

Infrastructure Development in Korea and Lessons Learnt

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**Ilho Chung
Won-Cheol Yun
Chongweon Kim**



KRIHS

Korea Research Institute for
Human Settlements

TRANSPORTATION

Development outcomes

Sector	Indicator	1990(A)	2010(B)	B/A
Road	Total length(km)	5.6M	10.6M	1.9
	Expressway(km)	1,550	3,860	2.5
Railway	Total length(km)	3,091	3,378 ¹⁾	1.1
	Double track ratio(%)	27.4	43.9 ¹⁾	1.6
	Electrification ratio(%)	16.9	55.9 ¹⁾	3.3
	Subway(km)	150	537 ¹⁾	3.6
Airport	Travel(thousand/year)	407 ³⁾	527 ¹⁾	1.3
Seaport	Cargo Handling Capacity(M.TEU/year)	511 ²⁾	1,964 ¹⁾	3.8
Logistics	ICD Area(thousand m ²)	760 ²⁾	1704	2.2

1) as of 2009, 2) as of 2001, and 3) as of 1998

Lesson 1

Intensive investments have been made on road and railway construction to propel economic growth and strengthen national competitiveness since 1990s.

The central government budget allocated to transport infrastructure has increased from 2.4 trillion won in 1990 to 19.6 trillion won in 2008 on the basis of "Special Accounts for Transport Facilities Act(1994)" and "Transport System Efficiency Promotion Act(1999)"

The share of transport infrastructure investment out of total government's expenditure was 8.8% in 1990. The share went up to 15.5% in 2003, but has steadily declined to 7.6% after 2008.

Lesson 2

Concentrated investment on transport infrastructure was the driving force behind Korea's economic growth as well as a useful strategy for stimulating the economy through job and effective demand creation.

In the early 1990s, huge public investment was made mainly in transport infrastructure for the purpose of more efficient production with lower logistics cost. That was considered to contribute to overcoming Asian financial crisis in 1997.

However, the idea that infrastructure investment needs to slow down has gathered strength since the mid 2000s based on the claim that stocks of transport infrastructure has already reached at a certain desirable level.

Nonetheless, consistent investment on transport infrastructure, aiming to reduce logistics cost, has enhanced Korea's national competitiveness and contributed to export expansion and regional development.

Lesson 3

Expanding transport capacity was rated to have effects on reducing socioeconomic cost like congestion cost and logistics cost and reforming the structure of mode share.

The increase rate of congestion cost dropped from 18.0%(1991-1999) to 4.0%(2000-2007), and the increase rate of logistics cost also decreased from 11.9%(1991-1999) to 7.1%(2000-2007).

For domestic passenger traffic(person-km), the shares of road and railway were 81.6% and 15.4% respectively in 2004, and 81.4% and 15.9% in 2008. For domestic freight traffic(ton-km), the share balance was somewhat improved with the shares of 73.4% and 7.7% in 2004, and 71.1% and 8.1% in 2008.

Still, over investment in roads led to unbalanced transport system resulting in external diseconomies (cost of traffic congestion and environmental pollution) and benefit loss (possible higher return from alternative investment bundle).

Lesson 4

Long-term master plan is more important for regional development and national competitiveness than demand-responsive ad-hoc transport infrastructure supply.

"Transport System Efficiency Promotion Act" was enacted and the national intermodal transportation plan was made compulsory in 1999 to reduce inefficiency caused by individual development planning by sector.

The efficiency of infrastructure investment is enhanced by improved coordination and synchronization of subsector plans.

Lesson 5

Consistent efforts is necessary to enhance efficiency of transport investment.

Large transport projects need post-project assessment to optimize flow of benefit.

Feasibility study should be strictly applied to avoid political pressure on transport investment.

Reckless implementation of PPP Projects should be screened in advance by making pre-qualification assessment mandatory by law.

Lesson 6

Vitalizing PPP projects not only helps make good budget shortfall and but could minimize social costs with timely supply of transport infrastructure.

Transparency, regulatory framework, rationalization of incentives and competition will increase PPP efficiency.

Lesson 7

User charge scheme must be reinforced to establish sustainable transport system.

Policy of low transportation fee as a measure for price stabilization has a negative impact on travel demand management.

For transport system to be sustainable, user charges should cover minimum costs, especially for high quality transport services.

Lesson 8

By developing transport technology through heavy R&D investments, more efficient and sustainable transport system could take root.

Application of technology including IT plays a major role in developing likes of smart highway, real time traffic management, e-port and fully automated train system.

ENERGY

Development outcomes

Sector	Indicator	1990(A)	2009(B)	B/A
Oil	Refining Facilities (1,000 BPSD)	840	2,855	3.4
	Daily Refinery Runs (1,000 bbl)	842	2,433	2.9
	Operation Rate (%)	100.2	80.5	0.8
Gas	Storage Tank (100,000 kl)	4.0	61.2	15.3
	Gasfication Facilites (ton/hour)	396	9,436	23.8
	Pipe Length (km)	223.9	2,777.0	11.9
Electricity	Generating Facilities (MW)	24,056	77,662	3.2
	Transmission Line Length (km)	101.242	188,292	1.9
	Distribution Line Length (km)	599,568	1,178,501	2.0

Source: Korea Energy Economic Institute

Lesson 1

Korea has been highly dependent upon external sources of energy, but the country has managed successfully to diversify its supply.

It is important to diversify energy supply and curb oil dependence, in part through enhanced energy efficiency policies and improved policy co-ordination.

Lesson 2

During the period of rapid economic growth, the Korean government has set up the centralized master plan for energy supply and demand to support economic development.

It is essential to improve co-ordination and communication among relevant governmental bodies in order to ensure that all energy-related government policies are consistent.

Lesson 3

The government deserves credit for the market liberalization in oil sector and the ambitious reform policies in the electricity and gas sectors that will bring numerous benefits.

However, it should be noted that the market restructuring does not necessarily require privatization of the concerned corporation.

Lesson 4

Korea has introduced an independent electricity market regulator (ERC), but not yet for gas market.

It is crucial to establish an independent energy market regulator with powers and responsibilities consistent with the best practices of previously experienced countries.

In addition, it should be ensured that the regulator monitors third-party access to network infrastructure and has the power to penalize operators who do not comply with the terms.

Lesson 5

By regulating the tariffs of public utilities such as electricity and gas, the government has successfully supported the export industries and controlled the prices of commodities.

However, it became a burden for the government in that cross subsidies exist among customer classes and the public debt has been accumulated due to the unreasonably low tariffs not recovering full costs.

The government now acknowledges that cost-reflective pricing can be the most effective means of spurring efficiency, and tries to normalize the tariffs of public utilities that cannot be easily implemented due to political resistance.

WATER

Development outcomes

Indicator	1990(A)	2010(B)	B/A
Water Supply Rate (%)	54.6	93.0	1.7
Water Supply Capacity (1,000 m ³ /day)	6,756	28.455	4.2
Sewage Treatment Rate (%)	34.0	87.1	2.5
Multi-Purpose Dam's Capacity (mil. m ³ /year)	2,139	9,495	4.4

Lesson 1

Dividing authority on the water sector is not recommendable as a response to an accident of water pollution.

Cooperation is hardly expected between responsible ministries of multi- regional and local water supply. Needless conflicts over water jurisdiction are likely to happen

Originally, the Ministry of Land, Transport and Maritime had handled the entire water sector. But, it is the Ministry of Environment that have been responsible for water supply and sewage treatment except dams and multi-regional water supply since 1990 when phenol leaks polluted the Nakdong River

Lesson 2

Local governments with small population have difficulty in water supply of their own due to relatively high production costs.

In Korea, one department in a local government handles water supply.

For effective water supply, the Ministry of Environment has tried to transfer the authority from local governments to a multi-regional agency, but faces with opposition of local governments.

The biggest reason of opposition is that the personnel in charge of water supply may be deprived of their position as public official with transferring the authority to a public corporation or the private sector.

Lesson 3

It is desirable to establish water supply districts including one large city and neighboring local governments.

It is effective for public corporations to handle water supply and sewage treatment by relevant rivers rather than to manage by administrative district.

Privatization should be approached carefully. Actually, it is a better idea to put the management under a specialized agency's charge if necessary than to privatize it.

Lesson 4

Unified management by one government ministry is more desirable than divided management between multi-regional and local water supply.

Lesson 5

Proper compensation for the direct/indirect damage from designating water source protection areas to people who live in the areas.

Water use charge in Korea is one of practical examples.

Lesson 6

The policy to diversify water sources should be considered as a response to climate change.

Korea is vulnerable to climate change due to high dependence on surface water(over 90%).

Sources of surface and underground water should be secured as many as possible.

Lesson 7

It is better to construct dams and other facilities now if necessary, because the construction is likely to be more difficult with the higher national income.

Lesson 8

It is needed to seek the measures to utilize a body of water for both agricultural and domestic use.

In Korea, agricultural water is under control of Ministry for Food, Agriculture, Forestry and Fisheries. Because water quality of the reservoirs for agriculture is managed only for agricultural use, the water is unable to be supplied for domestic use. Consequently, additional water sources are necessary.

Lesson 9

It is required to raise the water charge.

The current charge for water use is around 80% of optimal one. The percentage is often less than 50% in local governments with small population. Subsidy from general accounts covers its deficiency. Consequently, lack of investment for demand management ends up increasing leakage rate and cutting the budget to replace old pipelines

POLICY IMPLICATIONS

Policy Implications

- **An integrated and centralized infrastructure policies and plans are needed in the period of economic growth and infrastructure expansion.**
- **It should be prepared to transform smoothly from the supply-oriented and centralized infrastructure policies and plans to those of market-oriented and environment-friendly mechanism.**
- **It is essential to set up a long-term comprehensive infrastructure master plan, which should be backed up feasible investment policy along with the principle of focusing and choosing under a changing investment circumstance.**
- **More effort should be given to establish well-balanced sectoral infrastructure development plan and policy.**

Policy Implications

- **It is desirable for improving investment efficiency to introduce post-assessment procedure to feedback the evaluation results to future investment plan and policy.**
- **The government should concern to enhance user charge scheme not only for sustainable infrastructure development but also for infrastructure demand management.**

THANK YOU.