

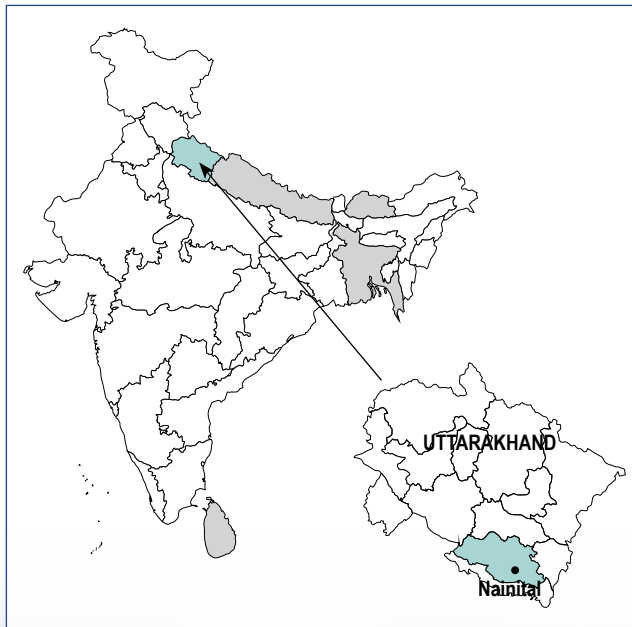
City Resilience Strategy: Nainital

Nainital city is located at an altitude of 1,938 m spread over an area of 11.73 sq. km in Nainital district, which is also known as the lake district due to the prevalence of more than 100 lakes. The city is named after the Naini Lake which covers 0.54 sq km. It is the headquarters of Nainital District and Kumaon Mandal. Nainital has a population of 41,377 as per the 2011 Census of India. The city's climate and scenic beauty make it a popular destination in the northern tourist circuit. Nainital is also an important administrative town in the state, having the High Court and well known educational institutions.

The climate of the area is subtropical montane with mean monthly maximum and minimum temperatures of 25°C and 0.5°C respectively. The area occasionally receives snowfall in the winter season and an annual rainfall of 1,300 mm.

Climate Risks

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



Changing Climate Conditions	Climate Scenario Summary Statements
High intensity rainfall 	The annual rainfall in the Himalayan region is likely to vary between 1268±225.2 mm and 1604±175.2 mm in 2030s. The projected precipitation is likely to increase by 5% to 13% in 2030s with respect to 1970s. It is also projected that there will be an increase in intensity of rainfall by 2-12% in the Himalayan region by 2030.
Increased temperature 	The mean annual temperature is projected to increase from 0.9±0.6°C to 2.6±0.7°C in the 2030s. The net increase in temperature ranges from 1.7°C to 2.2°C with respect to the 1970s. Temperatures also show a rise in all seasons.

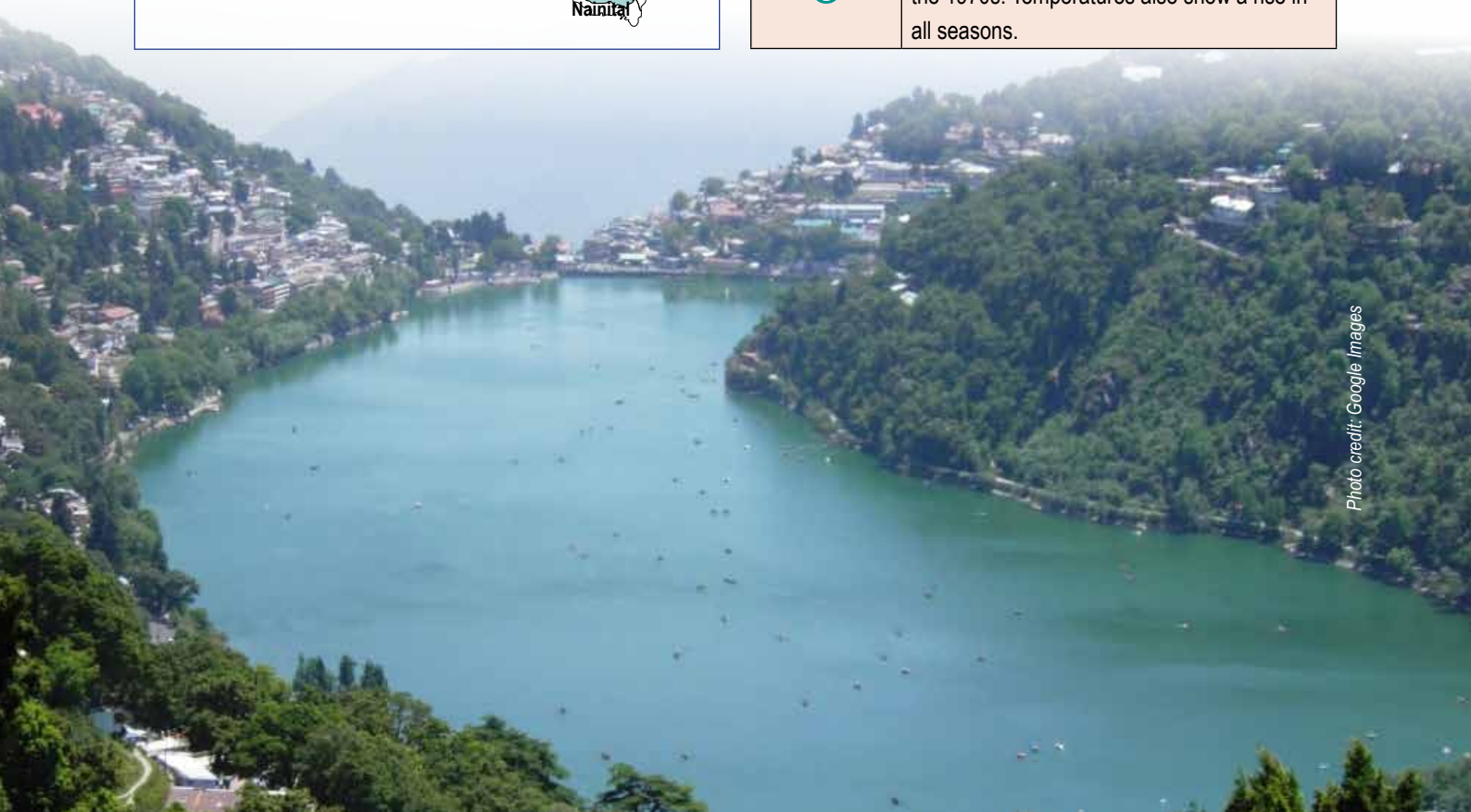











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Vulnerability Assessment

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

Fragile Urban Systems		Climate Fragility Statements
		<ul style="list-style-type: none"> • Poses additional stress on water supply system via higher demand and higher electricity requirement for water pumping systems especially in summer.
		<ul style="list-style-type: none"> • Leads to increase in the incidences of landfill fires and also provides favourable environment for growth and multiplication of microorganisms, resulting in uncontrolled emissions and odour in open dumps.
		<ul style="list-style-type: none"> • Leads to washing down of the garbage impacting forest ecosystems downhill and it will also increase leachate production which can result in ground water pollution and contamination.
		<ul style="list-style-type: none"> • Has an adverse impact on the overall habitability in the city, as it would exacerbate the risks of landslides, thereby demanding changes in the existing building by-laws and zoning regulations.
		<ul style="list-style-type: none"> • Damage is likely to roads and other transportation infrastructure.

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.






Actor Analysis for Nainital City

Vulnerable Actors	Supporting Actors
<ul style="list-style-type: none"> • Nagar Palika Parishad Nainital (NPPN) • Slum Dwellers • Rag pickers • School • Tourist • Lake Development Authority 	<ul style="list-style-type: none"> • Uttarakhand Jal Sansthan • Uttarakhand Power Corporation limited • Collectorate • Public Works Department • Commercial Establishments • Traffic Police

NPPN, which is the administrative body of the city scored low in the analysis indicating that it is not in a position to take much action with the available resources.

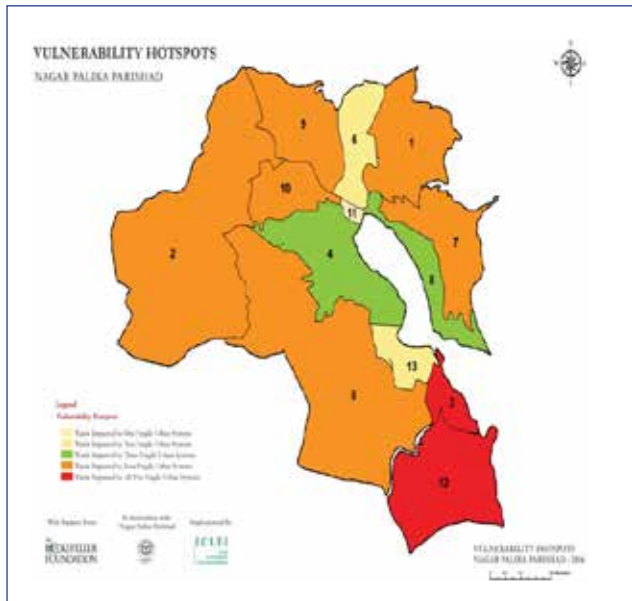
The adaptive capacities of the fragile urban systems are assessed on the basis of five broad categories – economic, technology/infrastructure, governance, social, and ecosystem services. Each of these five categories was rated as high/medium/low and averaged across all the urban systems to generate an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

Overall Adaptive Capacity of Systems in Nainital City

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

The vulnerable area assessment shows wards 3 and 12 as vulnerable to all four fragile urban systems (refer map). These are the most populous wards in the city of Nainital and have poor levels of basic services, which impacts the residents' health.





Among policy/non-infrastructural measures identified through the IAP, Information, Education, Communication (IEC) materials for awareness generation on water conservation measures such as rain water harvesting and solid waste management measures such as segregated waste collection and disposal have been identified. Policy level improvements to encourage implementation of traffic rules and urban land use plans are also important. Among infrastructural measures, decentralised waste management systems, improved pipelines for water supply, protection and enhancement of catchment areas, metering of water supply lines, construction of parking spaces and promotion of non motorised transport have been identified.



Photo credit: C/LEI South Asia

Key Interventions Identified for Nainital City

Infrastructural Measures	Non-Infrastructural/ Policy Measures
Water Supply	
<ul style="list-style-type: none"> Catchment area protection of Naini lake. <p>Costs associated (Long term action, includes reforestation, protection of forests, protection of soil, cleaning and maintenance): INR 100 lakhs for civil work, INR 40 lakhs for maintenance annually.</p> <p>Co-benefits: Can help promote water conservation habits in households.</p>	<ul style="list-style-type: none"> Rain water harvesting systems should be enforced in residential and commercial buildings. <p>Costs associated (Cost of meetings, cost of making policy): INR 1.5 lakhs.</p> <p>Co-benefits: Reduction of cost of using tankers or poor health from consuming low quality water.</p>
Solid Waste Management	
<ul style="list-style-type: none"> Adoption of decentralized waste management in inaccessible hilly regions. Segregated wet and dry waste can be collected every alternate day using a waste bag/basket carried on the back of the sanitary worker from each household. Organic waste and recyclables can be processed insitu. <p>Costs associated (Cost of staff for collection of waste, composting site construction and maintenance): INR 20 lakhs for initial construction and IEC, INR 2.5 lakhs per annum for staff costs/maintenance.</p> <p>Co-benefits: Can help generate municipal revenue.</p>	<ul style="list-style-type: none"> Promotion of source segregation of municipal solid waste through public awareness and well-designed IEC (Information, Education and Communication) materials (banner, pamphlets, hoardings etc). <p>Costs associated (Cost of designing and publishing IEC materials, cost of meetings): INR 5 lakhs.</p> <p>Co-benefits: Can be used for awareness generation of related issues as well.</p>
Urban Planning	
	<ul style="list-style-type: none"> Revisiting the land-use plan of the city to assess areas fit for construction and development activities and identifying ecologically sensitive hot spots for conservation and protection. <p>Costs associated (Consultant cost, staff costs will be recurring. but can be availed from municipal budget): INR 10 lakhs.</p> <p>Co-benefits: Conservation of ecologically sensitive areas will help in provision of ecosystem services.</p>
Transportation	
<ul style="list-style-type: none"> Construction a parking outside the city for tourist. Current parking space near bus stand and municipality is not able fulfil the parking demand during peak tourist season. <p>Costs associated (Civil cost, land cost, maintenance costs, can be done through a PPP project): INR 100 lakhs.</p> <p>Co-benefits: Can generate revenue for municipal corporation.</p>	<ul style="list-style-type: none"> Promotion of Non Motorized Transportation options. <p>Costs associated (Cost of designing and publishing IEC materials, radio jingles, televised advertisements, cost of meetings): INR 20 lakhs.</p> <p>Co-benefits: Cleaner air and less congestion can draw more tourists and generate revenue.</p>

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