

# **Water and Climate Resilience Programme (WACREP)**

**Mainstreaming Climate Change Adaptation in Development Planning: An Effective way to Achieve Climate Resilient Development in Bundelkhand Region of Madhya Pradesh**

**- POLICY BRIEF -**

**BY**

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## INTRODUCTION

Climate change is already being experienced all over the world in varying degrees as judged by the frequency, length and severity of extreme events occurring. Countries are grappling with its impacts, the effects of locally experienced climate variability and how to meet the challenge both individually and collectively. Climate change poses a serious risk to lives and livelihoods, particularly for the world's poorest and most vulnerable populations. India is one of the most vulnerable countries in the world, with a high-dependence on climate sensitive economic sectors such as agriculture, fisheries, livestock and forestry. Consequences of climate change threaten to affect food security, water security and energy access, all of which are crucial for lifting our marginalized out of extreme poverty and maintaining the living standards of the present well-off.

It is clear that technology, investments, policy and regulations alone will not be able to provide the solution. A multi-stakeholder engagement on a sustained basis, starting at the community, sub-national, national and regional levels, is required to arrive at a consensus, convergence and compact on the principles, content and metrics of what is to be done. Active cooperation at local level involving communities, local institutions and stakeholders, building up their capacities and empowering them as active participants in decision making processes are a foundational precondition for efficient and effective adaptation measures. This is because the effects of climate change are experienced locally by communities, local institutions and stakeholders and they are best suited to addressing them. With the declaration of Sustainable Development Goals (SDGs), year 2015 has already set the tone for transforming the development paradigm. Additionally, putting out its Intended Nationally Determined Contributions (INDCs) for climate change actions, India has once again reiterated that addressing climate change concerns and ensuring low carbon development is a priority for the growing economy. India's climate contributions and the targets put forth by 13<sup>th</sup> Sustainable Development Goal on combating climate change have identified technology, finance, human and institutional capacity building for adaptation and mitigation actions.

The long-term nature of climate change and the significant impact it can have on Indian agricultural systems requires future agricultural development policy and practices to include both short-term and long-term planning that incorporates climate change knowledge and understanding in order to adequately respond to the reality of a changing climate—a process referred to as **climate change adaptation**. This entails mainstreaming climate change adaptation in the current planning process in order to address the issues of growing vulnerabilities and livelihood security of poor and vulnerable communities. In India, mainstreaming climate change adaptation in the developmental planning is still in infancy. Mainstreaming requires cross cutting policy approach which will not only address climate resilient development in planning processes but will also make the already existing policies climate compatible. In order to achieve this, the decision makers first need to understand the impacts of climate change on various climate sensitive sectors such as natural resources, biodiversity, agriculture, health, socio-economic vulnerabilities, on the overall **economic development of the country**. Madhya Pradesh is the second largest state of the country comprising of 51 districts spread across 11 agro climatic zones. The state is rich in natural resources and agriculture is an important driver of the state's economy making it highly vulnerable to the risks of climate change. Several previous research outputs have fairly clearly indicated that Madhya Pradesh is among the most vulnerable states in India. Along with high physical vulnerability, the state is also extremely low on adaptive capacity. Bundelkhand, a semi-arid region of Madhya Pradesh, is particularly sensitive given the prevalent low levels of development and its high reliance on the

climate sensitive sector such as rainfed agriculture. Addressing the potential impacts of climate change in the Bundelkhand region requires increased attention on improving the area's ability to adapt to a changing climate while simultaneously addressing current developmental issues.

This policy brief **analyzes the existing policy and planning framework** in India and the state of Madhya Pradesh and investigates the current schemes for gaps in convergence, identifying the need of planning support tools and monitoring indicators from a climate change lens. The policy brief is based on the experiences of an action research initiative, "**Water and Climate Resilience Programme (WACREP)**" implemented in semi-arid Bundelkhand region of Madhya Pradesh. Building on the lessons learnt from the experiences of WACREP, it identifies tools for mainstreaming climate change adaptation in local planning and draws recommendations for the same.

## WATER AND CLIMATE RESILIENCE PROGRAMME

Development Alternatives, in association with Global Water Partnership and India Water Partnership launched the WACREP initiative in Datia district, situated in the semi-arid Bundelkhand region of Madhya Pradesh. The objective of this initiative under the WACREP programme is **mainstreaming climate change concerns into development planning**. The initiative aimed to integrate climate change adaptation in development planning processes of Madhya Pradesh. In order to achieve climate resilience in planning processes, it has been considered important to first understand the underlying locale specific vulnerabilities to climate change. Under the WACREP initiative, integration of climate change in planning processes was based on sound evidences which identified key climate change vulnerabilities in Datia district of Madhya Pradesh. Identification of locale specific bottom-up community based vulnerabilities helped to identify adaptation solutions for Datia district of Madhya Pradesh. For further integration of climate change concerns in district level planning processes, existing policy framework at state and district levels was analysed to scrutinise relevant state public programmes and schemes from a climate change lens.

The core focus of the WACREP initiative emphasised on building capacities of decision makers at panchayat and district level for mainstreaming climate change in planning processes. Existing decision making capacity was also evaluated for adapting to anticipated impacts. In this step, robust adaptation options were identified for setting priorities for adaptation needs. Different stakeholders from community, panchayat and district level were engaged for capacity enhancement and strategy development for integrating climate adaptive planning. The initiative built the capacities of communities on sustainable agriculture practices and water efficient adaptation measures. This way, the project transits from increasing the climate change understanding of communities to helping them design climate adaptive plans. Particularly designed capacity building campaigns enhance capacities of district government officials and elected panchayat representatives on one hand and guided them to design climate proof plans on the other hand. Existing schemes and programs were identified as entry points for designing climate adaptive plans. The consultative and bottom-up planning of this initiative not only helped to create a horizontal convergence between on-going schemes and initiatives at panchayat level but also created a vertical link between different levels of planning. The initiative adopted a participatory and analytical approach and engaged with communities and local level planners to integrate climate adaptive planning in decision making processes.

## APPROACH AND METHODOLOGY

The policy brief is based on understanding climate perspectives in planning through **primary field consultations/workshops** and **secondary literature review**. The approach has been applied to study the current situation of climate change adaptive planning at the district, state and national level. Desk research and analysis was conducted to collate lessons from secondary information and convergent project to study existing policy and institutional framework at district and state level. The report also briefly scanned the vulnerabilities of Bundelkhand and one district by means of secondary literature review, primary and secondary data analysis and field consultations with communities, PRIs and district officials. To validate the ground realities, several primary consultations with line departments and local CSOs were conducted in the one district of Bundelkhand. To represent community perspectives focussed group discussions were done with the farmers at village level in the district for situational analysis of climate adaptive planning. In addition, stakeholder consultations at district level were conducted to identify tools and define a roadmap for mainstreaming of adaptation in the planning process. The representatives included district officials, extension agencies and Civil Society Organisations.

## BUNDELKHAND REGION: ASSESSMENT OF CLIMATE CHANGE IMPACTS AND VULNERABILITIES

In order to design policies and plans in the light of climate change, it is essential to understand the impacts and vulnerabilities to the risks posed by climate change. This requires the foundation of a strong vulnerability assessment based on strong scientific evidences to convince the planners and policymakers for mainstreaming adaptation strategies in the current policy and planning framework.

Bundelkhand, a semi-arid region in India has fragile geophysical conditions and is highly prone to the impacts of climatic variability. The Bundelkhand region comprising seven districts of Uttar Pradesh and six districts of Madhya Pradesh state is one of the most backward regions of the country. The semi-arid geography is highly perturbed with variable climatic conditions intensified by erratic precipitation trends, high evapotranspiration losses, high run off rates and poor water retention capacity of the soil and large area of barren and uncultivable land. In addition to undulating terrain and climatic variability the drought prone region suffers from high socio economic vulnerabilities marked by increased climatic sensitivities and low adaptive capacities. Bundelkhand region is a chronic drought prone region of India. Bundelkhand faces two major problems i.e. inadequate and erratic rainfall and low water retention capacity of the soil. Variability of monsoon as a consequence of changing climate coupled with break-down of natural resource management practices are the key factors leading to frequent occurrence of droughts. Climatic changes have increased frequency of extreme weather events during past 15 years and raised the vulnerabilities and risks. The region witnessed continuous meteorological, hydrological and agricultural drought for six years in the period 2003-2009 (Inter-Ministerial Central Team, 2008). The continuous drought years in Bundelkhand have severely affected the agriculture productivity and subsequently weakened the livelihood systems. As the climate change impacts are likely to be faced most severely by such vulnerable regions of developing countries like India, there is an urgent need to integrate adaptive strategies at the local level and work towards strengthening national capacities.

## MAINSTREAMING CLIMATE CHANGE ADAPTATION IN DEVELOPMENT PLANNING

Addressing the potential impacts of climate change in the country will require increased attention on improving the ability to adapt to a changing climate while simultaneously addressing other developmental issues. Many development policies, plans and projects currently do not take climate change into account due to a lack of awareness and clarity on how to effectively develop and integrate adaptation options. Integrating adaptation into policy and planning provides an essential opportunity to make more climate-resilient development investments. Efforts have been put at national and state level to integrate scientific understanding of the changing climate into the planning process through usage of tools such as vulnerability assessment, Action Plan on Climate Change at the national and sub-national levels. However many still struggle to understand the policies, approaches and time lines required for effective planning for the uncertainties. In India, several national and state policies/ plans such as the National Action Plan on Climate Change (NAPCC) and State Action Plan on Climate Change (SAPCC) have elaborated the co-beneficial role of adaptation in some of the major sectors such as agriculture, infrastructure, water, urban and rural development. To ensure effective execution of these plans and policies, a bottom up process is required to feed in successful adaptation practices at local level.

According to Development Alternatives (DA), integrating climate change adaptation in national and sub-national planning can help to systematically assess climate impacts and incorporate response measures to reduce climate risks and vulnerabilities into development policies, plans, institutions, programs and projects. Integrating climate change concerns in national and sub-national planning helps to:

- Develop medium and long term climate resilient solutions which are cost-effective and scalable
- Climate proof existing and ongoing development plans/programmes
- Ensure local level implementation of national and state action plans on climate change
- Ensure climate smart investments
- Bring direct benefits to climate sensitive sectors (such as agriculture, fisheries, forests and sections (rural economies, farmers, tribal, fisherman)

Consultations with the stakeholders at district level brought out the gaps existing in the planning process. Currently most states, including Madhya Pradesh have put in place **District Planning Committees**. However, as stated by the Manual for Integrated District Planning, the process is a vertical one with line departments working in silos with little or no participation of the people/communities and a high degree of reliance on the District Commissioner/ Magistrate to tie these plans together<sup>1</sup>. Currently the primary focus in the process is on capacity building of District Planning Committees to ensure that this level of planning is participatory. While this may enable cross-sectoral planning to enable adaptation for climate change, district level planners especially at the Gram Panchayat level who have a critical role to play have poor knowledge of the impacts of climate change and how adaptation can be integrated into their priorities. Another gap that needs to be addressed is the climate resilient development of different agro-climatic zones within a district or a state. The planning process requires specific strategies that address the needs of sensitive agro-climatic zones such as Bundelkhand in particular.

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<sup>1</sup> Para 1.2.5 of the 1<sup>st</sup> chapter of the Manual for Integrated District Planning, Planning Commission, Government of India

The extensive fieldwork and consultations with the line departments in the Datia district of Bundelkhand brought out that scheme implementation and resource allocation at the local level is not efficiently distributed and that long term planning to address climate change, is not present. This deficiency is driven by a variety of factors including lack of climate change related information and communication capacity at the district and community level, insufficient scheme and policy outreach, and top-down budget allocation processes that do not necessarily reflect the needs on the ground. This is further aggravated by the lack of convergence between the departments both at vertical levels (village, block, district, state and national) and at the horizontal level (between departments e.g. agriculture, irrigation etc.) and planning agencies (e.g. district planning committee).

Although there is a framework to facilitate decentralised planning where information and plan formation flows from the ground to the state, the climate perspective is however missing. The framework develops perspective district plans for five years but climate adaptation is not highlighted in it. Also, the climate perspective requires a more long term vision, around 20 years which can be further broken into midterm plans - the five year perspective plans and ultimately the short term plans.

Primary consultations with the district level government officials brought forth that though planning at the policy level takes climate change concerns into consideration but when it reaches the local level the authorities are more into practical implementation of the schemes/plans and are mainly unaware of the concept behind the formulation of the particular scheme. Focus group discussions with the village farmers and Gram Panchayat heads in different villages in Datia district revealed that little is done in the way of planning for rainwater harvesting at their level due to lack of awareness. One such example is of the *Kapildhara Yojana*, under which irrigation facilities are provided to the beneficiary families including digging of new wells, ponds in fields for water recharging, check-dam, stop-dam, and digging of small ponds. The beneficiaries of the scheme are those farmers on whose lands there is no irrigation facility. From the consultations with village communities, feedback suggests that *Kapildhara Yojna* has been implemented in the region and has benefited the farmers to some extent. Various wells have been constructed in a large number of villages under Mahatma Gandhi National Rural Employment Generation Scheme (MNREGS) and have reduced the burden of water availability to the farmers. But due to the diminishing ground water levels, these wells have low water levels in the peak summer months and fail to solve the purpose. Despite development of various water conservation practices they are still inadequate indicating lack of sustainable planning and need for long term planning to support communities.

#### **IDENTIFICATION OF RELEVANT ACTORS IN MAINSTREAMING CLIMATE CHANGE ADAPTATION**

For the absolute integration of climate change adaptations in the planning process, it is inevitable to involve all the key stakeholders for holistic planning strategies. The key actors should include:

- Officials from the different levels of governance: sectoral and line departments, state level decision makers, planners from the decentralized planning process i.e. the local stakeholders from district, block and gram panchayat level.
- Scientists and researchers working on different aspects of climate change. The participation should include researchers from a wide spectrum of interdisciplinary studies analogous to the

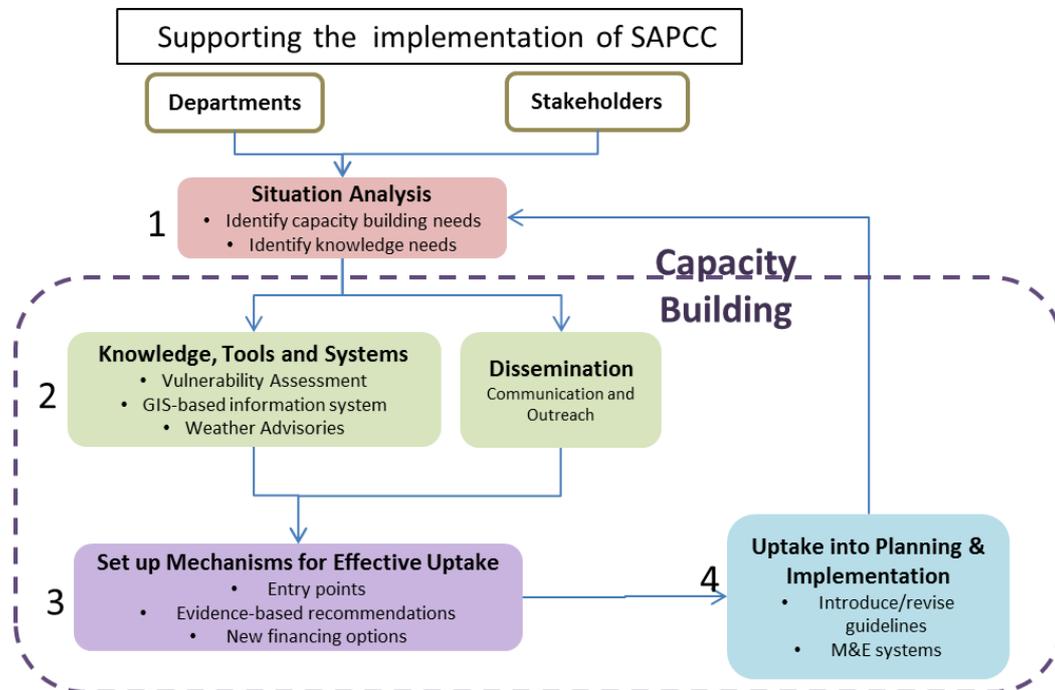
nature of climate change. Emphasis should be laid on the cross cutting nature of climate change thus including key actors from the fields of climate science, meteorology, agriculture, disaster management, geology, renewable energy, social science, economics and such sectors which are directly or indirectly related to climate change and its adaptations.

- Apart from the policy makers and scientists the adaptations in climate cannot be mainstreamed without the representation of community voices directly vulnerable to climate change. Therefore participation of nongovernmental organizations and civil society organisations is equally important in the process. This ensures participatory approach for climate change mainstreaming because such organizations directly working at the grassroots corresponds to the ground realities thus contributing in the bottom up planning process.
- One of the major hurdles today in the adoption of climate change mainstreaming is the availability of funds and resources. The involvement of funders and donor agencies such as bilateral and multilateral donors is of utmost important. Apart from this, representatives of the private sector can act as an important component in the mainstreaming process.
- Even though much is talked about climate change, however a large number of stakeholders are still unaware of the general concept of climate change. Therefore, there is a strong need for a connecting link between all the stakeholders. Climate change journalists and media personnel can act as an important medium to sensitize the issues of climate change mainstreaming. Besides this they can also initiate a two way dialogue by enabling a balance between top down and bottom up planning processes.
- Additional Rural Agriculture Extension Officers (RAEOs) are needed to reduce the number of villages and area designated to each officer. This will allow better outreach of climate adaptation information and schemes. Alternatively, civil society groups can also be utilized to assist in outreach in areas where RAEOs are not able to adequately serve.

## **FRAMEWORK FOR MAINSTREAMING CLIMATE CHANGE ADAPTATION IN DEVELOPMENT PLANNING**

Understanding about climate change adaptations at different levels of decision making in government is important. In order mainstream climate change adaptations into development plans and policies it is very important to understand the deep relationship between climate resilience and development. For example, climate change, raising temperatures and over exploitation of water resources is likely to deplete ground water resources in the future. In order to fulfil the water needs of communities in the future, digging of wells or mere installation of hand pumps will not be sufficient. The planners will have to consider water management practices by prioritizing options such as aquifer mapping, groundwater recharge through rainwater harvesting, water auditing, water budgeting etc. This will require adaptive planning with consideration of precipitation received, infiltration rate, runoff and recharge rate or in other words **climate resilience development**. Therefore, keeping the long term planning in mind, mainstreaming climate change adaptation at this point in time will be a cost effective alternative in future.

Based on the Development Alternatives experience in working on Climate Adaptive Planning and piloting it in one district of Madhya Pradesh under the WACREP initiative, a framework by DA has been developed, which suggests the following approach for mainstreaming climate change adaptation into the planning process:



The above Framework suggested by DA provides a mix of top down and bottom-up approach for climate change adaptation planning. This decentralized process defined for development planning in India provides a robust frame and platform for mainstreaming climate concerns into village and district plans and synergizing with state and national level sustainable development agenda. This framework builds on the experiences of Water and Climate Resilience Programme (WACREP) and provides an overall framework for integrating climate change in sub-national planning processes.

**Situation Analysis:** In order to view existing development planning and policies from a climate change lens it is first important to critically analyze existing data, information and capacity building needs from a climate change view. It is also crucial to reviews gaps in the current plans, schemes planning and implementation processes. This phase also identifies building blocks for integrating climate change concerns in planning processes. This includes engagement of trans-disciplinary stakeholders such as practitioners, researchers, government officials of different line departments, etc.

For instance, during the WACREP initiative, a comprehensive combination of top-up and bottom-up vulnerability assessment was conducted which provided a holistic picture of the climate change sensitivities and existing coping capacities of communities in Datia district of Madhya Pradesh. The study indicated that temperature and precipitation patterns in the study region show uneven fluctuations over the past 30 years. This is not definitive of climate change but shows clear trends of climate variabilities in the district. Bottom-up primary consultations reveal that the current state of the farming community is alarming and any productivity decline would result in mass scale migration to urban areas, worsening an already precarious labor shortage in the rural regions. Farmers have taken up a number of coping measures prominently, shifting to crops which require lesser water and diversification into trade of vegetables. Forests in Datia district have shown high vulnerability to

climate change and the district has been ranked highest with respect to forest vulnerability in the state of Madhya Pradesh. This is an area of serious concern and demands serious actions.

Thus, it is clear that Datia has high exposure to climatic variability and extremes, the farming community has very low adaptive capacities and the social capital has depleted due to long term climatic stress particularly in the last five years. Financially, the farmers are under debt primarily resulting from inability to pay back old loans. Additionally, the study has found that the farming community, particularly women, do not have access to information and the linkages with the institutional set up at the grassroots is weak.

Therefore, there is a clear need for assistance to adapt to climate change in the agriculture and forest sector. The study has identified a set of short/medium term and long term adaptation options including no cost options. Capacity enhancement of the institutional structure within the district is critical for successful implementation of a climate change adaptation project as is cross departmental coordination.

**Development of Knowledge, Tools and Systems for Climate Change:** Once the knowledge and capacity building needs of local level stakeholders is identified, the next step is to develop decision support systems for mainstreaming climate change concerns in planning processes. It answers the following:

Why is there a need to integrate climate change concerns in development planning? What are the current vulnerabilities and adaptive capacities against climate change?

What are the solutions (both adaptation and mitigation strategies) which needs to be integrated in the planning processes?

How can different decision support tools be used to facilitate the climate adaptive planning process? How can we use different technologies, climate models, economic assessments, GIS models etc. in this process?

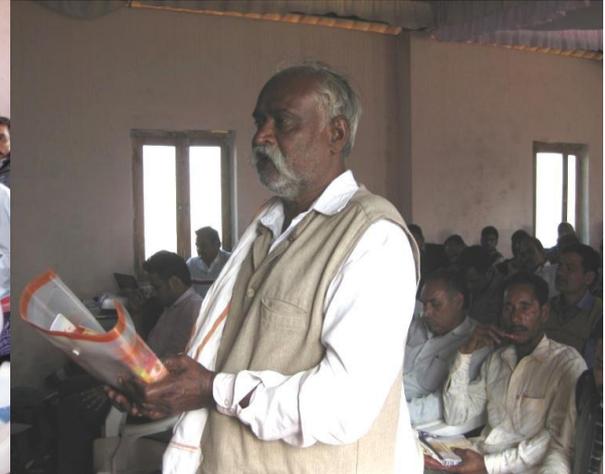
Under the Water and Climate Resilience Programme, training and capacity building of farmers on sustainable agriculture management practices helped them to adopt efficient water and soil conservation measures in the semi-arid region of Bundelkhand. Some of these practices include drip/sprinkler based irrigation, line sowing, raised bed technique, seed treatment, shade net, improved seeds, breeder seeds, agro-forestry and agri-horticulture models.

Close interactions with agriculture experts and institutions not only enhanced their knowledge but also increased their information accessibility. The intervention led to improved management of water and land resources, reduced risks of climate variabilities and increased acceptance levels of new agricultural technologies. At the start of the trainings few farmers had adopted seeds of improved varieties. However, regular trainings have led to wider adoption of the improved seed variety and other practices. Lastly, this has also created a cadre of master trainers who are not only adopting sustainable agriculture practices, but are also motivating other farmers from nearby villages for large scale uptake. They are now updated with latest government schemes and have largely benefitted from them.

The lesson which clearly emerged out of the process was, that in order to upscale soil and water conservation strategies in Bundelkhand region, there is a need to educate farmers through successful demonstrations and participatory practices. Integrating environmental concerns in village plans play an important role in aligning sustainable agriculture practices with their planning processes.



**Women farmers learning on rain water harvesting for soil & water conservation**



**Elderly farmer sharing his experiences of climate change impacts observed by his community over last 30 years**

Furthermore, engaging local communities for integrating climate change concerns in development planning is important in addressing local concerns of climate change and increasing climate resilience. Bottom-up analytical and participatory processes helped vulnerable communities in identifying local climate change vulnerabilities and respective adaptation strategies. Climate adaptive planning processes adopted in Datia district of Madhya Pradesh under the WACREP initiative, enhanced capacities of village level planners on integrating climate change adaptation in their existing plans. Lastly, linking the decentralized climate adaptive planning processes at panchayat level with development planning at district level helped in the uptake of locally developed climate adaptive plans at district.

**Set up Mechanisms for Effective Uptake:** It is a phase and implements stage where prioritized adaptation strategies are phased out and identified on the basis of available funds, human resource, institutional capacities, available schemes and institutional capacities. Based on the availability and capacities in a given planning cycle, decision makers at national, state, district or even panchayat level can select adaptation strategies for integration into development plans. It also helps to identify potential entry points such as:

- Ongoing schemes and plans (MGNREGS, IWMP etc)
- Sectoral Plans (State five year plans, Agriculture Contingency Plans, Disaster Management Plans)

For Datia district of Madhya Pradesh, climate adaptive plans were developed for Pathari and Nauner panchayats of Datia district. Communities identified village level vulnerabilities and highlighted adaptation strategies for them. The participatory exercises used three guiding factors (i.e. problems, solutions and means of implementation) for development of climate adaptive plans for the village. As a result, interventions for integrated watershed development, soil and water conservation and access to improved seed varieties were specifically included in their panchayat plans.

**Uptake into Planning and Implementation:** Once the responsible departments, potential schemes and budget resources are identified to incorporate climate change adaptation solutions in the development planning process, co-benefits of climate change can be integrated in development processes. It is then crucial to remember that once the plan is developed it is important to monitor its implementation through mapping of milestones and their delivery.

Advantages of Using the Framework for Mainstreaming Climate Change in Developmental Planning

- The framework views multifold impacts of climate change, evident sectoral overlaps and analogous co-benefits of adaptation thus viewing interlinkages between climate resilience and development planning.
- This approach allows climate concerns to be simultaneously addressed and embedded into everyday decision-making.
- It helps to leverage existing technical, human and financial resources and enhance capacity to identify co-benefits between adaptation needs and other priorities



Trainer elaborating the guidelines for developing climate adaptive plans in the group exercise



Mr. Chandan Mishra elaborating on the approaches for model village development

## Lessons from Water and Climate Resilience Programme

### Mainstreaming adaptation into planning – an effective way to respond to climate change

In the medium and long term, standalone projects are unlikely to meet all adaptation requirements in a cost-effective, scalable manner and therefore mainstreaming adaptation into development planning is an effective way to respond to climate change. The expected benefits include avoided policy conflicts, reduced risks and vulnerability, greater efficiency compared with managing adaptation separately, and leveraging the much larger financial flows in sectors affected by climate risks than the amounts available for financing adaptation separately.

While mainstreaming of climate change adaptation in policy happens at the institutional level, mainstreaming at the programme/ scheme level needs to be preceded by plans that help communities better adapt to those climate change related vulnerabilities and challenges. This involves identifying sector-specific vulnerabilities of the communities and the



region, capacity building of communities, capacity development of institutions facilitating the planning/implementation process, integration of those concerns in the plans for the scheme/ sector and a mechanism that ensures that activities are undertaken as per the prepared plans during implementation. Improving human and institutional capacity on climate change would require ongoing knowledge and planning support to public and private institutions, local and national institutions, local level decision makers and implementation entities.

Another larger question that needs debate is also the overall planning process in the country within which adaptive planning needs to be embedded. With issues like lack of local participation in the planning process, lack of convergence among stakeholders, scheme-based responses to village needs, multiplicity of plans (village/district plans, plans for flagships, departmental plans) which do not necessarily dovetail into one another, '*transmission losses*' of local priorities at each step towards aggregation of plans and the limited capacities of mentoring institutions and functionaries at the local level, any step towards adaptive planning needs to factor in these limitations of the current planning process.

Emerging lessons from Water and Climate Resilience Programme clearly highlight that in order to address global issues such as climate change at local level; there is a need to identify local climate change vulnerabilities and response strategies. This can only be enabled through engagement of local stakeholders and decision makers. This helps to integrate cross-cutting concerns of climate change in local planning processes. Climate adaptive planning at sub-national level is crucial in increasing resilience against climate risks. Furthermore, implementation of climate adaptive plans is possible through ownership of district and village level planners. Identification of linkages with ongoing schemes help to identify budgetary resources and helps to link village priorities with district priorities.

## CONCLUSION AND RECOMMENDATIONS

- As mentioned in this policy brief, the limited outreach of the agriculture extension officers could be supported by the gram panchayat level Technical Support Group (TSG) constituted under DDP to facilitate village planning. These TSGs should be trained on climate change issues and resilient strategies as these TSGs play a crucial role both in planning as well as in implementation. Therefore there is a need to incorporate climate perspective in the technical support group training manual to ensure reach of the climate understanding and its translation at the grassroots.
- Locale specific knowledge package should be developed since the requirements and priorities vary at each district. Development+ (development plus) schemes are required to subsequently address the issues of climate change. Even today the climate change concerns are externalities for the government officials. It needs to be internalized by incorporation of climate smart vision in the planning and implementation process.
- More systems for provision of simplified and relevant data for farmers are required to enable robust adaptation options. Currently this role is being played by 'interface' organisations and new investments by the government and donors are needed to strengthen and expand the ability of such institutions to integrate a wide range of information for climate change adaptation and translate this information into more decision relevant forms. In places where

such institutions are absent there is a need for government and donors to consider creating institutions/ organisations to fill this niche`.

- Data base should be generated for different users for data accessibility and knowledge flow. This will contribute in building up of strong scientific evidences through vulnerability assessments, risk assessments, climate change projections, impacts of climate change and allied sectors etc.
- There is also a need to disseminate findings from local research being conducted by KVKs to farmers who are not beneficiaries of extension programmes, and improve the profile of ATMAs so farmers find it more accessible. Finally, there is a need to develop a more robust system to ensure that meteorological information useful for adaptation is reaching grassroots in a timely and cost effective manner. The community radio can contribute effectively to all these processes.
- Another alternate to deal with the future uncertainties is adoption of **low regret** and **no regret** adaptation measures. Fortunately, many measures provide a host of development benefits in addition to fostering climate change adaptation. They can be implemented even in the presence of remaining uncertainties about future climatic conditions. No-regret adaptations are measures that would be justified under all plausible future scenarios, including the absence of manmade climate change. No-regret adaptation is not affected by uncertainties related to future climate change because it helps address problems associated with current climate variability, while at the same time, builds adaptive capacity for future climate change. Investment decisions for such interventions can be taken up without assessing project risks due to uncertainty on future climate e.g. enhancing provision and dissemination of climate information as well as access to early warning systems by local communities living in flood and/ or drought prone areas. Low-regret adaptation yields large benefits under relatively low risks e.g. promotion, including research and extension, training, marketing etc. of drought resistant cultivation in areas where drought risk is projected to increase. This type of investment is likely to yield positive returns under many future climate scenarios, but incorporates a small risk in the unlikely case that drought risk decreases in the project area in the next decades. Both no-regret and low-regret options can be “win-win” options when they enhance adaptive capacity (i.e., they reduce climate vulnerability and exploit positive opportunities), while also contributing to the achievement of other social, environmental or economic outcomes.
- There is an urgent need to reinforce the linkages between climate change planning and its implementation at the ground to ensure maximum effectiveness. Efficient delivery mechanisms need to be designed so as to ensure the sustainable execution of concrete options at the bottom level. Thus, building up the internal capacities of the implementation authority at the local level is required. This can be ensured by building the capacities of the bottom level planners and interface extension agents so as to enable ability to adopt climate resilient development. Frequent trainings, exposure visits to model villages and regular monitoring of the Government officials can highly contribute in ensuring sustainable execution of robust climate change adaptation at the grassroots.
- Addressing these current problems while simultaneously addressing climate change concerns for future requires strengthening the planning and implementation at all levels (village, district, and

state, national) of the government system in order to ensure efficient allocation of funds and communication of development policies. This will require identification of different stages in the policy development and implementation process to integrate potential intervention and revise pre-existing strategies using the climate change lens.

- Additionally, monitoring and evaluation of funds is essential to ensure effectiveness. This will make sure that the policies are percolated down to the grassroots in their original form and efficiently delivered to climate sensitive communities.
- Institutional mechanism should give importance for the primary evidences collected through various developmental studies or pilot projects and the findings should be integrated into the planning strategies.
- For climate adaptive planning the right balance of top-down and bottom- up approach in the planning process should be maintained. The challenge is not only to deal with the existing vulnerabilities but also to cope up with the additional threats posed by climate change in the coming future. This can be facilitated by:
  - Connect (with the communities directly facing the brunt of climate change)
  - Communicate (to inform the decision makers about the need of climate smart planning)
  - Collaborate (between the departments for streamlining adaptation options)

Thus despite of several gaps, there is an immense scope of successful implementation of climate adaptive planning in the decision making process of Madhya Pradesh. The central state of India is one of the leading states of the country with respect to taking climate resilient and low carbon development initiatives. Mainstreaming climate change adaptation at the design stage can revolutionize the scenario of climate resilient development in the country. For the development of parched geography of Bundelkhand, the state should not only consider financial resources but should prioritize human and natural resources for the overall economic development of the country.

All these recommendations can prove to be valuable for upliftment of the socially backward and vulnerable region of the state.