National Climate Stack Innovation Challenge

NABARD

WILL YOU INNOVATE TO UNRAVEL THE CLIMATE RISK TANGLE FOR HIM?

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Context and Rationale

India's climate risk is rising and becoming increasingly non-linear. The future of the farming community is increasingly tenuous in the face of heatwaves, floods and coastal hazards becoming more frequent and intense. These risks are compounded by population growth and resource constraints, and these challenges have only been intensifying with each passing year.

Current estimates indicate that there is a projected 9% crop yield drop by 2040 compared to 2010 levels and a risk of a 20-25% decline in medium-term incomes if these challenges are not addressed in a timely and comprehensive manner. **India's existing disaster response financial systems are not designed to manage the scale, speed, or nature of today's climate shocks.** Crop insurance under PMFBY has processed over 78 crore farmer applications, but delays, mismatches in hazard triggers. This systemic protection gap highlights the absence of a pre-arranged, climate-aligned risk-financing system.

Therefore, India needs credible near-term climate hazard forecasting for the next 10–15 years. This will allow governments, financial institutions, and communities to anticipate localised climate shifts and provide reliable forecasts to bridge the gap between seasonal projections and long-term climate scenarios.

Unfortunately, despite India's thriving digital ecosystem, such climate hazard forecasting remains constrained, due to three key factors: →

→ **Fragmented and inconsistent data spread across public and private stakeholders in different structures and syntaxes making interoperability difficult**

→ **Proprietary and expensive models often held in silos by various stakeholders.**

→ **Absence of credible, India-specific ground truth data to train and validate predictions**

Without granular, credible climate foresight, farmers will continue to face higher exposure, lower productivity, and limited access to the finance and technologies needed to adapt.

Suggested Solution Outlines

Can India leverage climate data currently distributed across institutions to develop a comprehensive Climate Stack? Can a platform be designed to systematically integrate climate-related datasets across the ecosystem and build robust predictive models through interoperable API networks? Can such a system incorporate an AI-enabled analytical layer capable of synthesising insights from integrated datasets to support climate-specific decision-making? The proposed solution framework emerges from these foundational questions.

Within the proposed solution architecture, DiCRA (https://dicra.nabard.org/ - Data in Climate Resilient Agriculture) presents a strong foundational platform. DiCRA is a standalone climate portal aiming at bringing climate data analytics closer to the entire eco-system as free knowledge and information resource. Initially imagined and set up by UNDP, the platform is now being hosted, expanded and maintained by NABARD with intellectual inputs from UNDP. The proposed Climate Stack framework could be anchored within and built upon the existing DiCRA infrastructure.

While multiple data streams have already been integrated into the DiCRA platform, a critical next step lies in embedding credible near-term (10–15 year) hazard forecasting capabilities within the system. The ability to generate granular, localised, and decision-ready projections would significantly enhance the platform's practical utility and serve as a foundational layer for advancing climate-informed planning across agriculture, finance, and public policy. Such forecasting represents an essential component in **transitioning DiCRA from a Digital Public Good - primarily a knowledge and data repository - into a Digital Public Infrastructure** that functions as an operational backbone for climate resilience. This transition requires not only robust predictive models, but also interoperable data standards, structured API integrations, transparent modelling frameworks, governance protocols for data access and consent, and sustained institutional adoption across stakeholders. By integrating these elements, DiCRA can evolve into a scalable, trusted, and implementation-ready climate intelligence infrastructure for rural India.

The potential benefits of such a platform are significant. Most importantly, farmers could have real time access to near-term projections which will support them in cropping and irrigation choices. The long-term projections can support more informed capital investment planning. The stack can be a veritable decision support tool for banks, start-ups, researchers, Government of India departments in their policy work.

Schematic outlining the solution pathway to solving for India's near-term climate hazard projections

6 climate hazards materially impact India, out of 10+ risks identified by global frameworks...

Key climate hazards:

Heat waves	*Coastal Erosion*
Extreme Precipitation	*Cold Waves & Frost*
Floods	*Glacial Retreat*
Cyclones	*Biomass Burning*
Droughts	*Soil Salinization*
Landslides	*Sand & Dust Storm*

Most relevant for India

...Granular projections for these hazards can be generated by leveraging DiCRA's high quality, open-access data...

Climate hazard projections:

DiCRA provides multi-year geospatial datasets *(NDVI, soil, land use, water indices)*

Innovators layer on downscaled climate model outputs *to DiCRA's base data layers*

We generate 3×3 km, village-level projections of key hazards *over a 10–15-year time horizon for India*

...yielding high-impact solutions which can situated within NABARD's Climate Change Fund's focus sectors...

Climate Change Fund focus sectors:

- *Water Mgmt. & Conservation*
- *Climate-Resilient Agriculture*
- *Decentralized Renewable Energy*
- *Livestock Mgmt. & Adaptation*
- *Afforestation & Reforestation*
- *Climate Information Systems*
- *Climate-Resilient Infrastructure*
- *Sustainable Livelihoods*
- *Coastal Vulnerability*
- *Waste Management*

Our proposed solution

...which can be championed by a range of actors across the ecosystem to drive scalable, climate innovation...

Key groups actioning solutions:

Policy Makers, *early and targeted climate-risk management for communities and public assets*

Cooperative Societies, *deploying community-level solutions and shared infrastructure that translate climate insights into action*

Private Sector, *localized, risk-informed products for credit, insurance, and infrastructure*

Research & Academia, *analytics with deeper insights that inform public policy and program design*

...ultimately unlocking a range of *tangible benefits for farmers* on the ground in India.

Illustrative farmer benefits:

Increased productivity, *more predictable yields through hazard-aligned cropping decisions*

Financial Resilience, *reduced exposure to climate shocks via risk-adjusted credit and insurance*

Resource Efficiency, *smarter water, energy, and input use driven by local climate signals*

Infrastructure Reliability, *fewer disruptions as storage, irrigation, and logistics adapt to local hazards*

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National Climate Stack Innovation Challenge

The National Climate Stack Innovation Challenge, with technical assistance from The Gates Foundation and Dalberg Advisors, UNDP, and FAO was launched during the Bharat Climate Forum on 9th of January 2026 in the august presence of the Hon'ble Vice President of India. It is being implemented as a 6-month guided, collaborative sprint combining scientific rigour with applied experimentation.

A. PURPOSE

The Challenge has a simple, specific aim: to develop a viable framework for a National Climate Stack for rural India. At this stage, participants are expected to submit a robust conceptual and implementation proposal focused on two core components.

First, proposals must present a credible approach to near-term (10–15 year) climate-hazard forecasting. Submissions should outline the methodological framework for generating granular, localised hazard projections **by leveraging DiCRA alongside other relevant public or open source and private datasets.** Participants are expected to identify key data streams, explain modelling techniques, and demonstrate how the proposed framework will produce scientifically sound and decision-ready forecasts.

Second, proposals must build on this hazard-forecasting layer to demonstrate how model outputs can be translated into practical, decision-support applications. This should include illustrative use-case dashboards that reflect potential applications across focus sector(s) such as agriculture, rural finance, water management, etc. Proposals should outline how these applications would be enabled through appropriate system architecture, including data integration pathways, API structures, and interoperability mechanisms necessary for operational deployment.

The Jury will evaluate submissions based on technical rigour, feasibility, scalability, and institutional relevance. Proposals demonstrating both robust forecasting capability and clear pathways to implementation may be considered for subsequent financial and institutional support.

B. PROCESS

The Challenge will adopt a tiered selection process engaging leaders from key ecosystem players:

- **Initial Screening (Mar-Apr):**
  - Opening up application entries, with participants submitting a proposal outlining their model approach. *Note: While open to all, outreach will prioritise ICAR institutes, agricultural universities, IIT/IIM and Atal incubators, startup networks, and private-sector innovators*
  - PMU undertakes structured review of all submissions to assess eligibility, problem understanding, and proposed methodology, to shortlist a subset of applicants
- **Model Development (Apr-May):**
  - Shortlisted participants receive an 6-8 week window to develop, refine, and document their climate hazard models
  - During this time, the participants will received mentorship from subject matter experts
- **Judging and Selection (May-June):**
  - *Technical Validation:* A Technical Advisory Group will assess scientific soundness, feasibility, and model suitability, refining the pool to 10 entries
  - *Jury-led Final Selection:* A multi-disciplinary, jury will evaluate finalists through presentation pitches to select the final 3 winners of the Challenge

Note: For the Technical Validation and Jury Selection steps, we will adopt a quorum-based participation model to ensure flexibility and timely decision making.

C. PRIZE MONEY

Awards of
₹15 lakh, ₹10 lakh and ₹5 lakh will be offered to the top three entries funded by NABARD.

Post-Challenge pilot opportunities could be pursued through programmes like TAF and other relevant schemes.

For more details, go to:
www.climatestackinnovationchallenge.com

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