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# Infrastructure Financing and Cost Recovery Options

## International Experience Applicable to Thailand

March 1991

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# **INFRASTRUCTURE FINANCING AND COST RECOVERY OPTIONS**

**INTERNATIONAL EXPERIENCE APPLICABLE TO THAILAND**

**March 1991**

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## ABSTRACT

### *Infrastructure Financing and Cost Recovery Options: The International Experience Applicable to Thailand*

This working paper, funded by USAID-RHUDO/Bangkok, was prepared by PADCO in March 1991 to assist the Royal Thai Government National Economic and Social Development Board (NESDB) to assess the applicability of relevant mechanisms for calculating, allocating and recovering the capital cost of infrastructure from public and private sources. As a sister study for the NESDB on *Infrastructure, Property Tax Mechanisms and Regulatory Instruments for Growth Management*, this working paper is one of several inputs by PADCO and the Land Institute Foundation (LIF) under NESDB's Study of Options for Financing Infrastructure Expansion (SOFIE). The NESDB SOFIE will identify how fiscal and non-fiscal measures could be used by the Bangkok Metropolitan Area (BMA) and other local governments in Thailand to deliver infrastructure to priority areas.

The paper identified several alternative financing methods used in developed countries that could be utilized in Thailand, including integrated tax structures, bonded debt, special districts, and property taxes based on market value. The primary criteria for ultimately selecting the top 19 methods were efficiency, equity and implementability. However, since these methods reflect prevailing conditions and circumstances in the countries where they were used, the paper underscored the need for some modification of these methods prior to their being transferred to Thailand. In addition, the paper found that the effectiveness of these methods could be enhanced when linked with decentralization, privatization and overall resource management policies and processes.

The working paper contains three sections. Section 1 defines the current international experience and the predominant trends associated with infrastructure financing and cost recovery. Section 2 categorizes and describes 19 specific infrastructure financing and cost recovery options that have been used throughout the world and which are candidates for implementation in Thailand. Finally, Section 3 contains PADCO's recommended list of infrastructure financing and cost recovery options over the short, medium and long-term for consideration by NESDB as policy inputs to the Seventh Plan.

*The views expressed herein are those of the authors and do not necessarily reflect those of the Office of Housing and Urban Programs*

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# FOREWORD

This working paper, *Infrastructure Financing and Cost Recovery Options: International Experience Applicable to Thailand*, has been prepared by PADCO to assist the National Economic and Social Development Board (NESDB) to assess the applicability of relevant mechanisms for calculating, allocating and recovering the capital cost of infrastructure from public and private sources. The working paper is one of several inputs by PADCO and the Land Institute Foundation (LIF) under NESDB's Study of Options for Financing Infrastructure Expansion (SOFIE).

SOFIE will identify how fiscal and non-fiscal measures could be used by the Bangkok Metropolitan Area (BMA) and other local governments in Thailand to deliver infrastructure to priority areas. These measures could act either as incentives to private investment or disincentives to limit growth, depending on a local government's specific development objectives or resource constraints. In fact, it is anticipated that a number of these infrastructure financing options could work together to achieve local master plan objectives. Using such incentives for plan implementation will enable local governments to respond more strategically to development alternatives and to utilize with greater impact the limited financial resources available to them.

The working paper contains three sections:

- Section 1 defines the current international experience and the predominant trends associated with infrastructure financing and cost recovery. These are discussed in the context of NESDB objectives to identify viable policy options for infrastructure financing in Thailand.
- In Section 2, we identify, categorize and describe nineteen specific infrastructure financing and cost recovery options which have been used throughout the world and which are candidates for implementation in Thailand. To facilitate review and subsequent cross-reference to other working papers, each of the nineteen options is presented on a single page using a standard format:

1. Taxes	11. Exactions
2. User Charges	12. Assessment Districts
3. Betterments	13. Land Readjustment
4. Bonds	14. Valorization
5. Loans	15. Excess Condemnation
6. Special Districts	16. Linkage
7. Tax Increments	17. Concessions
8. Impact Fees	18. Joint Use Agreements
9. Connection Fees	19. Tax Credits
10. Capacity Allocations	
- Section 3 contains our recommended list of infrastructure financing and cost recovery options for consideration by NESDB as policy inputs to the Seventh Plan.

# SECTION ONE

## INTERNATIONAL EXPERIENCE AND TRENDS

### 1 OVERVIEW

Responding to the demand for basic physical infrastructure (i.e., water, sewerage, roads and drains), whether to satisfy the service requirements of individual consumers or to support community growth and economic development objectives, is one of the fundamental roles of regional and local governments throughout the world. In developed countries, capital markets for tax-exempt bonds have provided a ready means for these sector entities to distribute the large initial debt for constructing new capital facilities over future time periods (typically 20-25 years) and to service that debt through a variety of conventional cost recovery mechanisms such as property taxes and user charges.

Over the past several years, however, because of the financial pressure that tax-exempt financing has exerted on the public treasury, some developed countries (including the United States), have been forced to "ration" the use of tax-exempt bonds, reserving them for high-priority public purposes. In response, national, regional and local governments have moved beyond conventional financing methods to "creative" and, at times, speculative approaches to raising capital. However, governments have in general expanded their capital financing and cost recovery options without exposing public resources to undue risk.

In many developing countries, the coexistence of extensive infrastructure deficits, extraordinary rates of urbanization and few capital financing options have motivated national policy analysts to reexamine which level of government should be responsible for the provision and financing of infrastructure and how financial and non-financial tools could be used to maximize the benefits of capital flows from public and private sources. Broad policies such as decentralization, local management improvement, privatization of municipal services, development lending facilities and environmental regulation (for both capital cost recovery and land management purposes) are all examples of this policy examination. Such policies may contribute, in one way or another, to the goal of obtaining the capital needed to finance infrastructure for community and economic development purposes.

### 1.1 EXPERIENCE IN DEVELOPED COUNTRIES

In developed countries, including the newly industrialized countries of Asia, the financing of basic infrastructure for community development purposes is a responsibility of national, regional and local governments. Investments for economic development objectives may include direct financial participation by national agencies or, more typically, indirect incentives through subsidies, guarantees or tax concessions. Financing instruments include loans, bonds, notes and other "contracts" which are freely traded by private corporations and individuals through well-organized capital markets.

The following discussion describes the principal policies and financing tools used in developed countries to finance infrastructure and recover the capital and operating costs associated with the provision of public services.

### 1.1.1 Integrated Tax Structure

Some of the most important incentives to infrastructure financing in developed countries are found in national tax codes. These structural provisions authorize a special treatment for "public" debt instruments acquired by private investors. In the United States and in many European countries, interest earned on this type of investments is exempt from taxation as earned income and/or as capital gains (unearned income). The availability of this tax shelter has enabled public debt issuers to attract private investment at relatively low levels of interest. The debt service payments of the government are, therefore, less than would be required if the true economic costs of capital (i.e., actual market rates) were imposed. Both taxpayers and investors benefit under this arrangement, although the progressive extension of this tax advantage to speculative and "non-public" purposes forced the United States Congress, in 1986, to limit the use of tax-exempt privileges.

States and local governments now operate within an aggregate debt ceiling designed to force priority use of tax-exempt financing. Because of limited access to tax exempt instruments, many private investors have been "forced" to place their capital in taxable instruments. Consequently, the tax losses to the national government have been reduced. The concern of State and local government officials that the change in national law would make the tax-exempt market less competitive and exert upward pressure on interest rates has not yet materialized. England and Germany, among several other European countries, permit local governments to finance infrastructure through tax-exempt instruments and allow investors to shelter a portion of their income from ordinary taxes.

In addition to tax exemption, national laws provide special accounting treatment for expenses incurred by private developers. First, the future repayment of construction loans for on-site infrastructure is treated as a current expense of the developer for purposes of calculating profit. As a consequence, most developments reflect a "paper" loss for many years after construction even while achieving a positive cashflow and substantial capital appreciation. Accordingly, it has been relatively easy for developers to incur the initial cost of infrastructure and still generate a positive rate of return. Second, accelerated depreciation benefits are available to developers. This permits the private investor to increase project expenses and, purely from a profit-and-loss perspective, reduce the tax exposure of the project.

Tax advantages associated with the cost of infrastructure are also available to property owners in the United States, a fact which makes it easier for the cost of infrastructure to be passed through to homeowners, either in the purchase price of the property (if the infrastructure is provided by a private developer) or through property taxes to service public sector debt. Both mortgage interest and taxes paid to States and local governments are deductible for the purpose of determining income tax liability. The mortgage interest deduction is an indirect subsidy to the U.S. banking industry which has been government policy since the economic recovery programs of the 1930s.

Each of these examples of direct and indirect incentives for infrastructure financing depends on an integrated tax policy. The national tax codes must provide the means for developers, homeowners and local governments to pass through the cost of infrastructure to the broad-based national tax system. In developing countries, the absence of a viable "local" government has reduced the need for an integrated tax policy. Relatively inefficient national tax collection procedures in many countries would appear to reduce the benefit of an integrated tax approach. Therefore, only those countries that are capable of undertaking broad reforms of the total tax system would benefit from a structural approach to infrastructure financing.

### 1.1.2 Bonded Debt

Regional and local governments and public enterprises in many developed countries are authorized to incur long-term debt to finance the construction of needed capital facilities, including basic infrastructure. These debt obligations are secured by a "bond", a specialized and legally enforceable contract entered into by the issuing authority (i.e., the government entity or public enterprise) that guarantees repayment of the debt from the proceeds of a stipulated revenue source. The rate of interest for the bond will vary according to the following key factors:

- Type of debt/Ability to repay
- Maturity/useful life of the facility financed
- Creditworthiness of the offeror
- Prior experience
- Other risk factors
- Rating of the bond

This overall evaluation is first made by the government or enterprise through its regular capital planning, programming and budgeting process. After determining the project's financial, economic and social feasibility, a prospectus is prepared and offered for consideration to an institution which "rates" the bond. The rating will establish the interest rate which the rating agency believes the market will require to compensate for the risk involved in purchasing the debt instrument. Since the factors used to rate the bond are important aspects in a decision on whether the experience of developed countries could be applied in Thailand, a short description of each follows.

- **Type of debt/Ability to repay**

There are basically two forms of bonded debt incurred by governments and enterprises: **general obligation bonds** that are backed by the "full-faith-and-credit" commitment of the offeror to repay the obligation from any and all sources of revenue; and **revenue bonds**, which are secured by the revenue stream of the bond-financed project and therefore represent only a limited liability of the offeror. General obligation bonds work best in jurisdictions with a strong and diverse tax base as demonstrated by the percentage of annual operating and capital expenses "covered" by tax revenues. Revenue bonds are used for commercial operations (called "trading" activities in England) with a public monopoly and a defined consumer base. Water, sewerage and electric utilities are frequently financed by revenue bonds, as are public markets and facilities such as parking lots, toll roads and other transport-oriented facilities. The bonds issued under a tax increment financing arrangement are a form of revenue bond financing, although the revenue stream to service the debt is property tax proceeds rather than operating revenue from a public facility.

Regional and local governments in Thailand do not have authority to raise taxes or establish user charges at levels sufficient to service long-term debt. Only the title transfer tax (a potentially valuable source of revenue if the actual transaction price were taxed) represents a source of legally authorized revenue for local governments to use for debt servicing. Regional governments have no comparable independent sources of tax revenue.

- **Maturity/useful life of the facility financed**

This is a correlation between the "useful life" of the facility and the term of the bond itself. For general obligation bonds, the maximum term is often set by law or precedent for each type of facility. Roads, for example, may have a maximum useful life of fifteen or twenty years depending on classification, while public buildings (such as schools or office

buildings) may have an anticipated useful life of thirty years. This determination will vary from country to country. For revenue bond financing, the relationship between useful life and bond term is a fundamental factor in the investment decision itself, being a measure of the risk and quality of the bond. In this case, the term of the revenue bond should not exceed the useful life of the facility, since the dedicated revenue stream assumes an operational facility.

- **Creditworthiness of the offeror**

This factor is a consideration of the overall financial position of the offeror and a projection of the economic vitality and development prospects that can be reasonably anticipated within its jurisdiction. The initial assessment of creditworthiness is typically made by the offeror as part of the process of preparing a prospectus. The following outputs from that analysis are packaged and presented to the rating agency: existing debt and annual debt service requirements, tax collection history and trends, operating and capital budget data, key financial performance ratios, identification of major commercial and industrial taxpayers by type and economic status, and growth factors such as building permits or value of new construction. Other factors to demonstrate creditworthiness may also be included by the offeror or required by the rating agency. Strong positive trends in tax collections and the absence of budget deficits over the past five years are critical determinants of creditworthiness.

- **Prior experience**

The credit repayment history of the offeror is a critical factor in the evaluation process. Not only is the official debt and repayment history of the government or enterprise of concern, but unofficial debt (such as the obligations of special districts within the jurisdiction) which the offeror may have a "moral obligation" to assume in the event of default, will also need to be evaluated. In many countries, overlapping jurisdictions are a common occurrence. In some cases, the debt position of "private companies" (such as water authorities in England and France) may also be a factor in the assessment of the offeror's experience since the offeror may have long-term contractual or moral obligations to continue the service in the event of default. Debt guarantees by the offeror may exist under past or present public-private development agreements.

- **Other risk factors**

A consideration of other risk factors is especially important when revenue bond financing is contemplated. Standard and Poor's rating criteria include the specific consideration of "susceptibility to the adverse effects of changes in circumstances and economic conditions", while Moody's will offer only a **Conditional** rating for facilities "unseasoned in operating experience". Many urban development projects in the United States have been financed through revenue bonds issued by a public offeror, usually the city itself, but dependent on a percentage of gross rents paid to the private sector developer/owner. As the rental market in cities has declined, these bonds have apparently been repaid from ordinary revenue or other borrowings to avert default.

- **Rating of the bond**

This is an objective evaluation of the bond, the facility and the offeror by a qualified agency with a broad perspective on regional and local governments throughout the country. The two principal rating agencies in the United States are **Moody's Investment Service** and **Standard and Poor's**. The offeror's bonds are rated according to their investment grade, with higher rated bonds earning lower relative interest rates. "Non-investment grade" bonds (e.g., bonds rated as Baa, Ba, B, Caa, Ca, or C by Moody's) are considered speculative in nature and entail higher interest costs for the offeror.

Bond financing for local infrastructure is an accepted practice in many developed countries. The abuses associated with some aspects of revenue bond financing have been corrected, in large part, although they still represent a much greater risk than the more conservative, general obligation bond approach. Thailand could consider this financing option as a medium-term solution (say, after 1995) to the issue of infrastructure financing. The principal benefit to Thailand would be the ability to spread the cost of infrastructure over a much longer period and therefore satisfy both community development and economic development objectives.

### 1.1.3 Special Districts

One of the mechanisms used in developed countries for infrastructure financing is the creation of either a) independent districts with separate bonding authority; or b) separate "financing" districts such as special assessment districts and tax increment financing districts. The former is an institutional device, since the independent district usually has its own governing board and statutory authority to incur debt in its own name. The latter is a temporary and strategic approach to capture the financial benefits of a designated geographic area for the purpose of recovering the financial costs of infrastructure provision.

Special districts constitute the largest and fastest growing segment of local governments in the United States. Both single purpose and multi-purpose districts have been established, with functional responsibility for housing/redevelopment (the most common with more than 10,000 districts), fire protection, water, sewerage, education and transportation being the most frequently organized single-purpose districts and the combination of water/sewerage (including sewage disposal) being the most prevalent form of multi-purpose district. Based on research by the Urban Land Institute (ULI), there were nearly 29,000 special districts in the United States in 1982. Utility districts (water distribution and electricity) had the highest level of expenditures, revenues and debt. More than \$23 billion in outstanding debt was attributed to utilities.

According to the ULI, the following are the principal advantages of special districts:

- alternative source of financing
- linking costs and benefits
- efficiency of service delivery
- independence from politics

Disadvantages include fragmentation and proliferation—with attendant decline in the capability of general purpose governments to finance other services—as well as a reduction in citizen awareness and accountability. Public choice advocates (e.g., Bish and Ostrom) have analyzed the same set of facts and come to the conclusion that citizen participation and accountability actually improve with an increase in the number of local service providers.

Special districts have a significant implication for infrastructure financings since they permit the full recovery of costs through comprehensive user fees. By establishing a commercial, private-sector orientation to service pricing and cost recovery, the district is usually able to offer quality services without relying on public revenues for operating subsidies.

Another type of "district" has been utilized by local governments throughout the world to isolate the cost and benefit of investments. Tax increment financing districts in the United States, "valorization" districts in Colombia and special assessment districts in the USA and Europe are examples of this approach. The boundaries of these districts are established by the local

government for economic development and taxing purposes, not as independent institutions. These districts have excellent potential in developing countries since they allow the local government to devise site-specific strategies throughout the jurisdiction and respond differentially to both community development and economic development requirements.

#### 1.1.4 Property Taxes Based on Market Value

In developed countries, as well as in those developing countries moving toward a market-oriented economy, the valuation and taxation of property based on market principles. Land and buildings are assessed at the "fair market value", i.e., the estimate of the price a willing buyer and a willing seller would agree upon to transfer the ownership of the property from one to the other. This accounts for the importance of the property tax as a source of local revenue in North and South America, parts of Europe, Japan, Taiwan, Singapore and, when new tax policies take effect, in Indonesia.

By comparison, developing countries influenced by the British or French approach, which bases the valuation and taxation of property on estimated annual rental value, typically have inefficient systems of local taxation and are heavily dependent on national subsidies to finance local service delivery. England's recent attempt to introduce the poll tax as an alternative to the system of "rates" demonstrates the difficulty of moving from an annual income approach to a long-term, net-worth approach of property valuation and taxation.

The importance of market values to infrastructure financing is associated with a number of inter-related factors. Property values, being an economic commodity, will have a high degree of elasticity with the general economy. Property is an investment rather than an expense. In this situation, since infrastructure has been shown to increase property values, the cost of basic infrastructure is seen by the property owner as a contribution to personal wealth. Consequently, property tax payments required to finance a share of the cost are accepted.

By the same token, citizen opposition to property tax increases has spread throughout the United States because the general cost of government and the taxes needed to finance operations apparently exceed the economic benefits which property owners could attribute to tax increases. From Proposition 13 in California to Proposition 2.5 in Massachusetts, voters have defined the specific relationship between property values and the rate of increase in taxation.

Thailand is already moving to improve property valuation and taxation although difficulties with land titling will remain an impediment for many years. Nevertheless, once these changes have been implemented, there could be a significant increase in local revenues from property tax collections, a portion of which could be used to finance infrastructure. As with other resource mobilization efforts, however, the key measure of success is net yield after expenses, not collections *per se*. Many developing country resource mobilization efforts seem to end up covering the expense of improved technology, better recordkeeping and more expensive staffing.

## 1.2 Experience in Developing Countries

In many developing countries, including newly-industrialized countries (NICs) in Asia and elsewhere, the demand for infrastructure, especially in urban areas, outstrips the financing capability of both national and local governments. Deficits in water, roads, sewerage, drainage, solid waste disposal sites and a range of other public facilities have led many countries to adopt a multi-faceted, long-range strategy comprised of the following major components:

- 1.2.1 Decentralization
- 1.2.2 Resource Management
- 1.2.3 Privatization

These three areas are also the mainstays of many of the donor-financed urban sector loans to developing countries. In combination with structural adjustment loans in agriculture and trade they are the tools that most developing countries will employ to finance infrastructure for community and economic development.

### 1.2.1 Decentralization

This paper defines administrative/political decentralization as a purposeful, authoritative act of central government to institutionalize a system of intergovernmental relations capable of planning, managing and financing infrastructure and associated services at "local" levels. Decentralization, by this definition, is a supportive policy for both implementing national government land management objectives and achieving local government economic development through the provision of infrastructure to actually strengthen the capability of local governments to adequately perform their land management and infrastructure financing role under a decentralized approach to public management and service delivery. The following local government features are being improved in many developing countries:

- Structure
- Staffing
- Systems
- Services
- Standards

These five areas are closely related in actual practice. Organization **structures** are supported by management **systems** being administered by **staff** delivering **services** according to established **standards**.

In many developing countries (e.g., Indonesia, Philippines, Egypt), decentralization is a policy thrust aimed at assisting local governments convert **from** the current stewardship approach to management (i.e., heavily focused on control of public resources and equity of service delivery), **to** an economic leadership model of governance in which local executives and legislators are given the means to orchestrate the community's total resource base (economic, financial, social and physical; public and private) for development purposes. Nowhere has this challenge been more difficult to achieve than in the provision of local infrastructure and utility services to maximize local economic potential.

### 1.2.2 Resource Management

One of the bedrock principles of most urban sector policy adjustment and local government improvement projects currently being implemented in developing countries is that local governments should finance a larger share of both their development cost (Indonesia, Nepal, Philippines) and operating expenses (Egypt, Philippines, Sri Lanka). Typically, the means of promoting greater local resource mobilization to achieve these objectives have been:

- improving local revenue collection and tax administration within current authority
- authorizing new sources of local revenue and greater local flexibility to establish cost-effective rates
- increasing the number of taxpayers by improved mapping and assessment procedures

- improving the direct recovery of capital costs from private sources in order to finance other local investments
- providing access to long-term capital through loans and/or bonds authorized at the national level

Efforts to restructure the national grants allocation system—either to take account of performance improvements (Sri Lanka), equalize local opportunities through "needs-based" formulas (Indonesia - proposed) or to increase the amount of discretionary resources available at the local level (Egypt - considered)—may be seen as indirectly contributing to local resource management.

Although any resources mobilized at the local level could contribute to development, we believe it is far more important for developing countries to focus on the purpose to which the mobilized resource will be put than to assume that quantitative increases in the amount of local revenue collected are positive measures of performance. In fact, many developing country accounting systems restrict current revenue (the target of most resource mobilization efforts) to the payment of current expenses. Improved tax collections, therefore, are more apt to be used to pay for local personnel costs than to be used for investment purposes. In some developing countries, increases in current revenue have encouraged central governments to reduce operating subsidy—a worthwhile result in terms of overall national finance—but one that leaves local units no better off than before.

By making investment in infrastructure the policy objective, rather than resource mobilization *per se*, developing countries could identify a range of options for long-term capital financing—the SOFIE approach. This is a far more worthwhile strategy than concentrating exclusively on resource mobilization through increased tax collections.

One capital investment financing approach that has broad support in developing countries is the establishment of specialized local government lending facilities at the national level. These development financing entities are designed to provide long-term financing of local government projects, usually through loans for commercial or trading activities. These project types include public markets, water and sewerage, electricity, transport and similar investments, which are "collateralized" by the stream of revenue directly associated with the project's activity. For network utilities such as water and sewerage, the marginal cost of the investment itself is subsumed within the total financial framework of the utility system. Development banks in Jordan, Kenya, Philippines and other countries will soon be joined by comparable facilities in Indonesia (Regional Development Account), Sri Lanka, Tunisia and Ghana.

While this is an important and positive step, it still means that many of the decisions about the provision of local infrastructure—not merely their financing—are still made centrally, by national planning and public works agencies. Local governments pay a share of this national development program through Subsidiary Loan Agreements. They do not plan, finance and manage locally-determined infrastructure. Most urban sector programs are aimed at giving local governments more control over local infrastructure financing decisions. Hand-in-hand with this new local responsibility to finance a greater share of infrastructure should be the authority to choose which specific projects will be implemented and at what standard of service. Selecting the "best" local infrastructure investments will require local decision-makers to a) match need with financial capacity, b) select a technological solution that is both appropriate to the problem and capable of being maintained, and c) tradeoff, by cost/benefit or economic rate of return

analyses, between current services and growth-oriented investments that encourage future development.

### 1.2.3 Privatization

Local government services in developing countries are frequently provided as public goods, with little concept of economic pricing or full cost recovery. This is especially true of many utility services (e.g., water, sewerage, solid waste collection). Many developing countries now accept the premise that a systematic, business-like approach to service provision is essential. Commercialization of local enterprises is the first step toward their "privatization". However, moving to a trading arrangement for any utility will require a planning, budgeting and financial control system which tracks revenues, expenses and depreciation in an efficient and transparent manner. Many existing local enterprise accounting systems do not satisfy these financial management standards.

With greater and greater frequency, the private sector in developing countries is being required to finance the up-front capital cost of local infrastructure as a precondition to the right of development. These costs are charged as development impact fees or recovered through valorization taxes or land readjustment, a unique public-private approach to cost recovery in which a portion of the subdivided land is sold to finance on-site infrastructure. The need for more beneficiary-based capital cost financing has motivated many developing countries to establish these up-front mechanisms for capital financing. Private sector development costs are passed through to home buyers or are reflected in increased land values. In countries still utilizing the "annual rental value" approach to property taxation, it may be more difficult to establish and capture valuation-based increases as a means of financing local infrastructure.

Among theorists, privatization of municipal services in developing countries has been discussed usually in terms of "contracting out" refuse collection and other capital-intensive services where private investors can pass through the cost of labor, materials, debt service and capital assets depreciation to consumers. The absence of both investors and capital in developing countries has limited, and will continue to limit, this option.

In reality, private sector financing of infrastructure and/or delivery of services is best described in basic terms: "private individuals should pay for what they consume". While large-scale private investment would be welcome, it is much more realistic to assume that the "private" sector, which is expected to more broadly participate in local service delivery financing, is the citizen-consumers who are the actual and direct beneficiaries of local services. Through economic rates, fees and service charges, the private consumer will pay the fair cost of service. If this leads to greater commercial viability for local services, privatization will have been achieved.

## Summary

Infrastructure financing in both developed and developing countries has become a major policy and management challenge. Experience has shown that policies to address the increasing demand for construction or replacement of capital assets must reflect cultural, social and political dimensions as well as those related to financing itself. Our research into international financing options has identified several alternative financing methods, each of which appears to reflect the prevailing conditions and circumstances of that country. Accordingly, none of the methods identified could be transferred to Thailand and implemented without some modification. However, there are some very promising infrastructure financing options that we recommend for NESDB consideration.

In Thailand, we believe that infrastructure financing and cost recovery policy options will be influenced by the need to address both existing needs for basic services at the community level while also providing the economic development platform upon which the next level of development will be built. This will require sensitivity and foresight. A balanced approach, permitting a variety of local government options and extensive private sector participation, may be preferable to a prescriptive and/or preemptive approach which relies exclusively upon one revenue source or financing method.

One of the important conclusions of our research is the fact that infrastructure financing must be seen as part of a much larger and diverse policy mosaic. Among the items which should be included in this broader context are decentralization, resource management and privatization (the primary areas of our analysis), as well as housing, employment, environment and economic opportunity. We believe that the NESDB, in association with other key national and local government agencies, will be able to devise policies which are responsive to these factors.

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## SECTION TWO

### INFRASTRUCTURE FINANCING TOOLS

This section identifies and describes a variety of popular methods for financing the capital cost of infrastructure. To highlight fundamental differences in the timing and source of capital financing we have categorized the nineteen methods as either public, private or public-private ways to:

- raise up-front revenue on the pay-as-you-go principle
- incur debt by bonds or loans (pay-as-you-use), or
- capitalize on equity in new developments

The results of this categorization are reflected in Exhibit 1.

Financing urban infrastructure in Thailand will involve the use of many techniques, often concurrently and/or in combination. For example, the BMA could utilize nearly all of the options described in this Section at different times and in diverse locations throughout the City.

Consequently, one of the fundamental requirements of an expanded "menu" of financing options is the institutionalization of debt management capacity at the local level. Through the introduction of technology (e.g., geographic information systems, computerized land management tools) and by training local officials on administrative and operational aspects associated with debt management, local governments may be capable of implementing the broad array of infrastructure financing and cost recovery tools which might be made available to them under policies advocated in the Seventh Plan. However, unless this capacity is carefully developed and reinforced by national technical assistance, local governments run a great risk of incurring financial losses due to improper allocation of debt.

Our preliminary determination of the most appropriate financing tools was influenced by three primary criteria, as follows:

#### 1 EFFICIENCY

This criterion includes a number of interrelated factors including the very important, and possibly dominant, factor of potential cost recovery performance in light of known conditions in Thailand. If a financing tool is unable to recover the initial cost of investment, it was not considered a prime candidate for inclusion in the Seventh Plan. Property taxes, for example, are considered a near term option (i.e., 5-10 years in the future) because of the uncertainty of new valuation and taxation procedures yielding higher net revenues. In addition to cost recovery, evaluation of each financing tool relative to its efficiency included consideration of buoyancy, elasticity, pricing, marginal costs, and other related issues.

#### 2 EQUITY

This criterion may appear to be somewhat subjective since it attempts to determine the relative and absolute "fairness" of each financing tool. Recognizing that an equity-oriented assessment is, at best, an inexact process, we first analyzed the intergenerational and horizontal aspects of each method (e.g., would current users pay a disproportionately larger share than future users; would everyone in a comparable position pay an equal amount). Our focus was on

**EXHIBIT 1  
INFRASTRUCTURE FINANCING MECHANISMS/INTERNATIONAL EXPERIENCE**

<b>SOURCE OF CAPITAL</b>	<b>METHODS OF FINANCING BASIC INFRASTRUCTURE</b>		
	<b>CURRENT EXPENSE (UP-FRONT)</b>	<b>DEBT (LONG-TERM)</b>	<b>EQUITY</b>
<b>PUBLIC</b>	1. TAXES 2. USER CHARGES 3. BETTERMENTS	4. BONDS 5. LOANS 6. SPECIAL DISTRICTS 7. TAX INCREMENTS	
<b>PRIVATE</b>	8. IMPACT FEES 9. CONNECTION FEES 10. CAPACITY ALLOCATIONS	11. EXACTIONS	12. ASSESSMENT DISTRICTS
<b>PUBLIC - PRIVATE</b>	13. LAND READJUSTMENT 14. VALORIZATION	15. EXCESS CONDEMNATION 16. LINKAGE	17. CONCESSIONS 18. JOINT USE AGREEMENTS 19. TAX CREDITS

whether it would be possible to **achieve** these objectives given the inherent characteristics of the financing method, not whether the method would meet this test in a specific local government in Thailand. We then assessed the method's **likely** implications relative to equity factors such as double taxation, tax incidence, ability to pay, and the relationship of the price of service to its actual economic cost (the "rational nexus").

### **3 IMPLEMENTABILITY**

The factors in this criterion include the statutory, regulatory and institutional implications of each method, with a bias in favor of those financing tools that represent the least change from current practice. Any administrative procedures reliant on sophisticated and costly technology are clearly identified (e.g., special districts identified through Geographic Information Systems) as are administrative and operational factors, where relevant.

Each of the options for infrastructure financing is presented in the same format—a standard, single-sheet description as follows:

- **Financing Tool**
- **Character**
- **Definition/Description**
- **Purpose**
- **Requirements**
- **Applicability to Thailand**

The nineteen options are presented in terms of the timing of their financing. All current financing options (Options 1-8) are followed by those dependent on debt (Options 9-15). Finally, those in which an equity ownership position is used as the basis for financing (Options 16-19) are listed.

FADCO would be pleased to provide additional information about any of these individual options if desired by NESDB. We plan to highlight the most promising options at the Phase I Workshop.

## Option No.1

**FINANCING TOOL: TAXES****CHARACTER: PUBLIC; CURRENT EXPENSE****DEFINITION/DESCRIPTION:**

Tax revenues are the typical means of financing public infrastructure. The primary sources of local tax revenue are property taxes, business taxes and excise taxes. The annual collections may be used to a) finance the total cost of the infrastructure ("pay as you go"); b) make annual debt service payments on outstanding bonds or loans ("pay as you use"); or, c) contribute to a reserve account for future investment.

**PURPOSE:**

Public financing of infrastructure through tax revenues is used whenever the facility is assumed to benefit the entire community.

In some cases, such as with "Tax Increment Financing", tax revenues are dedicated to retire debt incurred on behalf of a specific geographic area. Over the past several years, some business taxes at local levels in the United States have been allocated to commercial revitalization.

**REQUIREMENTS:**

For taxes to be used as a primary source of infrastructure financing, an effective system of tax administration (mapping, valuation, recordkeeping, billing and collection) is essential. Tax revenues must be sufficient to cover both operating and development expenses. Past trends and future projections of tax yield must be sufficient to retire any debt incurred for infrastructure financing purposes.

**APPLICABILITY TO THAILAND:**

Significant changes in the statutory authority and methods of local tax administration are needed for taxes to be used as one of the primary sources of basic infrastructure financing. The exemption of owner-occupied residential property from property taxes limits the potential yield from this tax source. In addition, the fact that most individuals have not been required to pay for local infrastructure previously may make it politically unacceptable to rely upon property taxes of individuals as a source of future financing.

The current property tax improvement project may increase the future yield from property tax revenues, but it is doubtful that any significant net increase in tax yields will occur in most local governments, other than Bangkok, until the end of the decade. Therefore, property taxes should be seen as a viable medium-term strategy, but will need to be supplemented by more immediately applicable financing sources.

**FINANCING TOOL: USER CHARGES****CHARACTER: PUBLIC; CURRENT EXPENSE****DEFINITION/DESCRIPTION:**

User charges are fees paid by consumers for infrastructure related services, typically for utility operations such as water, sewerage and electricity. The user charge consists of the following four cost elements:

- a. operating expenses
- b. maintenance
- c. depreciation
- d. debt service

The debt service portion of the annual user charge is allocated to cover the long-term cost of infrastructure.

**PURPOSE:**

User charge financing is a "private sector"/commercial approach to cost recovery. The total cost of service is passed through to the consumers as part of a monthly or quarterly bill for services issued by the local government or local enterprise in accord with the approved rate. The operating cost portion of the rate is generally based on use, with higher levels of consumption reflected in higher charges. The debt service portion may be allocated on the basis of use or apportioned equally among all consumers, each of which pays an equal share. The latter approach assures the availability of sufficient capital to retire outstanding debt since it is not affected by fluctuations in consumption.

**REQUIREMENTS:**

User charges for utility operations operate most effectively when combined with a cost accounting system to identify and allocate expenses. Without such a system, it is difficult to determine the factors that contribute to operating or capital cost increases. User charges to recover costs of debt service assume the authority to incur long-term obligations (e.g., bonds or loans). Accordingly, local governments without this authority do not often employ user charges to pay for debt service, but rather to cover operating and maintenance expenses only. As a result, physical deficits may increase in service areas that do not provide user charge financing for regular replacement of infrastructure through user charges.

**APPLICABILITY TO THAILAND:**

User charges are very difficult to implement over wide geographic areas and/or in communities with low-income consumers. "Free" service—typically for water—undermines the financial integrity of the overall operation, with the maintenance and/or replacement of infrastructure often sacrificed. The large number of low-income families in Bangkok and other urban areas could make it difficult to implement a community-wide user charge system based on commercial cost recovery principles.

**FINANCING TOOL: BETTERMENT LEVIES****CHARACTER: PUBLIC; CURRENT EXPENSE****DEFINITION/DESCRIPTION:**

Betterments are public charges to recover the capital cost of infrastructure. They are levied directly upon the immediate beneficiaries based upon either a "frontage" or land area basis and may be used in conjunction with other financing techniques (such as assessment districts) to directly link the beneficiaries to the costs. Betterments are frequently used for secondary and tertiary roads, as well as for water and sewer extensions. Betterments are assessed, levied and, usually, paid in advance of infrastructure construction.

**PURPOSE:**

Betterments are a means of forcing property owners, who will benefit from the provision of public infrastructure, to bear the burden of its cost. In most cases, the portion borne by individual property owners is based on an engineering cost estimate of the cost of installation, not either the long-term running costs of the infrastructure or its cost implications on the total system (compare to **impact fees**). The betterment principle can be applied to either existing or planned developments; levies may be made against individual owners or to a single developer of an approved subdivision.

**REQUIREMENTS:**

Capital cost recovery under a betterment principle requires accurate estimates of infrastructure construction costs so that the beneficiaries can be properly assessed. In addition, it usually depends upon "consensus" among all those being assessed. Private dedication of property (rather than expropriation) to achieve the public purpose may often be required. Delays in the payment of betterments can affect the capital cost estimate, forcing the public sector to assume a larger than anticipated share of the capital cost.

**APPLICABILITY TO THAILAND:**

A variation on the betterment approach is used frequently in Thailand, but by the private developer rather than the public sector. On-site infrastructure costs are apportioned to future home buyers in many subdivisions. The developer is under no obligation to document either the basis for the original cost or the methodology for its distribution to individuals, unlike the public betterment approach in which these factors are determined by regulation. Betterments are easier to implement where the benefitted property belongs to the same land use classification and/or the economic purpose of the land is similar. In areas with mixed uses, benefits are often more difficult to calculate. Accordingly, betterments will probably need to be implemented in conjunction with other financing and cost recovery tools.

<b>FINANCING TOOL: BONDS</b>
<b>CHARACTER: PUBLIC; DEBT</b>
<p><b>DEFINITION/DESCRIPTION:</b></p> <p>Governments use bonds to borrow money to finance the capital cost of infrastructure construction. Bonds are a form of enforceable contract since the issuer pledges to repay the debt on an agreed schedule from identified revenue sources. The linkage of the debt to a specific revenue source determines whether the bond is a <b>general obligation bond</b>, which is guaranteed by tax collections and other general revenues, or a <b>revenue bond</b> usually secured by a single non-tax source of revenue (compare to the revenue bonds for tax increment financing, which use tax sources as security). A revenue bond may be secured only by the revenue stream of the facility financed by the bond. Revenue bonds have a higher degree of risk and, therefore, a higher interest rate/investment yield than general obligation bonds.</p>
<p><b>PURPOSE:</b></p> <p>The primary purpose of general obligation bonds is to allocate the cost of infrastructure over a time period equal to its useful life. By linking debt retirement to a broad-based local tax source (property taxes), both current and future users pay for the capital cost of the facility. As a community's aggregate assessed value increases the actual portion borne by any individual property owner decreases. Revenue bonds are used with great effect by public enterprises (see the section on <b>Special Districts</b>) and to finance private commercial developments such as malls and markets. In the latter case, the flow of funds may be insured by an insurance company (e.g. Lloyd's of London) to reduce the risk to the public issuer as well as to the private investor.</p>
<p><b>REQUIREMENTS:</b></p> <p>The most fundamental requirement is a <b>capital market</b> to buy and sell bonds. Local governments and public enterprises need a steady and predictable revenue stream and a history of successful debt management to attract competitive interest rates. The ability to issue <b>tax-exempt</b> bonds (under authority granted by the national government) is also a major advantage since it will reduce the interest costs and debt service requirements associated with borrowing.</p>
<p><b>APPLICABILITY TO THAILAND:</b></p> <p>Local governments in Thailand are not authorized to borrow funds through the issuance of bonds, nor are they "creditworthy" in public finance terms due to their dependence on national grants for much of their income. However, it might be possible for the national government to establish a bond bank or development lending facility to enable local governments to obtain long-term credit for infrastructure financing (see <b>LOANS</b>).</p>

**FINANCING TOOL: LOANS****CHARACTER: PUBLIC; DEBT****DEFINITION/DESCRIPTION:**

Infrastructure may be financed through borrowing by a local government or public enterprise. Loans differ from bonds in several ways: shorter term, higher interest charges, lending arrangements and enforceability. Local governments or public enterprises may borrow on commercial terms from banks or other private lenders or on official terms from 1) national facilities established for that purpose or 2) international creditors. Most public sector loans are short term, usually for annual cash management purposes.

**PURPOSE:**

If bonded debt is not an authorized option, local governments and public enterprises may borrow funds for infrastructure financing. Generally, loans are more expensive than bonds, but do provide the advantage of multi-year repayment period, usually 3-8 years. The combined impact of local infrastructure deficits and absence of credit has encouraged many developing countries (Jordan, Kenya, Philippines, Indonesia, Colombia) to establish a national financing institution that makes concessional loans to local governments and enterprises for development projects.

**REQUIREMENTS:**

Local governments and enterprises often are constrained by restrictive debt limits, making it difficult to borrow funds to finance infrastructure. Therefore, for loans to be a viable source of capital, enabling laws must be passed to provide the authority and flexibility needed to incur long-term debt. Most national lending facilities lend funds only for revenue-earning projects, making it impossible for many local governments to satisfy the demand for basic infrastructure. Allowing local governments to obtain financing for community development projects would enable more basic infrastructure to be financed on a long-term basis.

**APPLICABILITY TO THAILAND:**

A national lending facility would provide local governments—especially the BMA—to obtain capital funds for infrastructure. It could not be the only means of financing, however. Other institutional and regulatory avenues would need to be opened for the full range of infrastructure to be constructed.

<b>FINANCING TOOL: TAX INCREMENTS</b>
<b>CHARACTER: PUBLIC; DEBT</b>
<p><b>DEFINITION/DESCRIPTION:</b></p> <p>Tax increments—from increases in the value of land attributable to public investment—can be used to retire debt incurred to improve a designated development area. <b>Tax increment financing (TIF)</b> is one of several relatively new infrastructure financing techniques used by urban areas in the United States. It is an approach that combines debt and taxes. TIF is a redevelopment tool that works best in situations where land values are static or declining. Anticipated increases in market value and higher property tax collections are the basis for incurring long-term debt to finance infrastructure. All annual tax collections above the current <b>baseline</b> are dedicated to debt service.</p>
<p><b>PURPOSE:</b></p> <p>TIF is a financing tool for public infrastructure provided as part of an areawide redevelopment strategy. Within a designated area, public investment in infrastructure and related private sector improvements are assumed to contribute to significant increases in the market value of property. In a sense, therefore, the "slum" area finances its own redevelopment over the life of the bond used to finance infrastructure. All taxing authorities, except as may be authorized by local law, pledge their future tax increments to retire the debt. This agreement to forgo taxes is fundamental to a TIF agreement.</p>
<p><b>REQUIREMENTS:</b></p> <p>TIF requires a fairly sophisticated approach to debt management and tax administration. While it might be possible to devise a debt repayment approach that did not depend on <b>ad valorem</b> taxes, increases in property values are the most common method of securing the bond and improving its marketability to private investors. It may be necessary to issue <b>bond anticipation notes (BANs)</b> to finance some of the start-up costs associated with redevelopment. The local government or public enterprise may also use its own resources.</p>
<p><b>APPLICABILITY TO THAILAND:</b></p> <p>For TIF to operate in Thailand, the following conditions would need to exist:</p> <ol style="list-style-type: none"> <li>1. an <b>ad valorem</b> approach to property valuation and taxation for land and buildings;</li> <li>2. a market for local debt instruments (i.e., bonds or loans);</li> <li>3. legal authority and operational capacity to allocate and account for tax payments in the manner required by TIF.</li> </ol>

**FINANCING TOOL: SPECIAL DISTRICTS****CHARACTER: PUBLIC; DEBT****DEFINITION/DESCRIPTION:**

Special Districts are single, limited-purpose local governments, generally independent of any general purpose local government but subject to supervision by some higher (perhaps **national**) authority. These Special Districts are authorized to incur debt in their own name and to collect revenue from user charges or other designated fees to pay for operating and capital expenses. In some cases, Special Districts may apply for debt guarantees from higher-level authorities in order to reduce the interest cost of new debt. The consumers of Special District services may be authorized to elect a governing board although, in some cases, the higher level authority may discharge this responsibility.

**PURPOSE:**

Special Districts were used originally to provide specialized technical services, especially **utilities**, to local consumers. Removing these services from political interference and introducing merit principles to personnel decisions were key considerations. However, as local government costs increased (and/or as a result of property tax limitations) the incorporation of independent Special Districts became an economic necessity. A Special District provides a service to consumers (compare to **special assessment districts**) including the provision of infrastructure necessary to its delivery. The debt service costs of the Special District are reflected in approved user charges.

**REQUIREMENTS:**

Special Districts must be authorized by a law that defines its responsibility, geographic area, management structure, financing powers and other factors critical to the independent viability of the entity. Authority to construct physical facilities is usually limited by a requirement that the general purpose government must approve the siting of all Special District infrastructure. Access to long-term debt (bonds or loans) is essential to the formation and operation of a Special District. Once Special Districts are established, new coordination mechanisms need to be established.

**APPLICABILITY TO THAILAND:**

Thailand has a great deal of previous experience with national parastatals, independent authorities and special metropolitan districts. These forms of Special Districts are different in scope and scale from the type of local Special District that might be created in the BMA and in other cities in Thailand. The most compelling reason for the creation of Special Districts is access to long-term capital financing. If this authority can be granted to Special Districts, along with the authority to establish user charges to cover all operating and capital expenses, Special Districts could be a means of providing infrastructure and recovering costs.

<b>FINANCING TOOL: DEVELOPMENT IMPACT FEES</b>
<b>CHARACTER: PRIVATE; CURRENT EXPENSE</b>
<p><b>DEFINITION/DESCRIPTION:</b></p> <p>Development impact fees are paid by a developer to the local government or Special District to compensate these institutions for the financial <b>burden</b> of the new development on existing, <b>off-site</b> infrastructure (e.g., sewage treatment plants, transport systems, reservoirs). Development impact fees are distinguished from <b>development exactions</b> that cover the cost of <b>on-site</b> infrastructure. The impact fees are assessed usually when the building permits are issued by the local government, although some jurisdictions have made them a condition of occupancy.</p>
<p><b>PURPOSE:</b></p> <p>Development impact fees are intended to recover the imputed cost of new development on the current/planned physical infrastructure of a community. Typically, the charges are assessed for each individual component of the total system based on either plat size, density of development, or size and type of building construction. Multiple bedrooms in detached dwellings are assumed to place higher demands on schools, for example, than one bedroom condominiums. Residences with garage space for two automobiles will have a greater impact on transportation systems than other forms of housing. Each impact is isolated and <b>monetized</b> so that the beneficiaries bear the cost burden of development.</p>
<p><b>REQUIREMENTS:</b></p> <p>Development impact fees are authorized by regulation, but the actual charges are calculated when a specific development is approved. To arrive at a fair allocation of the anticipated capital and operating costs, the local government must establish a mathematical model that can be regularly updated to reflect replacement costs of physical infrastructure while also calculating the effects of depreciation on the <b>unit value</b> of each facility that the new development will impact. The development impact fees are deposited to a special account reserved for future expansion or replacement of existing facilities. Where existing excess capacity is being allocated to the new development, the fees are used to retire existing debt.</p>
<p><b>APPLICABILITY TO THAILAND:</b></p> <p>Since much of the existing infrastructure in Thailand has been financed by the national government, the financial stake of local governments may be marginal. This raises the question of what level of government should be compensated and the purpose for which impact fees may be used. The need to develop and rigorously maintain a cost allocation model may argue against this financing tool in all but the most sophisticated local governments.</p>

## Option No.9

**FINANCING TOOL: CONNECTION FEES FROM CONSUMERS****CHARACTER: PRIVATE; CURRENT EXPENSE****DEFINITION/DESCRIPTION:**

Local governments and public enterprises (i.e., Special Districts) may establish connection fees for individual consumers, based on the demand that each "connection" will place on existing infrastructure. Broadly-defined, connections may include access to water, sewers, electricity and telephones, as well as "curb cuts" that permit access to roadways. Strong **regulation and enforcement** authority is needed to make this approach operate effectively. The connection fees must be non-confiscatory, but may not need to conform to strict limitations on fees that apply to many administrative and civil services. The connection fees can be used to restrict access to overloaded facilities, however, and can be priced accordingly.

**PURPOSE:**

Connection fees are used to capture the cost impact of even individual consumers on the existing network of local infrastructure. The authority to establish **economic prices** for connections must be approved by the local government, public enterprise or, perhaps, a higher supervisory authority. The actual amount of the connection fee can vary within the jurisdiction depending on demand factors and/or age and condition of the facilities upon which the connection will impact. Collection of the fee is a precondition to connection and, therefore, an efficient, **up-front** mechanism for cost recovery.

**REQUIREMENTS:**

Authority to establish connection fees must be granted to the local government or public enterprise. Since many "connections" may be required for each new unit added to the system, coordination among the various local service providers is important. The pricing and operational accounting standards associated with connection fees may require modifications in existing procedures. Connection fees may be treated as current revenue for the purpose of covering ordinary expenses, including interest payments, or they may be placed in a special fund for financing future development.

**APPLICABILITY TO THAILAND:**

Connection fees are already used for water connections in the BMA, although their economic purpose is not clear. Other connections are provided on demand for regulated utilities such as electricity and telephone. Access to roadways is restricted only to the Toll Road. Other connections are being provided apparently at the cost of labor and materials. It should be possible to use connection fees to generate funds for future construction of infrastructure, but only on a limited basis. Funds for cost recovery, however, could be obtained from connection fees.

**FINANCING TOOL: CAPACITY ALLOCATIONS****CHARACTER: PRIVATE; CURRENT EXPENSE****DEFINITION/DESCRIPTION:**

Where development pressure warrants, it may be possible to obtain either: a) up-front capital contributions to pay for the cost of new construction; or, b) payments for the **market value** of existing excess capacity, from developers or potential developers. In the former case, the local government or private enterprise indicate that it is planning to construct a new facility (say, sewage treatment plant) access to which will be restricted to current developments **PLUS** those future developments that have reserved future capacity for their use. In the latter case, the government **rationes** the supply and, thereby, escalates the price, of service. This may be both a land management and financing tool.

**PURPOSE:**

Capacity allocation is a means of capitalizing on demand for development by regulating the price of service to certain classes of users. Capacity allocations may raise legal questions since the existence of a public monopoly, rather than economic principles, causes an imbalance in the supply-demand equation. There may be environmental justification for competitive pricing, however, depending on, for example, the water quality objectives to be served. It seems reasonable to suggest that a clearly **public purpose** might withstand a legal challenge while an economic one might not. A form of capacity allocation has been in effect for wastewater treatment plants since 1972 in the USA. **Industrial cost recovery (ICR)** requires certain industrial users to pay for the cost of special infrastructure components that are necessary to process their waste discharges.

**REQUIREMENTS:**

Establishing a methodology to allocate capacity in an existing infrastructure network involves close coordination among technical, financial and administrative sections of the local government or public enterprise. In addition, a growth management regulation is needed to create demand for a limited resource—in this instance, the capacity of infrastructure

**APPLICABILITY TO THAILAND:**

Capacity allocations are most easily implemented with respect to sewage treatment and disposal facilities. Since there is very little supply of this capacity in Thailand, except what the private developers already provide on-site, it is doubtful that this financing tool will work very well. However, as environmental concerns become more prevalent, some form of capacity allocation may be possible.

**FINANCING TOOL: DEVELOPMENT EXACTIONS****CHARACTER: PRIVATE; DEBT****DEFINITION/DESCRIPTION:**

Development exactions are regulations imposed on a developer to provide on-site infrastructure as a pre-condition to development approval. There are no construction costs incurred by the public sector but, on the negative side, there may be **below-minimum standard** construction methods utilized by the developer unless the approving authority monitors work in process. The costs are passed through to homebuyers who, some suggest, bear a disproportionate share of the cost of public infrastructure. Even without development exactions, developers provide most on-site infrastructure in the BMA. It is not known whether this condition prevails throughout the country. Since local governments have little capacity to finance infrastructure, the provision of facilities by the private sector may be an **accepted cost of development**.

**PURPOSE:**

Development exactions (in contrast to development impact fees) are based on a **negotiated agreement** between the developer and the agency that approves local development. On-site infrastructure such as roads and drains, water and sewerage pipes, lighting and open space for passive recreation are common exactions. Some large subdivisions in the USA have been required to provide school buildings and covered recreation facilities. Anything beyond basic infrastructure will depend on the ability of the local government to regulate development.

**REQUIREMENTS:**

Development exactions for on-site infrastructure require legal authority to negotiate with developers about **tradeoffs**—site approvals for infrastructure provision. Since each development will have different cost and profit margins, the negotiators will need to understand the economics of development. Enforcement of construction standards will also be required.

**APPLICABILITY TO THAILAND:**

On-site infrastructure is regularly provided by many developers, but is not a specific requirement. It would be possible to mandate this standard, however, and filter out marginal developments. The developer's cost of compliance with exactions is passed through to homebuyers and **indirectly financed** by the private banking system. Exactions should be considered in the same context as **development impact fees** and **linkages**, all of which attempt to allocate the cost of infrastructure to the private developer in exchange for approval of land use. Some form of zoning or land management standard will also need to be employed as a guide to public sector decision-makers.

**FINANCING TOOL: ASSESSMENT DISTRICT****CHARACTER: PRIVATE; EQUITY****DEFINITION/DESCRIPTION:**

Special assessment districts (SAD) apply to any special geographic section within an urban area that has been established to promote, isolate and "tax" economic and development activities. This broad definition allows the term to cover export processing zones, enterprise zones, neighborhood associations and housing cooperatives, as well as conventional SADs that are created to allocate specific infrastructure costs to property owners within the district. The motivation for the establishment and boundaries of a SAD may come from the residents or from the local government. The financing options for infrastructure within the SAD consists of special fees or levies to recover a portion of the cost. The ownership of many SAD facilities rests with the property owners in the district.

**PURPOSE:**

Special assessment districts isolate the costs and benefits of community-level infrastructure. Typically, property owners are assessed the capital cost of infrastructure which may be paid up-front or financed over time, especially if the district has some incorporated status. When the boundaries are determined by the local government, financing of infrastructure is typically based on a one-time charge. Because SAD boundaries are designed to capture benefits within the defined geographic area, the type of infrastructure selected for financing should have no spillover or community-wide benefit.

**REQUIREMENTS:**

The designation of SADs for community-level infrastructure financing requires a fairly comprehensive database of local development and economic conditions down to the district/sub-district level. Computerized geographic information systems may be used to target areas with high potential for designation. A SAD is usually a **developed area** with a relatively homogenous character, although not necessarily the same land use pattern. A mixed use SAD could have the advantage of cross-subsidization. The assessment and collection of fees to cover the capital cost of infrastructure will require separate administrative procedures. If the local government elects to finance the capital cost and assess an annual fee, a procedure will be needed to apply a **lien** against property transfers.

**APPLICABILITY TO THAILAND:**

SADs could be used effectively in Thailand if the BMA and other local governments develop the ability to analyze local development patterns and determine the most "**financially effective**" boundaries. These will not conform probably to existing district and sub-district boundaries, nor to areas used for cadastral mapping or property assessment.

**FINANCING TOOL: LAND READJUSTMENT****CHARACTER: PUBLIC-PRIVATE; CURRENT EXPENSE****DEFINITION/DESCRIPTION:**

Land readjustment is a method of financing infrastructure within a defined, typically **undeveloped area** by redrawing parcel boundaries, aligning on-site infrastructure, donating certain valuable parcels for public sale and using the proceeds thereof to finance the up-front costs of infrastructure construction. The value added to each remaining parcel as a result of the placement of infrastructure compensates existing landowners for loss of land area. **Increased value** for reduced size is the essential motivation for land readjustment. Land readjustment has been used successfully in Taiwan, Japan and Korea. In those countries, the maximization of open land for housing purposes justified the involvement of the public sector in a basically private, economic transaction. Land readjustment negotiations can be **time-consuming**.

**PURPOSE:**

The purpose of land readjustment is to motivate the rational development of open land and provide **serviced plots** for housing development. In theory, land readjustment could be used for commercial development but there are no descriptions of that approach in current development literature. Financing infrastructure through the sale of land parcels donated to the government is a creative approach to financing, but one which could be managed entirely by the private sector with little, if any, public involvement required.

**REQUIREMENTS:**

Land readjustment that might involve local government would require strategic planning and management skills to: a) identify areas susceptible to readjustment; b) negotiate with landowners and arrive at a consensus agreement; c) "re-parcel" the area (including the placement and costing of infrastructure) so that landowners will accept the overall approach and agree to the dedication of valuable land for sale; and, d) facilitate and/or supervise the sale of land the installation of infrastructure.

**APPLICABILITY TO THAILAND:**

Land readjustment could be used in selected areas within Thailand where relatively large land holdings exist and could be used for housing development. Since the development of land for housing and other purposes in the BMA area may not need to be spurred on by the public sector, the practical use of the technique is not as clear as are other methods of infrastructure financing.

<b>FINANCING TOOL: VALORIZATION</b>
<b>CHARACTER: PUBLIC-PRIVATE; CURRENT EXPENSE</b>
<p><b>DEFINITION/DESCRIPTION:</b></p> <p>Valorization is a method of financing infrastructure that relies on increased land values (compare to <b>tax increment financing betterments and land readjustment</b>) to obtain the up-front financing of infrastructure. It has been used in developed areas in Latin America, especially to serve poor neighborhoods, and is a form of "self-help" financing among more affluent property owners in Western Europe. Public-private approaches in Latin America are initiated by the public sector and have experienced some difficulty, due to under-estimation of the actual cost of infrastructure and non-payment of costs by some of the beneficiaries.</p>
<p><b>PURPOSE:</b></p> <p>Valorization relies on the incentive of increased property value to secure the approval of property owners to underwrite the cost of infrastructure. The costs are usually apportioned on the basis of front footage, plat size or "benefit", usually based on ease of access. Where market value of land and/or net worth are important considerations, valorization should work effectively. Under annual rental income approaches to property taxation, the benefits of valorization may be less obvious to property owners. One other potential purpose for valorization could be slum upgrading.</p>
<p><b>REQUIREMENTS:</b></p> <p>Encouraging the private sector beneficiaries to pay for infrastructure by demonstrating to them the added value that will follow investment requires a very detailed understanding of neighborhood values, infrastructure needs and patterns of private land ownership. Valorization requires a local commitment to community development and, probably, would work most effectively when applied in concert with other development strategies. Valorization also requires a means of documenting increased values attributable to infrastructure.</p>
<p><b>APPLICABILITY TO THAILAND:</b></p> <p>Valorization could be a useful method of increasing the level of private investment in infrastructure in under-served districts and sub-districts of the BMA, provided that the increased values did not lead to higher property taxes. Some method of tax exclusion may be necessary to promote relatively high-capital contributions from middle-income residents. Allocating savings to infrastructure may produce short-term gains but contribute to social and financial problems in the longer term.</p>

**FINANCING TOOL: EXCESS CONDEMNATION****CHARACTER: PUBLIC-PRIVATE; DEBT****DEFINITION/DESCRIPTION:**

Excess condemnation is an indirect infrastructure financing method that involves the taking of land for infrastructure purposes (e.g., roads, railways, sewer lines, water lines), as well as an excess margin, which will be conveyed to a private developer for private, typically commercial, development. The developer agrees to install the required infrastructure as a condition of the acquisition of **development rights** to the excess land obtained by public authority. The land taking satisfies the public purpose criterion while providing a means for the provision of infrastructure at no cost to the public.

**PURPOSE:**

Excess condemnation has been utilized as a redevelopment tool, primarily for slum upgrading. The conveyance of development rights as a capital financing vehicle for infrastructure has been used for more than a century, especially for North America's railroads. There has been a subtle shift in the basic purpose in recent years with the private development objective serving as the primary motivation for the public taking, in many instances.

**REQUIREMENTS:**

Excess condemnation requires clear **statutory authority** to use public powers for private purposes. Some laws limit the exercise of eminent domain/condemnation/expropriation to specific **public purposes**, while many USA jurisdictions have very broad powers to take land for development purposes. In addition, it is essential that the management and operational systems which are associated with land management and finance are well designed so that the risk of financial loss is controlled. The financial condition of the private developer must be well documented and adequate performance bonds should be obtained.

**APPLICABILITY TO THAILAND:**

Excess condemnation is already in use in Thailand, although not for local infrastructure. The rail transportation project to be undertaken by Hopewell in the BMA area has used excess condemnation powers to obtain a right-of-way and additional land for housing and commercial development purposes. The use of excess condemnation needs to be limited to only high priority public projects that would not succeed without joint public-private investment. In addition, current statutes would need to be re-written to allow expropriation for purposes other than road construction.

**FINANCING TOOL: LINKAGE****CHARACTER: PUBLIC-PRIVATE; DEBT****DEFINITION/DESCRIPTION:**

Linkage is a term used to explain a *quid pro quo* approach to development approval (compare to development impact fees) by which a developer is required to undertake or finance through a "linkage fee"—a **parallel activity** in a less desirable location in exchange for approval to develop a desirable area, usually for commercial purposes. The parallel development must be a "public" purpose. This has included housing development, land for future growth management purposes, public facilities including those in the approved development area (compare to development exactions), and parks and recreation.

**PURPOSE:**

The primary objective of linkage is to use high demand for downtown commercial development to achieve development in low-demand areas. Many developers have objected to this use of the approval process, but no definitive court decisions have determined the absolute legality of this practice. The underlying philosophy of linkage is that outlying areas experience **negative impacts** from downtown development for which they should be compensated through a parallel development in which they are the intended beneficiaries. This **social engineering** has been praised and criticized equally.

**REQUIREMENTS:**

The development approval regulations must authorize some form of **indirect compensation** for negative impacts of development projects. Determining an equitable amount of compensation will require an experienced land valuer familiar with the economic conditions of both the primary and parallel development sites. **Monitoring** compliance with the contractual terms of the approval will require staff time of the development agency. The actual means of enforcing the obligation are unclear, given the limited experience with linked approvals.

**APPLICABILITY TO THAILAND:**

It is unlikely that a linkage philosophy could be approved in Thailand in the near future. The social objectives may be worthwhile (i.e., development of underserved districts) but the concept of compensation and reallocation of resources would need more study. Strengthening the subdivision control regulations to authorize linkage (and exactions) could provide a very useful tool for infrastructure financing.

**FINANCING TOOL: CONCESSIONS****CHARACTER: PUBLIC-PRIVATE; EQUITY****DEFINITION/DESCRIPTION:**

A concession (or franchise) is a right conferred by government to the private sector to build and/or operate a public facility or deliver a public service using public resources or authority. A concession may be considered a management contract, although that term is usually applied to a site-specific contract such as for arena management. The concessionaire may acquire the right on an annual or long-term basis, according to local procurement standards. Part of the concession agreement may be the construction of infrastructure, as has been proposed for "private" toll roads in the USA. In developing countries, concessions are often granted to water vendors, although this has led to many abuses.

**PURPOSE:**

A concession is a means of securing the participation of the private sector in infrastructure financing or service delivery under the regulatory control of government. If the concession agreement confers a monopoly, there may be a requirement for the concessionaire to construct infrastructure as part of the agreement. This has occurred with waste disposal where vehicles and disposal facilities have been acquired by the concessionaire for ultimate transfer to the government.

**REQUIREMENTS:**

A concession is a form of contract. Accordingly, it requires legal expertise to assure that the public is protected and also that the private concessionaire is able to realize sufficient profit to carry out the terms of the contract. As a means of financing infrastructure, it requires the same type of supervision as would be required for development exactions.

**APPLICABILITY TO THAILAND:**

Concessions could be an effective way of delivering some local services (e.g., garbage collection, waste disposal, bus transportation) but has limited applicability as an infrastructure financing tool.

**FINANCING TOOL: JOINT USE AGREEMENTS****CHARACTER: PUBLIC-PRIVATE; EQUITY****DEFINITION/DESCRIPTION:**

Joint use agreements are used to finance infrastructure through a combination of private investment and **public regulation/control** (compare to linkage and development exactions). The joint use may apply to a land parcel (with public buildings built by the private developer in exchange for density, height or other variances) or to a single building with a portion of the development dedicated to public purposes (e.g., fire station, school buildings). The public use of the development is typically negotiated with the private developer as a **bonus** provision of development authorization.

**PURPOSE:**

Joint use agreements are designed usually to take advantage of a public use within a private development. The financing of the associated infrastructure is **restricted** to the development site and usually does not involve the provision of additional infrastructure for purely public purposes. When public purposes are provided in a single building, the private developer may be granted a franchise to operate and/or maintain the facility. It is not necessary for the public use portion of the development to be owned by the public sector. A lease-back arrangement may be part of the negotiated agreement.

**REQUIREMENTS:**

Joint use requires legal and regulatory authority to **negotiate** an incentive agreement with a private developer. The grant of authority may give wide discretion to the approving agency or, alternatively, require **legislative approval** of the contractual terms prior to project initiation. Joint use agreements must define clearly the respective roles of the private and public sectors over an extended time period. Maintenance of the respective facilities should also be defined.

**APPLICABILITY TO THAILAND:**

Recent legislation has allowed the BMA to take a more strategic negotiating posture with respect to the approval of private developments. Any of the approaches described in this section will require the use of negotiation standards and staff training to facilitate their application to Thailand.

**FINANCING TOOL: TAX CREDITS****CHARACTER: PUBLIC-PRIVATE; EQUITY****DEFINITION/DESCRIPTION:**

Tax credits, conferred on the private investor by public law, have been used to encourage investment in "public" infrastructure, especially for environmental purposes. The State of California is the latest government entity to capitalize on tax credits to encourage private sector participation/compliance with public programs and purposes. A "job creation" tax credit is still available under national law in the USA. The environmental tax credit in California is unique among States in that it is classified as a negotiable instrument that may be bought and sold on a regulated market. Pollution control (water, air, noise) investments are eligible for treatment as tax credits.

**PURPOSE:**

Because private capital investment in pollution control facilities represents a major expense that could affect the survival and competitiveness of businesses, it was necessary to develop a financial "offset" that would achieve the public objective without putting a damper on economic development. For jurisdictions lacking the resources to implement a loan/grant program, tax credits may achieve the same purpose without putting pressure on the public treasury.

**REQUIREMENTS:**

Instituting tax credits for infrastructure development usually requires major changes in the statutes and regulations related to business accounting and taxation. The motivation for investment must be pressure to comply with other regulations and/or to avoid financial penalties. There is no need to allow tax credits to be freely negotiated for this financing approach to work effectively.

**APPLICABILITY TO THAILAND:**

Tax credits could be used as one aspect of a national policy to achieve certain environmental objectives such as flood control, sewage disposal, water distribution, etc. It would be very difficult for a local government to "target" the investment or to achieve specific benefits at a defined time. Nevertheless, if the private financing of infrastructure is a goal, tax credits could be a useful tool to its attainment.

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## SECTION THREE

### PRIORITY OPTIONS

To implement Seventh Plan policies related to land management and infrastructure financing, the BMA and other local governments will need to a) value and use land as an economic development resource, b) plan for and finance priority infrastructure, c) effectively manage long-term debt, and d) involve the private sector in the provision of infrastructure and the delivery of services. In addition, new or significantly modified institutions may be needed at both the national and local levels to support Plan objectives.

The economic and financial importance of all capital assets controlled by local governments will become more and more critical when "decentralized" land management and infrastructure financing authority is granted to them. Through regulation, expropriation, assembly, readjustment and preservation of land, local governments in Thailand will be capable of influencing public and private economic choices that directly impact local development. By establishing the priority status of alternative infrastructure investments, local governments will assume control over a fundamental determinant of local investment. Estimating the cost, source of funds and financing approach for infrastructure will enable local decision-makers to initiate proactive "partnerships" with private sector representatives and promote community wealth.

The tools described in the preceding section may help the BMA and other local governments in Thailand effectively manage the inter-related resources of land, infrastructure and capital. Since all of the nineteen tools are not capable of being implemented at this time, they are offered to national government policy analysts and local decision-makers as options for the design of an integrated infrastructure financing strategy which creates incentives and disincentives for development and land management. After evaluation by NESDB and discussion at the Phase 1 Workshop, the preferred alternatives will be identified, tested (if possible) and then defined in operational terms.

#### 1 CLASSIFYING OPTIONS

We have classified the nineteen options only insofar as their apparent ease of implementation and immediate utility. Political acceptability and other constraints have not been assessed. Our objective is to encourage the widest possible consideration of options, not to eliminate potentially valuable long-range alternatives to infrastructure financing. The three classifications are: IMMEDIATE, MEDIUM TERM, and LONG RANGE. Using its own, more detailed, criteria, NESDB may arrive at other conclusions and classify these options under different headings.

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|--|---|--|
| <p>■ <b>IMMEDIATE</b></p> <ul style="list-style-type: none"><li>● Betterments</li><li>● Exactions</li><li>● Impact Fees</li><li>● Assessment Districts</li><li>● Connection Fees</li><li>● Loans</li><li>● Concessions</li><li>● Linkage</li></ul> | <p>■ <b>MEDIUM TERM</b></p> <ul style="list-style-type: none"><li>● Taxes</li><li>● Tax Increments</li><li>● Tax Credits</li><li>● Excess Condemnation</li><li>● Land Readjustment</li><li>● Valorization</li></ul> | <p>■ <b>LONG RANGE</b></p> <ul style="list-style-type: none"><li>● User Charges</li><li>● Bonds</li><li>● Joint Use</li><li>● Special Districts</li><li>● Capacity Allocations</li></ul> |
|--|---|--|

It is also possible to classify the nineteen options within these three classes and/or to establish priorities according to the financing objective (i.e., pay-as-you-go, pay-as-you-use, equity) which NESDB wants to emphasize.

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