Vulnerability Assessments

Climate Change Adaptation in Rural Areas of India – **CCA RAI**

The work on climate change vulnerability assessments was realised under the Indo-German cooperation project Climate Change Adaptation in Rural Areas of India (CCA RAI) which is jointly implemented by the Ministry of Environment, Forests and Climate Change (MoEF&CC), Government of India and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. CCA RAI is financed by the German Federal Ministry for Economic Cooperation and Development. Over 5 years the project has demonstrated diversified use of vulnerability assessment through its application at the regional and local levels and in the process has developed it as a tool for widespread use by adaptation practioners. For further information see: www.ccarai.org

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Ministry of Environment, Forests and Climate Change, Government of India

Using climate change vulnerability assessment for adaptation planning at state and local levels: method and lessons learnt

Context/Background

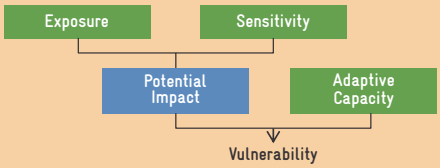
Assessing vulnerability to climate change is not only crucial for defining the risks posed by climate change but also for providing a starting point for identifying measures to adapt to climate change impacts and to efficiently allocate financial and other resources to the most vulnerable regions, people and sectors. Furthermore, climate change vulnerability assessments can be used to monitor and evaluate the success of adaptation measures.

The need for a structured approach on climate change vulnerability assessments in India was first felt in 2008 after the Government of India (GoI) released its **National Action Plan on Climate Change (NAPCC).** The GoI directed the state governments to prepare **State Action Plans on Climate Change (SAPCC).** SAPCCs are developed to mainstream climate change solutions in the development planning process at state level. Mainstreaming climate change concerns requires an understanding of the past, current and future climate stresses and their current and potential impacts in a region; as well as an understanding of the potential to adapt to these impacts. Vulnerability Assessment (VA) presents a scientific evidence of the additional climate induced stress besides outlining the non-climatic factors and emphasizes the need for action thus helping in planning and judicious allocation of resources. It hence provides a scientific and objective basis for prioritizing which sectors, social groups, or geographical regions need special attention for climate change adaptation.

What is vulnerability?

The most authoritative definition of the term "vulnerability" in the context of climate change has been put forth by the Working Group II of the Intergovernmental Panel on Climate Change (IPCC): Vulnerability is the degree, to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate change and its variation to which a system is exposed, its sensitivity, and its adaptive capacity.

The project has followed this concept for all the work around vulnerability assessment.



The work around vulnerability assessment forms an integral part of the project Climate Change Adaptation in Rural Areas of India (CCA RAI) where carrying out systematic VA exercises have supported a comprehensive adaptive planning process at local level demonstration projects for piloting adaptation measures and also at regional (State) level through climate proofing government programmes.

Approach

Adaptation/Working hypothesis for Vulnerability Assessment in CCA RAI

A structured approach for climate change vulnerability and risk assessment provides a scientific and objective basis for decision making to reduce the adverse impacts of climate change and guide towards judicious allocation of resources

CCA RAI work on VA has been demonstrated in three major variants

I. framework for vulnerability assessment

- guidebook to carry out VA developed by GIZ with inputs from The Energy and Resources Institute, Stockholm Environment Institute and Global Climate Forum
- the process has been broken down into simple steps and stages which can be customised to user requirements
- real examples inbuilt from VA exercises carried out at local and regional levels

II. state level vulnerability assessment

- indicator based vulnerability assessment at district level carried out for seven sectors in Madhya Pradesh
- composite vulnerability indexes generated for all districts
- the results helped in identifying districts that are most vulnerable to climate change and need special attention

III. local level vulnerability assessment

- bottom up local level, multi sectoral (or comprehensive) vulnerability assessment carried out by partner organisations to design need based adaptation strategies
- assessments based on analysis of intensive, cross sectoral data collection with rural communities through participatory method
- VA helped in establishing adaptation specific monitoring and evaluation indicators which help in tracking process

The work around vulnerability assessments have focussed around three broad contributions, first being, developing a knowledge product in the form of a framework and step-wise guidebook which could be used by the wider sector to design and conduct customised VAs. Second is that of conducting regional VA at the state level for multiple sectors related to Natural Resource Management using 'top-down'

method which involves generating composite vulnerability indexes . Third variant offered by the project is its experience of conducting local level vulnerability assessments using bottom-up approach based on a series of intensive participatory tools and methods. Although all three lines of activities were done parallel to each other the cross learning helped in meeting the objectives and enhancing the overall planning and also helped in building concrete learnings around conducting vulnerability assessments.

Results

I. Development of a framework for climate change vulnerability assessment

CCA RAI developed a vulnerability assessment framework (fig.1) to provide decision- makers and adaptation implementers such as local and state government officials, development experts and civil society representatives with a structured approach. This approach is documented in the publication titled 'framework for climate change vulnerability assessments.' The framework seeks answers to following key questions framed around vulnerability, as defined by the IPCC:

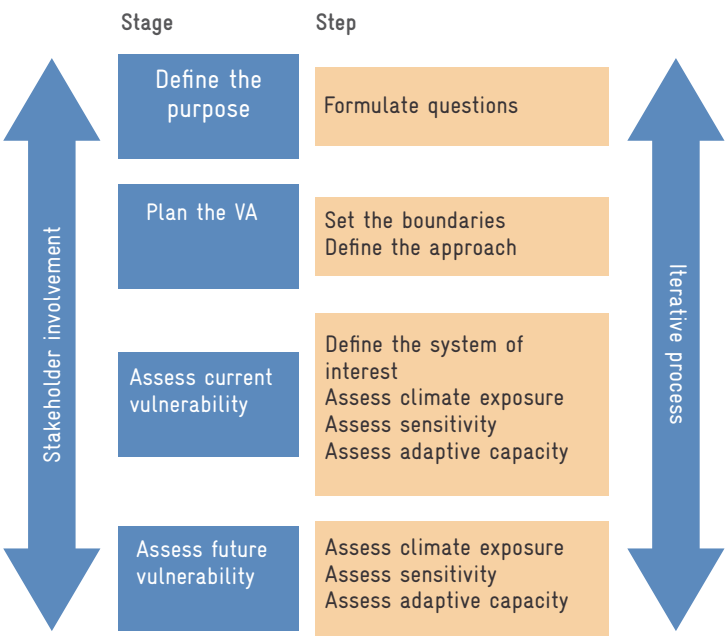


Fig. 1: CCA RAI Vulnerability Assessment Framework

- How to plan for a vulnerability assessment?
- Which tools or methods to select to carry out a vulnerability assessment?
- How to carry out a vulnerability assessment?

The framework can be considered as a cutting edge approach and is very relevant in the context of the state action plans since the SAPCC guidelines foresee to carry out a VA at state level. The publication contains practical examples of climate change vulnerability assessments carried out at state-level (the case of Madhya Pradesh)and at local-level.

II. State-level vulnerability assessments

Top-down indicator based vulnerability assessment for Madhya Pradesh gave implications of current impacts of climate change and extent of vulnerability in Madhya Pradesh across seven major sectors namely social, economic, agriculture, water resource, forest, health and climate. The study was carried out across sectors, spatially and temporally for which the system of interest was the entire state of Madhya Pradesh whereas the units for assessment were the districts and helped in identifying the vulnerable regions (districts) in the state. . The methodology involved generating composite vulnerability index for all 50 districts of the state. All 50 districts in the State have been ranked from 1-50 based on their relative vulnerabilities. Further drill down indexes for each sector helped in understanding the causes for a district's high or low vulnerability. Despite some limitations of the methodology, constraints of data availability and limited information available through climate models the study at state level has been first of its kind in India, and its results became part of the MP State Action Plan on Climate Change and are being used by state departments for formulating adaptation strategies. The study is published as "Vulnerability Assessment of Madhya Pradesh towards Climate Change- study under the MoEF-GIZ project on Climate Change Adaptation in Rural Areas of India."

III Local-level vulnerability assessments

Six out of nine CCA RAI demonstration projects on climate change adaptation carried out bottom-up vulnerability assessments in their respective project areas. The results of the vulnerability assessments were used by NGOs to define adaptation hypotheses while designing projects and in the process developed adaptation focused M&E frameworks. All NGOs used the findings of VA to identify and select appropriate adaptation options to address key concerns and risks identified by the study. In two cases, VA exercise has also been used to select beneficiaries for the project. The experiences from the local level vulnerability assessments were incorporated in developing a step by step guide on how to do vulnerability assessments at local level and link it with the Monitoring and Evaluation (M&E) system of a project. It is published as "Community-Based Vulnerability Assessments and Adaptation Monitoring-A step by step guide"

Application beyond the CCA RAI-project

Know how on local level vulnerability assessment has been shared with CCA RAI partner organisations and other sector institutions through a host of capacity building programmes. These organisations have widely used the VA approach in varied works such as developing panchayat level adaptation and development plans, identification and selection of primary stakeholders as project beneficiaries and selection of project villages in interventions beyond the CCA RAI support. Leadership for Environment and Development (LEAD) India, DHAN Foundation, MSSRF are some development organizations which have made stronger field analysis by using this VA approach.

Key learnings and recommendations

Overall learning

The impacts of - and vulnerabilities to - climate change can vary across regions (e.g. global, national, sub-national), economic sectors (e.g. agriculture, industry, shipping), social groups (e.g. urban populations, forest dwellers, coastal communities) or types of system considered (e.g. natural, social, economic, socio-ecological).Given these circumstances, the development of any "one-size-fits-all" solution for assessing vulnerability to climate change is challenging. Hence the Vulnerability Assessment framework developed under CCA RAI gives its user enough flexibility to plan, choose and adapt the tools to their specific contexts.

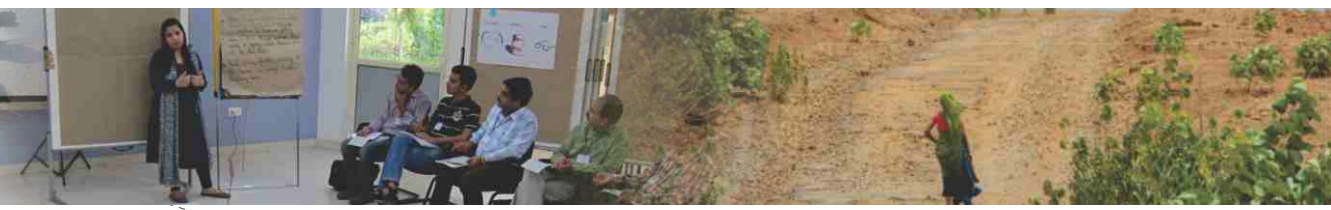
State-level vulnerability assessments

- Indicator based assessment is one of the most widely used tool for assessing vulnerability to climate change and can be a useful tool for supporting decision making as it enables a clear visual mapping of priority areas.
- Assessing vulnerability at state level for multiple sectors and domains using indicator based approach was done for first time in India and methodology is now being adapted by other agencies for assessing vulnerabilities in other Indian states.
- Vulnerability to climate change is not only determined by quantifiable variables but also by qualitative variables. Accommodating these variables in indicator based approaches is challenging and needs extensive stakeholder consultations besides open mindedness.
- The development of indicators is constrained by the availability of data related to specific variables. Very often these data are not available in the format which the study would need. In Madhya Pradesh, for example, crop production statistics on district level are available online for the year 1999 onwards. Crop production statistics prior to 1999 have not been digitized and are thus only available in paper which needs to be collected from various offices across the state. Similarly data for different indicators for the same time period is also not available while some required data was completely unavailable. The choice of indicators were governed by these factors. It was experienced that data collection and bringing it in usable format (data cleaning) was the most time consuming part of the study.
- Though greatest possible care can be taken in the selection and classification of indicating variables into the IPCC variables of Vulnerability, viz, exposure, sensitivity and adaptive capacity, the indicator based approach remains subjective. Given sufficient data availability, any number of variables could theoretically be included in the assessment.

- Stakeholder engagement at every step was found to be necessary and thus is strongly recommended for effective selection and classification of indicators as well as dissemination and use of results.
- The results of vulnerability assessment are affected by the inherent limitations of climate models and sectoral impact models.
- Vulnerability assessment at the state level provides the first insights into the districts that need immediate attention. The next step is to communicate the results to relevant stakeholders, policy makers, decision makers, and implementers so that the knowledge generated and its inferences are put into practice. Scientific methods and tools applied in the assessment need to be put into a comprehensive and simplified narration in a way that makes the end users of the assessment understand how data were analysed and results generated and most importantly how the finding is likely to affect the concerned sector. This helps the end user in determining the need for detailed study in selected areas for policy formulation.

Local-level vulnerability assessments

- PRA (Participatory Rural Appraisal) exercises form an integral part of local level vulnerability assessments. It has been learned that participatory exercises are very effective in generating essential information on all aspects of a community's vulnerability to climate change.
- Climate data are often not available at the local level and data from a higher spatial aggregation must be used for validation/ triangulation.
- Local level vulnerability assessments are supposed to increase the overall knowledge on climate change vulnerability and impacts on local levels. In order to achieve this goal, a better documentation of tools, methods and results of the assessments is necessary. However, the necessary knowledge on documentation and presentation of results is often not present with the NGOs.
- A clear distinction between sources of information is necessary to know where the line between community perception and scientific evidence can be drawn.
- Local level vulnerability assessments can also provide the starting point for developing monitoring and evaluation (M&E) frameworks for local level adaptation projects. Accordingly, an M&E framework for the projects should contain indicators based on the components of climate change vulnerability.



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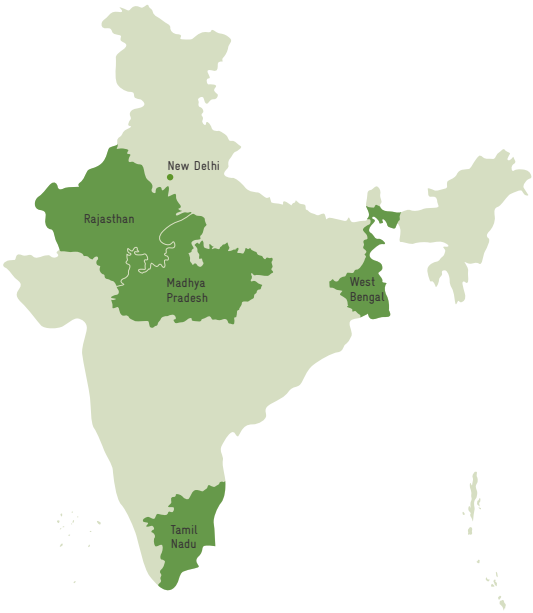
Responsible :
Anna Kalisch

Edited and compiled by :
Anna Kalisch
Somya Bhatt

Website :
www.ccarai.org



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PROJECT PARTNERS

Government of India
Ministry of Environment, Forests and Climate Change (MoEF & CC)
I http://www.envfor.nic.in/

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