Governance Screening for Urban Climate Change Resilience-building and Adaptation strategies in Asia:

Assessment of Bangkok City, Thailand

August 2007
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Governance and Capacity Assessments for Urban Climate Change Resilience-building and Adaptation Strategies in Asia

**Background to the study**
The resilience required to cope with a rapidly changing climate is comprehensive and requires robust systems and capacity, which do not currently exist in many parts of the developing world. Cities may have greater climate resilience because of the existence of infrastructure, but poor urban populations often do not benefit from these infrastructures or are more vulnerable because of their dependence on substandard infrastructure.

Focusing urban adaptation-related work in Asia has large potential impact, given that more than 60 percent of the increase in the world's urban population in the next 30 years will occur in Asia, a region that already has a greater urban population than any other continent.

The Rockefeller Foundation would like to foster new partnerships to promote work on urban climate change adaptation in Asia, as part of a broader initiative to promote climate change resilience. The Foundation provided a grant to the Institute of Development Studies (IDS) to complete a rapid governance and capacity assessment of 10 South and Southeast Asian cities, to address their ability and willingness to plan and implement an integrated climate change resilience program. The cities were chosen based on an analysis of the potential impacts of climate change and their degree of exposure.

The individual city studies, one of which is presented here, look in detail at how existing governance structures at municipal level might influence the potential implementation of climate change resilience programmes (e.g. urban disaster mitigation programmes with climate change consideration, improved building codes, land use zonation, modifications to the water and sewerage network, ecological and environmental protection programmes).

The research outputs from the individual city studies have provided the building blocks for a comparative analysis of the ten cities to inform the selection of a smaller set of cities where an integrated climate change resilience program could be implemented.

**Analytical Framework**
The analytical framework applied to the city level research drew on previous good urban governance work from the IDS. The categories are also based on understanding gained from the initial phase of the governance screening:

1. **Decentralisation and autonomy**
This encapsulates the ability and capacity of municipal governments to make decisions and implement across a range of responsibilities and services. These include in particular finance, urban planning, and disaster management. Autonomy focuses in particular on the relationship with other levels of government and other interest groups, as well as financial independence and managerial capacity of municipal authorities.

2. **Accountability and transparency**
Delivery of climate resilient urban development relies on a municipal system that maintains a relationship of accountability to its citizens, and is open in terms of financial management, information on the use of funds and adherence to legal and administrative policies.
3. **Responsiveness and flexibility**
Resilience in the face of uncertain climate shocks and stresses relies upon a governance system that can respond rapidly to a range of different scenarios and communicated needs. This category can draw in particular on studies of the components of flexible and adaptive decision-making.

4. **Participation and inclusion**
Participation and inclusion refers to the governance arrangements that enhance or preclude the participation of all citizens in decision-making, monitoring and evaluation. This refers in particular to the groups of citizens most vulnerable to prevailing climate shocks and stresses (including those in informal settlements).

5. **Experience and support**
A resilient urban system will build on existing experience in planning and successful implementation of climate-related risks targeting vulnerable groups. Such experience will depend on technical and implementation support to enable the successful implementation of adaptation strategies, including in the NGO/civil society sector, as well as technical and academic institutions.
1. BACKGROUND TO BANGKOK CITY

Bangkok is situated in the central region of Thailand on the low lying plains of the Chao Phraya River that extend to the Gulf of Thailand. The total area of Bangkok is 1,568.737 sq. km. In the 2000 census the population of Bangkok was around 6.3 million, ten per cent of the national population. The current population is estimated to be around seven million. However, this figure does not take account of the many unregistered residents in the surrounding metropolitan area. Recently, Bangkok has experience a large influx of foreign immigrants, long-term residents, and expatriates. The population density is about 4,050 per sq. km

Bangkok became the official capital of Siam in 1782 when the founder of the Chakri Dynasty, King Rama I, built his palace on the more defensible east bank of the Chao Phraya River and renamed the city “Krung Thep”, meaning the “City of Angels”. Over the past two centuries, the heart and soul of Bangkok has been by the Chao Phraya River and its many adjoining canals.

By the 1890s, Bangkok had become wealthier from centralized taxes collected from the growing rice trade and from the influx of more Chinese immigrants. This expansion of the city had its physical expression in the construction of more roads and for the first time Bangkok began to move away from its connection with water and become a land-base city. Between 1890 and 1925, 135 roads were built rapidly expanding Bangkok’s urbanization.

In 1939, during the reign of King Rama VIII, known as King Ananda, the name of the Kingdom of Siam was changed to Thailand to reflect the country’s democratic government and to symbolize the ‘Land of the Thais’ or the ‘Land of the Free’.

In the last three decades, Bangkok’s economy has undergone a significant economic transformation, encompassing extensive industrialization. The development of manufacturing support industries, extensive infrastructure and utilities, low-cost transportation networks, and the availability of a cost-competitive technically qualified workforce – together with active government support – has spurred numerous industrial sectors. These include such areas as automotives, electronics and electrical appliances, textiles and garments, and a broad-based agro-industry value-chain. Thailand’s backbone is still agricultural, and it ranks among the world’s leaders in the export of rice, sugar, canned tuna and canned pineapples.

Existing and future climate risks
Citizens of Thailand, and Bangkok in particular, are all too aware of the impacts of climate change. The issues are communicated daily through the media. Many of the impacts that are discussed have been felt for several decades already, although people realize that the extent of the impacts are getting worse. In Bangkok people are aware of higher temperatures, earlier and heavier rainfall, especially in 2007, and longer periods of rainfall than in the past.

The major problems faced in Thailand, accelerated by global warming, are floods, landslides, sea-level rise, coastal erosion and increasing vector borne diseases. Bangkok faces most of these except landslides and some vector borne diseases. Further assessments are needed to examine climate change related causes and impacts. For the purposes of this study the causes and impacts of flooding and the cities’ responses have been considered.

Flood problems in Bangkok are mainly due to the geographical location of the city, land use change and land subsidence. Bangkok’s location on low-lying flood plains of the Chao Phraya River and the ancient canals and ditches around the city leave it very susceptible to flooding during the rainy season
– particularly when the there is intense heavy rainfall, excessive water flowing from the north along the Chao Phraya, or intrusion of sea water from the Gulf up the river and into canals and ditches. Bangkok faces heavy flooding every 2-3 years.

The problem has been exacerbated by land subsidence from overuse of groundwater for Bangkok and surrounding provinces, and by land use change caused by rapid population growth/in-migration and ineffective urban land use. National policy is failing to control expansion of urban areas leading to traffic congestion, air and noise pollution, lack of housing for the poor and slum areas. Road construction to support increasing numbers of road users has affected the drainage capacity of the city, as has the expansion of industries, business centres and housing estates.

The central government and the BMA realize they need to address both mitigation of climate change by reducing GHG emissions and adaptation to the impacts being brought about by climate change.

2. DECENTRALISATION AND AUTONOMY

**Governance structures and divisions of functions**

The Bangkok Metropolitan Administration (BMA) was formed by the amalgamation of the administration of Bangkok and Thonburi provinces under the National Executive Council Order Number 335 of 1972. The extent of decentralized authority to the BMA is governed by the BMA Act 1985. The BMA is headed by an elected Governor.

By law, the Governor of BMA is to perform tasks as directed by the cabinet, the Prime Minister or the Minister of Interior, and the central government can exercise direct control over the functions of the BMA. Indirect control comes through budget support for certain functions and supervision of purchasing or hiring contracts. Administrative and fiscal powers are therefore not completely decentralized to the BMA.

The relationship between the central government and the BMA administration can be described from two perspectives. Firstly from the division of functions between the central government and the BMA and secondly from the level of supervision/control from the central government.

The Central government is responsible for matters of national governance (eg. Interior peace and order, defense, justice), and the provision of public services (transportation, electricity, water) and social services (education, public health, sport and culture) (Puang-ngaam, 2005). Under Article 89 of the BMA Act 1985 the following functions fall under the BMA’s jurisdiction: maintaining law and order to promote and support the safety and security of lives and properties; city planning; provision and maintenance of public infrastructures and services; disaster preparedness and risk reduction, and improving slum areas and housing.

The BMA comprises two main bodies, the Governor and the BMA Council. The Governor is the chief of the city administration, elected by popular vote for a four-year term. The Governor appoints four deputy governors as executive administrators who supervise administration, education, health, and public works. The Governor and his team are responsible for policy formulation, and supervision of all functions undertaken by the work force of the BMA headed by the Permanent Secretary of the BMA.

The BMA Council is comprised of elected members. The number of member depends on the population of Bangkok. There are currently sixty councillors with one councillor representing one hundred thousand people. The BMA Council is the legislative body responsible for making local laws, ordinances, regulations and by-laws for city development and management. The BMA Council also
reviews and approves the allocation of the annual budget. The Council acts indirectly as the representative body of the Bangkok population charged with monitoring the performance of the city administration.

The existing institutional organisation of the BMA is divided into three offices, 16 departments and 50 district offices. The three officers act as secretaries to the Governor, the BMA Council and the Civil Services Commission of the BMA respectively. The 16 Departments cover all aspects of the BMA functions and almost all departments have functions related to climate change adaptation in some way. The District Office’s are charged with delivering local governance, community development, occupational training and promotion, registration, public works, health care, revenue collection, and education.

A lack of clarity and crossover of functions of the BMA and the central government has caused major problems for the city. This overlap can cause conflicts between the BMA and other agencies, lead to a lack of unity in implementation, and mean some functions and responsibilities are not fulfilled at all. The most common overlapping functions are related to the provision of services such as mass transportation systems; combating air, noise, and water pollution; flood prevention; coastal erosion; disease control; and provision of housing for the poor. Within the BMA similar problems arise from centralized decision-making, lack of proper coordination amongst various units of administration and an unclear division of functions between districts and departments (cited in Puang-ngaam, 2005).

Financial decentralisation and autonomy

Regarding fiscal decentralisation, the 1999 Act stipulates the BMA can collect regular and special revenues (Boramanun, 2006). Regular Revenues come from two sources: Those collected by the BMA (local development taxes, household and land taxes, signboard taxes, slaughter duties, license fees, fees, fines, service charges, rental of BMA assets, income from public utilities and enterprises and miscellaneous income) and those collected by other government agencies (value added and special taxes, vehicle taxes and fees, liquor taxes, gambling taxes, excise taxes). Special Revenues come from loans and grants from other government agencies, NGOs, and cooperation and assistance from international agencies.

As of the fiscal year 2007, the estimated regular revenue is about 39,000 million Baht (around US$1,157.3million). The actual revenue of the first seven months of this fiscal year (1 October–30 April) is about 24,816.2 million Baht (around US$736.4million) or around 63.3 per cent of the estimated revenue. The BMA is authorized to use the regular revenues. The BMA’s expenditure budget received for fiscal year 2007 is also US$1,157.3million, which is equal to that of the total estimated revenue. The expenditure budget comprises of an investment budget (about 25 per cent of the total budget) and operational budget (about 75 per cent).

In addition to regular revenues, BMA also receives supportive revenue from the central government. For the budget year 2005, the total supportive revenue was around US$342.9million. This budget was allocated for various public service programs such as land transportation, environment, health, city development, education, security, and tourism.

The BMA utilises its revenues to implement activities as set in the BMA Public Administration Plan. The BMA’s expenditure can also be classified as regular and special expenditure. Regular expenditure refers to expenses allocated from regular revenue and income of BMA’s enterprises. Special expenditure refers to expenses allocated from special revenues. As of the fiscal year 2005, the largest portion (about 30 per cent) of BMA’s budget expenditure went on environmental activities. The second largest portion (about 25 per cent) was allocated to human resources and society activities. The budget expenditure for traffic control, transportation and public works was about 23 per cent (Table 3). (BMA, 2007a)
The BMA council scrutinise the yearly expenditure budget and there is a system for monitoring expenses for all activities. The adjustment of the budget expenditure is done during a fiscal year, for any tasks not progressing according to the plan. After screening by the BMA council, budgets for each activity can be amended according to project performance. If necessary the budget can be increased, reduced or transferred to another unit or sector.

**Decentralisation and climate risk reduction**

The physical and social problems faced by Bangkok City have provided the BMA with experience in tackling various issues related to climate change impacts. Successful programmes include flood control, disease control, food sanitation, garbage collection, and park management. Decentralisation of authority to the relevant departments and agencies in these areas is facilitating operations in these departments and improving response to disasters.

The Department of Drainage and Sewerage (DDS) is directly responsible for flood control in Bangkok. The Department has established the Operational Centre for the Prevention and Solving of Flood Problems in the BMA and a Flood Control Centre. DDS officials now have clear and distinct responsibilities and the director of the department has the authority and capacity to make decisions and implement tasks effectively. This decentralization of administrative power to lower level officials is improving the quality of work, and with new high-tech and computerised systems the department is able to work more rapidly and be more responsive to the needs of citizens.

### 3. ACCOUNTABILITY AND TRANSPARENCY

In terms of an operational budget, departments receive a set budget (once scrutinized by the BMA council) to perform their tasks or distribute to the district level if required. District offices can also submit proposals directly according to the needs of their constituents if in accordance with the city plan. All expenses are subject to the standard regulations and internal audits. Citizens rarely pay attention to the financial management of any government body, either because they do not know the required procedures, or they do not know that they have the right to know. This stems primarily from a bureaucratic culture in Thailand. People may perceive it more of an inconvenience to try accessing official information, especially on the use of funds.

According to Suwan et al (2003) due to the laws or procedures that citizens have to follow, government officials tend to be more ‘governor’ than ‘public servant’. This makes an holding officials to account very problematic. By accidental sampling Suwan et al (2003) found 53 per cent knew of their right to information relating to financial management of the BMA. However 67 per cent of all respondents had a bachelors degree, and based on a conviction that there is a positive correlation between education levels and understanding of rights to government information, and knowing that 67 per cent is well above the average number of the population holding bachelor degrees, especially in more deprived areas, the actual figure is likely to be considerably lower.

Information on the use of funds and adherence to legal and administrative policy for particular activities or sectors can be accessed by citizens via the internet, or can be requested according to official procedures. Accessing more detailed information to investigate transparency in financial management of the BMA and lower levels of administration is near impossible for most citizens.

### 4. RESPONSIVENESS AND FLEXIBILITY
Taking the case of flood management, research reveals significant improvements to the responsiveness and flexibility of Bangkok City authorities to cope with disasters and strengthen resilience in the city. Box 1 in section 6 describes flood prevention work carried out in Bangkok illustrating the capacity for city governance structures to respond to increasing risks and for different departments to work collaboratively to implement disaster risk reduction programmes.

Based on the Operational Plan for the Prevention of and Solving the Flood Problem in the BMA due to Rainwater and Inflow for the Year 2007, the DDS of the BMA has established an Operational Centre with the objectives of strengthening cooperation and enabling rapid solving of flood related problems. The DDS has also established 24 emergency service teams, equipped with the necessary technology to monitor the flood situation and manage the problems being faced during severe flooding especially in the case of flooded roads. In addition, the DDS has issued guidelines for daily flood prevention operations for units within the DDS and the districts.

Each district has also established an emergency service team charged with following the DDS guidelines. These guidelines enable all working units related to flood management to work together more effectively and be more responsive to the needs of citizens.

The Flood Control Centre can provide timely information required for urgent and rapid decision-making. Reports on daily weather forecasts and the flood situation within the BMA region, as well as weekly summary reports on the water situation in the BMA and related regions can be accessed via the internet or requested from the Operational Center. With improvements in quality of information and coordination, the BMA and concerned parties are able to make more effective decisions on flood prevention and control based on more accurate data.

5. PARTICIPATION AND INCLUSION

Potential for citizen participation in city planning lies within the BMA comprehensive plan and the BMA Public Administration Plan formulation process. For the most recent comprehensive plan (2006) there were several rounds of public consultation. An initial public meeting was attended by representatives of various sectors including government, private, media and citizens. Following several meetings of city planning specialists from the public and private sectors, organized by the Department of City Planning, a second public meeting was held to consult on the complete draft. Further meetings of specialists were held and all comments from all the consultations were fed into the final comprehensive plan (BMA, 2006)

The Public Administration Plan 2005-2008 is based upon surveys and public hearings designed to take account of public needs. BMA executives and officials participate in order to design operational plans in conformity with the Public Administration Plan. Strategic areas covered by the plan include mass transit system development, flood prevention and water quality improvement, air and noise pollution reduction and control, increasing green areas and promotion of energy conservation, disaster risk reduction, city planning and control of land use. The BMA departments or districts develop their operational plans according to functional-based, area-based or agenda-based approaches, considering the necessity and urgency of each strategic issue to particular areas. The departments and districts can set preliminary budgets for projects proposed in the operational plan, which are later subject to screening. They must ascribe indicators for monitoring each strategy and provide yearly, annual, half-way and final progress reports.

Through these processes citizens and all working units within the BMA are able to express their needs in the process of plan preparation. It follows that, if operational plans are implemented effectively, city
projects and programmes should meet the needs of vulnerable citizens. In reality genuine participation is not a reality and government activities are still largely top-down.

In general, participatory processes cannot be genuinely realised in Thailand at present. There are several crucial obstructing factors such as a bureaucratic culture, lack of sufficient regulations and guidelines, and lack of access to information. Furthermore, factors such as low levels of education, low income and disinterest are significant for participation levels, especially for vulnerable groups. Government operations are predominantly top-down and city plans are designed and implemented with little adherence to participatory processes.

6. EXPERIENCE AND SUPPORT

Given the physical and social problems faced in Bangkok, the BMA has accumulated experience in managing various problems related to climate change impacts. Successful programs include flood control, disease control, food sanitation, garbage collection, and park management.

Experience of flood control in Bangkok provides a positive case study of responsiveness and experience based on successful collaboration between the CDA and the Department of Irrigation (See Box 1). During severe floods the BMA and RID have managed to regulate water drainage by pumping floodwater in the BMA into the sea using BMA pumping stations and RID irrigation channels and RID pumping stations close to the sea.
Box 1 - Flood Prevention Strategies in Bangkok City

This year flooding is likely to be severe due to an early rainy season and heavy, almost daily rainfall in the BMA. However, the BMA and concerned agencies have taken measures to prevent and control the problem in advance to minimize the impacts.

After serious flooding in Bangkok in 1983, His Majesty King Bhumipol proposed 5 methods for resolving the problem.

- Accelerate water drainage to the sea through canals at the eastern part of Bangkok;
- Allocate green belt areas to prevent the expansion of the city, and use these areas for drainage routes during high run-off periods;
- Set up flood protection systems;
- Construct retention basins (“Monkey Cheek”) in various locations in the city to support the flood prevention programs;
- Enlarge and/or clear the waterways where the highways and railways pass through (BMA, 2007c).

The BMA and concerned agencies, the Royal Irrigation Department (RID) in particular, have implemented projects according to these methods along with other measures to prevent and control the flood problem. The BMA has employed structural and non-structural measures. Structural measures include the Polder System that prevents inflow from outside the polder through the construction of flood barriers such as dykes, earth embankments, roads and railways. Other structural measures to discharge water out of the polder – such as pumping stations, water gates, tunnels and sewers, improvement of drainage canals and the construction and/or improvement of ponds and wells for temporary retention basins – have been employed primarily in the densely populated areas of the BMA. Non-structural measures are mostly utilised in suburban or agricultural areas and include urban land use control, establishment of forecasting and warning systems and emergency service teams (BMA, 2007c).

The unit directly responsible for flood management in Bangkok is the Department of Drainage and Sewerage (DDS) of the BMA. The DDS initiated the construction of a dyke in the eastern part of the BMA. The dyke is about 72 kilometers in length and constructed in cooperation with the BMA, the RID, the Department of Highways and State Railway of Thailand. Another project is the nearly completed 77 kilometer flood barrier along the Chao Phraya River. The RID also currently manages 20 retention ponds. These structural measures clearly take time and huge investment, therefore prioritisation has been crucial.

Besides the RID, the BMA cooperates with a number of other concerned agencies to gather information for decision-making. Table 3 displays the activities of concerned agencies in cooperation with the BMA for flood prevention and control especially during the flood events.
Table 1: Activities of Concerned Agencies in Cooperation with BMA for Flood prevention and during the Flood Events.

<table>
<thead>
<tr>
<th>Agencies</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meteorological Department</td>
<td>• Weather forecasting,</td>
</tr>
<tr>
<td></td>
<td>• Monitoring the status and movement of clouds surrounding BMA region until the rain stops,</td>
</tr>
<tr>
<td></td>
<td>• Reporting the quantity and how severe the rain is,</td>
</tr>
<tr>
<td></td>
<td>• Connecting and exchanging rain data through telemeter system.</td>
</tr>
<tr>
<td>Royal Irrigation Department</td>
<td>• Water management in Chao Phraya Basin including the eastern and western plains of BMA region,</td>
</tr>
<tr>
<td></td>
<td>• Reporting the water levels of Chao Phraya River and its tributaries in the basin, and Pasak-Chonlasit Dam,</td>
</tr>
<tr>
<td></td>
<td>• Connecting and exchanging water level and related data through telemeter system.</td>
</tr>
<tr>
<td>Hydrological Department, the Royal Navy</td>
<td>• Forecasting water level in Chao Phraya River, which is influenced by high/low tides of the sea?</td>
</tr>
<tr>
<td>Metropolitan Electricity Authority</td>
<td>• Installing the electricity meters for pumping stations in case of extreme events,</td>
</tr>
<tr>
<td></td>
<td>• Stand-by to provide repairing service in case of electric breakdown for immediate use of the pumping stations.</td>
</tr>
<tr>
<td>Electricity Generation Authority of Thailand</td>
<td>• Reporting the water quantity flows and water levels from Bhumipol Dam and Sirikit Dam,</td>
</tr>
<tr>
<td></td>
<td>• Supporting the RID to forecast the water situation.</td>
</tr>
<tr>
<td>Royal Thai Police</td>
<td>• Supporting BMA and control the situation to prevent or stop any activities that may interfere or obstruct the officials on duty,</td>
</tr>
<tr>
<td></td>
<td>• Taking care of traffic problems during flood event, and informing the places where flood takes place.</td>
</tr>
</tbody>
</table>

The Operational Plan on Prevention and Solving the Flood Problem in the BMA due to Rainwater and Inflow for the Year 2007 described above provides another good example of experience in city planning for disaster preparedness. The chief and the vice-chief of the operational group responsible for implementing the Operational Plan are authorised to instruct other officials who work in this group. A monitoring group monitors progress towards the Plan’s goals, conducts inspection of constructions and projects that are an obstacle to the drainage system, and reports on the performance of tasks during the event of heavy rains. The secretary group are responsible for preparing equipment for the centre, coordination with relevant agencies/units, receiving complaints regarding flood problems, managing the computerized data system, reporting the results, and distributing data and information to the media.

The Flood Control Centre, established under the DDS, uses computer technology for systematic and efficient management of flood protection facilities. The system comprises of a master control centre with 52 remote sites scattered around Bangkok covering 1,000 square kilometres. At these remote sites, all data required for flood protection such as water levels in the canal and the Chao Phraya River, rainfall, pump status, and water quality is collected automatically and transmitted in cyclic mode to the master control centre via a telemeter system over UHF radios. The system can monitor, on real-time basis, the situation of flood and drainage systems for decision-making during the event (BMA,2007d).
Equipping the centre with more high-tech equipment enables more rapid response in conformity with the needs of citizens.

The director of the DDS has the required authority to make decisions and implement tasks. Positioning the Operational Plan and Operational Centre under the DDS and allocating the director and all other officials’ clear and distinct roles and responsibilities and the requisite level of authority to make decisions is building experience at local levels of the disaster risk reduction and responsiveness.

Regarding action on mitigation of climate change, the Office of Natural Resources and Environmental Policy and Planning (ONEP) is the national focal point of the UN Framework Convention on Climate Change and implements the CDM / Kyoto Protocol. The current role of the ONEP is at the national and international policy level. Cooperation between the ONEP and the BMA on climate change adaptation plans is missing, but the potential is there as adaptation becomes prioritised and international financing becomes available. An example of external support is in the form of World Bank assistance for mass transportation system management, city planning, environmental management, and carbon finance (BMA, 2007 b).
References


Abbreviations

BMA Bangkok Metropolitan Administration
BMR Bangkok Metropolitan Region
CDM Clean Development Mechanism
GHG greenhouse gas
NEB National Environment Board
NESDP National Economic and Social Development Plan
ONEP Office of the Natural Resources and Environmental Policy and Planning
RID Royal Irrigation Department