



Building Block for

Building Resilience and Climate Smart Urban Planning

Dr. Shyamli Singh Prof. Vinod K. Sharma



सत्यमेव जयते



Handbook for Urban Local Bodies Officers

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“

When we speak only of climate change, there is a perception of our desire to secure the comforts of our lifestyle. When we speak of climate justice, we demonstrate our sensitivity and resolve to secure the future of the poor from the perils of natural disasters.”

- Shri Narendra Modi

CLIMATE



FOREWARD

The 74th Constitutional Amendment marks a landmark moment in India's realm of urban local self governance, creating urban local bodies (ULBs) constitutional entities with the authority to provide better governance and more effective delivery of civic services to communities. It is therefore important for the states to devolve greater responsibility, power, and resources to the ULBs through the devolution of finances and officials envisioned in the Twelfth Schedule to the Constitution.



Indian Institute of Public Administration, New Delhi has developed a complete training program under the project "Blended Capacity Building Programme for Stakeholders of River Ganga under *Namami Gange*". The modules have been developed in a clear and easy to understand manner for the Urban Local Bodies Officers. Though mostly based on missions of *Namami Gange* and state governing municipal administration, it lends itself to customization to meet the special needs of other states and river bodies. The modules cover a wide range of topics, including perspectives of ULBs, their constitution, and organisational structure, as well as comprehensive lessons on ULB working.

Amidst unparalleled economic growth and a rapidly increasing population, India is faced with a series of difficult decisions regarding its future. With a 7.4 percent average annual growth rate during the previous decade, the country will become the world's fourth largest economy in approximately two decades. As a result of growing urbanisation and resource scarcity, as well as high poverty levels, this hopeful outlook is not without its obstacles. This module on building resilience and climate smart urban planning talks about gaps, needs and framework on introducing perspectives for urban local body officers. Further to bring a change in the city development dynamics for resilient urban cities. I am hopeful that this training module will significantly help to improve the skills of regulatory authorities across the country.

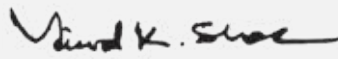
A handwritten signature in black ink, appearing to be 'S.N. Tripathi'.

S.N. Tripathi, IAS (R)
Director General, IIPA

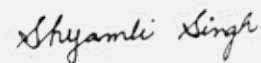
PREFACE

The frequency and severity of disasters caused by climate-related events have been increasing all over the world. Because of its distinct geo-climatic and socio-economic characteristics, India is also prone to a wide range of natural and man-made disasters to varied degrees. When a district is devastated by floods, droughts, landslides, earthquakes, cyclones, and other natural disasters, officials and planners need the correct information, resources, and tools to mitigate the damage. Only preparedness initiatives may provide such information/tools. Officials from urban local governments must also integrate climate-resilient strategies into a variety of ongoing development projects.

The National Mission for Clean Ganga has made tremendous progress by launching a number of programmes and regulatory frameworks to assist state governments with integrated management. The project "Blended Capacity Building Programme for Stakeholders of River Ganga under *Namami Gange* " Indian Institute of Public Administration, New Delhi has designed modules as a strategic step toward enhancing the ability of urban managers in cities. We are pleased to observe that the progress made in this direction has been chronicled as a step-by-step guide structure in these volumes. Team IIPA is confident that the module toolkit will motivate communities to reimagine their urban areas as part of the city's integrated vision and urban planning process. We look forward to collaborating with state governments and concerned citizens to protect these natural resources.



Prof. Vinod K. Sharma |
Faculty, IIPA



Dr. Shyamli Singh



Background

Climate change is the most determinant change factor of our time and cities must play a central part in addressing it. Building resilience enhances the reliability of a city's performance over time, making it better able to endure shocks. They are compelled to do so because the effects of climate change, which include rising sea levels, an increased frequency and severity of storms, heavy rains, floods, droughts, hurricanes, heat waves and other extreme weather events, which is being felt mostly by people living in urban areas and because cities produce 75 percent of greenhouse gas emissions.

The need for today is creating cities that can cope with climate change, it requires building resilience into urban planning, climate smart ways like (taking advantage of mitigation opportunities and adapting to reduce vulnerability). These concepts integrate traditional planning and technology in the most effective way to promote effective measures to cope with changing climate needs. It is intended to aid human development while also conserving Earth's biodiversity.

This module seeks to provide the local leaders and decisions makers with tools to support Climate Smart and Building Resilience in urban planning good practice. It aims to inform leaders about the value that Climate Smartness and Building Resilience bring to their cities and to facilitate a collaborative dialogue between leaders, policy makers and planners on in "urban planning."



Target Audience

- District collectors, Magistrates, Sub-national officials, Development, Departments and Public Services who address development and planning activities
- Officials of Urban local bodies, Panchayati Raj Institutions and Smart Cities Officials who implement the program
- Academia, universities, research institutions that can help documentation and assess related scenario.
- Citizen group and civil society as a whole

KEY CONCEPTS

Hazard

The potential occurrence of a natural or human-induced physical event that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, and environment (ISDR, 2007). More simply, any condition, material, process or event having the potential to cause harmful effect is understood as a hazard.

Vulnerability

Vulnerability means the characteristics of a person, group of persons (community) or their resources (property, infrastructure, environment or ecosystems) and the concerned situation that influences their capacity to anticipate, cope with, resist and recover from the impact of a natural or anthropogenic hazard. It involves a combination of factors that determine the degree to which someone's life, livelihood, property, ecosystems and other assets are put at risk by a discrete and identifiable event in nature and in society.

Disaster

As per the Disaster Management Act, 2005 of India, disaster is defined as 'a catastrophe, mishap, calamity or grave occurrence in any area, arising from natural or man-made causes, or by accident and negligence which results in substantial loss of life or human suffering or damage to, and destruction of, property, or damage to, or degradation of, environment and is of such a nature or magnitude as to be beyond the coping capacity of the community of the affected area'.

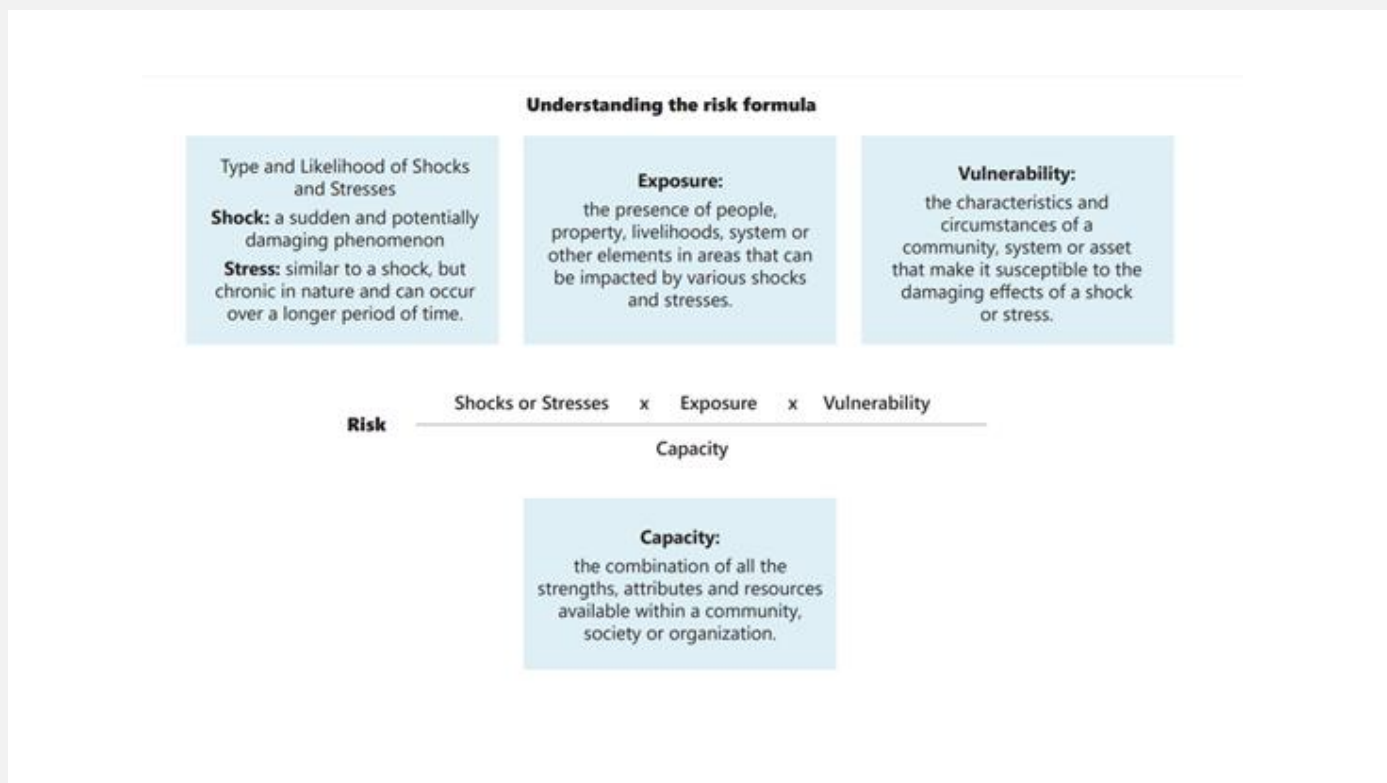


Uttarakhand disaster | Source : AP photo

KEY CONCEPTS

Disaster Risk

Risk is indicative function of the probability of occurrence of a hazardous event and extent of its damageability in terms of lives lost, persons injured, damage to property, environment, infrastructure and disruption of economic activity. Disaster risk is an expression of likelihood that a particular shock or stress can become a disaster (by causing damage and losses) and may be expressed mathematically as a function of shocks or stresses, vulnerability, exposure and capacity.



Resilience

“The ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner”. -United Nations International Strategy for Disaster Reduction. “The capacity of a system to absorb disturbance and reorganize while undergoing change”. -The Resilience Alliance

Disaster Resilience

is the ability of individuals, communities, organisations and states to adapt to and recover from hazards, shocks or stresses without compromising long-term prospects for development (DFID) - Hyogo Framework for Action (UNISDR, 2005)

Why Building Resilience and Climate smart Urban Planning?

Climate change is resulting in more frequent and extreme weather events that put a strain on state budgets around the world. By 2050, cities will house two-thirds of the world's population. Our cities, on the other hand, are dealing with the consequences of our current take-make-waste economy. Cities consume more than 75 percent of natural resources, produce more than 50 percent of global garbage, and emit 60-80 percent of greenhouse gases under this 'linear system.' A circular economy allows us to rethink how we manufacture and utilise the goods we need, and it allows us to experiment with new ways of assuring long-term success.

Circular development protects and improves city ecosystem services, which help to maintain natural cycles and promote the health of city dwellers. Ecologically, generative actions are frequently implemented through the incorporation of green - blue connectivity into the urban fabric, urban ecosystem management (e.g., water management, ecology, farming, forestry), and bioremediation processes (e.g., phytoremediation of contaminated urban sites). Together with the Sustainable Development Goals [external link icon](#) and climate targets [external link icon](#), the transition to a circular economy will help municipal leaders meet many of their other goals, such as improved housing, mobility, and economic development.

Twelfth Schedule of the Constitution of India

- Urban planning, including town planning
- Regulation of land use and construction of buildings
- Planning for economic and social development
- Roads and bridges
- Water supply for domestic, industrial and commercial purposes
- Public health, sanitation conservancy and solid waste management
- Fire services
- Urban forestry, protection of environment and promotion of ecological aspects
- Safeguarding the interests of weaker sections of society, including the disabled and mentally retarded
- Slum improvement and upgrading
- Urban poverty alleviation
- Provision of urban amenities and facilities such as parks, gardens, playgrounds
- Promotion of cultural, educational, and aesthetic aspects
- Burials and burial grounds, cremations, cremation grounds, and electric crematoriums
- Cattle pounds; prevention of cruelty to animals
- Vital statistics including registration of births and deaths
- Public amenities including street lighting, parking lots, bus stops, and public conveniences
- Regulation of slaughter houses and tanneries

What is a Disaster Resilient City?

A disaster resilient city:

-Is one where disasters are minimised because the population lives in homes and neighbourhoods with organized services and infrastructure that adhere to sensible building codes; without informal settlements built on flood plains or steep slopes because no other land is available.

-Has an inclusive, competent and accountable local government that is concerned about sustainable urbanization and that commits the necessary resources to develop capacities to manage and organize itself before, during and after a natural hazard event.

-Is one where the local authorities and the population understand their risks and develop a shared, local information based on disaster losses, hazards and risks, including who is exposed and who is vulnerable.

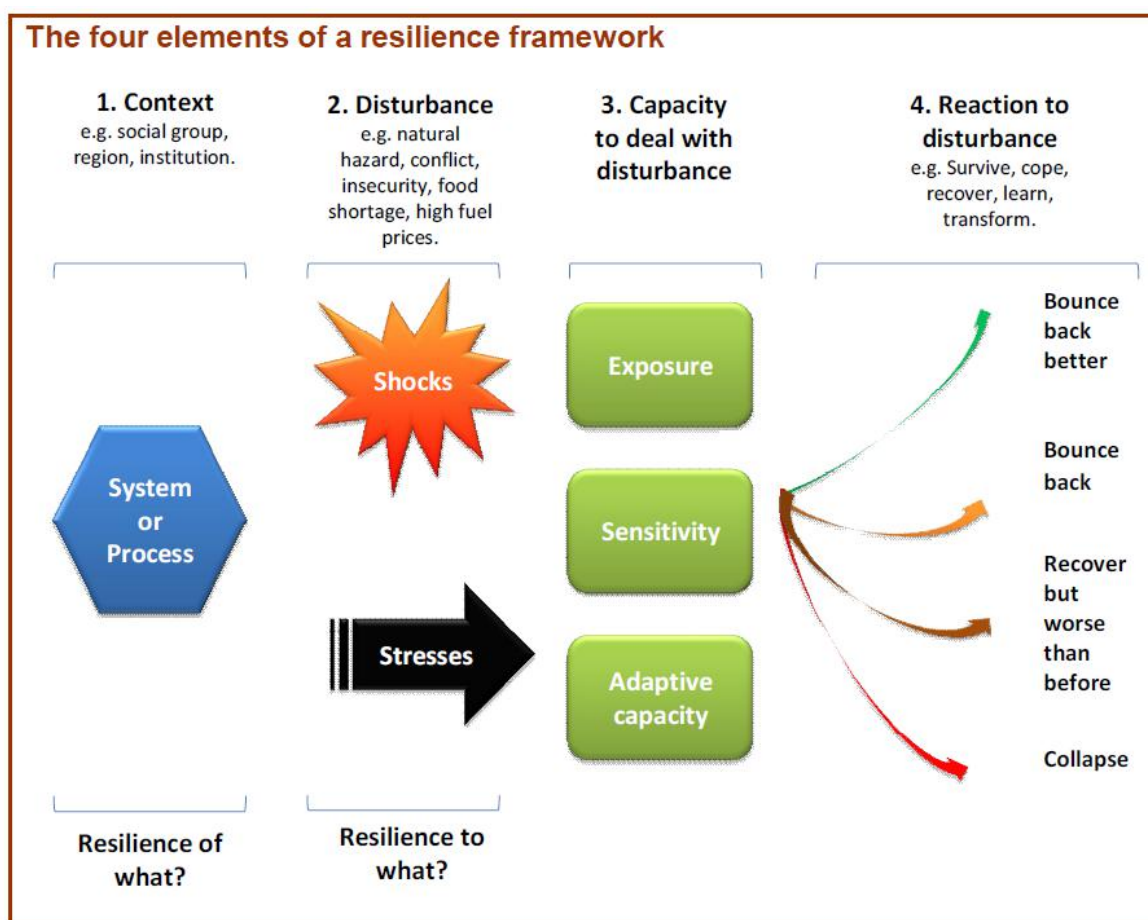


Source: <https://theonebrief.com/>

Disaster Resilience Framework

The **core elements of disaster resilience** as follows:

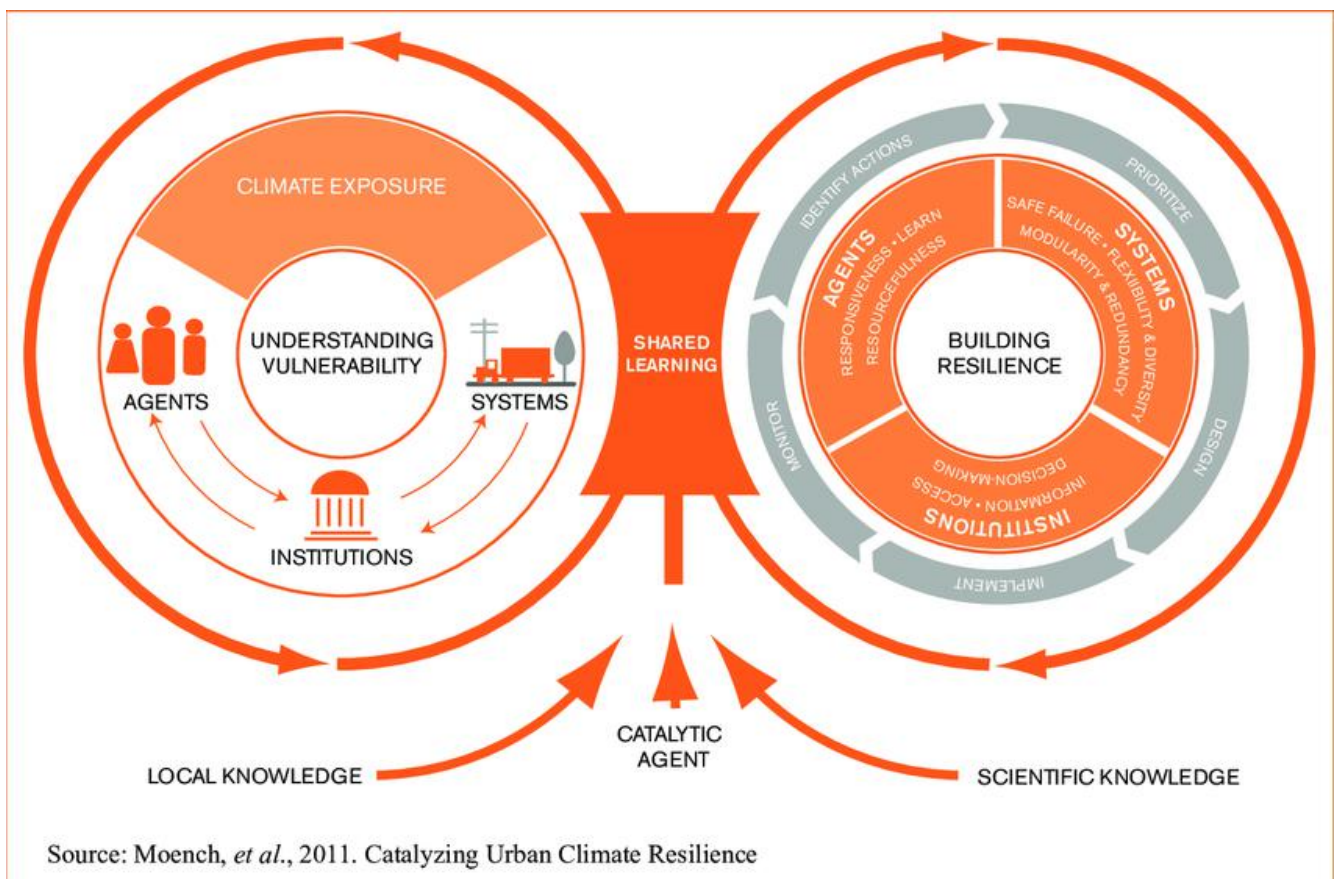
- **Context:** Whose resilience is being built – such as a social group, socio-economic or political system, environmental context or institution.
- **Disturbance:** What shocks (sudden events like conflict or disasters) and/or stresses (long-term trends like resource degradation, urbanisation, or climate change) the group aims to be resilient to.
- **Capacity to respond:** The ability of a system or process to deal with a shock or stress depends on exposure (the magnitude of the shock or stress), sensitivity (the degree to which a system will be affected by, or will respond to, a given shock or stress), and adaptive capacity (how well it can adjust to a disturbance or moderate damage, take advantage of opportunities and cope with the consequences of a transformation).
- **Reaction:** A range of responses are possible, including: bounce back better, where capacities are enhanced, exposures are reduced, and the system is more able to deal with future shocks and stresses; bounce back, where pre-existing conditions prevail; or recover, but worse than before, meaning capacities are reduced. In the worst-case scenario, the system collapses, leading to a catastrophic reduction in capacity to cope with the future.



Source: *How To Make Cities More Resilient - A Handbook For Local Government Leaders*, UNISDR

Urban Climate Resilience Framework

Urban Climate Change Resilience (UCCR) is the capacity of an individual, community or institution to dynamically and effectively respond to shifting climate impacts while continuing to function at an acceptable level. Putting it simply, it is the ability to survive and recover from the effects of climate change. Building resilience is a dynamic process which includes the ability to understand the potential impacts of climate change and to take appropriate actions before, during and after a particular consequence to minimize the negative impacts and maintain the ability to respond to changing conditions.



The Climate Resilience Framework (CRF) developed by ISET International is a conceptual planning approach to building resilience to climate change.

Key Components of CRF and their characteristics

SYSTEMS

AGENTS

INSTITUTIONS

How to build resilience and reduce climate risks

Building resilience enhances the reliability of a city's performance over time, making it better able to endure shocks. Climate change is the most determinant change factor of our time and cities must play a central part in addressing it. They are compelled to do so because the effects of climate change, which include rising sea levels, an increased frequency and severity of storms, heavy rains, floods, droughts, hurricanes, heat waves and other extreme weather events, will be felt mostly by people living in urban areas and because cities produce 75 percent of greenhouse gas emissions globally. Creating cities that can cope with climate change requires building resilience into urban planning, taking advantage of mitigation opportunities and adapting to reduce vulnerability.



Qualifying and quantifying risk The Urban Risk Assessment, developed by the World Bank, the United Nations Environment Programme (UNEP) and UN-Habitat with the support of Cities Alliance, is a standardized tool to assess urban risk and identify areas and populations that are most vulnerable, which are typically those living in informal settlements. The Urban Risk Assessment provides a framework for both qualitative and quantitative assessments to enhance a local governments' capacity to identify hazards arising from disaster and climate change risks; assess exposure and vulnerability of specific assets and populations; analyze institutional capacities and data availability, and quantify city vulnerabilities through the application of a baseline-benchmarking approach to assess progress over time and space.

<http://www.kcccc.info>

Embed resilience in urban planning

Integrate resilience in urban planning

Resilience depends on the capacity to anticipate and plan for the future

Resilience is not an add-on but an integral part of a city's plan

Assessments identify sectorial vulnerabilities and provide the basis for prioritizing spatial adaptation

Integrate investment in resilience into broader urban investment

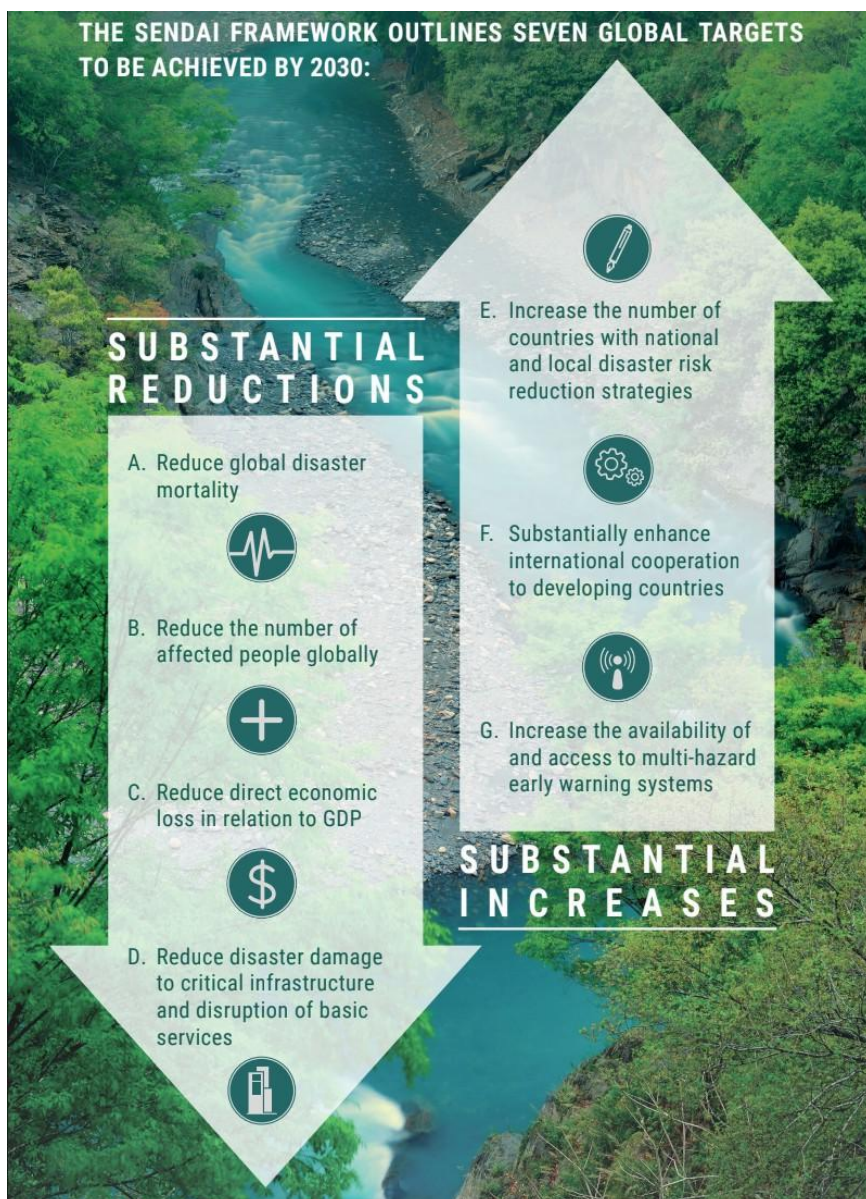
A resilient city is competitive and can sustain its advantage over time

Funds for resilience should be aligned with urban fixed investments

Inaction is expensive

Policy Frameworks

Disaster loss is on the rise with grave consequences for the survival, dignity and livelihood of individuals, particularly the poor, and hard-won development gains. Disaster risk is increasingly of global concern and its impact and actions in one region can have an impact on risks in another, and vice versa. This, compounded by increasing vulnerabilities related to changing demographic, technological and socioeconomic conditions, unplanned urbanization, development within high-risk zones, underdevelopment, environmental degradation, climate variability, climate change, hazards, competition for scarce resources, and the impact of epidemics, points to a future where disasters could increasingly threaten the world's economy, and its population and the sustainable development of developing countries. There is now international acknowledgement that efforts to reduce disaster risks must be systematically integrated into policies, plans and programmes for sustainable development through poverty reduction and



Source: www.undrr.org/implementing-sendai-framework

international cooperation, including partnerships. Sustainable development, poverty reduction, good governance and disaster risk reduction are mutually supportive objectives, and in order to meet the challenges ahead, accelerated efforts must be made to build the necessary capacities at the community and national levels to manage and reduce risk. Such an approach is to be recognized as an important element for the achievement of internationally agreed sustainable development goals. The importance of promoting disaster risk reduction efforts on the international and regional levels as well as the national and local levels has been recognized in the past few years in a number of key multilateral frameworks and declarations as explained.

Sendai Framework for Disaster Risk Reduction 2015-2030

The Sendai Framework for Disaster Risk Reduction (SFDRR) 2015-2030 was adopted at the Third UN World Conference in Sendai, Japan, on March 18, 2015. The Sendai Framework is the successor instrument to the Hyogo Framework for Action (HFA) 2005-2015: Building the Resilience of Nations and Communities to Disasters. The HFA was conceived to give further impetus to the global work under the International Framework for Action for the International Decade for Natural Disaster Reduction of 1989, and the Yokohama Strategy for a Safer World: Guidelines for Natural Disaster Prevention, Preparedness and Mitigation and its Plan of Action, adopted in 1994 and the International Strategy for Disaster Reduction of 1999. The Sendai Framework is built on elements which ensure continuity with the work done by States and other stakeholders under the HFA and introduces a number of innovations as called for during the consultations and negotiations.

SFDRR Goal

Prevent new and reduce existing disaster risk through the implementation of integrated and inclusive economic, structural, legal, social, health, cultural, educational, environmental, technological, political and institutional measures that prevent and reduce hazard exposure and vulnerability to disaster, increase preparedness for response and recovery, and thus strengthen resilience.

“Cities are made of stones, rules and people,”

*Joan Clos,
Executive Director,*

UN-Habitat

Sendai Framework Innovations

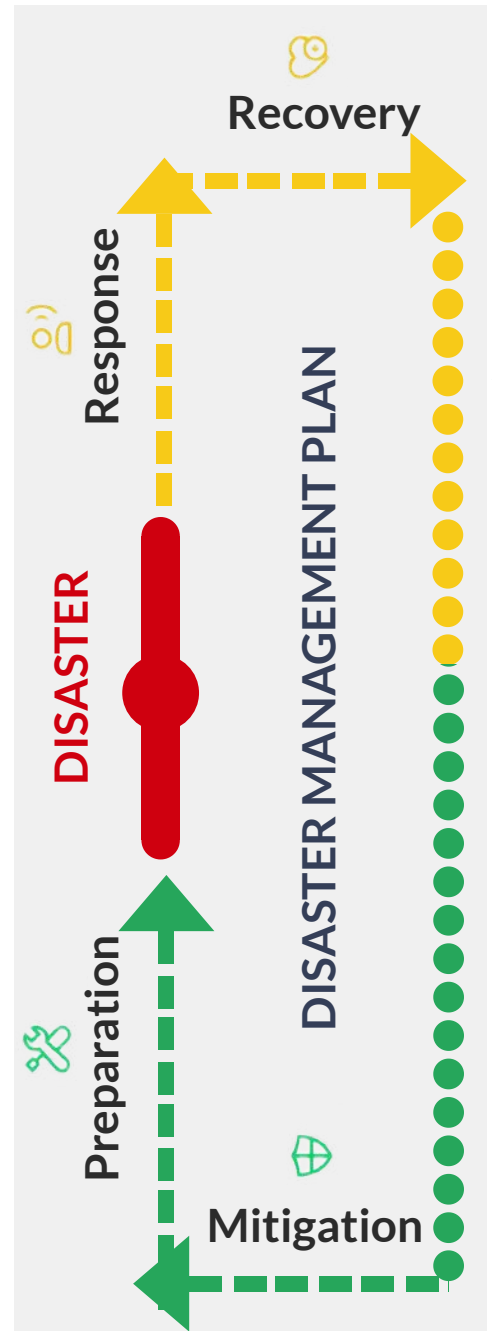
1. A shift from disaster loss to disaster risk from disaster management to disaster risk management, from “what to do?” to “how to do?”
2. Focus on people-centered preventive approach to DRR
3. Primary responsibility of States for DRR and shared responsibility for DRR with stakeholders
4. Broader scope which includes risk of slow-onset disasters and man-made and bio hazards

National Disaster Management Authority, India

The Government of India, in recognition of the importance of Disaster Management as a national priority, set up a High-Powered Committee (HPC) in August 1999 and a National Committee after the Gujarat earthquake, for making recommendations on the preparation of Disaster Management plans and suggesting effective mitigation mechanisms. The Tenth Five-Year Plan document also had, for the first time, a detailed chapter on Disaster Management. The Twelfth Finance Commission was also mandated to review the financial arrangements for Disaster Management. On 23 December 2005, the Government of India enacted the Disaster Management Act, which envisaged the creation of National Disaster Management Authority (NDMA), headed by the Prime Minister, and State Disaster Management Authorities (SDMAs) headed by respective Chief Ministers, to spearhead and implement a holistic and integrated approach to Disaster Management in India. The NDMA envisions to “build a safer and disaster resilient India by a holistic, pro-active, technology driven and sustainable development strategy that involves all stakeholders and fosters a culture of prevention, preparedness and mitigation.”

National Disaster Management Plan, 2016

The National Disaster Management Plan (NDMP) provides a framework and direction to the government agencies for all phases of disaster management cycle. The NDMP is a “dynamic document” in the sense that it will be periodically improved keeping up with the emerging global best practices and knowledge base in disaster management. It is in accordance with the provisions of the Disaster Management Act (2005), the guidance given in the National Policy on Disaster Management (2009), the aims and objectives of the Sendai Framework for Disaster Risk Reduction (2015-2030), the Sustainable Development Goals (2015) and the Paris Climate Change Agreement (2015).



INDIA'S COMMITMENT TO THE GLOBAL FRAMEWORK

Global framework / Goals/ Agreement	Thrust point	India's Stand
 <p>Sendai Framework for Disaster Risk Reduction, 2015-2030</p>	<p>It is a non-binding voluntary agreement for 15 years which recognizes the responsibility of countries for DRR and the shared responsibility with their local government, private sector and other stakeholders. SFDRR improves on HFA by identifying the gaps, good lessons learned and future challenges</p>	<p>India is a signatory to SFDRR and is attempting to comply with it on a voluntary basis. The recently released National Disaster Management Plan of India (NDMP), 2016, incorporates the approach articulated in Sendai Framework to achieve substantial reduction in disaster risk and losses in lives, livelihoods, and health and in the economic, physical, social, cultural, and environmental assets of persons/ businesses.</p>
 <p>Sustainable Development Goals (SDGs)</p>	<p>It includes 17 global SDGs with 169 targets. Twenty five targets of the new SDG Framework are directly or indirectly related to DRR in 10 of these 17 SDGs. The agenda identifies and asserts the immediate need to reduce climate & disaster risk, and emphasizes resilience building of communities and nations to achieve the SDGs</p>	<p>Explicit references for DRR, CCA and resilience can be observed in goals and targets specially related to poverty, hunger, healthy lives, building resilient infrastructure, education, sustainable management of water, climate change, resilient and smart cities.</p>
 <p>Paris Climate Agreement, 2015</p>	<p>Paris Agreement is legally binding to all the parties unless specifically excluded. It contains all greenhouse gas emissions from all sectors and human activities, sources and sinks. The agreement will bring about a process of maintaining a balance between mitigation and adaptation. In future approaches of climate adaptation, the loss and damage caused by disasters will be better incorporated to accomplish the goal of climate resilience. The preamble of agreement mentions about the adoption of Sendai Framework for Disaster Risk Reduction.</p>	<p>India ratified the agreement on 2nd October, 2016.</p>

Roadmap for DRR 2015- 2030, Government of Bihar

In the light of the SFDRR, the Government of Bihar in India formulated a Roadmap for DRR (2015-2030) for the state. The Roadmap adopts a clear distinction between ‘disaster risk reduction’ and ‘disaster management’ with focussed attention on disaster risk reduction through strategies and actions aimed at addressing the causal factors of disaster risk. This marks a conscious shift from focus on implementation of disaster response, relief and recovery measures only. Despite the shift in focus, management of residual risks has been duly accounted for in the Roadmap through actions for ‘preparedness for effective response and recovery’. This is in line with the Priority 4 of the Sendai Framework for Disaster Risk Reduction: Enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation and reconstruction. The Bihar DRR Roadmap framework envisages a Resilient Bihar and encompasses five components:



The Resilient Cities component of the DRR Roadmap focuses on policy and practice level changes aiming for resilience in urban areas of Bihar. The Resilient Cities Programme broadly focus on:

Disaster risks recognition, understanding and analysis;



Best climate smart practices & approaches in Ganga basin

Climate Smart practices can be incorporated using a variety of techniques and strategies to reduce the risk of natural catastrophes. These include legislative and policy frameworks, development plans and schemes, environmental and natural resource regulations, and policy planning instruments such as Strategic Environment Assessments, Environmental Impact Assessments, Life Cycle Assessments, and Environmental Auditing, among others. The districts of Gorakhpur (Uttar Pradesh), Shimla (Himachal Pradesh) and Almora (Uttarakhand) are among the few in India that have begun the process of integrating Climate Change Adaptation into Disaster Risk Reduction through various development schemes and plans, and have established their Climate Resilient District Disaster Management Plan.

CASE STUDY -1

Shimla: Addressing future climate change by building Institutional Capacity

OBJECTIVES



- To trial the IAP Guide and Toolkit in Shimla
- To improve capacity within the city to plan for future climate risks and opportunities
- To develop a plan of action for Shimla to address future climate risks and opportunities

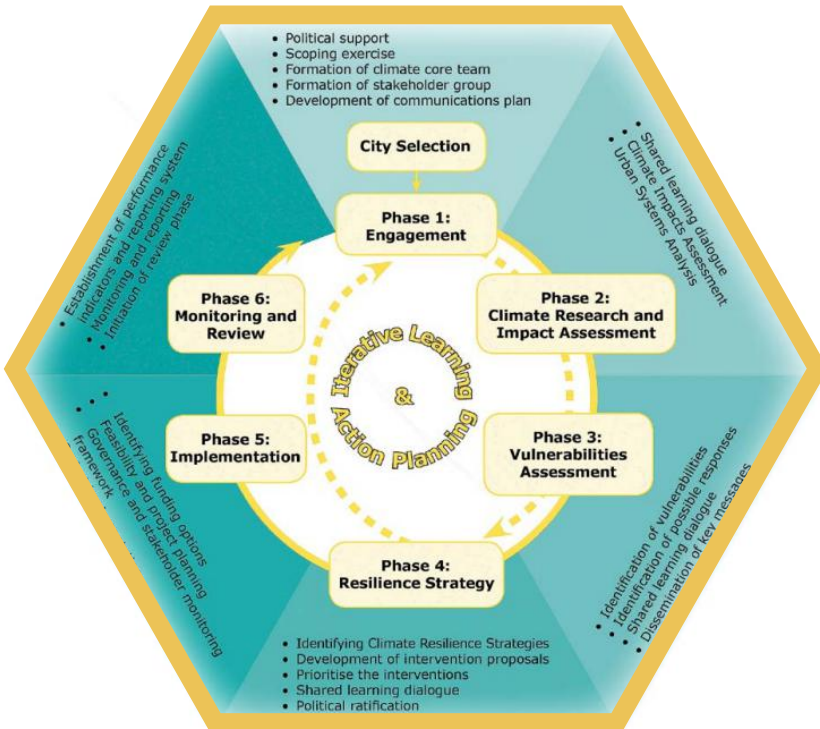


BACKGROUND

During 2012, the Shimla Municipal Corporation took advantage of the chance to pilot the ICLEI-ACCCRN Process (IAP) for climate resilience planning. The IAP pilot was a novel approach to climate resilience planning that drew on the ACCCRN's previous experiences. As a result, Shimla now has a better knowledge of the city's future climate scenario. The Shimla Municipal Corporation (SMC) has a structured procedure for identifying future climate vulnerability 'hotspots' to prioritise for action, and its staff has a greater awareness of the interrelated spectrum of potential impacts the city may face.

The IAP's collaborative aspect was cited as a significant quality of the approach and methodology. The piloting of the process also revealed areas for improvement, such as simplifying the theory and language used, moving quickly to ensure 'quick wins' could be implemented quickly, and perhaps most importantly, ensuring cross-organizational ownership of the process to aid in the integration of climate considerations into city planning, decision-making, and operations. The IAP's potential influence on Shimla has been diminished due to high personnel turnover at SMC. The pilot, on the other hand, emphasises the necessity of bringing in participants from throughout the business and promptly integrating climate decisions into procedures.

INTERVENTIONS CARRIED OUT SO FAR ARE:



IAP Project Phases

IAP consists of 6 phases as outlined in the image. Shimla has thus far been taken through the first 4

Phase 1. Engagement: Political commitment , Institutional set - up , Identification of perceived threats, past practices and opportunities; Communication

Phase 2. Climate Research and Impact Assessment: Assessing projected climate trends, Identifying existing fragile urban systems, Expected impacts of climate projections on fragile systems, Prioritization based on risk assessment

Phase 3. Vulnerabilities Assessment: For each impact, identification of vulnerable areas, vulnerable social groups, data gaps

Phase 4. Resilience Strategy: Resilience actions identified, Actions prioritized based on resilience indicators and feasibility criteria

Phase 5. Implementation: Identifying funding options, feasibility and project planning, monitoring framework and implementation

Phase 6. Monitoring and Review : Performance indicators and reporting system, Monitoring and Review

Image : The ICLEI ACCCRN Process guides stakeholders through several steps to assist identifying current vulnerability and future risk © ICLEI South Asia

Lesson Learned



- The IAP was perceived to be thorough and engaging but the underpinning theory was confusing
- The collaborative process was considered positive in breaking departmental 'silos'
- Simple, demonstrated actions are needed early
- Swift project turn-around helps keep participants engaged
- Simplifying some of the IAP theory would be helpful
- 'Bottom-up' approach – within a 'top-down' governance framework

CASE STUDY -2

Integrating climate change concerns in disaster management planning: Gorakhpur, Uttar Pradesh

OBJECTIVES



The objectives of the CDKN-START programme are to:

- Understand the systemic factors within the flood-prone Gorakhpur District that contribute to resilience or exacerbate vulnerability
- Understand specific policy innovations that could help to bridge the vertical gap between the integrated national policy framework and local contexts, and the horizontal gap between actions within sectoral development programmes to integrate disaster risk reduction and climate change adaptation practice
- Develop the relevant capacities of line departments and researchers on climate change adaptation and disaster risk reduction



BACKGROUND

Gorakhpur District is recognised as one of the most flood-prone districts in eastern Uttar Pradesh, India. Although its inhabitants are accustomed to twice-yearly flooding during the monsoon seasons, data from the past 100 years show a considerable increase in the intensity and frequency of floods, which are now recurring every 3–4 years and even annually in some blocks. Most of Gorakhpur's 4.4 million residents live in rural areas, with only 20% living in cities. One fifth of the total population is affected by floods, which cause loss of life, health and livelihoods for the poor inhabitants, and extensive damage to public and private property. For example, the flood of 1998 affected 1.4 million people and 16,000 houses, and agriculture losses amounted to roughly 90 crores.

An action research programme managed by START and supported by CDKN is currently addressing many of these issues in Gorakhpur. Jointly implemented by the Gorakhpur Environmental Action Group (GEAG), the Institute for Social and Environmental Transition (ISET) and the National Institute of Disaster Management (NIDM), the programme aims to effectively incorporate climate change considerations into disaster management planning within Gorakhpur District.

INTERVENTIONS

The Climate Resilience Framework offers guidance on resilient design norms, technical codes, necessary decision-making processes and other institutional dimensions to allow agents to promote climate resilience. Some of the features that were possible given the resource and time constraints at the DDMA level have already become part of the DDMP. However, the remaining features are explained in the flowchart.

Strategies Phases

Because of the key enabling factors highlighted above, the programme was able to exceed its initial goals. But it also faced some challenges at the district level. The following strategies were adopted

- The programme worked with various departments (including the lowest-ranked officers at the village level) directly through the iterative SLD consultations, facilitating joint understanding of vulnerability issues from the Climate Resilience Framework lens, and analysing departmental and inter-departmental issues related to vulnerability. Further, the DDMP and various department plans have been revised to incorporate data collection on impacts, damages and losses to departments in all future flooding and waterlogging in the district.
- The programme developed this understanding through the structured, iterative SLD process. In contrast to stakeholder consultations conducted in piecemeal fashion, the SLD process takes participants through a step-by-step process to develop understanding of comprehensive vulnerability issues and identify specific resilience-building actions.
- As part of the SLD process, the programme worked with the DDMA and subsequently its members in various departments one-by-one to develop joint understanding of inter-departmental issues that influence vulnerability.
- The programme overcame this by using simple-to-decipher results on extreme (precipitation) event analysis from other projects of ISET-GEAG

The programme used the Climate Resilience Framework, which unpacks complex vulnerability issues into four components: systems, institutions, agents and exposure.

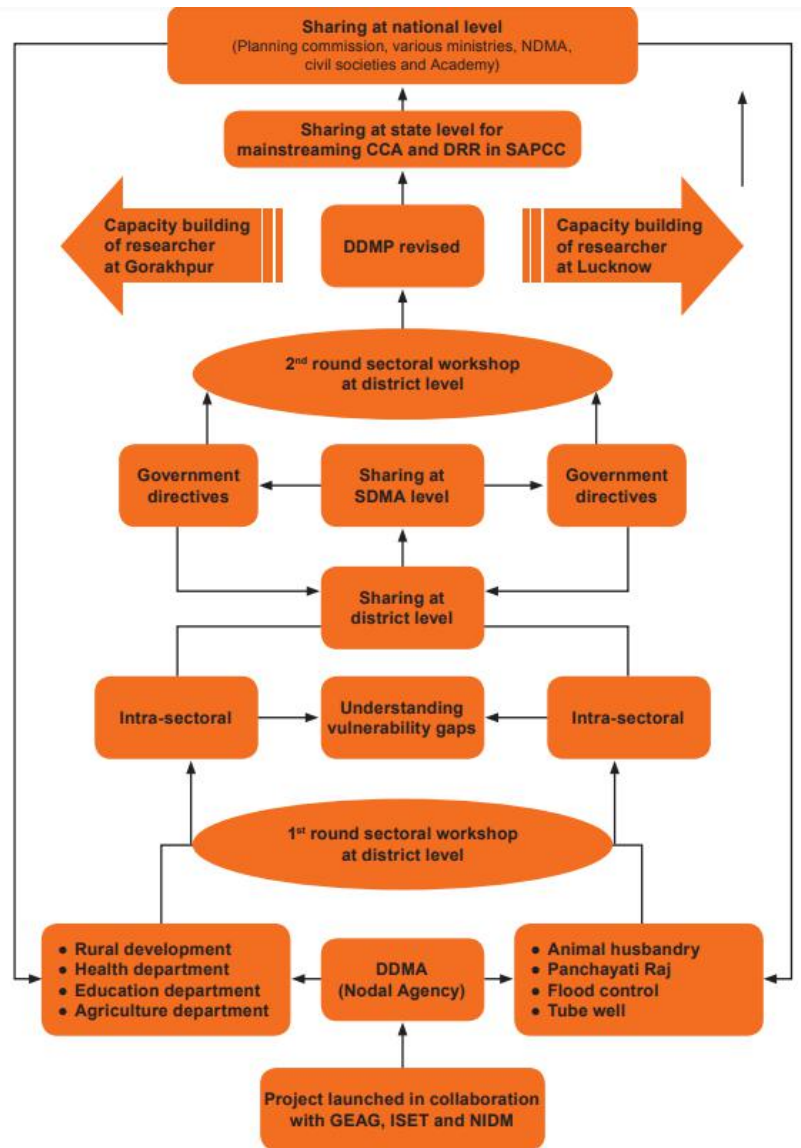


Image : Process for integrating disaster risk reduction and climate change adaptation into district level departmental plans



Lesson Learned

- The District Disaster Management Plans created as a result of India's Disaster Management Act (2005) can be an effective mechanism for promoting climate-sensitive planning at the district level
- Integrating climate concerns in District Disaster Management Plans can be aided by using the 'Shared Learning Dialogue' process with various government departments at the district level. This requires proper facilitation
- The 'Shared Learning Dialogue' process is critical to developing the capacity of various departments to understand, appreciate, plan and respond to climate risks
- Climate projections must be appropriately interpreted and presented in a way that fosters understanding of their implications for development programmes across government departments

CASE STUDY -3

MAINSTREAMING ADAPTATION INTO THE FOREST SECTOR IN UTTARAKHAND

OBJECTIVES



In 2014, the Government of Uttarakhand released its SAPCC with the theme Transforming Crisis into Opportunity. The SAPCC was prepared by the Forest Department, with technical support provided by UNDP.

The objectives of the programme were:

- To reorient development strategies so that they are more sustainable
- Gradual progress on adapting to climate change
- Building community adaptive capacity and resilience
- To integrate climate change concerns into subnational planning in India and enhance the capabilities of states to operationalize their SAPCCs.



BACKGROUND

Seventy-one percent of Uttarakhand is recorded as a forest area, and the majority of the terrain is hilly (Government of Uttarakhand 2014). Uttarakhand's forests are home to diverse flora and fauna, and they are also an important carbon sink. The forest and biodiversity sector, with the vast array of ecosystem services it provides, also has important links to other sectors, like agriculture, animal husbandry, water, and energy. Uttarakhand's forests are vulnerable to both climate and non-climate stressors. Temperature and precipitation projections threaten the forest ecosystem in the coming decades (Government of Uttarakhand 2014). For instance, a projected increase in heavy precipitation makes the threat of floods and landslides a critical concern for the state. One of the most severe landslides and flash foods took place in 2013, which affected 12 out of the 13 districts in the state and left more than 5,000 people missing or dead. Land-use decisions further diminish forests in Uttarakhand: Between 2000 and 2017, the state diverted over 50,000 hectares (123,553 acres) of forest land, and conflicts have arisen relating to land acquisition, tenure, and resource rights between the state agencies and the local communities (WRI 2017). The forest sector was therefore one of the priority sectors identified by the MoEFCC, UNDP, and SDC, leading to the pilot project, Building Climate Resilience of Forest Dependent Communities in Uttarakhand.

Interventions were implemented by the Forest Department

Adaptation activities have been introduced in the pilot project, which is being implemented by the Forest Department in conjunction with other sectoral departments. This pilot aims to improve the adaptive capacity and resilience of forest-dependent communities with a focus on gender inclusion. The project began in 2017 and has completed its pilot period of 15 months. According to representatives from the SCCC, this project is crosscutting in nature and brings together various key sectors. It focuses on issues such as sustainable forest management, agricultural diversification, and water security enhancement, which were identified and prioritized based on the VRA and SAPCC. The Pheri Kimora village in the Jaunpur block of the highly vulnerable Teri Garhwal district was chosen for piloting this initiative based on the VRA for Uttarakhand (INRM 2016), as well as on consultations with local stakeholders and a situational analysis.

Increased water storage and sustainable access



Forest regeneration

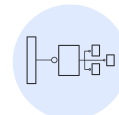


Diversification of cropping methods and crops



How mainstreaming occurred in the project

This section describes the combination of factors that were necessary to integrate adaptation into this project in the Pheri Kimora village. This project is just the beginning of the process of addressing climate risks by the Forest Department and, being a pilot, is intended to enable integration of adaptation into future plans and strategies.



Alignment with policy frameworks and schemes



Persistent communication and coordination with key stakeholders



Individual and institutional capacity-building



Information and tools










Alignment and use of funding streams to intentionally support mainstreaming



Lesson Learned

- Policy frameworks are important inputs, especially at the early stages of mainstreaming
- Using funding streams to intentionally support adaptation
- Programmatic mainstreaming may be more financially sustainable than project-specific mainstreaming
- Both political and administrative leaders have different yet complementary influences on the mainstreaming process
- Building capacity and institutional memory enables implementation and sustained action
- Persistent communication and coordination across sectors are critical for managing climate risks

Key National Agencies Working on Adaptation in India

	MINISTRY/AGENCY	KEY ROLE	AREA
	Ministry of Environment, Forest and Climate Change (MoEFCC)	The nodal agency for the planning, promotion, coordination, and oversight of the implementation of India's environmental and forestry policies and programs. Its Climate Change Division is the nodal body for climate change cooperation and global negotiations.	Policy & planning that influences program design at national and state level
	Ministry of Science and Technology	The nodal agency for the implementation of the Mission on Sustainable Himalayan Eco-Systems and Mission on Strategic Knowledge for Climate Change. Assisting with establishing State Climate Change Center (SCCC) cells.	Knowledge center and financial assistance provider for climate cells
	National Bank for Agriculture and Rural Development (NABARD)	The national implementing entity for the Adaptation Fund and the NAFCC that funds various government schemes and missions, as well as the direct access entity for the Green Climate Fund	Financing & coordination
	Prime Minister's Council on Climate Change	Coordinates the national action for assessment, adaptation, and mitigation of climate change, with assistance from the MoEFCC	Policy & planning
	Indian Network for Climate Change Assessment	A network of scientists that produce peer-reviewed findings on climate change, extending India's knowledge base. Including the National Institute for Climate Change Studies to conduct analytical studies as part of the Climate Change Action Program	Knowledge center
	Ministry of Finance; Finance Commission	The Finance Commission decides how revenue is to be distributed between the center and the states. It also decides the principles on which grants-in-aid will be allocated to the states.	Financing
	National Institution for Transforming India (NITI Aayog)	Created as a policy-focused think tank that would solely provide policy recommendations and technical support to states as the central government's main planning body	Policy & planning and advocacy for central and state-sponsored schemes

Prime Minister's Agenda 10 on Disaster Risk Management

1

All development sectors must imbibe the principles of disaster risk management

2

Risk coverage must include all, starting from poor households to SMEs to multi-national corporations to nation states

3

Women's leadership and greater involvement should be central to disaster risk management

4

Invest in risk mapping globally to improve global understanding of nature and disaster risks

5

Leverage technology to enhance the efficiency of disaster risk management efforts

6

Develop a network of universities to work on disaster-related issues

7

Utilise the opportunities provided by social media and mobile technologies for disaster risk reduction

8

Build on local capacity and initiative to enhance disaster risk reduction

9

Make use of every opportunity to learn from disasters and, to achieve that, there must be studies on the lessons after every disaster




10

Bring about greater cohesion in international disaster response

MONITORING AND IMPLEMENTATION

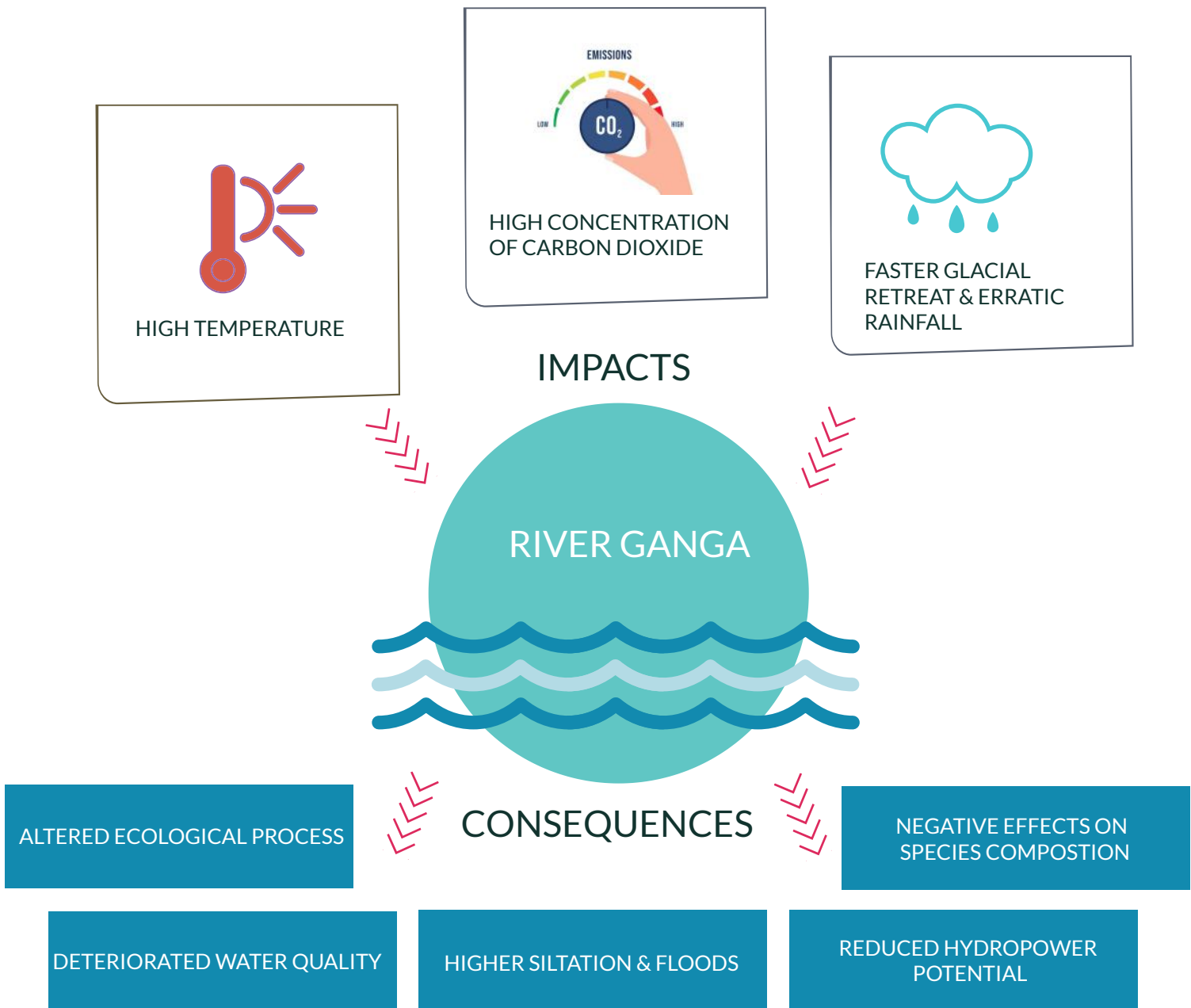


The District Commissioner must ensure the planning, coordination, monitoring and implementation of DRR activities. It can be done in the form of a checklist provided below:

SFDRR priorities	Activities	Details
Understanding the disaster risks	Planning (Mitigation and preparedness)	<ul style="list-style-type: none"> Plan and prepare in close consultation with various line departments at district level Maintain coordination and prepare department wise plan Establish regular communication and share information between research team and district level departments Define roles and responsibilities of line departments during various facets of disasters as per Incident Response System
 Strengthening disaster risk governance	Implementation	<ul style="list-style-type: none"> Identify & implement schemes of Central/ State Government based on the parameters of mitigation, relief and rehabilitation All departmental heads at the district level identify the suitable and relevant schemes which can be used in disaster risk
 Investing in disaster risk reduction for resilience	Monitoring	<ul style="list-style-type: none"> Monitor the functioning and adequacy of the resources present in the district, every six months Monitor the training of officers of the frontline departments as per their requirements; For example training on Ecosystem based disaster risk reduction Audit reports of various departments such as Environment, Irrigation (regarding canals) and Labor (Industrial Safety & Health) Departments
 Enhancing disaster preparedness for effective response	Review and update	<ul style="list-style-type: none"> Valuable inputs from actual disasters Lessons learnt from trainings Changes in disaster profile of district Increase in intensities, types and patterns of disasters Changes in regulatory requirements Updating of databases using GIS Technological developments/ innovations in identifying potential hazards or mitigating them Understanding the bottlenecks for addressing the impacts/damages/losses

Impact of climate change on the dynamics of River Ganga

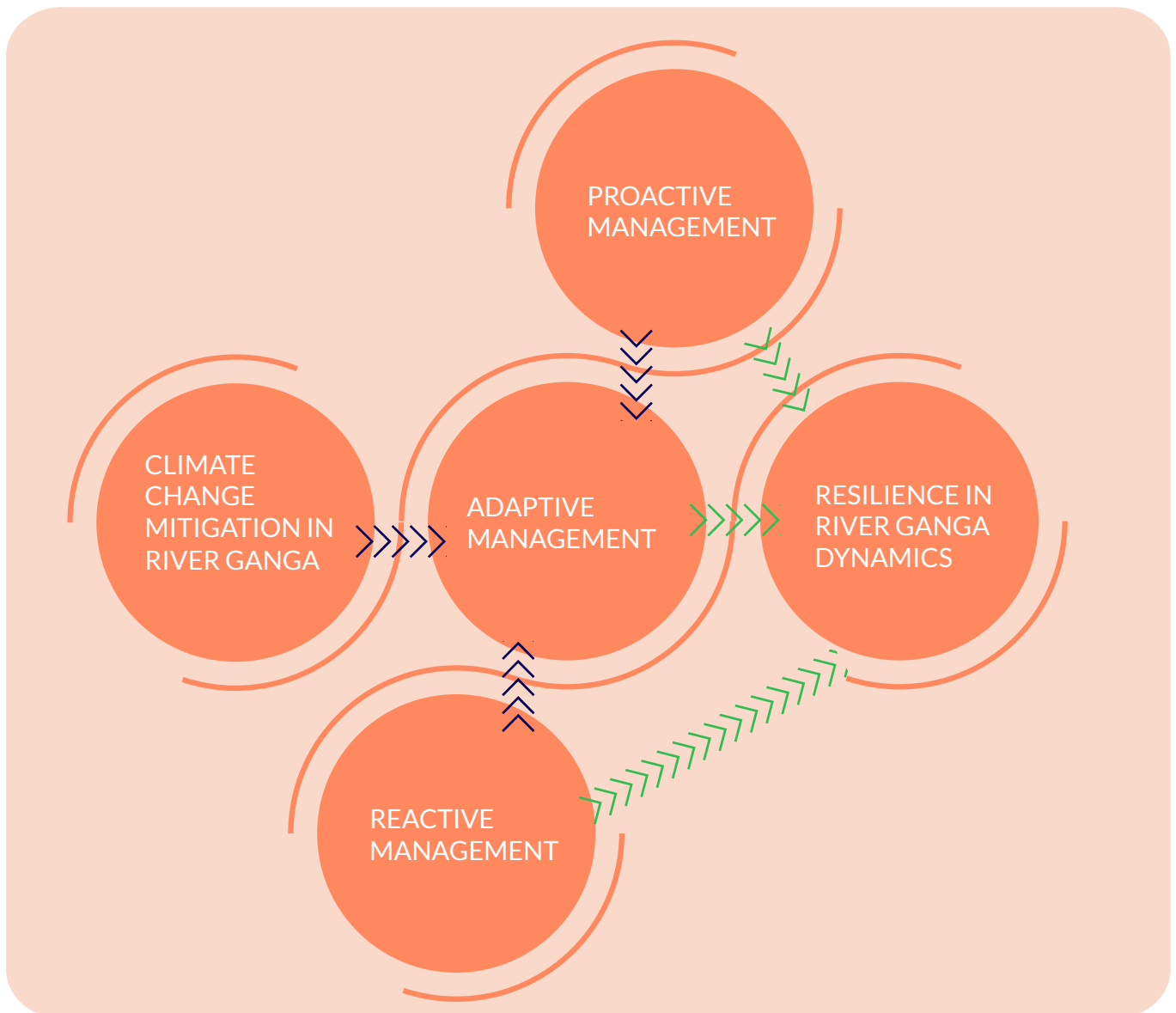
The Ganga's conservation and management is a national priority. It has been the country's most renowned river from time immemorial. Aside from delivering a variety of ecological services, the Ganga has played a major role in the economy's growth and development through supporting agriculture, industry, hydropower generation, tourism, and other recreational activities. However, the river's pristine purity has deteriorated dramatically as a result of rising urbanisation and industrialisation. Climate change will exacerbate the river's precarious state, and these hazards will become considerably more severe in the future years. Climate change impacts will not only cause extreme floods and droughts, but they will also lower the river's carrying capacity and assimilative capacity by changing its abiotic and biotic components. As a result, rapid action is essential to prevent further damage of the river environment. Despite a number of action plans implemented over the last few decades, much more needs to be done. In the area of climate change management, more concerted efforts are required. Plans for reducing pollution in the Ganga River must be integrated with efforts to address climate change through better policy planning. There is also a must to learn from previous experiences.



Management strategy for the River Ganga



Climate change will have terrible consequences not only for the river but also for the millions of people who rely on it directly or indirectly. Significant efforts will be necessary to mitigate the effects. Finding appropriate strategies to deal with the circumstance requires a proactive attitude. It is critical to do research on the dynamic characteristics of a riverine ecosystem, as well as stormwater management, river catchment management, aquatic ecology, and other relevant topics. Accepting the fact that climate change is already occurring, adaptive strategies must also evolve. Although rivers, as dynamic creatures, are constantly responding, present climate change is happening at a considerably faster rate than the rivers' adaptive capacity. Furthermore, the most effective way to mitigate the effects of climate-change-related disasters is to take a proactive strategy. As a result, a combination of these measures should help the Ganga's dynamics to be more resilient.



Effective policy planning is another important part of river management. Previous experiences have shown that the desired results could not be reached due to a lack of coordination among the numerous monitoring bodies involved. Because the Ganga flows through five states, any plan must be implemented in a coordinated manner. State boards and municipal authorities should also be involved, in addition to a central body. In order to control water-related concerns, public participation is also required. As a result, a decentralised approach to planning is critical for successful scheme implementation and beneficial outcomes.

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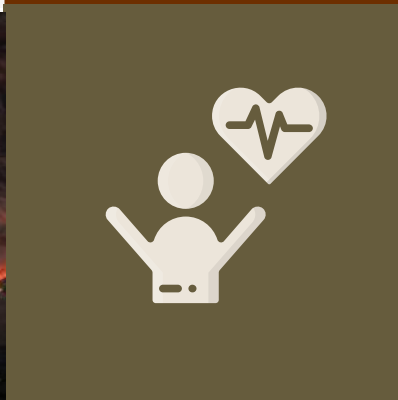
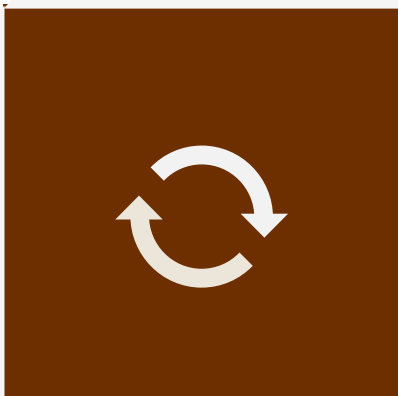
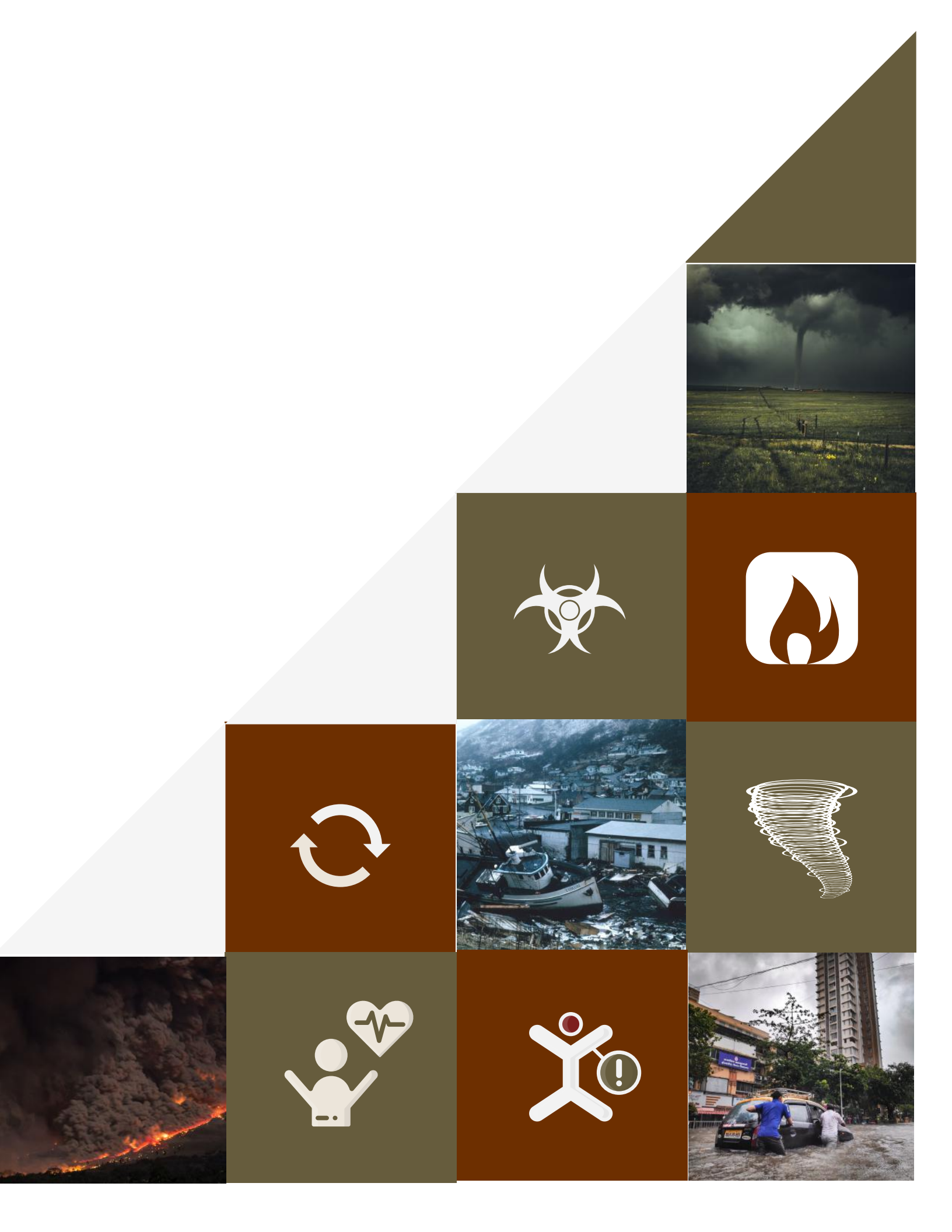
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Cultures and Climates
differ all over the world,
but people are the
same. They'll gather in
public if you give them a
good place to do it."

-Jan Gehl





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