progressing dramatically: for example, the broadcasting modes have shifted from the traditional terrestrial and cable television systems to systems using broadcasting and communications satellites. TV broadcasting services are also provided nowadays via the systems that fall under the category of communications, such as the Internet and IP (see Table 1-1).

These technological changes influence TV broadcasting in developed and developing countries. The latter, however, is required to keep an eye on trends in new technologies and select ones to realize

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Japan”, Ministry of Internal Affairs and Communications
(http://www.soumu.go.jp/johotsusintokei/whitepaper/ja/h23/pdf/index.html)

TV broadcasting services most suitable for their own situations and purposes.

Table 1-1 Types of TV Broadcasting by Broadcasting Mode

	Mode
Terrestrial broadcasting	A mode of TV broadcasting using radio waves transmitted from broadcasting stations on the ground. It is classifiable into analogue and digital. Major standards of digital terrestrial broadcasting are: (i) U.S. standard (ATSC) (ii) European standard (DVB-T for TV broadcasting; DVB-H for mobile TV broadcasting) (iii) Japanese standard (ISDB-T) (iv) Chinese standard (DTMB)
Satellite broadcasting	A broadcasting mode using a satellite. Classifiable into BS (broadcasting satellite) broadcasting and CS (communications satellite) broadcasting.
Cable television	A broadcasting mode of providing TV programs via cables (coaxial, optical and other cables)
New broadcasting modes	TV broadcasting using communications infrastructure: - Internet television: a system where viewers watch TV programs via the Internet connection - IP broadcasting: a system where viewers watch TV programs on the network administered by special IP networks.

Terrestrial digital broadcasting is more resistant to radio disturbance than traditional analogue broadcasting and capable of providing a larger number of channels with audio of the higher quality. It also features an interactive function, where viewers can receive TV programs transmitted from broadcasting stations and also respond to them from their side.

- Radio broadcasting

Terrestrial radio broadcasting is an audio medium that is the closest to people's everyday lives because of its features such as easy installation and operations of receivers, compactness, low prices and wide reception areas. It is also frequently used as an information transmission tool in emergencies. Types of radio broadcasting in general are classifiable as in Table 1-2.

Table 1-2 Types of TV Broadcasting by Broadcasting Mode

Low-frequency broadcasting	Low-frequency broadcasting is a type of radio broadcasting using radio spectrum with low wavelengths, used chiefly in Europe, Africa and regions at high latitudes, but not adopted by many broadcasting stations.

AM (amplitude modulation) broadcasting	Radio broadcasting using the medium- and high-frequency wavelengths. The signal (of medium-wave band) is subject to interference from electric storms, and the signal (of high-frequency band) requires frequent adjustments to tune the frequency to receive programs in certain seasons and time. An advantage is the ability to transmit signals to a long distance.
FM (frequency modulation) broadcasting	Radio broadcasting using very high frequency. Frequency modulation on very high frequency airwaves occurs in a narrow frequency range, but FM can convey information with the higher sound quality. Many community radio stations use VHF airwaves.
New broadcasting modes	Radio broadcasting using communications infrastructure: - Internet radio: radio broadcasting delivering audio contents on the Internet.

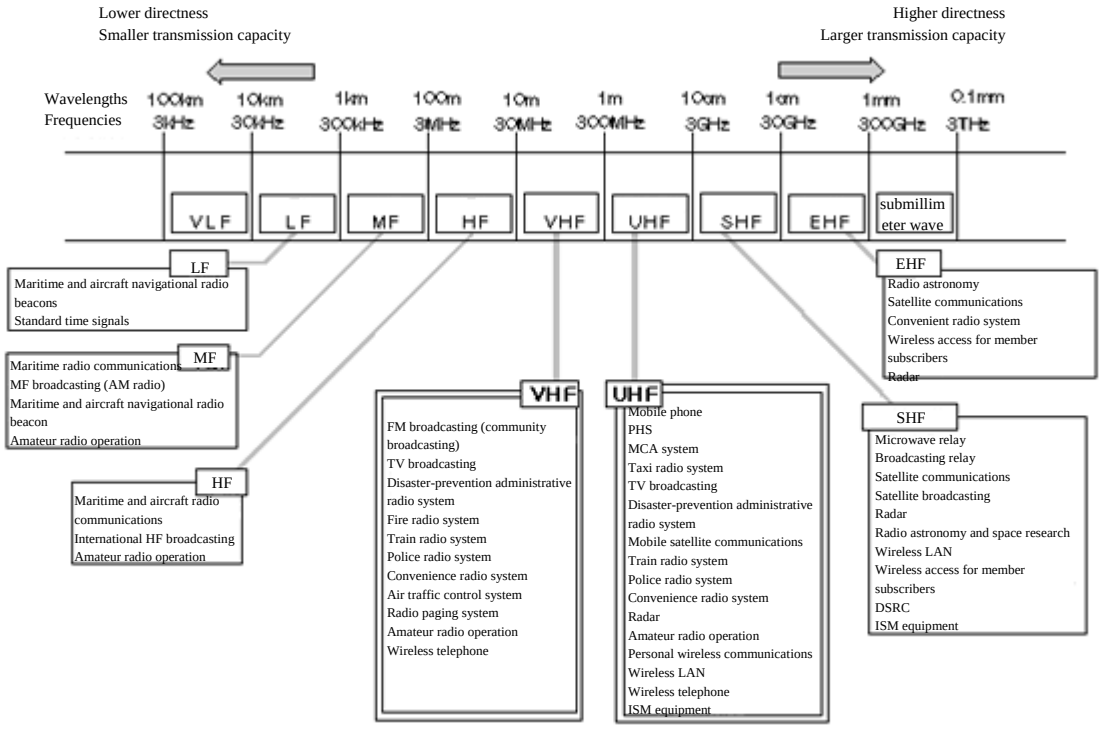
There are various names and definitions for community broadcasting: it normally refers to radio and TV broadcasting whose service is addressed to a specific region, community or citizens on a non-commercial basis. Some countries define it by laws or regulations, but the line between private local broadcasting and community broadcasting is ambiguous in many countries. Community broadcasting services are financed by various sources, including financial assistance of international organizations, donor countries and NGOs; governmental subsidies, donations and advertising revenue, while some countries lay down restriction on financial resources of community broadcasting services. One of the important aspects is that a community broadcasting station is established by citizens themselves or involves participation of citizens in the operation of the station. Another important aspect is the overall process including program production and operation, rather than the act of broadcasting radio programs itself.

BOX1-1 Types and Features of Frequencies Used for Radio and TV[4]

Frequency	Features
LF (low frequency)	The wavelengths range from 1 to 10km. It covers a fairly large area, but requires large antennas and transmitting facilities.
MF (medium frequency)	The wavelengths range from 100 to 1000m. MF travels longer distances and thus is used for ordinary radio broadcasting. Although it requires large transmitters and transmitting antennas, MF can be received with simply receivers.
HF (high frequency)	The wavelengths range from 10 to 100m. HF enables long-distant communications and is used for international broadcasting and domestic

[4] The Radio Use Website (http://www.tele.soumu.go.jp/search/myuse/summary.htm), Ministry of Internal Affairs and Communications

	broadcasting for remote areas.
VHF (very high frequency)	The wavelengths range from 1 to 100m. Although its directness level is high, VHF can bend around mountains and buildings to some extent. It conveys more information than HF, but the travel distance from a broadcasting station (transmitting station) is shorter than that of HF.
UHF (ultra high frequency)	The wavelengths range from 10cm to 1m. Its directness level is higher than that of VHF, UHF can also bend around some mountains and buildings. The volume of information to convey is large.



Source: the Radio Use Website, the Ministry of Internal Affairs and Communications

(2) Difference between communications and broadcasting

In Japan, the Telecommunications Business Act prescribes that the term, "telecommunications", means "transmitting, relaying or receiving codes, sounds or images by cable, radio or any other electromagnetic form", defining it as exchanges of information between specific parties (one to one), while the Broadcast Act prescribes that the term, "broadcasting", means "transmission of wireless communications for the purpose of direct reception by the general public", defining it as transmission of communication (one to n) to a large number of unspecified people. Since communications are conveyance of information among specific parties, the confidentiality of

communications are guaranteed by the Constitution. On the other hand, since broadcasting uses radio waves that are public resources, regulations are imposed on the contents of information.
In such circumstances, however, with the recent progress of technology, the boundary between communications and broadcasting is dissolving. For example, websites on the Internet are accessible through communications services, but transmit information for a large number of unspecified people: communications which used to be "closed" services are now "publicly open communications".
The nature of restrictions varies considerably depending on whether a given service is regarded as communications or broadcasting. Discussions has been continuing in Japan concerning how to deal with communications and broadcasting systematically.

(3) Digitalization of broadcasting

An analogue system uses a continuous range of signals to present information, whereas a digital system uses discontinuous values, conveying information by converting it in a binary numeric form. Because of its properties, digital broadcasting is more resistant to and almost free from various types of noise compared to analogue broadcasting, so it can transmit and receive information stably (no interference/distortion).
In general, the term "digital broadcasting" refers to broadcasting whose overall process is digitalized from transmission to reception. For the process of production and delivery of programs, broadcasting stations can reduce the cost of production, management, etc. of contents if they independently digitalize such contents. Digital broadcasting is superior to its analogue counterpart in terms of (i) the quality and stability; (ii) easiness to deliver various forms of information; and (iii) easiness of maintenance. In addition, it is easy to record and store information, but information in a digital format can be easily reproduced and leaked, so measures to protect copy rights should be taken.
Digital broadcasting adopted in the world is classifiable into four standards: Japanese standard (ISDB-T), European standard (DVB-T); the U.S. standard (ATSC) and Chinese standard (DTMB). A large number of countries, including developing countries, have already adopted the European-based standard. As for the Japanese standard, Brazil decided in 2006 to adopt it, and another 11 countries decided to follow Brazil by October 2011.

1-3 Trends of International Aid

Since the Kyushu-Okinawa Summit in 2000, the global awareness of and expectations for the ICT sector have been particularly heightening, leading to international conferences and establishment of task forces, as shown below, which presented the direction of cooperation in the broadcasting sector.

1) The UN Millennium Summit (September 2000)

(i) Under the goal, "development and poverty reduction", to ensure that everyone can benefit from ICT; and (ii) under the goal, "human rights, democracy and better governance", to ensure the freedom of media to play their essential roles and the freedom of the general public to have access to information.

2) The Second Phase of the World Summit on the Information Society (December 2003)
(i) To secure independence of media, and multiplicity and diversity of information; (ii) to provide technical cooperation by developed countries to developing countries, and to build networks; and (iii) to strive for bridging the digital divide in rural areas.

3) DOT Force (2000 - 2002)
To use community radio, broadcasting media and other communications media for campaigns to combat HIV/AIDS and other STDs in line with its initiative, "promotion to use IT in assistance to healthcare and STD measures".

4) The Global Alliance for ICT and Development (2006 -)
To promote policy dialogues and sharing of knowledge among a wide range of participants in its missions "freedom of expression" and "media" launched in "peace and culture".

1-4 Trends of Japan's Aid

Japan is required to play a role commensurate with its status as one of the world's most advanced ICT nations in the international society. In response to major social challenges shared by a number of countries in the world in the 21st century, Japan must take the initiative in the world in solving these challenges with ICT and passing on the achievements to the world.
In July 2000, prior to the Kyushu-Okinawa Summit, the Government of Japan published a "Comprehensive Co-operation Package to Address the International Digital Divide[5]". The basic concepts of the cooperation package were based on the belief that the private sector should take the initiative in developing the ICT sector and the public sector should commit itself to measures and human resources development in a manner that complemented the active efforts of the private sector. The package also placed emphasis on collaboration with the World Bank, UNDP, ITU and other international organizations, as well as other donors, when providing cooperation. In response to this, the Government of Japan announced a comprehensive cooperation package to inject public funds (ODA and non-ODA) of US$15 billion or so in five years starting in 2000 for efforts to bridge the international digital divide. This package included four mainstays; (i) to intelligently

[5] "Comprehensive Co-operation Package to Address the International Digital Divide", Ministry of Foreign Affairs (http://www.mofa.go.jp/mofaj/gaiko/summit/ko_2000/it.html)

contribute to an improvement of the awareness that "IT is an opportunity" and formulation of relevant policies and systems; (ii) to develop human resources (training); (iii) to assist development of ICT bases and establishment of an ICT network; and (iv) to promote the use of ICT in aid activities.

The Government of Japan has also provided cooperation in various fields in the ICT sector including broadcasting, such as human resources development; formulation of policies and systems through policy dialogues with governmental agencies in charge of ICT in developing countries; development of ICT foundations through implementation of international joint experiments; and assistance to international and regional organizations promoting global cooperation for bridging the international digital divide.

In Japan, the Strategic Headquarters for the Promotion of an Advanced Information and Telecommunications Network Society (IT Strategic Headquarters) established within the Cabinet Office assumes responsibility for decisions and announcements of the country's specific strategies for the ICT sector[6], taking into consideration international agreements adopted in summits and other conferences, and the latest trends in technology. The Headquarters formulated "i-Japan Strategy 2015" on June 15, 2009, launching a Vision of a Digital Society in Future and a digital strategy for achieving the Vision with three fundamental policies: (1) three priority areas ((i) electronic government and electronic local government fields; (ii) healthcare and health fields; and (iii) education and human resource fields); (2) revitalizing industry and local communities and nurturing new industries; and (3) development of digital infrastructure.

In a "New IT Reform Strategy[7]" published in 2006, the Headquarters presented its international measures that "contributed to the international society by providing problem-solving models". The New IT Reform Strategy aimed to make an international contribution by paying attention to the capability of ICT to reform the social structure, using ICT to solve social problems shared by countries in the world and presenting the problem-solving models and the capability of structural reform to the world. The Strategy set the following three goals for the international contribution:

(i) Promotion of strategic and comprehensive cooperation in the ICT sector

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[6] In 2000, the Information Technology (IT) Strategic Headquarters published the Basic Act on the Formation of an Advanced Information and Telecommunications Network Society. Then, the Strategic Headquarters for the Promotion of an Advanced Information and Telecommunications Network Society (IT Strategic Headquarters) published e-Japan Strategy (2001), e-Japan Priority Policy Program (2001), e-Japan 2002 Program (2001), IT Policy Package – 2005 (2005), New IT Reform Strategy (2006), Priority Policy Program 2006 (2006), New IT Reform Strategy Policy Package (2007), Priority Policy Program 2007 (2007), IT Policy Roadmap (2008), Priority Policy Program 2008 (2008) and i-Japan Strategy 2015 (2009).

[7] New IT Reform Strategy, the IT Strategic Headquarters, Office of the Prime Minister (http://www.kantei.go.jp/jp/singi/it2/kettei/060119honbun.pdf)

(ii) Establishment of ICT utilization models in Asia (such as the smooth circulation of people, goods, money, services and information utilizing IT)

(iii) Elimination of the digital divide created by the diversified languages and cultures in Asia

As for cooperation in the broadcasting sector related to the New IT Reform Strategy and the Priority Policy Program 2006[8] that was launched to achieve the goals set in the New IT Reform Strategy, the Japanese Government carried out, among other things, "Assistance for Development Disaster-Prevention Communications Systems (the Ministry of Internal Affairs and Communications)" and "Promotion of the Asia Broadband Program (Ministry of Internal Affairs and Communications and other related ministries and agencies)". In particular, the latter was revised twice afterwards to place further emphasis on the importance of the software side of cooperation (human resources development, improvements in applications and promotion of circulations of digital contents), as well as the hardware side including development of communications bases, and to incorporate new fundamental policies. It also referred to promotion of disseminating the advanced technologies and expertise including digital TV broadcasting and IT broadcasting using broadband to Asia countries with an eye to developing common foundations in Asia and in consideration of the trend in integration of communications and broadcasting.

The Government of Japan has also promoted overseas assistance and activities to disseminate its advanced digital broadcasting technology. As for terrestrial digital TV broadcasting, in particular, a total of 13 countries including Japan decided to adopt the Japanese standard (ISDB-T) as of October 2011. The government is promoting Japan's standard to countries in southern Africa that have not made decisions on digital broadcasting standards. The government also dispatches Japanese experts and carries out training programs in Japan to support the countries adopting the ISDB-T so that they can smoothly commence terrestrial digital broadcasting services.

[8] Priority Policy Program 2006, the IT Strategic Headquarters, Office of the Prime Minister (http://www.kantei.go.jp/jp/singi/it2/kettei/060726honbun.pdf)

Chapter 2 Approach to Broadcasting

2-1 Purposes of Broadcasting

”Thematic Chart for Development Issues for Information and Communication Technology” was set in the "Thematic Guidelines on Information and Communication Technology " published in 2003. With awareness of the importance of such a chart in the broadcasting sector, and in consideration of the present and future cooperation in the sector, “Thematic Chart for Development Issues for Broadcasting Sector” was set in this guideline.

The Chart has set three Development Strategy Goals consistent with the traditional form of cooperation and the progress of the digital technology, which are "improvement of broadcasting policy-making capacity", "development of human resources and organizations to support broadcasting" and "development of broadcasting facilities and equipment". It has also set the other goal, "the use and application of broadcasting in various sectors" to aim to apply the broadcasting technology and contents to other development issues. Moreover, intermediate goals have been set for each of the four Development Strategy Goals.

Of the four Development Strategy Goals, "improvement of broadcasting policy-making capacity", "development of human resources and organizations to support broadcasting" and "development of broadcasting facilities and equipment" are directly addressed to broadcasting issues, for which JICA has undertaken cooperation chiefly under its three schemes of ODA loans, grant aid, and technical cooperation projects.

The fourth goal, "the use and application of broadcasting in various sectors", is an approach aiming at the use and application of broadcasting, which JICA is prepared to tackle in future.

Broadcasting technology has been progressing so quickly as ICT, and digitalization has been introduced in many countries including developing countries. Unlike ICT, broadcasting is a means to simultaneously convey information basically from one party to a large number of unspecified people. It does not require audiences to have any advanced literacy to receive broadcasting programs, so it is open to a broad range of people. Because of these characteristics, broadcasting is naturally required to play a role in the public services and has in fact contributed to the stability of social order, democratization and political stability, though it has been used as a tool of propaganda. Thus, public broadcasting which has substantial impacts on society should serve as means to develop truth, fairness and democracy and promote public welfare.

The Schematic Chart for Development Issues for Broadcasting is shown in Table 2-1 below.

Table 2-1 Schematic Chart for Development Issues for Broadcasting

Development Strategy Goals	Intermediate Goals	Sub-goals for Intermediate Goasl	Selective means to achieve sub-goals / selective project activities

1. improvement of broadcasting policy-making capacity	1-1 Establishment of broadcasting policy	Formulation of broadcasting master plan	Assistance to formulation of nationwide broadcasting plan
			Assistance to formulation of broadcasting area plan
			Consideration of the contents of broadcasting services
		Formulation of frequency use plan	Assistance to formulation of frequency use plan
		Plan to adopt digital broadcasting	Assistance to formulation of master plan concerning adoption of digital broadcasting
			Announcement and public relations concerning adoption of digital broadcasting
	1-2 Development of broadcasting laws and systems	Development of broadcasting laws	Development of permission and authorization system for broadcasting stations
		Development of regulatory and supervisory organizations	
		Technical assistance for public corporation/privatization	
2. Development of human resources and organizations to support broadcasting	2-1 Professional development of broadcasting policy practitioners	Improvement in capacity of broadcasting policy formulation	
	2-2 Professional development of broadcasting engineers	Direction and production of programs	Technical transfer concerning program direction
			Assistance Technical transfer concerning production
		Operational, maintenance and management technology for broadcasting	Studio facilities
			Transmitting and relaying facilities
		Operation and management of broadcasting stations	Financial and personnel management of broadcasting stations
3. Development of broadcasting facilities and equipment	3-1 Development of broadcasting infrastructure	Development of facilities and equipment at broadcasting stations	Broadcasting equipment
			Development of Broadcasting transmitting systems
		Improvement and development of broadcasting networks	Transmitting stations and transmitters
			Relaying stations
		Reception facilities	Diffusion of receivers
			Power-supply facilities
	3-2 Development of contents	Building of database of contents	
		Improvement and increase in broadcasting programs	

4. The use and application of broadcasting in various sectors	4-1 The use and application in various sectors	Promotion of the use and application of broadcasting as a tool for information provision	Provision of information to the educational, agricultural, medical and healthcare and other sectors
			Assistance to operation of community broadcasting stations
			Assistance Disaster-prevention information system (c.f. emergency earthquake alert system)
	4-2 The use and application contributing to improvement in governance	Promotion of citizens' participation in politics and increase in transparency of the policy decision-making process of the central government	Assistance to broadcasting of election campaign
		Promotion of barrier free of broacasting	Assistance to closed-captioned broadcasting
			Multilingual broadcasting

2-2 Effective Approaches to Broadcasting

2-2-1 Development Strategy Goal 1: Improvement of Broadcasting Policy-Making Capacity

(1) Intermediate Goal 1-1: Establishment of Broadcasting Policy

Broadcasting services must be provided in a true and fair manner with the regional characteristics for the purpose of enhancing public welfare. Radio waves used for broadcasting are limited and precious resources and must be used in a fair and effective manner. Parties using radio waves are required to follow the International Table of Frequency Allocations, cooperate with neighboring countries to avoid interference, and formulate their own allocation plan of frequencies used. Therefore, they need to draw up a broadcasting master plan that clarifies the location and style of a broadcasting station to establish and the nature of broadcasting services while being careful not to create any regional divide. It is also necessary to formulate a plan to allocate specific frequencies to individual broadcasting stations with an eye to participation of foreign-capital stations and transition to digital broadcasting. Moreover, as developed countries have been heading to digital broadcasting, developing countries are expected to follow the trend to digitalization, too. Digitalization allows broadcasting stations to offer more channels, the higher quality and functions, and develop new ways of using and applying broadcasting through provision of interactive services. Digitalization of broadcasting means to digitalize facilities at all stages of the process from production, delivery, transmission and reception of broadcasting programs, so that adoption of digital broadcasting services require an overall master plan.

JICA's commitments

There is a growing tendency in assistance to broadcasting policy formulation to integrate broadcasting and communications as a result of the progress of ICT. This is attributable to broadband connections of the Internet and digitalization of broadcasting facilities. In line with this, policy makers need to consider its broadcasting policy from the two aspects, broadcasting and communications. In Japan, for example, the Broadcast Act, the Radio Act and the Telecommunications Business Act are laid down for its broadcasting policy. In order to reorganize and rationalize the legal system to meet the progress of broadband connections and digitalization, the Japanese Government formulated a new legal system and put it into force in June 2011 for the first time in 60 years.

JICA has carried out assistance to establishment of a broadcasting policy through dispatch of experts, training and dialogue programs, technical cooperation for development planning and other activities, and should extend the scope of its assistance to technical cooperation projects, which agree well with the recent technological progress.

(2) Intermediate Goal 1-2: Development of Broadcasting Laws and Systems

Broadcasting can convey information via radio waves instantly to a wide area and thus has a considerable impact on society. Development of democracy and public welfare must be sought through establishment of true and fair broadcasting and the security of freedom of expression. A key is to formulate regulations and standards that prevent broadcasting services from being influenced by any specific organizations or individuals, and clarify the scope of freedom of expression in broadcasting program production and management of broadcasting organizations. What is important is to develop democracy and promote public welfare by formulating laws on broadcasting, establishing an independent supervisory agency and formulating broadcasting ethical codes. Another important issue, in relation to the regional gap in broadcasting, is to establish a system or framework to provide public assistance to development of infrastructure including the security of electricity in low-profit rural areas.

With a worldwide trend to small government, state-run broadcasting stations in developing counties are on their way to public corporation or privatization. It is getting more difficult for them to rely on governmental subsidies: they are beginning to face the necessity to raise funds for themselves. In future, it will be necessary and important for them to establish a business system as a private company and develop fund-raising methods through a TV reception fee system and sales and marketing activities for advertising revenue.

One of the recent trends related to broadcasting laws and systems is integration of communications and broadcasting. The institutional ground to distinguish communications from broadcasting in Japan is the definition of telecommunications prescribed in the Telecommunications Business Act,

which says "transmitting, relaying or receiving codes, sounds or images by cable, radio or any other electromagnetic form", and the definition of broadcasting prescribed in the Broadcast Act, which says "transmission of wireless communications for the purpose of direct reception by the general public".

The line between communications and broadcasting has become obscure as satellite delivery of visual images becomes prevailing, so Japan now adopts standards to judge whether a given service is communications or broadcasting - that is, whether one can objectively acknowledge, not just from the subjective viewpoint of tis service provider itself, that the services are intended to be provided directly to the general public. More specifically, the standards concern (i) the degree of closeness between a provider and recipients, and the degree of strength of recipients' attributes; (ii) whether or not items subject to communications are provided based on the close relationship between the provider and recipients, and the recipients' attributes; (iii) confidentiality of the information transmitting method; (iv) management of receivers; and (v) presence or otherwise of advertisements.

On the other hand, with the integration of communications and broadcasting progressing, the government of Japan moved a step towards the integration: it formulated in June 2001 an Act on Broadcast on Telecommunications Services for the purpose of enabling to institutionalize broadcasting using telecommunications facilities. The term, "broadcast on telecommunications services" in the law refers to transmission of telecommunications for the purpose of letting the general public receive the relevant programs directly, and the services, whole or part, provided on the use of telecommunications services provided by telecommunication carriers. This act was integrated in November 2010 into the revised Broadcast Act, together with the Cable Radio Broadcast Act and the Cable Television Broadcast Act.

As described above, the integration of communications and broadcasting requires legal and institutional revisions including laws related to both broadcasting and communications. It should be also noted that the integration also involves the integrations of institutions, technologies and contents, and reshuffling of industries.

Points to note

- One of the biggest problem in shifting from analogue to digital broadcasting may be dissemination of reception systems of digital broadcasting services. Efforts must be made to enhance the understanding of the general public through announcements and advertisements of digital broadcasting, and take measures to keep receivers at low prices. Japan learned the importance of an environment for the smooth transition to digitalization and the necessity of public understanding during 13 years between October 1998 when the government announced the plan to digitalize the country’s terrestrial broadcasting services and July 2011 when the analogue TV broadcasting services came to an end. During the period, the Japanese

Government revised various laws including the Radio Act (2001) and arranged to commence terrestrial digital TV broadcasting services in the three major metropolitan areas (2003), one-segment broadcasting services (2006) and terrestrial digital TV broadcasting services in all the prefectures (2006) before the completion of full transition to the terrestrial digital broadcasting services. The government also committed itself to development of the environment by establishing in 2003 a Nationwide Conference for Promotion of Terrestrial Digital Broadcasting and in 2009 Ministry of Internal Affairs and Communications' Support Centers for TV Viewers in each prefecture.

- When digital broadcasting is adopted, the necessity arises to deal with issues related to the intellectual property rights since digital programs can be easily copied and reproduced.
- Experts to be dispatched to countries subject to cooperation are required to have knowledge about a wide range of fields because they are expected to give advice on policy, legal and technical matters.
- Experts to be dispatched ought not to be influenced by any specific agencies, organizations or individuals, and are expected to engage in cooperation at a neutral position at any time.
- Assistance to privatization cannot be set as an absolute goal because different countries have different historical backgrounds, economic foundations and degree of democracy, as well as the background of broadcasting services.

JICA's commitments

Not so many developing countries attach high priority to the strengthening of broadcasting administration, and JICA has not engaged in many cooperation projects for development of broadcasting laws and systems. For sound development of the broadcasting sector, however, the roles of presiding ministries and agencies in broadcasting administration are crucial. They are responsible, for example, for enactment of broadcasting laws, formulation of a plan to allocate frequencies efficiently and appropriately, formulation of a master plan for a shift to digital broadcasting, and establishment of a supervisory body to maintain the quality of the broadcasting contents. As the number of community broadcasting stations has been increasing, coordination with local governments and their roles themselves have been becoming more important. The importance of cooperation projects in this field is likely to be heightened as the sector is expanding in developing countries.

2-2-2 Development Strategy Goal 2: Development of Human Resources and Organizations to Support Broadcasting

(1) Intermediate Goal 2-1: Professional Development of Broadcasting Policy Practitioners

Human resources must be developed, who can deal with various disciplinary and regulatory

problems related to, for example, responses to digitalization and the accompanying next-generation media, intellectual property rights and broadcasting ethics, and independence of mass media on one hand, and, on the other, formulate and implement broadcasting policies and specific plans based on the understanding of the ongoing integration of broadcasting and communications.

JICA's commitments

JICA has carried out "executives' seminars" for broadcasting policy practitioners and executives of broadcasting stations and, in recent years, training programs on planning of adoption of digital broadcasting, and transitional policies and strategies towards digitalization. Figure 2-1 lists the training programs in terms of theme that were carried out in FY1995-2009. The programs concerning broadcasting policy accounted for 13% of the overall programs. The figure suggests that JICA offered training programs in a well-balanced manner among themes – the hardware side such as maintenance and management of broadcasting equipment and the software side such as program production and broadcasting policy. Cooperation in this sector is likely to continue to focus on training and technical cooperation projects.

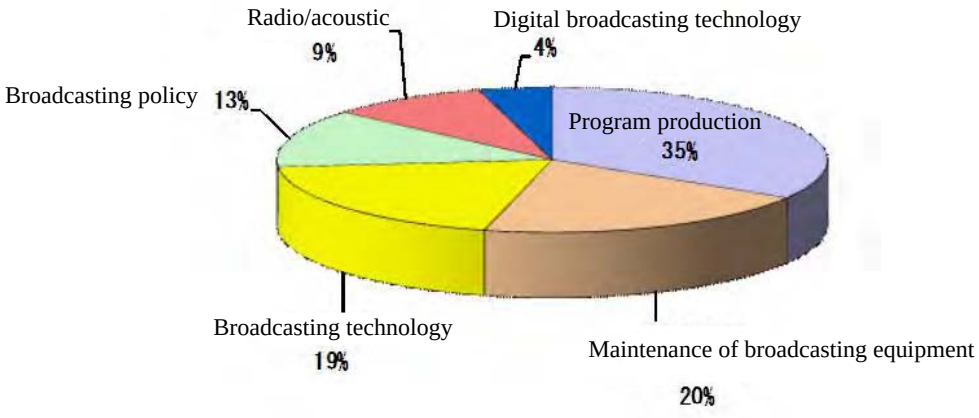


Figure 2-1 JICA Training Programs in the Broadcasting Sector (1995-2009)

(2) Intermediate Goal 2-2: Professional Development of Broadcasting Engineers

Many people are involved in production and broadcasting of TV and radio programs. All professionals, including those in charge of direction and production, engineers in charge of maintenance and management of studio, transmitting and relaying facilities, and those in charge of fund-raising, management and financial matters, are required as professionals to contribute to provision of programs. With digitalization of broadcasting sites, the necessity arises to train professional engineers and content producers to deal with digital broadcasting, while broadcasting

stations need to train relevant engineers, as well as content producers and management personnel who are aware of the public nature of broadcasting stations as mass media. In developing countries, however, broadcasting stations are not well equipped with advanced educational system or internal training programs at the moment.

Points to note

- Human resources must be developed, who can deal with digital technology and provide programs in a true and fair manner with full awareness of the necessity to develop the democracy and public welfare through broadcasting.

JICA's commitments

JICA has provided assistance to professional development of broadcasting personnel in various ways, such as technical cooperation projects, dispatches of experts to train personnel on site, volunteering activities (JOCV and SV) and training programs in Japan. The characteristics of these cooperation activities are that many of them are carried out after grant aid cooperation projects and that experts, volunteers and training programs are in close liaison with one another.

As for training, JICA has conducted group training in Japan for "production of TV broadcasting programs (general)" and overseas technical training for "production of TV documentary programs (training in third countries)" to assist an improvement in the capacity of planning and direction necessary for program production. JICA's training aims at not only methods of TV program production but also acquisition of knowledge about human rights, broadcasting ethics, copyrights and other relevant matters. Since digitalization is in progress in broadcasting stations in developing countries, JICA designs its curriculums to provide trainees with opportunities to learn skills for digital equipment through practical training on transmission and reception, and maintenance work with digital broadcasting equipment in such courses as "terrestrial digital TV broadcasting technology" and "the quality, maintenance and management technology for the stable and long use of studio broadcasting equipment".

Not just training but the scheme of individual expert dispatch and technical cooperation projects play a crucial role in professional development of human resources: JICA contributes to human resources development by dispatching individual experts in short- and long-terms after provision of equipment through ODA to transfer technology for maintenance of the equipment provided and the expertise to produce broadcasting programs with the equipment. JICA's recent technical cooperation projects include a "project to improve the maintenance and management methods of equipment" in Sri Lanka and a "project to support and strengthen the capacity of the national broadcasting station" in Bhutan. In these projects, JCIA contributed to a rise in the awareness and capacity of personnel and the

strengthening of management capacity of the organizations through day-to-day advice on the broadcasting technology and activities to improve the organizational structure of the broadcasting stations by long- and short-term technical experts.

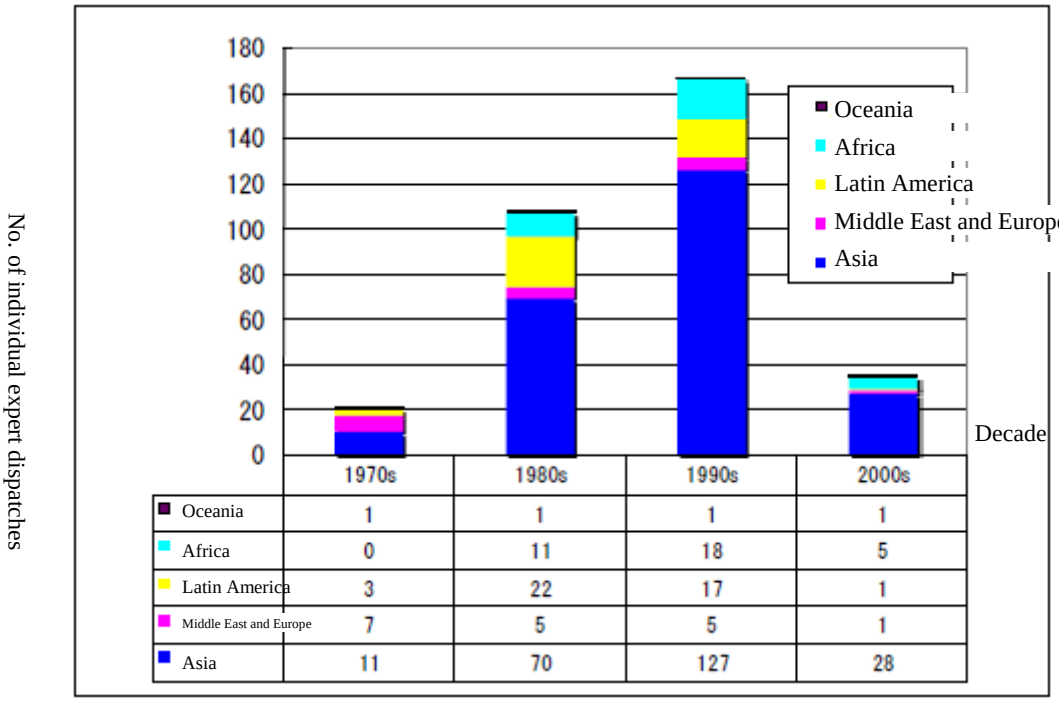


Figure 2-2 The Number of Individual Expert Dispatches in the Broadcasting Sector, by Decade (Short- and Long-term Dispatches Inclusive)

Since advances in broadcasting technology are relatively rapid as those in ICT, it is necessary to appropriately grasp the technologies required and constantly revise the contents of cooperation to meet the change of the times. In addition, since broadcasting has a substantial impact on society due to its nature, cooperation for professional development of human resources should be carried out from not only the technical viewpoint but also the ethical one.

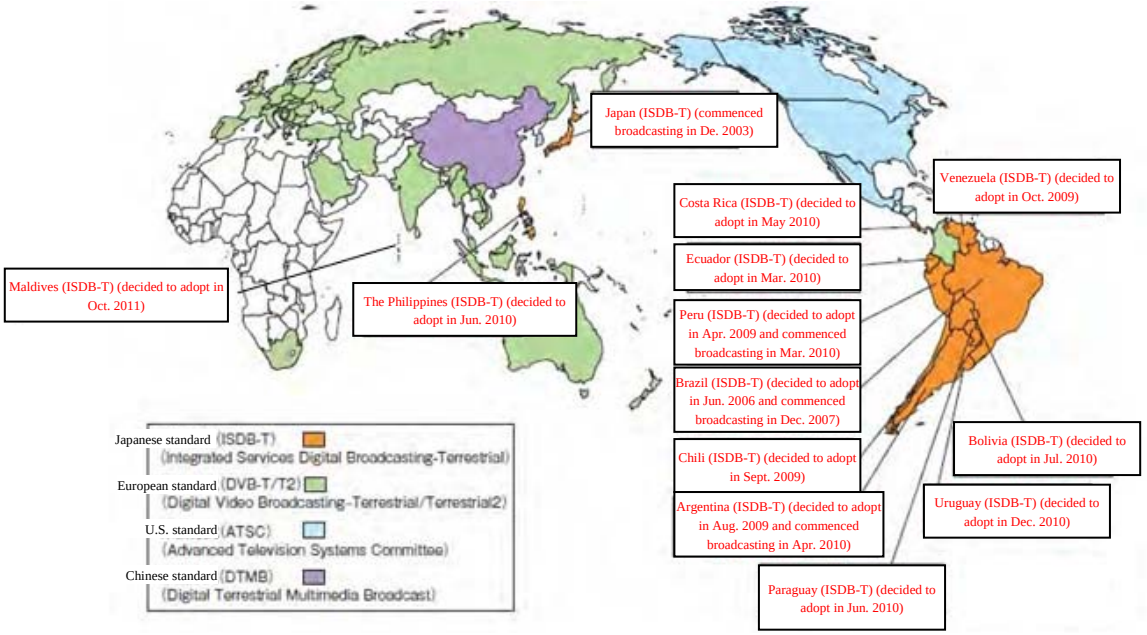
2-2-3 Strategy Goal 3: Development of Broadcasting Facilities and Equipment

(1) Intermediate Goal 3-1: Development of Broadcasting Infrastructure

Radio and TV broadcasting stations and transmitting facilities are normally located in countries' capitals and large cities. In the case of TV broadcasting, in particular, transmitting and relaying facilities are not built to cover the entire area of countries in many cases, so broadcasting does not reach quite a few rural areas. As for radio broadcasting, too, it is an urgent task to develop these facilities to cover islands and mountainous areas and other hard-to-reach locations.

In such circumstances, the TV broadcasting system has been shifting from analogue transmission to

digital transmission. In light of this, TV broadcasting equipment needs to be replaced by digital equipment. A conspicuous advantage of the terrestrial digital TV broadcasting system is the clarity of its TV screen. The greatest advantage, however, is that it enables to use frequencies effectively. In Japan, the radio frequency range of 470 - 770MHz of ultra-high frequency (UHF) used for digitalization is only 65% of the frequency range required for analogue broadcasting, so that the remaining 35% can be allocated for new purposes such as mobile phones, terrestrial digital radio broadcasting and the expressway traffic system. The standards for terrestrial digital TV broadcasting adopted by countries in the world are presented in Figure 2-3.



(Source) Based on White Paper 2011: Information and Communications in Japan, the Ministry of Internal Affairs and Communications

Figure 2-3 World Trend in Terrestrial Digital TV Broadcasting (as of October 2011)

The Ministry of Internal Affairs and Communications has actively promoted the Japanese standard for terrestrial digital TV broadcasting, which enables users to receive services in mountainous areas and also with mobile terminals. As of October 2011, twelve countries – Brazil, Peru, Argentina, Chili, Venezuela, Ecuador, Costa Rica, Paraguay, the Philippines, Bolivia, Uruguay and Maldives – decided to adopt the Japanese standard. The Government of Japan will carry out and continue technical and financial cooperation, as well as assistance to human resources development, for smooth adoption of equipment of the Japanese standards in collaboration with relevant organizations.

As described above, broadcasting infrastructure must be developed in consideration of the fact that the global trend lies in digitalization of TV broadcasting while some areas have difficulty in receiving analogue TV broadcasting programs.

With the technical innovation, types of broadcasting equipment and transmitting systems necessary for provision and production of broadcasting programs have been ever-changing. For example, visual materials used to be edited by tape-dubbing (linear editing), but now the major editing and management method is to convert visual images into the digital format and edited and managed on computers (non-linear editing). Moreover, while more and more information programs (such as weather forecasting) using computer graphics have been produced, digital broadcasting makes it possible to convey data synchronized with TV programs. Digitalization and adoption of multimedia are also in progress in the field of journalistic activities: the traditional method of transferring visual images uses special facilities and expensive circuit connections, while personal computers and IP networks enable instant transmission of images to editing studios at broadcasting stations. Equipment that suits these trends of the times must be supplied.

JICA's commitments

Since the 1970s, JICA has been committed to a large number of cooperation projects for development of broadcasting infrastructure in a manner to respond to changes in the situation of developing countries. During the period between the 1970s and the first half of the 1990s, projects for radio broadcasting outnumbered those for TV broadcasting. JICA engaged in projects to develop transmitting facilities for an expansion of the coverage of radio broadcasting and projects for educational channels designed for the primary and secondary education of TV broadcasting. From the latter half of the 1990s, it engaged in an increased number of projects to upgrade facilities which were developed in the 1970s and 80s but became decrepit. It was then difficult to repair such facilities due to the difficulty in procuring spare parts[1] because these facilities were no longer in production. During this period, the gap in the progress of developing countries concerning the broadcasting technology began to be conspicuous, so JICA took different cooperation approaches to semi-developed countries and developing countries. For the former, it carried out many projects aiming to improve specific capabilities such as development of general personnel in the broadcasting sector and an improvement in the quality of news programs, whereas, for the latter, it engaged in many urgent projects to supply facilities and equipment to help them re-expand the service coverage that had been reduced or avoid discontinuation of broadcasting

[1] In general, spare parts for electronic appliances are supplied for five years, but are in practice available for 10 years or so since agencies and suppliers have them in stock even after the end of production. After that, it is normally fairly difficult to procure them, so it is necessary to buy new equipment.

services as a result of the aging of their facilities. In recent years, cooperation projects for the latter outnumber those for the former. JICA's cooperation is unique in the sense that the cooperation agency has been paying attention to changes in major broadcasting equipment of the time and committed to the renewal of equipment which was supplied to broadcasting stations in the past and quite a few follow-up activities.

(2) Intermediate Goal 3-2: Development of Broadcasting Contents

TV broadcasting stations in developing countries broadcast programs purchased from other countries (mostly from developed countries) for many hours and extremely few programs produced themselves. In order to convey information useful for citizens in rural areas where information is less available than that in urban areas, broadcasting stations must improve the quality and quantity of local programs. In addition, some developing countries are multiethnic with a number of local languages, so it is necessary to translate programs into local languages to convey information to as many people as possible. Due to the low capacity, however, broadcasting stations in developing countries broadcast many programs only in official languages or those spoken only in metropolitan areas. More cooperation projects are needed to increase programs dubbed in other languages and assist community broadcasting to respond to multilingual culture and illiterate population.

Programs once produced and broadcast are stored in archives and become precious assets that can be reused. Videotapes recording TV programs used to be stored with a tag where simple information, such as program title and the names of cast and staff, is written. If metadata is created from broadcasting programs, it can be used to pick up necessary materials out of a vast amount of archives. In other words, building of digital content library database will increase the value of programs in stock.

Points to note

- JICA may be likely to increase the number of cooperation undertakings for development of broadcasting infrastructure partly because it launched ODA loans in its assistance scheme in October 2008. However, it cannot help broadcasting stations procure equipment if they do not improve their management. It is also recommended that JICA provide cooperation not only for state-run broadcasting stations but also private stations through, for example, establishment of funds.

- Care must be taken not to create the regional digital divide but to pay attention to provision of broadcasting services in rural areas although broadcasting stations tend to be concentrated in large cities. For this, it is effective to expand the broadcasting networks by increasing

transmitting and relaying stations.

- In recent years, developed countries have been rapidly adopting digital broadcasting. Many developing countries are also considering the adoption. However, viewers need to replace their analogue reception devices (televisions and radios) with digital devices, and it is likely that many will be unable to afford them. Any plan towards digitalization must be drawn up in consideration of the financial situation of these audiences.

- Prior to digital broadcasting, power supply to receive TV and radio broadcasting programs needs to be secured. Many rural areas still have no proper electricity in developing countries, so it is important to make efforts not to create new digital divide by taking certain measures to provide broadcasting services to such areas.

JICA's commitments

JICA has been committed to cooperation projects to develop contents, including a project for creation of TV documentary programs for Asian and African countries (technical cooperation project), a project to develop program software for a state-run TV broadcasting station (grand aid cooperation), a follow-up project for TV program production (technical cooperation project), and a project to develop program software for a state-run radio/TV broadcasting station. It will continue to apply technical cooperation projects and grant aid projects for assistance to this sector.

2-3 New Issues and Approaches in the Broadcasting Sector

2-3-1 Development Strategy Goal 4: Application of Broadcasting to Various Fields

This Development Strategy Goal is a cooperation approach that can be taken only if the subject broadcasting station is equipped with minimum broadcasting infrastructure as a result of cooperation activities for the three Development Strategy Goals cited in Section 2-2, cooperation provided by other donor, or self-efforts of the country concerned. The merger of JICA and the Japan Bank for International Cooperation (JBIC) in October 2008 enabled a newly born JICA to carry out assistant by systematically combining its three cooperation schemes, that is, grant aid cooperation, ODA loan and technical cooperation. In the same month, JICA established an Office for Private Sector Partnership within its headquarters to establish a new cooperation framework for the Public-Private Partnership (PPP).

A unique characteristic of the broadcasting sector is that interaction of information and vitalization of communications can, as in the case of ICT, contribute to an improvement in the efficiency in development of other sectors and the heightening of overall impacts. In other words, the use of broadcasting as a tool can contribute to the capacity development (CD) of the country concerned as a

whole (see Chapter 3 for the relationship with CD).
Because of its nature to convey information instantly to a wide area, broadcasting has a considerable positive impact on society if it is used to enrich truly public welfare. Moreover, since it neither costs receivers much nor requires any special literacy, it has a comparative advantage if it is used to transmit contents such as contents of basic education to a large number of people.

Since JICA has little experience in cooperation for this Development Strategy Goal, it will have to actively engage in cooperation in reference to projects carried out by other donors or the private sector.

(1) Intermediate Goal 4-1: Application of Broadcasting to Various Sectors
Broadcasting, through the delivery and program and various other contents, enables instantly people in a wide area to share useful information in various sectors such as agriculture, medical and healthcare, and education. For example, JICA has engaged in a cooperation project, where advisors promoted dissemination of information about agriculture through radio broadcasting to farmers in remote areas in Zambia. In this project, radio broadcasting, together with the experts' activities to conduct workshops and training programs and the distribution of radio with the manual winding power generating function and solar batteries, played a crucial role in providing new knowledge and technology to farmers in rural areas in Zambia.
As in the case above, the broadcasting sector can heighten the capacity of other sectors to solve their problems through activities such as production, recording and transmission of various contents. Since broadcasting is basically, unlike the Internet or telephone, a means to convey information uniformly and simultaneously to a large number of unspecified people, the contents are desirably designed not for specific groups of people. On the other hand, as the significance of community broadcasting services that are provided by a certain community for the community has been recognized, JICA should consider the possibility of providing cooperation for community broadcasting and other small-scale stations.

As for contribution especially to disaster-prevention activities, emphasis should be placed on development of network infrastructure and systems, and liaisons with communities to swiftly convey information in emergencies. For example, it should be considered in future to build emergency information systems equivalent to Japan's earthquake information, tsunami warning and emergency earthquake alerts given on radio and television. However, the use of TV, radio and other media, as well as alert systems, based on establishment of broadcasting networks, is not enough to improve the problem-solving capability concerning disaster prevention. It should be noted that general measures for emergencies, such as securing of evacuation routes in communities, should be also taken.

Possible use of broadcasting for disaster prevention includes broadcasting of educational programs to heighten the awareness of disaster prevention.

In passing, JICA plans to hold a "reconstruction diplomacy seminar", taking advantage of the experiences in the 2011 Great East Japan Earthquake. It is also planning to hold seminars on the application of ICT to disaster prevention activities.

JICA's commitments

For the application of broadcasting to various sectors, JICA has engaged in cooperation projects including a "project for education on AIDS through mass media" and a "project to improve lessons at school through TV programs". It may be able to offer assistance to development of broadcasting facilities and emergency alert systems.

(2) Intermediate Goal 4-2: Use of Broadcasting to Contribute to Improvement in Governance

Overall capacity development in the broadcasting sector can contribute to an improvement in governance. The effects of good governance will appear gradually as a result of CD including the transparent operations of media as an authority watchdog, development of a legal system supporting the media operations, visualization of the process of the national politics (election broadcasts, broadcasts of Diet debates, etc.), and an improvement in media literacy of the general public.

On the other hand, assistance and other supportive activities to a (state-run) broadcasting station can be harmful if good governance cannot be expected from the country concerned - that is, if there is a possibility of misuse of broadcasting. It should be also noted that cooperation may increase the risk of excessively heightening the nationalism if the country has a state-run broadcasting station only or the limited number of media.

As cooperation for the bases of any sector, the possibility of using broadcasting as a tool for multilingual and multicultural coexistence in multilingual and multicultural societies should be considered. Multilingual services such as closed captions and multilingual broadcasting are fairly effective as a means to share and convey information in such societies. Multilingual broadcasts of election campaigns will, for example, encourage minority groups to participate in politics and society. Assistance to broadcasting in sign language or with voice guidance will contribute to problem-solutions contingent to development of developing countries. Moreover, multilingual broadcasts will enable the people in a multilingual/multicultural society to watch the same programs and share a common consciousness. If a broadcasting station is biased or if broadcasting programs are addressed disproportionally to particular groups, on the other hand, the contents may become

exclusionary and serve as a seditious tool for nationalism.

JICA's commitments

JICA undertook a Project on Capacity Development of Bhutan Broadcasting Service (2007-2010) to support the use of broadcasting contributing to an improvement in governance, such as for TV news reports on elections. It should continue assistance to development of contents and broadcasts contributing to an improvement in governance by taking advantage of the high distribution capacity of broadcasting.

Chapter 3 Direction of Cooperation by JICA

Chapter 2 set the four Development Strategy Goals in the broadcasting sector in reference to the Development Strategy Goals in the "Thematic Guidelines <Information and Communication Technology>", and overviewed the basic concepts of each goal, JICA's commitments and points to note, as well as selective case studies. Table 3-1 presents a general overview of a scope of JICA's activities in the broadcasting sector as seen in these case studies. These activities, based on the Schematic Chart for Development Issues, are a mere selection of activities which can be carried out with minimum inputs and whose demand is expected to rise, so the general overview does not necessarily deny cooperation outside the scope. At the same time, JICA has carried out only a limited number of cooperation projects in the sector, so is required to accumulate experience.

Table 3-1 The Scope of JICA's Activities Extracted from Case Studies

Development Strategy Goal	JICA's activities extracted from base studies
1. Improvement of broadcasting policy-making capacity	(i) Formulation of an overall master plan towards adoption of digital broadcasting (ii) Assistance to establishment of a management structure of a broadcasting station, and to establishment of fund-raising methods through sales and marketing activities for development of a subscription fee collection system and TV commercial advertising revenue (iii) Dissemination of digital broadcasting receivers based on Japan's experience in transition to digital broadcasting. Efforts to promote the understanding of the public through announcements and advertisements of digital broadcasting, and measures to keep receivers at low prices.
2. Development of broadcasting organizations and human resources	(i) The use of non-linear editing and a content database (ii) The use of new digital media (iii) Building of a system easily enabling multilingual services
3. Development of broadcasting facilities and equipment	(i) Replacement of the current analog broadcasting equipment to digital one
4. Application of broadcasting to various fields	(i) The application of broadcasting to various fields, such as agriculture, medical and healthcare (enlightenment activities), education (poverty reduction), water resource management and disaster control (early disaster alert) (ii) Provision of information directly contributing to an improvement of people's lives (iii) Increase in the number and quality of local contents, and their maintenance and management

(iv) Creation of local contents and broadcasting in local languages

(v) Efforts to attract viewers and listeners to improve the audience rates

(vi) Active participation of listeners

Chapter 3 will compile the underlying basic concepts of each Development Strategy Goal and points to note so as to explore possible approaches that JICA should take in its cooperation for broadcasting in future.

3-1 JICA's Basic Stance and Points for Cooperation

The basic concepts of cooperation in the broadcasting sector are classified into "development of broadcasting infrastructure" and "use and application of broadcasting". The former is a process of developing infrastructure to transmit and receive broadcasts, and improve the capacity of the sector. The process was aimed under three Development Strategy Goals cited in Chapter 2 - that is, "1. Improvement of broadcasting policy-making capacity", "2. Development of broadcasting organizations and human resources", and "3. Development of broadcasting facilities and equipment". In order to make broadcasting to the benefit of the general public in a country subject to cooperation, broadcasting programs need to be transmitted to and received by the general public. In this regard, it is necessary to develop people, goods and capital necessary for constant transmission and reception of broadcasting contents, which will pave the way to the other basic concept, "application of broadcasting to various fields".

The other basic concept is related to the fourth Development Strategy Goal, "4. Application of broadcasting to various fields", shown in Chapter 2. Even if broadcasting infrastructure to transmit and receive broadcasting contents has been developed, broadcasting itself will not bring benefit to the country concerned unless good contents are produced and delivered. Following development of infrastructure, the focus of cooperation should be placed on an improvement in the quality and number of broadcasting programs. It should be noted that broadcasting, like ICT, is a tool to empower developing countries.

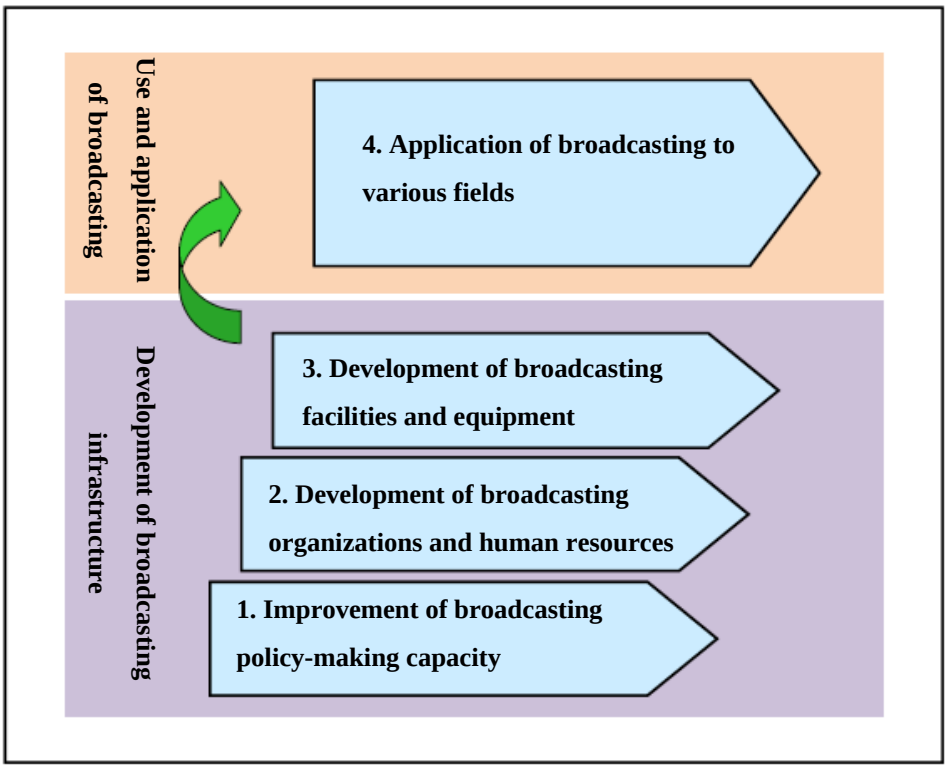


Figure 3-1 Flow of Cooperation in the Broadcasting Sector

The basic approach of JICA's cooperation in the broadcasting sector is "development of broadcasting infrastructure" as shown in Figure 3-1 above, based on which "the use and application of broadcasting" is promoted in appropriate sectors. In seeking either of the basic concepts, JICA is committed to cooperation by collaborating with international organizations, private companies, NGOs and other parties, and considering sectors where its cooperation can produce considerable positive impacts.

As for development of broadcasting infrastructure, it is important to make a balance between assistance to policy-making process, development of facilities and equipment, and development of organizations and human resources. As shown in the radar charts in Figure 3-2 below, it is desirable to research thoroughly the present situation of countries subject to cooperation and the status of assistance from other donors so as to make a balance among the three mainstays and produce a large triangle.

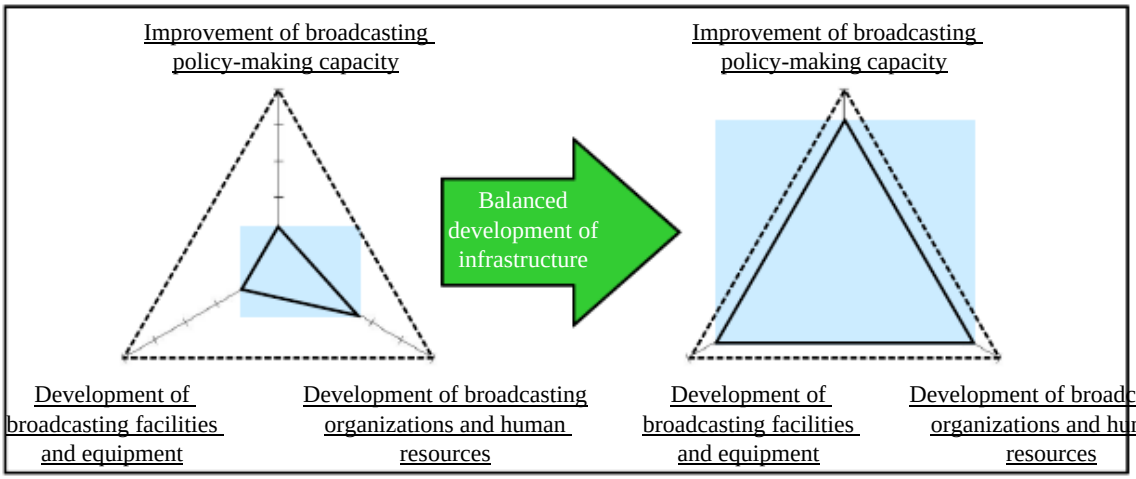


Figure 3-2 Example of Balanced Infrastructure Development of Three Goals (Radar Charts)

Cooperation for the use and application of broadcasting should be based on an overall development plan of the country concerned and attach priority to fundamental issues in accordance with the situation of the country. Broadcasting is a tool, so parties concerned with cooperation is required to bear in mind which sector the country expects to be ultimately benefited from broadcasting services. In other words, an ultimate goal (overall goal) of cooperation in the broadcasting sector serves also as a goal for other sectors. Therefore, parties concerned with cooperation need to go back to this point and consider retrospectively the quality and quantity of functions necessary for infrastructure development. Moreover, as stated in Chapter 1, since broadcasting is closely related to ICT, parties concerned with cooperation are required to consider the situation of the country subject to cooperation, examine which of ICT or broadcasting, or both should be adopted, and decide an appropriate technology to adopt.

- Cooperation for the Broadcasting Sector and Capacity Development

Capacity development (CD) is JICA's organizational-wide fundamental policy and counted as a basic concept for cooperation for the broadcasting sector. JICA regards CD as a "process where the problem-solving capacity of developing countries as an integrated capacity at various levels including individuals, organizations, society, etc. is improving[1]". The "problem-solving capacity" is definable as a combination of the "ability to set and achieve targets" and the "ability to identify and solve development issues"[2]. In short, what is important is for developing countries themselves to take the initiatives in solving their development issues.

JICA focuses on the following two viewpoints when placing emphasis on CD in cooperation for

[1] "Capacity Assessment Handbook - Project Management for Realizing Capacity Development –", JICA Research Institute, 2008.

[2] "Capacity Development Handbook for JICA staff: For Improving the Effectiveness and Sustainability of JICA's Assistance", JICA, 2004

the broadcasting sector. First, it focuses on an improvement in the problem-solving capacity of the broadcasting sector in countries subject to cooperation. This view, corresponding to development of broadcasting infrastructure cited above, is a process of heightening capacity of the government, ministries and agencies responsible for broadcasting, broadcasting stations, broadcasting personnel and other parties concerned in these countries. Their capacity is heightened by aiming to achieve the three Strategic Goals of “improvement of broadcasting policy-making capacity”, “development of broadcasting facilities and equipment” and “development of broadcasting organizations and human resources”, and also promoting cooperation associated with the Goals. The second view, corresponding to the use and application of broadcasting, is a process to improve the overall problem-solving capacity of these countries by aiming to achieve the other Strategy Goal of “application of broadcasting to various fields” and also promoting cooperation associated with the Goal.

In line with the views on CD shown above, it is necessary to aim to improve the comprehensive abilities covering systems such as administrative systems for policy and broadcasting acts, structures of broadcasting stations and their business systems, and other aspects of broadcasting. In order to foster the sustainable and spontaneous ownership of the countries concerned, establishment of a cooperation system and institutionalization of mechanisms need to be considered from a long-term perspective.

CD cannot be realized if any of the capacities at the individual, organizational, and institutional and social levels shown in Table 3-2 is missing. Parties concerned with cooperation should consider these capacities to be mutually related and be aware of the integrated capacity at any time.

Table 3-2 Capacities in the Broadcasting Sector

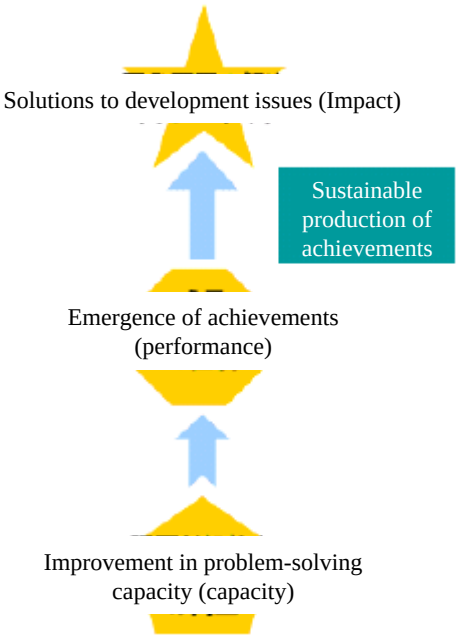
Level	Definition of capacity	Capacity concerning the broadcasting sector
Individuals	Will and ability to set and achieve action goals with their knowledge and skills	・ Knowledge, linguistic ability, skills, technology, wisdom, will, sense of responsibility and leadership of individuals in the broadcasting sector ・ Broadcasting ethics ・ Media literacy
Organizations	Decision-making process, management system, organizational culture and systems necessary to achieve specific goals	・ Human assets (human resources in technology, management and planning divisions of the broadcasting sector, and human resources development) ・ Physical the (facilities, equipment, land, funds, capitals necessary for the operations of the broadcasting sector) ・ Intellectual assets (know-how and implicit knowledge, statistical information, documents, manuals, leaderships and ownerships in the broadcasting sector) ・ Common awareness within organizations

Systems and society	Environments, condition and frameworks for processes, systems and implementation of decision-making concerning execution of policies and strategic measures that cannot be carried out by a single organization, all of which are necessary for demonstration of the capacities at the individual and organizational levels	・ Official legal system (broadcast law, and laws, government ordinances and regulations prescribing the definition and locus of management responsibility for broadcasting) ・ Fair regulations and standards (frequency allocation and broadcasting ethical standards) ・ Policies and politics (clear broadcasting policies, policy goals and politics at the national and regional levels) ・ Social infrastructure (dissemination rates of universal access funds, electricity and radio/TV) ・ Informal systems (practices, historical systems, taboos and norms) ・ Social organizations related to broadcasting (CBOs, NOGs and other entities) ・ Official and informal broadcasting markets and industries ・ Broadcasting education ・ systems (good governance) guaranteeing to reflect opinions of citizens and communities, and partnership ・ Social ownership (public opinions, consensus and awareness of cooperation)

In a project, it will be important for parties concerned with cooperation to be always aware of the "process of CD" (see Figure 3-3) that actors of CD continue to improve their problem-solving capacity through day-to-day activities and produce the achievements (performance), and ultimately reach solutions to development issues.

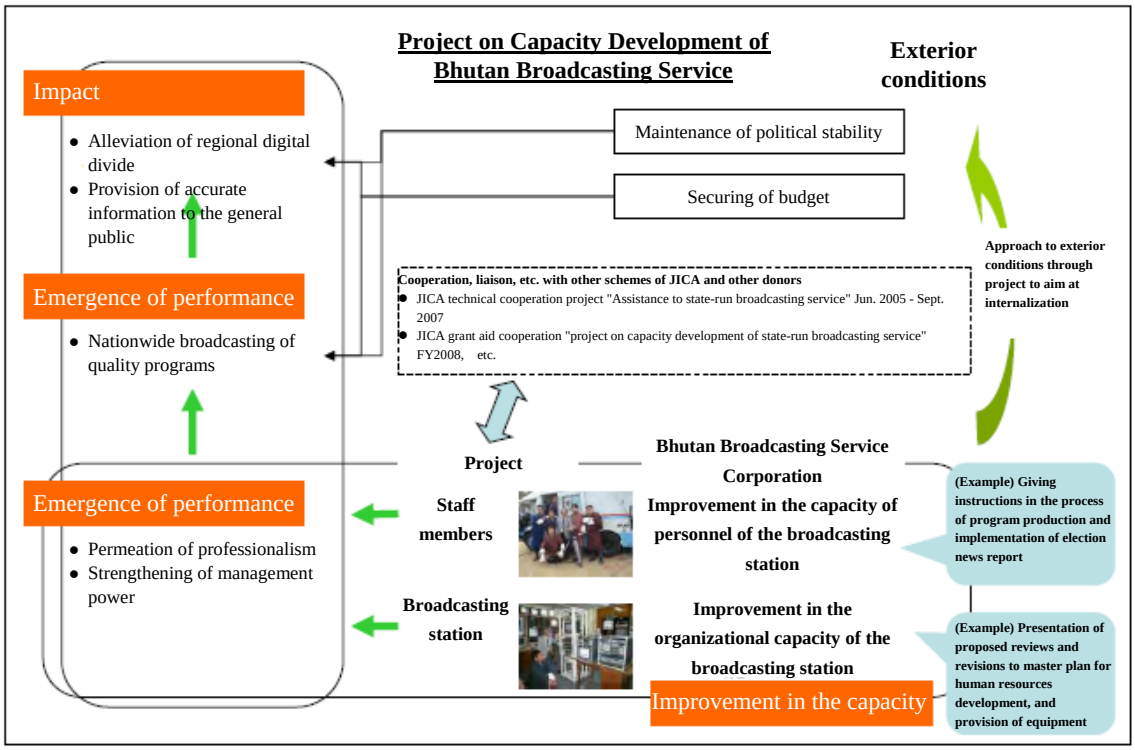
At the same time, it is also important to envisage a "story of CD" towards the final and ideal situation by clarifying the target level among individuals, organizations and society and systems particularly at the time of formulating a project, analyzing the present situation with awareness of the process to solutions of development issues in line with the concept of CD, and spontaneously filling the gap between the present situation and the final situation.

Figure 3-4 shows a "story of CD" designed in a technical cooperation project that JICA actually carried out in the broadcasting sector.



Source: Created by the author according to the “Capacity Assessment Handbook”, 2008.

Figure 3-3 Overall Image of Development and the CD Process



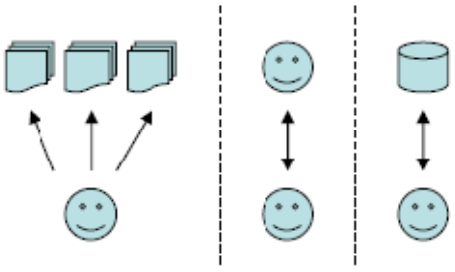
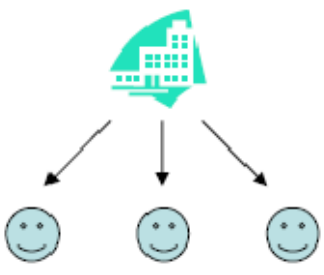
Source: created by the author according to the "Capacity Assessment Handbook", 2008.

Figure 3-4 Example Story of Capacity Development in the Broadcasting Sector

As shown above, JICA has provided various forms of assistance to the broadcasting sector. The following are points to note for future assistance to each Development Strategy Goals in reference to JICA's cooperation activities in the past.

An increasing number of people in developing countries are beginning to use the Internet in recent years. If high-speed communications such as ADSL and FTTH become available there, the distinction between information communications and broadcasting is likely to become more obscure. In Japan, for example, convergence in broadcasting and communications is already in progress: broadcasting programs use communications technology to enable audiences to participate in the programs in the form of opinion polls and the like, via mobile telephones and remote controls.

In this sense, ICT and broadcasting share quite a few aspects as a tool for empowerment. Even so, it should be still noted that they are different in terms of their fundamental natures, such as methods of conveying information, simultaneity of information, parties transmitting information (anonymousness) and the required level of literacy (see Figure 3-5).

Item	ICT	Broadcasting
Definition	The term “ICT” refers to a concept covering both information technology and communication technology, which are used to input, store, process, convey and output information. (According to “Thematic Guidelines <Information and Communication Technology>)	“transmission of wireless communications for the purpose of direct reception by the general public” (according to the Broadcast Act)
Means of conveying information	Internet, telephone, (database), ...	TV and radio
Image of conveying information		
Reliability of	Low	High

information		
Simultaneity of information	Low	High
Parties transmitting information	Unspecified and a large number	Specified and a small number
Information literacy	Basic literacy required	Basically literacy is not required

Figure 3-5 Comparison of the ICT and Broadcasting Sectors

It should be also noted that JICA's cooperation to the broadcasting sector is designed on the assumption that countries subject to cooperation have the minimum basic infrastructure. For example, in order for JICA to provide cooperation, the countries concerned need to have the minimum electricity infrastructure enabling broadcasting stations to transmit and people to receive broadcasting programs; unstable supply of electricity could be a bottleneck for cooperation. Even so, they do not necessarily need to have advanced infrastructure for broadcasting, and simple devices, such as radio with the manual winding power generating function or solar batteries and loudspeakers, can help improve the infrastructure. Thus, there is still a possibility for countries with no basic infrastructure to receive cooperation.

3-2 Issues for the Future

In October 2008, JICA was merged with the overseas economic cooperation division of JBIC and reborn as a cooperation agency to comprehensively implement three schemes of grant aid cooperation, ODA loans and technical cooperation. Until then, JICA had engaged in cooperation by combining financial cooperation and technical cooperation. For example, it assisted a developing country to procure broadcasting equipment under a financial cooperation scheme, and dispatched experts as follow-up activities under a technical cooperation scheme. From now on, however, JICA is expected to take more advantage of the synergetic effects of the merger and arrange liaison among the schemes in cooperation for the broadcasting sector.

So far, JICA has carried out projects for "development of broadcasting facilities and equipment" and cooperation for "development of human resources to support broadcasting" independently in many cases. The former has been carried out under the grant aid cooperation scheme, and the latter under the technical cooperation scheme to assist the operation and management of equipment supplied under the former scheme and to support production of programs by receiving trainees from the countries subject to cooperation. In future, it will be able to produce greater impacts of cooperation by carrying out cooperation projects where the two schemes are organically combined and addressing flexibly solutions of problems unique to each region, country or organization.

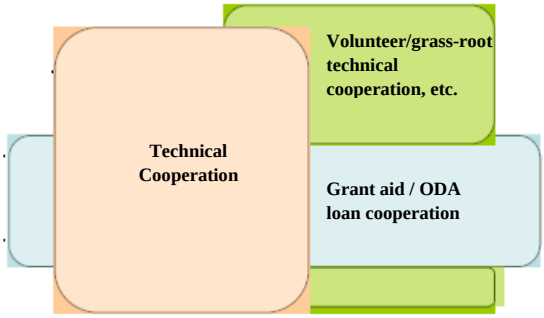
Development Strategy Goal	Scheme
4. Application of broadcasting to various fields	
3. Development of broadcasting facilities and equipment	
2. Development of broadcasting organizations and human resources	
2. Development of broadcasting organizations and human resources	

Figure 3-6 Combinations of Schemes in the Broadcasting Sector (Examples)

JICA should consider optimal combinations of schemes and cooperation by planning and designing projects at the preparatory stage and investigating fields where broadcasting can be effectively used so as to make the combinations seamless.

The constant use of volunteers can be effective for cooperation for individuals in relation to broadcasting. One of the major activities of Japanese overseas cooperation volunteers (JOCV) is to produce audio and visual learning materials, and radio programs on medical and healthcare, and education for the ministries and agencies, local governments and educational institutions in developing countries. Senior volunteers (SV) under JICA's volunteering scheme have been also engaged in production of audio and visual learning materials, advisory work for projects to upgrade digital equipment and transfer maintenance and management skills. It can be said, thus, that these activities of Japanese volunteers have been working on capacity development of "individuals" and "organizations".

If broadcasting is used especially as a "tool" as introduced in Case Study 4, it is important to take cross-sectoral approaches by not just considering cooperation from the viewpoints of ICT and broadcasting but also from the viewpoint of applying broadcasting to medical and healthcare, education and other sectors. Projects should be put into practice by gathering knowledge of the electricity sector that is a prerequisite for implementation of broadcasting projects and that of sectors to which broadcasting is applied. Since JICA practices accumulating knowledge of each issue at each department in charge of the issue, whether a cooperation project succeeds or not will depend on how closely a number of departments within JICA can cooperate with one another.

Since broadcasting can transmit information simultaneously to a large number of unspecified people, it has a high risk of abusing human rights. Cooperation of development of human resources in the broadcasting sector needs to involve not just technical assistance and but also consideration of broadcasting ethics including thorough (legal) compliance and respect for human rights. The focus of cooperation in the broadcasting sector at the global level is shifting from prevention of disputes

and promotion of democracy to development of media as a watchdog of the government power or the "fourth estate" which is free from any political influences. In future, JICA is expected to engage in cooperation to support organizational reform of media so that they can be free from specific political influences and build decision-making processes with high transparency.

Even countries where democracy is well established have actually experienced various broadcasting problems, such as disproportionate or biased flow of news and information, and loss of intrinsic cultures as a result of a monopolization of information. However, with less developed technology, as in the case of community radio broadcasting, it is possible to pave the way for democracy, if only at a community level, and subsequent empowerment of women. JICA is also expected to commit itself to assistance at such a local level.

In recent years, as in the expression "integration of communications and broadcasting", the line between communications and broadcasting has become obscure thanks to development of the Internet and digitalization of broadcasting. Therefore, it may be possible to implement projects more efficiently if cooperation projects that used to be carried out separately are combined and carried out simultaneously by, for example, transmitting broadcasting contents on the Internet. On the other hand, as a result of deregulation concerning broadcasting, the number of private and community broadcasting stations has been increasing and attracting an increasing number of audiences in major cities. The former, however, is private, profit seeking companies that cannot take a strictly critical stance to sponsor companies, so it is necessary to consider assistant that can establish policies and roles of state-run broadcasting stations to make them different from private ones. To take advantage of experiences of the broadcasting sector in Southeast Asia for Africa where the counterpart sector is beginning to develop in future, it seems possible to increase the responsibility of south-south cooperation in a shift to digital broadcasting, program production using digital technology and other undertakings.

Moreover, with the trend of privatization spreading to developing countries, there are concerns that broadcasting networks will be concentrated in profitable urban areas, and that broadcasting infrastructure fails to reach rural areas. Parties concerned with cooperation are required to give advice to the governments of countries subject to cooperation on how to get involved in the broadcasting sector to secure public broadcasting as infrastructure in underpopulated areas through, for example, the universal system. For this, it may be useful to refer to Japan's experiences. For example, NHK, Japan's national public broadcasting organization, raises its own revenue by using services combining communications and broadcasting called "video on-demand system" to improve its business base. In the system, viewers select a TV program that NHK broadcast in the past and NHK sends it to the viewers. For self-sustained development of public broadcasting stations in developing countries, it is considered possible to make full use of Japan's experience for them.

JICA has announced a vision "Inclusive and Dynamic Development". Together with this Vision, it

has defined four Missions to be achieved through four main Strategies. The Missions are: "1. Addressing the global agenda", "2. Reducing poverty through equitable growth", "3. Improving governance" and "4. Achieving human security", and the Strategies are "1. Integrated assistance", "2. Seamless assistance", "3. Promoting development partnerships" and "4. Enhancing research and knowledge-sharing". In cooperation for the broadcasting sector, too, JICA should define clear policies and strategies through research activities of JICA Research Institute and activities of ICT Task Force so as to bring positive impacts on the four Missions.