Action Plan for Mainstreaming DRR and CCA into Sectoral Development Plan of Municipal Corporation Shimla

FINAL REPORT

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Action Plan for Mainstreaming Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA) into the Development Plan of Municipal Corporation Shimla prepared under the USAID funded GoI-UNDP Project on Climate Risk Management in Urban areas through Disaster Preparedness and Mitigation.

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Cover photo: View of Shimla City from Cart Road, Taken by Jyotiraj Patra, April 2015

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Objective:

The overall objective of the Action Plan is to identify opportunities to mainstream disaster risk reduction (DRR) and climate change adaptation (CCA) elements in to the development plan of Shimla Municipal Corporation (MC). This report highlights some of the preliminary findings and suggests a way forward through specific mainstreaming activates that Municipal Corporation Shimla can undertake as part of the overall City Development Plan.

Context: The GoI-UNDP Project[1]

This action plan was prepared as part of the ongoing Government of India- UNDP Project on *Climate Risk Management in Urban areas through disaster preparedness and mitigation*, supported by USAID. This project is being implemented in multi-hazard states of Andhra Pradesh, Kerala, **Himachal Pradesh**, Odisha, Sikkim, Tamil Nadu and Maharashtra. The cities are: Gangtok, **Shimla**, Bhubaneswar, Thiruvananthapuram, Madurai, Vijayawada, Visakhapatnam and Navi Mumbai.

The project aims to:

a. Reduce disaster risk in urban areas by enhancing institutional capacities to integrate climate risk reduction measures in development programs as well as to undertake mitigation activities based on scientific analyses, and
b. Enhance community capacities to manage climate risk in urban areas by enhancing the preparedness.

Some of the key activities envisaged to as part of this project are:

a. Preparation of City Disaster Management Plan (CDMP);
b. Hazard Risk and Vulnerability Analysis;
c. Building capacities of communities in disaster response through trainings;
d. Formulation of an Action Plan to strengthen Early Warning Systems based on analytical studies;
e. **Preparation of Sectoral Plans (in four key sectors) to mainstream DRR and Climate Change Adaptation in development programmes**; and
f. Knowledge Management initiatives

It is with this background that the Municipal Corporation of Shimla decided to prepare an Action Plan for Mainstreaming for Mainstreaming DRR and CCA into the development plan of MC Shimla and floated a Request for Proposal for this. The consultancy work to carry out this assignment was awarded to the consultant in February 2015 (Letter Reference: No. MCS/AC/CRM/2015-428 dated 12/02/2015).

[1] http://hpsdma.nic.in/Project_Background.pdf

Consultation Process

The table below presents an overview of the consultation process carried out as part of the assignment:

Date	Stakeholder	Points of discussion
13/02/2015	Mr. Prashant Sirkek, HAS Assistant Commissioner, MC Shimla	• Overall discussion on the ToR of the Contract • Suggestion to focus on Water, Sewerage, Sanitation, and SWM sectors. • Report to be specific and action oriented. • Short and specific for the MC to act on this and suggestion to avoid preparing a long and research study kind of document.
16/02/2015	Ms. KomalKantariya City Project Coordinator	• Contacts of key HoDs of MC Shimla • Background documents such as the CDP and other relevant plans
18/02/2015	Dr. Sonam Negi CHO, MC Shimla	• SWM in the city and key challenges
18/02/2015	Mr. K. S. Chauhan Architect Planner, MC Shimla	• Overall planning in the MC Area and some of the implementational challenges
21/02/2015	Mr. Sanjay Chauhan Hon'ble Mayor	• Climate change and disaster risk priorities of MC Shimla
23/02/2015	Dr. S. S. Randhwa Senior Scientific Officer HP State Climate Change Cell	• The State Action Plan on Climate Change • Ongoing programmes such as IHCAP
24/02/2015	Mr. TikendarPanwar Deputy Mayor	• Making the plan more practice-centered • Use the plan as a way forward for further actions such as 100 Resilient Cities and other initiatives like ACCCRN

Based on these discussions and subsequent content analysis of various action plans of MC Shimla, a draft inception report was submitted to the Assistant Commissioner on 03/03/2015. Building on his initial feedbacks, a half-day workshop with various HoDs of MC Shimla was organised on 02/04/2015. The final report has been prepared based on the comments and suggestions received during this workshop.

Figure 1: Consultation Workshop on the Inception report on 02/04/2015 at MC Shimla.

What is mainstreaming?

Mainstreaming as a process of governance has been variously defined and applied. According to UNDP (2010):

> "Mainstreaming of DRR is a governance process enabling the systematic integration of DRR concerns into all relevant development spheres. In other words, responsive, accountable, transparent and efficient governance structures underwrite the environment where DRR can be institutionalized as an underlying principle of sustainable development."[2]

[2]UNDP, (2010), Disaster Risk Reduction, Governance and Mainstreaming, http://www.undp.org/content/dam/undp/library/crisis%20prevention/disaster/4Disaster%20Risk%20Reduction%20-%20Governance.pdf

Thus, the key to mainstreaming is to better understand and assess the implications of disasters and climate change on any development action and investment. Most importantly, it is an ex-ante institutional process of development planning and decisions which take in to account existing and future disaster and climate risks for a given system.

The primary objective of DRR and CCA mainstreaming is to help reduce the potential impacts of disasters and climate change and strengthen the capacity of the system to recover and bounce-back from any kind of shock or disruption. Investments in such mainstreaming planning and activities is cost effective and offer a high return. Benefit-cost ratio for such DRR and CCA mainstreaming investments are very much context-specific and according to the United Nations International Strategy for Disaster Reduction (UNISDR, 2007) it varies from a saving of four USD and beyond in disaster response for one dollar investment in disaster risk prevention and mitigation .[3]

Natural disasters-related loss and damage have been quite high in India. According to the latest Global Assessment Report on Disaster Risk Reduction (2015), India is one of the countries with high overall ratio of Annual Average Loss (AAL) to its overall social expenditure, capital stock and savings[4]. And India losses almost$9.8 billion every year due to natural disasters[5].
Mainstreaming disaster risk reduction initiatives, among others, has been a key initiative to strengthen capacities of key governance systems, infrastructures and development planning to better respond to and recover from natural disasters. Both the Disaster Management Act (2005)[6] and the National Policy on Disaster Management (2009)[7] of the Government of India categorically emphasize on mainstreaming disaster management into the development planning process at various levels and the leadership of local authorities in this process.

In order to develop a shared understanding among the stakeholders it is also essential to understand the steps in mainstreaming DRR and CCA into any development or sectoral plan. The following graphic representation, borrowed from Benson and Twigg (2007),[8] highlights some of the essential steps which facilitate mainstreaming in a given context (Fig 1). It is also critical to understand that mainstreaming DRR and CCA is a continuous process of learning and couldn't be undertaken as a stand-alone and time-bound activity.

[3] UNISDR (2007), High Level Dialogue, Information Note No 3, Costs and Benefits of Disaster Risk Reduction, http://www.preventionweb.net/globalplatform/2007/first-session/docs/media_docs/Info_Note_3_HL_dialogue_Costs_and_Benefits.pdf
[4] http://www.preventionweb.net/english/hyogo/gar/2015/en/home/index.html
[5] http://articles.economictimes.indiatimes.com/2015-05-04/news/61800211_1_natural-disasters-home-ministry-india
[6] http://www.ndma.gov.in/images/ndma-pdf/DM_act2005.pdf
[7] http://www.ndma.gov.in/images/guidelines/national-dm-policy2009.pdf
[8] Benson, C and Twigg, J, 2007, Tools for Mainstreaming Disaster Risk Reduction: Guidance Notes for Development Organisations, Geneva: Prevention Consortium.

Figure 1: Steps to DRR and CCA Mainstreaming (Source: Benson and Twigg, 2007)

Secondly, leadership is a key to garner continued support for interest in DRR and CCA mainstreaming. A 2012 study by the London-based International Institute for Environment and Development (IIED) concludes 'political leadership as No. 1 issues in managing disaster risk'. A recent study on mainstreaming by the Climate and Development Knowledge Network (CDKN, 2014)[9] identifies leadership and capacity constraints as key impediments for effective mainstreaming in to development and sectoral plans. Based on, this research, suggests the following key messages for governments:

a. Focus on amending and altering institutional practices;
b. Develop enhanced processes for understanding risk;
c. Acknowledge that mainstreaming processes are highly political and
d. Build effective partnerships.

DRR and CCA mainstreaming opportunities in MC Shimla's development plan

The city of Shimla, being a mountain city located in the climate-sensitive Himalayan region, is vulnerable to many hazards, both natural and man-made. While large part of the state falls in high seismic sensitive zones, the entire state is vulnerable to multiple hazards such as landslides, floods, cloudbursts, flash floods, forest fires and avalanches. The overall vulnerability map of Himachal Pradesh prepared by the HP State Council for Environment Science and Technology categorises five districts, including that of Shimla, in the Very High category (Fig 2).

[9] http://cdkn.org/wp-content/uploads/2014/03/CDKN_Guide_Mainstreaming_dr_management_final_rev_web-res.pdf

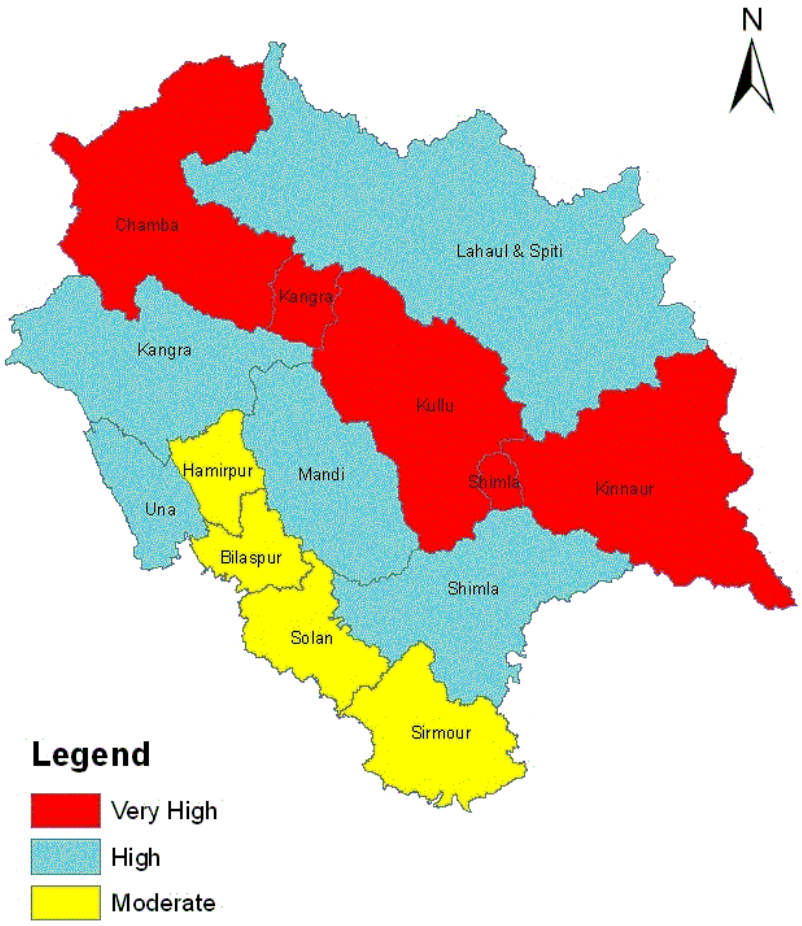

Figure 2: Overall Vulnerability Map of Himachal Pradesh (Source: http://www.hpsdma.nic.in/ProfileOfState/CurrentStatus.html)

The HP State Disaster Management Policy (2011)[10] has set forth a vision:

> "To build a safe and disaster resilient Himachal Pradesh by developing a holistic, proactive, technological driven, and community based strategy through a culture of prevention, mitigation, preparedness and response." (Section 3.1.1 page 13).

This present effort of the Municipal Corporation to prepare an Action Plan to mainstream DRR and CCA into the city development plan is an effort to contribute to the aforementioned macro-level policy vision. Disaster risk management is an integrated approach to assess and address disaster risk and hence it is essential to have a clear understanding of some of other related polices and planning initiatives at a given scale. The following section presents a snapshot of some of the policies and plans at the city level to help better understand the present context and planning priorities.

The Shimla City Development Plan (CDP, 2010)[11] identifies 16 basic urban services and also provides the institutional framework for the planning, design and implementation of these services. It provides a brief

[10] http://www.hpsdma.nic.in/SDMP%20English%20for%20Website.pdf

overview of some of the Disaster Management issues and concerns of the city. The City Disaster Management Plan (2012), prepared under the GoI-UNDP Urban Risk Reduction Project (2009-2012), is a comprehensive account of various hazards, natural as well as man-made, the city is exposed to and presents a series of hazard-specific mitigation plan.[12] Shimla city was also part of the Asian Cities Climate Change Resilience Network (ACCCRN) initiative[13] and, as part of this, ICLEI-South Asia prepared the Climate Resilience Strategy- Shimla in June 2013. In addition, the many sector-specific plans have been prepared with technical and financial assistance of various multi-lateral, bilateral agencies and Government of India initiatives under the Jawaharlal Nehru Urban Renewal Mission (JnNURM). For example, GIZ helped MC Shimla in the design of the City Sanitation Plan (CSP, August 2011)[14] and a Solid Waste Management Plan (2012)[15]. The Centre for Science and Environment (CSE) in March 2010 prepared the Decentralised Wastewater Treatment Plan for Shimla.[16] As part of the Shimla Sewerage Project (1997-2004), six sewerage treatment plants with a capacity of 35.63 MLD were constructed and commissioned in 2005 and 179.352 kilometer of sewer lines were laid in different zones of the town.[17] A Solar City Master Plan for Shimla, under the Ministry of New and Renewable Energy's (MNRE) Solar City Programme, has also been prepared.[18] A Comprehensive City Mobility Plan for Shimla, with an estimated capital investment of US $ 940.16 Million has also been proposed[19] and discussions are in advance stages with the World Bank.[20] The city also prepared a Slum Free City Plan of Action (SFCPoA) under the centrally-sponsored Rajiv Awas Yojana (RAY). New centrally sponsored schemes like AMRUT, HFA, Swachh Bharat Mission and PMAY have also been implemented in the city.

Climate change risk assessment of the city has been at its infancy. The State Strategy and Action Plan on Climate Change Himachal Pradesh (2012)[21] highlights the changing annual mean temperature and precipitation in the state. Because of technological constraints there hasn't been any climate change assessment at the city level[22] and thus lack of adequate scientific information on climate risk pose significant challenge to climate change adaptation planning at the city level.

Based on these, the report proposes an integrated Action Plan at two different levels:

a. **Sectoral level:** This will focus some of key urban sectors and through further consultation will identify specific opportunities for DRR and CCA mainstreaming; and

b. **Institutional level:** Going beyond these sectoral mainstreaming initiatives, it is also essential to create greater awareness among stakeholders at the city level to ensure their long-term engagement in the process and ownership of the initiatives. Some of the key stakeholders in this regard are various departments under the corporation, other key departments of the state (such as SDMA and the Climate Change Cell), elected representatives, research institutes, citizen groups, private sector and the media. This will capitalise on the existing institutional forums such

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[11] http://jnnurm.nic.in/wp-content/uploads/2010/12/CDP_Shimla.pdf
[12] http://hpsdma.nic.in/disastermanagement/CDMP_MCShimla.pdf
[13] http://acccrn.net/about-acccrn
[14] http://shimlamc.gov.in/file.axd?file=2011%2F10%2FR-SSRFinal-110517.pdf
[15] http://www.shimlamc.gov.in/file.axd?file=2012%2F6%2FMSWM+Plan.pdf
[16] http://www.cseindia.org/userfiles/Shimla_Report.pdf
[17] http://hpiph.org/ssp.htm
[18] http://mnre.gov.in/file-manager/UserFiles/Shimla_solar_city_master_plan.pdf
[19] http://resilient-cities.iclei.org/fileadmin/sites/resilient-cities/files/Resilient_Cities_2014/PPTs/A/A1_Panwar.pdf
[20] http://indianexpress.com/article/india/regional-india/rs-6000-cr-mobility-plan-for-shimla/
[21] http://www.moef.nic.in/sites/default/files/sapcc/Himachal-Pradesh.pdf
[22] Personal discussion with Dr. S. S. Randhawa, Senior Scientific Officer, State Climate Change Cell, on 23rd February, 2015

as the Honourable MC House and other suitable forums at the city/state level to create awareness on the need and opportunities for mainstreaming. This process is critical as would open up further spaces of engagement, learning, partnership and innovation.

Programmes: Ongoing and Planned

The Municipal Corporation Shimla, one of the oldest municipalities in India, has a strong governance and programme implementation structure in place. This consists of the Administrative and Political set up of the corporation. In order to identify sectoral/institutional entry points of mainstreaming DRR and CCA in to the overall developing planning context of the corporation, it is essential to understand the overall functions of the corporation. The corporation 'is entrusted with the development related matters of the MC areas and providing basic civic amenities'[23]. The services provided by MC Shimla have been categorised as Obligatory Duties, Functions Entrusted by the Government and other Discretionary Functions. A full list of these functions and duties are available at the MC website (Reference 26). Service provision constitutes the majority of these functions and as enshrined in the 74thConstitutional Act (CCA), a set of powers and functions are devolved to Urban Local Bodies (ULBs)[24].The 12thSchedule of the Constitution lists some of these functions of the ULBs.

At the moment, the Municipal Corporation Shimla has the following projects in operation:

a. Atal Mission for Rejuvenation and Urban Transformation (AMRUT)
b. Parking project
c. Slaughter house
d. Swatchh Bharat Mission
e. Stray Dogs
f. City SanitationPlan
g. Beautification of Shimla
h. Basic Service for Urban Poor
i. Housing for All/ Pradhan Mantri Awas Yojana
j. Challenge Fund
k. Ropeways

Some of the specific components of the JNNURM were the Urban Infrastructure and Governance (UIG), Basic Services to the Urban Poor (BSUP), Urban Infrastructure Development Scheme for Small and Medium Towns (UIDSSMT) and Integrated Housing and Slum Development Programme (IHSDP). MC Shimla implemented a couple of projects under the UIG (Table 1). Shimla was awarded the India Today Best City Award- Environment in 2013[25] and the ABP New Best City for Public Services in 2014[26].

The Himachal Pradesh Cabinet has recently cleared two large infrastructure projects in the city. The proposed Ropeway Project will connect the ISBT with Mall Road and Multi-storey Parking Project will be implemented through ADB finance.[27]Similarly, under the Rajiv Awas Yojana (RAY), it undertook the pilot Slum Area Development of Krishna Nagar area and constructed 224 and 76 new, one community centre,

[23]http://www.shimlamc.gov.in/page/Organization-Function.aspx
[24]http://indiacode.nic.in/coiweb/amend/amend74.htm
[25]http://indiatoday.intoday.in/story/india-best-cities-winners-and-why-they-made-it-survey/1/251350.html
[26]http://www.abplive.in/india/2014/03/11/article276160.ece/Delhi-tops-in-3-categories-at-ABP-News%E2%80%99-Best-City-Awards-2014
[27]http://indianexpress.com/article/india/india-others/himachal-govt-clears-rs-2000-cr-ropeway-project-in-shimla/

one park and rental housings respectively.[28] Presently Shimla MC is working on a non-motorized transport (NMT) system in the city as part of the larger INR 60,000 Crore City Mobility Plan (CMP) and had recently discussed this with the World Bank for financial investments in the plan[29]. Shimla City has also been selected as AMRUT city, other centrally sponsored schemes like Swachh Bharat Mission, Housing for All and Pradhan Mantri Awas Yojana.

Following projects approved by Ministry of Urban Development, Government of India (as per information provided by Project Cell, M C Shimla):

Sectors	SAAP next 2 years	SAAP 1st year	Total
Water Supply	20.049	21.60	41.65
Sewerage	12.6	24.68	37.28
Storm water drains	17	0.50	17.50
Urban Transport	53.561	4.86	58.42
Parks	2.67	1.30	3.97
Total	**105.9**	**52.9**	**158.8**

MC Shimla has been a pioneer in the door-to-door garbage collection programme in India and has built on this existing system to further leverage decentralised sanitation plans in the city. For example, a European Union supported project worth € 1110595.00 on 'Strengthening and Empowering Urban Local Authorities in the Delivery of Decentralised Sanitation Services' is being implemented in the city by MC Shimla (03/2013 to 08/2016).The project specifically aims to strengthen the capacity and effectiveness of Municipal Corporation Shimla and support 4 other ULBs in delivering decentralized integrated sanitation services for the urban poor in un-served settlements.[30] Shimla was also part of the European Union supported SUNYA (Towards Zero Waste in South Asia) project.

Table 1:Project Implementation Status under UIG, JNNURM in Himachal Pradesh[31]

Project Title	Approved Cost	Date of CSMC	Status of Work
Solid Waste Management for Shimla	1604.00	9-Mar-07	Work was awarded on PPP mode
Construction of widening and lowering of existing tunnel near Auckland House school (Including construction of approach bridge)	1009.06	19-Mar-07	Completed
Sanitary Landfill site for Solid Waste Management plant at village Bhariyal, Tehsil Dist. Shimla	1050.62	12-Mar-12	Under construction
Establishment of E- Governance	11.20	24-Dec-2012	Under process
Basic Services to The Urban Poor (BSUP)	**2400.55**	-	Near Completion
Projects withdrawn			
Rehabilitation of Water Supply distribution system for Shimla City	7236.00	CSMC*	
Rejuvenation of Sewerage Network in missing lines and left out / worn-out sewerage in various zones of Shimla, Phase-!	5474.00	CSMC	
*CSMC: Central Sanctioning and Monitoring Committee			

[28] http://shimlamc.gov.in/file.axd?file=2013%2F7%2FDPR+Krishna+Nagar+Slum+under+RAY+Part-1.pdf
[29] http://www.tribuneindia.com/news/himachal/governance/mc-seeks-funds-for-shimla-s-mobility-plan/44131.html
[30] http://eeas.europa.eu/delegations/india/projects/list_of_projects/302317_en.htm
[31] http://jnnurm.nic.in/wp-content/uploads/2014/08/HP.pdf

For a rapidly urbanising city which is also one of the most preferred tourist destinations in the country, Shimla city's infrastructures are struggling to cope with the burgeoning pressure. In addition to this anthropogenic pressure, the city is also at risk of climate change impacts and natural hazard vulnerabilities, mostly those of seismic and land submergence risk. It is in this background, that most of the Municipal Corporation's development plans have been physical infrastructure-based. And this provides an appropriate opportunity to build the capacity and interest of the officials and project developers for mainstreaming DRR and CCA elements in to the overall design, implementation and monitoring of various projects in the city. The ongoing GoI-UNDP Urban Climate Risk Management is well placed to initiate and facilitate the process at the city level as well as across the state through strategic collaboration with the state urban development department.

Suggested DRR and CCA mainstreaming entry points for these ongoing projects are:

a. **Assessment**: A detailed and scientific assessment of the disaster and climate-related risk pertaining to the proposed infrastructure projects should be undertaken. The focus should go beyond impacts and also look into ways how a given infrastructure project is contributing to risk reduction or risk amplification in the city. Such risk informed planning is key to ensure development designs and investments are risk proof. The Department of Town and Country Planning (TCP), through the Assistant Town Planer (ATP) - Shimla, in association with the HPSDMA and the Disaster Management Cell of MC Shimla, further facilitate this. There are more than 72 promoters[32]accredited by the TCP and their participation in the process is essential. In addition to TCP's in-house technical expertise and capacity, there are other research and technical support agencies such as the Civil Engineering Department, NIT Hamirpur and School of Engineering, IIT Mandi who could further support this assessment process. The Toolkit on Urban Planning developed by NIDM[33] could be a starting point to initiate this process at the corporation level in Shimla.
b. **Integration:** Based on this risk assessment, adequate risk reduction measures should be identified and integrated in to these projects. This is in addition to the standard risk screening and assessment exercise which are part of any infrastructure development. This process could provide be learning-by-doing experience for the project developers and designated line departments under MC Shimla and also help them build their professional skills on mainstreeting DRR and CCA in to infrastructure planning and development. Project proposals and DPR for JNNURM funding require an Environment Impact Assessment (EIA) and this provides additional opportunity to better integrate the key elements identified as part of the disaster and climate risk assessment for a proposed infrastructure project.
c. **Innovation:** Any risk reduction planning is generally considered to be resource-intensive and hence usually glossed over. But technological and financial innovations carefully undertaken could substantially reduce the cost of operation and maintenance (O&M) in the long-run and especially in case of a natural disaster or climate extreme events. For example, lack of innovative and risk informed hydropower projects led to a massive destruction of the entire sector during the 2013 Uttarakhand floods[34], which led to gross power scarcity in the national grid. Disaster risk insurance is one such financial innovation which could promote and incentivise inclusion of DRR and CCA elements in to such development projects.

[32]http://www.tcphp.in/Application//uploadDocuments/notification/Notice20150128_115106.pdf
[33]http://nidm.gov.in/pdf/pubs/DRR-Urban.pdf
[34]http://www.circleofblue.org/waternews/2014/world/uttarakhands-furious-himalayan-flood-bury-indias-hydropower-program/

d. **Low-carbon climate resilient (LCR) infrastructure**: Shimla's infrastructure needs are immense. While this provides many financial and implementation challenges in a hilly terrain, it also offers many opportunities to better plan and implement low-carbon infrastructures in the city. Most of the financial institutions and infrastructure development banks are more and more interested to finance such LCR infra projects[35]. A UNEP Study on Low Carbon Transport in India[36] offers enough insights for the ongoing/planned City Mobility Plan of Shimla.
e. **Green Investments:** Given the geographic location of Shimla in the Himalayas, there are many opportunities for green investments in the region which could reduce additional burden on the existing systems and further build resilience of the city. One such example is the storm water drainage system of the city. In addition to investing heavily in putting up new drainage plans, the traditional drainage system of the city could be revived to channel the storm water in case of heavy rain.
f. **Capacity building:** In order to better facilitate these abovementioned suggestions and ensure ownership of the Municipal Corporation, capacity development and institutionalisation is key to this. Under the Ministry of Urban Development supported Comprehensive Capacity Building Programme (CCBP), a panel of sectoral experts has been deputed for MC Shimla. This provides additional opportunities for designing and delivering context-specific training and capacity building activities for the officials and service providers with MC Shimla on mainstreaming DRR and CCA aspects. While the present panel of experts don't have a disaster management technical person on board, the City Project Coordinator and the State Project Officer (SPO), both can support the team in the process, as and when required.
g. **Develop a Framework:** While the above mentioned suggestions could be initiated as part of a long-term disaster and climate resilient Shimla city, it is essential to develop a framework through inter- and intra-departmental coordination, across the corporation and state level. The HPSDMA, the nodal agency for disaster management in the state, could take this up in close collaboration with the DM Cell of MC Shimla. It is essential to make this framework context specific to Shimla taking in to account its overall governance, development and geographic elements. Since most of the ongoing and planed infrastructure development in the city is with active participation of the private sector, their overall engagement in the design of this framework is essential. The Disaster Risk Management Framework (DRM-F)[37], jointly developed by UNISDR and PwC is one such reference point which could be contextualised to Shimla city.

While this section highlighted some of the ongoing and planned activities in the city, the future development plans of city will be guided and financed based on the City Development Plan 2041, which is under final review. Thus, in order to better mainstream DRR and CCA in to this futuristic Plan, it is essential to flesh out some of the sectoral opportunities which are not only the current priorities of the city government but also offer adequate institutional scope to build upon rather than plan and begin an initiative from the scratch. The following section delves deep into the draft City Development Plan 2041 and some of the sectors.

The Draft City Development Plan 2041

[35] http://www.oecd-ilibrary.org/environment/mobilising-investment-in-low-carbon-climate-resilient-infrastructure_5k8zm3gxxmnq-en
[36] http://www.unep.org/transport/lowcarbon/newsletter_3/pdf/PromotingLCTinIndia_Brochure.pdf
[37] https://www.pwc.com/en_GX/gx/governance-risk-compliance-consulting-services/resilience/publications/pdfs/pwc-unisdr-report.pdf

The draft City Development Plan for Shimla- 2041, supported under the Capacity Building for Urban Development project (CBUD), is being currently revised by an external technical agency. The Plan document presents a clear and concise Vision of Shimla (Box: 1) and is a comprehensive document developed through regular stakeholder consultations and meetings with respective departments. Although neither any element of climate change nor that of disaster resilience is part of this existing Vision statement, the Disaster Management Cell of MC Shimla has suggested a series of inputs to include DRR and CCA elements in the plan and also have 'disaster resilient' as a key component of the Vision statement. The Plan has many sectoral goals as part of the larger goal (Table 2).

Box 1

The Vision Statement for Shimla:

"Restoring the Grandeur, History and Heritage of Shimla; maintaining the city's continuity with the Past; "developing Shimla as the Climate Resilient Hill Capital in the Country." (page 193, Draft CDP

Table 2: Sectoral goals of the draft City Development Plan 2041

Aspect	Goal
Water	"Provision of Adequate Quantity of Safe Water to All"
Sewerage	"To achieve environmentally sustainable, recycling-oriented waste water management"
Drainage	"Provision of long-lasting Clean Natural and Road Side Drains"
Solid Waste Management	"Clean and Green Shimla through Environmentally Sustainable Waste Management Practices"
Transportation	"Providing Mobility with Choice, Comfort, Convenience, Frequency, Safety and Minimum Environmental Effects"
Heritage	"Conservation of Heritage for Present and Future Generation"
Health	"Commitment to create healthy ecosystem and value and care as an essential environmental, economic and community asset"
Environment	"Commitment to Protection and Continuous Improvement of Environment"
Tourism	"Engine of Sustainable Economic Growth for Shimla"
Slums	"Provision of adequate infrastructure facilities in al slums – To make Shimla Slum Free"

Sectoral Opportunities

While almost ten sectoral areas have been identified in the draft City Development Plan 2041, for the purpose of this Action Plan only specific sectors of water, sewerage and storm water drainage, sanitation, solid waste management were considered. These sectors also emerged as the priorities for the Corporation and were also suggested by the Assistant Commissioner to ensure that activities proposed as part of the Action Plan could be dealt with by the Corporation itself, as planning in other sectors such as transportation, tourism and slums are done by respective state government departments and designated agencies. Based on this, the following section presents a brief overview of the prioritised sectors is presented, followed by DRR and CCA mainstreaming opportunities.

Water

Water, as a life-saving natural resource, is also one of the most at risk resource to climatic and non-climatic stressors. Climate change impacts are most likely to result in erratic water availability and also change in water quality. Being located in a hilly terrain and fully dependent on natural sources for its water needs, the city's water supply system is highly vulnerable to climatic vulnerabilities. The city draws its water sources from six different sources with a combined maximum designated capacity of 62.21 MLD

(Table 3). For example, the Dhalli Catchment Area which remains the main source of water for the city of Shimla has been a declared reserved forest area in order to protect the entire catchment from any anthropogenic interventions such as deforestation and degradation from other development related activities such as construction and road development.

Table 3: Sources of Water in Shimla City[38]

Sr. No	Source	Installation Year	Transmission Type	Maximum flow designed capacity (MLD)	Average flow available for Jan-Nov (MLD)	Average flow available in lean period (May and June) (MLD)
1	Dhalli Catchment Area	1875	Gravity	0.45	0.25	0.25
2	ChuratNallah	1889	Pumping	3.86	2.83	2.50
3	Chair Nallah	1914	Pumping	2.50	0.60	0.50
4	Nauti Khad (Gumma)	1923 & 1982	Pumping	24.60	13.00	13.00
5	AshwaniKhad	1992	Pumping	10.80	9.00	5.00
6	Giri River	Under test run		20.00	12.00	9.50
	TOTAL			62.21	37.68	30.75

Water is treated at source and collected at 11 reservoirs before being supplied (Table 3). As could be seen, the flow is quite erratic during monsoon and the city faces acute water scarcity during summer months. Summer months (May and June) also witness an increased inflow of tourists to the city resulting in severe pressure on the city's already constrained water system. The city is divided in to 16 water distribution zones, which covers almost 70% of the city through a network of 150 km of supply system mostly made up of cast iron, galvanized iron and mild steel leading heavy leakages and loss in many cases.

Table 4: Water reservoir capacity in Shimla City (source: Revised Detailed Project Report for Rehabilitation of Water Supply Distribution System for Shimla City)

Sr. No	Reservoirs	Capacity in ML	Type(***UG: Under Ground; OH: Overhead***)
1	Carignano	3.01	UG
2	Sanjauli	8.78	UG
3	Ridge	4.63	UG
4	Mansfield	3.63	UG
5	Kasumpti	2.00	UG
6	Kasumpti	0.22	OH
7	Viceral Lodge	0.23	OH
8	Jakhu	0.32	OH
9	Boileagunj	0.24	UG
10	Balancing reservoir at Masobara	3.00	UG
11	Seog	10.90	
	TOTAL	39.96	

The draft CDP-2041 identifies a series of Action Plans and proposes specific projects under the Capital Investment Plan (CIP) (Table 4).

[38]Source: Draft City Development Plan for Shimla- 2041, Ministry of Urban Development, Government of India and World Bank

Table 5: Actions Plans for water sector under the Draft CDP 2041

Action Plans	Capital Investment Plan			
	Project	Sub Project	Estimated Cost in INR Crores	Implementing Agency
• Increase the household-level coverage • Water Supply System Rehabilitation Plan • Comprehensive Water Supply Plan • Operation and Maintenance Plan • Reforms	A per the Detailed Project Reports of SMC	• Improvement and refurbishment of the existing water supply to provide 24x7 water supply including metering.	136.00	IPH
		• Augmentation of water supply system tolift the water from the coal dam and receive 35 MLD water for the city of Shimla	350.00	IPH
		• Refurbishment of the existing traditional water sources ("Baowries") in the Shimla Ciry to create additional 8 to 10 MLD water supply	25.00	IPH
		• Implementation of gravity based water supply system scheme from Chanashil/	-	SMC
		• Dedicated supply for firefighting system.	50.00	SMC
Total Investment envisaged for water supply sector (2041)			1111.00	
Total Investment envisaged for 2021			561.00	

As mentioned earlier, the source of water as well as the entire storage and supply system of the city is vulnerable to climatic variability such as high precipitation, heavy snowfall, prolonged dry periods and other hazards such as earthquake, landslide and flash floods. Based on this the following DRR and CCA mainstreaming measures are suggested for the waster sector of Shimla city:

Table 6: Suggested DRR/CCA Action Plans for Water Sector in MC Shimla

Proposed Sectoral Plan/Project under CIP	Suggested DRR/CCA Action Plans
Water Source Development	• Undertake a detailed a vulnerability and climate risk assessment of all the six water sources, including seasonal fluctuations of water quality and quality. • This should involve a catchment-wide approach to better understand how a given source is impacted or likely to be impacted various climatic parameters such as rainfall/ temperature and other hazards like floods, landslides or pollution from the adjoin regions. • Based on these insights, adequate DRR/CCA measures could be put in place. For example, structural measures like strengthening of embankments or increasing the tree cover to reduce the risks of landslides and flood related impacts all along the water courses. • Micro- check dams could be constructed along these courses/*nallah*s to deal with the situations of less-than-normal flow during lean periods. • A detailed Water Budget for the City could be developed to understand the water demand-supply gaps in the city and its seasonal variations. This will help the WSSD to effectively monitor the source and supply. • There are many traditional and natural water sources (*bowries*) in the city and most of them have been encroached upon or degraded due to lack of proper maintenance and care. These traditional water sources could be rejuvenated and revived to meet the some of the water needs of the city.

Water Supply	• The existing water supply system of the city, which consists of a network of old cast iron, galvanized iron and mild steel, is quite vulnerable to floods, earthquakes and landslides. The hilly terrain of the city poses additional challenge in terms of coverage. A detailed GIS-based mapping of the entire water supply network of the city could be undertaken to identify the most vulnerable points/regions in the entire network to natural hazards and climatic impacts such as extreme rainfall or heavy precipitation. Secondly, this should involve identification of suitable alternate sources and systems (e.g. proximate water connection points for each region in case a given area is cut off from the main supply network becomes defunct during a natural disaster). • While the design and implementation of a more disaster resilient water supply system, including storage systems, is a capital intensive proposal, the Municipal Corporation could collaborate with the IPH, State Pollution Control Board and Public Works Department to explore and identify the opportunities as part of the proposed project for new water supply system. • In order to recover some of the costs associated with the construction of such disaster and climate resilient infrastructures the MC Shimla could revise its water pricing system and tariffs. • Detailed feasibility study of large scale Rain Water Harvesting (RWH) in Shimla should be explored at lease in new planning area.
Coverage and distribution network	• The proposed coverage and distribution networks under the CIP should take in to account the vulnerability of the region (to seismic, landslide, flood) where new networks are planned. An important DRR strategy is also to work with other infrastructure development agencies such as public works and housing development to better align all their activities in order to reduce risk accumulation in the system. For example, construction of water supply network which is along a vulnerable road could further add to the vulnerability of water supply system during a landslide. • Heavy snowfall and extreme cold temperature in the mountains often lead to frozen water pipes in the city. For example, during the extreme cold waves in Himachal in February 2014, many parts of Shimla witnessed 'frozen taps'.[39]Residents, hotel and restaurant owners could be sensitized on such critical issues of preventing and thawing frozen pipes. A good starting point could be the Guidelines Developed by the American Red Cross[40] and this could be used to build awareness and sensitize the public through the Resident Welfare Associations (RWAs) and Hotel Associations of the city.

[39]http://timesofindia.indiatimes.com/india/Seasons-coldest-night-freezes-Himachal/articleshow/30539308.cms
[40]http://www.redcross.org/prepare/disaster/winter-storm/preventing-thawing-frozen-pipes

Sewerage and Sanitation

The sewage generation for the city has been projected as 27 MLD for 2021, 36 MLD for 2031, and 49 MLD by 2041[41]. The current sewage generation is around 29 MLD of which only 4.8 MLD of sewage (18%) is treated by six STPs. The treated water is not reused in any form and is usually discharged into drains.

Table 7: STPs in Shimla City

Sr. No.	Sewerage Zone/Name of STP	Total Sewage Generation (MLD) 2010 population	Capacity (MLD)	Technology	Length if Existing Sewer Network (m)
1	Lalpani	13.76	19.35	Upflow Anaerobic Sludge Blanket (UASB)	91649
2	Summer Hill	0.74	3.93	Extended Aeration Process	16887
3	North Disposal	4.02	5.80	Extended Aeration Process	45222
4	Dhallii	1.58	0.76	Extended Aeration Process	11373
5	Sanjauli-Malyana	5.66	4.4	Extended Aeration Process	43480
6	Snowdon	0.93	1.35	Extended Aeration Process	12614
		29.02	35.59		221225

Table 8:Action Plans for sewerage and sanitation sector under the Draft CDP 2041

Capital Investment Plan			
Project	**Sub Project**	**Investment Estimated Cost in INR Crores**	**Implementing Agency**
Comprehensive Sewerage System	Provision of Sewerage network to households	96.84	IPH
	Provision of sewerage network, household connections and new STPs in un-served zones like North Disposal Zone (sub zone II) and SanjauliMalyana Zone Zone (sub zone II)	19.64	IPH
	Provision of sewerage network, household connections and new STPs in un-served zones like Totu Zone and Jutog Zone.	29.64	SMC
Rehabilitation of old system	Implementation of the sewerage system rehabilitation scheme for the Shimla City.	170.36	IPH
Decentralized Systems	Decentralized waste water treatment systems in newly developing areas (5 zones)	146.32	IPH
Septage Management Facility	Development of septage Management facility	0.80	SMC
Community Toilets	Development of new community toilets in the city	5.25	SMC
Public Toilets	Refurbishment of the existing public toilets in the city	12.00	SMC

There has been gaps in the sewerage coverage and management in the city. As per a study done by CSE in 2010, some of the gaps in the city's sewerage system are:

a. Missing links, where branch where branch sewer lines of the old systems have not been connected to the new network;

[41]Draft City Development Plan for Shimla- 2041, Ministry of Urban Development, Government of India and World Bank

b. Some of the grey-water drains, may not be connected to the new network, reducing the quantity of sewage reaching the STPs; and
c. Newly added municipal zones of Totu and Jatog have not been connected to the sewerage network.

One of the key opportunities is in terms of developing decentralised wastewater treatment systems (DEWATS) in the city. A detailed technical assessment towards this end was carried out by the New Delhi-based Centre for Science and Environment (CSE) in March 2010, a recognised Centre of Excellence for Sustainable Water Management of the Ministry of Urban Development, Government of India. This plan proposed 35 DEWATS in five unsewered areas in the city. Such DEWATS systems are not only cost effective but also environment friendly.

Table 9: Suggested DRR/CCA Action Plans for Sewerage System in MC Shimla

Proposed Sectoral Plan/Project under CIP	Suggested DRR/CCA Action Plans
Comprehensive Sewerage System	• A systematic disaster and climate risk vulnerability assessment of the existing sewerage system of the city including those of the six STPs. This will help identify some of key elements in the entire system which is vulnerable to different natural hazards and climate risks such as extreme rainfall or heavy snowfall in the region. A comprehensive and system-wide risk assessment is essential to better integrate the information with that of the water budgeting information and help develop a complete picture of the water supply and sewerage system. • Clogging of the sewerage system is a major issue in the city and such clogs are more likely to further intensify disaster related disruptions such as during a landslide or flood. The existing system should have adequate check valves to deal with such situations. More importantly, capacity building of the technical people managing the system is essential to help them identify the weak and vulnerable points before critical periods such as winter and monsoon when probabilities of heavy snow fall and rain is quite high. • High concentration of pollutants (such as total suspended solids, biodegradable organics, nitrogen, phosphorous, heavy metals and toxic pathogens) in the effluents of on-site STPs pose a major health hazard, both to people and the ecosystem. Such systems, if not properly managed, could collapse and result in an epidemic or major contamination during a natural disaster. Leaching could be more difficult to deal with during a disaster and hence proper and regular monitoring of the pollutant level in these systems. Filtration, micro-straining and aerobic biological decomposition process are some of the options which could be adopted to reduce these risks in the system. • Decentralised wastewater treatment systems (DEWATS) are a more environmentally friendly option in such terrain, which also reduces the disaster risk associated with a large, integrated and centralised system of sewerage treatment. A pilot DEWATS project was commissioned at Police Line, Bharari under the GIZ-supported SNUSP programme[42]. Such systems could be

[42] http://www.urbansanitation.org/e30473/e50238/e58468/

	established at cluster level and the overall maintenance and operation could also be decentralised with adequate participations of the RWAs and Ward Sabhas. • Bio-digester system can be explored and implement as pilot project in selected ward of Shimla City.
Community and Public Toilets	• The construction site and the masonry practices adopted for the construction of these toilets should take in to account the seismic, flood and landslide vulnerability of the location. Many regions within the Shimla are classified as Sinking Zone and such zones should be avoided for such public facilities. • Water and sewer connection of these toilets should be ensured so that they are functional and usable during any natural disaster or extreme weather events in the community.

The sewerage and sanitation system of the city is a vital infrastructure for the overall well-being of the city and its citizens. Hence integrating adequate DRR/CCA elements in to the design, operations and maintenance of these systems is vital to ensure their functionalities during a natural disaster and extreme climate events.

Solid Waste Management

Total solid waste generation is about 93 MT per day and it is projected to go up to 125 MT by 2021. The existing door-to-door collection, managed by the Shimla Environment and Heritage Society (SEHB), covers almost 86 % of the city. Solid waste processing and disposal at the *DharniKaBagicha* treatment plant with a capacity of 100 MT, which started functioning in 2001, has been found to be inadequate and which is non-functional now. Plans are under way to develop a scientifically engineered Sanitary Landfill Facility (SLF) at Bharial and operate it under a PPP mode. The plant which is started its operation in 2013 at Bharial is also not functioning since October 2015. Although the DPR for this was approved by the Ministry of Urban Development in 2012 there hasn't been much progress on its implementation. Currently, Municipal Corporation Shimla has proposed Waste to energy plant at Bharial, Taradevi Shimla.

Segregation at source is still not well established in the city and the same could be promoted through greater awareness generation and public participation in the city. This will help substantially minimize the waste going to the proposed scientifically engineered landfill (SLF) as mandated by the directives under the Municipal Solid Waste (Management and Handling) Rules {MSW (M&H) Rules, 2000}.The SEHB society, in consultation with various Resident Welfare Associations (RWAs), schools and colleges, merchant associations and the Tourism department, could organise innovative public outreach activities to promote 4Rs (Reduce, Reuse, Recycle and Refuse) practices at various levels. Some of the key lessons learnt under the European Commission funded SUNYA Project (Towards Zero Waste in South Asia) could be successfully scaled-up through institutional innovation and further programme development in this sector.

Under the Draft CDP- 2041, the following action plans and associated projects have been proposed:

Table 10: Action Plans for SWM sector under the Draft CDP 2041

Action Plans	Capital Investment Plans		
Project	Sub Project	Estimated Cost in INR Crores	Implementing Agency
Waste Collection Infrastructure	Procurement of vehicles required for efficient collection of waste.	4.06	SEHB
Transfer stations	Construction of two waste transfer stations in the city	50.00	SEHB

Landfill facility	Development of a sanitary landfill facility for disposal of inert.	11.29	SEHB
Upgradation Waste Processing Facility	Up-gradation of the existing waste processing facility including provision of a pucca approach road to the ficility	20.00	SEHB
Waste Segregation Stations	Construction of de-centralized waste segregation and composting/waste to energy- Incineration facilities in the city	50.00	SEHB
New-Waste Processing Facility	Construction of waste processing facility capable of processing 232 tons per day.	14.80	SEHB
Construction and Demolition Waste Facility	Construction of waste recycling plant for the construction and demolition waste	30.00	SEHB
Bio-Medical Waste Facility	Construction of new bio-medical waste treatment facility	20.00	SEHB
Source Segregation IEC	Preparation of IEC campaign strategy for source segregation and efficient waste management and its implementation of the strategy	5.00	SMC/SEHB
IEC Programs	IEC Campaigns for efficient waste management system	4.00	SMC/SEHB

Table 11: Suggested DRR/CCA Action Plans for MSW System in MC Shimla

Proposed Sectoral Plan/Project under CIP	Suggested DRR/CCA Action Plans
Door-to-door (D2D) waste collection	• The current system of D2D waste collection often comes to a standstill during heavy snowfall in winter or heavy rainfall. Community-level waste collection points, coupled with segregation at source should be promoted to deal with such situations.
Source segregation and collection of commercial waste	• The proposed sanitary landfill facility is an opportunity to mainstream DRR and CCA elements into the overall design, operation and maintenance (O&M) of the system. For example, a detailed vulnerability assessment of the proposed site could be undertaken to identify the potential hazards in the region and ways through which it could be affected during heavy snowfall or rains. The design should be made more disaster resilient with adequate structural measures and the Eco-Centres approach of GIZ is an effective design plan to ensure reduction of disaster risk such as those during landslides, floods or avalanches. The site development plan of such a center provides adequate opportunities for other value-added operations for compost production, co-management of septage, informal sector integration and additional climate-mitigating technologies may also be introduced into the system. A detailed design template is available at http://enrdph.org/wp-content/uploads/2014/05/EnRD-ECO-CENTER.pdf • Fire is a major hazard in such landfill sites. The proposed site should take in to account the existence of naturally occurring sources in the nearby vicinity and design a micro-water collection and storage system close to the plant. This water storage system will be exclusively to deal with any fire incident in and around the landfill.

Table 12 Site Development Plan of an Eco-centre, Source: GIZ, April 2013

Storm Water Drainage

Much of the storm water in the city of Shimla is drained through a network of naturally occurring channels of drains and small rivulets (called *nallahs*) because of its location in a hilly terrain. This network of *nallahs* help in the easy drainage of the storm water into Yamuna and Satluej rivers in the south and north of the city respectively. This network is part of the Kufri-Dhalli-Sanjauli-Ridge-Tutu watershed running through the city and consists of 13 major *nallahs*. In addition to these natural system of *nallahs*, there are around 67 storm water drainages in the city with a total drainage network of around 42.33 km. Inadequate maintenance of these drainage systems and c
hocking, silting and encroachment of *nallahs*, would pose severe constraint on the capacity of these systems in case of intense precipitation or heavy snowfall increasing the risk of water-logging, flash floods and landslides in the city. For example, obliteration and encroachment of such natural systems of drainage and wetlands were some of the underlying causes that resulted in severe floods in the Kashmir valley in September 2014 (TNN, 2014).[43]

A series of projects are proposed under the Draft CDP 2041 (Table 12). This sector is quite important for a city like Shimla which is located in the high-altitude mountains in the Himalayas and are vulnerable to cloudbursts and extreme heavy rainfall events.

Table 13 Action Plans for Storm Water Drainage sector under the Draft CDP 2041

Action Plan	Capital Investment Plans			
	Project	Sub Project	Estimated Cost in INR Crores	Implementing Agency
Strom water drainage rehabilitation plan	New Storm Water Drains	Development and provision of new pucca storm water drains in Shimla city.	25.47	SMC
Desalting of chocked *nallahs*	Improvement of major *nallahs*	Improvement and rejuvenation of major *nallahs*in the city as presented in city sanitation plan	179.00	SMC

[43] http://timesofindia.indiatimes.com/india/Kashmir-flood-tragedy-a-manmade-disaster-Bombay-Natural-History-Society-chief/articleshow/42762787.cms

This sector provides adequate opportunity to integrate DRR and CCA elements in its design and maintenance.

Table 14 Suggested DRR/CCA Action Plans for Storm Water System in MC Shimla

Proposed Sectoral Plan/Project under CIP	Suggested DRR/CCA Action Plans
Storm water drainage rehabilitation plan	• A scientific mapping of this intricate system of *nallahs*in Shimla should be undertaken to further strengthen this system and enhance the city's storm water drainage capacity. The GIS cell at UD could support MC Shimla in this initiative and help in the development a plan to rejuvenate and revive the city's natural drainage system. Based on this check-dams could be constructed at suitable places to store the water and use it during lean periods for non-drinking and other purposes. • The rehabilitation plan should look into the existing and emerging disaster risk in the city, most of which are related to rapid urbanization and other infrastructure development programmes. And the design of the drainage systems to take into account potential risks such as landslides, floods or sinking zone.
Desilting of chocked *nallahs*	• Chocking incidences are more pronounced during heavy rainfall and the system should take this into account so that adequate desilting are carried out in pre-monsoon phases and the risks of silting are reduced to certain extent.

Conclusion

The Municipal Corporation Shimla is well placed to undertake some of these proposed DRR and CCA mainstreaming actions. Some of the key opportunities are:

a. The city may be selected to be part of the 100 Smart Cities initiative of the Government of India and this gives immense opportunity to make this mainstreaming plan an integral component of the process of project proposal development and infrastructure design in the city. As all the stakeholders, including private sector project developers and service providers, gear up towards the design and planning process, this proposed Action Plan could be shared with them to build awareness and interest and help develop a common understanding and shared vision among all. It is proposed to further develop a concise and easy-to-understand learning document based on this Action Plan and the DM Cell, MC Shimla could work with the State Urban Development department and make it an integral component of all training and consultation processes.
b. The recent Nepal earthquake has highlighted the extent of seismic vulnerability in the Himalayan region. Many cities and governments have rejigged their risk reduction and mitigation strategies and investments. The Municipal Corporation of Shimla has decided to invest INR 321.50 Crore in to the overall disaster management and climate change adaptationsystem of the city as part of the revised City Development Plan (CDP)[44].
c. Shimla city has been selected for the prestigious and globally competitive CityLinks' Climate Adaptation Partnership Programme (CAPP)[45], with the City of Boulder (Colorado) as the Resource City. This provides adequate opportunities for the city to learn from disaster risk reduction and climate change adaptation initiatives of Colorado and also from the technical expertise of the Urban Climate Change Research Network (UCCRN), which is supporting this partnership.

[44] http://timesofindia.indiatimes.com/india/Shimla-Municipal-Corp-earmarks-320cr-for-disaster-mgmt/articleshow/47064971.cms
[45] http://icma.org/en/international/news/Article/105619/Six_Cities_Chosen_for_the_Climate_Adaptation_Partnership_Program

d. As mentioned earlier, the city doesn't have adequate climate and disaster risk information at the city/ward level and the proposed city-level HRVA study, to be supported by UNDP India, could meet some of these climate and disaster information needs of the city.

e. More importantly, the ongoing revision and finalisation of the CDP-2041, with extensive participation of all the line departments, citizen groups and civil society, provides the required platform to identify and initiate DRR and CCA mainstreaming entry points for the city. While the proposed mainstreaming activities are aimed to serve as a first step towards this process, the Disaster Management Cell, MC Shimla could take the lead in mobilising adequate political and official will and support based on a proposed framework (Figure 3). This could be strengthened at the corporation level by building on the existing policy/programme priorities and opportunities under various ministries/departments of the central and state government and key organizations which could support the MC Shimla in the overall process of mainstreaming DRR and CCA in to both sectoral and overall development plan of the city.

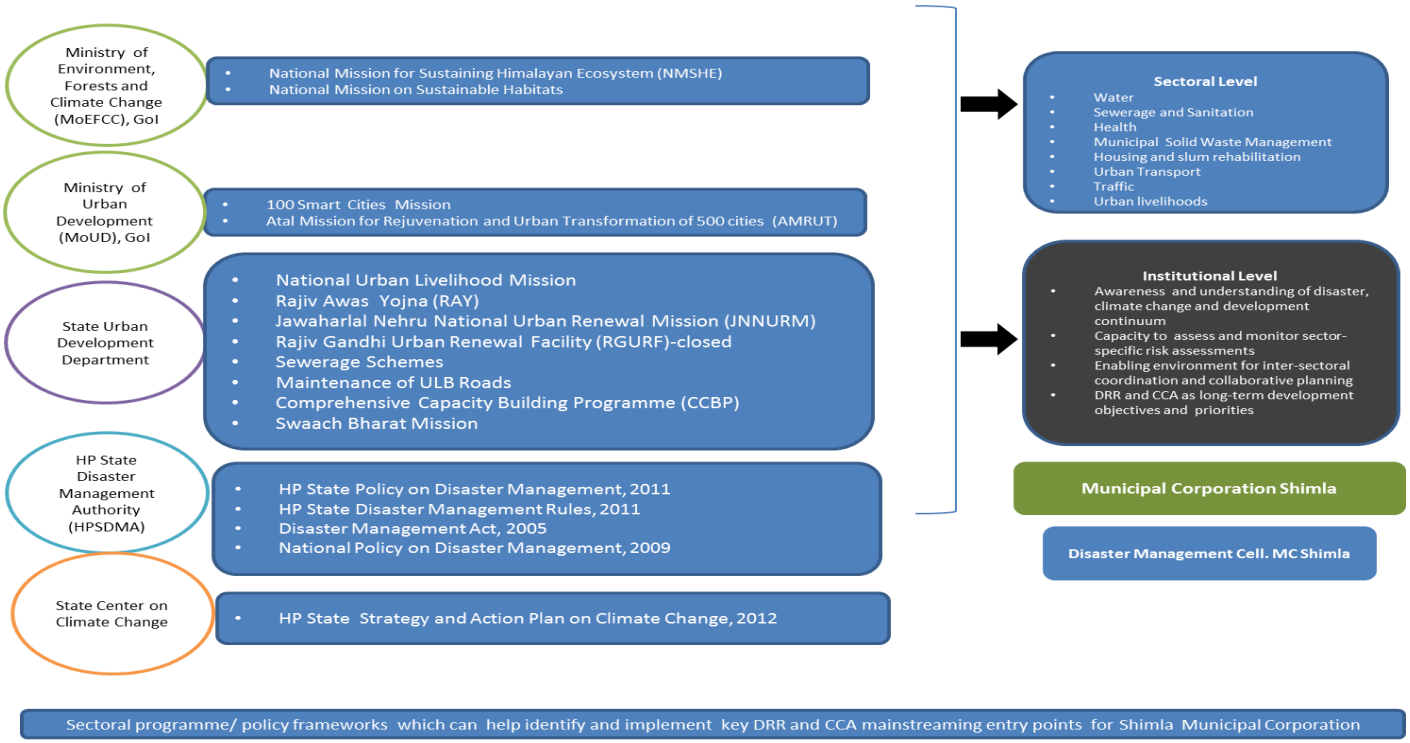

Figure 3: Policy and programme opportunities to further strengthen DRR and CCA mainstreaming activities in to the overall development plan of Shimla Municipal Corporation