

City Resilience Strategy: Keylong

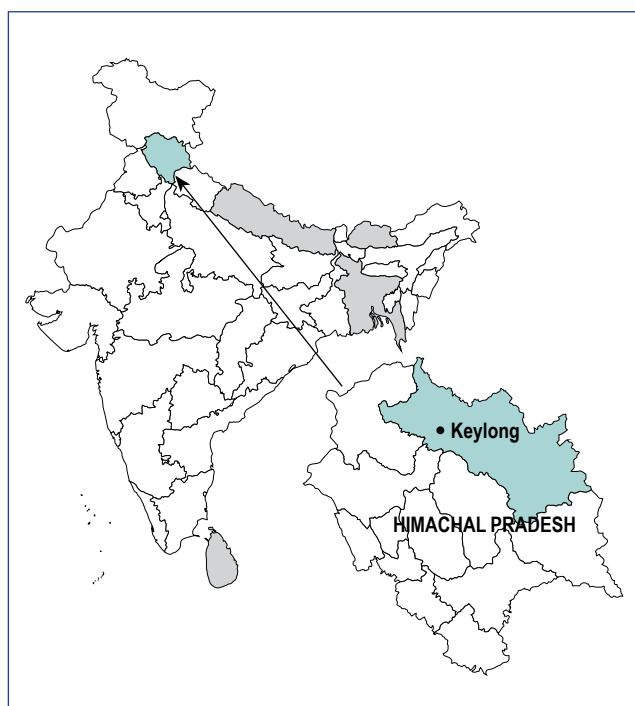
Keylong is the governmental centre and the district headquarters of the district of Lahaul and Spiti. It lies on the embankment of the Bhaga River where Chenab Valley, Bhaga Valley and Chandra Valley interconnect and is usually known as the Land of Monasteries. Keylong is situated on the main trade route between the Rohtang and Baralacha passes above the Bhaga River at an altitude of 3,156 m. It is virtually cut off from the rest of the world for more than six months in a year (November- May). Keylong is still primarily rural although it is quickly transitioning to an urban centre. The town has a total population of around 2,250 persons

which excludes the floating population of tourists and labourers. The economy is primarily agrarian.

Keylong has only two seasons- a short lived summer and long freezing winter. It seldom rains in the town. Keylong is prone to avalanches and cloud bursts which sometimes result in floods.

Climate Risks

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



Changing Climate Conditions	Climate Scenario Summary Statements
Increased rainfall with a corresponding decrease in snowfall 	There is a high level of confidence of an expected change of 1250 ± 225.5 mm to 1550 ± 175.2 mm in mean annual rainfall. High hill areas like Lahaul and Spiti may experience rainfall in the place of snowfall with increased temperature. The number of rainy days may increase in Himachal Pradesh with decrease in average intensity.
Increased temperature 	The rise in temperature with respect to the 1970s shows a range between 1.5- 2.8°C in Himachal Pradesh.



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Vulnerability Assessment

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

Fragile Urban Systems		Climate Fragility Statements
		Expected to lead to an increase in vector-borne diseases.
		Will lead to increased risks of surface and ground water contamination and unsanitary conditions, which can have impacts on health.
		Snow melt that supplies water to the town will reduce putting duress on the water supply system especially in summer.
		Will lead to decreased replenishment of springs and snow that supplies water as snow melt, leading to increased stress on the water supply system.
		Will encourage the spread of diseases, pests and vectors more suited to warmer climates, opening up the population residing there to health risks previously not encountered in the region.
		The risk of vector and water borne diseases may increase due to poor sanitation and hygiene.
		Will result in the increase in water pollution because of washing of feces into streams and nallahs.

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.

The Deputy Commissioner's Office, which is the administrative body scored high in the analysis as it has access to resources, the technical capacity and access to information.

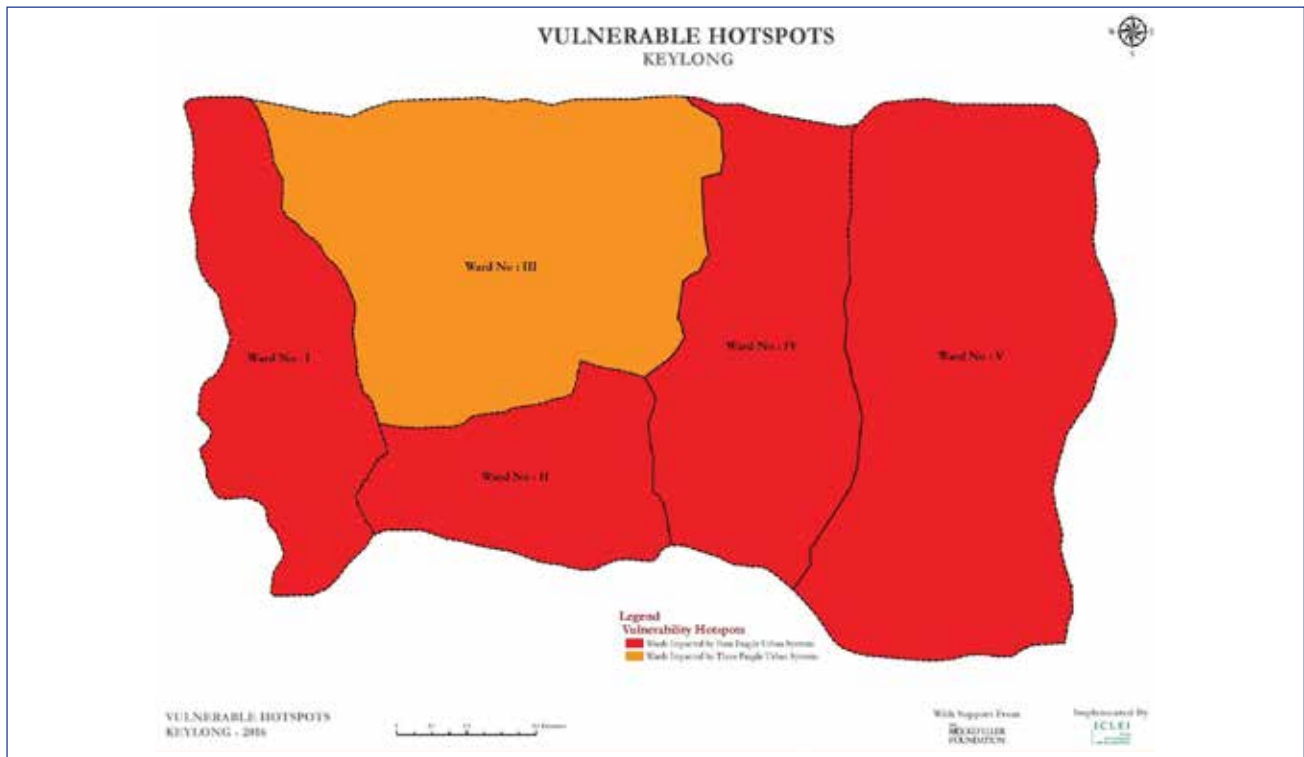
The adaptive capacities of the fragile urban systems are assessed on the basis of five broad categories – economic, technology/ infrastructure, governance, social, and ecosystem services. Each of these five categories was rated as high/medium/low and averaged across all the urban systems to generate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

Actor Analysis for Keylong

Vulnerable Actors	Supporting Actors
- Special Area Developmental Authority - Residents - Tourists - Migrant Workers - Hotel Association - Farmers - Trade Unions - Anganwadi Workers (SHGs) - Primary Healthcare Workers - Asha Workers (SHGs) - District Hospital - Health Department	- Gram Panchayat (Local Government Body) - Yuvak Mandals (Youth Groups) - Block Development Office - District Rural Development Agency - Deputy Commissioner's Office - Swachhata Doots (Cleanliness Messengers) - Ayurveda Hospitals - Amchi (traditional) Clinics - Irrigation and Public Health Department

Overall Adaptive Capacity of Systems in Keylong

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



The vulnerable area assessment shows that all the wards of Keylong town except ward number 3 are impacted by all four fragile urban systems (refer map). Therefore, these areas relatively need more focus on to build resilience through resource mobilization and infrastructure development.

Among the softer and policy interventions identified through the IAP, awareness generation activities to promote water conservation, prevent littering and promote better sanitation can be taken up using local *Mahila Mandals* (women groups) and *Yuvak Mandals* to convince people to change their behaviour for better management of resources. In case of hard measures, water conservation measures like rain water harvesting and protection of water sources, improvement of sanitation facilities to recycle and reuse waste water in agriculture and developing composting facilities for using wet waste to generate organic manure for agriculture can be explored. Health infrastructure needs major upgrading in the region.



Key Interventions Identified for Keylong City

Infrastructural Measures	Non-Infrastructural/ Policy Measures
Solid Waste Management	
A centralised composting centre should be set up close to the agricultural zones of the town. Costs associated: (Civil and construction work): INR 50 lakhs. Co-benefits: Avoid environmental damage and soil protection.	Development of a holistic waste management plan for the scientific management of solid and liquid waste. Costs associated: INR 5-8 lakhs for consultancy charges.
Water Supply	
Fencing of water spring sources to protect them from cattle and damage. Costs associated: (cleaning up and fencing of source): INR 15 lakhs per source. Co-benefits: Prevention of water-borne diseases.	Training given to <i>Mahila Mandals</i> to educate locals on water issues. Costs associated: INR 2.5 lakhs per training, including expert lectures and field training.
Sanitation	
Reuse of waste water for agricultural purposes where possible. Costs associated: INR 10 lakhs for simple biological treatment of waste water, without industrial effluents per unit. Co-benefits: Conservation of water.	
Health	
Improvement in health facilities in the regional hospital and construction of primary health centres for basic health care. Costs associated: (medical equipment, staff, training): INR 100-200 lakhs.	Capacity building programmes for health and paramedical staff including mid-wives. Costs associated: (logistics, training materials, staff costs): INR 2 lakhs per training programme.

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