

CLIMATE-SMART DISTRICT DISASTER MANAGEMENT PLAN AS EFFECTIVE TOOL FOR IMPLEMENTING STATE ACTION PLAN ON CLIMATE CHANGE:

Lessons from three states in India

Abstract

A systemic review of State Action Plan on Climate Change (SAPCC) of three project states in India, viz., Uttarakhand (Hilly, multi-hazard), Odisha (Coastal, multi-hazard) and Uttar Pradesh (Riverine, Flood & Multi-Hazard), envisaging variation in terms of their strategic approach and content given the diversity in their socio-economic, environmental and development contexts, has been carried out. It looked at the extent to which the provisions of the SAPCCs can be implemented at district, sub-district or local level (municipal, Panchayat/village by utilizing the framework of the Climate-Smart District level Disaster Management Plan (DDMP), district's departmental plans, and the issues of readiness for their implementation through ground action. An innovative exercise of 'Qualitative Coding System' has been undertaken to showcase the effectiveness of Climate Smart DDMP in implementing SAPCC.

Key Points

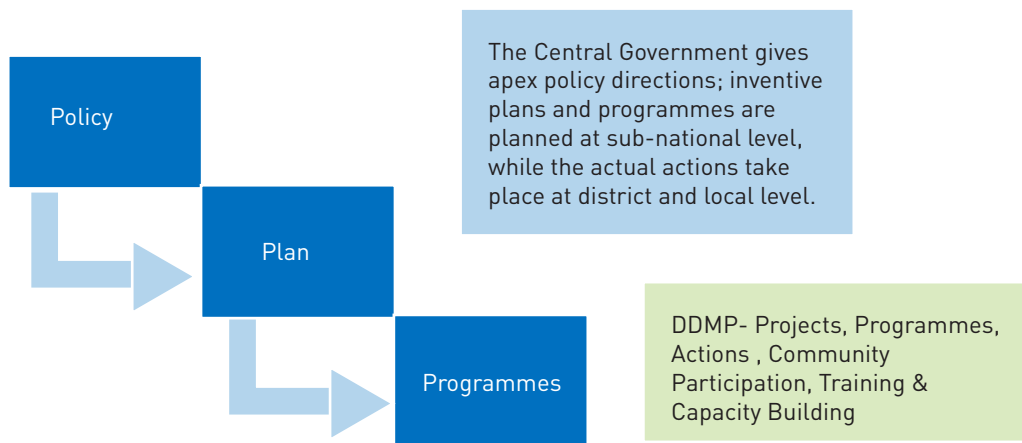
- The current implementation mechanisms of SAPCCs are practically non-existent below the state level. Neither there is a legal provision (such as the DDMPs that are mandated by a National Disaster Management Act (2005) nor the district level administration/departments or local bodies- Urban local bodies, Village Panchayats) have yet to come up with their climate action plans. Considering this, potential effectiveness of a Climate-Smart District Disaster Management Plan (Puri district of Odisha) prepared under the CDKN supported project (executed by GEAG, ISET, SDMA and DDMA) has been assessed for meeting the objectives of SAPCC implementation.
- DDMPs are implemented by the District Disaster Management Authority (DDMA) through their line departments (involving local government agencies) which are close to ground realities on nature and diversity of impacts resulting from different climatic disasters and extremes events on land, lives, property, ecosystem and resources of the people. In addition, the DDMP has established a mechanism for inter-department/inter-agency coordination - not only to respond to climate induced disaster but also to identify the vulnerability and risk to climate change, identify and implement mitigation actions and facilitate in capacity building of the key stakeholders. These features can greatly augment the capacity of states to implement SAPCCs by matching them with a bottom-up facilitation network. This includes the fact that they vertically integrate all units of government from village and cities to national level.
- In strategic hierarchy, the SAPCCs are between the national policy (NAPCC – with Eight National Missions and National Disaster Management Plan) and the ground level implementation of proposed actions and programmes at lowest administrative levels-district and local levels (Urban Local Bodies, Gram Panchayats). Thus, the implementation of SAPCCs at local level can be significantly bolstered by engaging with institutional, financial and monitoring mechanisms as envisaged in these Climate-Smart DDMPs (for example, Gorakhpur in Uttar Pradesh, Puri in Odisha and Almora in Uttarakhand).
- An innovative exercise of 'Qualitative Coding System' has been undertaken as a tool for assessing effectiveness of climate smart DDMP in implementing SAPCC. Therefore, an enabling framework that is backed by relevant policy and financial provisions is the need of the hour for actualising the implementation of SAPCCs using the provisions of DDMP.

Introduction

This study is part of the action project on integrating Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA) in sub-national level development planning and has been undertaken by Gorakhpur Environmental Action Group (GEAG) and Institute for Social and Environmental Transition-International (ISET-I) in technical collaboration with National Institute of Disaster Management (NIDM) faculty members for drawing the lessons for policy process and capacity building action which in the previous phase also resulted in the Delhi Declaration – Risk to Resilience 2014 (on Resilient Housing). The project has been supported by Climate and Development Knowledge Network (CDKN).

As the primary responsibility for dealing with disasters lies with the State Governments, this study caters to the process of CCA-DRR integration and mainstreaming it into development programmes, plans and projects at State level.

Figure 1: The Flow of Policy to Programmes in CCA-DRR



The study focuses on the three project states namely, Uttar Pradesh, Odisha and Uttarakhand. Currently the mechanisms for implementation of State Action Plan on Climate Change (SAPCC) - especially below the state level - are inadequate. As part of the project, DDMP of one district in each of the three states has been revised to evolve into a Climate-Smart DDMP. This involved a process of Shared Learning Dialogues (SLDs) to understand and engage with the key department's plans and programmes, and scaling up of the knowledge and lessons, thus generated, to the state level particularly in connecting the State Disaster Management Plan (SDMP) and SAPCC. Given the above backdrop, a review of literature and contextualization with the analysis carried out in the study has been accomplished to explore the ways for enhancing effectiveness of SAPCCs implementation. Specifically, the study answers following questions:

- To what extent SAPCCs address concerns of adaptation through disaster risk management?
- How SAPCCs have balanced their actions/provisions between adaptation and climate change mitigation?
- What are the challenges for implementation of SAPCCs at district and local level / through ground actions?
- How a comprehensive (and climate-smart) DDMP is useful in implementation of SAPCC?

ACTION PLANS ON CLIMATE CHANGE AND DISASTER MANAGEMENT IN INDIA

The National Action Plan on Climate Change (NAPCC, 2008) was released on 30th June 2008 offering a comprehensive strategy to deal with climate change. The action plan identifies measures to promote sustainable development of India along with co-benefits of addressing climate change. The core of this plan is Eight National Missions providing a multi-pronged approach to achieve key goals for addressing climate change. In 2009, the Indian National Government urged the state governments to come up with their own SAPCC in line with the eight missions in NAPCC (PIB, 2009).

As mandated by the Disaster Management Act 2005, the Government of India created a multi-tiered Institutional System of National Disaster Management Authority (NDMA), the State Disaster Management Authorities (SDMAs), and the District Disaster Management Authorities (DDMAs). The primary function of these bodies is to facilitate a paradigm shift from the hitherto relief-centric approach to a more proactive, holistic and integrated approach of strengthening disaster preparedness, risk mitigation, and emergency response (NDMP, 2016).

Table 1: Comparative analysis of State/District Disaster Management Plans and State Action Plans on Climate Change (SAPCC) at State level in India

	SDMP/DDMP	SAPCC
Authority	Multitier institutional framework National Disaster Management Authority, State Disaster Management Authority, District Disaster Management Authority, local authority	Advisory council on Climate change
Chaired by	Chief Minister, District Collector, Local authority	Chief Minister
Statutory/legal provision	The Disaster Management Act, 2005 / State Disaster Management Acts	No legal provisions
Nodal ministry	Ministry of Home Affairs	Ministry of Environment and Forests
Objectives	Comprehensive Disaster Management Plan addressing all natural and human induced hazards and disasters	Identifies measures that promote development objectives while also yielding co-benefits for addressing climate change effectively. It outlines a number of steps to simultaneously advance India's development and climate change-related objectives of adaptation and mitigation.
Departments	Disaster Management and Relief, Revenue	Forest and Environment department, Department of Environment, Science and Technology
Planning Approach	In line with the development plans of the State Five Year Plan	In line with the eight missions of the National Action Plan on Climate Change
Point of integration	Emerging concerns of urban, environment, population etc. are included in the proposed guideline	Disaster management has been included as a key area in SAPCC
Financial arrangement	National Disaster Response Fund (NDRF) and State Disaster Response Fund (SDRF), Mitigation fund (flexi fund 25% of all sponsored schemes/project funds), State Disaster Response Fund, National Disaster Response Fund, Chief Minister's Relief Fund 13 th finance commission allocations	No such dedicated funds for CCA but other ministries have funds under different missions

Source: Gupta et al., 2014b

Methodology

To start with, an extensive review of relevant secondary literature, reports and articles has been carried out. This has been combined with the objective assessments which included following:

- Analysis of how the aspects related to disasters risk management (DRM) and emergency response preparedness converge with the provisions of SAPCCs and its implementation framework. For this, an in-depth analysis of the vulnerability assessment section and DM & DRR component in sectoral analysis components of SAPCCs has been undertaken, for three states, viz. Uttar Pradesh, Odisha and Uttarakhand.
- The aspects analysed covered the following:
 - a. DM and DRR in their aims and objectives,
 - b. Disaster specific vulnerability assessment at state and district level, and
 - c. Sector specific key actions directly/indirectly catering to DRR as per NAPCC's guidance.
- Assessing the potential challenges in implementation of SAPCC that these states face. Systematic analysis of the Institutional, Financial and Monitoring & Evaluation (M & E) mechanisms was undertaken.
- Undertaking a detailed analysis of the comprehensive DDMP of a coastal district of Puri to assess its effectiveness

as a tool for implementation of SAPCC. The analytical study focused on how each section of the DDMP addresses different stages of disaster mitigation and management. Key actions, projects and programmes from each section of DDMP were identified and linked with the proposed actions in SAPCC.

- Innovative exercise through the tool “Qualitative Coding System” has been undertaken to demonstrate significant DDMP provisions that offer SAPCC actions implementation at different levels.

Key findings

HOW DO THE SAPCCs ADDRESS CONCERNS OF DISASTERS RISK REDUCTION AND DISASTER MANAGEMENT?

NAPCC envisages effective ‘disaster risk management’ in the “Other Initiatives (4.3 Disaster Management response to extreme climate events)” not a specific mission, but treated as cross-cutting aspect more implicitly in the Eight National Missions. It clearly highlights on the changing climate scenario for implications on frequency and intensity of disasters like cyclones, floods and droughts which are going to increase. It also talks about a paradigm shift in disaster management, from a ‘Response and Relief’ to ‘Prevention and Mitigation Centric’ approach. The plan identifies the importance of mainstreaming DRR into infrastructural project designs and strengthening communication networks and disaster management (DM) facilities at all levels.

The scenario of select SAPCCs is different to NAPCC, especially on the aspects of DRR and DM. It has been observed that most of the SAPCCs identify only strategic interventions to address climate change alone, putting emphasis on GHG reductions for mitigation measures and usually lacking provisions to deal with environmental vulnerabilities due to climate change impacts. This analysis has been carried out based on key provisions of DRM in the NAPCC. The SAPCCs which should follow the ideology of NAPCC should have the key provision of DRM within their frameworks. On that basis, the three key sections of SAPCC have been selected to analyze on how these sections have addressed the aspects of DM. The five key sectors analyzed were: Agriculture, Forest, Health, Coast & Disasters and Water. The findings from the three select SAPCCs are presented in the following table:

Table 2. DM and DRR in SAPCCs

State	Aim & Objectives	Disaster Specific vulnerability assessment (State & District level)	Sectoral Issues: Sectors or Sector Specific Key Actions directly/ indirectly catering to DRR as per NAPCC’s guidance
Odisha	Not mentioned	Yes, Multi-hazard mapping for districts	<p>Yes,</p> <p>Agriculture: Undertaking capacity building, Conducting climate-linked research studies.</p> <p>Forestry: Assessing fire management strategies, Obtaining access to updated knowledge on climate change science and policy developments, Capacity building of Panchayati Raj institutions / communities / JFM institutions to adapt to climate change.</p> <p>Health: Capacity Building of the health sector on climate change, strengthening approaches to deal with the physical and psychological impacts due to extreme weather conditions caused by climate change, Integrating climate change considerations in the State Health policy.</p> <p>Water:- Development of flood forecasting models, Constructing and protecting water harvesting structures, Raising awareness with Pani Panchayat through Farmers’ Training Programme and creating agro-climatic stations, Integrated Water Resources Management</p> <p>Specific Sector: Coasts & Disasters</p>

State	Aim & Objectives	Disaster Specific vulnerability assessment (State & District level)	Sectoral Issues: Sectors or Sector Specific Key Actions directly/ indirectly catering to DRR as per NAPCC's guidance
Uttar Pradesh	Not Mentioned	Yes, Indirectly- Exposure & Sensitivity related vulnerability mapping. Impact of extreme events on water resources	<p>Yes,</p> <p>Agriculture:- Identification of Vulnerable areas and assessing Vulnerability, Climate responsive research programmes, Establishment of Climate Field Schools (CFS) (One in each block), Establishment of climate change and agriculture cell.</p> <p>Forest:- Plantation (Afforestation and Reforestation) by Forest Department, Road side/canal side plantation, Management of dense forests, protected areas and wetlands</p> <p>Water:- Enhancement of Observational Infrastructure and Flood Management, Enhancing Preparedness for Drought Monitoring, Drought Mitigation and Development of Early Warning System, Research and development, Training and Capacity Building, Integrated water resource management in over exploited areas including basin management plan, Assessment of impact of climate change on water resources of Uttar Pradesh.</p> <p>Strategic Knowledge for Climate Change:- Various actions under this mission like Flood mapping, flood forecasting and downscaled climate change projections modelling, Hazard risk mapping and climate modelling</p>
Uttarakhand	Yes, Key importance is given to adaptation options along with Disaster Risk Reduction	No, but gives importance to the study by the Kumaon University Centre for Climate Change report which includes vulnerability due to hazards & disasters. The CDKN supported project titled "Vulnerability and Risk Assessment to Strengthen Uttarakhand SAPCC" has completed the District and Block level analysis of VRAs.	<p>Agriculture:- Investments in infrastructure for water management and soil conservation, Improved information, knowledge base and dissemination of information on climate changes and options to adapt to them</p> <p>Water:- Incorporation of DRR methods, Capacity development, education and awareness at all levels as high-priority agendas, Steps to foster integrated water resources development and management planning, and seeking convergence among various water resources programmes and organizations.</p> <p>Health:- Developing and strengthening disaster management teams in every district hospital specifically to respond to the effects of extreme climate changes and to increase co-ordination between the health sector agencies in the state and the disaster management department. Build and improve scientific knowledge and evidence base and understanding of climate change and its impacts on human health, Review the State Health Policy to incorporate climate change concerns, Develop better approaches to deal with heat wave conditions and protocols for dealing with the physical and psychological impacts after extreme weather events, Undertake a range of capacity building measures including awareness about various health hazards, & training of medical personnel etc.</p> <p>Forest:- Management of forest fires, Development of appropriate silvicultural techniques with climate change considerations, Increasing the existing area under forests and trees and improving the quality and density of the degraded forests.</p> <p>Specific Sector: Disaster Management</p>

CHALLENGES IN IMPLEMENTATION OF SAPCCs

The framework description for implementation planning is very limited in the SAPCCs especially on how the provisions would be executed at district/local level. Since none of the three SAPCC documents studies give an exclusive framework for implementation of actions, the extent of preparedness of the states for implementation have been examined by looking into the Institutional Structure to implement the present and future actions, financial mechanism, capacity and resources to facilitate

research, scientific assessment, data generation, management and sharing and monitoring & evaluation.

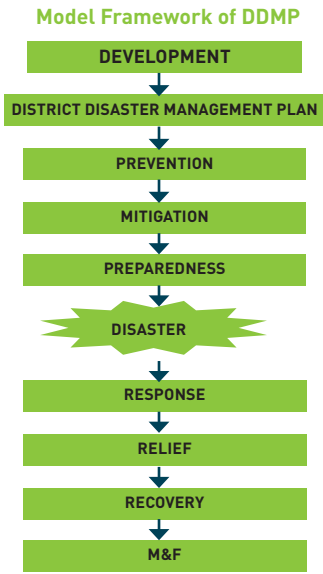
Table 3. Assessment of Strategies for Implementation of selected SAPCCs

Strategies for Implementation	Odisha	Uttarakhand	Uttar Pradesh
Institutional Mechanism	Yes, Orissa Climate Change Agency, Climate Change Action Plan Cell (2011)	Yes, Climate Change Cell, Important role of PPP in implementation. The Climate Change Cell is now there in place with announcement of 1% departmental budget to be allocated to deal with climate change issues.	Yes, State Level Climate Change Authority
Financial Mechanism	Estimation –Yes, action wise financial requirements Sources :Yes, identified sources for every action and includes Central assistance, state government allocations, external funding, donor agencies etc.	Estimation: - Yes, total budget estimation is given along with sector specific budgets. Yes, 1% of departmental budget allocated to deal with climate change issues. Sources: - Yes, civil society organisations, external agencies & international institutions.	Estimation: - Yes, Total budget estimation is given with a break-up of sector wise budget.
Monitoring & Evaluation	Yes, sector specific M&E framework is given with key targets & programmes to monitor for each sector	Yes, M & E framework is articulated which is overseen by State Committee on Climate Change.	Yes, M & E framework is given. Directorate of Environment and State level climate change authority
Research & Capacity Building (Human Resource, Scientific Research, Training)	Research- Yes, emphasis on need for scientific assessments. Capacity building-Yes, integrated with the sectoral actions. HR- Yes, Emphasis on requirement of policy makers, economists, engineers & scientists to solve problems related to climate change.	Research- Yes, Emphasis on the need of scientific research to build scientific data & evidence for the state. Capacity Building- Yes, emphasis on enhancing the capacities of government line departments for monitoring & implementation of the plan Training- Yes, Incorporating climate change related modules into educational curriculum	Yes, Strategic Knowledge on Climate Change Mission
Knowledge Management (Data & Information generation & management)	Yes, Climate Change Agency for sharing data and information	Yes, identifies the role of civil society, other Himalayan states & international support in knowledge management	Yes, Strategic Knowledge on Climate Change Mission. Also integrated in sectoral key priority actions.

DDMP AS EFFECTIVE TOOL FOR IMPLEMENTATION OF SAPCC

Within the structure of analyzed SAPCCs, it is observed that the key priorities are identified according to the sectoral needs, but the importance of local level (District or Village) implementation is not identified. For a plan to be effective at ground level, the vulnerability assessment should include the local vulnerabilities to climate change. The specific policy actions should be based on these local vulnerabilities and needs of people at the lowest administrative level. This bottom-up approach can be scaled up to state level for effective and successful implementation of proposed actions and plans in SAPCC. The shortcomings in the implementation approach of a SAPCC can be ruled out by various provisions of DDMP. For this purpose, a thorough understanding of a DDMP from CCA-DRR perspective and knowledge of various provisions in different sections is required. With such understanding, it becomes evident that the provisions of DDMP can act as precursors to actions in a SAPCC.

Figure 2. DDMP Preparation Model Framework (Source: Puri DDMP, 2016)



By the introduction of DDMPs like Puri, Almora and Gorakhpur which have integrated climate change concerns and related adaptation components within their structure, the exposure and sensitivity can be reduced and the adaptive capacity of humans and environment can be increased to climate change and associated disaster risks. A comprehensive DDMP like that of Puri ensures - effective communication between communities and governments, mobilizes funds, human and material resources and coordination between various sectors. All these help to achieve effective and quick response to climate related hazards. On the basis of our analysis of DDMP of Puri and SAPCC of Odisha, we have come up with the following figure. It shows the linkages between different sections of SAPCC and DDMP. For example in the Step 1 of vulnerability assessment in SAPCC, the provisions in sections II, III, IV, V, VI, VII and IX of DDMP will help or will act as precursors to the actions in vulnerability assessment of SAPCC. Table 4 shows overall result of the analyses.

Figure 3. Odisha SAPCC in a Nutshell- How DDMP actions/programmes/projects act as Tool for Implementation of SAPCC

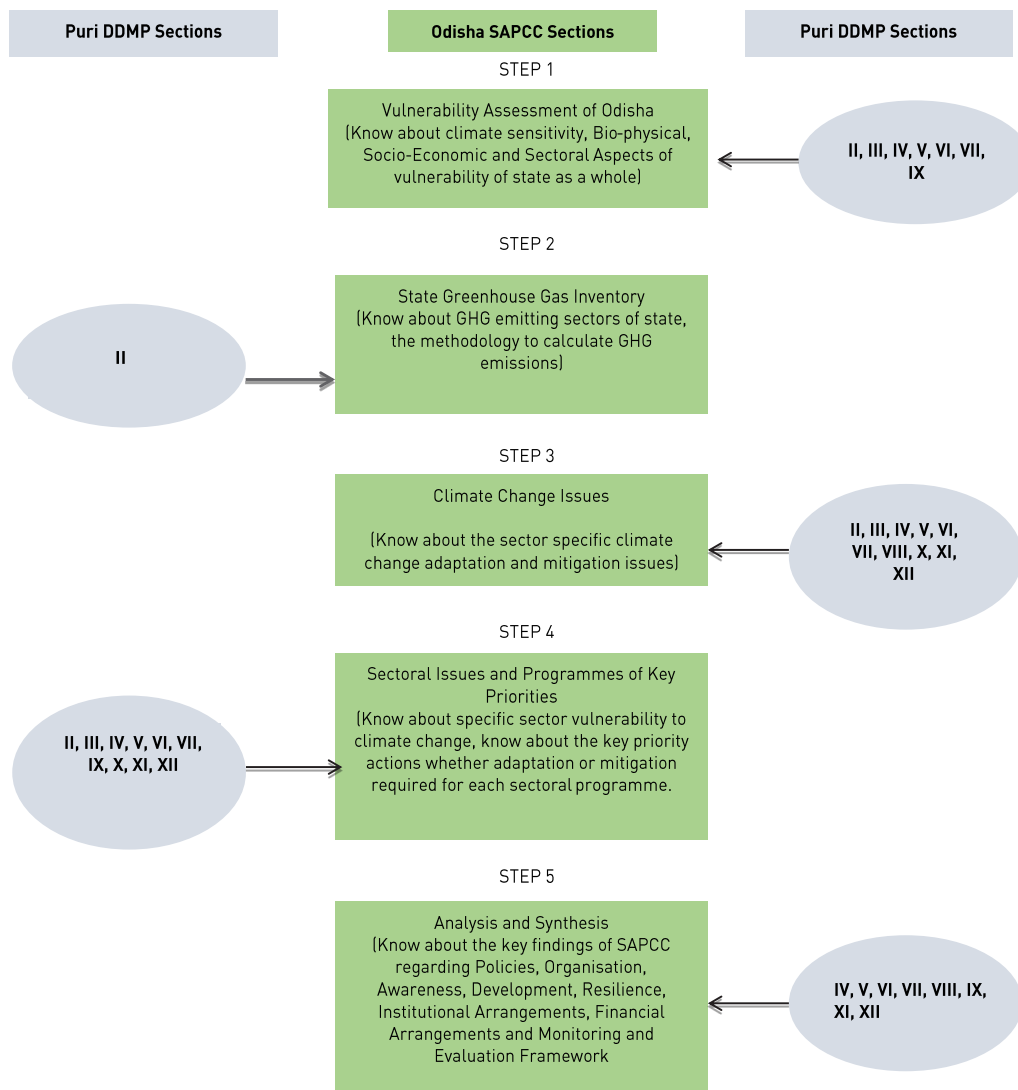


Table 4: Usefulness of Climate-Smart DDMP of Puri in implementation of the SAPCC

Components of DDMP	Usefulness of DDMP in implementation of SAPCC				
	Very High	High	Medium	Low	Very Low
District Profile		★			
HRVCA	★				
Institutional Arrangements			★		
Inventories & Evaluation of Resources					★
Preparedness & Capacity Building Programmes	★				
Mitigation Plan	★				
Response Plan				★	
Damage Assessment, Reconstruction and Rehabilitation Plan as per State DM Policy					★
Standard Operating Procedures			★		
Budget and Financial Allocation			★		
Monitoring and Evaluation		★			

A detailed analysis of DDMP of a coastal district of Puri was done to know the comprehensiveness of a DDMP and its effectiveness as a tool for implementation of SAPCC. The study analyzed on how each section of DDMP addresses the different stages and aspects of disaster risk management reflecting in the implementation of SAPCC in context of district and local level planning and actions. Key actions, projects and programmes from each section of the DDMP were identified and linked with the proposed actions in SAPCC with the help of a coding system.

QUALITATIVE CODING SYSTEM EXERCISE

The “Qualitative Coding System” (QCS) developed for this study gives unique codes to each section of SAPCC. The section specific actions identified from SAPCC, the key sectors identified in SAPCC and the key proposed actions in these sectors were all given unique codes. The following tables give the key to QCS generated through this study:

Table 5: Key to Qualitative Coding System

SAPCC- Codes of Key Sectors	AG -Agriculture
	CD -Coasts & Disasters
	FO -Forest
	HE -Health
	WR -Water Resources
SAPCC Sectors- Categorisation of Actions	A: -Adaptation
	M: -Mitigation
SAPCC- Codes of Chapters	SV -Vulnerability Assessment
	SG - Greenhouse Gas Inventory
	SC - Climate Change Issues
	SS - Sectoral Issues
	SI - Institutional Arrangements
	SF - Financial Arrangements
	SM - Monitoring & Evaluation
DDMP Section Codes	II - District Profile
	III -HRVC
	IV - Institutional Arrangements
	V -Inventories & Evaluation of Resources
	VI - Preparedness & Capacity Building

	VII-Mitigation Plan,
	VIII-Response
	IX-Damage Assessment, Reconstruction, Rehabilitation
	X-Standard Operating Procedure
	XI- Financial Arrangements
	XII-Monitoring & Evaluation.

Table 6: Qualitative Coding System: Codes of key actions in different chapters of SAPCC

SAPCC CHAPTER- Vulnerability Analysis , CODE SV	
Actions	Action Code
Multi-hazard mapping for each district	SV1
Sectoral segmentation of vulnerability	SV2
Socio-Economic Vulnerability Assessment	SV3
SAPCC CHAPTER- Greenhouse Gas Inventorization, CODE SG	
GHG Emissions Calculation	SG1
Mitigation from conservation measures	SG2
SAPCC CHAPTER- CODE SC	
Understanding Adaptation	SC1
Understanding Mitigation	SC2
SAPCC CHAPTER- Institutional Arrangements, CODE SI	
Formation of working groups for sectors	SI1
Formation of Orissa Climate Change Agency for inter-sectoral and inter-departmental coordination	SI2
SAPCC CHAPTER-Financial Arrangements, CODE SF	
Budget allocation for each sector	SF1
SAPCC CHAPTER- Monitoring & Evaluation Framework, CODE SM	
The monitoring of impacts of climate change and of progress in achieving key targets	SM1
The evaluation of programs undertaken to mitigate climate change as well as to adapt to its consequences	SM2
Sector Specific M & E -Key Impacts to Monitor -Targets to Monitor -Key Programmes to Evaluate	SM3

To link up different sections of DDMP and SAPCC, sections of DDMP were also given specific codes. Finally, the QCS was used in developing matrices in a tabular format to show how different sections of DDMP are catering to other sections of the same DDMP and on how the activities/actions/arrangements in different sections of DDMP are precursors to the proposed actions/programmes in SAPCC.

In this study we have systematically analyzed each and every section of the SAPCC and DDMP. Our analysis and recommendations demonstrated that a comprehensive DDMP which addresses DRR issues can be used as an effective tool for implementation of SAPCC. Two example QCS results of DDMP usefulness in SAPCC implementation are given here.

Table 7. Commonalities between DDMP Actions in different DDMP Sections and SAPCC (Preparedness)

DDMP Actions	DDMP and SAPCC Linkages							
	DDMP Sections		SAPCC Sections					
	VIII	IX	A	M	SV	SS	SI	SM
DRR Programmes and Projects. (Caters to vulnerability, Interdepartmental Coordination, community participation, M and E for DRR and CCA and training and capacity building for CCA-DRR)			SC1	SC2	SV1,SV3	SAG-1,6 SAG-5,7,8,9,12,13,17,18,SCD-1,6,12,13, SFO8	SI2	SM-1,2,3
Preparedness Checklist (Vulnerability map, Capacity Analysis, List of Food Storage facilities and Dealers, Dissemination of warning/coordination, Department wise checklist-Agriculture, Health,			SC1	SC2	SV-1,2,3	SAG-2,7, SCD1 SAG-11,12,13,14,SCD6, SHE-2,3,5,6	SI2	
Community Based Shelter Management(Cyclone Shelters, Health)			SC1			SCD14 SCD-1,7, SHE4		
Preparedness measures for different departments like Health, NGO			SC1	SC2		SHE-3,4,5, SWA-3,5,7 SAG-8,14,15, SCD-1,5,6,14,16, SFO-6,7		

On the basis of our analysis we identified the relevant DDMP sections which can directly or indirectly cater to the implementation of proposed sectoral actions of SAPCC. In our analysis, “Directly” means an action/programme specifically catering to the proposed action can be found out in the analyzed DDMP whereas “indirectly” means that we could not find the exact action in the analyzed DDMP but it can act as a precursor to the proposed action in SAPCC.

Figure 4. Key to use the table 8 (example – Agriculture)

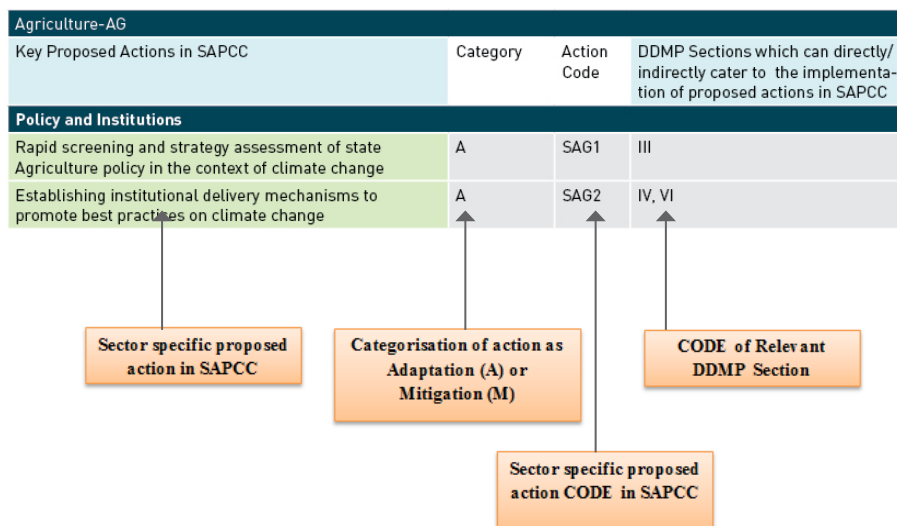


Table 8. Matrix showing DDMP provisions addressing SAPCC agenda (Agriculture as example)

Agriculture-AG			
Key Proposed Actions in SAPCC	Category	Action Code	DDMP Sections which can directly/indirectly cater to the implementation of proposed actions in SAPCC
Policy and Institutions			
Rapid screening and strategy assessment of state Agriculture policy in the context of climate change	A	SAG1	III
Establishing institutional delivery mechanisms to promote best practices on climate change	A	SAG2	IV, VI
Increase the area under perennial fruit plantation to help cope with uncertain weather patterns	A	SAG3	VII
Stop indiscriminate conversion of agricultural land.	M	SAG4	VII
For enhancing the adaptive capacity of agriculture sector public investment in irrigation, research for adaptive cultivars of main crops and better forecasting model decision support system would be needed and incorporated in the policy.	A	SAG5	VI, VII
Conducting climate-linked research studies	A, M	SAG6	III, VI, VII
Capacity Building			
Capacity Building and Technical Support to CBOs for better management of land and water to adapt to climate risks.	A	SAG7	VI, VII
Capacity Building of Extension Personnel and Farmers.	A, M	SAG8	VI, VII
Use of Gram Panchayat training Hubs for dissemination of information on climate change.	A	SAG9	VI
Continuing the livelihood focused, people-centric integrated watershed development programmes in rain-fed areas vulnerable to climate variations Sustainable livelihood interventions, There will be a continued investment in integrated watershed development programmes in climate sensitive areas and in furthering their replication across Orissa	A, M	SAG10	VII, XI
Training Needs: (i) crop/ varietal diversification (ii) shortening or lengthening, growing season planting date etc. (iii) mixed farming (iv) non-farm enterprise (v) better land and water management along with cropping mix (vi) risk transfer through insurance (vii) Assessment and promoting climate resilient indigenous farming practises.	A, M	SAG11	VI, VII
Improving monitoring and surveillance Techniques. Deciding on appropriate cropping, strengthening of pest surveillance, building response capacity through training, proactive measures for plant protection and introducing appropriate new farming techniques will be undertaken as a part of this initiative. Steps will be taken for creating massive awareness	A	SAG12	{Training and Capacity Building and Awareness} VI, VII, X, XII
Knowledge and Research			
Develop water-efficient micro irrigation methods for individual and community farm ponds. This will require the development of water-use. Efficient micro-irrigation methods such as drip irrigation systems and individual/community farm ponds. Small natural water bodies will be protected and nurtured in the upper catchment area.	A	SAG13	VI, VII
Develop preparedness to tackle emerging scenarios of pests.	A	SAG14	VI

Increase production of rice seeds to meet requirement under various weather scenarios.	A	SAG15	VI, VII
Use of weather data in order to generate appropriate response to possible climate scenarios.	A	SAG16	II, III, VI, VII
Developing sustainable soil, water and crop management practices	A, M	SAG17	VI, VII
Breeding studies on major crops for tolerance /resistance	A	SAG18	VI, VII Agriculture-Capacity Building, Prep
Seed Improvement	A	SAG19	VII

A mitigation plan in DDMP puts focus on the impact of a hazard, gives structural and non-structural measures and approaches to eliminate or limit a hazard's exposure and the impact on people, property and the environment. The mitigation plan of Puri district is unique in its own way as it incorporates a climate change action plan. An analysis of the DDMP with respect to its mitigation plan has been undertaken for its usefulness in SAPCC implementation. The QCS result is given in table 9.

Figure 5. Key to use the table 9 (An example of "Institutional Arrangements in DDMP" is taken to understand the Qualitative coding System.)

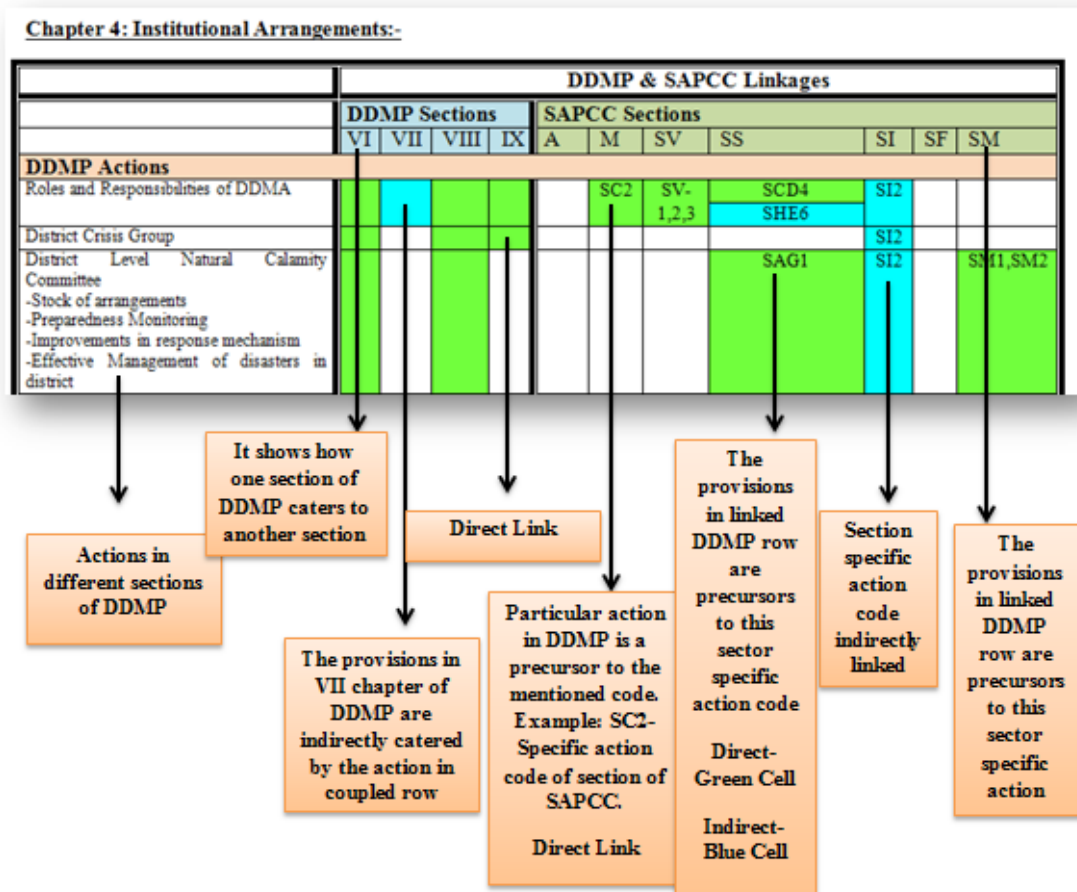


Table 9. Commonalities between DDMP Actions in different DDMP Sections and SAPCC (Mitigation)

DDMP Actions	DDMP and SAPCC Linkages									
	DDMP Sections			SAPCC Sections						
	VI	VIII	IX	A	M	SV	SS	SF	SI	
Planning assumptions for different departments				SC1						
Disaster Specific Measures and Approaches (Heat wave, Water, Disaster-Floods, Cyclones, Food)				SC1	SC2		SCD-15,16,SHE5,SWA4		SI2	
Climate Change Action Plan Remarks: Department/Sector wise impacts against each disaster are given along with existing coping practices (Disasters:- Cyclones, Floods, Drought, Heavy Rains) (Department/Sector:- Agriculture, Health, Water)				SC1	SC2	SV1, SV2	SAG-3,4,11,13, SHE2, SWA-4,5,7 SAG-7,17,SCD2			
Understanding Disaster Risks				SC1		SV1,SV2				
Inter-Agency Coordination for Disaster Management							SAG2,SCD4		SI2	
National/State Schemes for CCA-DRR (Health, Water, Agriculture, Disaster Preparedness)				SC1	SC2	SV2,SV3	SAG-4,6,7,9,17,SCD11,SHE2			
Investing in DRR Structural and Non-Structural Measures (Agriculture, Forestry, Health) Specific capacity needs for various departments (Health, Forest, Agriculture)				SC1	SC2		SAG-1, 5,8,10,11,12,13,19, SCD5, SFO-1,2,3,4,5,SHE2,5 SAG-4,4,7,9,15,17,18,SCD3,SFO12	SF1		

Key Recommendations

The Climate-Smart DDMPs are useful tools to bolster implementation of SAPCCs at the district level. There is a need to replicate preparation of such DDMPs in all the districts in India. Towards this, states of Uttar Pradesh and Uttarakhand have already taken concrete steps. The CDKN supported previous phase of the project in Gorakhpur which contributed to Government of Uttar Pradesh issuing Government Order (No-199/1-11-2013-state/11 dated March 13, 2013) for integration of DRR in Development Plans of various line departments. Also, in the state level consultation held recently in Dehradun, the state capital of Uttarakhand, the Disaster Mitigation and Management Centre (DMMC) (which is the key agency for coordinating preparation of DDMPs in the state) declared to take steps considering Climate-Smart DDMP of Almora district as model DDMP for the state. On action by Odisha state, similar clear policy actions are envisaged to apply the lessons of climate smart DDMP process undertaken at Puri district.

The Climate-Smart DDMPs have great potential to promote a bottom-up planning approach to revision and implementation of SAPCCs.

The implementation of SAPCCs at the lower levels of governance (district and village/ town/ city) can be strengthened by internalising the institutional, financial and monitoring mechanisms of Climate-Smart DDMP.

For actualising implementation of SAPCCs using the provisions of DDMP, an enabling framework is the need of the hour that is backed by relevant policy and financial provisions.

In most of the developing countries, there are different national level apex institutions for dealing with the subjects of Climate Change and Disaster Management, resulting in demand for creating two separate lines of sub-national level entities. For example in India these are the Ministry of Environment, Forest and Climate Change (MOEFCC) and Ministry of Home Affairs (MHA). However, at the sub-national levels, enabling policy frameworks are needed for integrating one sub-national entity with the other to address the gaps in capacity and inadequate institutionalization of implementation arrangements of either of the sub-national entities.

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