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Developing Financing Strategies for Implementing the State Action Plans on Climate Change

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February 2013

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Cover Images: Vivek Venkataramani

The report can be downloaded from
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Abstract

The project, "Developing Financing Strategies for Implementing the State Action Plans on Climate Change," aims at developing strategies to raise funds in order to assist the Central and State Governments in India to implement the State Action Plans on Climate Change (SAPCC) in an effective and efficient manner. This report is a high level strategy document based on interim findings from the project. It is based on a combination of interviews with experts and the authors' own research and expertise. This report primarily focuses on ways for States to access and leverage Central Government funds, thus, reviews the strengths and weaknesses of the current State Plans. It makes a detailed comparative assessment of select SAPCCs and some of the sectoral strategies therein with the corresponding national missions under the National Action Plan on Climate Change. The views of experts regarding challenges and opportunities to raise resources for implementation of the SAPCCs have been distilled and presented as high level strategies. This report also provides an analysis of various institutional arrangements for Centre-State disbursement of funds for climate change based on expert evaluations. It is hoped that the outputs of the report will enable both national and sub-national governments in better understanding some of the issues with the current State Plans and developing effective strategies when they start implementing some of these activities. Further, it will provide actionable insights to State Governments for a meaningful engagement with various actors to better target the State-specific requirements.

Acknowledgements

The authors are indebted to the experts who spoke to us at length sharing their knowledge and experience. We are deeply grateful to Rajasree Ray, Additional Economic Adviser, Department of Economic Affairs, MoF and Ritu Bharadwaj, Climate Change and Environment Adviser, DFID India for their input and assistance during the study and the preparation of this report. We are also very thankful to Jyotsna Mehta, Consultant, Climate Change Finance Unit, Department of Economic Affairs, MoF and our colleague, Revati Dhoble, Senior Researcher, IFMR for informal review of the report. We would also like to express our gratitude to DFID India for supporting this work.

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List of Acronyms

BCCI-K	Bangalore Climate Change Initiative, Karnataka
BPO	Business Process Outsourcing
CAMPA	Compensatory Afforestation Fund Management and Planning Authority
CDM	Clean Development Mechanism
DFID	Department for International Development
EE	Energy Efficiency
ESCO	Energy Service Company
FIT	Feed-in-tariff
GDP	Gross Domestic Product
GHG	Greenhouse Gas
INR	Indian National Rupee
JGY	Jyotigram Yojana
KWh	Kilowatt Hour
MNREGA	Mahatma Gandhi National Rural Employment Guarantee Act
MoEF	Ministry of Environment and Forests
MoF	Ministry of Finance
NAIS	National Agricultural Insurance Scheme
NAPCC	National Action Plan on Climate Change
NGO	Non-Government Organization
NMSA	National Mission for Sustainable Agriculture
PAT	Perform Achieve and Trade
PLF	Plant Load Factor
PRI	Panchayati Raj Institution
R&D	Research & Development
RCT	Randomized Controlled Trial
RE	Renewable Energy
SAPCC	State Action Plan on Climate Change
SGDP	State Gross Domestic Product
WBCIS	Weather based Crop Insurance Scheme

1. Introduction

1.1 PROJECT DESCRIPTION AND GOALS

The purpose of this project is to develop financing strategies that would assist the Central and State Governments in implementing the State Action Plans on Climate Change (SAPCC) in an effective and efficient manner. This report is a high level strategy document based on interim findings from the project. It highlights some of the major challenges involved in raising resources and recommends some useful strategies that would help mobilize funds from various sources. This report primarily focuses on ways to access and leverage Central Government funds. Although there has been some assessment of private and international funds, they will be dealt with in greater detail in the next phase of the project.

The purpose of this exercise has been to produce a rapid assessment of the barriers and opportunities in raising funds to implement the SAPCCs based on interviews with experts and policymakers, as well as the project team's research and expertise. The authors hope that this document would enable both national and sub-national governments in better understanding some of the issues with the current plans and developing effective strategies when they start implementing some of these activities. The authors also believe that the results of the study would provide some constructive insights for States to engage with various actors and better target them in relation to their State-specific requirements.

1.2 CONTEXT

The Government of India, in 2008, released the National Action Plan on Climate Change (NAPCC), which marks the country's initial attempt at preparing a deliberate and coordinated national response to global warming. The NAPCC identifies climate adaptation and greenhouse gas mitigation measures to simultaneously advance India's development and climate change-related objectives. The action plan was constituted from detailed plans submitted to the Prime Minister's Council on Climate Change, and consists of eight national missions. They are the National Solar Mission, National Water Mission, National Mission on Sustaining Himalayan Eco-system, National Mission on Enhanced Energy Efficiency, National Mission on Strategic Knowledge for Climate Change, National Mission for a Green India, National Mission for Sustainable Agriculture, and National Mission on Sustainable Habitat. In the context of the NAPCC, it has become imperative for all States in the country to have programmes of action that tune national initiatives to regional and local socio-economic and ecological conditions. This has assumed the shape of formulation of State

Action Plans on Climate Change. The SAPCCs document current and future development scenarios and likely impact of climate change, and identify vulnerable areas, sectors and communities and associated risks. Based on this assessment, each State has come up with its own list of activities to address these issues in specific sectors that are in line with the national climate missions. But progress of States towards achieving these goals is likely to falter over a familiar stumbling block: financing.

Successful implementation of the SAPCCs will depend on how well the plans are written, clarity of objectives and targets and prioritization of actions according to a well-defined set of criteria. Potential to raise resources will also depend on how well the State Action Plans are aligned with the national missions and States' strategies to leverage national and international funds. There needs to be synergies between Central expenditure and State finances and actions. Appropriate institutional mechanisms need to be created for Centre-State disbursements of public (domestic) funds.

2. Methodology

2.1 RAPID ASSESSMENT OF THE STATE ACTION PLANS

States were divided into six categories based on their economic profile – State Gross Domestic Product (SGDP) and Per-Capita Income[1]. Other criteria for categorizing States that might be relevant in this context, such as mitigation profile, vulnerability to climate change etc. were considered, but could not be applied due to lack of uniform data across all States.

Table 1: Categorization of States based on Economic Profile

	High Contribution to country's GDP (5-15%)	Medium Contribution to country's GDP (1-5%)	Low Contribution to country's GDP (less than 1%)
High per capita income (greater than INR 38,169)	***PEER GROUP I***	***PEER GROUP II***	***PEER GROUP III***
	Maharashtra Andhra Pradesh Tamil Nadu Gujarat Karnataka	Kerala Haryana Punjab	Himachal Pradesh Goa
Low per capita income (less than INR 38,169)	***PEER GROUP IV***	***PEER GROUP V***	***PEER GROUP VI***
	Uttar Pradesh West Bengal	Rajasthan Madhya Pradesh Bihar Orissa Chhattisgarh Assam Jharkhand	Uttarakhand Jammu & Kashmir Tripura Meghalaya Nagaland Manipur Arunachal Pradesh Mizoram Sikkim

Source: Environmental Sustainability Index 2011, Centre for Development Finance, IFMR (2012)

We selected at least one State from each category for the purpose of comparative assessment of the State plans, except for Peer Group III where none of the States had developed their SAPCCs when this exercise was undertaken. The categorization of States was done primarily to facilitate our understanding of State-specific challenges and ease of assessment, given the short timeframe for the study. The financing strategies presented in this report, however, are more generic in nature and apply across all States.

1 Rupanwita Dash, 2012, Environment Sustainability Index for Indian States 2011 accessed in August 2012

Based on a National Consultation Workshop[2] organized by the MoEF and international best practices in developing sub-national climate action plans, the project team developed a set of criteria against which the Plans of all the six selected States were evaluated. The criteria were developed mainly from the perspective of raising finances and are by no means an exhaustive list to evaluate the design of the Plans. The criteria used are described below:

Climate Profile and Assessment of Vulnerabilities: Did the Plan consider the emissions profile of the State and its vulnerability to climate change in order to come up with actions in different sectors?

Goals and Targets: Are the goals and targets properly defined?

Prioritization of Strategies and Actions: Did the Plan make an attempt to prioritize actions based on an objective set of criteria, such as effectiveness in reducing GHGs, existing institutional capacity or programs, private sector costs and savings, public sector costs, economic gains, social equity etc.?

Inter-Departmental Coordination: Is there an institutional mechanism in place/ proposed to coordinate the activities of various Departments/sectors and identify access to and leverage existing programs, resources, and tools developed by other Departments and organizations?

Cost Assessment: What are the existing allocations and additional resources to be mobilized for the proposed actions?

Identifying Sources of Finance: Does the Plan identify existing financing options and potential sources for resource mobilization?

2.2 DEVELOPING FINANCING STRATEGIES

The study used a combination of expert interviews[3] and desk research to understand the major challenges and barriers and to come up with some high level strategies to raise resources in order to implement the SAPCCs. The team, comprising the authors, DFID and the Department of Economic Affairs, MoF identified the experts. These are individuals proficient in their respective fields and are either domain experts and / or have a good understanding

2 2010, National Consultation Workshop on State Action Plans on Climate Change, MoEF. Workshop proceeding available at http://www.moef.nic.in/modules/others/?f=sapcc-workshop

3 One or more members of the research team spoke to each expert at length, generally over the phone, except in a few cases where the experts were based in Chennai. A serious attempt was made to keep comments constructive and relevant to the issue at hand. All interviews were recorded and then transcribed. Some analysis has been done for the points they have made, although a more detailed analysis of some of the recommendations will be done in the next phase of this project.

of climate policy and climate finance issues. Experts were chosen from four distinct groups – a) State and Central Government policymakers/bureaucrats, b) Consultants who had drafted SAPCCs, c) Private sector investors and entrepreneurs, and d) Independent experts or individuals from NGOs, think tanks and academia. An alphabetical listing of experts is provided in Annexure 1.

3. Results and Findings

3.1 STRATEGIES TO MOBILIZE FUNDS

A. A well written Plan is key to identifying needs and raising resources

The State Action Plans of the six selected States were evaluated against the criteria mentioned earlier. The detailed findings are presented in the form of a matrix given below.

Table 2: Evaluation of SAPCCs for select States

States / Criteria	West Bengal	Sikkim	Haryana	Karnataka	Rajasthan	Orissa
Climate profile:(GHG emissions, inventories and climate scenarios)	Provides details on observed changes in climate and future climate projections. Plan does not provide any details about the GHG emissions pattern in the State. GHG inventory data is in the process of being prepared and will be available in the final version of the action plan.	Provides details on observed changes and future projections on climate change. The plan does not provide any details about the GHG emissions in the State.	Provides detailed assessment of climate change scenarios along with future projections on climate for the State. Provides assessment of GHG emissions by sector for the year 2005-06.	Detailed assessment provided on climate change scenarios, projected change in climate and information on sector wise GHG emissions for the State based on recent studies (2011) by Bangalore Climate Change Initiative-Karnataka.	Provides details on observed changes in climate and future projections on climate change. Provides an account of GHG emissions inventory across sectors and districts in the State (1995 data).No recent study on GHG emissions structure for the State.	Does not provide any details on current status, future projections on climate change. There is no information provided on GHG emissions for the State.
Assessment of vulnerabilities	Emphasizes the need to assess vulnerabilities	The plan provides details on the likely impacts and vulnerabilities due to climate change on various sectors such as – water resources, agriculture, bio-diversity, hydro power generation, habitat and transport. The plan also provides detailed vulnerability assessment of rural communities.	The plan provides details on the likely impacts and vulnerabilities due to climate change on various sectors such as –water, forest, agriculture and human health.	BCCI-K (2011) has prepared a district wise vulnerability index for Karnataka based on the following dimensions- demographic and social, occupational, agricultural and climate. Proactive in conducting vulnerability assessments.	Emphasizes the need for vulnerability assessment and relevant research to be undertaken.	Emphasizes the need for vulnerability assessments and relevant research to be undertaken.
Prioritization of strategies	In depth sectoral analysis done to identify key priorities. Sectoral experts were consulted for guidance towards prioritization.	In depth sectoral analysis done to identify key priorities. Priorities were identified by conducting workshops for different working groups.	No explicit mention of prioritization of strategies.	Key priorities identified for each sector. No explicit mention of the approach used for prioritization.	Key priorities have been identified by taking into account national policies, sectoral strategies under the national missions and State level priorities, through multi-stakeholder consultations and interactions.	The working groups developed a prioritization approach to create a distinct list of priorities by categorizing them into high, medium and low priorities. Each working group identified 10-12 key priorities for the five year period 2010-15. The priorities were then shared with external stakeholders to obtain feedback.

States / Criteria	West Bengal	Sikkim	Haryana	Karnataka	Rajasthan	Orissa
Inter-Departmental Coordination	No explicit mention. Plan proposes to set up an institute for climate change which will be responsible for tracking research from different departments and also undertaking its own.	No explicit mention.	Constitution of Climate Change Authority in the State is being planned to facilitate coordination among various departments.	No explicit mention.	Climate change and Clean Development Mechanism Cell was set up in April 2010 under the Rajasthan Pollution Control Board.	Plan proposes setting up of a State Climate Change Agency for coordination.
Cost Assessment[1]	Cost assessments have been provided for most sectors except horticulture, livestock and energy efficiency.	Cost assessments provided for all sectors identified in the action plan.	Cost assessments provided for all sectors identified in the action plan.	No cost assessments provided.	Cost assessments are not provided for many of the strategies in the following sectors- energy, urban governance and development, and water.	Cost assessments have been provided for all sectors mentioned in the action plan.
Identifying sources of finance	No sources of funding identified.	No sources of funding identified.	No sources of funding identified.	No sources of funding identified.	No sources of funding identified.	Yes, identified sources for every action.
Targets	Actions proposed for strategies are defined more in terms of goals rather than targets, Fisheries sector has well-defined targets.	No specific targets for most sectors except for some sectors like water. Clear timelines have been provided for all actions.	Well-defined targets for most sectors like forestry, renewable energy and energy efficiency (not strategy wise) and health.	No specific targets or time frames indicated for most initiatives.	Physical and financial targets have been provided for most sectors based on information received from various government departments. Targets yet to be assigned for certain activities, especially those that require inter-departmental coordination.	No targets specified.

Source: Compiled from various State Action Plans for Climate Change

1 Detailed cost estimates of the State Action Plans provided in Annexure 2

The Plans do not follow a uniform framework and they all have their strengths and weaknesses. Although they are able to tune the national missions to their State-specific needs, there are key issues that if addressed, can help States in leveraging existing funds and increase their chances of raising additional ones. Here are some of the key observations and recommendations:

KEY OBSERVATIONS

- Most States fail to clearly define targets for their proposed actions. Karnataka and Orissa have not defined targets for any of their proposed strategies. For States that have made an attempt at setting targets, the targets have not been consistently set across sectors. For example, Haryana has well defined targets for the health, forestry and energy sectors, but not for sectors like water and agriculture. Targets for Haryana have also been set at an aggregate level and not strategy wise. Rajasthan has well defined targets for sectors, such as human health, agriculture, forest and bio-diversity. For sectors like energy and urban governance, targets have not been defined. We conjecture that targets have not been defined largely in sectors that require inter-departmental coordination (such as EE and RE) and/or if the nature of the strategy is to prepare plans and policies. Rajasthan is the only State with clearly defined targets for most sectors.

- Although States have made an attempt to come up with cost estimates for their proposed actions, there are inconsistencies in the estimates and most experts (including some consultants who have drafted the Plans) felt that the estimates are not robust and credible. While Orissa's estimated budget for climate change is Rs. 17,000 crore, West Bengal's budget is more than Rs. 30,000 crore (excluding many activities that don't have budget estimates) and Haryana's is around Rs. 50,000 crore. Sikkim has allocated nearly Rs. 7000 crore on improving floriculture activities and Rs 10,000 crore on replantation for area expansion under the cardamom programme (next 10 year period). This accounts for almost 20% of the budget for the National Mission for Sustainable Agriculture (NMSA) for 2011-2016. Haryana proposes to use Rs 15,000 crore on energy efficiency in agriculture, which is more than 15% of the NMSA budget for 2011-2016.

- Orissa is the only State that has identified sources of funding for each of their proposed actions.

- Although some States have provided a prioritized list of actions, there is a lack of assessment of options based on a set of objective criteria.

RECOMMENDATIONS

- Among the eight national missions, the Jawaharlal Nehru National Solar Mission and the National Mission on Enhanced Energy Efficiency are two of the more focused, sharper and clearer missions. States have a good lead to follow in these two areas. The Centre should carve out clear sets of priorities and actions in the other missions as well.

- Climate change actions are currently listed in terms of sectors. While this might make sense from an implementation perspective (because State Departments are divided along similar lines), from a fund raising perspective it would be useful if States can also categorize the actions by their major objectives (mitigation, adaptation, forestry based) and type of activities (concepts and plans, infrastructure, operation and management etc.). Different sources fund different kinds of activities and for different purposes, and States should identify potential sources for each of their actions. *This can take the form of a separate document called the Invest Road Map for the SAPCC.*

- States should prioritize their actions using objective criteria, such as public sector costs, economic gains, social equity, effectiveness in reducing GHG emissions etc. It is important to make strategic choices using agreed-upon principles and focus on a few actions that can lead to a directional shift in the State's development pathway. A fundamental problem with developing State Plans is that there is a lack of scientific knowledge and inadequate investment in climate science at the State level. States do not have a good sense of how climate change is going to affect their particular State, and this is an issue globally with sub-national predictions of climate change impacts. In the case of some of the State Plans, even basic analysis is missing. Therefore, they mostly tend to rely on best practices in various sectors as opposed to a thorough analysis of actions and priorities.

B. Public (domestic) Funds

B.1 Central and State Governments should restructure and re-align existing projects/ schemes, funds and incentives to rationalize the cost of implementation of the SAPCC, as well as promote innovations.

Some States have made a fragmented attempt, but this should be systematically done for all the priority actions in each sector. Karnataka's SAPCC for example, recommends restructuring of agricultural power tariffs to dis-incentivize avoidable electricity consumption and suggests that subsidies may be shifted to other priority areas such as investment in more efficient plants.

Some of these incentives come directly from the Centre and there should be a concerted Centre-State effort, especially in areas where the priorities are aligned. For example, both the National Mission for Sustainable Agriculture as well as the State Plans recommend a shift in cropping pattern to low-input hardy and resilient local varieties according to changing weather conditions in different agro-climatic zones and also promote successful models such as the system of rice intensification. A recent study by Byravan and Rajan[4](2012) suggests phasing out of producer subsidies for fertilizers, which reduce sustainability and increase emissions and providing incentives for sustainable agricultural practices like the ones mentioned in the NMSA and the State Action Plans.

Several experts suggested that there are many on-going schemes that could be dovetailed to address climate change issues, especially adaptation. The Mahatma Gandhi National Rural Employment Guarantee Act (MNREGA) was cited as an example of a Centrally Sponsored Scheme that could be easily tweaked to bring about increased resilience at the community level. The Compensatory Afforestation Fund Management and Planning Authority (CAMPA) was given as another example where the funds are not fully utilized in many States and could be used to fund some of the forestry related actions under the SAPCCs.

B.2 For accessing Central Government funds, State actions should be aligned with national priorities as laid out in the eight national missions under the NAPCC.

Three sectors – Agriculture, Forestry, and Energy - were chosen and actions proposed under these sectors for each of the six selected States were compared with the corresponding national missions to check for consistency and alignment. The detailed matrix for the agriculture sector highlighting areas of consistency and inconsistency is presented below. The comparison matrices for the other two sectors are provided in Annexures 3.1 and 3.2.

4 (2012) Byravan and Rajan, An Evaluation on India's National Action Plan on Climate Change- available at http://www.indiaclimatemissions.org/

Table 3: Comparison of agriculture sector strategies under the SAPCCs with the National Mission for Sustainable Agriculture

National Mission for Sustainable Agriculture	Orissa	Rajasthan	Sikkim	West Bengal	Karnataka	Haryana
1) Strategies proposed under the NMSA: Promotion of Dry land agriculture	Objectives of NMSA partially covered, initiatives specific to dry lands not given adequate importance	Central and State schemes implemented with well-defined targets. Adequate importance given towards this aspect	The State is high on promoting organic farming practices, is trying to implement organic certification. Macro management in agriculture and technology mission for integrated development of horticulture has been implemented in the State for soil conservation and to reduce perishability of crops. Other central schemes are also being implemented.	Relevant initiatives have been undertaken to develop weather resistant crops and improve yield. Randomized Controlled Trials (RCTs) are being used to scale up soil and water conservation.	Plans to provide incentives and subsidies to develop climate hardy crops after reassessing the State Agriculture Policy. It wants to restructure its power tariffs and subsidies to dis-incentivize excess usage of electricity and promote a shift to renewable energy sources. It encourages cropping shifts according to climate forecasts.	A number of initiatives are already in practice and being planned to make agricultural equipment energy efficient and on the whole, save energy. Specific budgetary estimates have been made for it
Risk Management initiatives amongst farmers	Needs more emphasis and focus	Automated weather forecasting stations to warn farmers against climate risks are being established.	Risk Management and weather proofing initiatives are gaining importance, but yet to gain popularity amongst local communities. Very little focus on implementation.	Crop insurance already in place in the State. Both Rabi and Kharif crops have been covered against damage during all seasons. Rs 475 crore and Rs. 500 crore have been estimated as the cost for the 12th and 13th plan period respectively.	Crop insurance is being provided through National Agricultural Insurance Scheme (NAIS) and Weather based Crop Insurance Scheme (WBCIS). The State also plans to promote indigenous livestock insurance schemes.	Risk management initiatives are being planned for the future. No clear strategies mentioned.
Access to information for farmers	Except for Monitoring & Evaluation initiatives, it has been completely neglected	Trying to utilize mobile technology to disseminate information on climate risks from weather stations.	The State is now planning to focus more on dissemination of agriculture related research and information.	Agricultural Business Process Outsourcing(BPO) Centres that would provide climate and agriculture related information to the farmers are to be established throughout the State to increase the adaptive capacity of the farmers to climate change. Satellite (TERRA) would be used to broadcast information. There are plans to purchase required equipments at the Gram Panchayat level.	The State would try to provide weather information through a single window via the Karnataka State Natural Disaster Monitoring Centre.	Very little emphasis has been given to this.

National Mission for Sustainable Agriculture	Orissa	Rajasthan	Sikkim	West Bengal	Karnataka	Haryana
Use of biotechnology to improve produce	Inadequate information available.	Various technologies are being researched to improve production, and reduce crop vulnerability.	Livestock development programmes have been initiated in the past, but there is little mention of any other usage of biotechnology to improve production.	The plan mentions suitable research facilities in the field of animal bio-technology and animal sciences to increase their productivity.	Inadequate information available.	Research is to be undertaken to develop crop varieties with lower emissions but nothing is being practiced at the moment.
2) Additional priority actions/initiatives	The State has apportioned Rs 1000 crore towards livelihood based, people centric, integrated watershed programmes (2/3rd of the entire agriculture budget).	Budgetary allocations spread out across other sectors like certified seed production, horticulture, reduction of wastelands, agro-forestry systems, etc.	The State has allocated nearly Rs 7000 crore on improving floriculture activities and Rs 10,000 crore on re-plantation for area expansion under the large cardamom programme over the next ten year period (almost 20% of the NMSA budget for 2011-2016).	Estimates a budget of Rs 1500 crore on RCTs which accounts for more than 50% of its budget and a substantial portion of the NMSA budget.	Focuses on livestock insurance and restructuring power tariffs to de-incentivize avoidable electricity consumption, although budgetary allocations are unavailable.	The State proposes to use Rs 15,000 crore on energy efficiency which is almost 15% of the NMSA budget

Source: Compiled from various SAPCCs & NMSA

Here are some of the key observations that emerged from this exercise:

- States have chosen sectors based on their vulnerability areas. Although these sectors are not always congruent with the way the national missions are divided, the actions are by and large in sync. For example, the Strategic Knowledge mission advocates setting up of knowledge networks among existing knowledge institutions to complement efforts taken under other national missions. It also encourages the States to create necessary institutional capacity for research infrastructure to provide access to relevant data on different sectors. Some States don't have an explicit Knowledge Mission and do not formulate an overall budget for it, but they have given adequate importance to research and development (R&D) and access to information in various sectors according to their varying capacities.

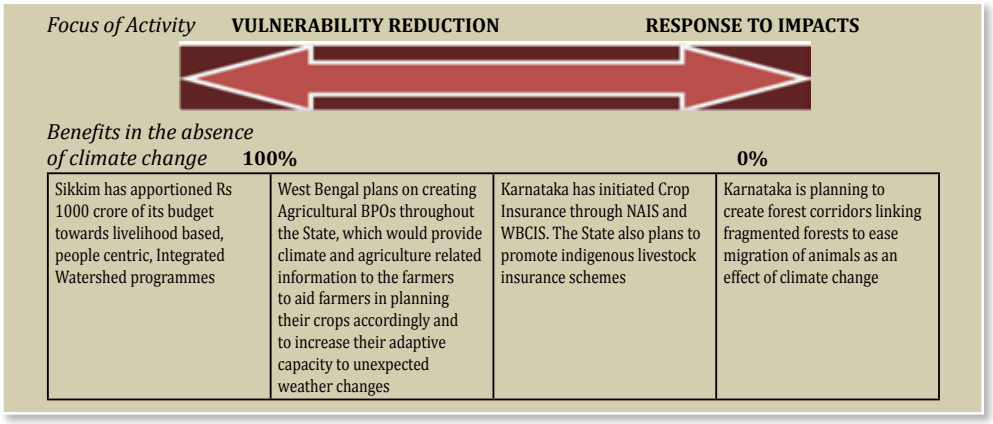
- Most States have failed to cover all the strategies enumerated under a particular national mission. The NMSA, for example, promotes *Dry Land Agriculture* in a large way through various strategies like development of drought and pest resistant crops, soil and water conservation, etc., which the States have not managed to emphasize completely. It should, however, be mentioned that alignment by itself may not be a positive thing. States should have the flexibility to address State-specific issues. In that regard, there is largely an effort to try and align the SAPCCs with the national missions in terms of cross referencing, but not one-to-one alignment.

- There are several areas where the States have explicitly mentioned the challenges in implementing the strategies under the national missions. For example, 90 per cent of the industries in Karnataka are small scale in nature. This poses a challenge for energy efficiency in the State. These industries will not fall under the Perform Achieve and Trade (PAT) scheme, one of the major strategies of the National Mission on Enhanced Energy Efficiency. Similarly, a key constraint in terms of taking advantage of Clean Development Mechanism (CDM) is the extensive approval and certification process, which is not a deterrent for larger projects such as wind power, but which makes participation for many small and scattered renewables projects unviable. In West Bengal, for example, scaling up of manufacturing will be particularly difficult in the solar thermal area, where there is no base in the country yet and where there are only a limited number of technology providers.

B.3 For funding adaptation, activities should be placed on a continuum from development to climate change. Percentage of Central Government funds for a specific activity should depend on where the activity falls on this continuum.

The range of adaptation actions proposed by the States can be placed on a continuum – from pure development activities on the one hand to very explicit adaptation measures on the other. Some adaptation efforts increase resilience and reduce vulnerability, and overlap almost completely with traditional development activities and schemes. On the opposite end are activities that target distinct climate change impacts and are outside the realm of

Figure 1 Continuum of activities: From Development *to* Adaptation



Source: Adapted from Bapna, Mahesh and McGray, 2008, Financing Adaptation Opportunities for Innovation and Experimentation, WRI Conference Paper.

traditional development. In between there is a broad spectrum of activities with different levels of emphasis on vulnerability and impacts. Figure 1 provides a demonstration of this continuum and how adaptation actions from the SAPCC can be placed on it.[5]

Since activities on the "left side" of the continuum are the ones where States and local governments will benefit even in the absence of climate change, a substantial share of funding these activities should come from these sub-national governments. As one moves to the right of the continuum, the capacity for sub-national funding decreases with an increasing need for funding from Central Government and international sources.

B.4 States should consider fiscal instruments to raise additional funds

Karnataka, in its SAPCC, has proposed a groundwater cess from which a groundwater fund would be created. The fund would finance groundwater recharge schemes within the State proposed by private and public project proponents. Similar incentives need to be considered by other States in different sectors and their revenue potential analyzed. Table 4 below provides a list of some of the State fiscal instruments that are already in place.

5 Bapna, Mahesh and McGray, 2008, Financing Adaptation: Opportunities for Innovation and Experimentation, World Resources Institute Conference Paper, available at: *http://www.teriin.org/index.php?option=com_publication&task=details&sid=1478*, accessed: August 2012; provides this framework for understanding adaptation and development in the context of International Climate Finance.

Table 4: Fiscal Instruments used by Indian States

State	Fiscal Instrument	Year Implemented	Revenue Potential	Use of Funds
Gujarat	Green Cess @ 2 paise per unit on generation of all kinds of electrical energy, excluding renewable sources	2011	Rs.244 crores for FY 2011-2012	Purchase of non-conventional energy, promoting generation of electricity through renewable sources and protection of environment
Maharashtra	Green Cess of 4 paise per unit on industrial and commercial consumers of public and private utilities	2005	--	Promote non-conventional energy projects
Maharashtra	Load Management Charge of Re. 1 per kWh if consumption above prescribed limit and rebate of Rs. 0.5 per kWh if consumption below prescribed limit	2005	Rs.94.5 crores in FY 2005-06	Promote and implement energy efficiency, energy conservation and demand-side management.

Source: Compiled from multiple websites

C. Private Funds

C.1 Mitigation

Private sector is expected to play a major role in funding mitigation activities and projects. Private investments in clean tech for 2011 increased by 54 per cent to Rs. 55080 crores, placing India at No. 6 among G-20 Nations[6]. While the private sector will invest on its own if there is a business case, governments can and are providing incentives to make investments more attractive and more importantly, providing policy support to create market certainty. Governments can also regulate/deregulate certain kinds of activities to create opportunities for sustainability investments and / or create a level playing field. Here are some of the strategies that evolved from the study that could help scale up investments in renewable energy (RE) and energy efficiency (EE):

6 PEW Charitable Trust, 2010, Who's Winning the Clean Energy Race Accessed in August 2012

C.1.1 By and large the incentives are in place, the government needs to focus on execution and providing the ecosystem.

The incentives that are currently provided by the government, in terms of feed-in tariff, capital subsidies, tax holidays etc. have been proven to work, but the execution of these policies and incentives need to be strengthened. A couple of examples were cited by experts. Under the JNNSM, the government announced feed-in-tariffs (FITs), which were much higher than what a solar power producer would normally get. This drastically reduced the pay back for solar projects. However, due to over-subscription for the first batch of projects, the government initiated a reverse bidding process for the allocation of projects. Although the jury is still out there on which is a better mechanism in the Indian context, one thing that is for sure is that the private sector needs certainty in the market place and these kinds of sudden policy shifts send them mixed signals.

Another example is the National Bio Fuel Policy, approved on 24th December 2009, where the 2010 targets have not been met. The country has a huge operational capacity in terms of production and only a fraction of that is being used now. Most of the petrol and diesel marketed in the country are via public entities and the government should make efforts to effectively implement this policy.

The other important area where States can play a major role is providing the ecosystem for private players to operate. West Bengal government, for example, has planned several interventions to create an energy efficiency market. It has developed guidelines for accrediting Energy Service Companies (ESCOs), identifying Clean Development Mechanism (CDM) potential in various sectors and building CDM roadmap with targets.

C.1.2 There are State-specific examples of successful interventions that are replicable across States.

For solar power, Gujarat is a good example. They announced a FIT of Rs 15 per unit for the first 12 years and Rs 5 per unit for the next 12 years. This provides certainty to the private players. The State has recently revised its rates, but it's because the capital costs have reduced.

Maharashtra is a good example for wind energy. Wind can vary greatly from one region to another and therefore, the Plant Load Factor (PLF) varies as well. Keeping this in mind Maharashtra has come up with zonal tariffs for wind energy. Although Tamil Nadu is a leader in wind energy now, all the good wind sites have been taken up and the State is seeing a slump in investments.

There are similar examples in the energy efficiency realm as well. Under a scheme called Jyotigram ("Lighted Village") Yojana, Gujarat invested Rs. 1404 crores in separating electricity feeder lines for agricultural and non-agricultural users to make farm power rationing effective and tamper proof. Traditionally, the transmission system is a single unit from which power is fed to various sectors for agriculture, industry and domestic use. The government constructed a whole new parallel transmission system to feed and monitor electricity to agriculture. Agricultural feeders continued to cater to the demand for irrigation; whereas the new Jyotigram feeders were laid to cater 3-phase power supply for 24 hours for the purpose of residential, commercial and industrial use. There was metering of transformers of JGY feeders. The scheme, implemented during 2004-06, transformed the rural electricity distribution scenario leading to improved quality of power supply, less interruption and more stable power supply, and a number of socio-economic benefits.[7]

C.1.3 Import restrictions may not be the answer to building indigenous capacity

It did not work well with the JNNSM, where the government tried to boost domestic capacity by linking it to FITs. However, power producers quickly found a loophole and started importing thin films, which is not as proven a technology as crystalline. Equipment manufacturing is capital intensive and makes sense only if the country can absorb it at scale or there is an export market.

C.2 Adaptation

It is generally known that the private sector operates on the basis of profits and would not invest in adaptation. Therefore, majority of the adaptation funds need to come from governments and international institutions. While this may be true, there are already areas where the private sector is investing in reducing climate related risks and increasing resilience of communities.

C.2.1 Weather/Crop Insurance

The role of private sector within crop insurance remains restricted as the issue of commercial viability continues to exist. Private insurance companies that work with the government insurance schemes are posed with certain difficulties of being able to incorporate risk reduction measures in their policies. Better public- private relationship dynamics and sound governance framework can play a key role in future private sector involvement. Reliable and robust information needs to be generated across different agro-climatic zones. General

7 Pramod.K.Mishra, 2010, Alleviating energy poverty through innovation: The case of Jyotigram Yojana (Rural Lighting Scheme) of Gujarat

awareness should be created about these schemes. States should undertake these initiatives and make these schemes more lucrative for the private sector.

C.2.2 There are lessons to be learned from social entrepreneurs and impact investors

Although they form a very small portion of the overall private sector investments, they play a critical role in providing last mile solution, in terms of products and services to the rural poor. They are lean, nimble, demand-driven, and they are able to reach places where public infrastructure and services are poor. This has particular relevance for adaptation, precisely because these are the communities that are most vulnerable to climate change.

There are several social ventures, for example, in the healthcare sector that are providing healthcare services at a low cost to the rural poor. They are extremely lean and use technology to train existing, low-skilled rural medical practitioners and connect them to urban doctors. It's about increasing the scope of rural services by formalizing the informal. These operations are at a very small scale now, but there are critical links in the chain that will help them scale up these initiatives at a cost that is much less than building a whole new set of infrastructure. It boils down to providing the ecosystem and the support services.

There are similar examples in other sectors and there should be a concerted effort to learn from the experiences of social investors and entrepreneurs.

3.2 STRATEGIES TO DISBURSE CENTRAL GOVERNMENT FUNDS

A. Central assistance to States should not only depend on their climate budget, but also be guided by issues of equity and vulnerabilty among States

States have varying capacities to mobilize resources. Often the poorer States are the ones that are more vulnerable to climate change precisely because they have fewer resources to address them. States are also at different levels when it comes to current initiatives and investments. States like Karnataka, Gujarat, and Maharashtra are ahead of the curve in terms of attracting private capital and getting RE and EE projects off the ground.

The other issue is that not all States are equally vulnerable to climate change. Climate change will have an impact on temperature, precipitation, extreme weather events, and different States will be impacted differently. These impacts will be further complicated by the socio-economic profile of the State, its dependence on natural resources etc. Although there are studies mapping vulnerability at a micro level, currently there is no index that ranks all the States based on their vulnerability to climate change.

These and other relevant factors need to be considered by the Centre while arriving at an appropriate level of Central assistance to States.

B. Existing institutional mechanisms for Centre-State disbursements should be maintained for funding climate change actions. The key, however, is accountability in the use of funds and monitoring and evaluation of activities and outputs. There should be clear division of authority for implementation and evaluation of the actions.

Since climate change action (especially adaptation) is not just additional to development but often is development, there is a strong case for maintaining the conventional channels of Centre-State disbursements through budgetary outlays. Centrally Sponsored Schemes may not work because it's difficult to adapt them to local realities and defeats the whole purpose of developing State Action Plans. Various other institutional mechanisms were looked into, including direct funding to Panchayati Raj Institutions (PRIs), and creation of an independent department of climate change (like Gujarat). Although PRIs work closely with communities where most of the adaptation actions will be implemented and where most of the indigenous knowledge lies, they might lack the technical capacity and the scientific knowhow. It might make sense to experiment a few pilot initiatives through PRIs, but the focus should be on developing a mechanism to systematically capture such knowledge and integrate it with the policy process.

With respect to creating an independent State Climate Change Department, no real need for such a Department was felt either by experts or State policy makers. Every State nodal Department works with their Central counterpart to implement relevant schemes. A new climate change Department will have to coordinate the actions of all these other Departments and hence needs enough teeth to be effective.

Instead, the focus should be on capacity building activities to ensure effective implementation of actions and independent monitoring and evaluation of activities and outputs within each State. It is important to climate proof existing developmental activities, increase accountability and traceability of funds, and assess the impacts of climate actions. States like Rajasthan and Madhya Pradesh have created a Climate Cell keeping these issues in mind, while other States like West Bengal and Haryana have proposed one. This might be a good institutional measure. However, the kind of power and authority that these Cells will have will depend on their institutional set up. The Rajasthan Climate Cell, for example, has been set up within the Rajasthan Pollution Control Board. The Orissa Climate Change Agency will be set up by the Department of Environment and Forests, whereas, the Madhya Pradesh Climate Change Cell has been set up within the Environmental Planning and Coordination Organization, a State level nodal agency for climate change issues. Therefore, mere creation of a Climate Cell may not be enough. The degree and amount of capacity and political support that it can garner will make the real difference.

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Annexures

Annexure 1 : List of interviewees

1. Dr. A.A. Nambi, Project Director, Climate Change, *MS. Swaminathan Research Foundation (MSSRF)*
2. Dr. A.K. Gosain, Professor, *Indian Institute of Technology (IIT) Delhi*
3. Mr. Ajay K Jha, Director, *Public Advocacy Initiatives for Rights & Values in India(Pairvi)*
4. Mr. Ashok Kumar Singha, *Complete-transformation (C-TRAN)*
5. Dr. D.N. Pandey, Member Secretary, *Rajasthan Pollution Control Board (RPCB)*
6. Mr. Josh Engel, COO, *Anavo Global*
7. Mr. Lokendra Thakkar, Coordinator Climate Change Cell, *The Environmental Planning & Coordination Organisation(EPCO), Madhya Pradesh*
8. Dr. N.H. Ravindranath, Professor, *Indian Institute of Science(IISC), Bangalore*
9. Mr. Narasimhan Santhanam, Director, *Energy Alternatives India*
10. Dr. Navroz Dubash, Senior Fellow, *Centre for Policy Research (CPR)*
11. Mr. Pavan Srinath, Programme Officer, *Public Affairs Centre (PAC)*
12. Mr. Ruchir Shah, Business Development Manager, *IntelleGrow*
13. Mr. Syed Iqbal Hasnain, *Henry.L.Stimson Center, Washington*
14. Mr. T Jayaraman, Promoter and Director, *Save Energy Concepts (SECO)*
15. Mr. Vikram Kapur, Ex-Chairman, *TN Pollution Control Board*

Annexure 2: Assessment of financial needs of SAPCCs

Financial Requirement of States in the next 5-10 years (in Rs. Crores)							
	Rajasthan	Orissa	West Bengal		Sikkim	Haryana	Total
Time Period	2010-2022	2010-2015	2012-2017	2017-2022	2012-2030	2012-2017	
Agriculture and allied activities[2]	109.67	1716.98	2702.75	4088.39	92.23[3]	111.51	8821.55
Health	50.49	499.98	277.99			108.49[4]	936.95
Forest and Biodiversity	42075.02[5]	4649.99	2650.00	2669.98	5108.02	6059.99[6]	63212.99
Enhanced Energy Efficiency and Renewable Energy	545.02	6499.98	9820.01	5220.02	1894.27	44060.87[7]	68040.16
Water	10.37	725.00	4163.02	5323.00		4496.96	14718.35
Urban development and transport	1.026	1259.98			1000.03	1264.95	3525.98
Strategic Knowledge on Climate Change	2.48					560.03	562.52
Industrial sector		325.03					325.03
Rural development					609.01	2224.21[8]	2833.22
Coasts & Disasters		1299.99					1300.00
Mining		55.03					55.03
Grand Total	42794.08	17031.98	19613.77	17301.38	8703.56	58887	164331.77

Source: Compiled from various SAPCCs

2 Allied activities are taken to include Fisheries, Horticulture and Animal Husbandry/livestock. Some States show an aggregate of all allied activities while others show them separately, as per data availability.
3 The aggregate refer to duration of 5 years (2012-17); excludes horticulture as the unit of currency was not mentioned.
4 The aggregate refer to the duration 2012-2022
5 The aggregate refer to the duration 2010-2022 and beyond
6 The aggregate refer to the duration 2012-2030
7 Includes Scheme on energy conservation in agriculture sector (2012-2022)
8 The aggregate refer to the duration of 13 & 14th Plan

Annexure 3

3.1 Comparison of solar sector strategies under the SAPCC with the Jawaharlal Nehru National Solar Mission

Jawaharlal Nehru National Solar Mission	Objectives	Orissa	Rajasthan	Sikkim	West Bengal	Karnataka	Haryana
	1) Strategies proposed in the JNNSM						
	Capture of low-hanging options in solar thermal	No explicit mention	Provision has been made in the building bye-laws of the State for solar water heating.	Plan emphasizes on the importance of solar water heaters and has made inroads in promoting the same. Huge emphasis on promoting Solar Passive Architecture. Pilots on solar parabola.	Proposes the replacement of use of grid power for certain end-users through low temperature solar thermal.	Considerable inroads made in solar water heating. Solar water heaters are mandatory for all government buildings and institutions. Mandatory use of solar water heating systems – Local body Bye Law Amendment.	Ongoing projects in solar water heating and solar cooking. Regulatory measures such as mandatory use of SWHs
	Promotion of off-grid systems to serve populations without access to commercial energy	Plan focuses on increased penetration of stand-alone systems for use by institutions, communities. No targets and interventions planned in order to meet this objective.	Demonstrate well designed prototypes of renewable solar lighting, solar pumps, solar stills.	No explicit mention.	Proposes promotion of solar lights in fisheries villages (with targets). Interventions planned are not directly linked to the increasing off-grid penetration.	Promotion of solar lighting, solar pumps through various programmes under the policy scheduled for 2011 to 2014.	Proposed investments in SPV lighting systems and other solar applications. Inroads made in installation of solar PV technology and solar home lighting systems under Remote Village Electrification Programme.
	Modest capacity additions in grid-based systems	Plan intends to maximize solar power generation through PV and thermal routes. No targets and interventions planned in order to meet this objective.	Made considerable inroads in grid interactive solar power projects. Intends to set up power plants under the national mission and many sanctioned projects have already been migrated to the NSM. Targets have been set for the same. Strategies such as technical assessment of potential sites of solar farms have been proposed.	No explicit mention.	Proposes increased power generation from Solar PV. Targets not defined.	In roads made in grid connected projects. Targets and timelines for future solar projects have been defined.	Proposed investments for generation of power from solar energy in the plan. Promoting Solar PV and Solar thermal power projects.

Jawaharlal Nehru National Solar Mission	Objectives	Orissa	Rajasthan	Sikkim	West Bengal	Karnataka	Haryana
	Creating favorable conditions for developing solar manufacturing capabilities, particularly solar thermal indigenous production and market leadership	Cursory mention of strengthening the manufacturing base.	Plan proposes many interventions for increasing the manufacturing capabilities through the State solar policy and other fiscal instruments. It proposes to develop indigenous and cost effective solar technology. The State solar policy provides for such initiatives.	No explicit mention.	Nothing specific to solar. Incentives for green energy producers, material and device manufacturing industries.	Interventions planned for developing solar manufacturing capabilities by creating a mechanism for certification and rating of manufacturers of solar applications. Creating a platform for investment in domestic solar manufacturing.	No explicit mention.
	2) Additional priority actions/initiatives	None	Proposes the creation of a solar Centre for excellence in order to enable applied research and commercialization of nascent technologies. The State solar policy provides for such initiatives.	None	None	None	Developing solar cities to address energy challenges at city level.

Source: Compiled from various SAPCCs and JNNSM

3.2 Comparison of the forestry sector strategies under the SAPCC with the National Mission for a Green India

National Mission for a Green India (GIM)	Objective	Orissa	Rajasthan	Sikkim	West Bengal	Karnataka	Haryana
1) Strategies proposed under the GIM							
Green India Programme (Increase in forest cover and density)		Strategies to implement capacity building activities under the Orissa Forest Academy have been outlined, the State classifies programmes into adaptation and mitigation activities, and also outlines the stage of implementation/ research, but it isn't indicative of the ongoing programmes.	The State promotes urban forestry on a larger scale when compared to the GIM. The State has a large number of centrally sponsored schemes combating desertification that are being implemented.	Wetland management is highly emphasized.	The State is focusing on many other issues, in addition to the objectives of the GIM. These are listed as vulnerability areas within the State.	The State is high on biodiversity conservation.	Only a selected few GIM objectives are covered in the State.
	1) Training on silvicultural programmes for fast growing and climate hardy species	No explicit mention.	No explicit mention.	Agro-forestry practices, mainly of cardamom to increase soil stability and fertility.	Silvicultural nurseries are being planned with advanced irrigation facilities to improve climate resilient species, but no specific programme is being targeted.	No explicit mention.	Well defined objectives have been mentioned under this head, but no specific adaptation / mitigation programmes are being targeted.
	2) Reducing forest fragmentation by providing for migration of flora and fauna species	Has plans of linking forest fragmentations through various landscapes to assist animals migrate as a consequence of climate change.	No explicit mention in this regard.	Schemes are being designed and planned for implementation under the FEWMD.	The plan mentions creating canopy corridors/ flyways to check on forest fragmentation, and link protected areas to help animals migrate.	Forest corridors to be created to the extent of 0 .1 mil ha.	Not given adequate importance, just mentioned as an objective of the Forest Department.
	3) Enhancing public and private investments for raising plantations to increase forest cover and density	No explicit mention.	No explicit mention.	No explicit mention.	No explicit mention.	No explicit mention.	Private players like Maruti Udyog, Hero Honda, DLF, etc have taken up planting of species across the State.

National Mission for a Green India (GIM)	Objective	Orissa	Rajasthan	Sikkim	West Bengal	Karnataka	Haryana
	4) Revitalizing community based initiatives like JFM and Van Panchayats for forest management	Adequate importance given to JFM and VPs and eco development committees have been created under them	JFM and community based forest management have been given adequate importance.	Sustainable forest mgmt. practices, JFM and eco-development committees are already in existence	The State is trying to promote community based tourism activities.	JFM, VPs are used to manage forest resources	The State already has many ongoing programmes to promote JFM, Village Forest Committees with aid from JICA and under the NAP
	5)Implementation of Green India Plan	Has carried out very few initiatives.	No concrete measures stated for the future.	Plans to implement specific schemes have been made, no other information available.	Plans to implement the Green India Plan.	GIM will be implemented with the help of various State Acts which are already in place.	No specific plans mentioned.
	6) Formulation of forest fire management policies	Has defined various actions under this objective.	Has an ongoing JFM programme in this regard.	Forest fire management has been given its due importance, scientific methods to deal with forest fires and manage forest cover after fires have been charted out.	Focused initiatives to detect and prevent forest fires.	R&D is being initiated in this area.	No explicit mention in this regard.
Biodiversity conservation	1) In situ and ex situ conservation of genetic resources especially of threatened flora and fauna	No explicit mention.	No explicit mention.	No explicit mention.	Very little focus is being given to this objective.	The State has implemented SBA 2002 and taken various steps to preserve genetic resources. 3542 BMCs have been created.	No explicit mention.
	2) Creating biodiversity registers for documenting genetic diversity and associated traditional knowledge	Monitoring carbon stocks and biodiversity to be taken up by an independent agency to be set up under the FD, yet to be created and made operational.	Has devised schemes for this purpose under nodal institutions and departments like State Forest Department and State remote sensing agency, and is implementing People's Biodiversity Register (PBR) for 100 sites, targets and has given its budget estimates.	Biodiversity registers may have been created in the past, but there is no mention of documenting genetic diversity now.	No explicit mention.	The creation of BRs is in the process.	No explicit mention.

National Mission for a Green India (GIM)	Objective	Orissa	Rajasthan	Sikkim	West Bengal	Karnataka	Haryana
	3) Effective implementation of Protected Area system under Wildlife Protection Act	Has planned to implement this in a stronger way henceforth, no clear measures suggested.	No explicit mention.	Protection of wetlands and linking protected areas to enable species migration is the primary focus.	34% of the land is under PAN, it plans to further increase it.	Three areas were declared as biodiversity hotspots under the SBA 2002, KBB created in 2003 has funded these initiatives.	Protected Areas are to be increased, specific targets outlined.
	4) Effective implementation of National Biodiversity Conservation Act 2001	Has taken certain steps to preserve biodiversity by linking forest fragmentations through various landscapes to assist animals cope with climate change.	Has plans of implementing certain policies related to biodiversity conservation, a State Biodiversity Board under creation, JBIC funded programme for biodiversity restoration is already being implemented	No explicit mention.	There is no mention of the Act, but there are well defined plans to protect forest biodiversity through various strategies like PES etc.	Creation of protected areas, biodiversity hotspots, fish sanctuaries, preservation of Western Ghats, all being undertaken in the State.	No explicit mention.
2) Additional priority actions/initiatives		The State envisages a budget of Rs 1200crore on improving tree planting and forest management to integrate with watersheds and water resource management. This sums up to 1/3rd of its additional costs and 1/4th of the entire budget	The State targets adaptation and carbon sequestration of areas outside forests (urban forestry) to the extent of 3,575,000ha which is estimated to cost them Rs 35,000crore. This forms almost the entire budget of the State in the Forestry sector	The State looks at various other areas apart from the GIM, like community based tourism, hazard mapping & warning system and green waste management practices. These programmes constitute nearly 35% of their overall budget.	The State has allocated a considerable portion (35%) of its overall budget towards mitigating impacts of landslides and storm surges, recharge of ground water and reducing man-animal conflicts.	The State also focuses on rehabilitation of mined areas, clearing encroachments to enhance carbon stocks in forest. But no clear budget estimates have been outlined.	The State has already come out with the State Environment Policy in 2006 with clearly defined objectives and schemes under it, the forestry sector actions have adopted many of the SEP objectives.

Source: Compiled from various SAPCCs and National Mission for a Green India

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Project supported by

UKaid from the British people

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