PART IV: MANAGEMENT AND FINANCING FOR THE IMPLEMENTATION

CHAPTER 12: POLICY ZONING PLAN FOR URBAN ENVIRONMENTAL IMPROVEMENT

12.1 Urban Development Strategies

(1) Review of Urban Problems in Bangkok

The urban environmental problems currently occurred in Bangkok are assessed in Chapter 3. It is concluded that the urban environmental problems are spread over all of Bangkok and differs by area.

In the central areas, flood problems along the Chao Phraya River, air pollution, high densely inhabit are crucial. Concentration of economic activities, population with inadequate infrastructure is an issue for urban environmental improvement. To this end, more land utilization and infrastructure provisions should be taken into consideration.

In the built-up areas, water pollution, traffic congestion and inadequate greens and urban amenity are pointed out as the urban environmental problems. The environmental infrastructure provisions can not catch up the rapid urbanization, resulting in causing environmental problems. It is necessary to promote infrastructure provisions to up-grade urban environment.

In the suburban areas, urban sprawl along major development corridors is a problem. It creates inadequate living environment and negatively affects to urban environment such as water pollution, uncollected solid waste and traffic congestion. Therefore, it is necessary to direct urbanization to appropriate directions through appropriately managing private development.

(2) Urban Development Policies

It is necessary to establish the following three directions of urban development policies:

- Improvement of land use efficiency in the built-up areas;
- Management of urbanization in the suburban areas; and
- Development of sub-centers for creating multi-polar urban structure.

For the above policies, much efforts on land use control, infrastructure and facilities provision, change of urban functions and urban redevelopment should be made. Policy Zones indicate necessary measures to be taken for certain areas in order to realize such urban development policies. Based on the policies, certain focal points of the planning directions are emphasized in accordance with local characterisitics of the current environmental problems as shown in Table 12.2.

Table 12.1 Issues on Urban Planing

	Central Area	Surrounding Area of Central Area	Urbanized Suburban Residential Area	Suburban Area to be Urbanized
Bangkok Peoples at Present	•Revitalization of Buildup Area •Improvement of Urban Amenity	•Provision of Roads •Improvement of Urban Amenity	•Provision of Roads •Provision of Sewerage •Prevention from Inundation	•Provision of Transport Facilities •Provision of Sewerage •Prevention from Inundation
Bangkok Peoples in future	•Intensified Land Use •Improvement of Accessibility	•Provision of Appropriate Public Transport System •Improvement of Urban Amenity	•Prevention of Sprawl Development •Provision of Public Transport System •Creation of Urban Amenity	•Prevention of Sprawl Development •Guideing Urbanization to Appropriate Direction with Public Transport System •Maintaining Greens and Flood Prone Area
Thai Economy	•Lessening Diseconomy caused by Traffic Congestion •Maintaining/strengthening Hab Function of Economy in Thailand and South East Area	-	-	Sub-center Development

Table 12.2 Application of Urban Development Policy by Area

Urban development Polices	Urbanized Area		Non-Urbanized Area
	Central	Suburban	
Improvement of Land Use Efficiency	Regeneration of Function	Environmental Infrastructure Improvement	
	Land Use Intensification		
Management of Urbanization		Guiding Urbanization with Infrastructure Provisions	
		Environmental Infrastructure Improvement	Control of Urbanization Preservation of Nature
Development of Sub-center			Development of Sub-center Zones

(3) Instrument of Urban Growth Management: Three Approach

With regard to the above urban development policies, various kinds of projects could possibly be employed. They are conceptually divided into three types, including the individual approach, the area approach and the system approach. The individual approach aims mainly at tackling the problem on site. The area approach aims mainly at tackling the problem by taking into accounts the view of a certain collective area. The system approach aims mainly at tackling the problems on the macro level such as the changing spatial structure and institutional re-arrangement.

Urban growth management should select the best combination from the above three approaches for urban environmental improvement in terms of balancing functional benefits and negative environmental impacts.

Table 12.3 shows a conceptual classification for possible programs and projects for urban environmental improvement using each approach.

Table 12.3 Conceptual Classification of Possible Programs and Projects by Three Approaches

	Problems	Problems Identified	Planning Direction		
			Individual Approach	Area Approach	System Approach
Urban Anabolism Management	Problems on Natural Conditions	Flood	Rise foundation at respective site	Restriction of urbanization at possible area	Construction of Flood way outside King's dike
		Land Subsidence	Piling to support building/house	Restriction of urbanization at the area without water supply	Restriction of ground water use Expansion of water supply area
Urban Growth Management & Provision of High Quality Social Capitals	Problems on Urban Planning	Low Living Environment	-	Urban redevelopment project	Supporting reconstruction of houses by public sector
		Disorderly Development	Supervising/guiding individual developers	Restriction of urbanization at the area	Strengthening of permission system (increase of criteria, rise of permission criteria)
		Deterioration of Inner City	-	Redevelopment project	Relocation program
		Land Speculation	-	Designating the area to supervising land trade	Loan Control
		Lack of Parks	Land purchase Compulsory land acquisition Utilization of public land	Urban redevelopment project	Obligation of park provision for large scale land development
	Problems on Low level of Accessibility and Traffic Congestion in Roads	Low road Density by Super Block	Land purchase Compulsory land acquisition Utilization of public land	urban development project (redevelopment, land readjustment etc.)	Obligation of land provision to public use for large scale land development
		Centralized Urban Structure without Sufficient Radial Transport System	Staggered commuting	Area traffic control	Relocation of urban function Sub-center development
		High Percentage of Vehicle Use for commuting	Vehicle use control	Area control	Introduction of MRT systems
Urban Catabolism Management	Problems on Air Pollution	Mobile Source	Improvement of vehicle engine to reduce emission factor	Increase vehicle speed Reduce vehicle volume	Strengthening of environmental standard
		Stationary Source	Improvement of efficiency of combustion in factories	Relocation of factories	Strengthening of environmental standard
		Dust from Construction Site	Strengthening of regulation on construction	-	-
	Problems on Water Pollution	Increase of waste water into Khlong	Saving water use by people	Provision of sewerage system	Controlling urbanization into appropriate direction
	Problems on Garbage	Increase of garbage generation	Reducing garbage generation by peoples Recycling	-	Encouraging Recycling
		Over capacity of Collection Vehicle	Increase of collection vehicle	-	-
		Difficulty of acquiring Final Disposal Site	-	-	Introduction of incineration plant
Type of Actions Needed			Individual infrastructure project Procurement/acquisition, strengthening of regulations Enlightenment activities	Policy zoning system Area improvement project	New institutional arrangement Large Infrastructure development

12.2 Policy Zoning

(1) Concept of "Policy Zoning System"

1) Objectives of Policy Zoning

Since the type of urban environmental problems differ by area, urban development policies as well as the approach to be employed will obviously differ by the area. To identify areas with necessary actions to be taken, the policy zoning system is proposed with the following practical objectives:

- To stipulate appropriate directions of development and implement by "zone"; concomitant with land use zoning;
- To implicate project/programs, institutional and legal frameworks, and financial and budgetary back-up to realize the planned directions; and
- To provide an advantageous tool for "growth management and control" in the urban planning administration in coordination with the relevant authorities.

2) Land Use Zoning vs. Policy Zoning

Land use zoning generally aims at indicating the appropriate land usage pattern, permissible activities and permissible types and sizes of buildings. However, it does not show the necessary actions to be taken for realizing such land use nor for solving/mitigating existing problems. On the other hand, the policy zoning system indicates necessary actions to realize urban development policies as well as urban environmental improvement policies. Therefore it is considered that policy zoning is a type of supplemental zoning system to the land use zoning system.

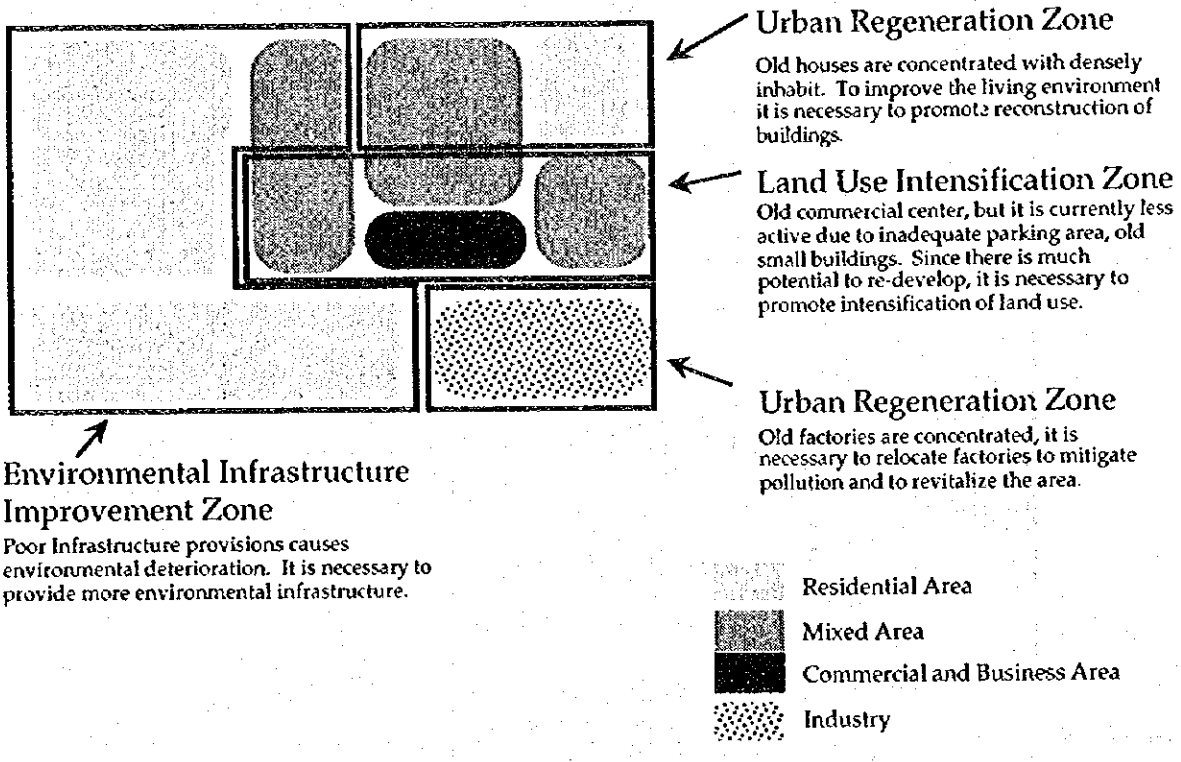

Fig. 12.1 Land Use Zoning and Policy Zoning

(2) Concept of Policy Zoning System

Following the urban development policies as well as the existing urban environmental problems, which were analyzed in Chapter 3, the following policy zoning concepts are employed;

1) Improvement of Land Use Efficiency in the Built-up Area

Replacement of Urban Functions

Industries with less functions located in the central areas and with less productivity compared to land prices should be replaced. The remaining spaces should be used for both new businesses and for provision of public facilities. The public sector should encourage the relocation scheme.

Maximization of land Productivity

The areas with improving land potential should be intensively utilized with higher buildings to create more open spaces and public spaces. The public sector should encourage private development by providing incentives.

Provision of Infrastructure and Facilities

The area with a low living environment should be improved by public investment.

Handing Down Historical Urban Stocks to The Next Generation

The old town view and historical landscape should be conserved as Thai cultural assets. The current view of towns should be maintained by regulations and incentives.

2) Urbanization Control Policy and Measures

Leading Planned Urbanization and Avoiding Urban Sprawl

The area to be urbanized should focus on providing infrastructure in order to direct private development. The other areas should be controlled with regard to private development. Furthermore, it is necessary to specially supervise land transaction and development to avoid land speculation for the area with higher land development potential out of the outer ring roads.

Preservation of Areas for Disaster Prevention and Natural Preservation

The areas used currently for disaster prevention and natural conservation should not basically be permitted any development to maintain present land use.

3) Sub-center Development for Multi-polar Urban Structure

The area for new sub-centers should be designated. The sub-centers should be developed by coordinated efforts of the public and private sectors. The areas for the core area of the sub-center zones and the relatively lower land development potential areas should be developed by the public sector. On the other hand, the areas with higher land development potential should be developed by the private sector with a certain degree of public control.

The above mentioned concept is summarized in Table 12.4.

Table 12.4 Policy Zoning Concept

Natural Conditions	Infrastructure Conditions	Living Environment	Urbanized Area		Non-Urbanized Area
			Central Area	Suburban Area	
✕	✕	✕	Provision of Infrastructure	Provision of Infrastructure Purification of Khlong Water	Preservation Control of Urbanization
△	△	✕	Regeneration of Urban Function	Provision of Parks Purification of Khlong Water	
○	○	○	Land Use Intensification Public Transport Use Promotion Maintenance of Scenery	Maintenance of Scenery	Planned Urbanization Sub-center Development

✕ Unsuitable Condition
△ Average
○ Suitable Condition

(3) Proposal of "Policy Zones"

1) Set-up of Policy Zones

Based on the above concept, the following 7 policy zones and 5 special development zones are categorized to realize the policy zoning system concept:

- Historical Conservation Zone;
- Urban Regeneration Zone;
- Land Use Intensification Zone;
- Infrastructure Improvement Zone;
- Infrastructure-led Urbanization Zone;
- Controlled Urbanization Zone;
- Preservation Zone;
- Special Development Zone:
  - Public Transit Advantageous Zone;
  - New Sub-center Development Zone;
  - Khlong Water Quality Improvement Promotion Zone;
  - Land Development/Transaction Supervision Zone;
  - Park and Open Space Zone; and
  - Special Scenic Zone.

2) Criteria for designating Policy Zones

Table 12.5 shows detailed criteria to designate each policy zone. Based on the results of the urban environmental assessment as well as the land potential and urbanization analysis, several indicators are selected to designate the each policy zone.

Table 12.5 Criteria for Designating Policy Zones

Zone		Criteria for Designation
1	Historical Conservation Zone	• Rathanakosin Area; • Extended District recommended by the Bangkok Plan.
2	Urban Regeneration Zone	• Chao Phraya rive side area with mixed land use of warehouses, factories. etc. which are no longer functioning well; • Part of the Khlong Toei Port Area where integrated development is required; • Part of CBD where infrastructures have been developed but the land uses are highly congested with mixed functions; • Part of CBD where urban redevelopment is assessed to be necessary from the disaster prevention point of view.
3	Land Use Intensification Zone	• Intensified land use is required to maximize the location advantages and land economy; • Mass-transit terminal areas; • Business areas with comparatively high road density and
4	Environmental Infrastructure Improvement Zone	• Part of built-up areas with poor infrastructures and poor environmental conditions: low road density, too high population density, less services of green and park, low service of water supply and sewerage, fears of land subsidence and occasional floods, • Part of built-up area with so-called super block problems
5	Infrastructure-led Urbanization Promotion Zone	• Area where urban land use should be promoted to accommodate increasing population and land use demands; • Areas with a high urbanization potential and a comparatively low built-up ratio at present where the urbanization pressure is thought to be high; • Areas with poor infrastructures and public facilities • Area where disorderly subdivision development is anticipated without provision of advanced infrastructure.
6	Controlled Urbanization Zone	• Areas with low urbanization potential and serious natural constraints ; • Areas where active urbanization needs to be controlled from the environmental point of view even though high urbanization potentials are observed; • Areas along rivers and Klongs necessary for flood prevention and environmental purposes.
7	Preservation Zone	• Areas with considerably low urbanization potential and to be conserved from the environmental viewpoint; • Areas to be reserved on a long-term perspective.
8	Special Development Zone	•
8.1	Public Transit Advantage Zone	• Part of CBD with intensive services by mass-transit systems are to provided (covered with 800 m walking distance from stations of MRTs); and • Part of CBD with extremely high traffic generation and/or attraction, and functionally accessible by alternative public transportation.
8.2	New Sub-center Development Zone	• Locations proposed by the Bangkok Plan, or • Another areas where are assessed to be suitable for publicly initiated sub-center development from the environmental view point.
8.3	Khlong Water Quality Improvement Promotion Zone	• Central urbanized areas both side of Chao Phraya River, encompassed with Khlong Lad Phrao in the eastern side and Khlong Bangkok Yai in the western side.
8.4	Land Transaction/Development Supervision Zone	• Non-built-up area at present with higher land development potential; and • Within controlled urbanization area.
8.5	Park and Open Space Zone	• Existing large-scale parks and open space; • Community parks to be planned; • Green areas to be conserved.
8.6	Special Scenic Zone	• Area with historical, cultural and tourism assets • Special area where landscaping should be improved • Part of Chao Phraya River side areas to be scenically preserved

(4) Designation of Policy Zones

Based on existing data and simulation data regarding urban planning, transport planning and environmental planning, the policy zones are designated, as shown in Fig. 12.2

(5) Necessary Measures for Policy Zones

To realize urban development and environmental improvement policies, necessary institutional measures are indicated by the policy in Table 12.6. Most of the necessary measures are based on private participation in urban development. The public sector needs to strengthen the regulatory measures as well as create new urban development schemes, which are discussed in the next chapter regarding an institutional plan for urban growth management.

Fig. 12.2

Policy Zoning

Legend

- Historical Conservation Zone
- Urban Regeneration Zone
- Land Use Intensification Zone
- Environmental Infrastracture Improvement Zone
- Infrastructure Led Urbanization Zone
- Controlled Urbanization Zone
- Preservation Zone
- New Sub-center Development Zone
- Khlong Water Improvement Promotion Zone
- Land Scaping/Scenc Zone
- Land Development / Transaction Supervision Zone
- Park / Open Space Promotion Zone
- Public Transport Priority Zone
- Existing Road (Class 1, 2)
- Existing Road (Class 3)
- Existing Expressway
- MRT Systems
- MRT Systems Expansion
- Expressway in 2000
- Improvement of Existing Road (DOH)
- New Road in 2000 (DOH)
- Improvement of Existing Road (BMA)
- New Road in 2000 (BMA)
- Improvement of Existing Road (PWD)
- New Road in 2000 (PWD)
- BMA Boundary
- District Boundary
- Chaopraya River

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KILOMETERS

THE STUDY
ON
URBAN ENVIRONMENTAL IMPROVEMENT PROGRAM
IN
BANGKOK METROPOLITAN AREA (BEIP)

BANGKOK METROPOLITAN ADMINISTRATION(BMA)
THE GOVERNMENT OF THE KINGDOM OF THAILAND

JICA JAPAN INTERNATIONAL COOPERATION AGENCY(JICA)

Table 12.6 Necessary Measures for Policy Zones

Policy Zone	Designation of Special Zone	Planning Direction	Proposed Measures				
			Public				Private
			Incentives		Regulation	Others	
			Provision of Infrastructure	Institutional Incentives			
Historical Conservation Zone		To conserve old chinese town scape, building reconstruction, signboard, change of building use should be controlled in certain degree.	•Provision of Street Furniture •Street Beautification	•Subsidy for old building owners •Subsidy for building repairs	•Signboard regulation •Regulation on reconstruction of old buildings •Regulation on change of building use		Encouraging tourists arrival
Urban Regeneration Zone	Special Scenic Zone	Present environment and facilities, which are less significant with certain historical value, should be utilized as tourism and recreational use to revitalize areas.	•Construction of park •Provision of Street Furniture •Street Beautification				Reuse of old factories, warehouses Encouraging tourists arrival
	Ordinal Zone	Certain production and distribution industries and governmental facilities should be relocated mainly to sub-center zones and regional centers to locate more significant facilities and generate lands for provision of environmental and amenity facilities.	•Provision of estate for relocation in sub-center zones	•Tax reduction for relocated firms •Special Depreciation for relocated firms	•Additional environmental standard		Redevelopment of site to introduce higher productive land use
Land Use Intensification Zone	Public Transport Priority Zone	Public facilities around MRT stations such as station plaza and bus terminal should be developed by the public sector. Provision of pedestrian facilities and area traffic control should be taken into account for encouraging public transport use.	•Provision of station plaza, bus terminal and pedestrian facilities	•FAR Bonus	•Area traffic control •Regulation for providing public spaces from the private development site		Redevelopment projects
	Ordinal Zone	Private redevelopment project should be encouraged with guiding development by coordinating regulations and incentives. Public urban facilities such as park, roads and water treatment facilities should be provided by utilizing public own lands.	•Construct public facilities on lands provided from private developers	•FAR Bonus	•Area traffic control •Regulation for providing public spaces from the private development site		•Provision of public spaces from redevelopment projects
Environmental Infrastructure Improvement Zone	Khlong Water Quality Improvement Promotion Zone	Khlong water purification should be encouraged. Waste water from households should be lessen its environmental loads.	•Construction of sewerage system •Introduction of dilution water •Dragging khlong		•Sewerage user charge	Promotion of peoples' awareness by public relations, education	•Cooperation for reducing environmental loads
	Park and Open Space Promotion Zone	Parks should be provided by utilizing public lands. Small parks and green path should be generated through private development projects.	•Construction of large parks on available public own lands •Construction o parks on land provided from private developers	•FAR Bonus	•Regulation for providing public spaces from the private development site		•Provision of public spaces through redevelopment project

Table 12.6 Necessary Measures for Policy Zones (Continued-2)

Policy Zone	Designation of Special Zone	Planning Directions	Proposed Measures				
			Public				Private
			Incentives		Regulation	Others	
			Provision of Infrastructure	Institutional Incentives			
Environmental Infrastructure Improvement Zone	Ordinal Zone	Living environment should be improved by providing roads, water supply and sewerage.	•Construction of major infrastructure •Construction of infrastructure on lands from private development		•Regulation for providing public spaces from the private development site •Redevelopment project (land readjustment project etc.) •Designation of urban planning project area which public sector has priority to negotiate land transaction	•Preparation of redevelopment plan	•Provision of public spaces through redevelopment project
Infrastructure Led Urbanization Zone		Urbanization movement should be directed by providing infrastructure and land use regulations.	•Provision of major Infrastructure		•Strengthening permission procedure for building permission and land subdivision permission to ensure provision of environmental infrastructure by private developers		•Provision of infrastructure in/around project site
Controlled Urbanization Zone	Land Transaction/ Development Supervision Zone	Regulations should be introduced to pay a special attention on avoiding sprawl development and discrepancy from land use plan. Building permission and subdivision certificate should be more severely managed.			•Strengthening permission procedure of building permission and land subdivision		
	Ordinal Zone	Urbanization should be restrained.			•Restructuring land subdivision committee to emphasize land use plan		
Preservation Zone		Existing land use should be preserved.			•Restructuring land subdivision committee to emphasize land use plan		

Table 12.6 Necessary Measures for Policy Zones (Continued-3)

Policy Zone	Designation of Special Zone	Planning Direction	Proposed Measures				
			Public				Private
			Incentive		Regulation	Others	
			Provision of Infrastructure	Institutional Incentives			
New Sub-center Development Zone	Existing Build up Area	Living environment should be improved by providing infrastructure. Public spaces should be generated through reconstruction of residential areas.	•Provision of Main Infrastructure	•FAR Bonus •Tax Reduction	•Formulation of Special standard for Sub-center zones		•Implementation of redevelopment project with sub-center standard •Provision of public spaces
	Future Expansion Area	Sub-center standard for infrastructure, building should be developed for upgrading private development.	•Provision of Main Infrastructure		•Formulation of Special standard for Sub-center zones •Regulation on providing public spaces/urban planning cooperation fund from private development site		•Implementation of land subdivision project with sub-center standard
	Planned Development Area	Infrastructure and public facilities should be developed by public sector.	•Provision of infrastructure, urban facilities and lands for industries	Tax reduction for relocated firms Special Depreciation for relocated firms	•Special legislation on land acquisition		

CHAPTER 13: INSTITUTIONS FOR URBAN GROWTH MANAGEMENT

13.1 Issues regarding Institutional Improvement for Urban Growth Management

(1) Introduction

Bangkok needs to continuously implement various programs and projects to improve the urban environment, that is not only the programs and projects proposed by this study, but also other programs and projects may be required in accordance with future changes. For this purpose, it is important issue to strengthen the capability of Thai government to revise/modify the programs and projects, to formulate new projects and programs, and to implement the projects, as well as to formulate the programs and projects in this study.

Furthermore, urban growth management is indispensable to realize balanced development between with economic efficiency and environmental sustainability. For this purpose, the study team proposed the policy zoning system indicate necessary measures for urbanization control and urban restructuring. To realize the policy zones, it is necessary to not only provide infrastructure and public facilities, but also control/guide private development into appropriate directions.

In this regard, this chapter proposes institutions related to urban development control as a part of urban growth management measures.

(2) Institutional Problems

As for urban growth management, provision of infrastructure, promotion of urban redevelopment, and private development control are basic necessities. To implement this, the public sector may need to improve capability for environmental management which could divided into the following 7 elements:

- Planning Data Management;
- Master Plan Formulation;
- Land Development Control;
- Land Use Control;
- Building Control;
- Land Acquisition for Infrastructure and Public Facilities Development; and
- Construction of Infrastructure and Public Facilities.

Current institution are reviewed from these points of view as follows:

1) Planning Data Management

Basic data is indispensable for formulating appropriate policies, regulations and development plans. However, some basic data such as land subdivision, land use, building and inventory of infrastructure are not available. Information on flooding and land subsidence are collected and compiled using different format and base map, which, as a result, prevents effective use of such information. Accordingly, detailed analyses using sound scientific data can not be appropriately carried out.

2) Master Plan Formulation

Urban and regional development master plans are formulated by planning authorities such as the City Planning department of BMA, DTCP and NESDB. The District Plan, which formulates micro-level plans for each district, is now being prepared for each district by BMA. The problem is that a structure plan covering the Bangkok Metropolitan Region (BMR) is not formulated, even though a rough spatial framework is planned in "Chao Phraya Multi-Polis Study" by NESDB. From the planning point of view, the development direction of Bangkok depends greatly on the spatial framework of BMR, so that the appropriate positioning of Bangkok in BMR should be discussed in detail.

3) Land Development Control

Land subdivision development is controlled by the Land Subdivision Control Act. It clearly regulates the procedure and development standard. However, many land subdivision projects occur and cause urban sprawl development in conservation areas in Bangkok. The problem is that the Act applies to projects with more than 9 houses. Smaller-scale land subdivision projects with less than 9 houses are out of its control. This should be reviewed.

4) Land Use Control

A land use plan is formulated in the General Plan. To realize the land use plan, the Town and Country Planning Act includes an article that stipulates permissible type of building use by land use. However, the Act also allows exceptional cases, which set a maximum percentage of area for different types of buildings, resulting in allowing different types of building construction. The reason why building development seems to be carried out free of control by the government depends mostly on this exceptional allowance as well as on existing buildings with different uses.

To realize the land use plan, linkage between the land use and the building control should be more strengthened.

5) Building Control

Building development is controlled by the Building Code. Structure, Shape and consistency with the land use plan are checked for building permission. For building capacity, 1000 % of FAR (Floor Area Ratio) permitted and maximum building height is regulated at less than 2 times of the length from public roads in Bangkok. However, the building coverage ratio is not adapted.

With the existing regulations, large building development can possibly be located in any place, and can be mixed with existing low-story buildings. This causes excess load on the infrastructure especially for roads, resulting in added loads of traffic generation.

6) Land Acquisition for Infrastructure and Public Facilities Development

For the projects to realize urban infrastructure and facilities, land acquisition is a critical problem due to high land prices. It is one of the main reasons for the delay of infrastructure and public facilities projects. At present, purchasing necessary land or compulsory acquisition are the only methods available for the public sector. Since the public sector can afford for the land to be within the maxim of land valuation prices, it is very difficult for the public sector to negotiate land purchase with land owner. On the other hand, compulsory acquisition allows purely public purpose only with complicated ad long procedure. It is therefore necessary to introduce new methods for land acquisition to accelerate the implementation of projects.

7) Construction of Infrastructure and Public Facilities

The Thai government has accumulated much experience with managing infrastructure and public facilities construction. Technically there are no problems. For the

construction of infrastructure and public facilities, the largest problem is project finance. The projects and programs have to be implemented with very limited public investment. On the one hand, it is necessary to expand the financial sources both from the public sector and the private sector. On the other hand, private participation in urban development is promoted to lessen public investment.

(3) Potentials and Seeds for Urban Environmental Improvement

Instead of institutional problems, there are three notable new situations that can be pointed out as potentials and seeds for urban environmental improvement:

- Economic Growth;
- Growth of Private Sector; and
- Peoples' Awareness.

1) Economic Growth

As described in Chapter 2, the Thai economy generally but especially Bangkok's economy has grown up very rapidly. It contributes to an increase of tax revenue and peoples' affordability as described in Chapter 15. It has positive impacts on the implementation of the projects/programs.

2) Growth of Private Sector

In consonance with economic growth, the private sector has grown rapidly. This results in the private sector being more affordable and responsible to society. In particular, private firms are financially strengthened to bear social costs. For example, the central areas were redeveloped by private developers with a total area of more than 1% a year. A good opportunity is provided to generate public open spaces by combination with private development. In other cases, certain oil refinery firms grew with an environmentally good image associated with their products. These facts imply that either voluntary or compulsory private participation in urban environmental improvement projects/programs is a key element for urban environmental improvement in terms of enlarging investment, land acquisition, reduction of emission and change of production and production process.

3) Peoples' Awareness

Awareness regarding the environment is rising. According to a survey conducted by IDE, 41 % of people of Bangkok recognize that natural and environmental deterioration are the most serious problems for Thai society, as shown in Chapter 3. Air pollution is considered to be the most serious problem by the people of Bangkok, followed by deforestation and water pollution. Peoples awareness strongly affects the implementation of urban growth management policies, programs and projects. The participation of private firms' in environmental activities is going to accelerate in response to consumer awareness.

(4) Planning Issues

Considering the current institutional problems and potentials, the Study Team identified the 4 following planning issues to improve institutions for urban growth management:

- Improvement of Information System for Planning;
- Acceleration of Public Land Acquisition;
- Strengthening of Regulatory Functions and Incentives for Private Participation in Urban Development; and
- Enlargement of Financial Sources for Urban Environmental Improvement Projects/Programs.

1) Improvement of Information System for Planning

In the projects and programs described in Chapter 10 and 11, the necessity of various master plans including revision of existing plans and studies are pointed out. However, basic data for planning is not sufficiently collected and compiled, resulting in huge costs and time required for planning. In addition, since the necessary data are kept in different offices, it takes a long time for data collection. It is necessary to improve the accessibility to the information for planning. Efforts at collecting and compiling basic data through monitoring and regular data exchange among related agencies are indispensable.

2) Acceleration of Public Land Acquisition

For the projects to realize urban infrastructure and facilities, the land acquisition method should be more varied, as the present land acquisition method is limited.

3) Strengthening of Regulatory Functions and Incentives against Private Development

Since the Thai society does not wish for government intervention in private activities, regulatory measures to control private development activities. There are not sufficient measures to realize urban development policies and urban plans, as regulatory measures are not attached to city planning administration. For example, there are few regulations effectively guiding land use. Building capacity control is not functioned due to adapting 1000 % of FAR to whole BMA. Without effective control, free private development causes a capacity gap between building and infrastructure in the central area, and urban sprawl in suburban areas, resulting in increased public investment. It is indispensable to strengthen the regulatory functions for private development.

With regard to the urban development, private building redevelopment in the central area and land subdivision development in suburban area are very active. If public spaces are provided through very active development, certain urban environmental improvement projects are much accelerated without land acquisition. The public sector provides certain incentives to private developers such as building capacity bonuses, additional height of buildings, different use of building instead of providing certain portions of land on site by the private developer. The public sector utilizes the land for public facilities such as footpaths and parks.

For this end, the public sector should prepare a set menu of regulatory measures and incentive measures to promote private participation in urban development, environmental technology development, privatization of infrastructure provision.

4) Enlargement of Financial Sources for Urban Environmental Improvement Projects/Programs

Related to private participation, the public sector should make efforts to enlarge financial sources for programs and projects. An appropriate fee level for public services, use of external resources and so on should be the key for enlarging financial sources for public investment.

13.2 Improvement of Information System

(1) Necessary Information

1) Topographical Map

The up-dated topographical maps covering BMA are not sufficiently prepared. The map covering the central area of Bangkok has been developed with a 1:4000 scale in 1987, but the map covering the suburban areas was developed in the late 1970's with 1:50000 and 1:20000 scales. It is necessary to up-date the topographical maps in accordance with rapid urbanization.

2) Spatial Data

Urbanization and development activities in Bangkok are occurring so rapidly that basic data for planning and policy making are not functionally prepared, in particular the data for spatial analyses. there is a great need to periodically collect data and store one place in order to secure data accessibility.

3) Infrastructure Inventory

Inventories of infrastructure such as roads and water supply are not prepared. They should be developed with a computerized system in order to provide valuable information, not only for planning, but also for the daily maintenance and operation of the infrastructure.

4) Socio-economic data

Socio-economic data are relatively well prepared. There are relatively few problems regarding this data.

(2) Information System Improvement Programs

The following programs on information system improvement are proposed:

1) Mapping

The topographical map covering the central area of Bangkok, approximately the current built-up area, should be prepared with a 1:2000 or 1:2500 scale. As for the other areas, a topographical map with a 1:5000 or 1:10000 scale should be developed. Detailed discussions can be found in Chapter 28.

2) System Information Center

A system information center should be developed in BMA with the following functions:

- Systematic training for the GIS operation;
- Application system development; and
- Data generation and information production.

Detailed discussion can be found in Chapter 28.

3) Infrastructure Inventories

To facilitate maintenance and operation work, the following inventories with a computerized system should be developed:

- Road inventory; and
- Water supply facilities inventory.

(3) Institutional Consideration

To facilitate mapping and road inventories, privatization is essential in order to secure a task force. However, access to the mapping work in Thailand is currently strictly limited for the private sector for national security reasons. The Royal Survey Department accordingly almost monopolizes mapping information. Considering that satellites will have a 1 m resolution within several years, it seems to be less significant for the government to monopolize mapping business for reasons of national security. Therefore, it is recommended that it should be more flexible for the private sector to enter the mapping business.

13.3 Acceleration of Public Land Acquisition

As for implementing the urban infrastructure and facilities development project of the "General Plan", the land acquisition system should be more diversified, since the present land acquisition method is less effective for facilitating public-initiative projects. Therefore, the following measures should be explored:

- Introduction of a Priority Negotiation System for the public sector
- Contribution of land from private development projects
- Land readjustment program

(1) Introduction of A Priority Negotiation System for Public Sector

1) Concept

It is proposed that the planning authority should justify urban facilities and infrastructure projects and give the right can negotiate land purchase with the land owner with highest priority. It is also proposed that in the designated areas, only urban infrastructure and urban facilities justified in the General Plan can be constructed. Other construction activities including the rehabilitation of existing building are strictly prohibited.

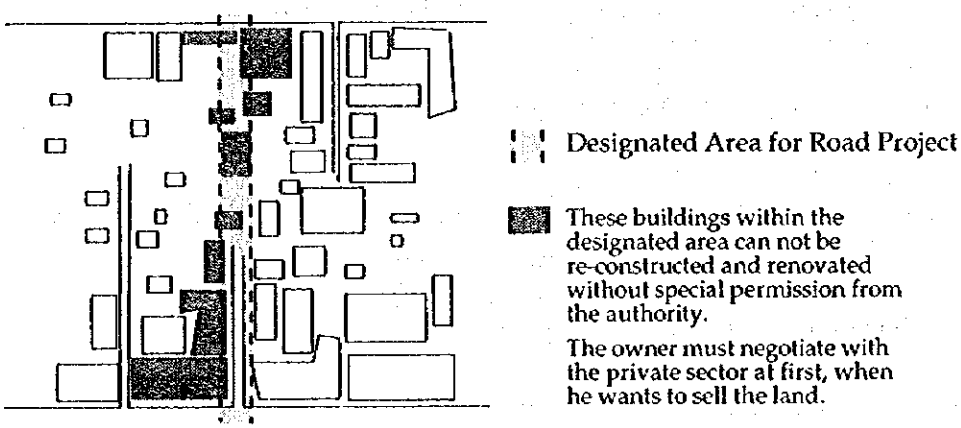


Fig. 13.1 Concept of Priority Negotiation System

2) Necessary Institutions

To realize the above concept, the following measures should be enforced:

- Identification of urban planning project;
- Designation of an urban planning project area;
- Provision of priority negotiation right to public sector; and
- Activities to be prohibited in the designated area.

Identification of An Urban Planning Project

At Present, the transport infrastructure and communication infrastructures are justified in the BMA's General Plan, but other infrastructures are not justified. In order to provide and smoothly implement the infrastructure projects, the General Plan and sector development plans should be coordinated. The infrastructure to be implemented should be justified by the General Plan.

For this purpose, section 17 of the Town Planning Act should stipulate in more detail types of infrastructure which can be justified in the General Plan, or the necessary BMA ordinance should be formulated to justify it. The projects justified by the General Plan are identified as the urban planning project.

Designation of An Urban Planning Project Area

For implementing the urban planning projects, two land acquisition methods are available such as purchasing and compulsory acquisition. To implement the urban planning projects with land purchasing, necessary land for the projects should be designated as the urban planning project area.

Provision of Priority Negotiation Right to the Public Sector

As for the designated urban planning project area, priority negotiating rights should be legally provided to the public sector. The landowner can not sell the land designated as the urban planning project area, unless the public sector gives up the urban planning project.

Activities to be Prohibited in the Designated Area

The following should be prohibited in the urban planning project area:

- New structure construction which has different purposes from the urban planing project;
- Changing the existing land form;
- Reconstruction of existing buildings; and
- Rehabilitation/renovation of existing building.

(2) Contribution of Land from Private Development Projects

1) Concept

Since private developers need to take responsibility for the society, it is necessary to encourage their cooperation in terms of urban development. It is advantageous for the public sector because the public sector does not need to purchase all land necessitated for implementing infrastructure projects.

Since building development by private developers in built-up areas is very active, it is a good opportunity for the public sector to obtain land, if appropriate development management can be done by the public sector. For this purpose, a new system is proposed in which the private developers voluntarily provide certain portion of land in their project sites to public sector. The public sector can give incentives to encourage private contributions. With the provided land, the public sector can implement public facilities projects. This method may be effective for small projects such as small parks, schools, footpaths, bus stops.

2) Necessary Institutions

To implement this new land acquisition system, the public sector needs to strengthen regulatory measures and give incentives to the private urban development project in order to guide the private developer's behavior.

Regulatory Measures

The following regulations should be reviewed in order to control free building development activities by private developers:

- Floor Area Ratio
- Set-back
- Building Height

- Building Coverage Ratio (new introduction)

Incentives

On the basis of more strict regulations in terms of building capacity, incentive measures can be effective to guide private development. Building capacity bonuses can be given to private developer who contribute land. Detailed discussions are made in the following section.

(3) Land Readjustment Program

A land readjustment program has been examined to be introduced in Thailand in several years, in a close cooperation with the Japanese government. The land readjustment program is known to be a useful program for comprehensively developing the area in terms of adjusting land form, providing public facilities such as parks and roads by contribution. The study and pilot projects have been already implemented, and a detailed technical scheme on the land adjustment program has been already determined. It is now in the legislative process. Accordingly, in order to promote the land readjustment project, it is important to improve supportive regulations and institutions at this stage. The following institutions should be reviewed for this purpose:

- Land valuation method;
- Micro level urban development plan (district plan);
- Regulations to keep existing land use and building; and
- Tax exemption for the program.

13.4 Strengthening of Regulatory Functions and Incentives against Private Development

(1) Concept

The principle is that:

- Urban development must not be permitted without appropriate planning; and
- Private development should not be carried out without adequate public facilities and infrastructure.

From these points of view, it is insufficient to manage private development in terms of the relation between policies applied in the General Plan and permission for development such as building permission and land subdivision permission.

As for urban development, especially for urban regeneration, land use intensification and environmental infrastructure provisions, it is necessary to accelerate urban redevelopment and infrastructure development. However, there is a limit to the public budget.

It is therefore necessary to utilize private urban development projects for improving the urban environment, since private development is very active and financially capable of contributing to urban development. To utilize the private sector, it is necessary to strengthen the general regulatory measures to manage private development activities, including land use, and building and land development. Incentives for participation in the urban development by the public sector should be also created. Both measures should be simultaneously undertaken in order to change private behavior. To this end, the following points are made:

- Revision of existing policies;
- Revision of existing regulations;

- Introduction of a new scheme
- Sub-center development scheme; and
- Introduction of new BMA ordinances.

(2) Revision of Existing Policies

The following policy should be enforced in order to prevent disorderly urbanization:

1) Control of Infrastructure Provisions in Controlled urbanization and Preservation Zones

According to the land development potential analysis described in Chapter 4, it is clearly implied that infrastructure provisions lead to land development potential. To control urbanization as well as to preserve existing land use in the suburban area, it is necessary to restrain infrastructure provisions in those area. Further, to restrain groundwater usage, housing development without public water supply should be discouraged.

To this end, priority of infrastructure provisions of both roads and water supply in the controlled urbanization and preservation zones should be reviewed.

(3) Revision of Existing Regulations

The following regulations should be reviewed to facilitate management of private development by the public sector:

- Rationalization of regulations on the building capacity
- Revision between building use and land use
- Review of the effectiveness of the "10 % allowance system"
- Review of the current land subdivision permission system
- Review of parking space obligations in the public transport priority zone

1) Rationalization of Regulations on the Building Capacity

Floor Area Ratio

According to the FAR survey conducted by the BEIP Study Team, it is estimated that the average FAR in Bangkok is approximately 150 %. Since a building can construct up to 1000 % of FAR, the current FAR regulation does not control building capacity well. It is necessary to review the FAR regulation. In this sense, MIT's "The Bangkok Plan" proposed FAR by land use and location, which is divided into 5 level, that is 1000%, 600 %, 400 %, 200 % and 100 %. It provides a good basis to discuss an improved FAR system for Bangkok.

Building Height

Regulations regarding the height of buildings is a measure to manage building capacity. The maximum building height is twice the distance between the building site and public road. This regulation allows for extremely high-rise buildings. It is therefore necessary to introduce other regulations to regulate building height. Regulating the absolute height is an example.

2) Revision between Building Use and Land Use

The current City Planning Act stipulates permissible types of building by land use, however, it is too vague regarding buildings that are not permitted and is therefore difficult to apply as a criteria for building permission. These vague references regarding prohibited buildings in the City Planning Act should be more clearly set out. In this sense, MIT's proposal could lead to further discussions regarding this matter.

3) Review of the Effectiveness of the "10 % Allowance System"

The current City Planning Act includes an exceptional article regarding permissible buildings in land use. It allows for different types of building from the proposed building with a limit of 10 % or 5 % to the total area. It gives any building construction legal status. Together with existing building, this exceptional regulation makes people feel that Bangkok is free for building construction in any land use zone. It is therefore recommended that this exceptional regulation should be reviewed.

4) Review of the Current Land Subdivision Permission System

According to the field investigation and Landsat data analysis conducted by the BEIP Study team, many land subdivision development projects can be seen in conservation areas, especially in the Minburi, Lat krabang, Taling Chan and Bang Khun Thian districts. The land subdivision development projects which include more than 9 houses need to be permission from the Department of Lands, but projects with less than 9 houses are not regulated. This results in urban sprawl. Therefore, the current land subdivision permission system should be reviewed with a view to applying to smaller-scale projects.

5) Review of Parking Space Requirement in the Public Transport Priority Zone

Car parking space is required for large scale buildings at present. Since public car parking lots have not been appropriately provided in the central districts, such a requirement has been effective for supplying car parks in the central district. However, it generates excessive this may deter use of mass rapid transit in the future. To encourage use of public transport in order to mitigate current traffic congestion, this regulation should be reviewed.

(4) Introduction of A New Scheme

To promote urban redevelopment and restructuring, the public sector needs to prepare systematic urban development project scheme. In accordance with the policy zoning system, the following three schemes are proposed:

- Relocation scheme for urban regeneration zone;
- Public Building relocation/intensification scheme; and
- FAR bonus scheme

1) Relocation Scheme for Urban Regeneration Zone

Concept of Relocation Scheme

Less significant establishments or industries should be relocated from the central area to the suburban areas. The site in the central area can be effectively utilized for introducing new business, public spaces supplying infrastructure and facilities for the area. To this end, a relocation scheme is proposed. The contents of the scheme are as follows:

Target of Industries to be Relocated

- Target establishments are large factories, warehouses/storage facilities, wholesalers along the Chao Phraya River
- Old low-story mixed-use building

Regulatory Measures to discourage staying at the current site

- Periodical revision of the rate for the House and Building Tax
- Additional Environmental Standards for waste water discharge and gas emissions

Incentives Measures to Encourage Relocation

- Preparation of appropriate estates in the sub-centers
- Reduction of House and Building Tax for certain duration

- Special depreciation
- Public finance with low interest rates and a long grace period
- Subsidies

2) Public Building Relocation/ Intensification Scheme

Concept of Public Building Relocation

As well as the encouragement of the relocation of the private sector, unnecessary establishments located in the central area including public sector buildings also need to be relocated. In the case of reconstruction of old public offices, some offices should be combined with larger buildings to generate open land, because it is possible to utilize this open land for public services. In this sense, BMA's effort to establish an inventory of public land is highly acceptable. The BEIP Study Team therefore recommend that this valuable effort should be completed as soon as possible. Based on this inventory, the public building relocation and intensification programs should be developed.

Candidates for Relocation

The following establishments of the public sector are preliminarily for relocation:

- Higher education and research institutes;
- Staff training and laboratories;
- Factories, and warehouses; and
- Others establishments with limited public interaction.

Usage of Remained Land

With open land created by relocation or intensification, the public service facilities justified in the General Plan should be developed. In addition to utilizing the land for public services, it is possible to utilize as a seed land for exchange with private land.

3) FAR Bonus Scheme

To increase public spaces in the central area, the FAR bonus system is proposed. If a private development project provides spaces for public areas such as parks, sidewalks and footpaths, the public sector gives a certain degree of the FAR bonus. This system is popular to increase open spaces in built-up areas especially in developed countries, and is proposed by MIT's Bangkok Plan, too. The maximum bonus is the difference of the building capacity between the building capacity can be obtained without contribution of land and the building capacity that can be obtained with contribution of land. The concept of the FAR Bonus scheme is illustrated in Fig. 13.2.

This system can be implemented after completion of the rationalization of the FAR system.

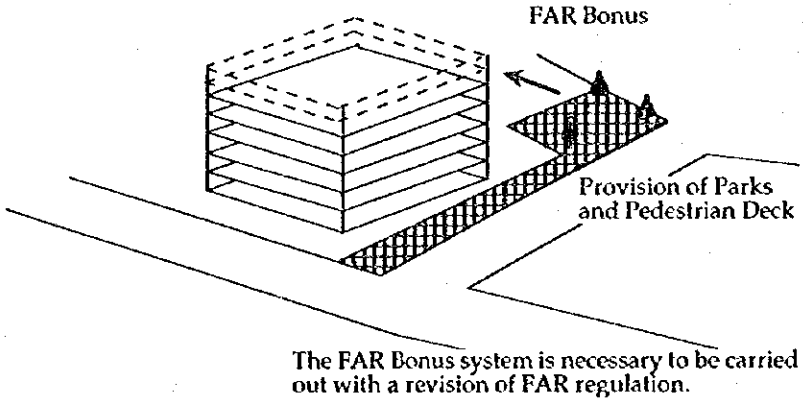


Fig. 13.2 Concept of Building Capacity Bonus

(5) Sub-center Development Scheme

1) Concept of Sub-center Development Method

Sub-center development needs a huge amount of investment. It is nearly impossible to depend only on public investment for the development. Since the sub-center development is one of the major efforts to reform the urban structure of Bangkok, it needs to diversify the sources of investment. Thus, the sub-center development should be developed with private participation.

It is proposed therefore that the sub-center area is divided into 3 areas in terms of development methods such as:

- Area 1: Current built-up area;
- Area 2: The area to be urbanized with higher land development potential; and
- Area 3: Planned development area.

Area 1: Current Built-up Area

The current built-up areas in the sub-center zone should improve their urban environment to satisfy the sub-center standard. For this purpose, the land readjustment program can be applied to these areas.

Area 2: The Area to be Urbanized with Higher Land Development Potential

Some areas in the sub-center zones are evaluated as higher land development potential areas. Such areas seem to be developed even if they are not designated to the sub-center zone due to their higher land development potential. Therefore, it is necessary to give intensive guidance to private development in order to satisfy a sub-center standard.

Area 3: Planned Development Area

This area has relatively lower land development potential with larger non built-up spaces. The public sector should take the lead in developing this area through land acquisition and provision of necessary infrastructure and core facilities.

2) Necessary Measures for Sub-center Development

To materialize the development method proposed above, necessary measures by type of area in the sub-center zone are indicated in Table 13.1.

Table 13.1 Proposed Measures for Sub-center Development

Designation of Special Zone	Planning Direction	Proposed Measures			
		Public			Private
		Incentives		Regulation	
		Provision of Infrastructure	Institutional Incentives		
Area1: Existing Build up Area	Living environment should be improved by providing infrastructure. Public spaces should be generated through reconstruction of residential areas.	•Infrastructure: Roads, Sewerage, Water Supply, Solid Waste	•FAR Bonus •Tax Reduction	•Special Building and Environment Standards for Sub-center zones	•Implementation of Redevelopment Project with Sub-center Standards •Provision of Public Spaces
Area 2: Future Expansion Area	Sub-center standard for infrastructure, building should be developed for upgrading private development.	•Infrastructure: Roads, Sewerage, Water Supply, Solid Waste	-	•Special Development and Environmental Standards for Sub-center zones •Development Guidelines	•Implementation of Land Subdivision Project with Sub-center Standard •Provision of Infrastructure
Area3: Planned Development Area	Infrastructure and public facilities should be developed by public sector.	•Infrastructure: Roads, Water Supply, Sewerage, Electricity etc. •Facilities: Rail Station, Station Plaza, School, Hall etc. •Estates for: Business buildings, Relocated Indsstries and Warehouses	Tax Reduction for Relocated Firms Special Depreciation for Relocated Firms	•Special Legislation on Land Acquisition •Consideration of Land Trust	-

3) Land Acquisition

Areas 1 and 2 are developed by the private sector, so that land acquisition is not a problem at all. It is, however, a key issue for area 3, which is a core of the sub-center zones, that land acquisition be should be smoothly and quickly carried out. There are conceptually two methods for land acquisition to be applied for area 3, that is:

- Acquisition from current land owners; and
- Lease from current owners.

Acquisition Method

This method is that the public sector obtains the necessary land from the current land owners through purchase or compulsory acquisition. Since the sub-center needs to be comprehensively developed in order to retain higher environmental standards, land acquisition should be done for not only infrastructure and public facilities, but also residential areas. As for land purchasing, it is necessary to apply the proposed designation of urban planing project area system to avoid land speculation. As for compulsory acquisition, it is necessary to review the applicable project, as current regulations on the compulsory acquisition are strictly. Therefore, with regard to these two methods, it may be necessary to establish a new supportive act to obtain large-scale land only for the sub-center development.

Non-Acquisition Method

If the current land owners remain, the public sector obtains only a use right. Many methods like Land Lease and Land Trust are developed at present especially for redevelopment projects. The advantage is that the public sector does not need to buy

land and suffer from land acquisition. However, it also has disadvantages in that the public sector should return the land if a land owner disagrees with extending the contract. Allocation of rent of the land will also be a complicated problem.

There are various kinds of land acquisition methods possible for sub-center development. To select the applicable land acquisition method, a detailed study should be carried out with regard to the following:

- Land owner's acceptance;
- Comparative financial advantage;
- Reliability as a public project;
- Difficulty in terms of the Thai legislative system; and
- Procedural difficulty for implementation.

4) Sub-center Development Guideline

Since it is proposed that sub-center areas should be developed with private participation, special guidelines for development and environmental for the sub-center area should be prepared in order to create an improved urban environment. For this purpose, development guidelines should be prepared to show minimum standards regarding buildings and lands, which should be followed by the private developers. A detailed discussion is made in the next section.

(6) Introduction of New BMA Ordinance

1) Traffic Assessment Study

Necessity of A Traffic Assessment Study

Building construction generates new traffic production. High-rise buildings can be constructed in any places up to 1000 % of FAR with some exceptional areas in the central area of Bangkok. This creates pressure on infrastructure, resulting in less road space in the central area. It is said that building development should be balanced to provision of infrastructure in the central area. Furthermore, some building construction activities negatively affects road traffic such as disturbing the smooth traffic flow by occupying road spaces and increasing the number of vehicles. It is necessary to mitigate negative impacts from building construction activities.

It is therefore proposed that a traffic assessment system be introduced to substitute the current building permission system. The traffic assessment aims at compelling mitigation measures of negative impacts on traffic flow for private developers. It should cover both construction and operation periods.

Proposed Scheme

The proposed scheme of the traffic study is shown in Fig. 13.3. Private developers carry out the study including the proposal of mitigation measures, and the public sector is responsible for evaluating the mitigation measures and requesting change of building capacity or improving mitigation measures, if necessary, as follows:

- A developer carries out the traffic assessment study;
- Submission of traffic assessment study to authorities;
- Public sector evaluates the project from the traffic impact point of view;
- If there is much problem with traffic, the public sector requests that the project size be reduced;
- Private developers can select either reduction of the project size or provision of urban development cooperate funds; and
- The private sector implements the project with mitigation measures in the construction stage.

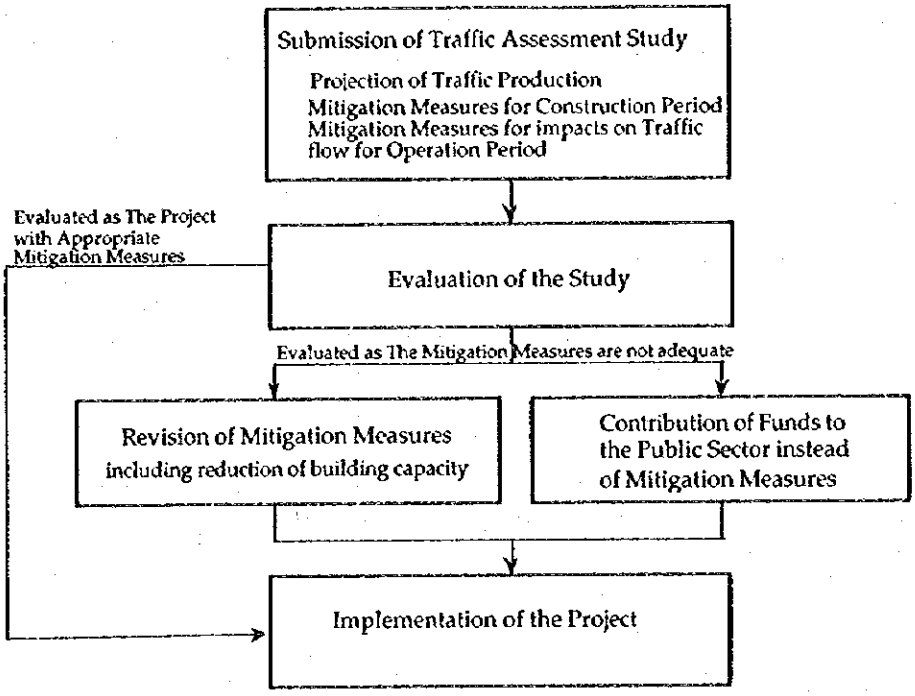


Fig. 13.3 Proposed Process of the Traffic Assessment Study

Target Project

- Large-scale residential development
- Large-scale commercial buildings such as hotels, department stores, commercial complexes
- Large-scale office buildings
- Factories in the built-up area

Items to be included in Traffic Assessment Study

- Summary of the development project
- Traffic production caused by construction and operation periods
- Proposed mitigation measures in accordance with the traffic production

Legal Status

Since this issue occurs in Bangkok, it is not necessary to apply whole nation at this moment. It is accordingly to propose that regulation should be set forth by BMA Ordinance.

Responsible Authority

It is proposed that the Police Department and BMA be co-responsible for this scheme.

2) Development Guideline

Concept

In general, the public sector is responsible for developing infrastructure and public facilities. However, limited amounts of public investment can not cover the necessary infrastructure and public facilities provisions due to very rapid urbanization. Further,

as for urban sprawl development, it is necessary to spend more cost to improve its environment by infrastructure provisions. Even it is a unfavorable development, the public sector is required to provide adequate infrastructure. This results in uneven allocation of public investment between favorable development and sprawl development.

To avoid lower standard residential development with inadequate infrastructure, supportive measures for the building code and the land subdivision act are required. To this end, development guidelines are proposed.

The development guidelines aim at indicating minimum standards of facilities and obliging the private developer to negotiate land use, infrastructure and public facilities provisions and cost allocation prior to starting project.

Legal Status

Necessary items for the development guidelines depend on the existing situation of the area, city and region. It is accordingly not effective for the guidelines to be enacted as low to apply to the entire Kingdom. The development guideline is therefore established by ordinance.

Items to be set by the Guidelines

- Standard of road to be constructed by private developer
- Standard of sewerage to be constructed by private developer
- Standard of water supply facilities to be constructed by private developer
- Necessary space for park
- Urban development cooperation funds instead of provision of the above facilities

3) Landscape Ordinance

Concept

Bangkok has already prepared the ordinance for historical conservation. It stipulates the prohibited use of buildings and maximum height of buildings in certain districts. The ordinance also regulates the size of signboards in the designated historical conservation areas. It prepares regulatory measures adequately to conserve buildings and landscape in the historical conservation areas. Many activities are carried out in the most historical buildings and the designated areas, and the most of buildings are owned by the peoples. Thus, conservation should be carried out by owners with maintaining their daily activities. From this point of view, it may required to include supportive measures which give owners motivation to conserve their historical buildings and landscape.

Institutional Incentives by Ordinance

- Financial incentives such as reduction of the House and Building Tax
- Subsidy to maintain, repair designated old buildings
- Implement special infrastructure development such as sidewalk improvement projects with provisions for specially designed street furniture
- Promotion of tourism and commercial use of old buildings

13.5 Enlargement of Financial Sources for Urban Environmental Improvement Projects/Programs

To enlarge the financial sources for implementing urban environmental improvement projects and programs, the following options could possibly be encouraged:

- Encouragement of private participation;
- Revision of Tax;
- Revision of the fee level of public services;

- Restructuring Administrative Organization to reduce recurrent costs;
- Utilization of external resources;
- Change to effective allocation of public investment budget; and
- Increase of subsidies from central government.

Among the options described above, the options regarding private participation, revision of tax, external resources and increase of subsidies are discussed in detail in Chapter 14 and 15. The other options are not discussed in this study, as they are political matters.

13.6 Organizational Improvement Programs

Responsible organizations have been established with jurisdiction for tasks. Although implementation of certain policies need consistency and coordination of related agencies, coordination among planning authorities, and coordination between planning and administration authorities are not satisfactory. In particular, coordination/ linkage should be strengthened as follows:

- Coordination among planning authorities;
- Linkage between urban planning and building permission; and
- Linkage between urban planning and land subdivision permission.

(1) Coordination among Planning Authorities

Spatial development planning related to BMA is mainly developed by three agencies, that is City Planning Department of BMA, the Department of Town and Country Planning (DTCP) and the National Economic and Social Development Board (NESDB). Although these agencies maintain a certain level of communication and discussion on occasion, it is difficult to understand the consistency of planning from their outputs. For example, the relationship among MIT's sub-center, NESDB's regional center, DTCP's satellite city and NHA's new town are uncertain in terms of mutual relation and allocation of function. Since it is obvious that the functions and spatial development direction of BMA need to be justified in the wider area of BMR or further, all plans needs to be explored as such. To this end, planning authorities need to set up collaboration studies for this matter.

(2) Linkage between Urban Planning and Building Permission

The City Planning Department is responsible for planning, and the Department of Public Works is responsible for building permission. Since building development seems to be permitted with little consideration of urban development policy, it is necessary to strengthen linkage between the City Planning Department and the Department of Public Works in BMA in order to reflect the urban development policy for the building permission.

(3) Linkage between Urban Planning and Land Subdivision Permission

At present BMA has no right to manage any land subdivision development project in Bangkok due to its current institutional arrangements. According to the Land Subdivision Control Act, BMA can not be a member of the land subdivision committee even for projects in the BMA jurisdiction. Since BMA is now responsible for administrating the Bangkok Metropolis as a local autonomous body, it is natural that BMA should become a member of the committee for the project in the Bangkok Metropolis in order to strongly reflect the urban development policy with the land subdivision permission.

CHAPTER 14: SOCIAL SYSTEM FOR THE IMPLEMENTATION

14.1 Integrated Efforts for Urban Environmental Management and Implementation

Bangkok, as the capital of Thai sprit and economy and the international hub city of the South-east Asia, can no longer ignore the environmental contamination. Air pollution and traffic congestion are disadvantages for Bangkok to be a center of economy in the region. Thus, Thailand needs to make more offers to move these diseconomies, accelerating financial investment for the environmental sector.

It is generally assumed that the required environment expenditures would share 2 - 3 percent of country's GDP. The required amount seems to be huge compared with the size of the budget of local government. The solution to the environmental problems will require a cost-sharing system and partnership among government, private sector and community. Government must take leading role to move the state in the right directions.

(1) Roles of National and Local Governments

There are two principle approaches to the environment management; the regulatory instrument (or command-and-control) and economic instruments. In Thailand, the regulatory approach are predominantly adopted by the measures of monitoring and enforcement systems, while there can be found a few example of adopting economic instruments.

The regulatory and economic instruments are used by the national and local levels of governments.

At the national level, governments should be responsible for policy making of pollution control. Their main functions are:

- establishing and enforcing standards and monitoring program;
- establishing the programs of economic instruments;
- carrying out research and technical development programs;
- establishing the national fund allocation system and providing financial assistance programs to the lower level of governments; and
- providing training programs in environmental management.

On the other hand, the major roles of local governments are:

- providing the services for the operation and maintenance of municipal waste;
- establishing and implementing pollution charge, permit and license systems as economic instruments; and
- establishing zoning and subdivision regulations for land and water use control.

The state enterprises have been established to provide the services of the environmental sector such as transportation, housing and water supply under the Ministry of Interior and the relevant ministry by the national government (refer to Figure 14.1). Wastewater Management Authority has been established in July 1995 under the Ministry of Interior, however, the operation and management system have not yet definitely been decided.

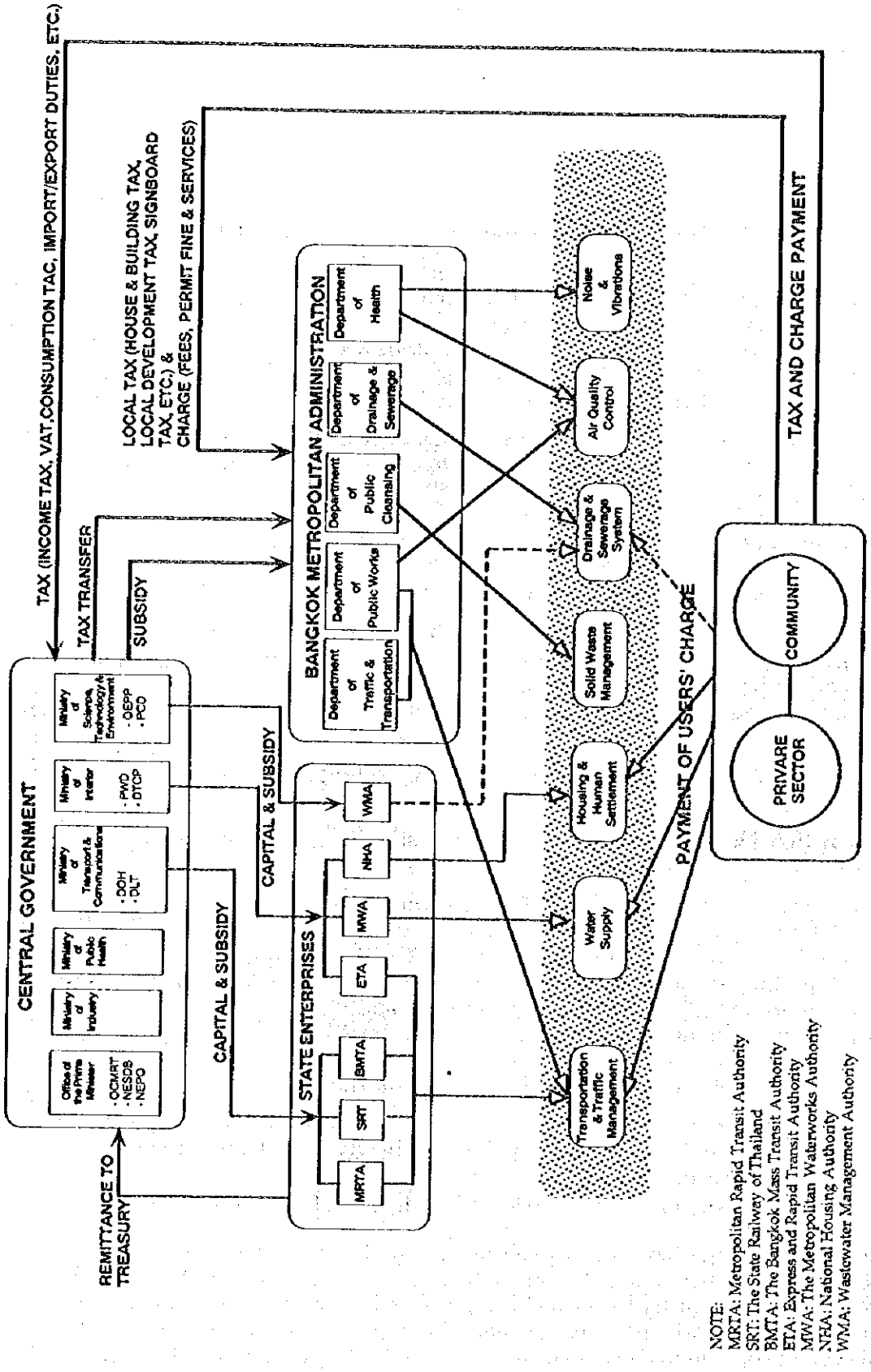


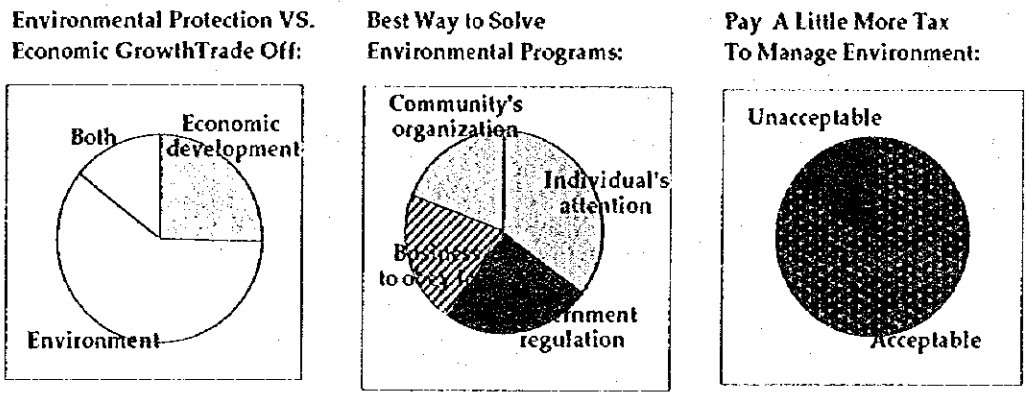
Figure 14.1: Environment Related Organization and Environmental Cost Payments

The solid waste treatment is directly managed by Department of Public Cleansing and the district offices of BMA.

(2) Social Change for Urban Environmental Development

There is an increasing awareness of the community that the environment protection should be given higher priority than economic growth. According to the Environmental Awareness Survey by IDE, the majority of the people in Bangkok responded that:

- environment preservation is more important than economic development for their lives;
- the involvement of individuals is important, as well as government, in the environment management; and
- it is acceptable to pay a little more tax to manage the environment.



Source: Environmental Awareness Survey, IDE

Fig. 14.2: Community's Awareness of Environment in BMA

(3) People's Participation by Community-based Approach

The involvement of community is an urgent and indispensable need, as well as that of private sector, in the environment projects such as water supply, solid waste management and wastewater management.

Regarding to the improvement of air pollution public participation is also essential because a significant reduction is expected from the change in public behavior and the increased the emission can be reduced to some extent by the awareness of the owners and drivers of vehicles, and contractors and owners of projects (refer to Box). It would be acceptable for polluters to pay those additional expenses by themselves in order to share social costs.

Major activities expected in each sector are shown in Table 14.1.

Table 14.1: Activities in Community Participation

Sector	Activities
Sewerage System	• Ditch Cleansing
Solid Waste Management	• Segregated Garbage Collection
	• Group Garbage Collection
	• Curve-side Collection
	• Supporting Activities to Recycling
Housing & Human Settlement	• Sweeping & Mowing Lawn in Park

National Campaign to induce public participation in reducing dust and air pollution

The purpose of the campaign is reduction of dust from black and white emission and dust from construction and other activities. A significant reduction is expected from the changes in public behavior and the increased care on the part of the public as regards dust reduction.

The project aims to achieve:

- to get across relevant information to the target groups at least once a day in the first six months of campaign, and once every two days in the latter six months;
- to induce public participation in reducing the level of dust and air pollution in Bangkok by at least 50%.

Target Groups

There are two key groups i.e. vehicle owners and people in the construction trade. They can be further categorized into the following subgroups:

- owners and drivers of diesel-powered private cars;
- owners and drivers of gasoline-powered passenger vehicles i.e. BMTA buses and other passenger cars;
- owners and drivers of trucks, including general goods carrying trucks and soil and building materials carriers. This subgroup generate highest level of black emission, dust as well as noise;
- owners and drivers of motorcycles which generate white fume;
- contractors of construction work which generate dust;
- owners of building projects;
- providers of mechanical maintenance and repairs such as owners and mechanics of car-repair services, petrol stations and spare-parts dealers; andstudents and general public.

Activities

The strategy calls for a campaign that will eventually create three social products namely:

- changes in attitude and perception among the people;
- changes in behavior, leading to the right practice and participation; and
- occurrence of a mechanism or equipment that support public participation in the long term.

The planned activities can be categorized as follows:

Disseminating Information

Educating the public is the key in inducing changes in perception and attitude. Activities will include the production of materials for use in all media i.e. TV, radio, newspaper, magazine, pamphlet, poster and more. Contents of the messages will include the cause and effect of dust pollution as well as ways to solve problems.

Encouraging Public Participation

Along with increasing awareness of the problem, we should also reinforce our campaign with activities that will encourage action. A system of reward/punishment should be employed to encourage positive behavior.

Supporting Participation

There are many forms of participation. For example, people can report to authorities of violations they come across; they pay more attention to their own engines, trucks, or work sites.

(4) ISO 14000

Presently, organizations of all kinds including private companies are increasingly concerned to acheive and demonstrate sound envrironemntal performance,especially in Europe, USA and Japan. Private companies have independently begun to undertake environmental 'review' or 'audits' to assess their environmental performance of their activities.

In 1996, International Organization for Standardization (ISO) have been introduced as an important international standards in terms of environmental management system and environmental audits. Particularly, "ISO14000 series" is one of the newest, which represent the international standards.

"ISO14000 series"specifies the following elements:

- standard for the report of the environmental management scheme for a factory and the amount of the emission
- standard for "Eco-label"
- standard for "Life Cycle Assessment" which evaluates the environmental impacts of the goods at each production stage
- method for environmental auditing of the above elements.

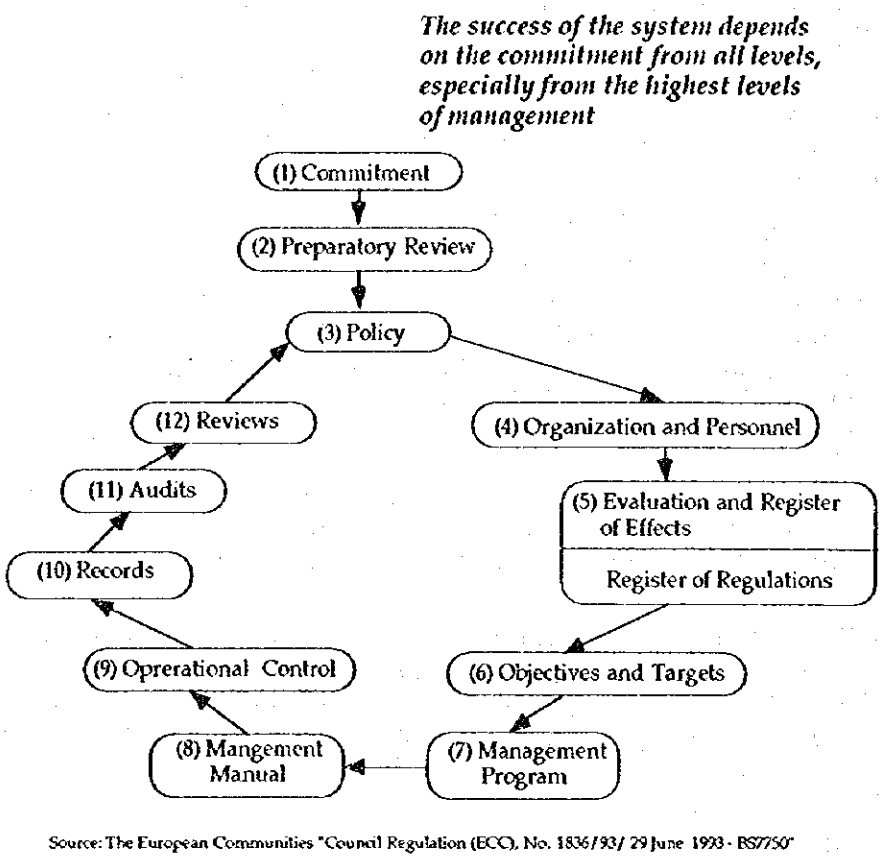
The ISO14000 is designated to enable a company to maximize its benefits and to minimize its adverse effects. In the case of adverse effects, emphasis are placed on prevention, rather than on detection after occurrence. This concept is one of the main streams of business and environmental management in many countries.

Under the ISO 14000, the producers of goods and services are required to have the responsibility to manage environmental pollution including the cost-burden of the environment preservation resulting from their economic activities within their own management system. On the other hand, the ISO 14000 will promote the company's reliance in the society and avoid the business risks caused by the environmental problems.

In Thailand, the introduction of the ISO 14000 will be required from the global point of environmental preservation in the near future.

Furthermore, based on the standards, each national and local levels of governments will be able to support the environmental management system and the certification schemes of company performing industrial activities within the government, and promote "Environmental-Oriented City".

Schematic Diagram of Environmental Management System



Source: The European Communities "Council Regulation (ECC), No. 1836/93/ 29 June 1993 - BS7750"

14.2 Polluter-Pay-Principle and Economic Instruments

(1) Environmental Expenditure

According to the OECD report the total pollutant abatement and control expenditures have been estimated to amount to between 0.8 % and 1.5 % of GDP in OECD countries as shown in Table 14.2. The share of public sector is greater than that of private expenditure in the most countries.

On the other hand, the World Bank has examined the necessary environment improvement costs for selected sectors in developing countries. According to the study, the additional costs of the required investment are estimated to amount to 1.4 % of the aggregated GDPs in developing countries in 2000 and the overall incremental costs in the range of 2 - 3 percent of GDP are estimated to be appropriate and sufficient with allowance.

Table 14.2: Pollutant Abatement and Control (PAC) Expenditure in OECD Countries, mid 1980s

	PAC expenditure as percentage of GDP			PAC expenditure as percentage of total national investment		
	Public	Private	Total	Public	Private	Total
Canada	0.89	0.36	1.25		1.52	
USA	0.60	0.86	1.46	1.14	1.62	2.76
Japan	1.17	0.08	1.25	2.87	0.28	3.15
Finland	0.52	0.64	1.16	1.06	1.12	2.18
France	0.56	0.33	0.89	0.83	0.46	1.29
Germany	0.78	0.74	1.52	1.54	1.54	3.08
Italy	0.13			0.24		
Netherlands	0.95	0.30	1.25		0.85	
Norway	0.54	0.27	0.81	0.85	0.44	1.29
Sweden	0.66	0.27	0.93	1.10	0.73	1.83
UK	0.62	0.62	1.24			

Source: The State of Environment Indicator, OECD 1991

The environmental costs will be added to the price of goods and services through market mechanism, and therefore ultimately paid by the consumers; namely, they are paying the environmental costs directly through users charges or indirectly through costs of goods and services, and taxes. However, the prices of goods and services are not affected by the total environmental costs. The large amount of environmental costs, which should essentially be born by producer and/or consumer, are transferred to the rest of the economy as "external diseconomy". In German the cost of external diseconomy, because of the environment pollution, is estimated to amount to 5 - 10 percent of GDP.

It should be noted that the required investment costs for environment improvement are extraordinary high in Bangkok, because of:

- the rapid growth of economy has accelerated the increase of discharges of the city;
- the infrastructure services could not catch up the economic growth; and
- frequent communication all over the world made increase people's eagerness to higher standard of life and thereby the discharges of the city have increased faster than its economic growth.

(2) Basic Concept: How to Share the Burden

The Polluter Pays Principle (PPP) is the basic concept to share the cost of environment, approved by OECD countries in 1972, aims that "the polluters should bear the full costs of pollution-reduction measures decided upon by public authorities to ensure that the environment is in an acceptable state."

The economic instruments are the principle approach as well as the regulatory enforcement for the environment preservation and control. User charge, effluent charge and subsidies such as grant, soft loan and tax incentive are adopted as major economic instruments to realize the PPP for environmental improvement in which some will discourage polluting activities and others encourage less polluting activities. The application of the PPP requires the private sector and community to have the responsibility of polluters to pay the costs of environmental damage caused by their activities. Moreover, the polluters can determine the most cost-effective measure for

achieving the acceptable levels of pollution and thereby the environmental costs of the society will be reduced.

In recent years many countries have used a variety of economic instruments. The major economic instruments and its advantages are presented in Table 14.3 according to the OECD's classification.

Table 14.3: Economic Instruments of Environmental Control by OECD's Classification

Type of economic instrument	Advantages	
Charges:	to discourage polluting activities to provide financial assistance to achieve reduction in pollution	Effluent charge User charges Product charges Administrative charges Tax differentiation
Subsidies	to encourage less polluting behavior	Grant Soft loan Tax allowance
Deposit-refund	to encourage re-use and/or more environmentally friendly disposal	for example, beverage container
Market creation arrangements	to encourage more efficient and cost-effective use of emission permits	Marketable or tradable permits
Financial enforcement incentives	to provide additional financial inducement to comply with existing environmental regulations	Non-compliance fees Performance bonds

Source: OECD

When properly implemented, the economic instruments provide several advantages such as to:

- reduce pollution while promoting cost-effectiveness;
- enhance the technology for the pollution control by private sector; and
- reduce the financial requirement of the government or provide the government with revenue for the environment investment

In order to implement economic instruments successfully, regulatory approach should not be ignored, namely, standard needs to be appropriately prepared and monitoring and enforcement system should effectively be implemented.

Among the economic instruments charge, including user charge, emission fee, and effluent fee, should be examined to introduce currently.

Economic Instruments in Thailand

In Thailand, some types of economic instruments are in use, as follows:

User Charges

The User Charge system is the most common type of economic instrument and introduced to municipal water supply and solid waste management in Bangkok. The details are described in the next section.

Tax differentiation

Excise tax is levied on the consumption of gasoline. The following table shows the "Tax Differentiation" among the types of gasoline which is designed to encourage the unleaded gasoline.

Excise Tax Differentiation of Unleaded Gasoline

Kind of Gasoline	Excise Tax (baht per liter)
Premium Gasoline	3.355 baht
Regular Gasoline	3.355 baht
Unleaded Gasoline	2.585 baht

Source: NEPO

Environmental Fund

The National Government has established an Environment Fund, authorized under the NEQA/1992, which will promote the investment of pollution control by local municipalities and private industries and encourage to minimize the waste.

The initial capital of five million baht was contributed to the fund by the government. To the supplement of the initial capital, the following sources are expected;

- service fees and penalties collected under the provision of the NEQA/1992;
- funds and properties from available sources both from domestic and foreign, and from public and private; and
- interest and operating revenue of the Fund.

Fund can be provided for the priority projects for the implementation of provincial action plans as;

- grants to government agencies or local administrations for the investment for central wastewater treatment or waste disposal facilities; and
- loans to local administrations or state enterprises for pollution control facilities.

(3) User Charge System: Affordability vs. Willingness-to-Pay

The users' charge system is commonly adopted for the sanitary services such as water supply, solid waste and wastewater management under the PPP. For the introduction of the users' charge system to sanitary services, the affordability of household to pay the users' charge is serious argument. It has been estimated by several international agencies that the limits of percentage to pay against the disposal household income may be:

- Water supply 4%
- Solid waste treatment 2%
- Waste water treatment 1%

Affordable Level of User's Charge in Bangkok

Based on the above figures, the affordable maximum levels of user's charges for low income group in Bangkok (per household per month) can be computed as follows:

- For water supply: B.100;
- For solid waste treatment: B.50; and
- For waste water treatment: B.25,

where, the minimum household income is assumed to be B.3,120 (= B.156[min. wage rate] x 20 days); the average dispersal income ratio, 80% of the total income; one incomer a household.

The present tariff schedules for water supply and solid waste treatment have been examined from the above context as shown in Table 14.6 and solved that the minimum charges are regulated in the range of the affordability as calculated above.

Table 14.4: Present Tariff and Minimum User Charge for Sanitary Services in Bangkok

Service	State Enterprise	Tariff	Tariff conditions	Average monthly charge	Consumption per month
Water supply	MWA	Baht 4.00/M3	up to 30M3 per month	Baht 120.00 per household	30M3 (200 liter x 5 persons x 30 days)
Garbage collection	BMA	Baht 40.00 per month (new tariff)	up to 20 liter per day	Baht 40.00 per household	180 liter (6 liter per day) (0.4 Kg x 5 persons = 2 Kg per day Garbage: 2 Kg amounts to 6 liter.)
Wastewater treatment	WMA	under review			

Willingness-to-Pay

However, on the other hand, another critical argument should be raised to implement the PPP: People's Willingness to Pay. Since the family managed at the minimum wage rate is already at a subsistence level, it is still questionable whether or not the family will pay the calculated charges.

The tariff schedule needs to be examined carefully to be justifiable on the social and economic ground. Moreover, some polluters may choose to pollute if the charge is not set at an appropriate level.

Users' Charges the State Enterprises

As shown in Figure 14.1, each State Enterprise is collecting the users charges for the services of transportation, sanitary and housing. The operating incomes collected by the State Enterprises are calculated in Table 14.7. The total operating revenues from the users for transportation, sanitary and housing services amounted to 22,973 million baht per year, which was approximately 1.7 % of total GPP in BMA, although the income of the SRT included the charges collected from the services outside of Bangkok.

Table 14.5: Financial Condition of State Enterprises

	Transportation				Sanitary		Housing
	State Railway of Thailand (SRT)	Bangkok Mass Transit Authority (BMTA)	Express and Rapid Transit Authority Thailand (ETA)	Metropolitan Rapid Transit Authority (MRTA)	Metropolitan Waterworks Authority (MWA)	Wastewater Management Authority (WMA)	National Housing Authority (NHA)
Fiscal Year	1994	1994	1995	1994	1994		1993
Finance (thousand baht)							
Capital by the Government	12,438,340	8,298,015	15,536,812	326,717	7,337,737		993,834
Operating revenue	7,524,023	5,633,163	1,749,116	0	6,618,898		1,372,156
Operating expenditure	7,289,294	6,757,034	1,435,556	0	3,709,204		664,098
Other income (loss)	423,850	227,847	145,894	32,744	-778,698		-297,173
Net Profit/Loss	658,579	-896,024	459,454	32,744	2,130,996		410,885
Remittance to the Treasury					603,500		23,206
Government Subsidies		341,466	388,740				

Source: SRT, BMTA, ETA, MRTA, MWA, WMA and NHA