

民間参加型の社会基盤整備に関する考察

EMERGING NEED FOR PRIVATE PARTICIPATION IN INFRASTRUCTURE
DEVELOPMENT AND MANAGEMENT

埼玉大学 M. N. ザイヌディーン*

埼玉大学 赤塚 雄三**

By M.N. ZAINUDEEN, Yuzo AKATSUKA

Abstract: Infrastructure plays an indispensable role in economic activity and human life. The expanding economies are confronting the crisis of rising demand on one hand and fiscal shortages on the other hand. This has paved way to the private investment and operation in the sector which has been traditionally a public sector domain. This paper focuses on the traditional trend of infrastructure development and management and the provision of private sector participation with related issues.

Key Words: Infrastructure, Public Sector, Privatization, Concession

1. Introduction:

Infrastructure is a broad umbrella term used for a wide range of facilities enjoyed by the society on a collective basis, such as health and medical facilities, education, transportation, power, telecommunication, irrigation net works and the like. Attempts have been made to classify them in various categories but a clear definition is yet to emerge. However, the focus of this paper is limited to the utilities and facilities of, *power, transport, telecommunication, water supply, sanitation and waste disposal*. The term infrastructure in this paper shall, therefore, refer exclusively to these amenities. These infrastructure share many common characteristics, which shall be discussed in detail later, but in brief they are essential services for household consumption and economic activity. The development of an economy, therefore, largely depends on the provision of these services. The provision for household consumption determines the quality of life of the society while the provision for

economic activity determines the level of productivity. Considering the two distinct features, infrastructure could be categorized into two basic groups¹;

1. Public utilities: Water, sanitation and waste disposal
2. Economic infrastructure: Transport, power and telecommunication

This does not mean that the former is not essential for economic activity or the latter for household consumption. This classification only infers to the importance of these services to the relevant category.

The provision of infrastructure for a reasonable standard of living and economic growth of a society is no doubt an eminent feature. This recognition has been growing rapidly in the recent past, particularly in the developing countries. The rapidly growing economies are in dire need for expanding the services to keep pace with the growth and urbanization. Due to various problems and deficiencies encountered in the development and management of infrastructure, new methods and techniques are sought for enhancing the performance of the sector, in the developed and developing world alike.

* 理工学研究科(博士後期課程) 048-859-3828

** 工学部建設工学科教授 048-855-3565

The objective of this paper is to discuss the traditional trend of infrastructure development and management, their inherent characteristics, current issues and problems, and the provision of private participation as a solution to such problems.

2. Traditional Trend of Infrastructure Development and Management:

(1) Evolution of Infrastructure:

The need for infrastructure seem to have sprung with the emerging of the civilizations of the early human history. The needs varied in type and magnitude depending on the physical and environmental factors of the settlements and their activities. Majority of the early settlements portray irrigation networks as a key feature since agriculture was the main source of living. As the civilizations grew the need for transportation facilities also grew along with the other infrastructure needs. However, the revolution in the sphere of infrastructure was an outcome of the industrial revolution. The expanding need for industrial and urban infrastructure on one hand and the developing technology on the other hand gave rise to macro scale networks of infrastructure services.

Soon after the industrial revolution many infrastructure services had been under private control in many economies. Particularly, the railways, which were the prime mode of transportation until the beginning of this century, and the navigation had been developed and run by private sector. With widening of the economies and changing political systems, the state sector started to have more control over the economies. Between the late 1800s and 1970s most of the countries funded their infrastructure from the fiscal resources or borrowings. In this period state controlled the entire system of infrastructure spanning from planning, policy making, ownership, regulation, financing, to the task of investment, operation and maintenance. Hence, the infrastructure has been referred as a *Public Good*.

The share of infrastructure in terms of services and investment is significant. The World Development Report 1994 reports that, on an average basis, the value added by infrastructure services accounts for about 7 to 11 percent of GDP and the infrastructure investment accounts for about 20 percent of total investment and 40 to 60 percent of public investment.

The theory behind public investment and operation of public goods is that the failure of

market mechanism renders the public sector intervention a necessity. For the successful operation of market mechanism, the following conditions must be met in the market ²;

- a. Perfect competition in demand and supply
- b. Increasing costs in all industries
- c. Excludability of costs and benefits
- d. Absence of public goods
- e. Complete knowledge of products and production
- f. Complete mobility of products and factors of production

In real life markets all these conditions do not exist together at any given time. The government intervention becomes necessary to cater the imperfections and deficiencies found in the markets.

(2) Reasons for Government Intervention in Public Goods:

The absence of necessary conditions for the perfect market mechanism can cause adversities to the society and economy, if no counter measures are taken. Such counter measures need to be taken on a collective basis. Individual choice is always self-biased, hence, a central body capable of unbiased decision making and implementation is necessary to take such counter measures ensuring a fair and just market mechanism. The government is found to be the most suitable body for this function.

Discussed below in brief are the key factors that create imperfections in real life markets.

a. Externalities

To obtain an equilibrium price through demand and supply, the exclusion principle must be met with, that is, everyone but the buyer of the goods must be excluded from the satisfaction of the goods provided. But in public goods spillovers exist in positive and negative forms, thereby making others benefit from one's gain, such as in the education and medical schemes, and making others suffer by one's activities, such as air and water pollution by industries. The exclusion of non buyers rejoicing the benefits gives rise to non-rival consumption. Private markets tend to be less keen in entering into production of such goods.

b. Efficiency of resource allocation and monopoly

To prevent monopoly markets, increasing costs should be present in all markets. The absence of this phenomena results in monopolies leading to inefficient resource allocation. Government intervention in forms of regulations

and antitrust laws are essential to keep control over such monopoly markets.

c. Imperfect information of products and production

To achieve the equilibrium price, both the consumers and producers should possess perfect knowledge about each other. Lack of complete knowledge leads to misallocation of resources. Public policies are essential to overcome such misallocations.

d. Equity goals of the society

This is one of the most important factors that influence public intervention in private markets. An efficient private market may only serve the affordable sector of the economy, giving rise to expanding gap between the rich and poor, which, in the long run, could bring numerous ill effects and challenges to the society and economy.

e. Stabilization policies

The debate whether private markets stabilize economy or, the stabilization policies create stability, still remains an issue unanswered. However, majority of the economists view that some form of government control is essential for stabilization of the economy.

In context of infrastructure, the need for public sector intervention has been largely due to its inherent characteristics, both in terms of production point of view as well as provision point of view.

3. Characteristics of Infrastructure:

Infrastructure accounts for high capital investment but yields only a marginal revenue, sometimes with little profit or with no profit (or at loss), yet remain an indispensable sector for human and economic development. This feature makes the investment a challenge. The reason behind is the characteristics of infrastructure in terms of investment and operation, as discussed below in brief.

(1) Production characteristics;

These are the characteristics related to the capital investment of the project.

a. Economies of scale and scope

Infrastructure markets are of large scale and complex in nature. This necessitates high investment and sunk costs in construction favoring a single producer. The government is

considered the most eligible producer for such massive investment.

b. Asset specificity of factors of production

Infrastructure projects are often said to be *One-off-projects*, that is, they are not recurrent in nature in terms of investment. The magnitude of investment makes it necessary to employ advanced technology and high investment in plant and equipment. If these resources cannot be re-employed by the producer, such investment becomes unfeasible resulting in wastage of resources.

c. The network characteristic of the systems

Most of the infrastructure possess the network characteristic covering a location, region or the whole nation. It is not practicable and efficient for many producers to enter into such a market. The best qualified producer in such case happens to be the government.

d. Nonexistence of substitutes to enhance competition

The efficiency of private markets largely depend on the availability of competition among suppliers, the absence of which result in monopolization of markets and undue profit making by the producers. The infrastructure markets generally lack substitution, thereby making the public investment necessary to maintain equity.

(2) Provision characteristics;

From the users perspective, what matters is the quality, adequacy and affordability of services rendered by the infrastructure. The magnitude and scope of investment become meaningless if they do not conform to user requirements. Investment decision and planning should take account of the long term services to be offered. The following is an outline of the characteristics of services rendered by the infrastructure during its operation.

a. Non-excludability of consumption

It is often difficult to exclude users of an infrastructure facility once provided, as in the case of a road where direct cost recovery and exclusion of free riders is difficult except in toll roads. Inter urban highways qualify the most suitable for toll ways. In case of an ordinary urban or rural commuter road, exclusion of free riders would be a complex and uneconomical process. This feature makes the private investment unfeasible for such infrastructure, leaving the option to public sector.

b. Low rivalry

A purely private good can only be consumed by one person at a time. But some infrastructure services characterize consumption by many at a time, such as the road networks, which makes them a highly public good.

c. Measurement and cost recovery problems

It's often difficult to measure the infrastructure service provision in economic terms since it has a built-in social cost. To cater the social needs these facilities are often subsidized to the users. The cost recovery of these provisions are hard to achieve. Only the public sector would provide such services. An example would be the common user pipe water system that usually caters the squatter dwellers in urban areas.

d. Externalities and spillovers

Infrastructure services are closely linked to the physical and natural environment and possess a high degree of spillover costs and benefits, which may cause either misallocation of resources or overallocation of resources. To ensure efficiency of resource allocation and social welfare, public sector intervention becomes necessary in the operation of such facilities in the form of regulations.

e. Price elasticity of demand due to the inelastic nature of demand of basic infrastructure

Services such as water, power and transportation are essential for public use. The increase of price will not result in decrease of consumption in relative terms. Private producers can make this an opportunity to maximize profits on the expense of the users, if the government does not intervene.

The above discussed characteristics of the infrastructure have been the reason for the tradition of public sector domain in this sector. However, the issue is that even the public sector has not proven itself an efficient producer or manager in this regard. In the present days context, the public sectors of most of the economies are confronting hardships in sustaining their traditional role in infrastructure which has given rise to increasing poor performance. The common reasons of poor performance are the inefficient management and low employee morale, unmet demand, poor and unreliable services, and lagging technology. The private sector participation is emerging as a solution to this crisis. However, the fact to be borne in mind is that the private participation is not the only solution, or the best solution in all circumstances. Nevertheless, it seems a timely solution for the financially restrained public sectors.

4. The Emerging Private Sector Participation in Infrastructure Development and Management:

The private sector participation in infrastructure is not essentially a new trend. As mentioned earlier, in the post industrial revolution era, most of the infrastructure such as canals and railroads were financed and built by the private sector. Though the public sector gradually took control, still many large scale and specialist projects were handled by private sector under concession or franchise arrangement. France was the pioneer of concession contracts³. This trend spread to the other parts of Europe as well in the mid 19th century. The Suez Canal, opened for international navigation in 1869, was a 99 year concession contract awarded to the Suez Canal Company by the Egyptian government to build and operate the canal. In the late 1970s, due to the increasing fiscal burden of the states and the rapidly rising demand for infrastructure, both in developed and developing countries, the governments were compelled to seek innovative methods for providing the infrastructure. Consequently, the private sector participation was sought in many forms, ranging from contracts to full ownership.

The choice of the form depends on the institutional and political framework. Bringing in the private sector is to enhance the input of one or more of the following three factors,

- a. Management
- b. Technology
- c. Finance

Though the former two reasons are identified vital for the improvement of the services which determine the productivity, the main reason for increasing private participation is the lack of finance for new investment as well as for operation of existing utilities. Private sector involvement occurs in two levels in the sector;

- a. Institutional level
- b. Project level

(1) Forms of Private Participation at Institutional Level:

a. Privatization of management

This often is hiring the management staff on a contract basis, principally for improving the management to promote the productivity of the organization.

b. Privatization of non-core assets and activities

The purpose here is to reduce the burden on the management on non-important areas so

that the management could concentrate on the main activities.

c. Partial privatization of equity

The objective here is to bring in some measure of private participation so that the management system of the organization could improve, and it would, to some extent, resolve the financial burden.

d. Privatization of core business

This is the most popular form at present. This means divestiture or sale of 51% or more of the assets of the organization to the private investors. In the 1980s the British government commenced a programme to privatize many of its nationalized industries, such as gas, steel, oil, water, electricity, telecommunication, air lines and airports, and was followed by many countries. However, in some countries such as Japan, certain infrastructure services remained in private hands throughout major part of the history⁴.

According to a World Bank statistics⁵, about one third of all the divestiture revenue of developing countries between 1988-92 came from infrastructure assets. This shows that, among the public sector entities, infrastructure related entities are the ones that face crucial problems.

e. Formation of new private enterprise

This is possible only in the case of services for which the new private ownership is made legal.

(2). Forms of Private Participation at Project Level:

Concession contracts are the widely adopted form. A concession is *an arrangement whereby a private party leases assets for service provision from a public authority for an extended period and has responsibility for financing specified new fixed investments during the period; the new assets then revert to the public sector at expiration of the contract* (World Development Report 1994).

Concession contracts can be of many different types as enlisted below⁶;

- a. Build-Operate-Transfer (BOT)
- b. Build-Own-Operate (BOO)
- c. Build-Own-Operate-Transfer (BOOT)
- d. Build-Transfer (BT)
- e. Build-Operate-Lease (BOL)
- e. Build-Transfer-Operate (BTO)
- f. Build-Own-Operate-Subsidize-Transfer (BOOST)
- g. Build-Rent-Transfer (BRT)
- h. Build-Lease-Transfer (BLT)

- i. Revenue Sharing Agreements (RSA)
- j. Rehabilitate-Operate-Transfer (ROT)
- k. Rehabilitate-Own-Operate (ROO)
- l. Contract-Add-Operate (CAO)
- m. Develop-Operate-Transfer (DOT)

The main difference between each other is the legal aspects related to rights and liabilities of the parties. Among them the BOT type concessions are the mostly adopted form. The references on written literature are found mostly on this type of contract. This was in operation in the 19th century in many countries as mentioned before, but was re-embarked at Turkey in the 1970s. At present numerous BOT contracts are in operation, but all of which are still at an infancy stage. The Philippines is the most successful in this type of projects. BOT contracts served a timely solution to mitigate the severe power shortage the Philippines was confronting in the late 1980s and early 1990s. Though at present these projects seem successful, the long term costs and benefits are yet to be observed. Already complains are arising from the domestic sector about high cost of electricity, and from the private sector investors that due to high cost of production they find it difficult to compete in the international market.

At an era of increasing fiscal burden and deteriorating public sector performance, the private sector investment in public dominated sectors bring many advantages, but this does not mean that they are not without many adverse effects on the society and economy. Some of these factors are discussed below in brief, from the user perspective.

(3) Advantages:

- a. Provides a wider access to capital.

Infrastructure investment accounts for high capital investment and become the most vulnerable tool of regulatory changes by the political system of a country. When the economies are restrained with budgetary problems, since the consumption and services sectors cannot be restricted, the governments tend to restrict their budget on investment sector, where infrastructure happens to constitute a substantial proportion.

- b. Brings in better management skills, enhance higher efficiency and lessens wastage of resources.

The critical problem with the running of public sector entities are the poor performance as a result of high degree of bureaucracy and low employee morale. The bureaucracy leading to job security disregarding performance and lack of

motivation leads to poor employee morale in the public sector. The management of such entities therefore, remains inefficient. The private sector is profit oriented, which leads to performance oriented management and higher efficiency. Hence, the wastage of resources are comparatively less in private sector.

c. Gives access to advanced technology.

Again the high degree of bureaucracy and high level of unqualified and untrained staffing combined with the shortage of capital in the public sector makes it difficult to promote the existing technology. But the performance oriented private sector always tends to tap the advanced technology.

d. Promotes faster implementation of projects.

The reason here too is the time consuming bureaucratic procedures and employee morale which makes the project planning and implementation often a crawling process, whereas, the motto in private sector, *Time is Money*, makes the process quite faster.

e. Reduces the fiscal burden of the state and the demand for public capital.

When the burden of a high capital investment sector such as infrastructure is eased out, the public sector's budgetary allocation becomes less tedious. The reduced demand for public capital by infrastructure sector will also make it possible to allocate that capital on other social infrastructure such as health and education.

(4) Disadvantages:

a. Sufficiency of supply cannot be ensured.

The private investment takes place where profit on investment and continuity of operation can be expected. The public utilities such as power, transport and telecommunication characterizes substantially higher demand during peak hours to that of off-peak hours, but the private investment may not cater for this peak demand at an affordable price to the users.

b. Pricing may be too high, specially for the lower income sector of the economy causing equity problems among users.

The private sector always aims at maximizing profits, thus may charge high price where the poor sector of the society may find itself deprived of the services.

c. Possibility of retrenchment of employment.

In case of divestiture, the new entity may not guarantee the employment of existing labor force, which could lead to labor unrest.

d. Inequality of distribution of services among regions.

The private sector is motivated to invest on high revenue yielding regions. Lack of investment is likely to occur in lesser revenue generating regions. The users of such regions would be deprived of the benefit of the services.

e. Political interference leading to corruption.

The large capital involvement makes this type of deal very attractive for the politicians for self gains. Unless clear and transparent procedures are adopted, individual gains on the cost of public interest cannot be avoided.

5. Issues and Problems:

As discussed previously, though the private participation foster many advantages, it also has many adverse effects. However, the booming economies are forced to promote private participation due to the emerging need so that they could sustain the economic growth and cater to the growing social needs. Hence, measures should be taken to address the issues and problems with respect to the private entry to the sector.

The concept of privatization, though adopted worldwide, continues to face resistance among the public. The *UNDP Human Development Report 1993* identifies seven deadly sins of privatization. These are; the reason for privatization with short term objectives, the wrong environment where the government continues to interrupt or provide no anti-trust laws, corruption among politicians, financing budget deficit by selling public enterprises, poor financial strategy to envisage optimum revenue and protection of national interest, poor labor strategies and absence of political consensus. It also reports that these sins are the outcome of privatization within the wrong framework and without a human development purpose in mind.

In the text titled *Privatized Infrastructure-the BOT approach* (Ed. C. Walker & A.J.Smith), 120 BOT projects, known by early 1995, have been enlisted along with their status core. Table 1 gives a brief summary of this statistics.

This statistics, however, does not cover all the countries or all the projects, though it covers a wide range of projects globally. For example, in Sri Lanka many BOT projects have been finalized⁷. The above statistics does not cover any project in Sri Lanka. Likewise there may be many unreported projects, and numerous projects which are likely to have emerged after the period stated.

Table 1 Summary of BOT Projects

Project Status	No. of Projects
In Operation	35
Under Construction	33
Proposed	30
In Negotiation/Tender	11
Status Unknown	2
Abandoned/Withdrawn	4
In Contract Formulation	5
Total	120

Among this long list of projects, no single project has reached the expiration of the contract or rivet back to the government. The success of a project on an overall socio-economic scale could only be judged after the expiration of the concession. The first designated BOT project, the Hong Kong Cross Harbor Tunnel, opened in 1972, is to reach the expiration in 1999, and is reported to be successful from all parties perspective⁸. There are reported projects of failure too. The Bangkok expressway which is in operation, was contracted on a BOT basis and subsequently taken over by the government at the time of opening due to the disagreement between the contractor and the Thai government on toll charges.

The analysis and allocation of the risk factor is the core issue in structuring a BOT contract. The political risk seem the uppermost risk factor. The first recorded concession, a water distribution project in France, awarded to the *Perier Brothers* in Paris, came to a halt during the French revolution and the Suez Canal project ceased with the Suez war in 1956⁸. The Bangkok expressway too is a failure due to political crisis. Hence, the stability of the political background of the country becomes the most important criteria for the success of a BOT project.

The choice of the form of private participation is influenced by several factors, namely the political perspectives, institutional performance, resource availability, prevailing demand, and the social background. The advantage of concessions over private ownership is that the government could maintain better control over the former and assure a higher degree of national interest. An important issue to be considered in concessions is the transfer of ownership to the government at the end of the contract period. By this time the asset may have depreciated substantially requiring rehabilitation.

The key factors in the context of success in both types of private participation are identified as; the presence of an unbiased and stable political background, a sound legal framework, clarity in laws and regulations, strong domestic capital markets providing credit facilities, the opportunity for floating the project on a local stock market, easy and speedy processing criteria, a fair risk sharing basis between the government and private sector, and the incentives available for providing attractive returns and protection of investment⁹.

6. Conclusion:

The provision of infrastructure services has close links to efficiency and growth of an economy, poverty alleviation and environmental protection. The growing world economies are forced to expand their infrastructure. According to a World Bank estimate the developing countries invest \$200 billion in infrastructure annually¹. The demand seems particularly severe in the fast growing Asian countries. The Asian Development Bank estimates that the infrastructure investment demand in Asia over the next decade is above \$1 trillion⁹. The traditional role of public sector in infrastructure is also changing with the growing demand and increasing deficiencies in the prevailing system. The private sector entry is continuously gaining importance since it provides solutions to the shortfalls in the sector. However, it should be noted that the government's role still remain significant. According to the World Bank, the private financing in infrastructure in the developing countries is about 7% and is expected to double by the end of the century¹. As the private sector involvement grows, the role of the government is shifting from development and operation to care taking.

The government has the responsibility to ensure proper analysis of social costs and benefits in privatizing the infrastructure. Regulations need to be imposed for safeguarding the user interests. It is also expected to provide guaranty for the risks the private contractor is taking. The national security should be protected in entrusting public utilities to private investors, particularly to foreign investors.

The initiative of the government in enhancing the domestic market conditions attractive to private investors, enforcement of a sound legal framework, assurance of sound political and economic environment and promoting a healthy financial sector are some of the key aspects in ensuring success of private participation.

However, it is still too early to make concrete conclusions about the private participation in the sector. Only with the process of time that the success and failure in the social interest could be observed. A sound framework drawn between the government and investor on the user interest is likely to bring fruitful outcomes, if the barriers in the path of achieving this are tackled with caution and intelligence.

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