

**Request for Proposal (RFP)
On**

**Accelerating Catalysing Solutions for Climate Change's
impact on Agriculture in India**

**Under Grand Challenges India
Project Management Unit, Biotechnology Industry Research
Assistance Council (PMU-BIRAC)
(A Government of India Enterprise)**

**Jointly supported by
Department of Biotechnology (DBT),
Ministry of Science and Technology, Government of India
&
Bill & Melinda Gates Foundation (BMGF)**

Call Opens	3rd December 2023
Closure of Submission	31st January 2024, 4PM IST

Introduction

Climate change impacts various aspects of Indian agriculture, encompassing both gradual shifts and extreme occurrences, and they are interlinked with food security, ecosystem services, and health. Extreme weather events like floods, droughts, cyclones, and heatwaves pose a significant threat to agricultural productivity, while rainfed areas are susceptible to yield reductions due to increased crop water demand and changing rainfall patterns during the monsoon season. The alteration of agricultural pests and diseases can be expected to be a major concern because of more pathogen and vector development, rapid pathogen transmission, increased host susceptibility etc. (GOI, 2016). Climate change can impact the current food production regions, making them unstable and unsuitable, affecting the food availability and nutritional quality. This sector is particularly vulnerable to the threats of climate change, and the associated risks can severely impact food crop and milk production in India. As a result, the most vulnerable groups such as women, children, small scale producers, low-income households, minority groups etc. are at a higher risk of being disposed to malnutrition, livelihood loss, rising costs and competition over resources (IPCC, 2022). There is an urgent need to invest in creative solutions to help vulnerable populations adapt and build resilience to the existing and future climate related challenges impacting agriculture and their livelihood.

The Grand Challenges India (GCI), is a flagship program borne from a collaboration between the Department of Biotechnology, Government of India, and the Bill & Melinda Gates Foundation. It was launched in 2012, with a shared objective to collaboratively address critical global health and development issues, benefiting the people of India and other developing countries. To facilitate and coordinate this collaborative initiative, the Program Management Unit at Biotechnology Industry Research Assistance Council (PMU-BIRAC) was instituted. GCI lends support to studies concentrating on early-stage research, product development or innovation aimed at addressing health and developmental concerns. It places emphasis on innovative, impactful research by either enhancing existing strategies or forging entirely new pathways to confront broader global health and developmental challenges.

The core principles that Grand Challenges initiatives follow are,

- i) Strategic and well-articulated grand challenges serve both to focus research efforts and capture the imagination and engage the world's best researchers.
- ii) Projects are selected based on national and societal need and transparent calls for proposals seeking the best ideas.
- iii) Funders, investigators and other stakeholders actively collaborate to accelerate progress and integrate advances to ensure these advanced technologies reach to developing countries masses
- iv) Projects are selected not only for scientific excellence, but also to achieve the desired impact, and these are milestone-driven and actively managed to that end.
- v) Projects and investigators will have to follow global access commitments to ensure the fruits of their research are available to those most in need.

Here, GCI announces a call on “*Accelerating Catalysing Solutions for Climate Change’s Impact on Agriculture in India*” a program directed at addressing challenges in the agri-food

system in the context of climate variability and change. This call aligns with the global Grand Challenges call “*Accelerating Catalyzing Solutions for Climate Change’s Impact on Health, Agriculture, and Gender.*” Its primary objective is to recognize and bolster promising innovations while cultivating a network of researchers and stakeholders to heighten awareness about the challenges and channel forthcoming outcomes into practical solutions. Corresponding with the global call by Bill & Melinda Gates Foundation, alongside GCI, other partners of Grand Challenges such as GC Africa (pan-African), GC Brazil (Ministry of Health of Brazil), GC Ethiopia (Armauer Hansen Research Institute), GC Rwanda (National Council for Science and Technology), and the Pasteur Network are initiating their proposal calls. Each partner country will independently manage the call within their respective nations.

This Request for Proposals (RFP) is specific to Indian researchers only.

2. Background

Adaptation to the changing climatic conditions would be crucial to ensure that food production is maintained and the agricultural sector becomes resilient to the climatic irregularities. Different ways to adapt to climate change have been found to work well in different regions and among different communities. Some of these methods include improving crop varieties, involving communities in the adaptation process, ecosystem-based approaches like diversification, land restoration, agroecology, and agroforestry, etc. Such approaches make communities more resilient to climate change while bringing multiple benefits. However, the outcomes of these approaches may differ depending on the specific social and environmental conditions and evidence needs to be generated to support long-term productivity and the impact on essential services like pest control, soil health, pollination, and temperature regulation.

The potential of adaptive measures can also vary based on factors like the local economy, types of ecosystems, combinations of plant and animal species, and the level of institutional support. As noted in the IPCC AR6 WGII Summary for Policymakers, to ensure the proper implementation of adaptability measures, it is essential to recognize the changing climate scenario, the need for adaptability and the importance of policies, both scientific as well as social as ‘transformation entails system transitions strengthening the resilience of ecosystems and society’ (IPCC, 2022, p. 8). Therefore, there is a need for a program that delivers short-term and long-term outputs that help agriculture and food system to adapt to climate change and can provide evidence to decision makers to mainstream climate resilient agriculture in agricultural policies. Consequently, there is an urgent need to invest in creative solutions to help vulnerable populations adapt and build their resilience to the existing and future climate related challenges impacting agriculture and build alternative livelihoods. This work will involve making those most affected, especially women, major stakeholders in discussions about how new climate resistant and adaptive innovations will be deployed, as well as giving them a deliberate choice and advantage in the creation of new economic opportunities that result from these investments.

3. Program Overview

The overall purpose of this program on “Accelerating Catalysing Solutions for Climate Change’s Impact on Agriculture in India” is to increase the research and professional capacities, policy and administrative responsiveness, and agricultural-food-nutrition practices for better adaptation to climate variability and change in the Indian sub-continent. This RFP seeks innovative research and pilot/feasibility projects utilizing transdisciplinary approaches to better adapt to mitigate or reverse the combined, deleterious effects of climate change on agriculture in India. It is intended towards development of scientific and technological solutions as well as action research enabled by innovation, technology development, or knowledge creation for evidence-based policy. We are especially interested in (i) locally led, system-level innovations that are scalable and sustainable and (ii) cross-cutting solutions at the intersection of multiple scientific and engineering disciplines.

4. Desirable outcomes

The overall expected outcome is enhanced resilience to climate variability in vulnerable regions. Two specific outcomes desirable are,

- (i) Increased and More Responsive Adaptation Mechanisms, Technology and Policy.
- (ii) Knowledge, Innovation and Policy to Confront Nutritional and Environmental Challenges at the local and regional levels.

The projects proposals will have to specify how these outcomes will be realized with research in one or combination of the following themes.

- Mapping and Enhancing Landraces: Epigenetic responses to environmental stress.
- Securing Plant and Animal Proteins: Crop-livestock system to enhance agroecosystem resilience.
- Millets, Tubers and Tree Crop Staples: Reviving Regional Food cultures/varieties for Climate Adaptation.
- Soil Health and Biodiversity.

5. Detailed Research Areas

The major research areas within the above thematic areas which may be focused for a resilient agricultural production system and for which proposals are sought are as follows,

i) Mapping and Enhancing Landraces: Epigenetic responses to environmental stress

Research related to improvement of cultivars have mainly focused on increasing yield, and not on climate-resilience. Genome sequencing significantly increases the rate and accuracy for identifying genes of agronomic traits that are relevant to climate change, including adaptation to stress from pests and disease, temperature and humidity, altitude, and water extremes. Genomic assisted breeding approaches for climate resilient crops and vegetables and translation to commercial cultivars are still limited.

- Accelerating demonstration of wild relatives of Crops
- Adaptability of Lesser-known crops and livestock. Assessing adaptation responses of underutilised or lesser-known crops and livestock species apart from the dominant major food crops and livestock in different agroecosystems.

- Microbiome analysis in Plant health
- Adaptation strategies through enhancing water and nutrient use efficiency.
- Modelling studies for assessing multiple dimensions of adaptation options for productivity, sustainability, and greenhouse gas emission. Enhanced crop data integration to allow for early warning, and better forecasting of weather patterns and events.

ii) Securing Plant and Animal Proteins: Crop-livestock system to enhance agroecosystem resilience

Diversifying agricultural systems is an adaptation strategy that enhances resilience to climate change while offering socio-economic and environmental advantages. Diversity of food culture, landraces, crop and livestock system and their relationships with adaptation, pest and disease pressure and other socio-ecological constraints are some of the areas where research needs to be focused.

- Agroecological practices and integrating natural resource management, food security, and livelihood could be tested to stimulate inclusive growth for a sustainable and integrated tree-crop-livestock system.
- Research focusing on the combination of scientific data collection and solution-led field research on climate-smart livestock production. Research may include improvements in the cultivation of specific fodder crops, feed processing as well as manure and pasture management.
- Innovation in the composition of specialized nutritious foods (e.g., RUTFs to treat severe acute malnutrition), considering susceptibility of raw ingredients to climate shocks, price volatility, and decreased nutritional quality.

iii) Millets, Tubers and Tree Crop Staples: Reviving Regional Food cultures/varieties for Climate Adaptation.

- Enhancement of production and productivity of millet-based crop diversification. Mapping of past and current adaptation to climate change in diversified cultivation system.
- Studying changes in pest dynamics, pest/pathogen-crop relationships and emergence of new pests and pathogens under changing climate.
- Multidisciplinary perspective with a clear reference to eco-geography, units of land, scale, variability that define each agro-ecosystem for climate change risk mitigation, improved rural livelihood, and better nutrition.
- Surveillance system to strengthen the resilience of local food system. Facilitating community participation in/crowd-sourcing data collection to track climate change impact at local level (e.g., changes in weather patterns or detection of invasive vector species etc.).

iv) Soil Health and Biodiversity

- *In-situ* methods for measuring Biological Nitrogen Fixation at field level to help validate climate-smart biofertilizers as next generation inputs. Research topics may include novel biosensors for measuring nitrogen fixation by free-living and non-

symbiotic microbes and methods for proving candidate microbes are indeed drawing nitrogen from the atmosphere for crop benefits rather than mining the soil.

- Estimation of bio-geophysical and geo-chemical parameters of soil.
- Comparative studies on soil health and bioavailability of nutrients in millets in different agro-climatic regions.

We are looking for proposals that

- Provide a strong rationale for the work proposed, demonstrating a clear understanding of India's context and needs, and present a defined hypothesis and associated plan for how the idea would be tested or validated.
- Articulate how the project will lead to impact in the near-term and how those benefits will be sustained past the lifetime of the project.
- Articulate the scalability of the solution beyond a small local region or population. Strong consideration will be given to approaches that can scale to multiple geographic areas, zones, demographics, etc.
- Demonstrate engagement with local communities, local and/or regional decision-makers and adopters of relevant innovations or policies.
- Inter-sectoral co-ordination and collaboration is strongly encouraged.
- We encourage applications from women and women-led organizations.

We will not consider funding for proposals that

- Do not demonstrate actionability and scalability to support impacted communities in India to adapt and be resilient to the effects of climate change on agriculture.
- Do not demonstrate a pathway to sustainable impact and scalability.
- Are not linked to or have no plan to engage relevant key stakeholders and decision makers from the affected communities.

6. Program Structure

i) Eligibility Criteria

This RFA is India-led and proposals are solicited from Indian nationals having good scientific record and working within the country in established academic institutions, research institutions, agricultural research institutions, not-for-profit organizations/ trusts/ foundations, or companies.

- The proposal should have a clearly defined plan with details of proposed activities, specific milestones and timelines, and the budget estimates. The proposal must be budgeted clearly indicating the budget components to carry out each proposed activity on a milestone basis.
- Research proposals will be supported financially at recognised academic institutions, universities, national laboratories and other recognized R&D institutions having all the necessary facilities to carry out the proposed research. We also encourage partnerships with researchers of national/international expertise, subject to the call guidelines.

Note: Please read the following carefully to understand the category you will be applying under and the documentation that may be requested should your proposal be selected for further financial due diligence. This call is open to,

- **Indian Academic** – If the applicant is an Indian academic scientist, researcher, or PhD student (citizen of India), they must be willing to incubate at a recognized incubator and submit a letter of intent for the same.
- **Companies** - Companies incorporated under the Indian Companies Act, 2013 having a minimum of 51 percent Indian ownership.
- **Limited Liability Partnership** - Limited Liability Partnership (LLP) incorporated under the Limited Liability Partnership Act, 2008 having a minimum half of the persons who subscribed their names to the LLP document as its Partners should be Indian citizens.
- **Indian institution/ universities/ public research organization** - Academic institutions established in India and having NAAC/ UGC/ AICTE or any equivalent recognition certificate or any other Public/Government supported organization.
- **Society/ Trust/ NGO/ Foundation/ Association** - Society/ Trust/ NGO/ Foundation/ Association established in India under the relevant Indian Law having at least half of the stakeholders (partners/ trustees/ members/ associates etc.) as Indians.

ii) Project duration

The projects will be supported for a period of **36 months (3 years)** starting from signing of Agreement.

iii) Funding

The funding level is upto INR 80 Lakh (USD \$100,000.00) for each grant.

If selected for financial support, investigator shall sign an agreement with BIRAC. Funding will be awarded for 3 years, subject to expert evaluation and the applicant complying with agreed milestones. Funds will be released on achievement of each milestone.

The allowable cost will include following,

Non-Recurring Budget: Equipment and accessories (upto 20 percent of proposed cost), list of equipment's, if required and justification in relevance to the project activities (quotations supporting proposed equipment and accessories) should be submitted.

Recurring Budget (commensurate with project activities): Manpower (upto 30 percent of proposed cost); Consumables (upto 20 percent of proposed cost); Travel, Research contingency (on case-to-case basis), Outsourcing (in case any activity to be outsourced), Training cost if any, Overhead of each primary & other cost recipients(s) (upto 10 percent of the recurring cost).

*Note: Justifications to be provided for roles of each manpower involved, consumables proposed, travel, training and research contingency. Budget heads without cap will be

considered on case-to-case basis and based on call specifics by Technical Advisory Group (TAG).

iv) Collaboration

GCI encourages collaborations based on the belief that synergies between experts across diverse disciplines are important for the challenges that we seek to address. Both national and global collaborations are encouraged. In case of global collaboration, at least 80 percent of the funding must go to an organization within India. Application budgets should be commensurate with the scope of work proposed.

7. Rules and Guidelines

a. Application Process: Please be advised that the entire application process is online through the BIRAC portal.

- Proposals in the correct format needs to be submitted on the online portal by interested applicants.
- The application will be seeking the following information in the project proposal:
Proposal information: A description of the specific problem your proposal addresses including background of the study, research questions, rationale, aims and objectives of the study.
Methodology and Implementation Plan: A description of how you plan to undertake the proposed study, the methods used, study location, alternate approaches (if any), plan for effective collaboration and implementation.
Deliverables and Expected Outcome: A description of deliverables and expected outcomes based on the study goals and objectives.
Translation: A description if the study will have applied value or have exploratory value in the area. Highlight if there is any scope of translation of the outcome of the study and if there are any short term or long-term implication(s) in agriculture.
- After an initial triage, expert review panel/ Technical Advisory Group established under the Grand Challenges India partnership will evaluate the proposals submitted.
- Post proposal review and legal eligibility check, the shortlisted applicants will be invited to present their proposals in detail to TAG.
- Pending financial and technical due diligence, the final awardees will be selected by the TAG.
- Once *Due Diligence* is successfully completed, award certificates will be awarded to the selected GCI applicants.
- PMU- BIRAC will then enter into separate funding agreements with successful GCI cost recipient(s) to govern the project terms and conditions and fund disbursement modalities.

b. Application instructions*

- Please visit the BIRAC website at www.birac.nic.in and follow the link to GCI proposal submission on the portal.
- If you are applying to a BIRAC/GCI scheme for the first time, please note that you will have to register on the portal. The verification and activation of your new

account may take upto 24 hours before you can apply for the scheme. Please take this into account while applying.

- Once registered kindly click onto proposal submission under GCI and select for **Climate Change's Impact on Agriculture in India** and proceed towards proposal submission.
- The online form needs to be filled completely with all appropriate documents uploaded.
- Please also ensure that the Proposal Summary document is uploaded based on the format provided. Incomplete proposals will be rejected in the triage round.

*** Important Instructions**

- Applicants are advised to fill-up and submit their applications early without waiting for the last date in order to avoid any last-minute contingencies. The online system will cease accepting applications automatically after 1600 hrs of the last date of submission.
- Applicants are advised to provide sufficient details in their applications to allow for an informed and fair evaluation/review.
- Requests for changes in the proposal once submitted will not be entertained.
- Applicants should read the guidelines for clear instruction and other details for comprehensive preparation of the proposal.
- Please read through the application form in its entirety and ensure that your technical details, budget, and organization details follow the eligibility criteria provided.
- The proposed budget shall be made **INCLUSIVE** of all applicable taxes and shall be considered accordingly.
- Proposals that do not meet the eligibility criteria and/or do not fall under the scope of call will not be reviewed, regardless of other parameters.
- Applicants shall warranty that the statements and particulars contained in the full proposal and supporting documents are correct. They have to warrant that they are under no contractual restrictions or legal disqualifications or any other obligations which would prohibit them from undertaking the present project or entering into any Agreement in this regard etc.

Note: We will not be able to provide individual feedback to applicants who are not selected for further rounds.

c. Application Timeline and Key dates

Call Opens	3rd December, 2023
Closure of Submission	31st January 2024 at 4.00 PM

Triage and Review	February-March, 2024
Shortlist and selection	First week of April, 2024
Award announcement	May, 2024

d. Selection Process

Grand Challenges India (GCI) along with stakeholders’ team will screen the proposals for eligibility. If the application is found to be incomplete or not complying with the provisions described in the RFP, the application will be considered ineligible. After an initial triage, a subject expert review panel/ Technical Advisory Committee (TAC) established under the GCI partnership will evaluate the submitted eligible proposals.

Proposal will be evaluated based on evaluation criteria that will assess the novelty of proposed hypothesis; approach and methodology (realistic and clearly presented research plan, objective, methods, expected outcome and proposed timelines); milestones and feasibility of proposal components; organizational and investigator capabilities; clearly defined collaborative arrangements; and cost relevance to proposed work and value of research outcome.

- Post proposal review and legal eligibility check, the shortlisted applicants will be invited to present their proposals in detail to TAG.
- Pending financial and technical due diligence, the final awardees will be selected by the TAG.
- Once Due Diligence is successfully completed, award certificates will be awarded to the selected GCI applicants.
- PMU- BIRAC will then enter into separate funding agreements with successful GCI cost recipient(s) to govern the project terms and conditions and fund disbursement modalities.

e. Evaluation and Decision-Making Criteria

Proposal Merit

- Does the proposal’s approach align with the objective of RFP? Are the objectives, activities and milestones well defined?
- Does the proposal demonstrate usefulness of preliminary work for the proposed scope of work?
- Does the proposal capture enough novelty to address the discussed challenge?

Applicant Capability

- Is the investigator competent to ensure the effective conduct of the proposed work?
- Do the investigators possess relevant capabilities and appropriate experience for the same?

- Do the investigators have any prior experience in the field?

Approach and Methodology

- Is the research methodology and work plan adequately detailed and realistic? Will the demonstration take place in difficult/ challenging India-centric setting?
- Have the investigators provided clear metrics for monitoring project progress, including milestones, outputs, expected timelines and budget?
- Has the applicant anticipated difficulties/risks that may be encountered? Have mitigation plans been considered in case of failure?

Best Value

- Is the proposed budget reasonable considering the defined scope of work? Have reliable references been provided for justification?
- Is the resource allocation across various stages, sufficient and appropriate?

f. Requisites for Funding

Successful proponents shall enter into necessary funding agreements. The fund disbursement will be subject to completion of required formalities by way of Grant-in-aid assistance and associated documentation. The fund recipient shall be accountable for fund utilization as per the sanction.

g. Fund Disbursement

The disbursement of funds for the research project will be carried out upon successful achievement of milestones. Disbursement will be done in instalments as follows:

Signing of agreement	30 percent
1st technical milestone	20 percent
2nd technical milestone	20 percent
3rd technical milestone	20 percent
Submission of final report	10 percent

h. Process of Sanction of Funding

- Site visits for Technical Due Diligence may be conducted (Physical/Virtual) however certified infrastructure pictures and details to be provided by the applicant to BIRAC as and when required.
- Financial Due Diligence may be done on case-specific requirements as per BIRAC norms.
- After the final recommendation of the relevant applicable committee, application will be proceeded further for financial concurrence, legal concurrence, and issuance of Agreement as per GCI/BIRAC/DBT norms.
- After successful execution of the above documents and fulfilment of other formalities, fund disbursement will be initiated by GCI/BIRAC/DBT.

i. Post Approval review and Monitoring

The projects will be monitored and mentored regularly by a Project Review and Monitoring Committee constituted by GCI/BIRAC/DBT. On Successful completion of each Milestone, the investigator will be required to submit a detailed Milestone Completion Report which will be assessed by the TAG for its completion. On recommendation of the TAG, the next Milestone budget will be released.

Contact details:

Further information can be obtained at BIRAC website. www.birac.nic.in

For queries about the application and submission of the completed application form, write to us with the subject line ‘Climate Change and Agriculture’ at

Mission Director, PMU-Grand Challenges India

Email- mdpmubmgf@birac.nic.in

Senior Program Manager, PMU-Grand Challenges India

Email- user-23@birac.nic.in

References:

GOI, 2016. Climate change and Agriculture in India. A Thematic Report of National Mission on Strategic Knowledge for Climate Change under National Action Plan on Climate Change. Ed Gupta, A and Pathak, H. Climate change Programme, Department of Science and Technology, New Delhi. Pp 51.

IPCC. 2022. Climate Change 2022: Impacts, Adaptation and Vulnerability | Climate Change 2022: Impacts, Adaptation and Vulnerability. IPCC Sixth Assessment Report.