

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

Assessment of Chittagong City,
Bangladesh

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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 per cent 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 ten South and Southeast Asian cities, to address their ability and willingness to plan and implement an integrated climate change resilience programme. 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 CHITTAGONG CITY

Chittagong is the second largest metropolis in Bangladesh. Situated in the Bay of Bengal, Chittagong has historically been an important centre of commerce due to its geo-strategic location and is regarded as the commercial capital of the country. The city is well known for its scenic beauty, and the unique combination of hills to the north, flat land bounded by the Karnaphuli River to the southeast, the Halda River valley to the northeast and the Bay of Bengal to the west. Within the city there are number of tidal canals that serve as the main drainage channels. Its diverse ecosystems with low-lying coastal area, beaches, estuaries, lakes and hills create opportunities for different economic activities, and social and cultural diversity.

The Chittagong Statistical Metropolitan Area (SMA) covers an area of 1,152 square kilometres and consists of six metropolitan *thanas* (districts), 68 wards and 236 *mahallas* (localities) with a population of 3.38 million. Chittagong City Corporation covers an area of 155 square kilometres with a population of 1.99 million. The population growth in the last decade is estimated at about 4.4 per cent per annum, which is much higher compared with national growth of about 1.6 per cent. The garment industry has increased the number of females migrating into the city. 35 per cent of the city's population are slum dwellers.

Chittagong has been developed by different colonial groups who came to the city for business and settled. However, in the 1970s many of these immigrants left, and business and trade reverted to the people of Chittagong. Ethnic minorities in the city include *Kala Firinghis* (European descendants) and groups such as the Chakma tribe from the Chittagong Hill Tracts.

The city of Chittagong attracted the attention of the outside world from very early days. The Arabs knew of the port in the ninth century A.D. De Barros, the first of the great Portuguese chroniclers of Asia, described Chittagong in 1552 as “the most famous and wealthy city of the kingdom of Bengal, by reason of its port at which meets the traffic of that entire eastern region”. After the continual rise and fall over the centuries that followed, the city lost its importance in the region, due mainly to the trading activities of the East India Company and the rise of Calcutta. After the partition of Bengal in 1905 it rose again to prominence, and after the liberation of Bangladesh Chittagong went through a massive rehabilitation and reconstruction programme. Within a couple of years Chittagong became operational both as a city and as a port. Today it is gateway for the country's exports and imports and a large number of industries are situated in Chittagong.

Chittagong alone is home to eight industrial zones, and around 720 industrial units and factories are situated on the banks of the river Karnaphuli, the major river that runs through the city of Chittagong. Of these, 217 have been identified as very polluting and having tremendous impacts on river water quality. With a tidal flux ideal for the beaching of large vessels, Chittagong scraps around fifty percent of the world's large-scale ships. Located on a stretch of coast once covered by mangrove forest, the ship-breaking industry is another source of highly toxic wastes which are harmful to human health as well as coastal flora and fauna.

The dumping of solid waste beyond designated areas and uncontrolled solid waste disposal in slums are major environmental challenges for the City Corporation. Like all the coastal cities in Bangladesh, Chittagong Metropolitan Area has no sewage treatment plant so raw sewage (municipal, domestic, commercial and industrial) drains directly into its waterways. There are some septic tanks and community latrines but these systems also seep into the city's waterways.

Lack of safe drinking water and sanitation are key challenges for Chittagong's authorities. The Chittagong Water Supply and Sewage Authority (CWASA) supplies drinking water to the city dwellers without treatment, and the city's slum population (35 per cent of the city's total) has no access to safe drinking water and sanitation at all. Waterborne diseases are prevalent, and the

Corporation's health services are insufficient to deal with the problem. NGOs such as the NGO Forum for Water Supply and Sanitation (WATSAN), ActionAid and WaterAid are working to improve drinking water supplies and sanitation facilities. But large-scale intervention is required to improve this situation.

Existing and future climate risks

Chittagong is about 15 km upstream of the river mouth where the Karnaphuli River meets the Bay of Bengal. On average it experiences about 3,000 mm of rainfall annually, of which about 2,400 mm falls during the normal monsoon period. As a result of urbanisation, water that used to collect in the low-lying areas now occurs in urban areas. This hill cutting and consequent siltation of waterways also exacerbates the impacts of more intense rainfall. The combined effects of hill cutting and excessive rainfall in a short period are likely to have been the cause of the recent devastating landslides.

There are no explicit studies on impacts, vulnerability and adaptation to climate change nor climate variability and the likelihood of extreme climatic events at Chittagong City level. The Chittagong regional consultation workshop on the National Adaptation Programme of Action (NAPA) identified likely climate change-related problems as:

- increased frequency of flooding, particularly flash flooding
- increased flood levels
- increased frequency and extent of storm surges
- increased intensity and frequency of cyclones
- waterlogging
- salt water intrusion
- sedimentation

Chittagong is also vulnerable to cyclone and tidal surges. The Bay of Bengal is a breeding ground for cyclones. The city has already faced nine devastating cyclones and storm surges in the last 100 years, of which the cyclone in April 1991 was the most major in recent years.

Changes in weather systems due to climate change will aggravate the problems already being faced by cities and will present new problems. According to the Bangladesh NAPA the worst affected sectors will be infrastructure, human settlements, agriculture (including fisheries), industry, trade and human health (MOEF, 2005). These in turn will have considerable impacts on economic activities, employment, food security and livelihoods.

2. DECENTRALISATION AND AUTONOMY

Since January 2007, a non-political Caretaker Government has been running the country and has demonstrated the importance of good governance. The vision for the nation as a whole has produced some trickle-down effects for good governance at city level. For example, the Caretaker Government has promoted payment of wage arrears and ordered the government to implement enforcement mechanism to do so. This has resulted in budgetary re-allocations to pay workers' arrears in Chittagong City Corporation from an original 1.74 per cent to a revised 8.85 per cent of total expenditure for the fiscal year 2006-07. This has been further increased to 12.85 per cent of the total budget for 2007-08.

A number of autonomous and semi-autonomous departments and agencies under different ministries are responsible for providing services at a local level in Chittagong. Key organizations serving at City level are the Chittagong City Corporation (see Box 1), Chittagong Development Authority (see Box 2), and Chittagong Water Supply and Sewerage Authority (CWASA). Other departments and agencies delivering services include the Power Development Board (PDB) and Titas Gas Company under the Ministry of Energy and Mineral Resources (electricity supply), Chittagong Medical College and

Department of Health under Ministry of Health (health services), and Chittagong Port Authority under the Ministry of Shipping (operates the port and port development).

Most agencies are autonomous in nature, with their own organisational structure and charters of work, however constitutionally they are bound by their respective ministries. The central government keeps a close watch over departments through the line ministries and exerts more control over a number of specific issues particularly those of national significance.

Generally sectoral ministries initiate the process for formulating sectoral policy and rarely involve other ministries and departments. In most cases, ministries form a core group involving experts from universities, different pressure/influential groups, and national and international non-government organizations. The Ministry of Law deals with law and judiciary issues as well as formulation of policy by other ministries.

Different groups play influential roles in shaping policies relevant to them. In particular the business community plays an important role in shaping industry and business-related policy while environmental research and policy institutes and environmental movements are very active in influencing environmental policy and regulations. There are opportunities for external organisations to express their views on new and existing policies.

All Government budgets are centrally allocated and channeled through line ministries to departments and agencies. The Monitoring Cell of the Ministry of Finance verifies and approves the budgets submitted by agencies through their line ministries.

Box 1 - Chittagong City Corporation

The City Corporation is responsible for the delivery and maintenance of basic services such as roads and footpaths, solid waste disposal, drainage and sewage systems, street-lighting, mosquito control, and educational and health services.

The Corporation is an autonomous body governed by elected representatives comprising a Mayor, 41 Ward Commissioners and 14 female Commissioners. Administratively the Corporation is under the Ministry of Local Government, Rural Development and Co-operatives. The Mayor is elected for a five year term and being the senior-most elected official at the city level operates as a *de facto* centre of coordination on operational matters. Ward Commissioners are responsible for carrying out development activities at the local level and representing their constituent's needs and demands at the City Assembly.

The monthly Assembly meeting is presided over by the Mayor or in the Mayor's absence a Ward Commissioner. The Assembly takes immediate decisions on urgent issues if they fall within the Corporation's remit. When outside the Corporation's mandate the Assembly forwards the issue to the relevant Standing Committees.

Planning committees formulate city planning proposals which are then presented to the General Assembly for a final decision and disbursement of funds. In special cases or when multi-sectoral issues arise, the Corporation seeks the opinion of the civil society, experts in the field and university teachers.

The Chief Executive Officer of the Corporation is a senior government official appointed by the government for three year terms. The CEO administers the operation of activities carried out by different departments of the Corporation and brings Chittagong City Corporation activities in line with central government policy and regulations.

Financial Autonomy

Chittagong City Corporation has two primary sources of finance. The majority comes from its own sources (ranging from 55 to 65 per cent), 80 per cent of which comes from taxes. The Corporation also receives development grants (ranging from 35 to 45 per cent) channeled through line ministries. Expenditure items are mainly: a) management and maintenance (ranging from 40 to 50 per cent) which includes salary, allowance, honorarium, repair and maintenance, utility expenses, office operational costs, b) investment in permanent resources (ranging from 18 to 40 per cent), and c) development activities (ranging from 15 to 35 per cent) which directly depends on availability of development grants.

Source: City Corporate budget and expenses from 2004 to 2008

Box 2 - Chittagong Development Authority

The Chittagong Development Authority (CDA) was established in 1959 as an autonomous body to ensure planned and systematic growth of the city. Its principal functions are preparation and continuous review of Chittagong City's Master Plan, preparation of long and short-term development programmes including road infrastructure, shopping complexes and residential and industrial estates, and the development of regulations according to the Bangladesh Building Construction Acts, 1952 and its subsequent revisions.

The CDA is controlled by the Ministry of Housing and Public Works and all its activities are administered by the Chairman. It consists of a Chairman and five Members, all of whom are appointed by the government and may or may not be permanent government. The CDA Board, headed by the Chairman and consisting of 11 other members from various sectors (e.g. WASA, Chamber of Commerce and Industries, Railway Board, Port Authority, City Corporation), is responsible for decision-making relating to development activities in the Chittagong area.

The CDA plays an important role in the national budget allocations for development activities in Chittagong. The chairman of CDA has the power to approve project costs up to 0.5 million BDT without the decision of the Board. Project costs above 0.5 million BDT need approval from the Board for implementation. For project budgets of over Tk 20 lacs the Board has to hand over the decision to Executive Committee of the National Economic Council (ECNEC) which is the highest government body that appraises and gives final approval for all major projects or programs.

Authorising committees examine the feasibility of projects before authorising implementation. Civil society has no part in the decision-making process, and loopholes in the planning process allow for a certain level of corruption and inefficiency to cause delays. The decision-making process, particularly the awarding or authorising of projects, is influenced by power politics and vested interests of the ruling party. Interdepartmental cooperation within agencies is very weak which is also detrimental to planning processes.

The CDA is responsible for the enforcement of the city building code. No permanent structure can be built within the CDA area without prior approval by the CDA. This includes buildings, shops, markets etc. The Government has formed a building construction committee headed by the chief engineer as the Chairman of the committee. The committee meets frequently to approve building plans, arrange for the demolition of unauthorised construction and provide guidance for prospective developments. The CDA can only approve the construction of major infrastructure included in the Master Plan and unfortunately the Master Plan is not regularly updated

In cases of large projects like the Master Plan that involve various sectors, the committees are composed of representatives from all relevant sectors. The Technical Management Committee is in charge of the Master Plan. Some levels of institutional coordination are emerging but coordination among individuals and colleagues is still lacking.

Financial Autonomy

CDA owns a huge number of plots for residential, industrial and commercial developments. Allocation of plots is a major source of income as well as renting markets, and collecting planning and land transformation fees etc. Grants for preparation of the Master Plan, projects such as road construction and drainage system development come from the Bangladesh government and development agencies. The budget allocated to the CDA has been reduced and delays in disbursement of funds are also hampering project implementation.

Decentralisation and autonomy for disaster risk reduction.

The Government of Bangladesh has formulated Standing Orders for Disaster Management (SODM). The SODM aim to ensure that all relevant persons at all levels understand their duties and responsibilities regarding disaster management and enable local authorities to respond effectively without waiting for government assistance. This indicates a level of decentralisation in the field of disaster management. All ministries, departments, and agencies must prepare their own action plans based on their responsibilities under the Standing Orders.

The Government has also formed the *City Corporation Disaster Management Committee*. The Committee meets at least four times a year, or as necessary during a disaster. The Committee comprises the Mayor as Chairman, key members of the Corporation and representatives of the relevant departments or agencies, including one NGO.

The City Corporation Disaster Management Committee has a set of responsibilities for non-disaster periods covering effective mechanisms for dissemination of cyclone and flood forecasts, and preparing safe and equipped shelters. During disasters the Committee operates an information centre and control room for coordination of disaster relief operations. The committee conducts assessments, formulates plans, identifies priorities and arranges distribution of resources from the Ministry of Disaster Management and Relief. The Committee also maintains the accounts relating to the relief and rehabilitation process.

3. ACCOUNTABILITY AND TRANSPARENCY

In general, accountability and transparency within the Corporation and the CDA is questionable. The City Corporation is accountable to city dwellers/voters and tax payers through the Ward Commissioners. However, financial transparency is weak. There are few mechanisms for citizens/tax payers to access financial information or to scrutinize the Corporation's revenues or expenditures.

Public procurement regulations govern the process of tendering projects and awarding contracts. The relevant department prepares the project documents including the budget. Tender announcements are advertised in newspapers and some through websites. Tender proposals are then reviewed by a technical committee and the CDA's engineering department reviews the budget and gives final approval in accordance to the Public Procurement Regulations.

The tender and project awarding process is often heavily influenced by the ruling political party, influential business groups and individuals. The Mayor of the City Corporation and Ward Commissioners are generally affiliated to the major political parties and therefore either use political power to influence the decision-making process or are influenced by senior party officials to take a particular decision.

Yet the overall situation is improving. The authorities are now following a more 'bottom-up' approach in the implementation of projects/activities. They have relaxed their rule of secrecy and are more open to sharing financial information. The process of awarding contracts has also become more efficient and there have been some trickle-down effects of the Caretaker Government's efforts to root out corrupt government officials and create an atmosphere of cooperation and trust.

4. RESPONSIVENESS AND FLEXIBILITY

One example of the city's responsiveness to climate related disasters is detailed below (Box 3) outlining the responses of agencies at the local, national and international level to the worst landslide to hit Chittagong, in June 2007. The case reveals a good level of responsiveness in difficult circumstances, assisted by good cooperation amongst agencies and sufficient equipment, medical and food supplies.

The existing governance structures are sufficiently responsive and flexible to address extreme climate and non-climate related disasters, particularly in the area of recovery and rehabilitation, although in most cases insufficient financial resources seriously hamper the response. Climate resilient urban development in Chittagong is primarily based on experience of historical climatic events such as cyclones and tidal surges. As yet there are no initiatives designed to incorporate future climate change and associated risks into the planning, designing or implementation of projects.

But initiatives to strengthen disaster preparedness are highly relevant. The Standing Orders for Disaster Management (SODM) ensure the relevant persons/agencies are clear on their duties and responsibilities and have plans in place to ensure timely responses. The Standing Orders are to be followed during Normal times, Precautionary and Warning stage, Disaster stage and Post-disaster stage.

The City Corporation Disaster Management Committee meets at least four times a year but the flexibility in the committee's mandate is there to enable them to meet as often as necessary during a disaster. The Chairman of the committee can also recruit more members in times of emergency or in unusual circumstances.

The responsibilities of the CDMC during non-disaster periods include:

- Ensuring speedy dissemination of cyclone and flood forecasts to all officers, concerned persons/organisations and other persons having relevant responsibility in the City area
- To identify and equip safe shelters
- To arrange for practice mobilisation drills from time to time for disseminating warning signals/forecasts, evacuation, rescue and primary relief operations in co-operation with the Disaster Management Bureau.

During Disasters:

- To operate emergency information centres and control rooms for coordination of evacuation, rescue, relief and primary rehabilitation operations across the city. If necessary, conduct rescue operations and arrange the sending of reserve teams to highly affected areas
- To conduct damage assessments in accordance with the directives of the Disaster Management Bureau and other National authorities and dispatching to the appropriate authorities including the Ministry of Disaster Management and Relief
- To identify priority areas and arrange for distribution of the resources received from the Ministry, district or any other authority objectively. To maintain the accounts of relief and rehabilitation operations and dispatch to the relief-giving authority.

5. PARTICIPATION AND INCLUSION

The concept of stakeholder consultation is gradually becoming an integral part of policy-making processes in Bangladesh but consultation is still limited to influential stakeholder groups. The views and concerns of vulnerable communities are still missing in policy and programme development. In some cases civil society, trade associations, stakeholders are consulted in decision-making processes of the CDA and Corporation, but in most cases the decisions are made by the heads of departments. The CDA and the Corporation have their own authorisation committee. After draft plans are prepared,

the authorisation committee verifies the project and submits to the board. The board calls a meeting for approval or rejects the plan. There is no involvement of NGOs, civil societies or other groups or individuals in this process.

There is a civil society group in Chittagong City which brings together architects, engineers, planners, academics, journalists and researchers from different disciplines. The group is rich in knowledge and is very active on environmental issues, but the city government rarely takes account of opinions in the decision-making and planning processes.

Decisions within the Department of Environment (DoE) in Chittagong are made by a divisional committee. The committee consists of representatives from relevant organizations. For instance, the decision regarding pollution levels of the Karnaphuli River involved the CCC, Ship Owners' Association, CDA and Chittagong WASA. The DoE also has a committee known as the Development Coordination Committee (Unnayan Shammanay Committee) both at the district and divisional levels. They meet once every month to discuss projects to be carried out, priority issues and areas of environmental concern. So, whilst an increasing number of stakeholders are included in departmental committees, civil society and citizens, including the most vulnerable, remain excluded from decision-making and disaster risk reduction strategies in Chittagong.

6. EXPERIENCE AND SUPPORT

Being a coastal city Chittagong has experience of cyclones and storm surges as well as very recent experience of devastating landslides. Therefore Chittagong's capacity to react to natural disasters, particularly to implement recovery and rehabilitation operations, has seen rapid progression. But systematic approaches to integrating climate risk reduction into city planning have been missing with severe consequences. Box 3 outlines the experience of landslides brought about by a combination of intense rainfall, poor city planning and failures in natural resource management.

Box 3 Chittagong's worst landslide – poor governance, climate change or both?

On June 11 2007 Chittagong City experienced its most devastating landslide yet. 126 people died and many houses, slums and infrastructure were destroyed. Intense rain began at 3 am, by 6 am the landslide has started and by 7 am two-thirds of the city was flooded. Flooding was exacerbated by the high tide which slowed the discharge of rainwater into the river system. Transport and communication were cut off and the emergency services were unable to reach the worst affected areas.

On June 13 the Communication Advisor Major General called a meeting and formed two investigative committees. A major cause of the landslides is perceived to be the practice of hill cutting around Chittagong. Over the past decades 30,000 hills have been destroyed by hill cutting to clear land for development, both by private land expropriators and by the City Corporation itself to make way for new residential areas. The CDA's 1995 Master Plan forbid the hill cutting but the practice has continued unabated, despite protests and lobbying by concerned citizens.

A summary report confirmed that the absence of specific policy guidelines on hill management, and lack of initiative to investigate indiscriminate hill cutting and encroachment on government land are the main reasons behind the rain-induced landslides in Chittagong. A mobile court set to work preventing hill cutting. Some influential people associated with hill cutting and slum building were identified and old cases were re-opened.

The Government of Bangladesh responded promptly to the disaster and allocated a cash grant of Tk2,000,000 (USD29,000) and 200 mt of rice to affected families. The local Police, Fire Brigade, Army, Local Administration, Red Crescent, Health volunteers and NGOs searched for survivors despite Search and Rescue operations being severely hampered by the flooding and continuing heavy rains and a lack of equipment for excavation.

Chittagong City Corporation opened three emergency camps and distributed 82 mts of rice, 50 mts of molasses, 600 matchboxes and 1,000 candles. The Corporation mobilised two medical teams. The Directorate General of Health Services (DGHS) district Control Room was placed on 24 hour monitoring alert and nine medical teams and one mobile unit were assembled to assist victims and address emerging health problems. There were no reports of scarcity of emergency drugs and medical supplies and medicine stockpiles were available.

UNICEF and WFP Country Offices jointly sent four teams to conduct emergency assessments. The WFP Country Office monitored the situation and providing technical support to the DGHS. Close coordination with district and city administration was observed and meetings took place with health personnel and District Civil Surgeons. The WHO provided support to NGOs and UN agencies on health sector management. UNDP mobilized logistical support and provided five vehicles (including fuel and drivers) to reinforce the rescue and relief operation.

The UN received no formal request for international assistance. According to the UN Country Team, the local authorities currently had sufficient Search and Rescue capacity, food and medicines.

Several new initiatives stand to improve the city's capacity to implement climate risk reduction programmes. The recent Comprehensive Disaster Management Programme (CDMP) initiative was launched under the Ministry of Food and Disaster Management. The focus is on earthquakes which have no relationship with climate related risks but the programme does incorporate important aspects of urban disaster resilience.

ActionAid Bangladesh has prepared an Earthquake Vulnerability Atlas for Chittagong for preparedness and is attempting to push disaster risk reduction up the policy agenda. This atlas of the Corporation area has been piloted under DIPECHOII. The vulnerability atlas provides a bird's eye view of the city's vulnerability to earthquake disasters and detailed information for four wards. Under the DIPECHOIII project, detailed user-friendly information will be developed for 23 high and moderate risk wards of the Corporation. The improved atlas will give a comprehensive view of vulnerability in the context of an urban setting, marking important buildings, schools and other public places as well as providing an overview of open spaces.

The SODM are intended to clarify the role of all agencies in disaster management and establish mechanisms for preparedness, and should therefore support the city in resilience-building. Likewise the City Corporation Disaster Management Committee is gaining experience is supporting climate risk resilience. The CDA and the Corporation have sufficient experience and capacity for planning and building infrastructure, but implementation of projects targeting vulnerable groups has been missing due to the unavailability of risk and vulnerability assessments of different socio-economic groups at the city level. International, national and local NGOs have provided support for recovery and rehabilitation.

Good urban governance as such is still lacking in Chittagong City but there are positive indications of improvement. Climate change is such an all-encompassing environmental problem that impacts most sectors in some way. Integrated planning and cooperation within and between agencies and institutions is needed to tackle the problem and come up with a sustainable strategy for long-term climate resilience. Urban governance and the present activities need to be revised and reformed, taking into account climate change and its adverse impacts.

Chittagong City's infrastructure provides greater resilience to climate change impacts but as always it is the urban poor that are most vulnerable and suffer the most in disasters. Although in the case of climate-related risks and disasters most city dwellers are affected. Infrastructure alone cannot provide urban climate resilience. Chittagong's institutions also need to increase their capacity in terms of awareness-raising, disaster preparedness and response. There is currently no explicit consideration of future climate risks in the current city planning process, primarily due to lack of understanding of climate change and little knowledge on how to integrate climate risk reduction into all the different stages of the planning process.

The following capacity building activities could help develop the required knowledge for integrating climate change into planning, design, implementation and monitoring to increase resilience of urban infrastructure:

- Developing tools for climate risk and vulnerability assessments necessary for integrating adaptation into sectoral and local level development plans
- Building the capacity of the planning and engineering departments of the CDA and the Corporation to understand the importance of addressing climate change and integrating climate change adaptation into programme and project design
- Piloting the integration of adaptation exercises into the Detailed Area Plans for greater Chittagong and sharing learning from the pilots to design large scale interventions or scale-up activities
- Building capacity in generating required seasonal, monthly, weekly and daily weather forecasts and communicating forecasts with vulnerable communities and different institutes.

Abbreviations

AD	Anno Domini
BBS	Bangladesh Bureau of Statistics
BCAS	Bangladesh Centre for Advanced Studies (BCAS)
BDT	Bangladeshi Taka
CCC	Chittagong City Corporation
CCCI	Chittagong Chamber of Commerce and Industries
CDA	Chittagong Development Authority
CHT	Chittagong Hill Tracts
CMC	Chittagong Municipal Corporation
CPA	Chittagong Port Authority
CWASA	Chittagong Water Supply and Sewage Authority
DAP	Detail Area Plan
DoE	Department of Environment
ECNEC	Executive Committee of the National Economic Council
IDS	Institute of Development Studies
ILO	International Labour Organization
LGED	Local Government Engineering Department
NAPA	National Adaptation Programme of Action
NGO	Non-government Organization
PCBs	Polychlorinated Biphenyls
PDB	Power Development Board
SODM	Standing Orders on Disaster Management
SMA	Statistical Metropolitan Area
UNDP	United Nations Development Programme
WATSAN	NGO Forum for Water Supply and Sanitation