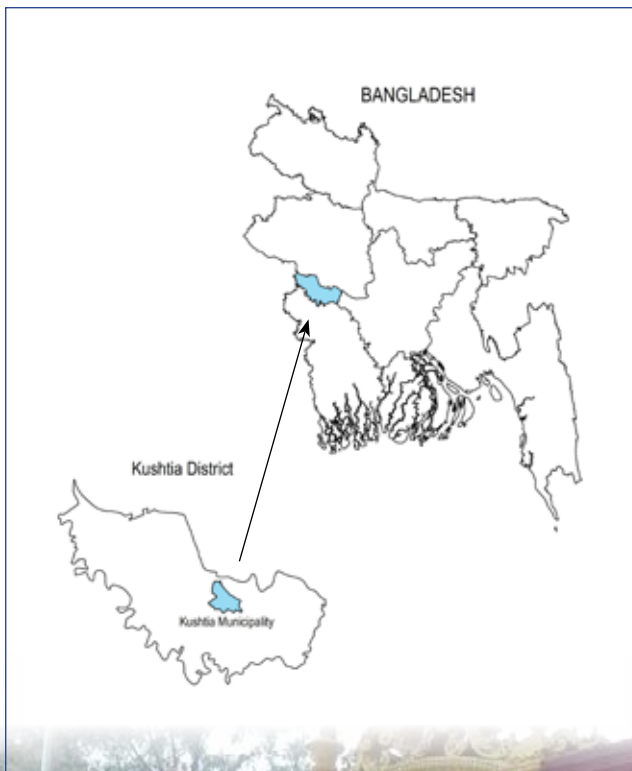


City Resilience Strategy: Kushtia

Kushtia is the most populous city of Kushtia district located between 23°42'N and 23°59'N and between 88°55'E and 89°04'E. Situated in the south-western part of Bangladesh lying just south of the upper Padma River, Kushtia district is bounded on the north by Rajshahi, Natore and Pabna districts, on the east by Pabna and Rajbari Districts, on the south by Jhenaidah, Chuadanga and Meherpur Districts and on the west

by Chuadanga and Meherpur Districts and India. The city consists of a Paurashava (Municipality) with 12 wards and 36 mahallas having a total population of 375,149.

The annual average temperature of Kushtia district varies from a maximum 37.8°C to minimum 11.2°C and annual average rainfall is 1,467 mm. Kushtia and adjacent districts fall under the disaster-prone region of the country where flood, river erosion, cyclone, drought are almost a yearly phenomenon.



Climate Risks

The two major future climate risks identified through the ICLEI ACCCRN Process (IAP) for Kushtia are:


















Changing Climate Conditions	Climate Scenario Summary Statements
Irregular rainfall 	Pre-monsoon rainfall will decrease while monsoon and post-monsoon rainfall will increase. From 2051 onwards annual average rainfall and monsoon rainfall will follow a higher increasing trend.
Increased temperature 	The monthly average maximum temperature will increase during the monsoon period and will decrease in other periods. The monthly average minimum temperature will increase in all periods and the annual maximum and minimum temperature will follow an increasing trend.



Photo credits: ICLEI South Asia

Vulnerability Assessment

The fragile urban systems and their corresponding climate fragility statements for Kushtia are:

Fragile Urban Systems		Climate Fragility Statements
  	 	<ul style="list-style-type: none"> Will create greater demand for water and put the system under stress. This will impact municipal finances and human health. Water level of the river needs to be improved and will be impacted further affecting transport, water supply and thereby economy and health.
	 	<ul style="list-style-type: none"> May increase the incidence of heat strokes and diarrhoea that cannot be tackled by the inadequate health facilities presently available in the city.
	 	<ul style="list-style-type: none"> Will impact crop cycles, fishery and fruit production by influences on the crop and pest life cycle. Quality of leather may be impacted due to climate change. Women will be the most impacted since they are primarily engaged in agriculture.
	 	<ul style="list-style-type: none"> Can impact sewerage flow and discharge in the nearby rivers, thereby impacting health.
	 	<ul style="list-style-type: none"> Will impact drainage of certain areas because of low coverage of the present system, impacting health.

Through the vulnerability assessment, the adaptive capacity of the key actors identified in the IAP was scored based on three parameters: capacity to organize and respond, availability of resources, and access to information. Actors who receive a low adaptive capacity score are classified as vulnerable while those who receive medium and high scores are classified as supporting and can aid the local government in resilience building activities. The table below presents an overall analysis of actors across the different fragile urban systems.






Overall the Kushtia Municipality scored as a supporting actor since it has access to technical and financial resources and to information; therefore it has the ability to respond to stresses.

The adaptive capacities of the fragile urban systems are assessed on the basis of five broad categories – economic, technology/ infrastructure, governance, social, and ecosystem services. Each of these five categories was rated as high/medium/low and averaged across all the urban systems to generate an overall score for each parameter in the city as detailed in the following table.

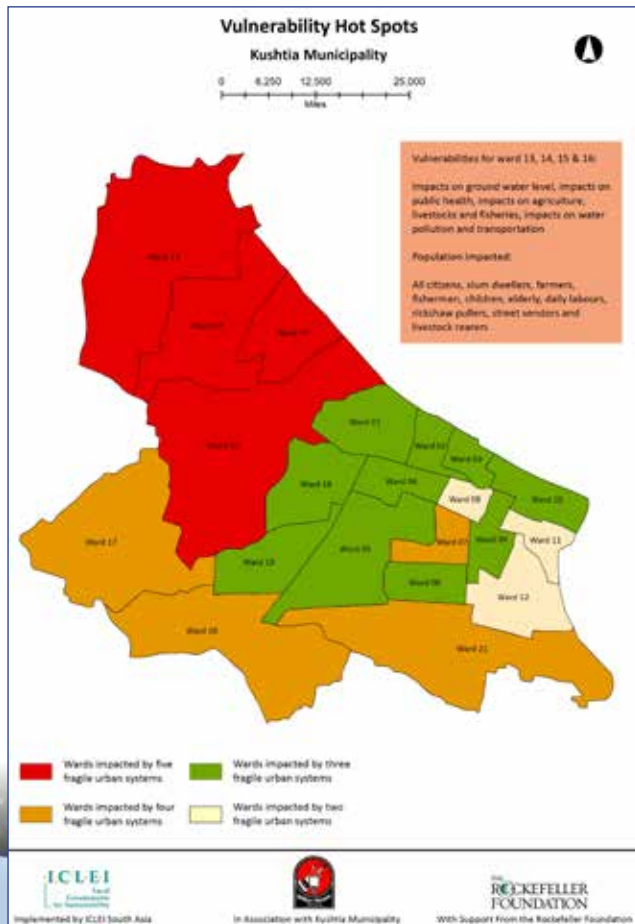
Actor Analysis for Kushtia City

Vulnerable Actors	Supporting Actors
<ul style="list-style-type: none"> Slum Dwellers Residents Farmers Fishermen Women Children Daily Labourers Rickshaw Pullers Elderly Livestock Rearers 	<ul style="list-style-type: none"> Municipality Department of Public Health and Engineering Bangladesh Water Development Board Civil Surgeon Office

Overall Adaptive Capacity of Systems in Kushtia City

Adaptive Capacity Parameters	Adaptive Capacity Score		
	Low	Medium	High
 Technological/ Infrastructure			
 Economic			
 Governance			
 Societal			
 Ecosystem services			

In Kushtia, wards 13, 14, 15 and 16 were identified as the vulnerable hotspots (refer map). These wards are closer to the river banks and house large urban poor populations and lack basic infrastructure. The remaining wards in the city are also impacted by two or more fragile systems. The hotspots in the city need particular attention.



Possible adaptation interventions were identified for the four fragile urban systems in Kushtia on the basis of their climate risks and vulnerabilities, the vulnerable areas and the vulnerable actors to adapt to the possible impacts of climate change on these systems. These prioritized interventions were inter-linked with ongoing programmes and projects. The way forward for the city to build resilience includes:

- **Capacity building of staff:** Staff needs training regarding management of waste since this is also related to sewerage and drainage in the city, and is also directly related to improvement of health of citizens.
- **Infrastructure development:** Water supply systems, solid waste management systems, drainage, septage management facilities need to be established in the city to improve the resilience of these systems.
- **Awareness generation:** Citizens engagement and awareness generation activities are essential to increase the acceptance of municipal reforms. Several legal provisions need to be applied in a better and more effective manner to improve the situation of the urban systems in the city, for example, decoupling sewage pipes from drains.



Key Interventions Identified for Kushtia City

Infrastructural Measures	Non-Infrastructural/ Policy Measures
Water Supply and River System Management	
<ul style="list-style-type: none"> Rain Water Harvesting - Implementation of a rainwater harvesting program for the storage of rainwater in surface (public) ponds/tanks and recharging ground water where appropriate. The Municipality can also encourage citizens to apply this rainwater harvesting program in their building rooftops for both potable and non-potable usage. <p>Costs associated (Civil costs, construction costs, labour, materials, staff costs, meeting, training): USD 10,000 per unit.</p> <p>Co-benefits: Improves soil conditions, green cover.</p>	<ul style="list-style-type: none"> Awareness campaigns on water conservation, the importance of rain water harvesting and maximizing water-use efficiency in the home. It can be done by specialists for local government staff and then local government will campaign with the other stakeholders within the city. <p>Costs associated (IEC materials, printing costs, meetings, trainings, logistics, staff costs): USD 2,500 per training.</p> <p>Co-benefits: Can be useful for awareness raising of other systems.</p>
Health	
<ul style="list-style-type: none"> Increase the number of primary health care centres. <p>Costs associated (Civil costs, construction costs, materials, staff costs, labour): USD 20,000 per unit.</p> <p>Co-benefits: Can serve as awareness generation centres.</p>	<ul style="list-style-type: none"> Assessment of health risks with support from subject matter experts and health department. <p>Costs associated (Cost of consultants, report preparation): USD 10,000.</p> <p>Co-benefits: Create database for future planning.</p>
Economy	
	<ul style="list-style-type: none"> Vocational training for women and men to diversify from traditional means of livelihood based on farming and fishery. <p>Costs associated (Cost of trainings, meetings, logistics, staff costs, materials): USD 5,000 per training for 20-25 people.</p>
Drainage and Sewerage	
<ul style="list-style-type: none"> The municipality is producing compost fertilizer in its compost plant through a box-composting system. Co-composting can be introduced to deal with faecal sludge. It is a process by which biodegradable waste is biologically decomposed under controlled conditions by microorganisms (mainly bacteria and fungi) under aerobic and thermophilic condition. Faecal sludge can be treated using this method. <p>Costs associated (Sludge disposal trucks, construction costs, civil work costs, labour, materials, training, meeting): A detailed project report needs to be prepared to assess costs.</p> <p>Co-benefits: Supplementary income opportunities, material recovery.</p>	<ul style="list-style-type: none"> Training of staff responsible for managing solid waste on safety procedures, scientific management of waste and waste handling. <p>Costs associated (Cost of training materials, staff costs, logistics): USD 5,000 per training for 20-25 staff.</p> <p>Co-benefits: Better solid waste management can lead to improvements in flow in drains.</p>