

The background of the cover is a photograph of a smiling man wearing a straw hat, talking on a mobile phone. The image is overlaid with a blue-tinted grid pattern.

ADB

# Information and Communication Technology for Development

## ADB Experiences

Asian Development Bank



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This paper takes stock of selective ADB projects across sectors and countries that use ICT to help achieve project outcomes and development objectives. It was prepared by Mary Grace Mirandilla, RSDD consultant, and Hyunjung Lee, ICT Economist, RSDD, with significant contributions and strong support from project officers and consultants, including Anupma Jain, Ayako Inagaki, Christopher Spohr, Claude Bodart, Dong-Soo Pyo, Hayman Win, Ian William Makin, Jazira Asanova, Juzhong Zhang, Kowsar Chowdhury, Lei Lei Song, Noel Magor, P. Altankhuyag, Renato Reside, Jr., Sabyasachi Mitra, Thatha Hla, Thomas M. Minnich, and Toshiyuki Yokota.

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# Abbreviations

ABO	– Asian Bonds Online
ARIC	– Asia Regional Information Center
ASEAN	– Association of Southeast Asian Nations
BIMP-EAGA	– Brunei Darussalam-Indonesia-Malaysia-Philippines East ASEAN Growth Area
BIMP-FC	– BIMP Facilitation Center
DEPP	– Distance Education Partnership Program
EWS	– early warning system
GIS	– geographic information system
GMS	– Greater Mekong Subregion
ICT	– information and communication technology
ITS	– intelligent transport systems
IIREM	– ICT for Innovating Rural Education of Mongolia
IRRI	– International Rice Research Institute
JFICT	– Japan Fund for Information and Communication Technology
LEARN-IT	– Linking Extension and Research Needs through Information Technology
NODES	– National Online Distance Education Services
OREI	– Office of Regional Economic Integration
PDA	– personal digital assistant
PHC	– primary health care
PRC	– People's Republic of China
RCI	– regional cooperation and integration
RICE-IT	– Rice Information Technology
SASEC	– South Asia Subregional Economic Cooperation
WSIS	– World Summit on the Information Society

# Introduction

In this era of global integration, information and communication technology (ICT) becomes indispensable and embedded in everyday activities. The promises of ICT seem limitless. It can provide governments, businesses, and citizens with access to relevant information and allow them to communicate to make informed decisions and enable more efficient processes and services to address various economic, social, financial, and educational needs. As a sector, ICT has contributed to the creation of the most rapidly growing industries, such as electronics, business process outsourcing, and telecommunication and internet services. As an infrastructure, ICT is seen as an enabler of economic growth and competitiveness based on the uptake and utilization of ICT in business and society. However, the asymmetrical level of ICT use and pace of ICT diffusion in countries around the world have caused the uneven distribution of the benefits of ICT. This creates the “digital divide” among and within countries and communities, and calls for attention and assistance from international development agencies.

As early as 1997, the United Nations General Assembly declared access to communication as a “basic human right,” which was later on supported by the Okinawa Charter on the Global Information Society in 2000. To further strengthen government support for ICT development, the heads of states of 175 countries gathered at the World Summit on the Information Society (WSIS) in Geneva, Switzerland, and made a commitment to build a “people-centered, inclusive, and development-oriented Information Society.”<sup>1</sup> The WSIS Declaration of Principles emphasizes the harnessing of ICT to enable people to improve their lives and to promote the Millennium Development Goals.<sup>2</sup>

In 2003, the Asian Development Bank (ADB) published its ICT strategy with three strategic ICT thrusts as guidance for ADB operations: (i) creating an enabling environment through policy improvements and relevant infrastructure provision, (ii) building human resources for general ICT literacy and ICT professional skills through the use of ICT, and (iii) developing ICT applications and information content through ADB-supported projects and activities.<sup>3</sup> Further, in its new long-term strategic framework (2008–2020),<sup>4</sup> ADB points to the “absence of well-planned rural, urban, and interconnected systems of infrastructure, as well as ICT infrastructure, as a factor depriving many economies of private investment.”

In line with strategic direction, ADB has financed infrastructure projects and integrated various ICT applications and information content in ADB-supported projects and activities for improving inclusive and effective public services and efficiency of government administration. ADB has also indirectly contributed to the development of the ICT sector by supporting interventions that create an ICT-literate workforce, build the capacity of government institutions and policy makers who can influence the direction of ICT growth, and conduct further research on ICT. On the other hand, ADB has increasingly used ICT to improve sectors that are crucial to economic development.

These projects tend to include ICT applications ranging from simple web portals and electronic databases to more complex information and management systems and business applications. Examples include distance learning to support education and skills building in remote areas; telemedicine to support health care in rural areas; agriculture information services to provide

<sup>1</sup> World Summit on the Information Society (WSIS). [www.itu.int/wsindex-p1.html](http://www.itu.int/wsindex-p1.html)

<sup>2</sup> See *WSIS Declaration of Principles, Building the Information Society: a global challenge in the new Millennium*, page 2.

<sup>3</sup> ADB. 2003. *Toward e-Development in Asia and the Pacific*. Manila. [www.adb.org/Documents/Policies/ICT/ICT-policy.pdf](http://www.adb.org/Documents/Policies/ICT/ICT-policy.pdf)

<sup>4</sup> ADB. 2008. *Strategy 2020: The Long-Term Strategic Framework of the Asian Development Bank 2008–2020*. Manila. [www.adb.org/Documents/Policies/Strategy2020/Strategy2020-print.pdf](http://www.adb.org/Documents/Policies/Strategy2020/Strategy2020-print.pdf)

crop prices, weather forecasts, and new farming techniques that can be translated into improved income for the rural people; and disaster warning systems that provide timely information in advance to the poor and marginalized groups who are particularly vulnerable to natural and man-made disasters.

Further, ADB has selectively financed the broadband and backbone infrastructure to improve cross-border connectivity and rural access using public–private partnerships. These projects cover a wide range, from establishing regional ICT infrastructure (through fiber-optic backbones and regional exchange hubs) to public ICT access (through broadband wireless networks and rural community e-centers) in the community. ICT infrastructure projects supported by ADB constitute a small portion of total ICT-related projects in ADB, but these projects target improved connectivity for landlocked countries and remote areas within

individual countries and, therefore, have significant development impact.

In addition, to support the capacity development needs from the various ADB ICT-supported projects, ADB is working with various partners, such as the United Nations and the governments of the Republic of Korea and Singapore, as well as private companies, such as Microsoft Corporation.

In assisting its member countries in these projects, ADB has been part of searching for better development solutions and innovative approaches using ICT and experiencing the challenges of realities in implementation. This paper selectively takes stock of such ADB initiatives across sectors, countries, and regions to share their experiences.

For further details on the projects featured here, visit [www.adb.org/ICT](http://www.adb.org/ICT).



# Making ICT Work for Education in Mongolia: Issues, Challenges, and Solutions

Ironically, perhaps, factors, such as vastness and low population density, mean that ICT has a tremendous potential as a tool to support development in rural Mongolia, while creating major challenges. In many areas, there is only one phone per *soum*.<sup>5</sup> Many towns, especially in the immense rural areas, have no electricity for many months. During winter, electricity is available only at night.

Given these constraints, providing computer labs in schools is not practical. Likewise, providing broadband internet service is not an option. Thus, very few teachers in rural Mongolia, other than those teaching informatics, have used a computer.

Despite the lack of supporting infrastructure for ICT, the reason for adopting ICT has, in some cases, been driven more by ill-advised “tech euphoria” than needs and hard realities, especially in rural Mongolia. In the run-up to elections, for example, local politicians sometimes promise to equip schools with computers under the rubric of “education modernization.” These computers often remain underused or even completely idle for various reasons: provision of old machines without any software, lack of supportive training for computer use and maintenance, and absence of electricity in recipient schools.

Computers, therefore, often become a white elephant. In some cases, school management may consider computers so precious that they are locked out of reach of teachers and students. Where computers are being used, they are often limited to simple tasks, such as printing tests or attendance sheets. While perhaps time-saving, these types of usage are, at best, uninspired ways to utilize ICT to spur educational innovation.

Until recently, there has also been a lack of stocktaking and coordination in the development community about the practical value of ICT solutions being supported in Mongolia. A wide range of assistance has been provided to Mongolia’s education sector despite the absence of realistic, needs-driven, and comprehensive strategies and plans for ICT to promote national education goals, such as access, quality, and equity. Mongolia is a country of limited resources to meet sometimes competing priorities. It is undergoing a transition from an 11-year to a 12-year education system, and its most obvious immediate needs are basics, such as rehabilitating school buildings, buying desks and chairs, and installing washbasins and toilets. This situation makes it imperative to analyze the relative benefits and costs (both up-front and recurrent) of any investment on ICT. Too often, piecemeal and fragmented assistance have not adequately considered the long-term costs of providing ICT or the capacity of governments and communities to fund operation and maintenance after external funding support has ceased.<sup>6</sup>

Indeed, Mongolia presents a huge challenge for the introduction of ICT in general, and the modernization of education using ICT in particular. In addition to donor coordination, the Mongolian context highlights the importance of developing a deep understanding of, and appreciation for, the local context and needs of target beneficiaries, and a critical analysis of how ICT can be best introduced in a meaningful and sustained manner, as part of broader approaches centered on national education objectives.

As one of the lead donors to Mongolia’s education sector, ADB has been working to introduce innovative approaches in view of priority needs,

<sup>5</sup> *Soum* is a district, a sub-administrative unit of an *aimag* (province).

<sup>6</sup> Interview with Jazira Asanova, ADB project officer, 26 September 2008, ADB, Manila.



capacities, and knowledge of challenges. For example, preparation of the grant proposal for the *ICT for Innovating Rural Education of Mongolia (IIREM)*<sup>7</sup> project funded by the Japan Fund for Information and Communication Technology (JFICT), started with a critical analysis of needs and on-the-ground realities in poor and remote rural areas, conducted in parallel with the design of a larger loan project, the *Second Education Development* project.<sup>8</sup>

In terms of technology, IIREM did not have ambitious objectives. Recognizing the isolation and lack of connectivity in rural areas, weak capacities, absence of relevant Mongolian-language content, and other issues, it supported a “minimalist” approach in hardware investment. ICT selection was driven by education needs and not by the hype of the latest technology. The project’s hardware component centered on one laptop per school, earmarked for use by teachers and principals to access resources, and supported the adoption of improved, student-centered pedagogy. More fundamentally, however, the pilot attempted to revolutionize the view of ICT as a tool for improving teaching and learning (versus

ICT as a goal by itself). IIREM interventions focused heavily on the provision of “soft components”: capacity building, development of locally relevant content, creating and enabling peer networks across schools, and monitoring and evaluation to feed back into implementation.

Projects that introduce new concepts require innovative approaches and mold breaking. Critical to IIREM’s success was the identification and nurturing of “ICT for education champions.”<sup>9</sup> These champions included officials from the Ministry of Education, Culture and Science who provided policy support to the project. Equally important are the local education officials, teachers, and head teachers in “mentor schools” in both Ulaanbaatar and *aimag* (provincial) centers who provided support to schools in remote rural areas. This critical mass was key in changing the perception that “ICT means hardware and computer labs.” Networks that linked people, not machines, were instead built.

This strategy also allowed IIREM to tap existing resources.<sup>10</sup> IIREM engaged a range of stakeholders to develop offline materials



Photo by L. Ariunaa, 9 June 2007.

A post-completion visit of IIREM’s ADB project officer, Christopher Spohr (rightmost, visible in photo), in a school in Bayankhongor Aimag at the fringe of the Gobi Desert

<sup>7</sup> ADB. 2004. *ICT for Innovating Rural Education of Mongolia (JFICT 9044-MON)*. Manila.

<sup>8</sup> ADB. 2002. *Second Education Development Project (Loan 1908-MON)*. Manila.

<sup>9</sup> Phone interview with Christopher Spohr, ADB project officer, 15 September 2008.

<sup>10</sup> Read more about the evaluation of IIREM in Strigel et al. 2007. *Where Desert Meets Technology: Findings from ICT in Education Initiatives in Rural Schools in Mongolia (ADB TA 6278-REG)*. Manila: ADB. [www.adb.org/Documents/Reports/Consultant/39035-REG/appendix8.pdf](http://www.adb.org/Documents/Reports/Consultant/39035-REG/appendix8.pdf)

Photo by L. Ariunaa, 14 January 2006.



IIREM's subpilots on ICT use in dormitories. Mostly poor boarding students at Jargaltkhaan Soum School in Khentii Aimag use a laptop computer to spread their horizon

(CD-ROMs) to help rural teachers and principals learn innovative methods. More importantly, it linked staff from remote schools with those in mentor schools via e-mail networks<sup>11</sup> and periodic training, which centered on sharing of grassroots innovations and local good practice.

This analysis helped provide information for the preparation of the *Third Education Development project*<sup>12</sup> and the technical assistance on Education Sector Reform.<sup>13</sup>

Following is a summary of information related to the ADB grant-funded IIREM project.

**Table 1. IIREM Project Information Summary**

Type	Grant
No.	9044
Country	Mongolia
Department	East Asia Department (EARD)
Division	Urban and Social Sectors Division
Approval	2004
Completion	Closed (TA completion report not available as of printing)
Program Officer(s)	Christopher Spohr
Sector	Education
Subsector	Education Sector Development
Project Name	ICT for Innovating Rural Education in Mongolia (IIREM)
Objective	To break down isolation from information and support for educators in disadvantaged rural areas, and enhance education quality and relevance by empowering teacher innovation toward a pupil-centered, active learning environment

Source: ADB.

<sup>11</sup> Given connectivity issues, text-only (low-bandwidth) e-mails could be typed-in offline, and one teacher could carry the laptop to hook up to the phone line in the *soum*-level telecom office.

<sup>12</sup> ADB. 2006. *Third Education Development Project (Loan 2238-MON)*. Manila.

<sup>13</sup> ADB. 2007. *Education Sector Reform (Grant 4950-MON)*. Manila.

# Pioneer Private Sector Partnership Expands Education in Sri Lanka

**L**ike many developing countries, Sri Lanka struggles to improve access to postsecondary education, which suffers from inefficiencies. In response to the challenge, the Government of Sri Lanka crafted a human resource strategy, which includes the Draft National Employment Policy for Sri Lanka and e-Sri Lanka: an ICT Development Roadmap. However, public resource constraints limit the expansion and modernization of tertiary education, and the government's capacity to accommodate the number of students who want to pursue higher education.

Recognizing this great challenge, ADB funded the *Distance Education Modernization Project*,<sup>14</sup> a \$45 million project that aims to introduce distance education in the country by using the appropriate technologies and tapping public-private capacities. The main components of the project include the following:

- (i) establishment of the Distance Education Partnership Program (DEPP) to raise quality and enhance capacity,
- (ii) partnership of public and private postsecondary institutes to increase access to education services, and
- (iii) capacity expansion of the Open University of Sri Lanka.

In a pioneering project, the private sector was tapped to manage a distance education network—to provide curriculum content, training, mentoring, peer group support and interaction, and maintenance of hardware and software through multimedia centers

nationwide—within a framework of well-defined policies and guidelines.<sup>15</sup> Since education in Sri Lanka has always been provided by the public sector for free, no formal policy framework legitimizes the practice of the private sector in offering education services. However, things are slowly beginning to change. There is good progress in policy reform supporting private sector participation, a development where ADB played a major role.

The DEPP—now called the National Online Distance Education Services (NODES)—established an ICT infrastructure and introduced technology for NODES centers in urban and rural areas. The project took longer to accomplish its outputs mainly because more time was needed for diverse stakeholders (i.e., government officials, institutions, and students) to understand the concept and build the required system. “The most difficult part was changing the mindset of people,” says Ayako Inagaki, the ADB project officer who processed and initially implemented the loan.<sup>16</sup> Institutions and universities have a conventional way of thinking and doing things so it was difficult to start something new. More than the physical infrastructure, the most crucial task for Inagaki is how to build capacity and change the management system of educational institutions, such as those of the Open University.

With the systems in place, the real challenge is to ensure that partners have the institutional capacity to switch from paper-based to online education, such as developing online courses for the NODES centers. Although it is still difficult to tell whether ICT has achieved its objectives,

<sup>14</sup> ADB. 2003. *Distance Education Modernization Project (Loan 1999-SRI)*. Manila.

<sup>15</sup> Loxley, W. and P. Julien. 2005. *ICT in Education and Training in Asia and the Pacific*. ADB. Manila. Retrieved 2 July 2008 from [www.adb.org/Documents/Reports/ICT-Education-Training/ict-education-training.pdf](http://www.adb.org/Documents/Reports/ICT-Education-Training/ict-education-training.pdf)

<sup>16</sup> Interview with Ayako Inagaki, ADB project officer, 8 September 2008, ADB, Manila.

the project has already gained initial success in terms of putting a distance education system in place; introducing a policy framework that supports private sector partnership; and raising public awareness about distance education through consultations, mass media marketing, national seminars, and exposing people to the NODES facilities.

The DEPP has contributed to further expanding ADB's experience in e-education for the last several years. "It is high time to talk about the actual impact and main conditions for success in the use of ICT for education," Inagaki offers. In the

case of DEPP, a facilitating policy environment (national policy on ICT, legal framework, and regulations), and the right combination of needs-based content and appropriate technology made all the difference. "In using ICT for education, make sure that the project is not technology-driven. The needs and type of education must be appropriate to the beneficiaries, and the use of technology should adjust to the needs of the learners, not the other way around," Inagaki adds.

Following is a summary of information related to the ADB loan-funded Distance Education Modernization Project.

**Table 2. Distance Education Modernization Project Information Summary**

<b>Type</b>	Loan
<b>No.</b>	1999
<b>Country</b>	Sri Lanka
<b>Department</b>	South Asia Department (SARD)
<b>Division</b>	Agriculture, Natural Resources and Social Services Division
<b>Approval</b>	2003
<b>Completion</b>	31 Mar 2010 (revised)
<b>Program Officer(s)</b>	Kowsar P. Chowdhury
<b>Sector</b>	Education
<b>Subsector</b>	Tertiary Education
<b>Project Name</b>	Distance Education Modernization Project (DEMP)
<b>Objective</b>	To modernize the postsecondary education system, especially through the introduction of distance education and the promotion of public-private partnerships to reduce pressure on public sector enrollment

Source: ADB.

# Samoa SchoolNet: Connecting Remote Pacific Islands and Providing Community Access

**T**he Independent State of Samoa has achieved significant progress in education, with a 99% adult literacy rate—the highest in the Pacific islands—and access to secondary education for 90% of those completing eighth grade. Despite these accomplishments, many areas for improvement remain. The net enrollment rate at the primary level was 69% in 2006, of which more than 25% do not complete the 8-year program. Poor families who struggle to pay high tuition fees at the secondary level are adversely affected by this low performance. There are problems of equity, relevance, and quality of learning achievements and effectiveness of resource utilization. Subject teachers are lacking, and the scattered islands pose a problem for regular training of rural teachers.

Responding to these challenges, ADB funded the *Supporting the Samoa SchoolNet and Community Access Pilot Project* in 2003,<sup>17</sup> followed by the implementation of the SchoolNet and Community Access Project in 2007,<sup>18</sup> both of which aim to improve the quality and efficiency of education through increased access to ICT. The projects also address issues that revolve around training teachers in the rural areas on how to use the computer as a teaching tool in classrooms. With the use of ICT, SchoolNet can more easily reach out to both urban and rural children and reduce the access gap to quality education.

A case study<sup>19</sup> on Samoa's ICT use for education reported how the SchoolNet strategy worked. ADB supported five schools in Samoa that have a community learning center, each of which was provided with a network of 10 internet-ready computers (thin client configuration),<sup>20</sup> two PC servers, a video camera, a data projector, two printers, a fax/scanner, a photocopier, and uninterruptible power supply devices for the servers. Three of the five schools were connected via dial-up internet and two—those located in the capital city of Apia—via wireless area network. SchoolNet provided training to ICT administrators (teachers who volunteered and were appointed by their principals as the key teacher counterpart for the project) and a number of teachers on (i) basic skills in computer and digital media, (ii) computer use as a teaching and learning tool, and (iii) development of resources and lesson materials for selected subjects. ICT administrators, principals, and selected school committee members were also offered training on business planning and management of school-based community learning centers. In addition, SchoolNet set up the SchoolNet portal, developed a number of e-resources,<sup>21</sup> and collected links to online teaching and learning resources accessible through the SchoolNet portal.<sup>22</sup>

“One cannot underestimate the importance of ICT in education and other aspects of life,” says Kowsar

<sup>17</sup> ADB. 2003. *Supporting the Samoa SchoolNet and Community Access Pilot Project (TA 4305-SAM)*. Manila.

<sup>18</sup> ADB. 2007. *SchoolNet and Community Access Project (Grant 0097-SAM)*. Manila.

<sup>19</sup> For a complete list of the case studies, see Consultants' Report of TA 6278-REG *Innovative Information and Communications Technology in Education, and Its Potential for Reducing Poverty in the Asia and Pacific Region*. [www.adb.org/Documents/Reports/Consultant/39035-REG/default.asp](http://www.adb.org/Documents/Reports/Consultant/39035-REG/default.asp)

<sup>20</sup> A thin client setup features central servers on which all applications and data are hosted, while the individual (student) terminals, featuring a monitor, keyboard, and mouse, are directly connected to these servers for any significant data processing. This creates a local area network among the computers involved.

<sup>21</sup> Nine learning objects and 15 adaptations of electronic learning materials have been developed. In addition, SchoolNet organized an inventory of useful sites for teaching materials (URL collection).

<sup>22</sup> Strigel et al. 2007. *Provoking Change: Technology in Education Case Studies from Samoa (Summary of Findings)*. [www.adb.org/Documents/Reports/Consultant/39035-REG/appendix14.pdf](http://www.adb.org/Documents/Reports/Consultant/39035-REG/appendix14.pdf)

Chowdhury, the ADB project officer who processed and initially implemented the grant. “ICT is a most effective way of reaching disadvantaged groups equally. It can also give better leverage to teachers who cannot travel a long way for trainings, or have access to teaching materials; and for students who cannot have access to regular textbooks and learning materials.”<sup>23</sup> To connect the islands, however, the ICT requirement needs to be assessed and developed. ICT need not be confined to the internet as a whole range of technologies—such as CD-ROM, DVD, television, and radio—can be used.

SchoolNet’s key implementing strategies include (i) developing a flexible design in order to adapt to changing technological and local conditions; (ii) consolidating the project with ongoing programs to avoid a fragmentary approach; and (iii) adopting a participatory approach, which employs close coordination with bilateral and multilateral agencies, nongovernment organizations (NGOs), civil society members, public and private school teachers, and even church groups. This approach stresses the need

to accompany ICT with a strong training and capacity-building component so that teachers will not hesitate to use the technology, and students can easily use learning materials.

Initial surveys among the target beneficiaries of SchoolNet indicated that teachers and students were very excited about implementing the project. However, Chowdhury stresses the importance of validating what is working, what is not, and how to improve the project constantly. One of the most critical issues, according to Hayman Win, succeeding ADB project officer who implemented the project, was sustainability of the ICT system to be achieved through a community access approach and regular awareness-raising among community members about the long-term benefits of investing in ICT and computer training for teachers and students.<sup>24</sup>

Following is a summary of information related to the ADB technical assistance and grant-funded SchoolNet and Community Access Project.

**Table 3. Samoa SchoolNet and Community Access Project Information Summary**

<b>Type</b>	Technical Assistance (TA)	Grant
<b>No.</b>	4305	0097
<b>Country</b>	Samoa	Samoa
<b>Department</b>	Pacific Department (PARD)	PARD
<b>Division</b>	Pacific Operations Division	Pacific Operations Division
<b>Approval</b>	2003	2007
<b>Completion</b>	31 July 2007 (actual)	—
<b>Program Officer(s)</b>	Hayman Win (previously Kowsar Chowdhury)	Kiyoshi Nakamitsu (previously Kowsar Chowdhury)
<b>Sector</b>	Education	Education
<b>Subsector</b>	Education Sector Development	Senior Secondary General Education
<b>Project Name</b>	Supporting the Samoa SchoolNet and Community Access Pilot Project	SchoolNet and Community Access Project
<b>Objective</b>	To improve quality and efficiency of education, enable access to global information through improved access to ICT, and assist the government in increasing social inclusion and reducing poverty in the rural areas	To increase capacity of the existing road infrastructure, efficiency of road transport, and quality of transport service

Source: ADB.

<sup>23</sup> Interview with Kowsar Chowdhury, ADB project officer, 16 September 2008, ADB, Manila.

<sup>24</sup> Interview with Hayman Win, ADB project officer, 12 September 2008, ADB, Manila.



# Health Education: Reaching Remote Ethnic Minorities in the Greater Mekong Subregion Using Information and Communication Technology

**T**he Greater Mekong Subregion (GMS) is home to 240 million people, about 21 million of whom belong to ethnic groups living in remote mountainous areas with relatively poor social and physical infrastructure. Ethnic minorities, especially women, in the GMS cross-border areas are at risk of getting HIV and/or AIDS because of lack of access to education and health care, poverty, lack of culturally and linguistically appropriate information, cultural and social breakdown within some communities, nontraditional drug use, human trafficking, and involvement in commercial sex. Preventive education for HIV and AIDS through ICT has been limited due to inadequate infrastructure, hardware and software, trained personnel, and financial resources.

In 2002, ADB funded a regional technical assistance project on *ICT and HIV/AIDS Preventive Education in the Cross-Border Areas of the GMS*<sup>25</sup> to help reduce the incidence of HIV infection among vulnerable age groups and poor and marginalized populations, and to expand the use of ICT and other multimedia technologies for preventive education in secondary schools and certain population groups (e.g., schoolchildren, out-of-school youth, mobile groups, ethnic minorities, and their communities) in cross-border areas.

The main strategies of the project included (i) training teachers to use ICT-based learning materials and preventive education efforts in schools; (ii) decentralizing development of materials down to the provincial or district level;

(iii) developing and disseminating educational radio programs and audio tapes; (iv) systematically collecting, storing, and repackaging innovative education materials in an expanded clearinghouse of information and materials support; (v) establishing a geographic information system (GIS); and (vi) targeting interventions at special and interstitial populations, in collaboration with community-based organizations and NGOs. ADB partnered with the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the Southeast Asian Ministers of Education Organization. The project achieved its outputs satisfactorily. Representatives of all participating governments, in various forums, expressed satisfaction with the key outputs and their interest in expanding activities.

In 2005, ADB approved a regional technical assistance project on *HIV/AIDS Vulnerability and Risk Reduction among Ethnic Minority Groups through Communication Strategies*,<sup>26</sup> a follow-on project that built on the lessons and achievements of the ICT and HIV/AIDS Preventive Education project and expanded its scope to new languages, countries, and ethnic groups. "The challenge was to think of different ways to communicate (HIV/AIDS) information, especially in groups that live in remote areas and those along the cross borders," explains Anupma Jain, ADB implementing project officer for the HIV/AIDS Risk Reduction project.<sup>27</sup> Adopting a community-based research approach, the project collected information and learned about the experiences of each community and how issues were translated in their own minds. Life stories of community members in ethnic languages

<sup>25</sup> ADB. 2002. *ICT and HIV/AIDS Preventive Education in the Cross-Border Areas of the Greater Mekong Subregion* (RETA 6083). Manila.

<sup>26</sup> ADB. 2005. *HIV/AIDS Vulnerability and Risk Reduction among Ethnic Minority Groups through Communication Strategies* (RETA 6247). Manila.

<sup>27</sup> Interview with Anupma Jain, ADB project officer, 3 October 2008, ADB, Manila.



were pieced together and developed into radio dramas that contained lessons on HIV/AIDS within the context of structural and socioeconomic vulnerabilities. The role of local authorities, such as the village chief, and holding community meetings proved crucial to making people understand what the project intended to do and gain the trust of the research team. An external evaluation of the project found that this community-based approach was effective for dealing with a sensitive issue.

This rich ethnographic approach employed on this project has resulted in strong community engagement. Qualitative research techniques have fostered an iterative development process through continual feedback and pre-testing among the target ethnic groups. A healthy rapport appears to have been developed between project staff, key local activists and community members.<sup>28</sup>

“The key was finding an effective way of communicating the information you want to be developed on the vulnerabilities and risks of HIV prevention to a targeted group, given the local situation and circumstances,” says Jain. “Independent evaluation of project activities has given us solid information on the effectiveness of these strategies in furthering behavior change in HIV prevention and other sectors.”<sup>29</sup>

The project combined traditional ICT—the radio—which allowed information to be communicated to more people (specifically to ethnic groups whose level of education may not be as high and who do not have access to other ICTs) and modern ICT—GIS maps—which allowed the integration of geographic attribute information (roads, rivers, administrative boundaries, etc.) with census data (population, ethnicity, religion, language, migration patterns) and spatial data. The final evaluation of the project found, however, that the long-term objectives of GIS maps should be clearly defined from the start as it involves tedious data collection and requires significant resources.

Both projects on ICT and HIV/AIDS Preventive Education and the HIV/AIDS Risk Reduction can be rich sources of information for community-based projects that deal with vulnerable groups and sensitive health information. “Keep it simple,” Jain offers. The project needs to be clear about the target group, the kind of information provided, and the resources available to them. ICT is an approach to reach remote communities, but developing information that is culturally and linguistically appropriate takes time.

In 2006, ADB approved a regional technical assistance project on *Fighting HIV/AIDS in Asia and the Pacific*,<sup>30</sup> an umbrella assistance comprising 12 subprojects that assist member countries to achieve the HIV-related Millennium Development Goal (MDG 6/Target 7)—to have halted and begun to reverse the spread of HIV and AIDS by 2015. The umbrella assistance aims to develop and implement a more effective and evidence-based response to the AIDS epidemic at the country and regional levels.

Under subproject 4 of the Fighting HIV/AIDS project, ADB continues its partnership with UNESCO and participating GMS countries. The subproject adopts a method that combines traditional and modern ICTs. Its activities include (i) cross-border application of ethnic radio dramas, (ii) cross-border development of ethnic radio dramas, (iii) development of new radio dramas, (iv) maintenance of GIS activities, and (v) development of training materials for developing radio drama programs for HIV/AIDS prevention. Maintenance of the GIS activities involves updating information for Cambodia, the Lao People's Democratic Republic (Lao PDR), and Thailand. The goal is to connect GIS graphical feature databases with statistical information related to HIV/AIDS incidence, interventions, and coverage; and distribution of the population at risk.

Under subproject 3 of the Fighting HIV/AIDS project, the GIS system for the Lao PDR, which was developed under the HIV/AIDS Risk Reduction project, is expanded to include data and

<sup>28</sup> Marshall, P. and R. Butler, *The Kreung Cry Differently from the Tampuon: Final Project Evaluation Report*. ADB. 2005. *HIV/AIDS Vulnerability and Risk Reduction among Ethnic Minority Groups through Communication Strategies (RETA 6247)*. Manila.

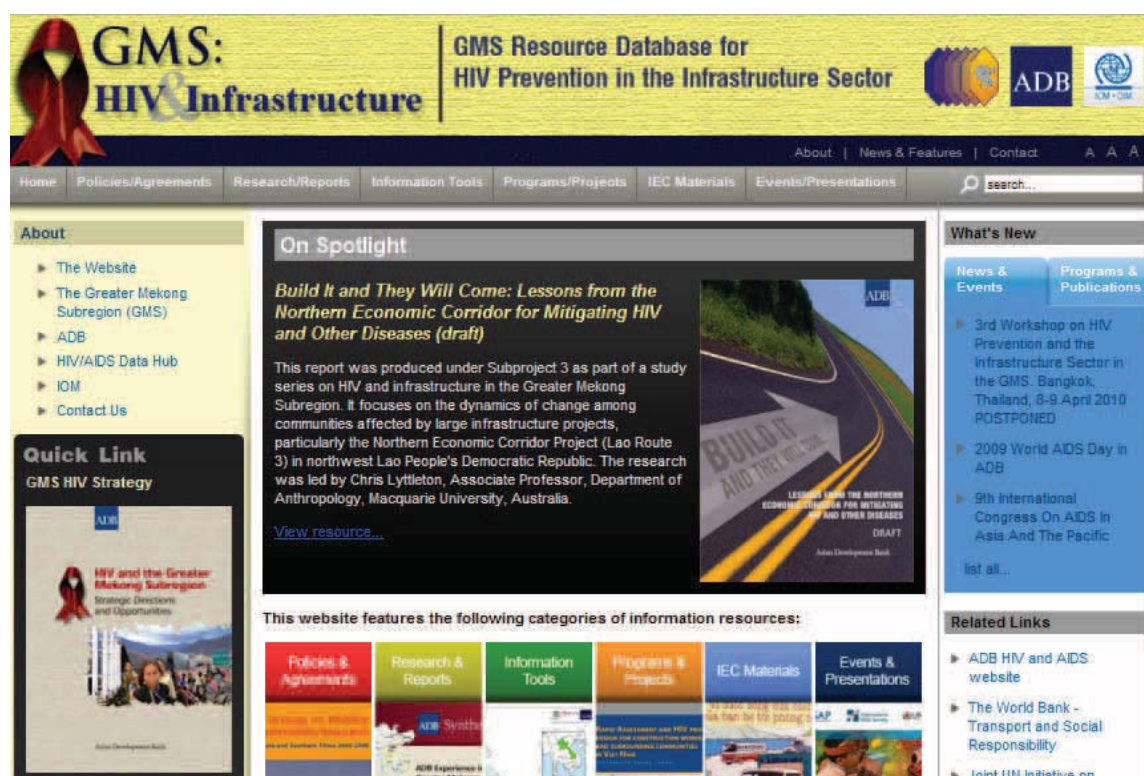
<sup>29</sup> Interview with Anupma Jain, ADB project officer, 3 October 2008, ADB, Manila.

<sup>30</sup> ADB. 2006. *Fighting HIV/AIDS in Asia and the Pacific (RETA 6321)*. Manila.

information related to transport in cooperation with UNESCO, the International Organization for Migration (IOM), and the Ministry of Public Works and Transport. Under this subproject, ADB and the IOM launched the GMS HIV and infrastructure website (<http://hiv-infrastructure.info/index.php>) to highlight the 2009 commemoration of World AIDS Day. The website offers a resource database for HIV prevention initiatives in infrastructure, including policies and agreements; research and reports; guidelines and tools; programs

and projects; information, education, and communication (IEC) materials; and workshops and presentations. The resources in the website, while focused on the GMS, may be adapted to other subregions.

Following is a summary of information related to the ADB technical assistance for HIV/AIDS risk reduction and preventive education in the GMS, as well as fighting HIV/AIDS in Asia and the Pacific.



GMS HIV and Infrastructure

Source: <http://hiv-infrastructure.info/index.php> (screen captured on 7 April 2010).

**Table 4. HIV/AIDS Risk Reduction and Preventive Education Project Information Summary**

<b>Type</b>	Technical Assistance (TA)	Technical Assistance	Technical Assistance
<b>No.</b>	6321	6247	6083
<b>Country</b>	Regional/Greater Mekong Subregion	Regional/Greater Mekong Subregion	Regional/Greater Mekong Subregion
<b>Department</b>	Southeast Asia Department (SERD)	SERD	SERD
<b>Division</b>	Social Sectors Division	Social Sectors Division	Social Sectors Division
<b>Approval</b>	2006	2005	2002
<b>Completion</b>	–	31 May 2008 (actual)	31 December 2004 (actual)
<b>Program Officer(s)</b>	Anupma Jain	Anupma Jain	Anupma Jain
<b>Sector</b>	Multisector	Multisector	Health, Nutrition, and Social Protection
<b>Subsector</b>	Multisector	Multisector	Health Programs
<b>Project Name</b>	Fighting HIV/AIDS in Asia and the Pacific	HIV/AIDS Vulnerability and Risk Reduction Among Ethnic Minority Groups Through Communication Strategies	ICT and HIV/AIDS Preventive Education in the Cross-Border Areas of the Greater Mekong Subregion
<b>Objective</b>	To develop and implement a more effective and evidence-based response to the AIDS epidemic at the country and regional levels	To reduce the vulnerability to, and risk of, HIV and AIDS among ethnic minorities living in the cross-border areas of the GMS, specifically in Cambodia, the Lao PDR, Thailand, and Yunnan Province (PRC)	To (i) develop ICT learning materials for HIV/AIDS preventive education in local languages; (ii) build the capacities of teachers, health workers, multimedia providers, and other stakeholders for HIV/AIDS preventive education; (iii) expand the use of ICT interventions in HIV/AIDS preventive education; and (iv) deliver ICT-based interventions to isolated, marginalized, and vulnerable populations

Source: ADB.

# Innovative Information and Communication Technologies: Expanding Rural Health Service Access in Mongolia

Rural health care services in Mongolia remain underdeveloped and lag behind in access and quality of provided services and institutional and structural capacity. The scattered locations of *bags*<sup>31</sup> and distance to primary health care (PHC) facilities reduce access of rural people to professional medical consultation, and limit access of PHC workers to up-to-date professional information. There is a limited medical practice due to a small population and limited opportunities for properly supervised on-the-job training and continuing education. Poor transportation and communication conditions are also major obstacles to improving the quality of rural PHC facilities. As a result, maternal and infant mortality rates in the rural areas are twice as high compared to those in urban areas.<sup>32</sup>

In 2004, ADB approved a grant to fund *ICT for Improving Rural Health Services*,<sup>33</sup> supported by the Japan Fund for Information and Communication Technology (JFICT), to improve access to, and quality of, health services for vulnerable rural groups in Mongolia, especially poor mothers and children. The project aims to demonstrate the feasibility of introducing a basic ICT network to reduce infant and maternal mortality at the PHC level.

The Rural Health Services project has four main components: (i) development, testing, and installation of a new ICT-supported consultative, referral, and epidemiological surveillance system that will interconnect aimag (province) hospitals and health departments with remote and isolated

soum and bag PHC facilities; (ii) institutional support and training for health specialists, general practitioners, and nurses through ICT-supported distance education, as well as development of an ICT strategy and action plan, an ICT-based registration, consultation, and referral format, and an ICT handbook and materials; (iii) monitoring, evaluation, and auditing; and (iv) linkage and complementary actions between the grant and the ADB-financed Second Health Sector Development Project, and effective communication with other international agencies and stakeholders during grant implementation.

According to a series of field missions, the project was successful in achieving its main outputs. Health information software developed under the grant is used nationwide (in 21 *aimags*, 8 cities, 206 family group practices, and 94 *soums*). Personal digital assistants (PDAs) were distributed to 45 *bag* feldshers<sup>34</sup> from the five pilot *aimags*. A PDA user's guide was developed for midwives and bag feldshers. The project has set up information networks in five project *aimags*, as included in the government information technology action plan. In *aimag* centers, health departments and general hospitals are interconnected through a local area network. Fiber-optic connections were established, servers were set up, and all computers were interconnected, which facilitate data exchange and handling of basic medical statistics. Eleven soums with digital telecommunication lines were connected directly to the aimag health departments by telephone line, facilitating file transfer. As a result, more than 2,000 health care workers are able to use internet services.

<sup>31</sup> *Aimag* hospital—first-referral hospital for the population of the province; *bag*—smallest rural administrative unit; *soum*—district; *soum* health center—health center that provides primary-level care services to the district population, including migrants; feldsher—medical or health care professional that provides service in rural areas.

<sup>32</sup> Reducing child mortality is Goal 4 and improving maternal health is Goal 5 in the Millennium Development Goals.

<sup>33</sup> ADB. 2004. *ICT for Improving Rural Health Services (Grant 9053-MON)*. Manila.

<sup>34</sup> A *bag* feldsher is a community nurse.

“The project’s design emphasizes on soft interventions undertaken in collaboration with the Second Health Sector Development Project—training, content development, network building, monitoring, and efficacy assessment—factors that are all vital to extension and sustainability,” says P. Altankhuyag, ADB consultant for the Rural Health Services project.<sup>35</sup> Different kinds of ICTs were used to provide information and communications. A bulletin board system enabled doctors and nurses to connect, access materials, and share their opinion online throughout Mongolia. The health information software was developed to enable information exchange between health and insurance organizations, thereby preventing duplicated data entry and saving lots of paper work. There is room for improvement of the software, as it does not understand Mongolian language commands.

To ensure sustainability, the project aims to strengthen local capacity and ownership through (i) involvement of local institutions in developing ICT for health care, (ii) partnership with NGOs and *soum* and *bag* representatives to develop content and implement training and institutional support, (iii) involvement of the private sector (firms and individual specialists) in developing ICT applications for PHC services, and (iv) promotion and demonstration of successful primary health care innovations.

“Introducing ICT into rural areas as a development initiative,” says Altankhuyag, “is inherently challenging” as there is naturally initial resistance to change, especially for a “technically novice” workforce. But this can be overcome through “sensitive and sustained training inputs,” he adds. Due to trainings and preparatory activities, the project has been well received by its target beneficiaries: Mongolia’s Minister of Health, heads of *aimag* health departments, health workers, and participants of computer skills training. Allocating a huge portion of the budget to training will help ensure the long-term operational sustainability of the project; for example, many workers who have achieved “technical independence” still have not learned to use ICT to solve internal work-related problems.

An inevitable sustainability problem in rural Mongolia is the sparse ICT infrastructure. Future work should, therefore, consider focusing on more cost-effective wireless communications technology as a means for “last-mile” connectivity. More work is also needed to institutionalize a comprehensive set of ICT guidelines, standards, and regulations, including an information security plan and manual, and continuous training support for permanent network administrators and information technology staff.

Following is a summary of information related to the ADB grant-funded Rural Health Services project.

**Table 5. Mongolia Rural Health Services Project Information Summary**

Type	Grant
No.	9053
Country	Mongolia
Department	East Asia Department (EARD)
Division	Urban and Social Sectors Division
Approval	2004
Program Officer(s)	Claude Bodart
Sector	Health, Nutrition, and Social Protection
Subsector	Health Systems
Project Name	ICT for Improving Rural Health Services
Objective	To improve access to and quality of health services for the vulnerable groups of the rural communities, especially poor mothers and children

Source: ADB.

<sup>35</sup> E-mail interview with P. Altankhuyag, ADB project consultant, 10 October 2008.



# Linking Research and Farmers: Transfer of Rice Information through Information and Communication Technology

**K**nowledge is a major need for farmers.<sup>36</sup> It can empower them to make informed decisions—from selecting seed variety to selling their produce in the market. Knowledge, however, can only be useful if it is credible and reliable, packaged in a format that target users can understand, and delivered to a wide audience in a timely manner. On-the-ground realities in developing countries show that a gap exists between credible research-based information and the extension system, which serves as an information intermediary to farmers. The challenges lie in the extension service's ability to provide timely feedback to research organizations and in the research system's ability to transfer new knowledge to the extension system.<sup>37</sup>

To address this challenge, ADB approved JFICT funds for *Improving Poor Farmers' Livelihoods through Rice Information Technology*<sup>38</sup> to facilitate the transfer of rice information to intermediaries with the support of appropriate ICT. The idea started with the International Rice Research Institute (IRRI), the executing agency, who saw the potential of rice knowledge banks as a good medium for making their research more accessible. Information was localized for the use of the extension workers, and two networks were established—Linking Extension and Research Needs through Information Technology (LEARN-IT) and Rice Information Technology (RICE-IT). The main project components include (i) providing localized content from the Rice Knowledge Bank for agricultural service institutions, which will house information needed by farmers; (ii) institutionalizing the use of ICT,

which will provide farmers culturally appropriate training packages designed by participating agricultural service institutions using the Rice Knowledge Bank; and (iii) strengthening the network of agricultural extension practitioners.

The key strategies of the project include building the capacity of local institutions and maximizing their existing resources in generating credible information, which will be transformed into an appropriate format and delivered in a manner that is most practical for the end users. ICT can facilitate this process by storing agricultural information, printing brochures for farmers, or helping extension workers transfer data or communicate via e-mail. The most critical steps, however, involve following traditional pathways—analyzing the existing information flows, the stakeholders involved, and the role that each plays. The country's local authorities, for example, are critical actors, as they convert agricultural information into forms that they think are most appropriate to the local context. ICT can be used to address the inefficiencies, gaps, and disconnected knowledge—such as lost or limited copies of publications—in the traditional pathways. The internet can allow access to agricultural information anytime, anywhere, and to anyone, who can then pass it on to those who do not have direct access to the internet.

A critical question and challenge in e-agriculture is how extension workers in the field access ICT and use it in a significant way. Generally, extension workers do not have access to the internet. Instead, they get information in CD format, making it difficult to continually get up-to-date

<sup>36</sup> "Credit, price, and access to knowledge" are the three major limitations of farmers. See Bell, et al. 2004. The Rice Knowledge Bank: What Is It and Can e-Communities Benefit? Paper presented at the Regional Workshop on Building e-Community Centers for Rural Development, Bali, Indonesia, 8–14 December 2004. [www.adbi.org/files/2004.12.08.cpp.rice.knowledge.paper.pdf](http://www.adbi.org/files/2004.12.08.cpp.rice.knowledge.paper.pdf)

<sup>37</sup> Dela Cruz, R. 2007. LEARN-IT: Making rice info technology available in real time. *BAR Chronicle*, 20 (8), 1–31, August. [www.bar.gov.ph/barchronicle/2007/aug\\_1-31\\_features2.asp](http://www.bar.gov.ph/barchronicle/2007/aug_1-31_features2.asp)

<sup>38</sup> ADB. 2004. *Improving Poor Farmers' Livelihoods through Rice Information Technology (JFICT 9047)*. Manila.

information. The Rice Knowledge Bank is intended to provide updated content and respond to the needs of extension workers in a timely manner. This added value can translate into huge savings. “A study from Thailand revealed that there is a \$2,800 savings per extension worker each year—that’s the amount from the cost of each extension worker trying to get access to information,” shares Noel Magor, head of IRRI’s Training Center and LEARN-IT project director.<sup>39</sup>

Following a multistep information flow, ICT can be used in rice knowledge banks to facilitate easy access to the Knowledge Bank website ([www.knowledgebank.irri.org/rice.htm](http://www.knowledgebank.irri.org/rice.htm))—the world’s leading ICT repository of rice-based training and technology information. Information is transferred to the extension workers,

transformed into a meaningful format, and then relayed to farmers.

RICE-IT encounters many challenges, including lack of ICT infrastructure in rural areas and links within institutions (e.g., scientific and research institutions) where credible information can be sourced.<sup>40</sup> Like most pilot projects, sustainability is also a primary issue and can be a potential problem once external support to maintain the websites is pulled out. With more interest and recognition of the added value of the project, support from governments and funding institutions can help ensure sustainability.

Following is a summary of information related to the ADB technical assistance for the Rice IT project.



Rice Knowledge Bank homepage, [www.knowledgebank.irri.org/rice.htm](http://www.knowledgebank.irri.org/rice.htm) (screen captured on 7 April 2010).

**Table 6. Rice IT Project Information Summary**

<b>Type</b>	Technical Assistance
<b>No.</b>	9047
<b>Country</b>	Regional/Greater Mekong Subregion
<b>Department</b>	Southeast Asia Department (SERD)
<b>Division</b>	Agriculture, Environment, and Natural Resources Division
<b>Approval</b>	2004
<b>Program Officer(s)</b>	Ian William Makin
<b>Sector</b>	Agriculture and Natural Resources
<b>Subsector</b>	Agriculture Production, Agri-processing, and Agribusiness
<b>Project Name</b>	Improving Poor Farmers’ Livelihoods through Rice Information Technology
<b>Objective</b>	To improve food security and livelihood of poor farmers in the GMS through increased application of existing agricultural information, using information and communication technology (ICT) to manage and share information at the national and regional levels

Source: ADB.

<sup>39</sup> Interview with Noel Magor, International Rice Research Institute, 25 September 2008, ADB, Manila.

<sup>40</sup> Interview with Ian William Makin, ADB project officer, 9 September 2008, ADB, Manila.



# South Asia Subregional Economic Cooperation Information and Communication Technology Development: Framework for Connecting South Asia

ICT has the potential to help developing countries connect remote rural areas, overcome geographic barriers in providing social services, and create more economic and social opportunities. However, developing countries tend to lag behind in ICT infrastructure. In 2002, the South Asia Subregional Economic Cooperation (SASEC) countries<sup>41</sup> performed poorly in terms of ICT access compared with East Asia and all of Asia.

Recognizing the potential benefits of ICT infrastructure to economic and social development, SASEC established an ICT working group in 2002 to strengthen institutional cooperation for ICT undertakings, develop a mechanism for discussion, and collectively agree on steps to facilitate cooperation in ICT in the subregion. During the first SASEC ICT working group meeting, member countries identified lack of regional connectivity as a major problem. There is no direct trunk or satellite telecommunications link between Bangladesh and Nepal, Bhutan and Nepal, and Bangladesh and Bhutan. Traffic between these countries is routed through a third country, and the existing route of transmission of regional telecommunications traffic is extremely costly and inefficient, which adds to the cost of doing business in the subregion. A mechanism of policy harmonization among SASEC countries was absent, thereby hampering regional connectivity.

To foster regional cooperation in South Asia, ADB funded a regional technical assistance project, called the SASEC ICT Development Master

Plan,<sup>42</sup> to (i) promote regional connectivity in telecommunication networks, (ii) harmonize technical standards and develop appropriate regulatory regimes for the region, (iii) facilitate cooperation in the development of ICT applications for the subregion, and (iv) strengthen the capacity for human resources development in ICT on a regional level.

Due to the good performance of the consultants, excellent coordination, and cooperation of the steering committee and the SASEC ICT working group, the project was able to deliver its main output—the master plan that will guide ICT development strategies, regional ICT collaboration, and cross-border network access, among others. The master plan also recommended the SASEC regional connectivity directly linking four countries as its first priority area for an ensuing investment project.

“Guiding countries in reaching a consensus on critical issues where they have varying interests is a key to achieving regional cooperation,” says Dong-Soo Pyo, ADB project officer.<sup>43</sup> The regular SASEC ICT working group meetings were a critical venue for discussing and managing the various needs, concerns, and interests of the SASEC countries. Getting the commitment of government offices that are critical decision makers in ICT investments is a basic, but often ignored, aspect of pursuing ICT development projects. In the case of the SASEC master plan, the support of the finance ministry was an essential component of its success.

<sup>41</sup> SASEC countries include Bangladesh, Bhutan, India, and Nepal.

<sup>42</sup> ADB. 2005. *SASEC ICT Development Master Plan (RETA 6232)*. Manila.

<sup>43</sup> Interview with Dong-Soo Pyo, ADB project officer, 2 September 2008, ADB, Manila.

Key lessons from the ICT Master Plan project point to the importance of (i) a participatory approach involving the ICT ministries, regulators, service providers, and service users (individual and industry, urban, and rural) from each country; (ii) placing ICTs in the context of the Millennium Development Goals; (iii) achieving a balance between what is technically possible and what is politically accepted; (iv) building human resource skill at various levels, including the capacity to engage in ICT research and development and to implement regulatory regimes; (v) grounding the master plan within the existing policy agenda and interests of member countries; and (vi) creating a mechanism of joint supervision and monitoring of technical assistance.

The results of the ICT Master Plan project were turned into the SASEC Information Highway Project, a \$24 million investment package in the form of a grant, a loan, and technical assistance from ADB. This investment project was approved,

in July 2007, by the working group and, subsequently, in December 2007, by ADB. As a continuation of the ICT Master Plan project, the project takes a notable and innovative approach to supporting ICT-enabled poverty reduction through regional cooperation. It also considers the importance of ICT capacity development for local entrepreneurs through education, incubation, mentoring, and informal networking. Through the project, regional goods and services are expected to be more fully integrated electronically and delivered more cost-effectively to the most marginalized people. This is the first SASEC subregional investment project to include all four countries, and it, therefore, marks a milestone in regional cooperation in South Asia, reaping tangible benefits after a decade of joint effort.

Following is a summary of information related to the ADB technical assistance for the SASEC ICT Master Plan project.

**Table 7. SASEC ICT Master Plan Project Information Summary**

<b>Type</b>	Technical Assistance
<b>No.</b>	6232
<b>Country</b>	Regional/South Asia Subregional Economic Cooperation (SASEC)
<b>Department</b>	South Asia Department (SARD)
<b>Division</b>	Transport and Communications Division
<b>Approval</b>	2005
<b>Completion</b>	30 November 2006
<b>Program Officer(s)</b>	Dong-Soo Pyo
<b>Sector</b>	Information and Communication Technology
<b>Subsector</b>	Telecommunications and Communications
<b>Project Name</b>	SASEC ICT Development Master Plan
<b>Objective</b>	To foster regional cooperation in ICT among South Asia Subregional Economic Cooperation (SASEC) countries

Source: ADB.

# Connecting Afghanistan through Mobile Phones

**A**DB has provided a series of private sector loans and credit enhancements<sup>44</sup> to Afghanistan's mobile operator, Roshan, for telecommunications development since 2003 through private sector loans totaling \$135 million, a B-loan<sup>45</sup> of up to \$30 million, and a guarantee of up to \$25 million.<sup>46</sup> Project sponsors are the Aga Khan Fund for Economic Development, Monaco Telecom International, and TeliaSonera.<sup>47</sup>

When ADB started its assistance in 2003, only 80,000 people in Afghanistan had access to a phone—one of the lowest phone penetration rates in the world after more than 20 years of war. With ADB assistance, Roshan extended its coverage to areas that have little or no telecommunications infrastructure, using mobile communication, satellite, and radio wave transmission technologies. It has also expanded the role of small and medium-sized enterprise service providers as subcontractors of Roshan, and aided the creation of a mobile banking system called M-Paisa. The mobile service has given people in remote areas better access to markets and information, and supports fragmented communities. It has also boosted the private sector significantly by helping businesses reach hitherto inaccessible areas.<sup>48</sup>

Roshan has pioneered a telemedicine project that links doctors in Afghanistan to more experienced staff at the Aga Khan University Hospital in Karachi, Pakistan. With over 400 patients receiving treatment via this system,



this potentially life-saving telemedicine project is playing a key role in the reconstruction of Afghanistan's health care system.<sup>49</sup>

<sup>44</sup> ADB 2004. *Private Sector Guarantee for Telecom Development Company Afghanistan (Roshan)*. Manila; ADB. 2005. *Equity Investment for Afghanistan Renewal Fund Limited*. Manila; ADB. 2006. *Private Sector Loan, B-Loan, and Political Risk Guarantee for Telecom Development Company Afghanistan (Roshan)*. Manila; ADB. 2008. *Private Sector Loan and Political Risk Guarantee for Telecom Development Company Afghanistan (Roshan)*. Manila.

<sup>45</sup> ADB's B-loan is available for private sector projects in which ADB is a direct participant. B-loans are funded by commercial lenders, with ADB acting as "lender of record." Read more at [www.adb.org/privatesector/finance/com\\_financing.asp](http://www.adb.org/privatesector/finance/com_financing.asp)

<sup>46</sup> These are the amounts approved by the ADB Board; actual use is lower.

<sup>47</sup> E-mail verification and update from Thomas M. Minnich, investment specialist, Private Sector Infrastructure Finance Division, Private Sector Operations Department, ADB.

<sup>48</sup> Interview with Jose Antonio Tan III, economist (public finance), Governance, Finance and Trade Division, Central and West Asia Department, ADB, Manila.

<sup>49</sup> ADB. 2009. *Leapfrogging to Mobile Technology. OCR Making an Impact*. Manila. [www.adb.org/Documents/Feature-Stories/2009/Afg-Leapfrogging-Mobile.asp](http://www.adb.org/Documents/Feature-Stories/2009/Afg-Leapfrogging-Mobile.asp)

*The Economist* ranked the growth of the telecommunications industry as the “biggest success story” in Afghanistan. It stated that the spread of mobile phones has had a revolutionary impact on business, even among local farmers,

who can check prices before herding their sheep to market.<sup>50</sup>

Following is a summary of information related to the ADB loan-funded Roshan Telecommunications projects.

**Table 8. Roshan Telecommunications Projects Information Summary**

Type	Loan	Loan	Loan
No.	7281	7238	7202
Country	Afghanistan	Afghanistan	Afghanistan
Department	Private Sector Operations Department (PSOD)	PSOD	PSOD
Division	Infrastructure Finance Division 1	Infrastructure Finance Division 1	Infrastructure Finance Division 1
Approval	2008	2006	2004
Completion	Fully Disbursed	Fully Disbursed	Fully Disbursed
Program Officer(s)	Thomas M. Minnich	Thomas M. Minnich	Thomas M. Minnich
Sector	Transport and Communications	Transport and Communications	Transport and Communications
Subsector	Information and Communication Technology (ICT)	ICT	Transportation and Communications/ Telecommunications
Project Name	Roshan Expansion Project (Phase III)	Roshan Phase II Expansion: Telecom Development Company Afghanistan Limited (Company)	Roshan Cellular Telecommunications Project
Objective	To expand interconnectivity within and outside Afghanistan, enhance network redundancy, further reduce subscription tariffs, and assist in providing additional value-added functionality (such as mobile money transfer services) and the rollout of environment-friendly infrastructure (such as solar panels to power transmission towers)	The project involves the Phase II expansion of Roshan’s cellular network to provide accelerated near-countrywide coverage, additional network redundancy, and a network upgrade	To finance the expansion of Roshan’s mobile cellular telephone network from a limited current base of 158,000 subscribers, and geographic area of only six cities and less than 13% of the population covered, to more than 1 million subscribers and coverage well in excess of 50% of the population by 2010; as well as the restructuring of Roshan’s capital base over 2004–2005, including partial prepayment of up to \$3.5 million of the short-term, start-up Alcatel vendor debt facility

Source: ADB.

<sup>50</sup> *The Economist*. 2006. Creeping Towards the Marketplace. 2 February.

# BIMP-EAGA Website: Supporting Trade and Investment by Facilitating Access to Information

**T**he Brunei Darussalam-Indonesia-Malaysia-Philippines East ASEAN (Association of Southeast Asian Nations) Growth Area (BIMP-EAGA) is a subregional grouping in Southeast Asia, consisting of Brunei Darussalam, and neighboring portions of Indonesia, Malaysia, and the Philippines, that face similar economic and security issues in addition to sharing geographic proximity. While the grouping was launched in 1994 to strengthen cooperation and economic growth in these areas, it has faced challenges in establishing a cohesive identity for itself as an attractive destination for investment due partly to a lack of information readily available to the private sector on business opportunities. The lack of information has also served as an impediment to policy makers in identifying bottlenecks to trade and investment, and to effectively monitoring the impact of reforms aimed at improving the investment climate in the subregion.

While most of the information needed to better inform decisions by the private sector and policy makers is regularly collected in all four countries, it is also scattered across a large number of national government agencies and local government units—making it difficult, time-consuming, and costly to obtain. Information made available, moreover, is often aggregated at a level that undermines its utility—particularly to investors interested in detailed product-and-location-specific information needed to identify and take advantage of business opportunities.

To help address such information-related issues, ADB provided assistance to BIMP-EAGA through a grant from the Japan Fund for Information and Communication Technology (JFICT)<sup>51</sup> to develop an online database ([www.bimp-eaga.org/](http://www.bimp-eaga.org/)) aimed at pulling together and making readily available trade and investment-related information, at

a level of detail useful to stakeholders through an intuitive, user-friendly interface. The project, however, initially faced resistance from agency officials in some countries who were concerned that making public detailed trade and investment-related data might hurt the business of existing firms by inviting additional entrants and increasing competition. Officials in a number of agencies were also concerned about the additional workload implications of providing and updating such data. Finally, there was an issue of limited staff capacity to maintain the database once it is developed and handed over to the BIMP-EAGA Facilitation Center (BIMP-FC)—the secretariat for the subregional grouping consisting of a handful of staff (none of whom have IT-related backgrounds).

Recognizing the capacity constraints in BIMP-FC, the database and website were designed from the start to require minimal day-to-day intervention by staff, with news feeds and updating of other features largely automated while manual steps involved in updating features, such as calendared events, were made as simple and intuitive as possible.

Understanding and agreement were also reached with focal agencies in each country that provision and updating of trade and investment data and related information would be their responsibility rather than that of BIMP-FC, as the secretariat lacked both authority and capacity to do so. It was also in the self-interest of BIMP-EAGA member countries to provide information aimed at stimulating trade and investment and generating jobs.

To help address concerns about provision of information undermining the business of incumbent firms, ADB conducted extensive stakeholder consultations that clearly indicated

<sup>51</sup> ADB. 2004. *Developing a Database on Cross-Border Trade and Investment in BIMP-EAGA (JFICT 9051-REG)*. Manila.



strong demand from the private sector for access to detailed trade and investment-related information on the subregion (including from incumbent firms who, presumably, might be well placed to take advantage of such information to support expansion into additional markets or product lines)—indicating that such concerns were largely misplaced.

Finally, agency concerns regarding additional workload involved in providing and updating data were addressed by designing the database to allow for uploading of data from focal agencies in their native formats and file types so that no additional processes were required beyond the simple uploading of existing files to the database.

Thatha Hla, ADB project officer, noted that they made sure that they were working as much as possible with existing processes rather than trying to reinvent them—recognizing institutional and capacity constraints, as well as incentive issues,

and taking these into account in the technical and institutional design of the project, while also making sure that the information and services provided by the website fitted user needs as closely as possible in terms of content and interface. Fundamental to this approach was close and repeated stakeholder consultations and dialogue throughout the development of the website.<sup>52</sup>

Once developed, the website was handed over to BIMP-FC, as planned. It currently serves a wide range of users and has established itself as the main portal for information regarding the subregion—appearing as the top-ranked site in Google searches and attracting a steady flow of interest from within the region as well as outside.

Following is a summary of information related to the ADB grant-funded BIMP-EAGA Online Database project.

**BIMP-EAGA**

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- Investment Related Events
- Tourism Related Events
- Other Events

### The Brunei Darussalam-Indonesia-Malaysia-Philippines East ASEAN Growth Area (BIMP-EAGA) Database

The BIMP-EAGA database is intended to support trade and investment in the [subregion](#) through facilitating access to information necessary for the private sector to identify and take advantage of business opportunities and for policy makers to identify and address issues affecting the investment climate.

It currently contains more than 20 million trade and investment related statistics and documents spanning the 4 member countries. Its content and design reflect feedback from wide-ranging stakeholder consultations held in each country and the contributions of 12 national government agencies as well as numerous local government units.

### BIMP-EAGA News

**To attract foreign direct investment to Brunei**  
 Brunei News, Brunei Headlines from Brunei fm  
 ... and transport system if it wants to attract foreign direct investments (FDI), said the Sultanate's representatives to the Bimp-Eaga Business Council. ...

BIMP-EAGA Homepage, [www.bimp-eaga.org/](http://www.bimp-eaga.org/) (screen-captured on 7 April 2010).

<sup>52</sup> Interview with Thatha Hla, ADB project officer, 17 November 2008, ADB, Manila.

**Table 9. BIMP-EAGA Online Database Project Information Summary**

<b>Type</b>	Grant
<b>No.</b>	9051
<b>Country</b>	Regional/Brunei Darussalam-Indonesia-Malaysia-Philippines East ASEAN (Association of Southeast Asian Nations) Growth Area (BIMP-EAGA)
<b>Department</b>	Southeast Asia Department (SERD)
<b>Division</b>	Governance, Finance and Trade
<b>Approval</b>	2004
<b>Program Officer(s)</b>	Thatha Hla
<b>Sector</b>	Industry and Trade
<b>Subsector</b>	Trade
<b>Project Name</b>	Developing a Database on Cross-Border Trade and Investment in BIMP-EAGA
<b>Objective</b>	To support the participating countries in revitalizing and sustaining economic cooperation in BIMP-EAGA by establishing institutional and technical infrastructure necessary for quantitative planning and monitoring

Source: ADB.



# The Asia Recovery Information Center, Early Warning System, and Asian Bonds Online: ADB Projects Responding to Client Needs

**T**he financial crisis that hit the East and Southeast Asian countries in 1997 shocked many economies that were ill-prepared to respond to its debilitating effects. Governments found themselves groping in the dark and not equipped with the information that would have forewarned them of the impending crisis. The crisis highlighted the role of effective economic and financial surveillance at the national, global, and regional levels in maintaining stability and sustaining growth in a highly globalized economic environment.

In response to the financial crisis, ADB provided assistance to three e-government projects—the Asia Recovery Information Center (ARIC),<sup>53</sup> ASEAN+3 Early Warning System (EWS), and AsianBondsOnline.

The concept of ARIC first emerged at the Meeting on Development Cooperation: Responding to the Asia Crisis<sup>54</sup> held in Sydney on 5 March 1999, participated in by representatives from 27 countries and nine international organizations (including ADB). The meeting discussed “the need for accurate and timely information on the economic and social impacts of the crisis, and progress of the recovery.” The meeting agreed that an “internet-based facility

would provide the most efficient means of gathering, collating, and disseminating (this) information.”<sup>55</sup> In response to a proposal from the Government of Australia, ADB approved a technical assistance project to create and host the ARIC website (<http://aric.adb.org/>), which was financed by the Australian Agency for International Development (AusAID) and launched in March 1999. ADB was the best choice as the implementing agency of ARIC since its Office of Regional Economic Integration (OREI) (formerly Regional Economic Monitoring Unit, or REMU) was created with the specific mandate to monitor and analyze economic crises and recovery. OREI’s work was a good basis for the content of ARIC, as OREI gathers information from various sources, analyzes them, and uploads them regularly to the ARIC website.<sup>56</sup>

Due to the demand<sup>57</sup> and good performance<sup>58</sup> of ARIC, ADB headquarters recommended an ARIC Phase II,<sup>59</sup> which was supported by an independent evaluation by AusAID.<sup>60</sup> Phase II aimed to consolidate and expand ARIC activities, taking into account the faster-than-expected recovery in Asia, and it extended the country coverage to include the People’s Republic of China, Singapore, and Viet Nam. On 25 July 2006, ADB Board of Directors endorsed the Regional Cooperation and Integration (RCI) Strategy, in

<sup>53</sup> In May 2004, the ARIC website was relaunched with a new look and country scope, and was renamed the “Asia Regional Information Center.” Read more at [www.adb.org/Documents/News/2004/nr2004060.asp](http://www.adb.org/Documents/News/2004/nr2004060.asp)

<sup>54</sup> Read more at [www.adb.org/REMU/aric.asp](http://www.adb.org/REMU/aric.asp)

<sup>55</sup> ADB. 2000 July. ARIC Midterm Review Report (Draft).

<sup>56</sup> Interview with Juzhong Zhuang, assistant chief economist, ADB, 3 September 2008, ADB, Manila.

<sup>57</sup> From its launch in early November 1999, the number of hits of the ARIC website increased to more than 400 per day in March 2000. It eventually stabilized at about 300–400 per day. The ARIC project has also produced other knowledge products, such as the *Asia Recovery Report*, whose inaugural issue has been downloaded over 35,000 times globally (as of end-2000).

<sup>58</sup> The ARIC website has been cited by reputable publications, such as Scout Report, Forbes Magazine, Asia Observer, and the Far Eastern Economic Review, among others.

<sup>59</sup> ADB. 2009 May. *Asia Recovery Information Center (ARIC), Phase II TA Completion Report (RETA 5981)*. Manila.

<sup>60</sup> ADB. 2000 July. ARIC Midterm Review Report (Draft).

which ADB acts as catalyst, coordinator, and knowledge leader of RCI in Asia and the Pacific. The RCI strategy has four pillars:

- (i) Regional and subregional economic cooperation programs (cross-border infrastructure and software)
- (ii) Trade and investment cooperation and integration
- (iii) Monetary and financial cooperation and integration
- (iv) Cooperation in regional public goods

In line with these, economic information, data, and documents contained in the ARIC website were categorized into the four pillars. Also, other functions, such as the posting of news articles, were rationalized. The ARIC website also provided a vehicle for the preparation of the semiannual *Asia Recovery Report*, which was later renamed the *Asia Economic Monitor* (AEM) report, as well as confidential notes in support of regional meetings and other reports in support of ADB management, such as *Weekly Market Digest*, a weekly summary of developments in financial markets in the region and other key markets. In 2004, the ARIC website's country scope was expanded to also cover Bangladesh, India, Pakistan, and Sri Lanka in addition to the original 12 countries in the ASEAN+3 group.<sup>61</sup> Phase II saw the daily number of visitors at 351 and 17,658 hits in December 2009. Because of increased interest in the site, it was recommended to support a phase III, focusing on the building of an intranet to enhance awareness of RCI issues within ADB, additional economic databases, and the enhancement of macroeconomic surveillance in support of the AEM.

ASEAN+3 finance ministers saw the urgency and requested for the development of a regional *early warning system* (EWS) prototype that will help them detect economic and financial vulnerabilities that could lead to a crisis similar to what struck them in 1997. In response, ADB approved the small-scale regional technical assistance in June 2001,<sup>62</sup> which supported collaborative efforts

among the ASEAN+3 countries leading to the development of a regional EWS that would help detect emerging macroeconomic, financial, and corporate sector vulnerabilities, in an attempt to prevent financial crisis in the future. The prototype comprises four components: (i) a set of macro-prudential indicators, (ii) a nonparametric EWS model, (iii) a parametric EWS model, and (iv) a set of economic leading indicators of business cycles.

The next challenge was to make the EWS prototype readily available and accessible to the concerned countries. ASEAN+3 looked to ADB to provide a user-friendly and manageable medium for this system. Recognizing the potential of ICT to provide this type of services, ADB developed a Windows-based EWS software application, called the Vulnerability Indicators and Early Warning System, in CD-ROM format. These CDs were conveniently distributed throughout the region for the exclusive use of central banks, monetary authorities, and ministries of finance of the ASEAN+3 countries. A website, where updated databases for use in the EWS application can be downloaded by the countries involved, was also developed.<sup>63</sup>

To ensure the optimal use of the system, ADB provided a grant to develop country-specific EWS based on the regional EWS prototype previously developed.<sup>64</sup> A further grant has been provided to enhance the capacity of selected government agencies to implement the EWS for assessing financial vulnerabilities, which saw the conduct of training workshops in various countries on the EWS and use of the Vulnerability Indicators and Early Warning System.<sup>65</sup> In addition to the software, knowledge products, such as books on EWS, were also produced.

AsianBondsOnline (ABO), a one-stop clearinghouse of information on the rapidly growing sovereign and corporate bond markets in the region, is part of the ASEAN+3 Asian Bond Markets Initiative, a cooperative effort to help develop mature bond markets in the

<sup>61</sup> "ASEAN+3" includes the 10 ASEAN members (Brunei Darussalam, Cambodia, Indonesia, the Lao People's Democratic Republic, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Viet Nam) plus the People's Republic of China, Japan, and the Republic of Korea.

<sup>62</sup> ADB. 2001. *An ASEAN+3 Framework for the Development of Early Warning Systems* (RETA 5986). Manila.

<sup>63</sup> Inputs from Renato Reside, Jr., ADB project consultant, and Lei Lei Song, senior economist, ADB project officer.

<sup>64</sup> ADB. 2002. *Capacity Building for Implementing Early Warning Systems in ASEAN+3 Countries* (RETA 6070). Manila.

<sup>65</sup> ADB. 2007. *Enhancing the Capacity of Selected ASEAN+3 Countries for Assessing Financial Vulnerabilities* (RETA 6391). Manila.

region. Before developing the website, extensive consultations with various market participants, such as investment banks from different parts of Asia, were conducted to determine if there was a demand and value added for such an activity. The website (<http://asianbondsonline.adb.org/regional.php>) was launched in May 2004 by ASEAN+3 finance ministers at the sideline of the ADB Annual Meeting in Jeju, Republic of Korea.

Since its launch in 2004, the ABO website has progressed from an information site on local currency bond markets in the region to a one-stop clearinghouse that supports all bond market participants with original content on bond market developments and information dissemination. In terms of content, the website includes (i) structural aspects of local currency bond markets in the region (e.g., market infrastructure, rules and regulations, market activities, and market data), updates on the activities of the ASEAN+3 Asian Bond Markets Initiative, and a large number of progress indicators; (ii) research outputs (e.g., market analysis and policy research) and news articles and commentary related to the bond markets of each country in the region, and a knowledge center comprising a bond glossary, data releases, and a how-to-buy guide for bonds and bond funds; and (iii) Market Watch, which is updated twice daily and provides the major market-priced variables and year-to-date and month-to-date performance figures for each country. The website has also extended its content to include information on new issuance and Islamic finance. In 2009, a revamped website, which included

new sections, such as the Credit Risk Watch (CRW), was launched. The CRW contains a series of important financial and economic indicators, including monthly bond market data.<sup>66</sup>

The Asia Bond Monitor, a knowledge output based on data and analysis from the ABO website, has moved from being a semiannual to a quarterly publication and marks the expansion of ABO analysis from the government sector into the corporate bond market. All issues can be downloaded from <http://asianbondsonline.adb.org/regional/abm.php?src=spotlight>.

The ARIC and the EWS sites are used by their target clients, such as policy makers and researchers. ARIC and EWS serve to inform the public and deepen analysis of the region's economic developments, as well as the region's fragilities, leading to enhanced regional economic surveillance. The ABO website is a public good that benefits all stakeholders, including institutional investors, investment banks, policy makers, academics, and researchers. ASEAN+3 has identified it as the key information and data source on local currency bond markets in emerging East Asia. The ABO is a unique asset, providing a comprehensive database and analysis on local currency developed. It has received unsolicited positive feedback from private investors and multilateral financial institutions.

A summary of information related to the ADB regional projects on the ABO website, ARIC website, and the ASEAN+3 Early Warning Systems Framework is shown on Table 10.

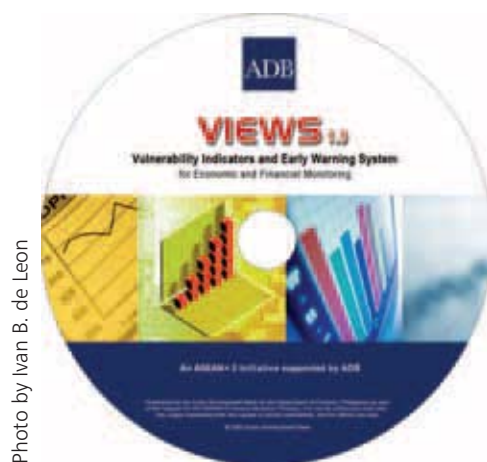
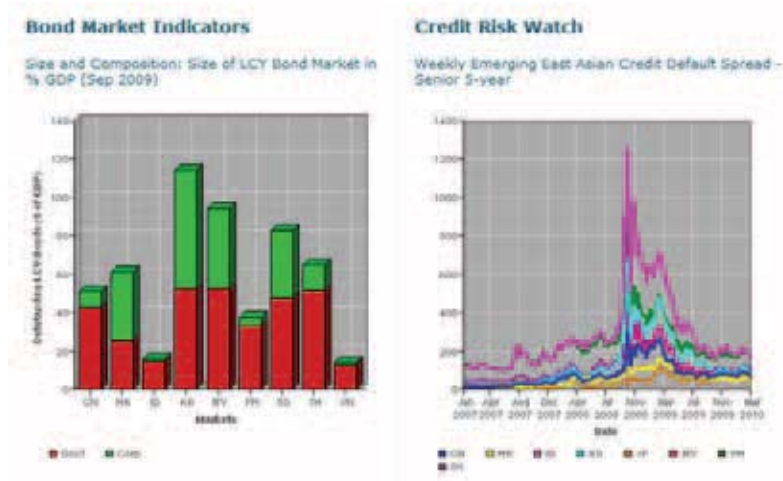


Photo by Ivan B. de León

CD cover of VIEWS

<sup>66</sup> E-mail verification and update from Sabyasachi Mitra, ADB project officer.

**Figure 1. Some indicators monitored by AsianBondsOnline**

Source: <http://asianbondsonline.adb.org/> (screen-captured on 7 April 2010).

**Table 10. Project Information Summary for ABO, ARIC, and ASEAN+3 Early Warning System Framework**

Type	Grant	Technical Assistance	Technical Assistance
No.	9041	5981	5986
Country	Regional/Office of Regional Economic Integration (REG/OEI)	REG/OEI	REG/OEI
Department	Office of Regional Economic Integration (OEI)	OEI	OEI
Division	OEI	OEI	OEI
Approval	2004	2001	2001
Completion		30 November 2003	
Program Officer(s)	Sabyasachi Mitra	Lei Lei Song	Lei Lei Song
Sector	Finance	Public Sector Management	Public Sector Management
Subsector	Capital Markets and Funds	Economic and Public Affairs Management, Trade and Services, Finance Sector Development	Economic Management
Project Name	Asian Bonds Online (ABO) Web Site	Asia Recovery Information Center (ARIC), Phase II	An ASEAN+3 Framework for the Development of Early Warning Systems
Objective	To improve information flows for Asian bond markets through the establishment of an Asian Bonds Online Web Site	To continue and consolidate the ARIC activities in phases I and II and implement new activities, such as the building of new economic databases, an intranet for regional cooperation and integration (RCI) purposes, enhanced macroeconomic surveillance, as well as to serve as a portal for news and other documents related to RCI	To support collaborative efforts among the ASEAN+3 countries, leading to the development of a regional early warning system to help detect emerging macroeconomic, financial, and corporate sector vulnerabilities, in an attempt to prevent future financial crises

Source: ADB.

# Information and Communication Technology for the Transport System in the People's Republic of China: A Developing Country Pathway

**T**he People's Republic of China (PRC) is one of the fastest-growing economies in the world. Much of this growth can be attributed to development of infrastructure, such as roads and transportation systems. Concomitant to this growth is more pressure on the transport system, as freight traffic and the number of vehicles on the road increase. To address these issues and the emerging demand for road transport, the PRC Government sought to increase the capacity and efficiency of road transport by using newly available ICT. The application of information technology to surface transportation, called intelligent transport systems (ITS), helps gather, organize, analyze, use, and share information—an ability crucial to effective, efficient, and economical operation. In response to a request by the PRC, ADB funded a grant for a Transport Information System<sup>67</sup> to increase the capacity of existing road infrastructure, boost efficiency of road transport, and improve quality of transport service. The expected outcomes include recommendations on how the PRC should deploy ITS and a travel information service system (TISS), assistance to the Ministry of Communication to develop a standard architecture framework for TISS, and implementation and operating guidelines.

Although ITS is just beginning to emerge in developing countries, Toshiyuki Yokota, ADB project officer, thinks that developing countries can take a different and leapfrogging path and do not need to necessarily follow the same route as the developed countries in ICT adoption.<sup>68</sup>

However, Yokota also cautions that the installation of ICT alone will not solve transportation problems if the attitude and ways of people using ICT do not change. For example, a traffic accident reporting system can enable a police officer to report traffic accidents to its central office instantaneously using a cell phone and a touch pad. However, if corrupt police officers can choose not to report the incident, underreporting can still occur despite the deployment of ICT. Yokota also says that information sharing is the most important aspect in developing ITS.

Investment in ITS can be seen as an efficient way of supporting both traditional infrastructure and economic growth. “The application of ICT can increase the efficiency of current infrastructure,” Yokota explains. ICT is an efficient investment if it is used to increase the value of the current infrastructure. For example, road conditions can be reported, documented, and managed through ICT to make accurate investment and policy decisions about expansion and rehabilitation. Freight management can be improved through an ICT-enabled database and registration system that can be accessed quickly and easily. ADB support for ITS in the PRC can help other governments appreciate the potential benefits of ITS and appropriate ways to adopt ITS in developing countries where ITS are still at an early stage.

Following is a summary of information related to the ADB technical assistance for the Transport Information System project.

<sup>67</sup> ADB. 2007. *Transport Information System (TA 4991)*. Manila.

<sup>68</sup> Interview with Toshiyuki Yokota, ADB project officer, 10 October 2008, ADB, Manila.

**Table 11. PRC Transport Information System Project Information Summary**

<b>Type</b>	Technical Assistance
<b>No.</b>	4991
<b>Country</b>	People's Republic of China
<b>Department</b>	East Asia Department (EARD)
<b>Division</b>	Transport Division
<b>Approval</b>	2007
<b>Completion</b>	27 October 2009
<b>Program Officer(s)</b>	Toshiyuki Yokota
<b>Sector</b>	Transport and Communications
<b>Subsector</b>	Roads and Highways
<b>Project Name</b>	Transport Information System
<b>Objective</b>	To increase capacity of the existing road infrastructure, efficiency of road transport, and quality of transport service

Source: ADB.



## Information and Communication Technology for Development: ADB Experiences

The role of information and communication technology (ICT) in an increasingly interconnected and interdependent world transcends geographical boundaries, economies, and sectors. Over the past decade, ICT has helped create the most rapidly growing industry sectors, driven efficiency in government and business operations, and developed the essential building blocks to a knowledge-based economy. The ability of ICT to change the way people do things is either hidden in internal processes—such as how a government office manages data collection—or manifest in the end product—such as digital support for health care services in a remote province. While the level and nature of the benefits of ICT may differ for every stakeholder, there is a consensus of what ICT can help provide to governments, businesses, and citizens: faster access to relevant information, an efficient means for communication, an enhanced ability to make informed decisions, and a voice to otherwise unheard peoples. As these cases from ADB would show, access to ICT alone will not result in significant, lasting change. It is the adoption of appropriate technology, paralleled with an enabling policy environment, a responsive and needs-based approach, improved individual and institutional capacity, nurtured partnerships with key stakeholders, leadership by local champions, effectively managed change, and sustained support that make the difference.

### About the Asian Development Bank

ADB's vision is an Asia and Pacific region free of poverty. Its mission is to help its developing member countries substantially reduce poverty and improve the quality of life of their people. Despite the region's many successes, it remains home to two-thirds of the world's poor: 1.8 billion people who live on less than \$2 a day, with 903 million struggling on less than \$1.25 a day. ADB is committed to reducing poverty through inclusive economic growth, environmentally sustainable growth, and regional integration.

Based in Manila, ADB is owned by 67 members, including 48 from the region. Its main instruments for helping its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance.

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