

A Study on the Long-Term Investment Strategies of Social Overhead Capital

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I. Introduction

1. Background

Social overhead capital (SOC) is the basic requisite of national economic activities, which is directly related to competitive power in industry and to the quality of people's living. The improper investment and poor management system concerning SOC during past years caused the lack of SOC facilities in many areas. Furthermore, expected future environment such as: an abrupt increase in SOC demand, a limitation of natural resources, the change of both political and economical situation in and outside the country, the change of the consumers' behavior, the rapid rise of land value will make SOC problems even more difficult. Therefore it is right time to study the long-term investment strategies of SOC for coming 21st century that may provide SOC systematically and efficiently.

2. Objective

This study is based on the deep analysis of above backgrounds and past SOC policies. Through prospecting the conditions of social economy in 2000's the basic direction of SOC investment policy is established and the long term planning of an expansion of SOC is suggested.

3. Scope

2001 is the target year for this study. The main subject of study is in the narrow

definition of SOC, which is directly related to the competitive power in industry such as road, railroad, port, airport, and water supply.

II. Current Status of Social Overhead Capital(SOC)

1. Characteristics of SOC

SOC facilities are the driving force of economic development and the basic establishment for improving the level of people's welfare. Nevertheless, it is easy to neglect SOC in behalf of the short-term profit. Furthermore, nobody who enjoys the benefit of SOC facilities is willing to pay for them.

2. Current status of SOC in Korea

In comparison with increasing the individual consumption, the lack of investment concerning SOC facilities results in deteriorating people's welfare. The most parts of the SOC facilities are almost saturating from the lack of them such as road, railroad, port, airport, water supply.

Detail descriptions are as follows:

a. Road

The total length of road is 56,715km. Since 1986 the numbers of automobiles have increased 2.6 times, but the lengths of road have increased only 1.2 times.

b. Railroad

The total length of railway is 3,090.5km in 1990. Compared with 3,021km in 1961, only 69.5km has been increased.

c. Port

In 1990, the capacity of port is 346 million tons, which reaches 2.64 times in comparison with 131 million tons in 1980. Especially the capacity of container is 2.393 TEUT, which has increased over 15% since 1980.

d. Airport

In the case of domestic airline, the capacity of passenger is 110 million people a year, which has increased 13.3% since 1970 and that of freight is 182,479ton, which has increased 20.1% since then.

e. Water supply

Between the demand and the supply in water supply of 7.1 billion tons have seemed to be well balanced. However, approximately 75 percent of water supply facilities are concentrated on the area of Seoul, which results in the lack of water on the remaining countryside. Also it is hard to solve the financial problem due to cheap water price in industry.

III.SOC Investment Policies in Past Years

1. Investment results and related policies

In 1950's the investment policy was passive, which is concentrated on constructing bridges or restoring railways. In 1960, the introduction of foreign capital the stability of administration stimulated the national industrialization. In this period the 1st Economic Development Plan had been established. There were the repair of the road, the beginning of the construction of the expressway, and the expansion of the harbor facilities. In 1970's government recognized the importance of SOC investment and established the 1st comprehensive national physical plan (CNPP). Through this plan, SOC was invested in various areas more systematically. In this period the total transportation system was established by the full scale construction of the expressway, the electrification of the railroad. In 1980's 2nd CNPP was established. Even they were continuing the expansion of SOC, balanced development between regions and public services were more stressed. The expansion of the electrified railroad network and the national and local road was focused.

2. SOC investment and economic growth

Since 1960's keeping with the construction of expressway, a number of manufacturing factories have been located near interchanges of the expressway. Furthermore, each part of SOC—railroad, water, electricity—has contributed to the development of the manufacturing industry. Moreover, SOC investment gave an impetus to the creation of demand through promoting the public consumption in the perspective of short terms. And it brought about improving the economic potential of the concerned area in that of long terms.

Owing to the development of highway system, the physical distance of the country has been dramatically reduced and the percentage of water supply has increased from 74% in 1988 to 80% in 1991. As numbers of people who use subway and airplane are increasing, it results in diversifying the use of transportation. The pavement ratio of national road almost 100% in 1992.

3. Cause of SOC problems

The fundamental causes of SOC problems are the uncontrolled spill-overs and urbanization of Seoul area, and inappropriate policy of industrial location. They result in the regional imbalance, the congestion of road and port. As most industrial factories are gathered in the axis of Seoul-Pusan axis, traffic congestions in this area are

very serious. Also rapid increase in expenses of land acquisition, small amount of investment, and poor management skills brought to the waste of time and resources, decrease of export.

IV. Basic Direction of SOC Investment Policies in 2000's

In 2000's there will be the unification of South and North Korea and the activity of interchange between Korea and China/CIS. Due to the limitation of available resource, the effectiveness of utilizing resources resources will be emphasized. Technical innovation of transportation will come true. Moreover, because of the change of people's way of thinking leisure activity as well as economic activity will be also emphasized.

1. Fundamental discussions

a. The long-term development strategies of nation

The development of industrial complexes in Asan, Koonsan, Dasbool which are located in South-West Coast at axis as a front base for the interchange between Korea and China/CIS stands out the importance of link between south and north and between west and east. All road forms lattice and the opportunity of the regional development would be equalized by the enforcement of local autonomy and decentralization. The development of axes between Seoul and Pusan, between Seoul and Honam area which link to gateway system of Pusan and Kwangyang will vary the transportation network system. All country would divide into nine regions and each region will emphasize their functions.

b. Chronic problems of capital area

Capital area has been recognized as the hotbed of concentration, waste, and ineffectiveness. Despite the fact that demands surpass supplies currently, the increasing demand will make there problems even more difficult.

c. Expecting on the explosive increase of SOC demand

The quality of people's lives has been greatly improved as income increase. It is necessary to expand the facilities and system which correspond to increasing cars and the various transportations.

d. Insufficient natural resources

Financial resources of investment for SOC would be limited. Lacks of large-scale factory complex and the road space can be predicted because of the limitation of land resources. Lacks of workers and rise of labor costs result from the limitation of human resources.

e. People's basic need

The emphasis on the economic activities into the leisure activities would be

changed. The formation of the sphere of half-day life, the demand of regional development which is based on the desirable demand of country development and the extension of regional egoism would be required.

2: Basic direction of SOC expansion

Basic directions concerning SOC are the establishment of unified network for express transportation, the formation of half-day life in a nation, the expansion of supply for the satisfaction of people's basic desire suitable in the period of high income, and the formation of frame of transportation system ready for the unification between South and North Korea.

a. Road network between regions

Nine principal road networks which link east and west, 7 networks which link south and north are built in order to make the sphere of half-day life throughout the nation and to correspond to the demand of desirable country development.

b. Transportation system of metropolitan area

Transportation system of metropolitan area establishes the wide transportation network based on subway, electrified railway and express bus.

c. International transportation network coping with international trading network

New international airport in Youngjong-do would be built in overcoming capacities in Kimpo airport. Moreover, international airport would be constructed in many local cities, which stimulates the frame of decentralization. "Two-Port" system centralized on Pusan and on Kwangyang would be established to solve the limited capacity of container transport.

d. Interconnection between transportation and regional development

In the case of planning the building of new city, large-scale housing or factory complex, harbor, and airport which cause the large-scale transportation master plan concerning linking transportation system such as railroad and road are simultaneously established.

e. Managing a demand

Mass transportations have a priority to control the increasing traffic volume. The traffic demand is managed using the method of the reasonable fare and of the policy for vehicle tax.

f. Counterplan against metropolitan area problems

It is requisite to strengthen the policy which holds back the concentration of the metropolitan area in order to solve the traffic hindrance in the Metropolitan area and to expand SOC facilities. The construction of the electric railway and belt way around the outskirts of Seoul helps the establishment of the large-scale unified traffic network.

g. Financial expansion and saving the cost of investment

Expand finances, increase oil tax having direct relation with SOC, issue bonds, imported foreign capital, and expand civil capital. To save the cost of investment, try to acquire public estate and establish the concept of "all land owns by government" for protecting from rising the cost for land compensation.

h. Effective investment and stimulating the development of construction technology

In the short-term plan, utilizes the new technology and activates a turn-key based bidding. In the long-term plan, we have to consider following items: establish research and development system, construct general information exchange center, adopt co-work center between government and civilian, develop general construction technology, design standardization, automation, and rationalize integration system

V. Expansion Strategy on Each Sector

1. Road

a. Basic Direction

The principal network which can drive the 12 million cars would be built and two-port system in Pusan and Kwangyang would be established. The transportation network which can be various in the axis between Seoul and Pusan would be constructed. The long distance transportation utilizes mass transportation. The self-sufficient formation of local economic network leads to the reduction of traffic demand in Seoul and local areas. The expansion of the suburb circulation road on main cities helps decentralization. The links between metropolitan areas and East coast and leisure area would be strengthened to cope with the demand of sightseeing. The construction of south-north expressway network around the Metropolitan area prepares the unification between South and North.

b. Future Plan

The expansion of road network between Seoul and Incheon and the construction of Asan Harbor will enable it to decentralize the quantity of material mobilization in metropolitan area. The link between the west part of Metropolitan area and the Kyongbu line and the construction of the outskirt's circulation road will bring about the solution of traffic difficulty in Metropolitan area.

The development of Kyongin oil pipeline will result in the reduction of transportation demand between Seoul and Incheon. The road which links to the Youngjong-do airport makes it effective traffic network of metropolitan area.

Moreover, the link between the East Coast and the leisure area and Metropolitan area should be strengthened through the comprehensive transportation system in order to cope with increasing demand of leisure which results from the improvement of people's income.

With considering the increase of transportation demand after unifying South and North Korea, the express way will have been built 1,500km and expanded 700km, and the national road will have been expanded 5,500km and paved 100% by 2001.

2. Railway

a. Basic Direction

The constructions of express electric railway, the modernization of the existing facilities of principal road, and the scheme about the double-track system and about electrified railway system improve effective management of railway and help the expansion of public transportation facilities for the solution of the traffic difficulty in Metropolitan area.

b. Future Plan

Renovation and Electrification of the existing railroad

ChoonAng line	Electrification with double track line
ChonRa line	Renovation and electrification
ChangHang line	Electrification with double track line
KyungBook line	Electrification with double track line
YoungDong line	Electrification
ChoongBook line	Electrification
KyungBoo line	Electrification
KyungChon line	Electrification
KyungChoon line	Electrification

Construction of industrial railroad and North-South connecting railroad

—Industrial line route: Changhang-Kunsan, Asan harbor, Daebool complex, Kunsan harbor, Kwangyang harbor, Pusan harbor

—North-South connecting line route: KyungEui double line track, KyungWon, East sea coast line, Kumkang Mt. line

3. Port

a. Basic Direction

The development of harbor considered the balanced development between regions should be promoted. The specialized harbor considered on the regional characteristics should be constructed. The transition to coastal transportation of mass cargo makes the coastal shipping activated. The management of harbor would be made better by civilization and harbor investment of 3 sector method.

b. Future Plan

—The development centered on key ports for each subarea:

The Metropolitan area; Incheon, Asan

The Middle area; Kunsan, Janghang, Gojung, Daesan

The West-South area; Mokpo, Yeosoo, Kwangyang, Wando

The East-South area; Pusan, Ulsan, Pohang, Masan, Choongmoo, Samchunpo, Jinhae,
Okpo, Kohyun

The Taebaek area; Donghae, Mookho, Samchuk, Sokcho, Okgae

The Cheju area; Cheju, Seoguipo

—The specialization of harbor based on the regional characteristics:

Oil; Kwangyang, Ulsan, Incheon, Pusan, Masan, Kunsan

Cement; Donghae, Samchuk, Mookho, Kwangyang, Pusan, Masan

Sand; Incheon, Cheju, Pusan

Coal; Mookho, Incheon, Pusan, Yolsan, Kwangyang

Machinery; Kwangyang, Pohang, Incheon, Ulsan, Okpo

Limestone; Hoopo, Samchuk, Pohang, Kwangyang

4. Airport

a. Basic Direction

The construction of key international airport should be propelled to cope with the increase of international passengers and baggages. The diversity of airline network and airport should be planned through the various airline networks between Cheju-do and Metropolitan area, between the metropolitan areas, and between local areas, through the flexible management of regular or irregular airline, and through the expansion of airline network which links to sightseeing area.

b. Future Plan

Regional international airport such as new Youngjong-do airport, new East-West coast airport, Chungjoo airport, and new Cheju airport would be constructed. The old facilities of international airport would be modernized and expanded. The expansion of domestic airline facilities belongs to the expansion of multi-purpose airport facilities which can be used for military purpose, the service of helicopter for attending or leaving the office and the expansion of airline networks through equipping completely the emergency runway of inland.

5. Water resources

a. Basic Direction

The basic direction concerned with water resources contains the expansion of water supply, the improvement of water quality, the establishment of comprehensive management system about water resource, and the equipment of legislation.

b. Future Plan

The expansion of water supply and the improvement of water quality belong the restraint of water waste through the reasonable water rate, the effective division of water, the room for reservoir water of agriculture, the development of underground water and the use of river-mouth. The subject who does business of water resources would be unified, and the comprehensive development of river valley, the reasonable management, and the unification of guidance and direction would be designed. The equipment of legislation contains the guarantee of function about irrigation, flood control, and preservation, and the enactment of basic law about water resources.

VI. Discussions on Efficient Supporting Systems

1. Required investment and raising financial resources

a. Required investment

The total amount of investment necessary for the expansion of road, railway, harbor, airport is predicted to reach around 81.3 trillion won by 2001.

b. Available financial resources

Basically, it is desirable to supply SOC by government because SOC has an attribute that brings about the fails of market. But SOC investments by government cause the deficit of finance such as raising price and shrinking civil investment. So, utilizing incomes by taxation and public funds of central and local government is more efficient. As income by normal taxation has a limitation to increase, issuing public bonds would be considered. It is inevitable to relieve tax and guarantee profit for inducing civil investment. This support should be controlled by public lest it should deteriorate by a favor of certain companies.

The size of available financial sources for investing SOC during next 10 years is as follows. Total amount of taxation by 2001 would reach 455 trillion won. If considering other incomes, total income would reach 469 trillion won. In 1992, 13 percent of total income is invested to SOC, so approximately 61 trillion won can be used for financial resource.

c. The size of deficient financial resources and the way of raising

The total amount of necessary investment is 81.3 trillion by 2001, and this amount exceeded 66 trillion won of available financial resource. So deficient funds can be compensated from issuing bonds, adjusting tax rate, introducing an object tax, raising oil tax, etc.

2. Acquisition of land and requital system

a. Trend and problem

The areas of Korean public land have been increased 13.9% of annual average from 1985 to 1990. The high increase of public land is expected to continue. However, the plan on land supply by government is insufficient.

The compensation money provided for public business increases 18.3% of annual average, from 81 billion won in 1976 to 6.6 trillion won in 1990 and thus this increase of compensation money makes national budget more difficult. Moreover, the unified standard of compensation is established without considering the characteristics of construction such as road, factory complexes, dam, and harbor and thus it provokes people's complaint. Public business is entangled in interests between the central or local government, public group, and residents so that it makes the compensation period prolonged.

b. Improving plan

It is desirable that the plan on mid- and long-term land supply has a connection with local plan including the system of prior- sale right, of land bank, of prepayment, and of development utilization right. The fund which purchases public land can be added to existing budget items and it enables a regular fund to purchase public land every year.

3. Curtailment of investment on the construction

a. Trend and condition

Although there exists technology introduced by foreign country, or new one expected curtailment effect of investment developed through independent investigation, the problem on system cannot make its application. Consequently the related system and the investigation development on SOC should be established so that investment effectiveness on the fund of construction business required to expand SOC facilities would be devised. Accordingly the development on the building technology should be expedited.

b. Short-term plan

In order to make effectively on the establishment of SOC facilities and to promote domestic construction technology, related system that the existing technology can be actively utilized should be propelled.

c. Long-term plan

Long-term plan should be necessary because the large amounts of funds are consumed to establish the frame of research and development through the expansion of laboratory facilities. The acquirement of laboratory facilities is prior to the active

research and development and thus it requires the continued investment.

4. Transportation network planning of the national capital region

a. Trend and problem

The law on the plan of the national capital consolidation was established on Dec. 31, 1982, the basic plan on the national capital consolidation on July 11, 1984, and consequently the enforcement plan of the national capital consolidation of July 15, 1986. The main policy contains the control of the construction or extension of factory complex, of higher institution of learning such as college or university, of a large building.

In fact, there are many problems such as the concentration of population, the increase of the 2nd, 3rd industry, the sudden increase of traffic volume which brought about road congestion, all-day-long traffic jam, the limited capacity of the capital electric railway and the weak function of shipment by railway.

b. Future condition

The phenomenon on the concentrated population in the Metropolitan area will be more serious. The development of satellite cities around the national capital will result in broadening the living circle, and in a sudden increase of car. The traffic problem in national capital will be predicted to bring about the problem on the supply of traffic supply and on the traffic system.

c. The basic direction for minimizing the traffic problem of the national capital in near future.

The traffic counterplan of the national capital should be approached and established in the perspective of the long-term and fundamental use of the land. The new large scale facilities which result from the traffic congestion should be controlled or decentralized. The active policy on the supply of the traffic facilities such as the expansion of public transportation facilities is preferentially necessary. The continued investment for the development of the technology on the traffic management is also necessary.

d. The comprehensive analysis on the type of transportation in the near future

The service of the most roads in 2001 would be expected not to improve greatly in comparison with it in 1989. Most of all, the road situation will be worse in 2001 than in 1989 especially in the route case of Sungnam-Bundang, Anyang-Pyungchon, KyungIn, Kimpo, and the congestion of the traffic on the Namboo Circulation road in Seoul would be predicted.

Despite the fact that KyungIn and KyungSoo electric railway will be double of double-track line in 2001, its existing worse condition would not be able to be avoided.

The new KyungIn railway in conjunction with the planned Incheon subway is necessary, and another railway in KyungSoo line is needed in spite of topographical

problem. And, Kwachon line should be double of double track in order to solve the congestion of Seoul-Kuro route. Also in a long-term plan Bundang line would be prolonged to Suwon for building Suwon-Incheon railroad network in conjunction with existing Sooin, Ansan line.

In the case of building new town, interconnection point with crowding road would be avoided, and traffic distribution is considered especially on the city border line. Circulating Expressway of capital area would be constructed as soon as possible. As traffic in the south outer ring is expected to rapid increase, the more facilities would be expanded.

In case increasing the number of automobiles and the price of land, expansion of public transportation and changing stations should be strongly considered. And the utilization of waterway using KyungIn canal and Namhan river would be examined for the minimization of cost.

For maintaining the condition of 1985 in harbor 1.74 trillion won and 6.4 trillion won would be invested during 1991-1993 and 1991-2001 each.

VII. Conclusion

The continued increase of population, the development of urbanization, of industry which result from the high growth of the national economy, the car explosion brought inevitably about the fundamental change of the whole land. Therefore the realities of SOC, the reflection of the policy on the past investment, the expansion strategy and effective system which the trend of policy in 2000's keeps abreast with were discussed above.

Finally the vision of our land in 2000 s can be suggested: The propulsion of the 3rd plan on the land development and the systematic and comprehensive investment on SOC such as road, railway, harbor, airport, electricity should be promoted. After 2001, the demand of high-tech SOC such as express traffic network, information network through express communication, the city with high technology would be expected to increase rather than the fundamental demand such as the road, the factory complex.

A various kind of SOC investment—population, industry would be scattered from the concentrated population areas such as Seoul, Incheon to the outskirts area. The business complex and the high-tech industry complex would be newly established in the big cities of local area. The international harbor would be constructed in the linkage of the international sightseeing area and the high-tech industry complex that the characteristic of local areas is considered. The international airport in Youngjong-do, Cheju, Chungjoo, East-West coast would be constructed. The expansion of water, electricity, the factory complex would make the infrastructure of the company production. The equipment on the connection road and railroad network between

South and North Korea should be promoted in preparation to the activity of the trade of material and of people.

In the perspectives of long term, the framework of "cross-stripes-principal network system" which contains 9 road network between East and West and 7 road network between South and North would be constructed. The comprehensive system on transportation such as road, harbor, airport would be established. The network of express railway based on Kyungboo, Honam, Youngdong line has formed the main means of transportations for half-day lives. It will make the comfortable space of living and the well-balanced and developed country.