Space & Environment is a quarterly magazine published by KRIHS. Its purpose is to introduce current issues on territorial planning in Korea and disseminate research achievements and international activities of KRIHS and other Korean institutes.

SPACE & ENVIRONMENT

Vol. 69 March 2017

ISSUES & TRENDS

Conditions and Implications of Korea-China Cooperation in the Overseas Infrastructure Market

Hyunju Lee

1. Need for Korea-China Cooperation in the Overseas Infrastructure Market

As the external environment shifts along with China's One Belt, One Road (OBOR) initiative, Korea needs to seek ways to fully respond to infrastructure demands from China and neighboring countries. China's implementation plan for the initiative lists five fields of cooperation: policy coordination, infrastructure connectivity, increased trade investment, financial integration, and private sector exchange. Among these, infrastructure connectivity is being pursued as a top priority. As part of the initiative, China is running various joint infrastructure projects (e.g. transportation, energy) with nearby neighbors through six economic corridor projects (Figure 1). Korea needs to recognize these potential infrastructure projects as an opportunity to join the overseas construction markets. Moreover, Korea should seek ways to cooperate with China in the overseas infrastructure market to lay foundations for the nation's expanded economic peripheries.

2. Strengths and Weaknesses of Korea-China Cooperation in the Overseas Infrastructure Market

1) Strengths and Weaknesses of Korean and Chinese Businesses

According to the Korea Institute of Construction Technology (KIC), Chinese businesses are strong in construction, design, and competitive prices, while Korean businesses are strong in project planning and management, and quality and safety control. According to the KIC, Korean builders ranked twelfth place overall in 2011 and rose to sixth in 2015, while China moved from third to first over the same period. As of 2015, China was stronger than Korea in construction competitiveness (Table 1). Meanwhile, Korea has a solid overseas construction capacity with a large number of experienced engineers. Also, Korea appeared more competitive than China in its capacity to plan and manage projects and maintain quality and safety.

Table 1. Competitiveness of Korea and China in Overseas Construction by Process

		Construction		Design		Prices		Builder Capacity	
		Score	Ranking	Score	Ranking	Score	Ranking	Score	Ranking
2011	Korea	7.0	12	4.3	19	7.8	3	78.3	12
	China	9.5	3	3.6	21	10.0	1	93.6	3
2012	Korea	7.3	8	5.9	10	8.2	6	74.7	7
	China	9.1	3	4.5	19	10.0	2	78.7	5
2013	Korea	7.4	4	2.9	19	7.8	5	66.2	7
	China	7.3	5	1.5	20	9.6	3	61.5	11
2014	Korea	7.4	6	2.3	16	8.7	5	65.4	6
	China	10.0	1	2.7	11	9.8	3	81.1	1
2015	Korea	7.0	5	2.3	11	8.5	5	67.6	6
	China	10.0	1	2.3	10	9.7	3	81.7	1

Note
(1) Out of 10 points.
(2) The survey was conducted with 22 countries in 2011, 21 in 2012, 20 in 2014, and 19 in 2015.

Source
Reproduced based on ICEE reports. 2013, 2015.

In 2015, Korea boasted more advanced technology than China in water treatment, water supply and sewage infrastructure, building and managing information and communication technology (ICT)-applied cities, road traffic safety facilities, and waste treatment.[1] Meanwhile, China's competitive edge was found in resource development and renewable energies. For some infrastructure segments, Korea's technological level in 2015 was compared against China's in terms of years of technological gap. As a result, Korea was clearly more competitive in water treatment, and water and sewage systems. Korea's lead was also partially seen in building and managing ICT-applied cities, underground water, transportation planning and evaluation, and nuclear power. Korea was also narrowly more advanced than China in the fields of road transportation, air pollution prevention and carbon capture and storage (CCS), cargo loading, rail system maintenance and operation multimodal transportation, and logistics information.

1 Seoul National University. 2015. Institute of Construction and Environmental Engineering (ICEE). p.8.

2) Key Cases of Korea-China Cooperation

There are two ways in which Korea can cooperate in the overseas infrastructure market: A company from one nation can subcontract a project awarded to a company from another nation, or companies from two nations can jointly win an order as a consortium. However, countries often do not work together in the overseas infrastructure market for many reasons including delays in corporate decision making, concerns about technology and information leaks, and differences in culture and operation methods.

Table 2. Key Cases of Korea-China Cooperation in the Overseas Infrastructure Market

Type	Cooperation Method	Project	Description
Cooperative order reception	Subcontract	UAE Shah Project (2010)	- Korea: Samsung Engineering (Turnkey construction order for details design, equipment purchase) - China: Jilin Chemicals Ind. Corp. (Subcontract for machinery, piping, steel erection)
			- Based on the pre-built cooperative relationship, China subcontracted from a Turnkey deal won by Korea. This cooperation model combines Korea's project management capacity and China's strength in procurement.
Joint order reception	Korea-China consortium	Ecuador Pacific Refinery Project (Negotiation continues as of January 2017)	- Korea: Hyundai E&C, Hyundai Engineering - China: Beijing Petrochemical Engineering, Tianchen Engineering,China Machinery Industry
			- A cooperation model where Korea and China jointly bid for a project based on a combination of their strengths.

Source
Reproduced based on press accounts and interviews with corporations.

3. Opportunity and Threat Factors for Korea-China Cooperation in Overseas Infrastructure Market

1) China's Plan for the Six Economic Corridors

As part of the OBOR initiative, Beijing is working on six economic corridor projects. A concrete negotiation is already taking place and an agreement is being reached between corresponding summits for the China–Pakistan corridor and the corridor that connects China, Mongolia and Russia. Suggested by Chinese Premier Li Keqiang during his visit to Pakistan in 2013, the China–Pakistan project will build an economic corridor (about 3,000km) connecting Kashgar in China's Xinjiang province with Pakistan's southern port city of Gwadar with a total investment reaching US$46 billion. More specifically, the project includes two-phase projects that will improve the China–Pakistan Railway, Karachi–Lahore Highway, and Karakoram Highway. Among them, a partial section of the Karachi–Lahore Highway will be funded by the Asia Infrastructure Investment Bank (AIIB). As for the China–Mongolia–Russia corridor, details have been discussed to pursue cooperation in transportation, energy, and trade investment at the summit in June 2016.

2) AIIB Project Launch

In 2016, the AIIB approved investment of US$1.73 billion for nine projects located in Central Asia, Southeastern Asia, South Asia, and East Asia. Due to the relative large scale of these projects, funding for most projects are co-financed by other multilateral development banks (MDB), except for the Bangladesh project. This trend is likely to continue. The project fields include transportation, energy, and regional development.

Table 3. AIIB-approved Projects (2016)

No.	Investor	Project	Field	AIIB Approval Date	Investment (USD in millions)
1	Tajikistan	Dushanbe–Uzbekistan Border Road Improvement Project	Transportation	Jun. 24	Total (105.9): AIIB (27.5), EBRD[2] (62.5)
2	Pakistan	National Motorway M-4 project	Energy	Jun. 24	Total (823.5): AIIB (300), WB[3] (390), Govt. (133.5)
3	Bangladesh	Distribution System Upgrade and Expansion Project	Energy	Jun. 24	AIIB (165)
4	Pakistan	National Motorway M-4 project (Shorkot–Khanewal section)	Transportation	Jun. 24	Total (273): AIIB (100), ADB (100)
5	Indonesia	National Slum Upgrading Project	Regional development	Sept. 24	Total (1,743): AIIB (216.5), WB (216.5), borrower (1310.0)
6	Myanmar	Myingyan 225 MW Combined Cycle Gas Turbine (CCGT) Power Plant Project	Energy	Sept. 24	Total (65): AIIB (20), IFC[4] (45)
7	Oman	Railway System Preparation Project	Transportation	Dec. 8	Total (60): AIIB (36), OGLG[5] (24)
8	Oman	Duqm Port Commercial Terminal and Operational Zone Development Project	Transportation	Dec. 8	Total (353.33): AIIB (265), SEZAD (88.33)
9	Azerbaijan	Trans Anatolian Natural Gas Pipeline Project (TANAP)	Energy	Dec. 21	Total (8,600): AIIB (600), borrower (2,100), WB (800), other MDBs (2,100), commercial banks (3,000)

2 European Bank for Reconstruction and Development
3 World Bank
4 International Finance Corporation
5 Oman Global Logistics Group

Source
The AIIB website. https://www.aiib.org.

3) Risks and Other Factors in Developing Countries

Threats in the overseas infrastructure market include business risks specific to Asian developing countries. Cooperation between the two countries can be impeded by factors such as government and external debts of some Asian countries, geopolitical insecurities, Chinese firms' low-priced bids, and market disruptive moves. Another challenge is the recent conflict between the two nations regarding Korea's diplomatic security policy to deploy a Terminal High Altitude Area Defense (THAAD) system on the Korean peninsula.

4. Korea-China Cooperation Strategy in Overseas Infrastructure Market

Figure 1 shows an analysis of the strengths, weaknesses, opportunities and threats (SWOT) in the overseas infrastructure market.

Figure 1. SWOT Analysis of Korea-China Cooperation Model in Overseas Infrastructure Market

Internal Conditions	**· More chances to win orders with combination of each country's strengths** - Korea: [Field] Water treatment, development of ICT-applied cities, etc. [Process] Project planning and management, safety management - China: [Field] Resource development, renewable energy, etc. [Process] Construction and competitive prices in procurement	**· Lack of experience cooperating in the overseas infrastructure market** - Concerns for delayed decision making technology and information leaks - Uncertainty in benefits of cooperation - Different corporate culture and management methods
External Conditions	**· Establishment of AIIB and its projects in full-swing** - Pursuing nine projects in Indonesia, Pakistan, etc. (2016) - Pursuing co-financing with other MDBs (World Bank, Asia Development Bank) **· China pursues the six economic corridors** - China–Mongolia–Russia, New Eurasian Land Bridge, China–Central Asia–West Asia, China–Indochina Peninsula, China–Pakistan, Bangladesh–China–India–Myanmar	**· Business risks of Asian developing countries** - Government debts, household debts, external debts - Geopolitical instability **· Negative image of Chinese firms for their low-price bids and market disruption in some overseas infrastructure markets** **· Conflict between Korea and China regarding the recent diplomatic security policy**
Strategies	**· Develop various Korea-China cooperation models combining the two nations' strengths** **· Increase the number of Asian infrastructure market projects harnessing the AIIB**	**· Focus on projects with political and strategic importance for both Korea and China**

S W O T

Source
Lee, Hyunju. 2016. The Study on Korea-China Infrastructure Cooperation to Realize the Eurasian Initiative.

Based on the SWOT analysis of the two nations' cooperation, a follow-up strategy can be formulated. An aggressive investment strategy is needed considering the internal strengths, weaknesses, and external opportunities of the cooperation model. To that end, various cooperation models that combine advantages of the two countries need to be developed and employed. To create infrastructure demand in Asia, a strategy should be taken to expand business opportunities via the AIIB. Meanwhile, risks should be minimized in an environment that considers internal strengths, weaknesses, and external threats of the cooperation by implementing priority projects with strategic economic and political importance for both countries

5. Policy Implications

First, it is important to share accurate information on relevant projects by region and field to promote cooperation between Korea and China in the overseas infrastructure market. Considering Beijing's adoption of the OBOR initiative and ongoing efforts on the six economic corridors as part of the initiative, it is critical to quickly provide information on the new projects and market conditions. With the AIIB's support for some road projects of the China-Pakistan corridor, there is a strong chance China will win assistance from the AIIB for the other corridor projects. Thus, government-level support should be provided for Korean companies to win contracts for ongoing or potential projects, particularly the corridor projects.

Second, given the trend of large-scale AIIB projects, cooperation among financial institutions is likely to continue. Thus, support from the financial sector is needed to facilitate Korea-China cooperation in the infrastructure market. More support should be provided to increase Korean companies' opportunities to win orders by assisting at the government level to facilitate cooperation among private financial firms and utilizing domestic infrastructure funds and development funds for co-financing with the AIIB.

Third, Korea should seek opportunities for Korean firms to participate in the China–Mongolia–Russia corridor project. The project is relevant to Korea's future land development and prosperity as it creates a community of development and cooperation among the three countries near to the Korean Peninsula. Government-level response measures should be developed to harness a bilateral agreement with China as well as a multilateral agreement with China, Mongolia, and Russia to secure Korean participation in the project.

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IN-DEPTH LOOK 01

Strategic Direction for Export of Korea's Smart City Models

Jaeyong Lee

1. Growing Need for New City Models for Export

Thanks to financial institution support, global population growth, and urbanization demand, the world financial market is predicted to grow by around 50 percent from 2010 to 2020, yet this does not mean that growth will come evenly.[1] While the Middle East's construction market is shrinking, emerging markets in Asia will likely grow. Due to the sluggish Korean market caused by a real estate slump and lower demand from the public sector, Korean builders have steadily turned to overseas projects. The volume of overseas orders is sharply slowing, however, amid the rise in associated risks due to the recent plunge in crude oil prices and political uncertainty in the Middle East. In 2015, Korean builders suffered a 30 percent drop in overseas orders received to US$46.1 billion from 2014.

The development of new city models is crucial to diversify the types, regions, and sectors of overseas projects. In recent years, the smart city concept has drawn worldwide attention, and the global market for consulting on smart cities is seen as a blue ocean with an estimated worth projected to skyrocket from US$411.3 billion in 2014 to US$1.13 trillion in 2019.[2] To keep abreast of this growing global trend, Korean builders should formulate a systematic strategy to join the global smart city market.

1 You et al. 2011. Risk Management System Improvement for Overseas Construction Projects Using Probabilistic Approach. Construction Issue Focus.

2 MarketsandMarkets. 2015.

2. Factors for Advancing into Smart City Markets Abroad

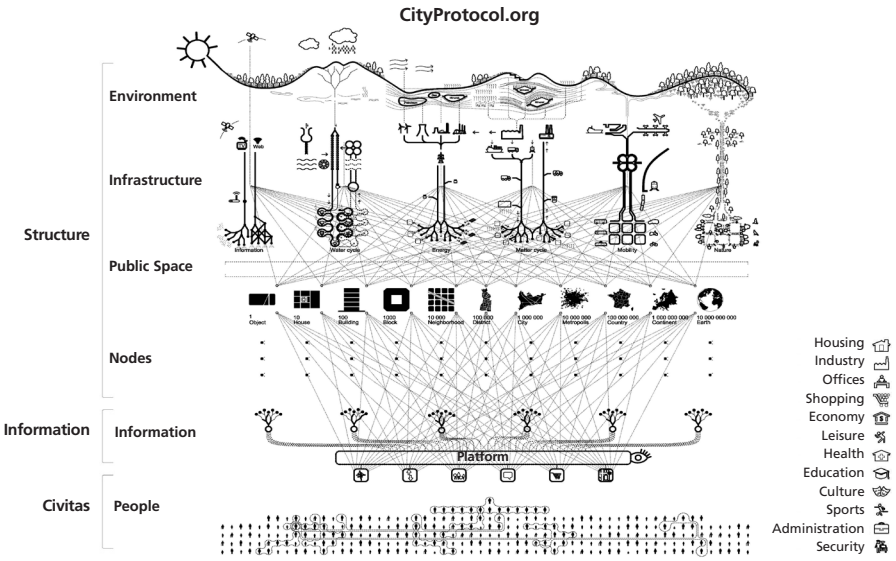
There remains a lack of a unified concept of the smart city in academia, and definitions vary in the field worldwide. Among academics and policymakers, the collective smart city components are widely discussed using varying terms such as framework, protocol or model. Based on global trends and concepts proposed three smart city factors: (1) technology (physical infrastructure, smart technology, mobile technology, virtual reality, and digital networks), (2) institutions (governance, policy, regulation, and directionality), and (3) people (human resources and social capital). Smart city projects in Korea have emphasized the technology factor with an approach focused on services such as transportation and public safety.[3]

Overseas markets, however, suggest a number of non-physical components as drivers of growth for smart city. Chourabi et al. (2012) pinpoint (1) management and operation; (2) technology; (3) governance; (4) policy; (5) civil community; (6) economy; (7) infrastructure, and (8) environment as success factors for a smart city. As shown in Figure 1, smart city elements also can be broken down into physical structure, the society that occupying the structures, and the interaction between

3 Nam et al. 2011. Conceptualizing smart city with dimensions of technology, people, and institutions, The Proceedings of the 12th Annual International Conference on Digital Government Research.

society and the structure. The structure are further classified as domains of the environment, infrastructure and construction; society is divided into citizens and government; and social-structural interactions are categorized as informational, functional, economic, and cultural.

Figure 1. Barcelona's City Anatomy



Source
ISO/IEC JTC 1 Information Technology. 2014. Smart Cities Preliminary Report.

Reviewing smart cities around the world, successful cities exhibit the following factors: (1) use of information and communication technologies (ICT) in construction and communication, represented by the Internet of Things (IoT), and Cloud, Big Data and Mobility (ICBM); (2) IT infrastructure that can serve as a technological basis; (3) urban infrastructure; (4) services based on technology and infrastructure; (5) non-physical factors (governance, civil community, policy and social capital), and (6) an effective business model for raising capital needed for building and operating a smart city. A comprehensive approach to these factors will ensure that Korea can effectively export its smart city models.

3. Korea's Strengths and Weaknesses in Smart City Sector

Korea has accumulated rich experience in building, managing and operating smart cities through new city projects. In contrast, leading smart city countries in Europe are relatively inexperienced in applying smart city technology when building new cities leading smart city countries. Another Korean strength is its experience of systematically building smart cities to be governed under a pre-existing legal system. Though Japan has amended laws to keep pace with the Fourth Industrial Revolution and smart city trend, lack of a dedicated legal system sets limits on the pursuit of smart city projects that require large-scale investment. Unlike its developed counterparts, Korea is considered as a model of fast growth among developing economies that are rapidly emerging as potential markets for smart city models.

On the other hand, Korea has found it difficult to secure useful and detailed information on such markets, and this has been the nation's biggest challenge in pursuing projects abroad. Recently, most projects for smart cities as part of new city

development have fallen in the category of development and investment. A proposal should indicate an effective way to create demand in developing economies to win contracts. The current Korean smart city model, however, relies on government budgets to fund infrastructure construction, so new business models will be needed to handle overseas demand. Korea should develop multiple models based on public-private partnerships, as smart city projects abroad employ any of several business methods, such as collaboration, Build-Operate-Transfer (BOT), Build-Transfer-Lease (BTL), or they may combine models, using BOT to build infrastructure and BTL to operate services.

4. Strategic Direction to Advance into Smart City Markets Abroad

Data on overseas markets are crucial for private companies trying to go global, and this is where the Korean government should step in. The Global Window (www.globalwindow.org) of the Korea Trade-Investment Promotion Agency (KOTRA) is a key website that offers information on business destinations abroad for domestic companies. The Export-Import Bank of Korea (Eximbank) also operates a consulting center for overseas investment to assist Korean companies wishing to expand abroad. While these two centers can help obtain overall information on a destination in initial project planning, they may not provide sufficient details required to pursue concrete projects. Another information window, the e-government overseas investment support system (www.egovexport.or.kr), offers data on the e-government systems, overseas projects and bids of other countries, but the website was last updated in 2014.

In addition, smart city projects are increasingly implemented according to developmental investment by total solution providers, along with growing official development assistance (ODA) and loans. Thus the role of a multilateral development bank (MDB) such as the Asia Development Bank(ADB), the Inter-American Development Bank (IDB), and the International Bank for Reconstruction and Development (IBRD) as fund providers is key. Yet Korean players have had limited participation in MDB projects, largely due to lack of information (43%).

Table 1. Strategic Direction for Korea's Advance on Overseas Smart City Markets and Network Building

Category	Description
Information on overseas destinations	- Political conditions of target country (e.g. political stability, policy consistency, legal system) - Sociocultural information (e.g. population, climate, education) - Economic situation (e.g. economic status, social infrastructure) - Technology (e.g. maturity of informatization in public and private sector) - Information on smart city projects and bids
Information on Korean companies	- Investments in overseas smart city markets by industry - Capacity to advance overseas (e.g. flagship products and technology, patents, global experience, human resources) - Examples of successful overseas advances
Information on local governments in Korea	- Status of local governments' smart city projects - Status of smart city services and systems within local governments - Information on local governments, overseas organizations, and networks
Information on overseas market advance	- Information on PPP process - Procedures to identify and pursue MDB projects - Range and type of government support

Source
Lee et al. 2016. Strategic Direction for Korea's Advance on Overseas Smart City Markets and Network Building, Korea Research Institute for Human Settlements.

The U.S. Agency for International Development (USAID) acts as the information window for overseas construction projects in the U.S. This organization provides a onestop service for supporting global project participation by American corporations. As such, Korea should pay close heed to this case study. Also crucially important for Korea to advance in the overseas market for smart cities is global smart city indicators and standards. Interest in these indicators is growing, and countries or cities that rank high on such indicators tend to have advantages in their overseas strides, thanks to publicity and associated impact. On the contrary, Korea has little interest in global indicators and network participation, which will likely limit its influence in smart city discussion at the international level. Key global networks for smart city projects are summarized in Table 2.

Table 2. Current Indicators of Major Global Smart Cities

Network	Description
Smart Cities Council (smartcitiescouncil.com)	- World's largest smart city network - No. of participants: 120 including major global companies (e.g. IBM, Cisco, Huawei) and international organizations (e.g. IDB, ITU, ISO) - No participation by Korean companies or organizations
Smart City Expo World Congress (www.smartcityexpo.com)	- World's most influential conference on smart cities held every year since 2011 in Barcelona, along with smart city exhibition - In 2016, 420 people from 105 countries gave presentations, and 485 exhibition booths were operated. - Cooperation with global companies (e.g. Amazon, Microsoft, Huawei)
Smart Cities Innovation Summit (smartcitiesconnect.com)	- Along with an exhibition, this conference is participated by 200 cities, mainly in America. Participating Korean cities include Seoul, Daegu, Suwon, and Goyang. - Sponsored by global companies (e.g. Cisco, Intel, AT&T, Hitachi)
China Smart City Expo	- Organized by China's National Development and Reform Commission, this conference involves a wide range of government ministries. - The 2nd conference was hosted in 2017. A special session for Korea was prepared with the attendance of Korea's Minister of Land, Infrastructure and Transport and related organizations (e.g. LH) and Korean companies.
European Network of Living Labs (openlivinglabs.eu)	- This international network of living labs began as Eurocentric but recently shifted its focus to the whole world. - Participated by organizations related to living labs (World Bank, Beijing City Administration Information System and Equipment Center (CAISEC), Living Labs in Southern Africa (LLiSA), and France Living Labs) - Established in 2010, the network mainly pursues user-oriented living labs based on the public-private-people partnership (PPPP) model and shares knowledge.
Global City Teams Challenge Super Cluster	- Pursued by U.S. National Institute of Standards and Technology (NIST), and U.S. Ignite - With the goal of IoT innovation for smart cities, the super cluster encompasses six fields: transportation, public Wi-Fi, disaster and safety, energy and water resource management, dashboard, and healthcare and environment

Source
Lee et al. 2016. Strategic Direction for Korea's Advance on Overseas Smart City Markets and Network Building, Korea Research Institute for Human Settlements.

Following Europe's lead, other countries such as the U.S. and China are actively creating global networks of smart cities. Korea took a bold step relatively early in the field by opening the U-City World Forum in 2008, but the event was discontinued after its third hosting. Therefore, strategic creation and participation in such global networks are what makes the essential first steps for foreign players to land smart city projects abroad.

Even from the initial phases, Korea has pursued smart city projects systematically based on a favorable legal system. On the contrary, many countries including China, Japan, India, Vietnam and Saudi Arabia cite laws and regulations as a hurdle to the introduction of smart cities. Thus Korea's laws governing smart cities have become a benchmark in the global community, and several countries like Saudi Arabia and Vietnam have requested cooperation in preparing smart city legislation. If Korea offers consulting on legal systems and share Korea's own experience based on Korean laws and plans, it could have a positive impact on Korea's global advance abroad.

Many say reworking the framework of existing methods of exporting new city models to accommodate the adoption of the smart city concept would give Korea a competitive advantage, considering the positive track record and excellent performance of Korean players. The overseas urban development projects increasingly require application of the smart city concept. For example, LH has replaced its original design with a smart city version in a contract for a new city development project in Bolivia per request by Bolivian authorities.

Developed economies are making aggressive efforts to join smart city markets around the world. Their approach can be broken down as devising strategies, forming a global network, testing and publicizing the results based on indicators, securing successful domestic models, developing a number of business models such as PPP, and taking actions to procure public funding. The U.S. and Japan have adopted strategies that clearly aim to promote effective advances toward smart city markets abroad. Europe is at the forefront of efforts to build a global network and has shown strong results based on indicators. The U.S. also has a global network for developing solutions. Despite not leading a network, Singapore has gained global reputation as the world's top smart city by actively responding to global networks and indicator selection. Moreover, all developed economies are testing and employing various models, including PPP, to raise their chances of landing overseas projects. They are also consistently working to secure initial funds to build cities and infrastructure. Japan, in particular, has adopted wide-ranging strategies to secure official funding.

Table 3. Global Expansion Strategies for Developed Economies

Developed Economies	Developed Economies' Strategies to Advance Overseas Markets				
	Plan for Overseas Advance	Global Network Building/ Indicator-based Results Testing	Successful Domestic Model	Business Models such as PPP	Funding Solution
European nations	○	◎	◎	◎	○
Singapore	○	○	◎	◎	○
U.S.	◎	◎	△	◎	○
Japan	◎	△	○	◎	◎

Source
Lee et al. 2016. Strategic Direction for Korea's Advance on Overseas Smart City Markets and Network Building, Korea Research Institute for Human Settlements.

As targeted overseas countries asked for a range of terms and conditions, identification of those demands in advance would be necessary. China has created consortium providing platform of linkages between domestic companies and

the companies of abroad. India is not an exception in this regard where securing contracts in absence of local linkages is at challenge. With limited experience in large-scale projects, Latin American countries and Vietnam have high demand for consulting services and strategies for smart cities. Development of PPP and other business models are also essential, as all target markets approach their smart city goals from the aspect of economic stimulation. India and China are implementing pilot projects in smart cities at the national level, as are Latin American countries and Vietnam in the selected cities.

Table 4. Requirements for Host Countries Accepting Foreign Investment

Country	Requirements				
	Development Investment	Partnership with Domestic Company	Consulting & Strategy Building	Business Models such as PPP	Pilot Projects
India	◎	○	○	◎	◎
China	△	◎	○	◎	◎
Latin American countries	◎	△	◎	◎	○
Vietnam	◎	△	◎	◎	○

Source
Lee et al. 2016. Strategic Direction for Korea's Advance on Overseas Smart City Markets and Network Building, Korea Research Institute for Human Settlements.

To help Korean players effectively advance to overseas smart city markets, the strategies employed by other countries should be benchmarked to formulate a game plan based on global networks and indicators, prepare tactics to promote the success of Korean smart city models, develop business scenarios and secure funding solutions. The requirements of target markets should be carefully reviewed to foster partnerships with companies in such markets and introduce investment and development appropriate to the project type. Finally, Korea's existing strategies for smart city projects abroad should be reexamined and revised to raise practicality and effectiveness.

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IN-DEPTH LOOK 02

Strategies for Logistics System Development in Cambodia

Jonghak Kim

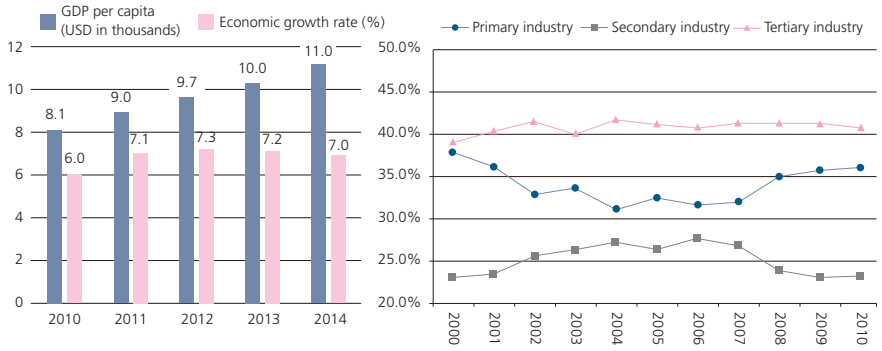
1. Cambodia: An Overview

Cambodia is a country located in Southeast Asia (or Indochina) with an area of 181,000 square kilometers and a population of 15.4 million (as of 2015). It occupies a beneficial position geographically in terms of trade, with borders on Thailand, Vietnam, and Laos. At the same time, the lack of any international port at all at Sihanoukville and the role of the port at Phnom Penh as a simple feeder remain issues to be resolved in light of Cambodia's strong dependence on external trade. Moreover, the heavy concentration of the population in the capital at Phnom Penh has caused severe residential and transportation issues in that region. Since 2000s, Cambodia has attempted to use its sewing and garment industries to achieve economic development, although poor transportation and distribution infrastructure have posed an obstacle to this. It thus needs to promote national development and encourage local economies through the efficient construction of a transportation network and other logistics infrastructure. The Cambodian government has recognized expansion of transportation and logistics infrastructure as a priority task for development of the third stage of its National Strategic Development Plan (NSDP) for 2013–2018 and pursuit of its national development strategy and is working to achieve this. Plans for distribution and transportation infrastructure have already been formulated in terms of a rail network (2014, KOICA), ports (2011), and highways (2014, China). In addition to a long-term development plan to build a transportation and logistics network connecting the Greater Mekong Subregion, the need for short-term investment plans has also emerged.

2. Cambodia's Social and Economic Conditions

Per capita GDP of Cambodia passed US$1,000 in 2013, while the economic growth rate has remained at the high level of 7 percent since 2010. Its financial balance, however, has been at around -5 percent of GDP, with a financial loss of around US$700 – 800 million each year. In 2010, primary industry accounted for 36 percent of GDP, while secondary industry represented 23.3 percent and tertiary industry 40.7 percent. Major areas of employment included agriculture for primary industry, garments and sewing for secondary industry, and tourism and services for tertiary industry. Agriculture in particular is becoming a major source of revenue for regions on the urban periphery. Because agriculture is Cambodia's chief revenue source, the industry is heavily influenced by logistics. Accordingly, the country is undertaking efforts to cut distribution costs and promote agricultural competitiveness through logistics development.

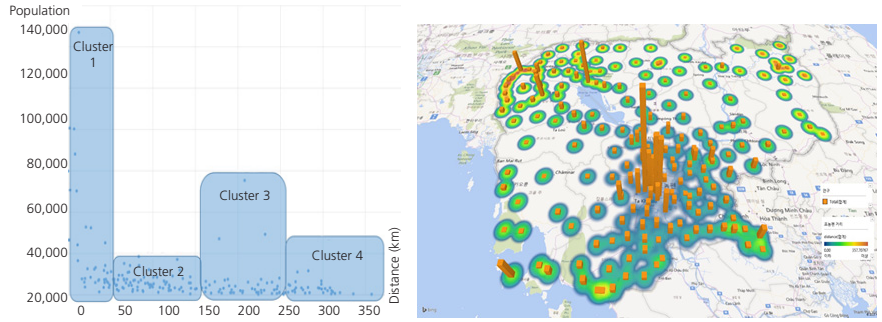
Figure 1. Economic Growth Rate and Specific Industries as a Percentage of GDP



Source
KOICA. 2013. Master Plan for Railway Network Development in Cambodia.

The Cambodian population stood at 15.7 million in 2015, with the capital city of Phnom Penh representing over 10 percent of the total at 1.83 million. Analysis of the populations of Cambodia's 194 districts in terms of scale and distance from Phnom Penh showed around 40 percent of all inhabitants within a 50km radius of Phnom Penh. Populations outside of Phnom Penh remain low. In terms of distribution, populations outside of Phnom Penh, Sihanoukville, and Siem Reap were found to be high in cities near the borders with Thailand and Vietnam (including Poi Pet and Battambang near the Thai border and Svay Rieng near Vietnam).

Figure 2. Cluster Analysis and Distribution of Population Scales and Distances



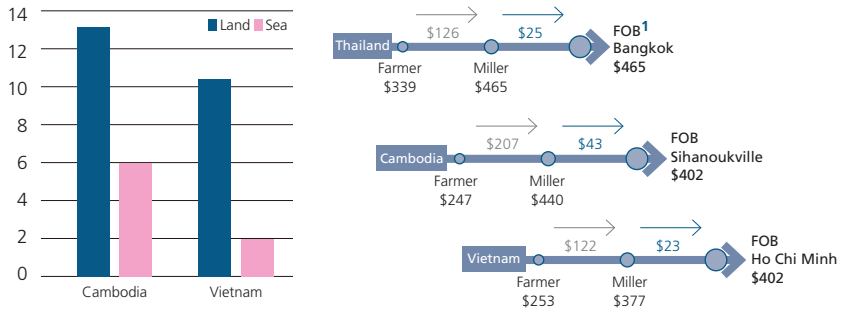
Source
Kim, Jonghak. 2016. 2015 KSP Construction and Infrastructure Policy Advising Project: a Cambodian Logistics Development Strategy.

3. Logistics in Cambodia

At US$7.8 billion, Cambodia's exports in 2012 were 16.9 percent higher than the year before, with imports also increasing by 15 percent (US$7.1 billion) over the same period. Both exports and imports have increased in direct proportion with Cambodia's continued economic growth. Cambodia's chief export and import partners are very different. Its import partners are mainly other Southeast Asian or Asian countries, with many imports from Thailand, Singapore, China, Indonesia, Korea, and Japan. Import volumes from Europe and the U.S. are very low. Due to its weak industry base, Cambodia depends on imports for most of its industrial products, and the reason for its high import volumes from surrounding countries appears to be the cost competitiveness of industrial product imports from Southeast Asia as opposed to Europe or the U.S. In contrast, China, Europe, and the U.S. are chief partners for exports. In other words, Cambodia's chief export item, rice, is exported to Europe and the U.S. rather than to other Asian countries, which manage one's own rice production.

In general, Cambodia's logistics costs are higher than those in neighboring countries. Whereas marine transportation costs US$2 for 1 tonne per 100km in Vietnam, it costs three times higher at US$6 in Cambodia; by land transportation, it costs US$13 in Cambodia, which is 2.6 times higher than Vietnam's cost of US$5. As a result of the high distribution costs, the cost competitiveness of Cambodian rice is lower than neighboring countries, even though the natural environment is favorable for rice production and production costs are low. An examination shows distribution costs of US$151 for Thailand and US$145 for Vietnam; at US$250, Cambodia's cost competitiveness is the lowest of the three.

Figure 3. Comparison of Distribution Costs (L) / Current Competitiveness in Rice Production and Distribution (R)



1 Free on Board

Source

Aldaz-Carroll, Enrique. 2014. Improving Rice Trade Logistics to Help Reach 1 Million Tons Export Target. World Bank National Trade logistics Blueprint Workshop.

To boost logistics competitiveness, a production chain from producer to consumer must be organically linked through roads, railways, and inland waterways. Cambodia currently lacks this kind of organic production chain. Improvements to its distribution conditions through future logistics policy plan formulation and infrastructure building may lead to stronger export competitiveness.

In 2012, Cambodia ranked below 120th for the level of its infrastructure; that level has increased significantly, however, and the country has recently ranked in the top 80th. Its Logistics Performance Index (LPI), which indicates logistics competitiveness, rose 46 places from 129th to 83rd in the four years between 2010 and 2014. This suggests that Cambodia's competitiveness has increased from before, and that infrastructure investment is taking place on an ongoing basis.

4. Strategies for Logistics Development in Cambodia

1) Strategy: Developing National Distribution Complexes and Development Corridors

Expanding National Distribution Complexes

Construction of national distribution complexes is necessary to reduce Cambodia's logistics costs. This irrational logistics system has given rise to side effects in the form of increased distribution costs and transportation volumes. Dependent as it is on imports for most of its industrial products and construction goods, Cambodia has an economic structure where increased logistics costs result in higher market prices, necessitating all the more efforts to advance its logistics system through construction of distribution complexes.

The six distribution complexes suggested in this study are capable of adopting a hub-spoke framework in which distribution efficiency is achieved through selection of priority bases encompassing traffic not only for individual provinces but also their surrounding regions. From regional traffic generation volume data, the following can be suggested as a general list of priorities for the six distribution complexes.

Phnom Penh ① ⇒ Sihanoukville ② ⇒ Kampong Cham ③ ⇒ Siem Reap ④ ⇒ Battambang ⑤ ⇒ Stung Treng ⑥

As a metropolitan area containing a large concentration of population and economic power, Phnom Penh ranked first on the list of priority in terms of requiring efficient volume handling. Sihanoukville ranked second because of its high port volumes and traffic with surrounding regions, while Kampong Cham was judged to rank third for its proximity to Phnom Penh, its high population, and its large traffic volumes with surrounding regions. In fourth place is Siem Reap, which has a highly developed tourism industry; in fifth is Battambang, which occupies the plains near the Thai border and has large agricultural production volumes.

Because so much of Cambodia's population, economy, and society is concentrated in Phnom Penh, and because it ranked first on the list of priorities as suggested in this study, consideration should be given to selecting a suitable site for priority distribution complex construction. As with highways, logistics is not a form of infrastructure in which construction and operation exist separately; without an efficient logistics system, such infrastructure may end up shunned by the market. Accordingly, successful construction and operation of distribution complexes requires pursuit under a public-private partnership (PPP) format. At the same time, the state should provide institution support for efficient distribution complex management through logistics standardization and informatization.

Developing National Distribution Corridors

Cambodia has a radial national trunk road network centering on Phnom Penh, with a high rate of paving for its N1 digit highways and overseas aid projects under way in various locations. Railroads are scheduled for future expansion, but visible achievements have yet to be realized. The presence of the Mekong River, among other things, offers a favorable environment for inland waterway development, but large differences in water levels between the dry and rainy seasons have resulted in few clear achievements in usage beyond the new port at Phnom Penh. Building an efficient logistics and transportation system requires shortening of travel times between the departure and arrival of cargo, but it also entails the minimizing of loading and unloading efforts for transfer between means of transportation. An efficient mixed-purpose transportation system will need to be introduced in the medium to long term through linkage between means of transportation. Today, however, construction of a mixed-purpose transportation system is less essential than construction of a systematic transportation network concentrating on single, efficient transportation means.

An advisable approach for the eight distribution corridors suggested in this study would be to determine the most suitable means of transportation for the form of cargo handled by each corridor, with transportation infrastructure to be expanded accordingly. Due to data limitations, however, the study suggests priorities for each corridor according to large truck volumes. As a consideration for priority assignment,

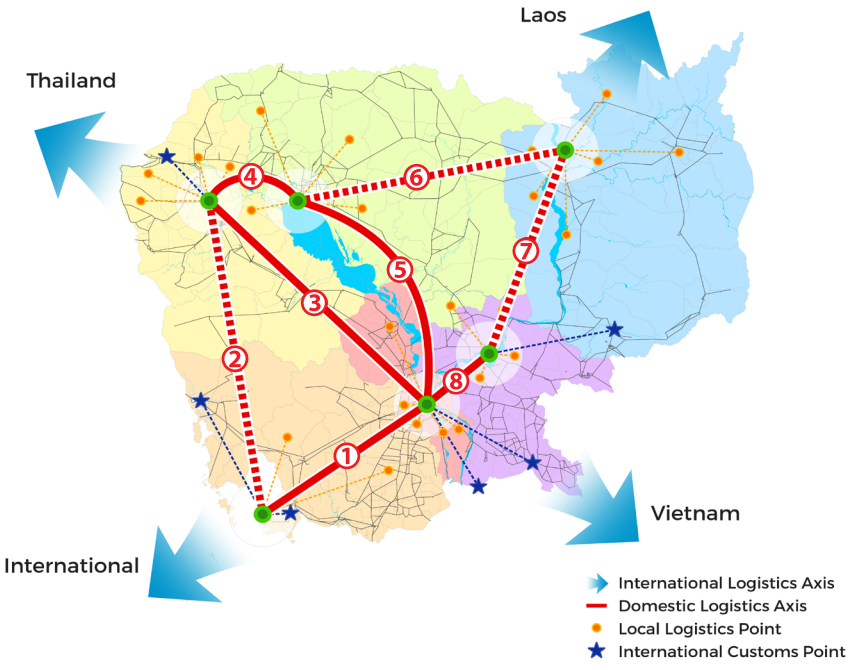
the following eight corridors were assigned priority status according to the Importance Performance Analysis (IPA) method, taking into account the two factors of transportation demand and transportation infrastructure supply level.

Corridor 1 (Phnom Penh–Sihanoukville ①) ⇒ Corridor 8 (Phnom Penh–Kampong Cham ②) ⇒ Corridor 5 (Phnom Penh–Siem Reap ③) ⇒ Corridor 3 (Phnom Penh–Battambang ④) ⇒ Corridor 7 (Kampong Cham–Stung Treng ⑤) ⇒ Corridor 4 (Battambang–Siem Reap ⑥) ⇒ Corridor 2 (Sihanoukville–Battambang ⑦) ⇒ Corridor 6 (Siem Reap–Stung Treng ⑧)

Analysis of the priority rankings for Cambodia's distribution corridors showed higher priority status for Corridors 1, 8, 5, and 3, which are linked to Phnom Penh. The highest ranking of these, Corridor 1, would connect Phnom Penh, which ranks first for distribution complex priority, with the second-ranked distribution complex at Sihanoukville. As this corridor is subject to the highest transportation demand and has the best developed infrastructure and expansion plan, it appears to be in most need of development. The second-ranked distribution corridor is Corridor 8, which connects Phnom Penh (ranked first for distribution complex development) with Kampong Cham (ranked third). Following these in priority status are Corridor 5 between Phnom Penh and Siem Reap and Corridor 3 linking Phnom Penh to Battambang.

The distribution corridors priority rankings are a reflection of supply plans for each form of transportation infrastructure (roads, railways, and inland waterways) and transportation demand for the corridor in question. They may be used as data when considering logistics aspects in future expansions of Cambodian transportation networks. As can be seen in the logistics corridor priority, the construction of a national distribution complex for the Phnom Penh region appears to be an especially an urgent issue to be dealt with.

Figure 4. Cambodia's Major Logistics Bases and Development Corridors



Source

Kim, Jonghak. 2016. 2015 KSP Construction and Infrastructure Policy Advising Project: a Cambodian Logistics Development Strategy.

2) Future Tasks

From the aforementioned strategy, four areas of tasks can be identified as requiring implementation by Cambodia. First among these is formulation of an implementation plan for construction of distribution complexes. This is arguably the most urgently needed action in achieving advancement in Cambodian logistics today. As specific steps, regions requiring priority development should be selected, with a focus on the six bases suggested in this study, and distribution complexes should be built to meet regional needs. Implementation plans for distribution complex construction can be divided into two broad types. The first comes at the planning stage, during which specifics related to complex location, functions, scale, and facilities are planned and examined through a feasibility analysis. The feasibility analysis findings provide an indication of the funds needed. The second stage is actual construction based on the details identified in the planning stage. This includes purchasing of land, actual building, sale and rental of space, and distribution complex management.

A second task is the development of logistics corridors. Once distribution complex construction is completed with the first task, logistics corridors must be developed to link the complexes together. As noted in the previous section, Cambodia has a radial national trunk road network centering Phnom Penh, which means that road-based construction of logistics corridors should be very simple. A strategy will be required in which road-based corridors are built in the short term and a multi-purpose transportation system incorporating railways and ports is developed in the medium to long term. Because distribution complex characteristics differ from one region to the next, logistics corridor development should be optimized for these conditions. A third task involves development of a logistics-related organization. Logistics necessitates participation and decision-making from a broad range of actors, including local governments, the Ministry of Industry, the General Department of Customs, the Ministry of Transport, and the Freight Forwarder Association. For each of these actors to provide the necessary decision-making and functions, a logistics organization must be developed to serve as a control tower. A fourth task is formulation of a national logistics framework plan to serve as an underpinning for all logistics policies. This would be a comprehensive plan encompassing not only the three tasks mentioned above but also the distribution industry.

Figure 5. Logistics Tasks for Cambodia and Priority Rankings

Priority status for the four tasks can be assigned in two forms. The first approach is to execute tasks ① to ③ to expand practical logistics facilities in the short term before formulation of a framework plan. The second is to implement individual tasks in sequence after formulation of a framework plan. While there is no definite answer to which approach is better, however, formulating a plan after expansion is complete appears to be a more prudent approach than deferring initial expansion until the plan is made available, especially, when greater positive effects are to be seen in national distribution complex.

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Source

Kim, Jonghak. 2016. 2015 KSP Construction and Infrastructure Policy Advising Project: a Cambodian Logistics Development Strategy.

IN-DEPTH LOOK 03

Multilateral Cooperative Plan for Building the Eurasian Spatial Data Infrastructure (SDI)

Haekyong Kang

1. Background of Cooperation in Building the Eurasian SDI

Geopolitical Importance of Eurasia and Potential Partnership

Since 2008, when the eruption of the global financial crisis spawned consequential shifts in the worldwide economy, a number of developed economies as well as Korea have realized Eurasia's geo-economic importance as a region linking east and west. Eurasia's political and economic vision is aligned with the vision of Europe, driving the geopolitical and geo-economic integration of Eurasia. This leads to strategies[1] such as plans to form the Eurasian Union (EAU) and Eurasian Economic Union (EEU) that are expected to cause the geopolitical reorganization of Eurasia and exert significant impact on the region's vision and concept of space.

As the growing politico-economic importance of Eurasia is expected to raise the region's global status. For Korea, countries in Eurasia can be partners in diplomacy and security, helping relieve tension on the divided Korean Peninsula. Korea and Eurasia can also be economic partners through shared interests, including forming a cultural community based on similar historical backgrounds and promoting economic exchanges driven by cultural similarities. Korean society will reap great benefit if Korea develops cooperative networks with Eurasian countries.

Need for the Eurasian SDI

Eurasian countries have diverse political, economic and geological characteristics, and thus a variety of data are being created and recorded without standardization. This could lead to issues over the integration of unstandardized spatial data in the region. To alleviate discrepancies, it is necessary to implement a standardized system to share spatial data so that such data effectively be of use in situations such as prevention of or recovery from natural disasters in the Eurasian region.

Governments mostly utilize a data integration framework combining various types of data based on spatial data to improve transparency of a decision-making processes. Such a decision-making process contributes to higher productivity by effectively managing national resources that impact the national economy, including land and water, safe spaces for settlement through risk management of cities, infrastructure and disasters. Eurasia's inadequate information and communications infrastructure underscores the need for a spatial data infrastructure as a catalyst to promotes convergence with other industries. This requires an integrated form of spatial data infrastructure in the Eurasian region to share spatial data for collectively responding to emergencies including disasters, boosting the efficiency of national administrative systems, and promoting economic activities.

1 Won, Dongwook et al. 2015 Geopolitics of International Transport Corridor. Korea Institute for International Economic Policy. p.51.

Necessity for Cooperation between Korea and Eurasian Countries in Spatial Data

With the Korean government's was implementation of spatial data policy over the last 20 years, academia and business sectors in Korean society have extended the bounds of their knowledge on building spatially-enabled government systems, databases, and technologies. However, the maturity of spatial data policy in Eurasian countries is still at an early stage. A powerful synergy can be developed through sharing experience, knowledge, technology, and spatial information between Korea and Eurasian countries.

For this purpose, the Korean government in October 2016 set up the Eurasian SDI Initiative, a policy consultative body to promote spatial data cooperation among governments and other public organizations. The initiative aims to support the formation of a system to share spatial data in Eurasia through multilateral cooperation and serve as a channel to share demands from Eurasian countries with the supply sectors with which the countries wish to cooperate. For this purpose, experts from major participating countries in Eurasia and the initiative have developed a draft of a multilateral cooperative plan and a guideline to operate the Eurasian Initiative.

2. Draft of Multilateral Cooperative Plan for Building the Eurasian SDI

1) Definition of the Eurasian SDI

The Eurasian SDI refers to ① the activities by the Eurasian SDI Initiative, ② the results of such activities and ③ the rational and physical bases to perform such activities to form a system for sharing spatial data in Eurasia. The types of activities are classified into four tiers. The first is the conceptual level, which sets the purpose and vision of the Eurasian SDI. The second is the component level to define the components of the Eurasian SDI such as basic spatial data (framework data), standards, data sharing platform/ clearinghouse, and so on. The third is the rational level to define the logical basis such as approaches, procedures and criteria. And the fourth is the physical level to define the physical deliverables such as systems, DBs, or services in practice including a legal framework.

Table 1. 4-Tier Model to Define the Eurasian SDI

Activities/Results/ Basis of Each Level / SDI 4-tier Model	Activities	Results	Logical & Physical Bases
Conceptual Level (Conceptual definition from perspective of purpose)	Finding joint agenda, collecting opinions, reaching agreement	Planning (vision, purpose, goal), policy agreement and evaluation	Means of communication, meetings, decision criteria, agreements, policy statements
Component Level (Structural definition from perspective of components)	Deriving business model, defining components, forming relationships, designing cooperative structure with partner countries	Business architecture, link system architectural diagrams	Business consultation, methodology
Rational Level (Logical definition from perspective of construction methodology)	Studying system of DB construction / service development methodologies	Methodology, DB model, system architecture	Technical documents such as standards, coordination of reference systems, spatial information specifications
Physical Level (Physical definition from perspectiveof practical implementation)	DB construction, technological development	System, service, DB	Operating instructions, spatial information platform

Source

Kang, Haekyong et al. 2017. Research on Support for Building Eurasian Spatial Data Infrastructure. National Geographic Information Institute.

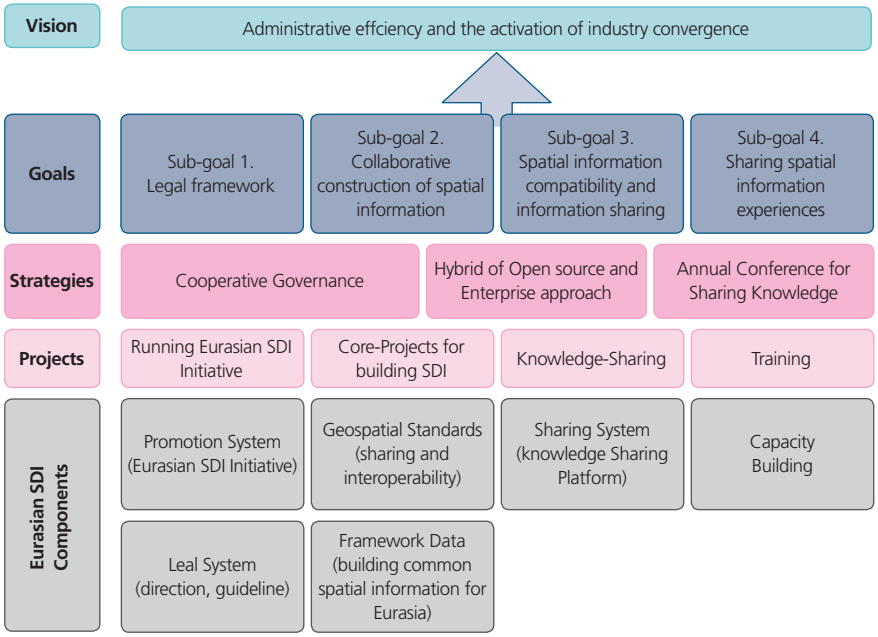
2) Vision and Goal for Building the Eurasian SDI[2]

The setup of the Eurasian SDI aims to achieve administrative efficiency and promote convergence industry in Eurasian countries. To achieve this vision, the goal for building the Eurasian SDI is to secure the five components of a platform sharing spatial data. Its sub-goals and priorities are as follows:

- Sub-goal 1: Legal framework and system for collaborative compilation of spatial information
- Sub-goal 2: Collaborative compilation of spatial data
- Sub-goal 3: Spatial data compatibility and information sharing
- Sub-goal 4: Sharing results from experiences utilizing spatial data

2 The vision and goal for building the Eurasian SDI were set in consideration of opinions from leading organizations of Mongolia, Kyrgyzstan, Uzbekistan, Kazakhstan and Korea, which signed an MOU on building the Eurasian SDI in 2016 and holding consultations with UNESCAP experts.

Figure 1. Draft Vision and Goal for Building the Eurasian SDI

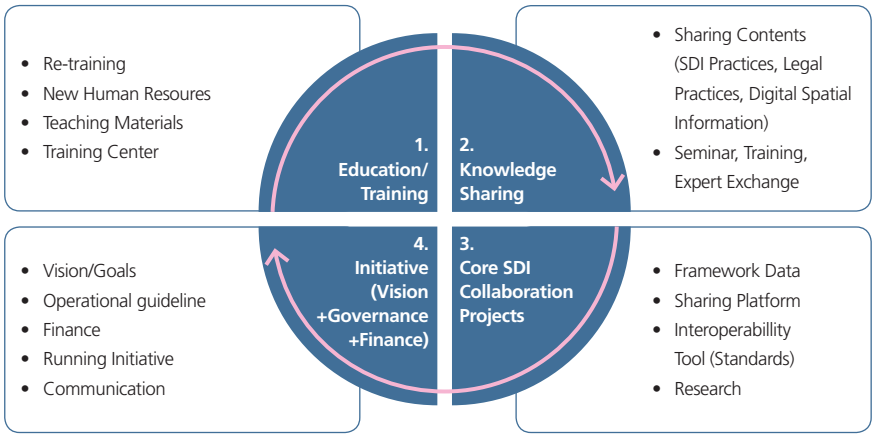


Source
Kang, Haekyong et al. 2017. Research on Support for Building Eurasian Spatial Data Infrastructure. National Geographic Information Institute.

3) Core Projects of the Eurasian SDI

The core projects of the Eurasian SDI are mainly (in order of importance) ① education and training, ② knowledge sharing, and ③ core SDI collaboration projects, and ④ management of the Eurasian SDI Initiative to set up and operate its own governance system to build the SDI.

Figure 2. Proposed Core Projects of Eurasian SDI



Source
Kang, Haekyong et al. 2017. Research on Support for Building Eurasian Spatial Data Infrastructure. National Geographic Information Institute.

4) Governance Structure to Building the Eurasian SDI

The Eurasian SDI Initiative is a policy consultative body formed under an MOU signed by governments and public organizations in Eurasia. The initiative sets principles and cooperative plans to achieve its vision and goals.

The Eurasian SDI Initiative comprises the Eurasian SDI Strategic Board, Secretariat, Strategic Advisory Group, Technical Advisory Group and Working Groups. The board makes decisions on general matters about building Eurasian SDI, especially on formulating, revising and evaluating a master plan to build SDI and sharing deliverables.

3. Conclusion and Future Research Plan

1) Conclusion

This research provides the basis for the concept and necessity of the Eurasian SDI, suggesting common policy directions, and a vision and goals for participating countries and organizations. Further implications suggest proposing a multilateral cooperative plan for the Eurasian SDI, which defines the scope of proposed activities by enabling the Eurasian SDI Initiative, including Korea, to achieve its vision and goals, thus a guideline will be provided to allow for continuous multilateral cooperative activities.

This research differentiates the Eurasian SDI by considering all of the conceptual (set a vision and goal), component (define basic spatial information and standards), and methodological and physical levels (systems and services) so that none are overlooked in building the SDI. In particular, the concept of the Eurasian SDI suggested by this research is based on Korea's own experience in building SDIs, and this is expected to serve as a framework that defines the scope of activities needed to build the Eurasian SDI.

Finally, this study suggests a draft guideline to manage the Eurasian SDI Initiative, which will play a leading role in building the SDI. Thus it will be used as criteria for the initiative's decision-making processes, such as selection of cooperative activities for building the Eurasian SDI.

2) Future Research Direction

Research on Methodology to Build the Eurasian SDI

This research defines the Eurasian SDI based on the four-tier model in consideration of the conceptual, component, rational and physical levels. It does not, however, provide details on the four tiers vis-a-vis each component of the Eurasian SDI. For instance, to secure basic spatial data, a key component of the Eurasian SDI, the study suggests that for the purpose of building the SDI, items, criteria and coordinates are needed according to the four-tier model. However, the study does not go into detail on what the purpose should be, what components and procedures should be considered in the methodology, or what the criteria should be. If the Eurasian SDI Initiative wishes to secure each component to build the Eurasian SDI, details and methodology on the four-tier model will be needed. If so, future research should handle this. If such a methodology is developed, it can serve as a good case study for other countries planning to build the Eurasian SDI.

Support for Creating Training System for the Eurasian SDI

A survey[3] conducted by Korea Research Institute for Human Settlements (KRIHS) on building the Eurasian SDI showed that training support is the top priority for participating countries. In particular, demand for retraining of high-level officials and that for technical training of working-level officials were high. If Korea supports the creation of a training system for the Eurasian SDI based on its experience in spatial data training for developing countries and its spatial data technologies, Korean technologies will gain major recognition that will open new opportunities for their use in Eurasia. So one consideration could be research on supporting the development of training materials based on Korea's experience and technology in spatial data in consideration of Eurasia's demand.

Support for Building Knowledge-Sharing Platform for the Eurasian SDI

The purpose of the Eurasian SDI is to develop a knowledge-sharing system to share spatial data. This entails preparing a framework to share all documents, activities and deliverables produced in the process of building the Eurasian SDI as well as the spatial data itself. The platform can be used as an environment under which new services based on spatial data are created in Eurasia. If Korean technology is used to build the platform, it can directly contribute to creating value activities based on spatial data as well as collecting data. Such a platform can help Korea export its technologies.

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3 KRIHS in 2017 twice sent a survey document containing 29 items to government organizations in Mongolia, Uzbekistan, Kyrgyzstan and Kazakhstan that signed the MOU on building Eurasian SDI to collect their opinions.

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GLOBAL PARTNERSHIP NEWS

2016 International Conference of Geospatial Information Science (ICGIS)

Korea Research Institute for Human Settlements (KRIHS) on Sept. 2 hosted the 2016 International Conference on Geospatial Information Science (ICGIS) in Seoul as part of the Smart Geospatial Expo organized by the Ministry of Land, Infrastructure and Transport. Under the theme of Geo-IoT and Geospatial Analytics of Big Data, the event sought to shed light on the value of geospatial information amid the rapidly changing paradigm of geospatial information technology and plan on finding the sector's latest tech trends and policy directions.

In particular, this year's conference featured a keynote speech by British scholar Paul Longley of University College London, and presentations by Steve Liang, professor at the University of Calgary (Canada); Daniel Kastl, CEO of Georepublic UG (Germany); Sakong Hosang, senior research fellow at KRIHS; Toshikazu Seto, professor at the University of Tokyo (Japan); Lee Gwang-seop, senior research fellow at Korea Railroad Research Institute, and Fernando Carrasco, Asia-Pacific partners manager at Carto. In the following discussion forum under the theme of the IoT and big data era and the future of geospatial information, participants discussed a variety of issues including linking existing IT and geospatial information, the realization of data and technology, and the importance of geospatial information.

Capacity Building Program on Housing Policy Development in Latin America

The Global Development Partnership Center (GDPC) of Korea Research Institute for Human Settlements (KRIHS) hosted Capacity Building Program on Housing Policy Development in Latin America from Dec. 6-9, 2016. Over the four-day event, KRIHS invited to this program ten officials from the National Housing Commission (CONAVI) of Mexico, the Financial Institution for Territorial Development (FINDETER) of Colombia and the National Secretariat for Housing and Habitat (SENAVITAT) of Paraguay.

Under the theme of Housing Policy Development for the Latin American-Caribbean Region, the event shared the knowledge and experience gained from Korea's economic and territorial development policies, as well as the flow of Korean land and housing policies and housing finance and rental policies. The status and challenges of the three participating Latin American countries and the implications of the Korean model were also discussed. KRIHS then announced that it plans on

offering technical and financial support and online classes through capcacity building programs and consultation to boost potential cooperation measures.

5th World Bank-KRIHS Annual Workshop

The Global Development Partnership Center (GDPC) of KRIHS on Dec. 13 jointly hosted with the World Bank the fifth the World Bank-KRIHS Annual Workshop in Washington, D.C. The yearly event had the two institutions sharing their research knowledge and project results as well as explore continuous ways of cooperation.

In this seminar, the keynote presentation was on the theme of Application of Big Data in Urban Development and Policymaking, followed by those on the application of big data to urban and regional planning, real estate and transportation. The World Bank also introduced its operations in the same fields in China and India and held a Q&A and discussion afterwards.

In the closing ceremony, KRIHS President Kim Dongju expressed hope for the continued holding of the annual workshop, and that through this type of knowledge and experience sharing, the World Bank, KRIHS and the developing world should specifically discuss tripartite cooperation measures that apply joint workshops pushed for with the World Bank and externally financed output (EFO), as well as strive to continue knowledge sharing programs with potentially high effects in development cooperation.

4th IDB-KRIHS Annual Workshop

The Global Development Partnership Center (GDPC) of KRIHS on Dec. 15 co-hosted the fourth Inter-American Development Bank (IDB)-KRIHS Annual Workshop with the IDB in Washington, D.C. The event saw both institutions share the results of their cooperative activities, big data-related research and continuous cooperation plans.

Andres Blanco, IDB Senior Specialist, then compared the economic growth and urbanization processes of Korea and Latin America. He also suggested five sectors for potential cooperation and announced the results of cooperative activities between IDB and KRIHS.

In the closing ceremony, Director Hwang Jang-hoon (Korean Ministry of Strategy and Finance, dispatched to IDB) stressed the importance of cooperation among Korea, Latin America and IDB for urban development in Latin America. KRIHS President Kim Dongju then stressed the importance of the cooperative activities of KRIHS-IDB and cooperation between Korea and Latin America in housing, transportation, national policy and governance

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Published by the Korea Research Institute for Human Settlements (KRIHS, http://www.krihs.re.kr/)

Edited by the Global Development Partnership Center
(GDPC, http://gdpc.kr/)
Tel. +82-44-960-0596
Fax. +82-44-960-4772

Designed and Produced by
Designintro Co., Ltd.
(http://www.gointro.com)
Tel +82-2-2285-0789