



Future-Ready Jharkhand Pathways for Climate-Resilient Jharkhand



Workshop Report

Building a Climate Resilient Jharkhand : Adaptation and Mitigation

21 June 2022, Ranchi

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The **Department of Forest, Environment & Climate Change (DoFECC)** is one of the important departments in the Government of Jharkhand that aims to foster ecologically sound, socially beneficial and economically prosperous development of the Jharkhand State by effectively enforcing relevant policies and regulations for the sustainable management of its forests and forest resources.

The **Centre for Environment and Energy Development (CEED)**, an environment and energy expert group, is involved in creating sustainable solutions to maintain a healthy, rich and diverse environment. CEED primarily works towards Energy Transition, Ambient Air Quality, Clean Water for All and Zero Waste Solutions by creating an enabling ecosystem to scale up investments in low carbon development pathways, climate mitigation and adaptation. CEED engages with industries, think tanks, stakeholders and the public to create environmentally responsible and socially just solutions.

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Foreword



Jharkhand is one of the most climate-vulnerable states in the country, which is committed to charting an arduous journey in achieving a climate-resilient society. Indeed the deepening climate impacts are critical given the priorities related to development targets including poverty eradication, energy access, health & education for all. Therefore, there is a sense of urgency to underpin the state's plans to increase efforts to mitigate climate change and ramp up climate resilience simultaneously.

Climate actions are an integral part of Sustainable Development Goals (SDGs) and the state government of Jharkhand is working towards achieving them with a holistic and inclusive development approach. As per the mandates of the Government of India and the National Action Plan on Climate Change (2008), the Government of Jharkhand had also prepared the State Action Plan on Climate Change in 2014. The State Action Plan (SAP) has envisaged a vision of 'achieving economic growth-poverty alleviation and enhancing livelihood opportunities while ensuring environmental sustainability.' We have taken formidable measures in terms of the key pointers of the action plan and we are committed to creating a climate-resilient Jharkhand.

Development planning and climate adaptation strategies are inter-linked. Developing and identifying best practices from around the globe and translating them into local context by industry, community and society is crucial for a climate-resilient Jharkhand. A multi-stakeholder approach is key, where every step counts from industry & business sectors, civil society, academia and common people.

Jharkhand is a relatively small state yet full of potential to realise the goal of inclusive development with sustainability in every economic sphere! This workshop organised by the Department of Forest, Environment and Climate Change and the Centre for Environment and Energy Development (CEED) has brought forward the new development vision and action plans for achieving climate resilience, healthy and inclusive Jharkhand. I am hopeful that this will not only enrich the informed policy deliberations and programmatic interventions for Jharkhand alone but also for the other states as well!

Sh. Arun Kumar Singh, IAS

Development Commissioner, Jharkhand

Additional Chief Secretary, Department of Health, Medical Education & Family Welfare, Jharkhand



Message from PCCF, Jharkhand



One of the biggest survival crisis of civilization, climate change has now become part of everyday life and its impact transcends the geographical boundaries across the social strata. Developing resilient infrastructure also forms an integral part of many development objectives that work towards the achievement of Sustainable Development Goals (SDGs). The major objective of the SDG-11 is “to make cities inclusive, safe, resilient and sustainable” emphasises the kind of development model we need to think of for future generations and the planet.

Integrating climate change adaptation considerations into policy processes and decision-making across a range of sectors and scales is important in managing the impacts of climate change. Climate-conscious development and spatial planning are key. Therefore, this conference is a part of higher-level policy discussions with all key stakeholders for a future-ready and forward-looking Jharkhand where a climate-resilient economy will be at the core of things.

Policy and programs need to be forward-looking and evolve to the needs of the changing time. We are hopeful that a new development vision is at the doorstep, what is required here is a collaborative and convergent approach in the true spirit so that Jharkhand can mark a niche on the map of sustainability and prosperity.

Sh. A.K. Rastogi, IFS

Principal Chief Conservator of Forest, Jharkhand
Chairman, Jharkhand State Pollution Control Board



Message from Secretary, Dept. of Agriculture, Animal Husbandry & Co-operative, GoJ



Climate change is one of the most complex problems people have ever faced. Natural resources and the environment are already under pressure due to anthropogenic factors and indiscriminate urbanisation and industrialisation processes in sensitive regions. Climate change is projected to exacerbate these pressures.

Adaptation planning should be informed by a thorough understanding of contextual vulnerabilities and not limited to climatic risks, but also encompassing existing socio-economic factors. The climate-resilient pathway involves ambitious mitigation action, transformative adaptation practices and climate-sensitive developmental responses.

Since a multi-stakeholder approach for managing climate-resilient Jharkhand is crucial, this workshop has been conducted to streamline the broader ideas and solutions to effectively realise these on the ground. This will lead to better policy formulation and program implementation in the state.

Sh. Aboobacker Siddique P., IAS

Secretary, Department of Agriculture, Animal Husbandry & Co-operative, Jharkhand



Message from APCCF-CAMPA Jharkhand



Changing climate impacts have posed greater challenges to the key development issues such as food, water, clean air, habitat, health and natural environment which are often interrelated and even leads to undesirable consequences at various scales.

Since the lives and livelihoods of many rural and vulnerable communities (tribals especially) are at risk, vulnerability mapping and risk assessment are key. This can assist regional level long-term adaptation planning by identifying areas with varying exposure to climate change-related hazards and subsequently formulating a step-based plan to prepare and mitigate the possible consequences.

This workshop was organised with the belief that multi-stakeholder partnerships, throughout the stages of planning and implementation, allow the exchange of knowledge, capacity building and risk-sharing. With this workshop, Jharkhand has the opportunity to learn from the global as well as local experiences and models to promote climate-resilient infrastructure strategies to secure a better future.

Sh. Sanjeev Kumar, IFS

Additional Principal Chief Conservator of Forest-CAMPA, Jharkhand



Message from CEO, CEED



To make India's success story truly happen on the world stage, States can act as frontiers for climate action at the subnational level. This creates an exciting opportunity for States like Jharkhand to play a significant role in achieving the milestones highlighted in the national and state missions and ambitious targets like net-zero emission and climate resilience.

Though there is a State Climate Action Plan on Climate Change, the state has to develop a cross-sectoral clear understanding of the climate change status, sensitivity and capacity. This should lead toward designing climate-resilient action's more scientific, accurate, acceptable and resource-efficient.

Jharkhand has the courage, ambition and incredible amount of natural and human resources to unlock barriers to streamline climate mitigation and energy solutions. It can demonstrate the success on the climate-resilient front too and mark a niche position on the national map!

Sh. Ramapati Kumar

Chief Executive Officer

Centre for Environment and Energy Development (CEED)



Executive Summary

Climate change has put a burden on the existence of the entire biosphere affecting the planet's sustainability. It is no doubt a cocktail of multiple challenges influencing almost every aspect of mankind including human health, agriculture, forestry, weather, and several anthropogenic and natural hazards. Based on a wider range of impacts, climate change seeks innovative approaches to minimize the threats, adapt to the changes and mitigate the associated issues. With increasing levels of scientific certainty of the climate change impacts, adaptation and mitigation were seen as potential tools for reducing the associated risks. Adaptation is a response system to anticipate and cope with the negative impacts of climate change that cannot be avoided. Whereas, mitigation is a way to keep climate change impacts relatively moderate rather than extreme.

In addition to the adaptation and mitigation strategies, the increasing burden on existing natural resources, the need for a more robust mechanism is felt which incorporates both adaptation and mitigation principles and is more resilient in nature. Such a mechanism will have overarching goals where both adaptation and mitigation complement each other. Cutting carbon emissions and offsetting other greenhouse gases is no doubt the most crucial step toward intervening in the problem, however, such approaches will take relatively longer time and effort due to various scientific, economic, and geopolitical factors. In such a scenario, building climate-resilient developmental pathways could be of greater impact by including strategies, choices, and actions that reduce both climate change and its impacts.

Jharkhand is a resource-rich state with large mineral reserves, forests, agricultural land, and small, medium and large industries. The anthropogenic activities associated with these resources not only affect the climate but are also affected by the alteration in the climate. Although climate change is a synoptic or a regional issue, the scale of its impacts and vulnerability is quite localized in Jharkhand due to the spatial variation in economic activities and land use. A robust roadmap for building a climate-resilient Jharkhand relies on the state's preparedness for the climate emergency, and the development of effective strategies for adaptation and mitigation plans in a more decentralized manner.



Notable Speakers



Sh. Arun K Singh, IAS
Development Commissioner
GoJ



Sh. A.K. Rastogi, IFS
PCCF, Jharkhand
Chairman, JSPCB



Sh. Aboobacker Siddique P, IFS
Secretary, Agriculture Deptt.,
Animal Husbandry & Co., GoJ



Sh. Sanjay Srivastava, IFS
PCCF, ED, WDD
GoJ



Sh. Sanjeev Kumar, IFS
APCCF-CAMPA
GoJ



Dr. D.K. Saxena, IFS
CCF,
GoJ



Sh. H.S. Gupta, IFS
Retd. PCCF, Wildlife
GoJ



Sh. Ramapati Kumar
CEO
CEED



Sh. Ved Prakash
DFO
Ramgarh, GoJ



Dr. K.K. Sharma
Director
IINRG, Ranchi



Sh. Anurag Dixit
GM
Tata Steel Mining, Bokaro



Dr. Nitin Kulkarni
Director
IFP



Prof. (Mrs.) Kamini Kumar
Acting VC
Ranchi University



Sh. Ranjit Tibrewal
FJCCI



Dr. Manish Kumar
Director (R&D)
CEED



Sh. Bikash Das
Principal Scientist
ICARRCER, Ranchi



Sh. Binay Pattanayak
Senior Education Consultant
The World Bank



Sh. Somesh Biswas
Chief Corporate Sustainability
Tata Steel Limited







KEY RECOMMENDATIONS OF THE WORKSHOP



Key Recommendations of the Workshop

01

A structured framework for the conception, design, and implementation of plans and operations is required to allow policymakers and practitioners to incorporate climate-resilient measures into their decisions.

02

Develop a long-term land-use plan for ensuring forest growth, food security, and climatic resilience. Ensuring sustainable harvesting, improved processing, and access to non-timber forest product markets are must for a climate resilient Jharkhand.

03

There should be planned urbanization for efficient use of natural resources and sustainable development. There should be increasing use of water-efficient/drought-resistant crop varieties, adopting an improved irrigation strategy to achieve the goal of improved crop water productivity.

04

Climate finance is needed for mitigation efforts because large-scale investments are required to significantly reduce emissions. Climate finance is equally important for adaptation, as significant financial resources are needed to adapt to the adverse effects and reduce the impacts of a changing climate.

05

To ensure local food security and price stability, a national grid grain storage system from the household/community level to the district level must be built. Farmers should be rewarded for resource conservation and efficiency by giving credit to shift to adaptation measures.

06

To address the health consequences of climate change in an integrated and coordinated manner, ESG guidelines for private and public sector players can be developed to streamline fund flow and systematically fill state health sector gaps.

07

Climate resilience in the state necessitates sustainable mining practices, less deforestation, better waste and water management, and resilient infrastructure solutions. To address rising emissions, strengthen infrastructure and reduce the wide-ranging effects of climate change on people's livelihoods and well-being, climate governance and climate financing must be prioritized.

08

Establish a think-tank at the village level with committed, educated individuals who would understand the fundamentals, brainstorm solutions, and work diligently in partnership with villagers to promote village sustainability.

09

Ensure basic infrastructure at each place for supporting each village in its preparations and initiatives for sustainable development. The activities would include continuous and comprehensive assessment, capacity building and handholding for collective planning and sustainable development.

Motivation

The future loss and damages from the deleterious impacts of climate change can be minimized by investing in climate resilience measures and ensuring that the most vulnerable sectors can recover more rapidly from disaster, for example by mobilizing risk finance and improving disaster relief readiness. The science-based mitigation measures complimented by the localized adaptation strategies can significantly help in building resilience in a resource-rich state like Jharkhand. The key motivation for organizing this workshop was to ensure the initiation of such a concrete roadmap for decision making, both for the current and future, taking into the consideration of evolving processes for building a climate-resilient development in Jharkhand.

Goals and Objectives of the Workshop

The workshop aimed to bring all the stakeholders of the complex socio-economic and governance system of the state of Jharkhand on a common platform to brainstorm the idea of building a climate-resilient Jharkhand. It was conceptualized by keeping the idea of integrating both adaptation and mitigation strategies of climate change impacts in the state together. The idea of this workshop is based on the following broader objectives:

- » To assess the current and future risks of climate change and further develop strategies for preparedness and adaptation in Jharkhand.
- » To develop a roadmap for evolving mitigation measures for climate change impacts over Jharkhand
- » To integrate the efforts of policy making and financial institutions for a climate-resilient Jharkhand.



Structure of the Workshop

The workshop was structured around three sessions that revolved around highlighting the threats and vulnerability of climate change in Jharkhand, the current trends in the indicators of climate change, mitigation and adaptation strategies in the state. Furthermore, the perspectives of various stakeholders like industries, research organizations, academia and government departments were the most important component of the workshop followed by the discussion on the feasibility of various climate finance frameworks in the state.

01

Session 1: Climate Change : Threats, vulnerabilities and adaptation for climate resilient Jharkhand

02

Session 2: Climate change adaptation and mitigation strategies for Jharkhand.

03

Session 3: Strengthening climate governance, finance and policy in Jharkhand.

Session 1 discussed the threats and vulnerabilities of climate change with respect to Jharkhand. The current state-of-the-art of climate change indicators in Jharkhand and their potential impacts on various economic sectors. Sessions 2 primarily focussed on highlighting the ongoing and future adaptation and mitigation strategies in the state. Session 3 facilitated discussion on the financial management in the state that could support the state to adapt to the threats of climate change and implement mitigation measures effectively.

The workshop witnessed participation from various government departments i.e. Department of Forest, Environment and Climate Change, GoJ, prominent academic and research institutions, corporate groups, banking and finance companies of Jharkhand.



INAUGURAL SESSION



Inaugural Session



The workshop started with the inaugural session composed of Sh. Arun Kumar Singh (IAS), Development Commissioner cum Additional Chief Secretary, Department of Health, Medical Education and Family Welfare, Government of Jharkhand; Sh. A.K. Rastogi (IFS), Principal Chief Conservator of Forest and Chairman, JSPCB; Sh. Sanjeev Kumar (IFS), APCCF-CAMPA; and Sh. Ramapati Kumar, Chief Executive Officer, Centre for Environment and Energy Development. The welcome note and context setting of the workshop were done by Sh. Sanjeev Kumar followed by the emphasis on a climate-resilient Jharkhand by Sh. Ramapati Kumar from CEED.

Sh. A.K. Rastogi (PCCF, Jharkhand) elaborated on the broader intent and objectives of the workshop and emphasised that for combating climate change, adaptation strategies require continuous inputs from scientific research, stakeholders engagement and technological solutions for redesigning the key policy and programs with a focus on vulnerable areas and populations.

Sh. Arun Kumar Singh (Development Commissioner, Jharkhand) delivered the keynote address and said that there is a need for an integrated approach for mainstreaming the climate adaptation strategies in the planning, programmatic and implementation phase with a clear vision to attain the sustainable goals and inclusive development.



Highlights

It is necessary to set up windows to promote research and development, innovation and entrepreneurship through enabling policy environments like legal and institutional landscape, and financial and physical infrastructure for climate resilience.

01

Vulnerability assessment and strategies development should be scaled up to develop cross-sectoral strategies for the state.

02

New Infrastructure Resilience through adherence to Strategic Environmental Assessment (SEA), and Environmental Impact Assessment (EIA) should be sped up.

03

The current practices of data collection and interpretation will require significant changes to fit into the climate change management regime that is proposed to ensure timely appropriate responses.

04

Harnessing the potential of 'Nature-based Solutions (NbS)', like the ones offered through 'Ecosystem-based Adaptation (EbA)', to contribute to the resilience of infrastructure networks.

04

Environmental knowledge and awareness are crucial in all stages of the disaster management cycle including pre-disaster prevention and mitigation, and post-disaster response, relief, reconstruction and recovery.

06

Effective, interactive, and innovative governance practices can help address the institutional barriers that lead to adaptation implementation-related deficits.

07



Takeaways from the Speakers



“Climate-resilient pathways include strategies, choices, and initiatives that reduce climate change impacts. Development planning and adaptation strategies are inter-linked. We have taken formidable measures as per the state climate action plan and we are committed to creating a climate-resilient and inclusive Jharkhand.”

**Sh. Arun Kumar Singh (IAS),
Development Commissioner & Additional Chief Secretary, Department of Health
Medical Education & Family Welfare (Jharkhand)**



“Climate Change impacts transcend the geographical boundaries across the social strata. Therefore, integrating climate change adaptation considerations into policy processes and decision-making across a range of sectors and scales is important for the creation of a forward-looking economy. What is required here is a collaborative and convergent approach in a true spirit, so that Jharkhand can mark a niche on the map of inclusivity, prosperity and sustainability.” -

**Sh. A.K. Rastogi (PCCF, Jharkhand and Chairman, Jharkhand State Pollution
Control Board)**



“A robust roadmap necessitates the building of a climate-resilient Jharkhand, which can facilitate the state’s preparedness for the climate emergency and the development of effective strategies for adaptation and mitigation. We have to look at the key challenges of land degradation and initiatives on sustainable ways of natural landscape restoration for resolving the riddles of land, water and forest.”

**- Sh. Sanjeev Kumar (IFS), APCCF-CAMPA
Jharkhand**



“A state-wide implementation of the state climate change action plan is possible through the highest order of convergence. It can be aided by facilitating efficient climate governance, and strong institutional and public participation and coordination among different sectors. Based on the newer goals of the Paris agreement and Glasgow Convention, a review and update of the state climate change action plan of Jharkhand is the need of the hour.” -

**Sh. Ramapati Kumar, Chief Executive Officer
Centre for Environment & Energy Development (CEED)**

Session 1 >>

CLIMATE CHANGE : THREATS, VULNERABILITIES AND ADAPTATION FOR CLIMATE RESILIENT JHARKHAND



Chair:
Sh. A.K. Rastogi
(PCCF, Jharkhand and Chairman, Jharkhand State Pollution Control Board)

Overview

Climate-related disasters could wreak havoc on the state's agriculture, critical infrastructure, and essential community resources, resulting in job losses and worsening poverty. Considering the huge dependence of Jharkhand on natural resources, this becomes impervious to understand the climate change threats and the associated vulnerabilities. Natural climatic inconsistency, such as decadal fluctuations, and human-induced variability, such as land cover and greenhouse gas (GHG) emissions, both affect rainfall patterns. An increasing trend is apparent in maximum and minimum temperature whereas the decreasing trend of rainfall indicates a precarious situation for agriculture, water resources, and the overall economy of the State. Rainfall variability substantially impacts water supplies, agricultural output, and, as a result, the economy.

Objectives of the Session

Jharkhand has a diverse landscape, abundant natural resources, and a rich native habitat and culture. This focuses on the need to protect water resources and manage rapid land use and land cover changes, primarily due to urbanization and deforestation, as well as to minimise climate variability to some extent. The dry monsoon, along with high temperatures, increases the likelihood of drought, resulting in lower crop yields, socio-economic instability, and more undernourished people. Sh. A. K. Rastogi, (PCCF, Jharkhand), presided over and moderated the session by providing background information and situated the discussion around climate change and its threats, and adaptation related measures.

The session aimed to identify the probable districts of concern where a further detailed study and climate action are needed. Moreover, the identification of the vulnerable stakeholders to the deleterious impacts of climate change and create awareness of adaptation and mitigation was also anticipated from the discussion. The overall emphasis was to synthesize robust inputs to the policymakers for efficient management of natural resources in the state vulnerable to climate change impacts.



Highlights

01

Carbon emission released from forest fires has been identified as an environmental concern in the context of global warming.

02

Carbon market is less effective than the regulatory market, it gives us the opportunity to “imperfectly act now” and support the value of reducing carbon emissions.

03

Tropical reforestation and avoided deforestation are efficient, cost effective land based strategies.

04

Boundaries are important to avoid double-counting emissions and reductions and for including otherwise unaccounted for parts of the total carbon footprint.

05

Bio-sequestration offsets reduce atmospheric CO2 concentration by growing vegetation that will store carbon in plants and soils.

06

Forest Genetic Resources (FGRs) can be utilized for conservation and improvement of future trees.



Takeaways from the Chair and Speakers



“Jharkhand is experiencing unpredictable effects of climate change, and districts in the northern part of the state are particularly hard hit. As a result, all departments must place a greater emphasis on climate change adaptation and mitigation.”

Sh. A.K. Rastogi (PCCF, Jharkhand and Chairman, Jharkhand State Pollution Control Board)



“Tremendous efforts are required to achieve climate-resilient Jharkhand, including expanding observational networks, maintaining monitoring systems, providing value-added weather services to farmers based on regional changes, and continuing to invest in education and outreach programmes.”

Dr. Sanjay Srivastava (IFS), PCCF cum Executive Director Wasteland Development Board, Government of Jharkhand



“The transition from fossil fuel energy generation to new renewable energy can directly reduce atmospheric carbon emissions. Our economic system should internalize the implications of climate change and we have to voluntarily contribute to the shift. In addition it is essential to plan real reductions through increased efficiencies before options like carbon offsets.”

Dr. H.S. Gupta (IFS), Ex-PCCF, Wildlife Government of Jharkhand



“Agroforestry system provides ample opportunities for diversification and produces a range of economic, environmental and socio-economic benefits. Major key challenge is marketing of trees planted under Agroforestry.”

Dr Nitin Kulkarni, Director, Institute of Forest Productivity (IFP)

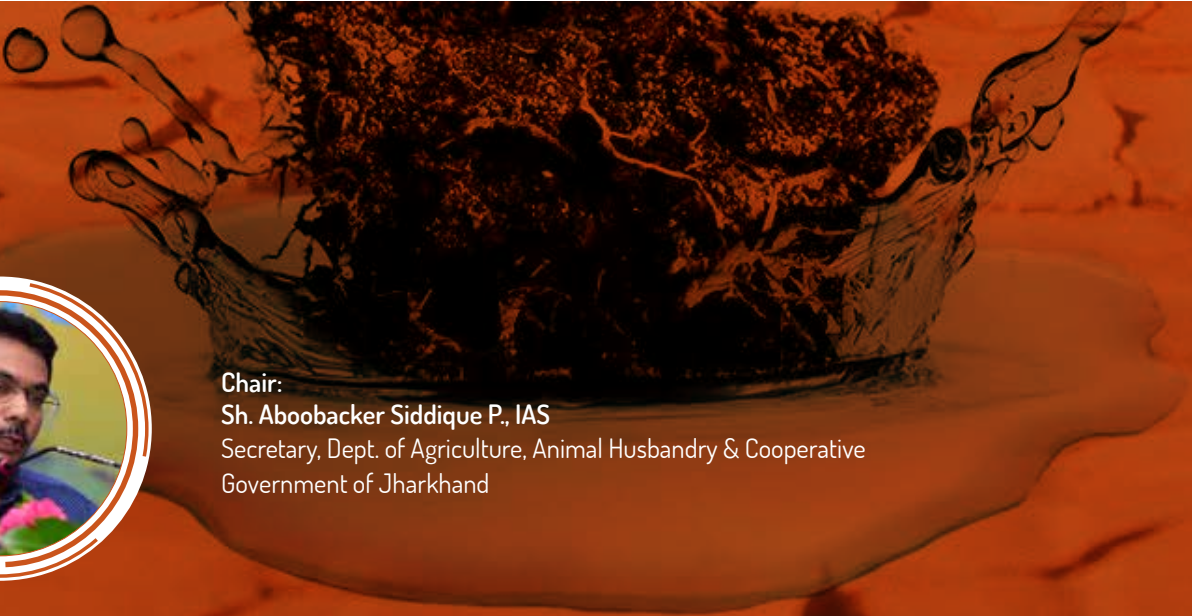
Session 2 >>



CLIMATE CHANGE ADAPTATION AND MITIGATION STRATEGIES FOR JHARKHAND.



Chair:
Sh. Aboobacker Siddique P., IAS
Secretary, Dept. of Agriculture, Animal Husbandry & Cooperative
Government of Jharkhand



Overview

Climate change is proving to be one of the greatest challenges faced by the global community today and the past trends and erratic behaviour in climatic events reveals that changes in the climate of Jharkhand are evidence of natural climate variability. About 14 out of the state's 24 districts are classified as highly vulnerable, which includes Sahibganj, Pakur, Chatra, Garhwa, Palamu, Giridih, Hazaribag, Bokaro, Khunti, and Godda. As a result, the climate change challenge necessitates an appropriate, evidence-based, and coherent policy response, followed by adequate action that can help reduce the state's vulnerability and build resilience in the face of climate change impacts.

Objectives of the Session

The session's goal was to better understand and present a comprehensive view of climate change adaptation and mitigation strategies for a future-ready Jharkhand. Climate-smart agriculture, future-ready transportation system, role of non-timber forest produce, and clean energy for a climate resilient Jharkhand were some of the topics discussed during the scoping process for climate change mitigation and adaptation strategy. It also aimed to understand and develop a framework for climate change adaptation in the coal mining sector in the state. The session was chaired and moderated by Sh. Aboobacker Siddique P. (IAS), who outlined a cross sectoral approach to discuss and develop strategies for the state's preparedness and adaptation to climate change risks, as well as a roadmap for evolving mitigation measures for Jharkhand's climate change impacts.



Highlights

01

Protecting and improving sustainable forest-based livelihoods is crucial for laying the groundwork for long-term economic and social development in the state.

02

Climate Smart Agriculture, in tandem with the promotion of appropriate traditional knowledge, is the primary climate adaptation strategy for the agricultural sector.

03

With the increasing effects of climate change on crop production and other livelihoods, non-timber forest products serve as a safety net for the vulnerable communities.

04

Ensuring sustainable harvesting, improved processing, and access to non-timber forest product markets are must for a climate resilient Jharkhand.

05

Climate resilience in the state necessitates sustainable mining practices, less deforestation, better waste and water management, and resilient infrastructure solutions.



Takeaways from the Chair and Speakers



“Agriculture sector adaptation strategies require technological advances to combat climate change, since the majority of agriculture-dependent communities are relatively poor and live in villages with limited access to resources, a sound and supportive policy framework that considers the social sector is required to facilitate the adaptation process.”

Sh. Aboobacker Siddique P. (IAS), Secretary, Department of Agriculture, Animal Husbandry & Co-operative, Government of Jharkhand



“Multi-sectoral climate adaptation strategies, such as mining, energy, agriculture, forest, health, rural and urban development, and disaster management, are crucial for designing and building a Future-Ready and climate-resilient Jharkhand.”

Sh. Sanjeev Kumar (IFS), Additional-Principal Chief Conservator of Forests (APCCF-CAMPA), Government of Jharkhand



“Diversification into biotic and abiotic stress tolerant crops and varieties using bagging techniques, soil organic carbon management, and adoption of climate smart agriculture, including the use of appropriate traditional knowledge for adaptation, are all essential for climate resilient agriculture in Jharkhand.”

**Sh. Bikash Das, Principal Scientist
ICAR-RCER, FSRCHPR, Ranchi**



“To assist forest-dependent communities in adapting to climate change, NTFP-focused forest management is required. Traditional lac-dependent sources of income should be strengthened, and related skill-building programmes should be implemented.”

**Dr K. K. Sharma, Director
Indian Institute of Natural Resins and Gums, Ranchi**



“Collaboration and convergence are required to achieve a climate-resilient future. The coal industry will actively support the path to net-zero emissions for a sustainable future.”

**Sh. Anurag Dixit, General Manager
Tata Steel Mining, West Bokaro**



“Climate change adaptation and mitigation strategies cannot be implemented in isolation. They are complementary to one another. Building new land sinks and protecting existing land sinks are crucial for mitigating climate change impacts in Jharkhand.”

**Dr. Manish Kumar, Director (Research & Development)
Centre for Environment and Energy Development**

Session 3 >>

STRENGTHENING CLIMATE GOVERNANCE, FINANCE AND POLICY IN JHARKHAND.



Chair:
Prof. (Mrs.) Kamini Kumar
Acting VC, Ranchi University

Overview

Climate change poses significant risks to the regional economy and the financial system as a whole. These risks may appear vague and distant, but are rapidly approaching, and require immediate action. Understanding climate governance and climate financing, which have the potential to play a pivotal role in addressing climate change, must be prioritized in order to address rising emissions, to build better infrastructure, and to mitigate the wide-ranging effects of climate change on people's livelihoods and well-being. However, in Jharkhand, the role of climate governance and the impact of climate finance flows fall short of what is required to create a sustainable, net-zero, and resilient state. Climate action in the economy is a fundamental concern, and all public and private actors must connect their investments with regional targets for net-zero and long-term solutions.

Objectives of the Session

The overall purpose of this session was to look into Jharkhand's climate adaptation mitigation readiness in terms of strengthening the climate governance and policy in the state. In addition, the session also explored the need for adequate climate financing in Jharkhand, as well as the role of education, awareness, and public participation in climate action. The topics that were covered included financing climate action plan : challenges and opportunities, building a climate resilient livelihood system, SDGs and climate change in the context of Jharkhand, strengthening climate governance in Jharkhand and preparedness of the Jharkhand's business leadership towards climate adaptation and mitigation. Prof. (Mrs.) Kamini Kumar, Acting Vice-Chancellor, Ranchi University, set the tone by presenting the current climate governance framework while suggesting proactive action and recommendations to support robust adaptation and mitigation strategies to realise Jharkhand's vision of a climate resilience economy..



Highlights

01

Climate governance is linked to the development and well-being of nature and people. The sustainable development goals also prioritise resilience approach in every spheres of the economy for betterment of people.

02

Globally, the majority of climate finance provided and mobilized by developed countries is in the energy and transport and storage sectors.

03

The National Adaptation Fund for Climate Change (NAFCC) was established to finance the adaptation to climate change for the State and Union Territories of India that are particularly vulnerable to the adverse effects of climate change.

04

The National Clean Energy Fund was created to promote clean energy, and funded through an initial carbon tax on the use of coal by industries. Its mandate is to fund research and development of innovative clean energy technology in the fossil and non fossil-fuel-based sectors.

05

Near-zero technologies are still under development, making economic viability and customer willingness to pay extra for 'cleaner' products uncertain.



Takeaways from the Chair and Speakers



“Considering the impact of climate change on the state economy and society, there is a greater need to institutionalize information and knowledge-management across the stakeholders. We need to prepare specialized curriculum and specific academic courses and research projects in schools and universities for preparing the future generation. Similarly, special sessions for government officials and other key stakeholders such as representatives of the industries, business, and CSOs should be imparted for ensuring a well crafted information delivery mechanism.”

Prof. (Mrs.) Kamini Kumar, Acting Vice-Chancellor, Ranchi University



“Agriculture and forestry must be developed as resilient livelihood sectors based on horticulture-based cropping systems and agro-forestry-based cropping systems. Furthermore, Jharkhand would benefit from village level Capacity Building for Climate Resilience and Social Entrepreneurship.”

Dr D.K. Saxena, IFS, Chief Conservator of Forests, Government of Jharkhand



“There is no shortage of green finance availability. The international investors are avoiding investments in fossil fuel-based initiatives. Thus, we have a huge opportunity to finance green hydrogen and renewable energies technologies in future.”

Sh. Somesh Biswas, Chief Corporate Sustainability, Tata Steel Limited



“Things change when communities talk about regional issues. We must ensure that citizens form inclusive Sustainable Development Groups (SDGs) in the village to discuss each aspect of the SDGs and plan for implementing it in their village through collective measures in partnership with government, resource agencies and other development partners.”

Sh. Binay Pattanayak, Senior Education Consultant, The World Bank



“By focusing on the energy transition and bringing new technologies to boost market access, government agencies, academia, think tanks, and CSOs can work together by formulating a policy roadmap to build vibrant and inclusive Jharkhand.”

Sh. Chetanaya Sawhney, Program Manager, Swaniti Initiatives



“Various plans and schemes must be implemented effectively and efficiently in order to provide positive results on the ground. Increasing initiatives of solar rooftop and electrical vehicles (EV) on a large scale must be facilitated.”

**Sh. Ranjit Tibrewal, Former President
Federation of Jharkhand Chamber of Commerce and Industries (FJCCI)**



SPEAKERS PROFILE

Speakers Profile



Sh. Arun Kumar Singh, IAS
Development Commissioner cum Additional Chief Secretary, Dept. of Health, Government of Jharkhand

Sh. Arun Kumar Singh is a senior Indian Administrative officer of the 1988 batch. He has vast experience serving in the department of mines, Industry regulations and safety, Forest, Environment and Climate Change Department, and Water Resource Department. His career in deploying several policy measures has been exemplary. Sh. Singh is the recipient of numerous awards and accolades which include “Swachh Survekshan 2018” for achieving the best-performing state under Swachh Bharat Mission (Urban), “National Swachhata Awards 2018”, Ramachandran award for urban decentralization in Jharkhand, AMRUT Award 2015-16 for urban reform and Krishi Karman Award 2011-12 and several others. An avid believer in sustainable development, Sh. Singh is widely celebrated for his environmental conservation efforts.



Sh. A. K. Rastogi, IFS
Principal Chief Conservation of Forest, Jharkhand Chairman, Jharkhand State Pollution Control Board

Sh. A. K. Rastogi is an officer of the Indian Forest Service of the 1986 batch. He is also working as PCCF, in the GoJ. He also holds the position of Chairman of the Jharkhand State Pollution Control Board. He has been a critical force in terms of taking lead on various policy issues and has worked in various departments such as Land Acquisition, Water resource, and Pollution control board. Sh. Rastogi brings vast experience in the field of climate and has represented the government in various international conferences such as COP meetings and other forums. His area of interest includes land/water resource management, biodiversity conservation, environmental laws, and climate change issues.



Sh. Aboobacker Siddique P., IAS
Secretary, Department of Agriculture, Animal Husbandry & Co-operative, Government of Jharkhand

Sh. Aboobacker Siddique P is an officer of the Indian Administrative Service of the 2003 batch. He holds the position of Secretary, Department of Agriculture, Animal Husbandry & Co-operative Government of Jharkhand. He has extensive experience in facilitating dialogue on sustainable development among different stakeholders of society. His vast experience would be crucial input to the roadmap for future-ready responsible Jharkhand.



Dr Sanjay Srivastava, IFS
PCCF, Executive Director, Wasteland Development Board, Government of Jharkhand

Dr Sanjay Srivastava is an officer of the Indian Forest Service of the 1989 batch and presently working as Principal Chief Conservation of Forest (PCCF) cum Executive Director of Wasteland Development Board in the Government of Jharkhand. Dr Srivastava has an illustrious career in natural resources conservation and has made substantial contributions to the Climate Change work in the state of Jharkhand. He has presented many papers and participated in various international and national conferences. He is an avid believer in participatory approaches to forest protection and regeneration. An outstanding officer of the State, Dr Srivastava represented Govt. of Jharkhand in COP-24 and COP-14. His interests include analysis of institutional and policy issues and socioeconomic impacts of resource policies.



Sh. Sanjeev Kumar, IFS
Additional Principal Chief Conservator of Forest (CAMP),
Government of Jharkhand

Sh. Sanjeev Kumar is an officer of the Indian Forest Service of the 1992 batch. He also holds the position of State Nodal officer for Climate Change. He has several national/international publications. He is credited for two books on Ethnobotany. Sh. Kumar got several awards for promoting livelihood through silk rearing/lac cultivation in the rural area. Received Special Jury Award in International Film Festival for his documentary film on Folk Art- Vision through Images. His paintings were exhibited in many art galleries in India and abroad. Sh. Kumar's immense experience in nature and biodiversity conservation will be a substantial contribution to climate-resilient responsible Jharkhand.



Sh. H.S. Gupta, IFS (Retd)
Retired Principal Chief Conservation of Forest (Wildlife)
Government of Jharkhand

Sh. HS Gupta is an officer of the Indian Forest Service of the 1986 batch. He has served as the Principal Chief Conservator of Forest, Govt. of Jharkhand, and Director of Jharkhand Tribal Empowerment and Livelihood Project. He also served as a Professor at the Indian Institute of Forest Management, Bhopal, and as a Regional Coordinator at National Afforestation and Eco-development Board, MoEF, Bhopal. Although relieved of his duties from the Indian Forest Service, he still works for the welfare of nature and wildlife through his expertise in forestry, wildlife, and climate change.



Dr D. K. Saxena, IFS
Chief Conservator of Forests
Government of Jharkhand

Dr D. K. Saxena is an officer of the Indian Forest Service of the 1992 batch. He has an illustrious career in the field of forest & biodiversity conservation and wildlife. He has been instrumental in taking farsighted steps in forest area policy and planning, climate adaptation, and mitigation measures in the state of Jharkhand. An avid believer in sustainability, Dr. Saxena's perspective will be critical for our climate-resilient aspirations.



Sh. Ramapati Kumar
Chief Executive Officer
Centre for Environment and Energy Development

Sh. Ramapati Kumar has 25 years of cross-cultural experience in conceptualizing and executing policy development. His aspiration for sustainable development has transformed into this beautiful idea as the Centre for Environment and Energy Development (CEED). He contributed to Environment Management, Sustainability, Climate change, Renewable Energy, and Waste management including E-waste, Education, and Livelihood. He has participated in various national and international conferences to highlight the issue related to climate change, energy, and so forth. Sh. Kumar has wide experience in public policy making and is part of various committees engaged with climate change mitigation projects.





Prof. (Mrs.) Kamini Kumar
Acting Vice-Chancellor, Ranchi University

Prof. (Mrs.) Kamini Kumar is acting Vice-Chancellor of Ranchi University, Ranchi. Prof. Kumar was also earlier appointed as the first women Pro-VC of Ranchi University in 2017 and became acting VC in March 2021. She brings about four decades of experience in academia and is published in reputed academic journals. Her areas of interest are Biodiversity and climate change. Prof. Kumar is a believer in the participatory model to address the issue related to climate change.



Dr Manish Kumar
Director (Research & Development)
Centre for Environment and Energy Development

Dr Manish Kumar leads the interdisciplinary research on ambient air quality, energy transition, and climate change issues in India and South Asia. He has been deeply instrumental in investigating the sources of air pollution over the Indo-Gangetic Plain (IGP) and understanding the contributions from the underlying value chain. He has more than 10 years of experience in environmental research over a wider set-up, including government, industry, and academia. Dr. Kumar has completed his post-doctoral research on air pollution in India and the potential for air quality improvement using science and sustainability applications jointly with the Stockholm Resilience Centre (SRC) and the Stockholm University, Sweden. Dr. Kumar has also served as a visiting scientist at the Max Plank Institute for Chemistry, Germany. He has published more than 30 peer-reviewed articles in various national and international journals. Dr Kumar serves as the editor and reviewer in several international peer-reviewed journals.



Dr Nitin Kulkarni
Director, Institute of Forest Productivity

Dr Nitin Kulkarni is Director, Institute of Forest Productivity (IFP), and has three decades of experience with several national/international publications. His field of interest includes Forest Entomology particularly Bioecology and Integrated pest management strategy for judicious use of chemical insecticides in the forest. His vast understanding of forest ecology will provide critical input for sustainable development in Jharkhand. Dr Kulkarni is a life fellow of the Entomological Society of India, ICAR, New Delhi.



Sh. Ved Prakash
DFO, Ramgarh (Government of Jharkhand)

Sh. Ved Prakash is a senior officer at the Department of Forest, GoJ. He has extensive experience in Forest and Biodiversity. He has been instrumental in encouraging the participation of local communities in joint Forest management. He has been involved in the successful execution of several crucial projects for forest, ecology, and wildlife conservation. Sh. Prakash is generously known for his passion for nature conservation.



Dr K. K. Sharma

Director, Indian Institute of Natural Resins and Gums, Ranchi

Sh. Kewal Krishan Sharma has 36 years of illustrious experience in research and extension. He has published numerous research articles, books/technical reports, book chapters and other articles, patents in lac research. He has made generous research contributions in enhancing quality and production lac. Presently, Dr Sharma is heading the ICAR-Indian Institute of Natural Resins and Gums, Ranchi as Director. He is also the Project Coordinator of the All India Network Project on Conservation of Lac Insect Genetic Resources. Dr Sharma is a Fellow of the Entomological Society of India, IARI, New Delhi and a Member of several professional societies.



Sh. Anurag Dixit

General Manager, Tata Steel Mining, West Bokaro

Sh. Anurag Dixit has extensive experience in the mining industry. He is currently the General Manager of Tata Steel's West Bokaro coal division. Throughout his extensive mining career, he was instrumental in introducing a variety of sustainable mining practices, as well as several adaptation and mitigation measures to address sustainable mining. He enjoys nature, drama, and sports, and he has written and presented over a dozen technical papers in national/international journals and seminars, as well as represented industry associations before policymakers through technical committees.



Sh. Somesh Biswas

Chief, Corporate Sustainability, Tata Steel Limited

Sh. Somesh Biswas has about three decades of experience in mining to market in the steel industry. He has worked in different functions – Spanning from Steel Plant Maintenance, Operation, Improvement programs, Marketing & Sales. His current responsibilities involve Strategy development for the evolving market. Sh. Biswas takes interest in the conceptualization of the techno-economic feasibility of sustainable initiatives in Tata Steel.



Dr Bikas Das

Principal Scientist

Indian Council Of Agricultural Research (ICAR)- RCER, FSRCHPR, Ranchi

Dr Bikas Das is a Principal Scientist (Horticulture) at the ICAR RCER Farming System Research Centre for the Hill and Plateau Region in Ranchi. He has been with the centre for over two decades. He is a Fellow of the Indian Academy of Horticultural Sciences and the 2014 recipient of the ICAR's Fakhruddin Ali Ahmed Award for Outstanding Research in Tribal Farming Systems. He has made significant contributions to environmental science, ecology, and horticulture, and has numerous research papers published in peer-reviewed journals, books, and technical bulletins.





Sh. Binay Pattanayak

Senior Education Consultant, The World Bank

Sh. Binay Pattanayak is a highly motivated educational professional who currently works as a Senior Education Consultant at The World Bank. He has over two decades of experience in the field of equitable quality education, including technical expertise and innovative educational leadership. He was awarded the Dr Sarvepalli Radhakrishnan School Excellence Leadership National Award for Innovative Practices in School Education, as well as the National Award for Best Effort in Science Popularization. Sh. Pattanayak has also contributed to the improvement of elementary education in various states through the Sarva Shiksha Abhiyan.



Sh. Ranjit Tibrewal

Federation of Jharkhand Chamber of Commerce and Industries

Sh. Ranjit Tibrewal is a well-known industrialist in the state. He has previously served as the president of FJCCI. He was instrumental in creating a healthy working environment in FJCCI to enable traders and industries of various sectors to grow and reach greater heights. Sh. Tibrewal has extensive experience in facilitating dialogue on sustainable development among industrial communities.



Sh. Chetanya Sawhney,

Program Manager, Swaniti Initiatives

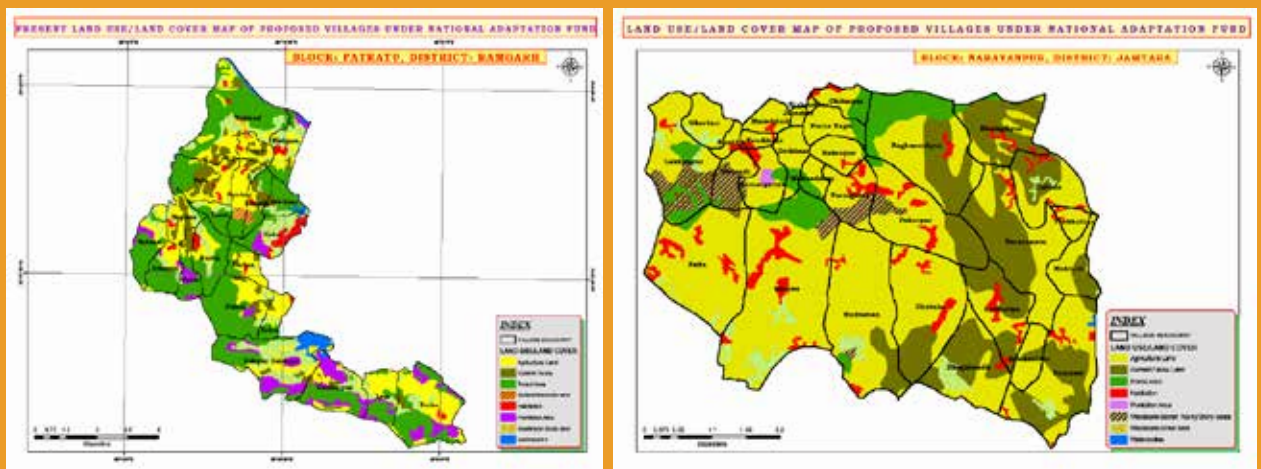
Sh. Chetanaya Sawhney has extensive experience in the sustainable energy transformation domain. He has made a substantial contribution to securing the livelihoods of the vulnerable population to climate change. He is constantly engaged with government departments in Jharkhand to facilitate an institutional shift towards a green economy by promoting renewable energy, sustainability, and a circular economy.



**LEARNING FROM THE
GROUND
FIRST CLIMATE
ADAPTATION PROJECT
OF JHARKHAND**



Learning from the Ground First Climate Adaptation Project of Jharkhand



Department of Forest, Environment and Climate Change, GoJ

Introduction

The Department of Forest, Environment, and Climate Change (DoFECC), Government of Jharkhand has taken up a project under the National Adaptation Fund for Climate Change called “Enhancing Climate Resilience of Forests and its Dependent Communities in two landscapes of Jharkhand.” These locations are as follow:

Block : Patratu, District : Ramgarh

Block : Narayanpur, District : Jamtara

Aims and Objectives :

The project aimed to meet various objectives such as to enhance capacities and provide support services for facilitating adaptation; to improve forest microclimate through soil and moisture conservation and water harvesting; to enhance gender sensitive and climate resilient livelihood systems; to bring about small wood use – efficiency and alternative material use; and also, to bring about energy efficiency and alternative energy use.

Component 1

The first component of the project i.e., capacity building and support services for adaptation includes awareness about climate change, awareness about adaptation programme, setting up weather station at Patratu and Narayanpur, strengthening of the JFMCs, training to farmers, training on Natural farming, Climate change and agriculture, monitoring of the soil health, community cadres, capitalizing on assets, abilities and opportunities, concept of organic farming, concept of INM and IPM, training on operation of weather station, monitoring according to indicators set for outcome including financial, self-evaluations based on monitoring indicators, training on convergence and resource generation, and concept of sustainability and running an institution. The Figure 1 exhibits the endeavours for enabling support services for facilitating adaptation.



Figure 1 : Enhancing capacities and providing support services for facilitating adaptation

Capacity building has resulted in the revitalization of village forest committees. It provided active participation in avoiding forest fire incidents, increased awareness of the importance of wildlife in forests, regulations on fuel wood and small timber consumption, the use of organic formulations in place of chemicals for cultivation, and improved access to main line departments for various programmes. The activities included in component 1 with their achieved targets has been illustrated as Figure 2.

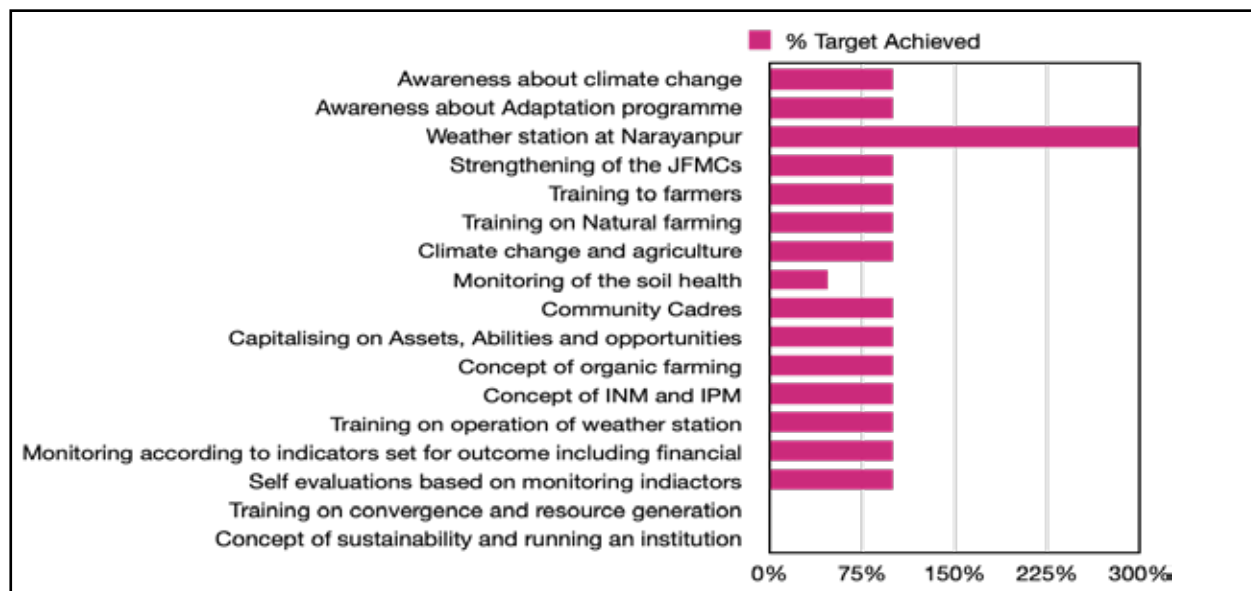


Figure 2. Success rates of goals met for various activities in Component 1 as a whole.



Component 2

The second component of the project was Forest Microclimate improvement through Soil and Moisture Conservation (SMC) & Water Harvesting (WH). It intended to work on a landscape basis for treating areas and drainage lines for improving the soil moisture regime in the forest and non-forest area. Moreover, area treatment has been done to reduce soil erosion and improve ground water recharge with contour trenches and field bundings along with plantations in the non-forest area. Some of the activities included in component 2 have been presented as Figure 3.



Figure 3. Improving forest micro-climate through Soil and Moisture Conservation & Water Harvesting

Due to an improved soil moisture regime, both Ramgarh and Jamtara experienced an increased green cover landmass and improved natural regeneration in forest areas. The rehabilitation of degraded land in both the landscape and drainage line treatments have been made possible by the use of kulthi and pigeon pea for agriculture, which has transformed the patterns of land usage. The success rates of component 2 have been presented as Figure 4.



Figure 4. Success rate of goals met for various activities in Component 2 as a whole.

Component 3

Climate-resilient and gender sensitive livelihood promotion which is the third component of the project intended to improve productivity with reduced GHG emission by use of intensification methodology and use of organic formulations along with diversification of livelihood systems like integrating with animal husbandry livelihoods. Agriculture based livelihoods with change in practices and PoP has been introduced with intensification methodology and use of integrated insect and pest management and use of organic formulation with farmers. Figure 5 represents the successful gender inclusiveness in climate resilience process with special reference to various livelihood activities.



Figure 5: Enhancing gender sensitive and climate resilient livelihood systems.

Animal husbandry-based livelihood systems have been introduced in the form of Kadaknath poultry, Khaki campbell ducks and heifer rearing preferably with families having a girl child. Value addition units with solarized livelihood stations have benefited an average of 4 villages per center. The success rate of component 3 is illustrated in Figure 6.

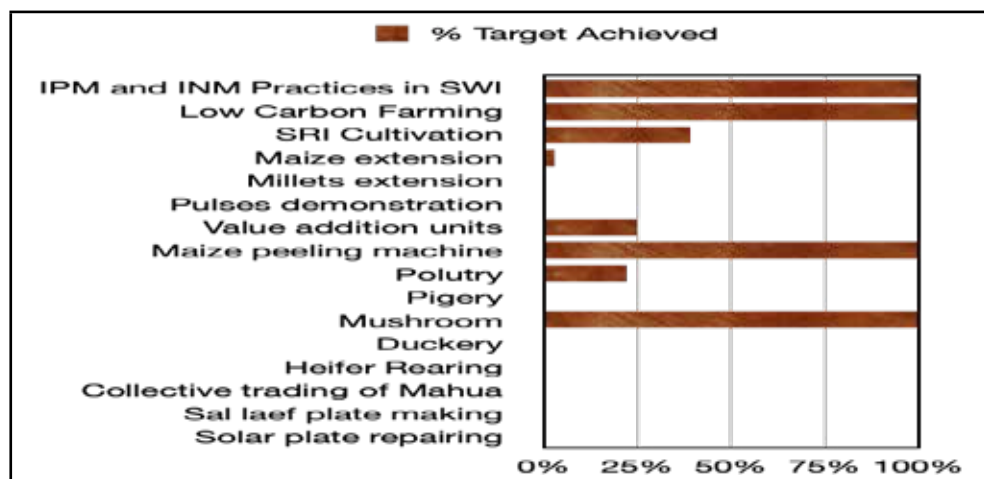


Figure 6. Success rate of goals met for various activities in Component 3 as a whole.



Component 4

Improving small wood efficiency, the fourth component of the project intends to increase shelf-life of the poles used for roofing and also for the wood used for different purposes in housing. Treatment has been done by communities to reduce biotic pressure on forest especially for sal poles. This is expected to significantly help in natural regeneration of Sal and improving biodiversity in the forest. In this phase of the project in the two landscapes with the objective to reach out to a specified number of families has already been met. The current state-of-the-art small wood use efficiency is exhibited in Figure 7.



Figure 7. Enhancing small wood use-efficiency and alternative material use

Component 5

Increasing energy efficiency and alternate sources of energy, the fifth and last component of the project intends to increase energy efficiency of the current energy systems, promoting use of alternate and renewable energy sources. Under this component improved cook stoves, bio gas plants, solar home lighting systems and kitchen garden has been promoted. The demand for fuel wood has decreased as a result of improved cook stoves with increased thermal efficiency, which has also reduced the biotic pressure on forests. The visuals showing promotion of efficient energy sources in the rural dwellings in Figure 8.

Due to the use of kerosene lamps in thatched dwellings, solar lanterns have increased the quality of life and decreased the risk of fire, while solar street lights have boosted social gatherings in two regions' villages.



Figure 8. Enhancing Energy use-efficiency and Alternative Energy use.



Conclusion

Community engagement, sensitization, and stewardship are critical for the successful implementation and handholding support of any government-run rural programmes. This has been one of the most important lessons of this ongoing project in Jharkhand. This project has had a significant and positive impact on the climate resilience of forests and the communities that rely on them. This model can be replicated in other parts of the state while taking into account all five of the aforementioned components for overall community and forest development.



AGENDA

Time	Agenda
09:00- 10: 00 AM	Registration of Delegates
10:00- 11:00AM	<p>Session 1: Climate Change and Jharkhand: Threats, vulnerability and adaptation for climate resilient Jharkhand</p> <p>Chairperson: Sh. A.K. Rastogi, IFS Principal Chief Conservator of Forests (PCCF) & Chairman-JSPCB Govt. of Jharkhand</p>
	<p>Indicators of climate change in Jharkhand: Current scenario and future projections.</p> <p>Dr. Sanjay Srivastava, IFS PCCF cum Executive Director Wasteland Development Board, Government of Jharkhand</p>
	<p>Building roadmap for a climate-resilient Jharkhand: Key elements, challenges and opportunities</p> <p>Sh. H.S. Gupta, IFS (Retd) Retired PCCF, Wildlife Government of Jharkhand</p>
	<p>Utilizing land carbon sinks in Jharkhand towards the mitigation of climate change impacts.</p> <p>Dr. Manish Kumar Director (Research & Development) Centre for Environment and Energy Development (CEED)</p>
	<p>Climate resilient agro-forestry in Jharkhand.</p> <p>Dr. Nitin Kulkarni Director Institute of Forest Productivity (IFP)</p>

11:00-12:00 PM	Inagural Session
	<p>11:00 AM: Lighting of The Lamp</p>
	<p>Welcome & Context Setting</p> <p>Sh. Sanjeev Kumar, IFS Additional-Principal Chief Conservator of Forests (APCCF-CAMPA) Govt. of Jharkhand</p>
	<p>Need for a Climate resilient Jharkhand</p> <p>Sh. Ramapati Kumar Chief Executive Officer Centre for Environment and Energy Development</p>
	<p>Address by Guest of Honor</p> <p>Sh. Rahul Sharma, IAS Secretary Department of Planning and Development Government of Jharkhand</p>
	<p>Special Guest Address</p> <p>Sh. A.K. Rastogi, IFS Principal Chief Conservator of Forests (PCCF) Government of Jharkhand Chairman, JSPCB</p>
	<p>Key Note Address</p> <p>Sh. L. Khiangte, IAS Additional Chief Secretary Department of Forests, Environment and Climate Change Govt. of Jharkhand.</p>
	<p>Address by Chief Guest</p> <p>Sh. Arun Kumar Singh, IAS Development Commissioner Government of Jharkhand</p>
12:00 -12:15 AM	Tea Break



<p>12:15 PM - 01:30 PM</p> <p>Moderated Session: Q/A along with concluding remarks from chair of the session</p>	<p>Session 2: Climate Change Adaptation and Mitigation Strategies for Jharkhand</p> <p>Chairperson Mr. Aboobacker Siddique P, IAS Secretary Department of Agriculture, Animal Husbandry & Co-operative Government of Jharkhand</p> <p>A future-ready Jharkhand towards climate change adaptation and mitigation: Mission and vision.</p> <p>Sh. Sanjeev Kumar, IFS Additional-Principal Chief Conservator of Forests (APCCF-CAMPA) Govt. of Jharkhand</p>
	<p>Climate Smart Agriculture in Jharkhand: Scoping climate adaptation strategy for agriculture sector</p> <p>Sh. Bikash Das Principal Scientist ICARRCER, FSRCHPR, Ranchi</p> <p>Role of Non-timber forest produce for climate resilient Jharkhand</p> <p>Dr. K. K. Sharma Director, Indian institute of Natural Resins and Gums Ranchi</p> <p>Future Ready Transport system in Jharkhand</p> <p>Sh. Kamal Kishore Soan, IAS Secretary Transport Department Government of Jharkhand</p> <p>Framework for climate change adaptation in mining Sector in Jharkhand</p> <p>Sh. Anurag Dixit, General Manager Tata Steel Mining West Bokaro</p> <p>Role of Clean Energy in mitigating the impact of climate change in Jharkhand</p> <p>Prof. S.K. Samdarshi Director & Coordinator (CoE-GEET) Central University of Jharkhand</p> <p>Concluding Remarks by Chair of Session</p>
<p>01:30 PM- 02:30 PM</p>	<p>Lunch Break</p>

<p>02:30 PM - 03:30 PM</p> <p>Moderated Session: Q/A along with concluding remarks from chair of the session</p>	<p>Session3: Strengthening Climate Governance, Finance and Policy in Jharkhand</p> <p>Chairperson: Prof. (Mrs.) Kamini Kumar Acting Vice-Chancellor Ranchi University</p>
	<p>Building a Climate Resilient livelihood system in Jharkhand</p> <p>Dr. D.K. Saxena, IFS Chief Conservator of Forests Government of Jharkhand</p>
	<p>Financing Climate Action Plan : Challenges and opportunities.</p> <p>Sh. Somesh Biswas Chief Corporate Sustainability Tata Steel Limited</p>
	<p>SDGs and climate change in the context of Jharkhand</p> <p>Sh. Binay Pattanayak Senior Education Consultant The World Bank</p>
	<p>Strengthening Climate governance in Jharkhand</p> <p>Sh. Chetanaya Sawhney Program Manager Swaniti Initiatives</p>
	<p>How prepared is the Jharkhand's business leadership towards climate adaptation and mitigation?</p> <p>Sh. Ranjit Tibrewal Federation of Jharkhand Chamber of Commerce and Industries</p>
	<p>Concluding Remarks by the Chair of Session</p>
<p>03:30 PM - 03:45 PM</p>	<p>Tea Break</p>
<p>03:45 PM - 04:15 PM</p>	<p>Valedictory Session</p> <p>Sh. Sanjeev Kumar, IFS Additional-Principal Chief Conservator of Forests (APCCF-CAMPA) Govt. of Jharkhand</p> <p>Sh. Ramapati Kumar Chief Executive Officer Centre for Environment and Energy Development</p> <p>Sh. A.K. Rastogi, IFS Principal Chief Conservator of Forests (PCCF) & Chairman-JSPCB Govt. of Jharkhand</p>





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