Ignite Life Science Foundation

Call for Proposal on ‘Climate Resilient Agriculture’

A. Preamble:

Climate change portends intensifying negative impacts on food and nutrition security, ecology, and human health. India’s agricultural sector stands at critical crossroads under such circumstances. Erratic and intense monsoons, drought, heat or cold waves pose a challenge. Due to altered abiotic stresses, the patterns of the disease and pest profiles of areas and crops are changing. Thus, challenges of simultaneous biotic and abiotic stresses are emerging, with contours of such stresses changing from season to season and location to location. The problems are further compounded by climate change-mediated soil, water and air quality decline. While agricultural productivity and efficiencies are at risk, agriculture itself is a source of greenhouse gases and contaminants that promote climate change. Thus, adaptation research cannot be discordant to mitigation strategies. Research cannot be directed for solutions that promise adaptation but add to climate change. While advances in genomics, digital agriculture, stress physiology, and climate forecasting offer unprecedented opportunities, no one scientific domain holds all the answers. Only through interdisciplinary collaboration—bringing together teams of experts in genetics, breeding, computational sciences, climate modeling, agronomy, soil microbiology, socioeconomics, nutrition, behavioral economists, policy innovators and any other relevant stakeholders, can we design resilient agro-ecosystems and technologies that are both scientifically sound and practically viable, especially keeping in mind the unique dynamics of Indian agriculture and the profile of Indian farmers. Present technological solutions suffer from lack of scalability due to limited infrastructure, fragmented knowledge systems, weak research-to-field linkages also not cognized for at the inception stage itself, and socio-economic and political barriers faced by smallholder farmers. Hence, appropriate technology adoption remains sporadic and uneven. The solutions lie not just in interdisciplinary research results, but also in pathways for those results to the farmers, markets and customers. **With this aim in mind, we are calling for proposals in key areas that focus on addressing national priority of making Indian agriculture globally competitive and resilient through novel and innovative strategies and solutions.**

B. Uniqueness of the Request for Proposals (RFPs):

The suggestions for multidisciplinary research solutions and the thrust on pathways to market and assessment of impact of the product on society are not new. However, such advise has often been an ideological exercise in papers, meetings and brainstorming sessions. The RFPs are almost never geared to formulating teams that can address problems at a systems level. Some international organizations have succeeded in connecting different aspects of either the upstream or the downstream research. Hence, attempts for projects to connect the discovery research to the translational research have been missing. At Ignite we believe this gap can be filled through expert mentoring of a team that has or can provide specific parts of the solution effectively. Such components to solutions can then be synergistically integrated by another set of experts in downstream research to conjure an effective and practical holistic solution. The downstream experts are often never a part of a discovery-based proposal. Equally, the upstream discovery scientist, while aware of the larger problems for which they wish to provide solutions, never engage deeply with the value-chain and supply chain stakeholders, especially farmers, who will be the users of their discoveries or technologies.

Our RFP is a multi-phase exercise. In the first phase, we invite the initial Letter of Interest (LoI), which must address the clear and strict guidelines provided to assess multidisciplinarity, feasibility and the practical need of the proposal.

In the second phase, 4-6 teams will be invited for face-to-face interaction with Ignite experts to refine the proposal for cross-sector integration, stakeholder engagement towards co-development and co-benefits and impact assessment in one or more of the three pillars of sustainability – economic, social and environmental. This will be an iterative process between the proposal team and Ignite.

In the third phase, Ignite will undertake a final review and select 1 or 2 winning proposals for support. Another 1 or 2 teams will be supported to pitch their proposals to public-private funding teams of a common vision, thus, establishing a pipeline of strong holistic research proposals with high potential to effectively address national needs for agricultural solutions to address climate change mediated vagaries.

The differentiating and unique approach will be the powerful synergy from having all stakeholders at the table, all through the project, right from the beginning, providing a continuous improvement opportunity through learning about the problems and possible solutions from each component sector/discipline.

Sectorial multidisciplinarity in RFP will be captured through:

- Different agricultural inputs (biological, physical, financial, technological)
- Range of production systems (crops, livestock, industrial plants, medicinal plants, etc.)
- Multiple research drivers (yield, farmer incomes, nutrition, resource efficiency, climate adaptation, economic/social goals, etc.)
- Deliverables that connect research to real-world outcomes
- Contained expertise (lab-based, data-driven, breeding, genomics, engineering, socioeconomics)
- Field expertise (on-the-ground trials, farmer engagement, infrastructure)
- Time-to-impact for real-world benefit
- Cross-sector integration for how expertise from at least three domains will be integrated
- Stakeholder and value chain engagement for multidisciplinarity in science and also in practice
- Geographic and ecosystem diversity to span different environments for success
- A multidimensional impact matrix (e.g., productivity, income, biodiversity, climate resilience, policy change) to force thinking across economic, social, and environmental outcomes.

These aspects are present in more details in Table 1. (Appendix 1), which must be filled as a requirement by each partner of a team for the first phase of LoI. Disciplines where most tools, techniques and approaches are not common or transferable would be seen as sectors, and the LoI must identify research in different sectors. For example, marker assisted breeding, genomic selection, molecular biology and biochemistry are all in the sector of BIOLOGY. These could be combined with soil physics or soil chemistry, but not with soil microbiology.

C. The RFPs in Detail:

Ignite Life Science Foundation invites Letter of Intent (LoI) from interdisciplinary teams of scientists across various entities. The call is intended to support a consortium-based approach, where critical partners and experts—typically 4 to 6 scientists from diverse disciplines and institutions—collaborate towards a unified set of deliverables. The component scientists and entities must be identified and convened prior to drafting the Letter of Intent (LoI) and mutually agreed specific component contributions to the final goals must be presented in the filled **Table 1**, as a part of the LoI. Given the deliverable-focused nature of the RFPs, public-private partnerships are eligible and private sector monetary, or in-kind contribution is preferred. Detailed information on each RFP is provided here (link). The areas are outlined below:

1. **Integrated Climate Resilience Breeding:** This RFP focuses on using advanced genomic approaches to breed crop varieties resilient to multiple biotic and abiotic stresses in the context of climate change.

   For example, drought and heat stress occur together, as do salinity and heat stress in coastal areas. Light stress is also common with drought and heat stress. However, abiotic stress can predispose the plants to biotic stress. For example, drought makes corn more susceptible to Aspergillus flavus to cause aflatoxin contamination; waterlogged rice become more susceptible to blast disease by Magnaporthe oryzae; salt stressed barley is more prone to Fusarium root rot and heat-stressed tomato plants are more susceptible to *Botrytis cinerea* (gray mold). Abiotic stresses affect plants, especially cereal crops differentially during the vegetative and reproductive phases and the genetic or agronomic solutions may be different for the two phases. Hence this call will look into:

   - Leveraging gene discovery, genome editing, and speed breeding techniques to address a wide spectrum of stresses occurring simultaneously. Employing high-throughput phenotyping platforms and AI/ML-based advisory tools to enhance integration with genomic and climate models for delivering real-time, actionable insights to smallholder farmers.
   - Driving innovations through biofortification, millet-derived trait engineering, and vegetative propagation methods such as grafting and tissue culture to fast-track next-generation resilient crop varieties for climate-adaptive and nutritious agriculture.

   The **outcome** of this proposal should be to build a pipeline of climate-resilient, nutritionally enriched, and rapidly deployable crop varieties that empower smallholder farmers and enhance food system sustainability.

2. **Sustainable Soil, Water, and Carbon Management for Climate Mitigation:** This RFP focuses on improving soil, water, and carbon management to support climate mitigation through low-emission and resource-efficient practices. Key priorities include developing microbial and genetic solutions to reduce fertilizer use, promoting Conservation

Agriculture, and creating a standardized Carbon Monitoring, Reporting, and Verification (MRV) platform cognizing for the Indian context and yet globally acceptable. For example, a Direct Seeded Rice system that reduces not just methane emission, but also nitrous oxide emissions.

- Must implement climate-smart agriculture by enhancing soil health, reducing emissions, and improving resource-use efficiency through biological inputs, precision tools, and regenerative practices.

- The aim should be to reduce methane emissions in rice and livestock systems by utilizing microbiome strategies and optimizing resource inputs. The proposals that involve novel and innovative practises other than DSR, ZT and raised bed methods would be of interest.

The **outcome** of this RFP should be to promote methane reduction, real-time monitoring, and a blockchain-based carbon MRV system cognizing for the Indian context to enable low-emission farming and create new income opportunities for Indian farmers.

3. **Research based Climate-Adaptive Mechanization and Precision Agriculture – Tools, Techniques, Apps and Digital Advisory Systems:** This RFP focuses on developing affordable, sensor-based mechanization and precision tools tailored for smallholder farmers. It should emphasize IoT-driven irrigation and stress detection, small-scale machinery, farmer training, and participatory models to enhance productivity and climate resilience. It must deliver affordable, sensor-based mechanization and IoT tools for smallholders to improve input efficiency, reduce costs, and build climate resilience.

   The outcome of this proposal should be to deliver field-ready precision tools, real-time decision support systems, and inclusive capacity-building frameworks that empower smallholders to adopt climate-resilient farming practices.

4. **Agro-ecology and Diversified Farming Systems for Nutrition and Resilience:** This RFP aims to promote region-specific, diversified farming systems that enhance climate resilience, nutritional security, and income stability for farming communities. For example, the rice:fish:chicken system in rice, which improves income, nutrition, soil health and sustainability. The Proposals should:

- Leverage crop and gene diversity through multi-cropping models, integration of functional foods, and innovative value chains, with a special emphasis on urban and peri-urban nutrition strategies.

- Promote best agronomic practices, consumer behaviour research, nutrition trends and market linkages to ensure adoption and impact.

The **outcome** of this proposal should be to establish climate-resilient, nutrition-sensitive farming systems that valorize local biodiversity and deliver health, economic, and ecological benefits.

5. **Predicting, Preventing, and Managing Climate-Induced Pest and Disease Outbreaks:** This RFP aims to tackle the increasing threat of climate-driven pest and disease outbreaks by integrating plant science, climate modeling, and digital innovation. The focus area is to predict outbreaks using AI/ML, breeding for resistance using modern tools, studying

climate impacts on pest behavior, and deploying real-time monitoring and advisory systems. It can include ideas to strengthen quarantine practices as a prevention strategy.

The **outcome** of this proposal should be strengthening sustainable agriculture through early alerts, reduced pesticide use, stronger quarantine systems, and community adoption of climate-resilient practices.

D. Key Components of the Letter of Intent (LoI):

- Details to be filled in Table 1 (Annexed).
- Clear evidence of pre-submission consortium discussions for respective work packages and how they integrate
- Name and Contact Information (all the PIs involved)
- Research Organizations Involved: State the various organizations/institutes involved. Indicate clearly the primary applicant (point person for communication and spearheading the proposal), secondary applicant/s and collaborators.
- Proposed Research Programme: (Limit 1,000 words)
  - Research Question- Type of problem being solved
  - Hypothesis
  - Brief Methodology
  - Novelty of the proposal/ How it is different from existing body of work
  - Deliverables
  - Importance / Criticality for Indian agriculture
- Expertise of the group: Indicate the expertise within the group to drive the proposal to fruition (200 words).
- Impact of proposed work on: (a) Social, (b) Environmental, (c) Health (d) Farmer/agri-centric, and (e) Economic dimensions. (250 words each)

E. Duration and Funding quantum:

- 3 years (extendable for additional 2 years upon review)
- Up to Rs. 1 Crore per year.

F. Who can apply?

Scientists or teams of Scientists who can on-board other specialities/expertise necessary for implementation of interdisciplinary work can apply. Interdisciplinary and multi-institutional consortia comprising any combination of academic institutions, public research bodies, and private entities listed below:

- Central, State, Private and Deemed Universities
- National Institutes (e.g., ICAR, ICMR, CSIR, IITs, NITs, IISERs)
- ICRISAT
- State Agricultural Universities (SAUs)
- Public-funded research organizations and Labs
- Krishi Vigyan Kendras (KVKs)
- Rural Innovation Centres and Incubators
- Public-Private Partnerships (PPPs)
- Farmer Producer Organizations (FPOs)

  - NGOs working in sustainable agriculture, natural farming, and climate resilience (foundations having research facilities, scientists, and have DSIR certification)
  - Municipal bodies engaged in urban agriculture and nutrition
  - Agri-tech companies and climate-tech innovators
  - Startups and SME (small and medium enterprises)

G. How to apply

- Please register at Ignite’s grant management software.
- Fill in all the information required to create your profile.
- Once logged in, you will get the Grant details on the dashboard.
- Click "Apply" and upload all the required documents before submitting the application.
- You may upload the LoI and Table 1 as separate files under the proposal folder in the software. (Please find the reference Table 1 in the Grant details folder. Kindly download the table sheet, make the necessary edits, and submit it with LoI).
- Click here to register and apply: https://grant-management.ignitelsf.in/
- The last date for submitting the LoI is **28th September 2025**.
- Alternatively, only if there is an issue with the website, you may upload the submissions to ambika@ignitelsf.in (Please make sure you inform of these issues before emailing us).

H. LoI Submission Deadline:

- 30 days from the publication of this announcement.

- Successful candidate(s) from Phase 1 will be invited for face-to-face interaction and submitting their full application within 45-60 days of submission of LoI.

- **Criteria of selection:** In this call, only the research proposals for building networks or clusters between institutions and involving investigators of different disciplines, will be considered. Therefore, the LOIs will need to:

  - Be Multidisciplinary and reflect inter-institutional collaboration
  - Have Clear objectives
  - Clearly articulate short-term and long-term deliverables
  - Clear Impact statement

The decision of the Scientific Advisory Board of Ignite will be considered final and binding.

I. Point of Contact:

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Head - Program Management
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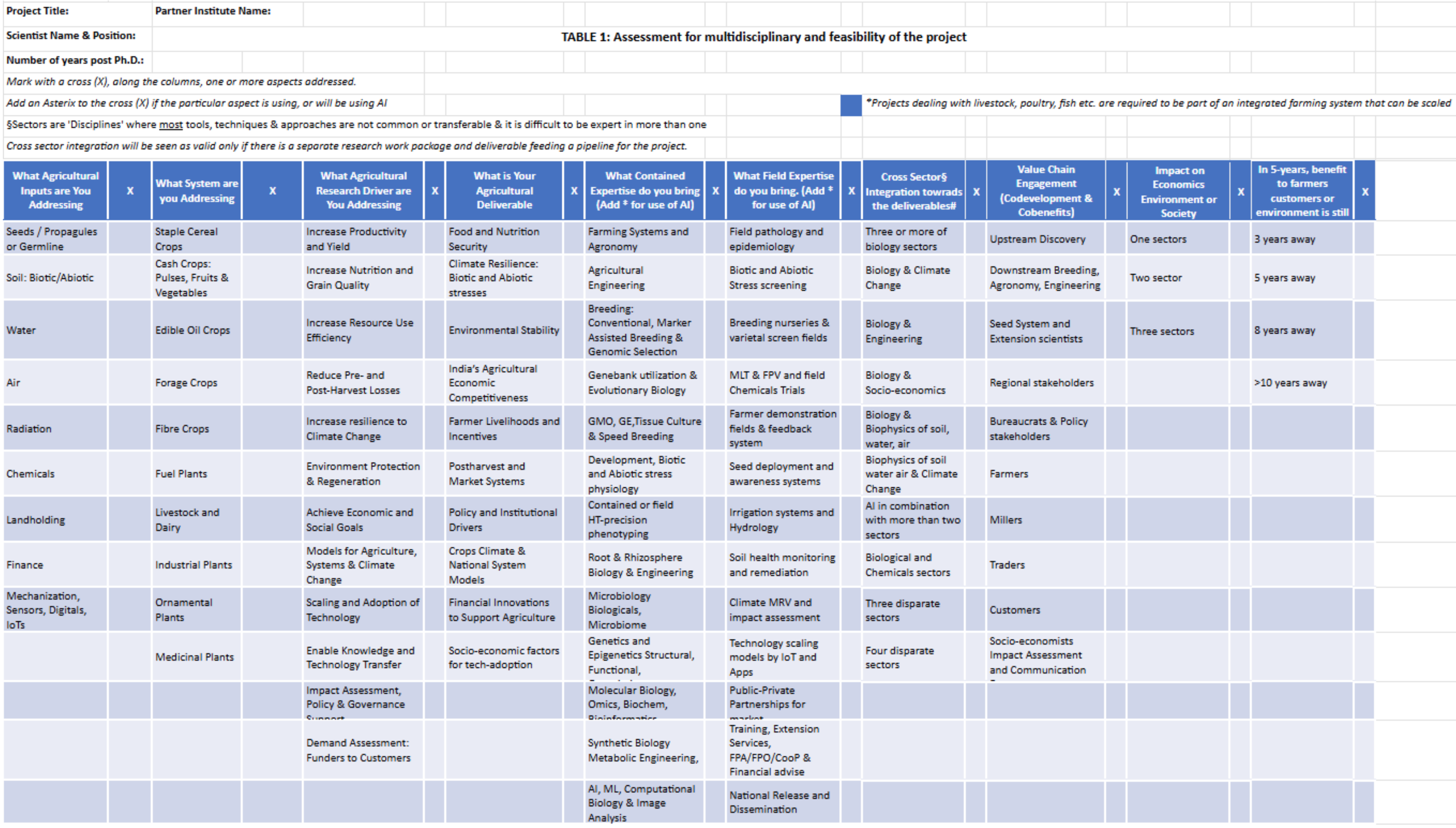
ANNEXURE

Table 1

This is a reference image for Table 1 that can be downloaded from the Grant details in the Grant management portal for your submissions.



Project Title: **Partner Institute Name:**

Scientist Name & Position:

TABLE 1: Assessment for multidisciplinary and feasibility of the project

Number of years post Ph.D.:

Mark with a cross (X), along the columns, one or more aspects addressed.

Add an Asterix to the cross (X) if the particular aspect is using, or will be using AI

🟦 *****Projects dealing with livestock, poultry, fish etc. are required to be part of an integrated farming system that can be scaled*

§Sectors are 'Disciplines' where <u>most</u> tools, techniques & approaches are not common or transferable & it is difficult to be expert in more than one

Cross sector integration will be seen as valid only if there is a separate research work package and deliverable feeding a pipeline for the project.

What Agricultural Inputs are You Addressing	X	What System are you Addressing	X	What Agricultural Research Driver are You Addressing	X	What is Your Agricultural Deliverable	X	What Contained Expertise do you bring (Add * for use of AI)	X	What Field Expertise do you bring. (Add * for use of AI)	X	Cross Sector§ Integration towrads the deliverables#	X	Value Chain Engagement (Codevelopment & Cobenefits)	X	Impact on Economics Environment or Society	X	In 5-years, benefit to farmers customers or environment is still	X
Seeds / Propagules or Germline		Staple Cereal Crops		Increase Productivity and Yield		Food and Nutrition Security		Farming Systems and Agronomy		Field pathology and epidemiology		Three or more of biology sectors		Upstream Discovery		One sectors		3 years away	
Soil: Biotic/Abiotic		Cash Crops: Pulses, Fruits & Vegetables		Increase Nutrition and Grain Quality		Climate Resilience: Biotic and Abiotic stresses		Agricultural Engineering		Biotic and Abiotic Stress screening		Biology & Climate Change		Downstream Breeding, Agronomy, Engineering		Two sector		5 years away	
Water		Edible Oil Crops		Increase Resource Use Efficiency		Environmental Stability		Breeding: Conventional, Marker Assisted Breeding & Genomic Selection		Breeding nurseries & varietal screen fields		Biology & Engineering		Seed System and Extension scientists		Three sectors		8 years away	
Air		Forage Crops		Reduce Pre- and Post-Harvest Losses		India's Agricultural Economic Competitiveness		Genebank utilization & Evolutionary Biology		MLT & FPV and field Chemicals Trials		Biology & Socio-economics		Regional stakeholders				>10 years away	
Radiation		Fibre Crops		Increase resilience to Climate Change		Farmer Livelihoods and Incentives		GMO, GE,Tissue Culture & Speed Breeding		Farmer demonstration fields & feedback system		Biology & Biophysics of soil, water, air		Bureaucrats & Policy stakeholders					
Chemicals		Fuel Plants		Environment Protection & Regeneration		Postharvest and Market Systems		Development, Biotic and Abiotic stress physiology		Seed deployment and awareness systems		Biophysics of soil water air & Climate Change		Farmers					
Landholding		Livestock and Dairy		Achieve Economic and Social Goals		Policy and Institutional Drivers		Contained or field HT-precision phenotyping		Irrigation systems and Hydrology		AI in combination with more than two sectors		Millers					
Finance		Industrial Plants		Models for Agriculture, Systems & Climate Change		Crops Climate & National System Models		Root & Rhizosphere Biology & Engineering		Soil health monitoring and remediation		Biological and Chemicals sectors		Traders					
Mechanization, Sensors, Digitals, IoTs		Ornamental Plants		Scaling and Adoption of Technology		Financial Innovations to Support Agriculture		Microbiology Biologicals, Microbiome		Climate MRV and impact assessment		Three disparate sectors		Customers					
		Medicinal Plants		Enable Knowledge and Technology Transfer		Socio-economic factors for tech-adoption		Genetics and Epigenetics Structural, Functional,		Technology scaling models by IoT and Apps		Four disparate sectors		Socio-economists Impact Assessment and Communication					
				Impact Assessment, Policy & Governance				Molecular Biology, Omics, Biochem,		Public-Private Partnerships for									
				Demand Assessment: Funders to Customers				Synthetic Biology Metabolic Engineering,		Training, Extension Services, FPA/FPO/CooP & Financial advise									
								AI, ML, Computational Biology & Image Analysis		National Release and Dissemination									