

# Urban and Regional Development / Transportation / Information and Communication Technology (ICT)

## Infrastructure That Fulfills People's Hopes



Of the eight Millennium Development Goals (MDGs), relevant goals are shown in color.

Infrastructure contributes to the sustained improvement in quality of life by supporting the economic growth of a country or region and redistributing wealth. In today's era of globalization, developing countries must also become part of the global infrastructure network through measures like building more highways, ports, and airports and developing information and communication networks. They need to build even more expansive infrastructure due to urbanization, modernization, industrialization, and other forms of progress. The result is massive demand for infrastructure projects.

JICA provides assistance for infrastructure needs that differ for each stage of economic growth. One way is by preparing urban and regional development plans that include studies to determine the most suitable social systems and institutional frameworks. Transportation infrastructure, information and communication networks, and other projects are then implemented based on those plans. JICA also extends cooperation for strengthening organizations and training people needed for the maintenance and operation of these infrastructure systems.

## Urban and Regional Development

### ● Overview of the Issue

The world's population is currently estimated to be 7 billion. In developing countries, the urban population has grown from 680 million in 1970 to 2.6 billion in 2010. By 2030, about 80% of the world's urban population is expected to be concentrated in developing countries. Growth of urban areas is indispensable to a country's economic development. However, large number of cities in developing countries cannot provide enough housing, infrastructure and employment institutions to receive the large inflows of people seeking jobs. As a result, many people are forced to live on unstable incomes in poor living environments. Furthermore, growth of urban populations causes pollution due to traffic congestion and the large volume of garbage, a decline in public security and many other urban problems that are becoming more complex and serious every year.

### ● JICA Activities

In the postwar years, Japan also experienced urbanization at an unprecedented pace that caused a variety of urban problems. To solve these problems, Japan constructed infrastructure and developed housing while establishing the standards required for urban development. Japan also focused on the development of new technologies in order to reduce pollutions and boost productivity. In addition, Japan quickly began taking action for disaster management and recovery in order to reduce risks associated with earthquakes, typhoons and other natural disasters. JICA uses Japan's experience and technologies involving urbanization to support urban and regional development in developing countries in the following six sectors.



Holding a public meeting in the process of formulating a master plan for sustainable urban development (Kenya)

1. Establishing basic infrastructure contributing to economic activities
2. Establishing quality housing
3. Establishing low-carbon urban areas
4. Establishing urban areas with disaster resilience
5. Establishing sound city management systems
6. Achieving the revitalization of urban areas

### Inclusive and Dynamic Urban Development

JICA provides support for the creation of cities that can generate a positive cycle of economic growth and poverty reduction. Activities are based on rapid responses from medium- and long-term perspectives to the problems encountered by urban areas in all developing countries. With the vision of inclusive and dynamic urban development, JICA provides support in which all types of people can participate.

## Comprehensive Support from Creating Development Concepts to Human Resources Training

JICA is dedicated to meeting the diverse needs associated with urban and regional development in developing countries. Meeting these needs requires assistance at many stages including the preparation of development plans, implementation of development programs and operation and maintenance of the completed facilities. To execute these processes in a self-reliant manner, the capacities of the organizations and people involved in implementing urban and regional development plans must be increased, the necessary legal systems must be improved, and other measures must be taken.

Through technical cooperation, financial cooperation, training programs in Japan and other activities, JICA approaches comprehensive assistance for urban and regional development.

## Transportation

### ● Overview of the Issue

In developing countries, the poor state of transportation infrastructure, including roads, railways, ports, and airports, has impeded attainment of both economic growth and poverty alleviation. Development of transportation infrastructure is indispensable to make economic growth sustainable, facilitating the efficient movement of people and goods.

The demand for transportation infrastructure is high worldwide. The need to maintain, repair, and upgrade aging structures is ever-growing. Securing funding is a big challenge for a government because infrastructure projects require significant amounts of financing. Public funds are limited and are far from sufficient to fulfill all infrastructure development needs. To fill the

### Case Study

#### Mongolia: Support for the Urban Development of Ulaanbaatar

## Consistent Urban Development Project from City Planning to Implementation Capacity Building

**The population of Mongolia's capital city, Ulaanbaatar, is rapidly growing and various issues, such as urban sprawl and a shortage of infrastructure facilities, are arising. JICA has extended its consistent support from city planning to implementation of urban development projects to ensure sustainable urban management.**

### Rapid Growth of the Population

Since the collapse of the socialist system in 1992, Mongolia's capital city, Ulaanbaatar, has seen rapid reforms through the introduction of a market economy, which concurrently caused broad changes in the urban structure. With freedom of movement within the country, which was implemented in 1997, and the inflow of nomads who gave up on pasturing after the severe snow damage in 1999 and 2003, the city's population has rapidly increased from 650,000 in 1998 to over 1,300,000 in 2012. Currently, the annual population increase rate of this city is approximately 3%.

A large part of the population inflow originates in rural areas and, with nomads putting up their *gers* (portable dwellings), urban sprawl is increasing. Partly due to the inability of the Mongolian Mortgage Corporation, which is in charge of providing public housing, to cope with this population increase, housing supply does not meet housing demand and 60% of the city's population is believed to be living in *ger* areas, where fundamental urban infrastructure is nonexistent.

In these areas, new urban problems are also emerging including environmental issues such as air pollution caused by the use of coal for heating and pollution by wastewater.

### Promoting Sustainable Urban Development

JICA conducted the Study on City Master Plan and Urban Development Program of Ulaanbaatar City (2007–2009) and established

a city master plan draft incorporating elements such as a balanced land use plan considering environmental conservation and legal city planning system. The master plan passed through the national parliament in February 2013 after the completion of reviews by the Ministry of Road Traffic, Ministry of Construction and Urban Development, and the Ulaanbaatar City Government.

Moreover, in order to assist in implementation of this master plan, JICA started the Project on Capacity Development in Urban Development

Sector in Mongolia (2000–2013) in cooperation with local authorities in Japan. Through this project, JICA supported the establishment of planning systems, including land reallocation and urban management and the human resources development for implementing development projects. As a result of these efforts, an urban redevelopment law to enable enhancement of living environments is expected to pass in the national parliament in 2014.

JICA is contributing to the promotion of sustainable urban development through consistent urban development projects from establishing urban master plans to necessary legal systems and organizations for implementation of the master plan.



Ulaanbaatar city is sprawling through the inflow of nomads and redevelopment of these areas with fundamental infrastructure is required.

## Case Study Supporting Infrastructure Exports through ODA

**JICA's Assistance for Intelligent Transportation Systems (ITS)**

Intelligent Transportation Systems (ITS) are widely recognized as an efficient and effective way to ease traffic congestion in many large cities by controlling traffic to realize the optimal use of existing road capacity. JICA has been supporting several ITS projects to address urban traffic problems in developing countries considering Japanese ITS firms' advanced technologies.



Installing a traffic control system provided under Grant Aid on a highway in Hanoi, Viet Nam.

**A Smart Solution for Traffic Problems**

ITS uses information and communication technologies (ICT) to mitigate traffic congestion and prevent accidents by providing drivers with traffic information to change their behaviors.

Interest in ITS technology is high, especially in ASEAN and South Asian countries, to operate their toll highway networks that are ever expanding to support their recent economic growth. Western and Korean manufacturers are active in the ITS business in Asian countries, where electronic toll collection systems (ETC) have already been put in place. So are the Japanese ITS companies. Their activities so far include projects for an electronic road pricing system in Singapore and traffic-light systems in Thailand.

In addition to support for urban road and railway projects in partner countries, JICA assists in human resources development and technology transfer by dispatching experts and accepting trainees with the cooperation of the Ministry of Land, Infrastructure, Transport and Tourism (MLIT). JICA also provides assistance for designing desirable future urban transportation systems through preparation of urban transportation master plans. In the field of ITS-related Japanese technologies, JICA has project experience in traffic-light control, traffic management, and information services.

The traffic-light system by the Japanese firm in Thailand mentioned earlier is conducted based on its success in an intersection improvement pilot project in Chiang Mai

conducted under JICA's urban transportation planning study, and is welcomed by Thailand for addressing traffic difficulties.

**Support from Policy Preparation to Project Implementation**

Myopic preference for a low-cost ITS option without a clear long-term strategy may limit the scope for future system expansion and compatibility with other traffic systems. To avoid this, in Viet Nam, JICA first implemented technical cooperation to establish technical standards for ITS to enable the Vietnamese government to introduce and operate ITS guided by an appropriate technical policy. A Grant Aid project to install an international standard traffic control system for a highway in Hanoi followed. Its technical advantages were understood by local people, creating opportunities for this quality traffic system to be adopted to other highways.

**Integrating Expertise of Japanese Industry, Academia, and Government**

In 2011, JICA set up an ITS study group in Japan consisting of members from private companies, universities, and governments to facilitate information exchange as to how effectively Japanese ITS technologies can contribute to developing countries' challenges. This group later transformed into a support committee to provide advice for ITS-related studies conducted by JICA.

In 2013, the ITS World Congress was held in Tokyo, where many ITS specialists met in one place. Taking this opportunity, JICA, in close coordination with ITS industries, academia, and government, launched an ITS technical training course targeted at African and Asian countries to help them design comprehensive transportation systems and introduce ITS tailored to local conditions.

As described above, JICA continues its activities to provide solutions for partner countries' urban transportation problems by consolidating ITS expertise in various sectors and combining Technical Cooperation, ODA Loans, and Grant Aid.



Presentation of a report at an ITS training program. The training participants exchanged views with private companies' participants.



Myanmar: training on gauge measurement, part of the Project on Improvement of Railroad Service and Safety of Railway.

financing gap, other funding sources, including private capital, need to be tapped to ensure value for money and sustained transportation services.

Furthermore, there is also the need to support partner countries to address environmental challenges, like greenhouse gas emissions reduction and air quality improvement, by reducing traffic congestion through introduction of public transportation and also by improving logistics through alternative transportation modes like railways.

### ● JICA Activities

The main aim of JICA's cooperation for the transportation sector is to contribute to improvement in the living environment and increase in incomes by vitalizing socio-economic activities through attainment of swift, smooth, and safe transportation of people and goods.

For developing countries, building roads and bridges alone is not enough for transportation infrastructure development. A plan for an efficient transportation system needs to be prepared, and human resources need to be developed and organizations strengthened for proper infrastructure planning and maintenance. Also, institutional arrangements should be made to enable transportation operators to sustainably manage their infrastructure assets. JICA focuses on the users and beneficiaries of infrastructure services, including women and children, people with disabilities, minority groups, and local residents, and actively promotes community participation and collaboration with NGOs, giving serious consideration to "who will use it and for what purposes."

In addition, cooperation for the transportation sector needs to be considered from a variety of perspectives. International transportation facilitates trade and the flow of people and strengthens regional economies beyond national borders. National transportation ensures people's fair access to transportation services and balanced development. Urban transportation supports sustainable urban development by improving urban mobility. Rural transportation improves living standards of rural

areas, which tend to be left behind urban areas. As such, JICA pursues "inclusive and dynamic development" so that all people can share the benefits of development.

### Introducing Advanced Technologies to Address Transportation Issues in Developing Countries

To respond to transportation challenges in partner countries, JICA has helped enhance knowledge on a range of technologies and build capacities to choose and adopt the best solutions that reflect local conditions and constraints. There are many cases where advanced technologies are applied to traffic problems in developing countries, particularly to those that use Information and Communication Technology (ICT). In this kind of field, combining a private firm's expertise and academic knowledge is a key for successful intervention. JICA plays a coordinating role to help partner countries address transportation challenges, facilitating the participation of various sectors [ → see the Case Studies on pages 61 and 73].

## Information and Communication Technology (ICT)

### ● Overview of the Issue

Information and communication technology (ICT) has been advancing rapidly in developed countries. In the administrative, social, and economic sectors, ICT has been used to computerize central government operations (e-governance), educate via the Internet (e-learning), and facilitate digital trade and commerce (e-commerce). ICT also has the potential to support a variety of improvements that can enhance quality of life, including increasing the efficiency of the economic and social systems of countries, raising productivity, and conserving energy. It is not an exaggeration to say that ICT has become vital to the functioning of modern-day society.

In many developing countries, however, the spread of ICT

has been slow. This has led to a digital divide with developed countries.

Furthermore, developing countries have gaps, within their countries, between areas where communication infrastructure is established and areas where there is little or none. This gap translates directly into a structure of widening economic disparities.

### ● JICA Activities

In its new Medium-Term Policy on ODA announced in February 2005, the Japanese government, based on an understanding that ICT is one means to attain sustainable growth, states that improvement in the ICT field, development of infrastructure, and assistance in human resources development are its major approaches to assist in sustainable growth and poverty reduction. JICA also believes that bridging the digital divide is necessary to bring in effectiveness and efficiency in any type of cooperation, and has been contributing to improve ICT utilization in developing countries.

#### ICT Policies Linked to Social and Economic Development

JICA offers the following five approaches to increasing the use

of ICT in developing countries:

(1) Improving ICT policy-planning capabilities: dispatching advisors to support the formulation of IT policies in such areas as national strategy concerning telecommunication, the development of relevant industry, and user protection including information security measures.

(2) Developing ICT infrastructure: formulating a plan to develop backbone networks and rural communication infrastructure, and reinforcing their maintenance and management capacities.

(3) Improving aid effectiveness and efficiency through ICT use: increasing project effectiveness and efficiency by adopting ICT in government administrative departments and using ICT for cooperation projects in a variety of sectors including education, health care, and commerce.

(4) Training skilled ICT personnel: implementing human resources development projects to enhance the capabilities of technicians and policy planners in order to further diffuse ICT usage. This step accounts for a large proportion of JICA's ICT support.

(5) Broadcasting: extending cooperation to expand the use of Japanese-style digital terrestrial broadcasting, which can withstand interference and allows stable reception.

#### Case Study

#### Bosnia and Herzegovina: Project on Informatics Curricula Modernization

### Promoting Ethnic Collaboration by Standardizing Informatics Education

**The scars of the conflict in the 1990s still remain in Bosnia and Herzegovina. JICA is assisting standardization of high school informatics education as the first step toward integrated education to promote reconciliation.**

#### Spreading a Modernized Curriculum to All High Schools Nationwide

In Bosnia and Herzegovina, Muslim (Bosniaks), Serbs, and Croats, who were involved in the ethnic conflict that ended 19 years ago, still continue to provide education to students using separate curricula and textbooks.

The international community supporting Bosnia and Herzegovina started to promote education integration in 2002, led by the

Organization for Security and Co-operation in Europe (OSCE), from the viewpoint that such separation in education could become a source of future recurrence of conflicts. In the following year, 2003, the Framework Law on Primary and Secondary Education was adopted. Also agreed on was implementation of the Common Core Curriculum, which was designed to start integration from common parts, where educational controversy among the ethnic groups were not seriously anticipated. However, the ethnic

groups were reluctant to integrate; visible results were not achieved.

JICA, which regarded consolidation of peace in the Balkans as a pillar of its assistance, responded to the OSCE's initiative, modernized curricula based on Japanese informatics textbooks, and conducted an integrated course on a trial basis in the Mostar High School, where Muslims and Croats, who had previously learned under separate curricula, studied together from 2006 to 2007.

In the next two years, from 2008 to 2010, the trial courses were expanded to 18 major general high schools nationwide for the Project on Informatics Curricula Modernization in Bosnia and Herzegovina. In Phase 2, from 2010 to 2014, the curricula have been implemented in all 54 general high schools. JICA is also extending its assistance to the educational authorities concerned to officially approve this modernized curriculum.

The project has provided opportunities for school teachers belonging to three different ethnic groups to work together for the first time, and is promoting communication among them. Moreover, common frameworks underlie study even for the school subjects where educational content differs widely among the ethnic groups, such as history and geography. The project has started to play its role as a catalyst, and the total integration of education in the near future is hoped for.



Students studying under the new curriculum using PCs supplied with the project.